



BOARD OF TRUSTEES

REGULAR MEETING AGENDA

December 8, 2021
7:00 PM
9900 Park Avenue
Firestone, CO 80504

PRE-MEETING WORK SESSION 6:30 PM IN THE TRAINING ROOM

AGENDA FOR THE WORK SESSION IS A DISCUSSION OF THE REGULAR MEETING AGENDA BELOW

REGULAR MEETING 7:00 PM IN THE COURT ROOM

1. **Call to Order & Roll Call**
2. **Pledge of Allegiance**
3. **Approval of Agenda**
4. **Public Comment** *(maximum time permitted for all Public Comment is 30 minutes)
5. **Consent Agenda**
 - 5.a. Approval of November 17, 2021 Meeting Minutes
 - b. **Ordinance 1001:** AN ORDINANCE OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, VACATING A PORTION OF A PUBLIC GAS LINE EASEMENT WITHIN LOT 10, BLOCK 1, DEL CAMINO JUNCTION BUSINESS PARK PUD
 - c. **Ordinance 1002:** AN ORDINANCE OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO AMENDING ORDINANCE NO. 996 CONCERNING THE ANNEXATION OF PROPERTY KNOWN AS FIRESTONE COUNTY ROAD 19 ANNEXATION NOS. 1 THROUGH 8 TO CORRECT AN ERROR IN THE LEGAL DESCRIPTION OF ANNEXATION PARCEL NO. 8
 - d. **Resolution 21-201:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING A FINAL SUBDIVISION PLAT; AND ACCEPTING THE PROPERTY INTERESTS DEDICATED BY THE FINAL PLAT FOR CERTAIN REAL PROPERTY LOCATED WITHIN BAREFOOT LAKES FILING NO. 4, 1ST REPLAT; AUTHORIZING A SUBDIVISION DEVELOPMENT AGREEMENT PERTAINING TO THE BAREFOOT LAKES FILING NO. 4, 1ST REPLAT

* Individuals that desire to address the Board of Trustees are requested to sign up at the table at the entrance to the meeting room. Individuals are allotted 3 minutes of Public Comment during the entirety of the meeting. Maximum time permitted for all Public Comment during a meeting is 30 minutes.

If you need special assistance in order to participate in a Board of Trustees meeting, please contact the Town Clerk's Office at 303-531-6264 in advance of the meeting to make arrangements. A forty-eight-hour notice is requested.

- e. **Resolution 21-211:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO APPROVING THE PARTIAL ASSIGNMENT OF INTEREST IN THE SUBDIVISION AGREEMENT FOR BAREFOOT LAKES, FILING NO. 4, 1ST REPLAT FROM BAREFOOT, LLC TO RICHMOND AMERICAN HOMES OF COLORADO, INC.
- f. **Resolution 21-202:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING A PROFESSIONAL SERVICES CONTRACT MASTER SERVICES AGREEMENT BETWEEN THE TOWN OF FIRESTONE AND LEONARD RICE CONSULTING WATER ENGINEERS, INC.
- g. **Resolution 21-203:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING AN AGREEMENT BETWEEN THE TOWN OF FIRESTONE AND BISHOP LAYTON INC DBA DESIGN CONCEPTS FOR THE PREPARATION OF FRONT END SPECIFICATIONS FOR PARKS CONSTRUCTION PROJECTS AND PARKS TRAILS AND OPEN SPACE STANDARDS
- h. **Resolution 21-204:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING AN ENGINEERING SERVICES AGREEMENT BETWEEN THE TOWN OF FIRESTONE AND PLUMMER ASSOCIATES, INC., REGARDING THE WATER TREATMENT PLANT PROJECT
- i. **Resolution 21-205:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, ADOPTING THE TOWN OF FIRESTONE DESIGN STANDARDS AND CONSTRUCTION SPECIFICATIONS FOR PUBLIC IMPROVEMENTS, 2022 EDITION
- j. **Resolution 21-206:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, ADOPTING A FIRESTONE POLICE DEPARTMENT RECORDS FEE SCHEDULE
- k. **Resolution 21-212:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING THE COLORADO OPIOIDS SETTLEMENT MEMORANDUM OF UNDERSTANDING AND ASSOCIATED SETTLEMENT DOCUMENTS

6. Presentation

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- a. Frederick-Firestone Fire Protection District 2021 Third Quarter Service Report

7. Land Development

- a. **PUBLIC HEARING: Ordinance 1003:** AN ORDINANCE OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO AMENDING SECTIONS 16.2.3, 16.2.5, 16.3.3, 16.4.2, 16.5.4, 16.6.2, 16.6.3, 16.6.4, 16.6.5, 16.6.7, 16.6.12, 16.11.3, AND TABLES 3-1, 4-1 AND 6.12-6 OF CHAPTER 16.04 (FIRESTONE DEVELOPMENT CODE) OF TITLE 16 OF THE FIRESTONE MUNICIPAL CODE

8. Discussion/Action

- a. **Resolution 21-200:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, LEVYING GENERAL PROPERTY TAXES FOR THE 2021 TAX YEAR, TO HELP DEFRAY THE COSTS OF GOVERNMENT FOR THE TOWN OF FIRESTONE, COLORADO, FOR THE 2022 FISCAL YEAR
- b. **Resolution 21-199:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, PRESCRIBING THE TOWN OF FIRESTONE'S WATER RATES, FEES, TOLLS AND CHARGES AND STORAGE AND INFRASTRUCTURE INVESTMENT FEES
- c. Motion to Cancel December 22, 2021 Board of Trustees Regular Meeting
- d. **Resolution 21-207:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, ACTING BY AND THROUGH ITS WATER ACTIVITY ENTERPRISE APPROVING A PURCHASE AND SALE AGREEMENT WITH JAMIE BYBEE
- e. **Resolution 21-209:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING CHANGE ORDER NO.1 TO THE AGREEMENT BETWEEN THE TOWN OF FIRESTONE AND INTEGRATED WATER SERVICES INC FOR CONSTRUCTION OF A PUMP STATION FOR THE ST. VRAIN WATER TREATMENT PLANT
- f. **Resolution 21-210:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING AN AGREEMENT BETWEEN THE TOWN OF FIRESTONE AND LAYNE CHRISTENSEN

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COMPANY FOR EXISTING WELL MODIFICATIONS FOR THE ST. VRAIN
WATER TREATMENT PLANT PROJECT

9. Public Comment *(maximum time permitted for all Public Comment is 30 minutes)

10. Reports

10.a. Staff - Deputy Clerk to confirm with Board preference on Municipal Judge interviews

10.a.i. November Monthly Board Reports

10.b. Mayor

10.c. Trustees

11. Executive Session

- a.** An executive session pursuant to C.R.S. 24-6-402(4)(e)(I) for determining positions relative to matters that may be subject to negotiations, developing strategy for negotiations, and instructing negotiators and C.R.S. 24-6-402(4)(b) for a conference with an attorney for the Town for the purpose of receiving legal advice on specific legal questions concerning litigation issues regarding Central Weld County Water Districts service to the Town

12. Adjournment

* Individuals that desire to address the Board of Trustees are requested to sign up at the table at the entrance to the meeting room. Individuals are allotted 3 minutes of Public Comment during the entirety of the meeting. Maximum time permitted for all Public Comment during a meeting is 30 minutes.

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**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 5.a

Consent Agenda

Meeting Date: December 8, 2021

Initiated By: Jessica Koenig

Dept: Town Clerk

AGENDA TITLE

Approval of November 17, 2021 Meeting Minutes

SUMMARY

HISTORY AND PREVIOUS BOARD ACTION

RECOMMENDATION

Approval of November 17, 2021 Meeting Minutes.

ALTERNATIVES

ATTACHMENTS

1. November 17, 2021 Draft Meeting Minutes

FINANCIAL CONSIDERATIONS

TOWN OF FIRESTONE, COLORADO
Board of Trustees Special Meeting
MINUTES
November 17, 2021

1. Call to Order & Roll Call

The Board of Trustees of the Town of Firestone met for a Special Meeting on November 17, 2021, at the Police Department & Municipal Court building, 9900 Park Avenue, Firestone, Colorado. Mayor Sindelar called the meeting to order at 7:22 PM.

The following were present upon the call of the roll:

Mayor: Bobbi Sindelar
Mayor Pro-tem: Frank A. Jimenez
Trustees: Don Conyac
David Whelan
Samantha Meiring
Sean Doherty
Doug Sharp

Staff: **Present:** Jan Sloat, Director of Human Resources; Paula Mehle, Director of FURA & Economic Development; Raelynn Ferrera, Assistant to the Town Manager; Jessica Clanton, Director of Finance; Julie Pasillas, Director of Public Works; Todd Bjerkaas, Director of Planning; Marty Ostholhoff, Planning Manager; Jessica Koenig, Town Clerk; AJ Krieger, Town Manager; & Mary Lynn Macsalka, Town Attorney

2. Pledge of Allegiance

Mayor Sindelar led the pledge of allegiance.

3. Approval of Agenda

Motion by Trustee Whelan, **second** by Trustee Meiring, to Approve the Agenda, All in Favor, **Motion carried.**

4. Public Comment *(maximum time permitted for all Public Comment is 30 minutes)

There was no one present that wished to give public comment.

5. Consent Agenda

Motion by Trustee Meiring, **second** by Trustee Doherty, to Approve the Consent Agenda
Roll Call Vote:

Yes: Trustee Conyac, Trustee Whelan, Trustee Meiring, Mayor Pro Tem Jimenez, Trustee Doherty, Trustee Sharp

No: None

Abstain: None

Motion carried.

- a. Approval of November 10, 2021 Meeting Minutes

6. Presentation

- a. Historic Firestone Neighborhood Plan Update Presentation

7. Discussion/Action

- a. **PUBLIC HEARING: Resolution 21-117:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, ADOPTING A BUDGET FOR THE FISCAL YEAR OF 2022 AND APPROPRIATING SUMS FOR AND DEFRAYING THE EXPENSES AND LIABILITIES FOR THE FISCAL YEAR BEGINNING JANUARY 1, 2022 AND ENDING DECEMBER 31, 2022 IN ACCORDANCE WITH THE STATUTES OF THE STATE OF COLORADO

Mayor Sindelar opened the public hearing for Resolution 21-117 at 8:37 PM.

Jessica Clanton, Finance Director, presented to the Board of Trustees.

Mayor Sindelar closed the public comment portion of the public hearing at 8:40 PM.

Motion by Trustee Conyac, **second** by Trustee Whelan, to Approve **Resolution 21-117**: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, ADOPTING A BUDGET FOR THE FISCAL YEAR OF 2022 AND APPROPRIATING SUMS FOR AND DEFRAYING THE EXPENSES AND LIABILITIES FOR THE FISCAL YEAR BEGINNING JANUARY 1, 2022 AND ENDING DECEMBER 31, 2022 IN ACCORDANCE WITH THE STATUTES OF THE STATE OF COLORADO

Roll Call Vote:

Yes: Trustee Conyac, Trustee Whelan, Trustee Meiring, Mayor Pro Tem Jimenez, Trustee Doherty, Trustee Sharp

No: None

Abstain: None

Motion carried.

- b. **Resolution 21-118:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROPRIATING SUMS OF MONEY TO THE VARIOUS FUNDS AND SPENDING AGENCIES, IN THE AMOUNTS AND FOR THE PURPOSES AS SET FORTH BELOW, FOR THE 2022 FISCAL YEAR

Motion by Mayor Pro Tem Jimenez, **second** by Trustee Conyac, to Approve **Resolution 21-118**: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE,

COLORADO, APPROPRIATING SUMS OF MONEY TO THE VARIOUS FUNDS AND SPENDING AGENCIES, IN THE AMOUNTS AND FOR THE PURPOSES AS SET FORTH BELOW, FOR THE 2022 FISCAL YEAR

Roll Call Vote:

Yes: Trustee Conyac, Trustee Whelan, Trustee Meiring, Mayor Pro Tem Jimenez, Trustee Doherty, Trustee Sharp

No: None

Abstain: None

Motion carried.

- c. **Resolution 21-109:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, ACTING BY AND THROUGH ITS WATER ACTIVITY ENTERPRISE APPROVING A PURCHASE AND SALE AGREEMENT WITH BAREFOOT LLC

Mayor Sindelar recused herself from Agenda Item 7c as she is employed by Barefoot, LLC. Mayor Pro Tem Jimenez served as presiding officer for Agenda Item 7c.

Motion by Trustee Sharp, **second** by Trustee Doherty, to Approve **Resolution 21-109:** A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, ACTING BY AND THROUGH ITS WATER ACTIVITY ENTERPRISE APPROVING A PURCHASE AND SALE AGREEMENT WITH BAREFOOT LLC

Roll Call Vote:

Yes: Trustee Conyac, Trustee Whelan, Trustee Meiring, Mayor Pro Tem Jimenez, Trustee Doherty, Trustee Sharp

No: None

Abstain: None

Motion carried.

- d. Live Streaming Meetings Discussion

8. **Public Comment** *(maximum time permitted for all Public Comment is 30 minutes)

There was no one present that wished to give public comment.

9. **Reports**

10. **Adjournment**

Motion by Mayor Pro Tem Jimenez, **second** by Trustee Conyac, adjourn at 9:12 PM, All in Favor, **Motion carried.**

Introduced and Approved the DAY of MONTH YEAR

TOWN OF FIRESTONE, COLORADO

ATTEST

Bobbi Sindelar, Mayor

Jessica Koenig, Town Clerk

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 5.b

Consent Agenda

Meeting Date: December 8, 2021

Initiated By: Marty Ostholt

Dept: Planning & Development

AGENDA TITLE

Ordinance 1001: AN ORDINANCE OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, VACATING A PORTION OF A PUBLIC GAS LINE EASEMENT WITHIN LOT 10, BLOCK 1, DEL CAMINO JUNCTION BUSINESS PARK PUD

SUMMARY

FlexSpace, LLC, the owner of Lot 10, Block1, Del Camino Junction Business Park PUD has requested that the public interest in a fifty-foot gas line easement be vacated. The vacation of the public interest in the gas line easement on Lot 10, Block 1, Del Camino Junction Business Park PUD will allow for more flexibility in the development of this lot in the future.

HISTORY AND PREVIOUS BOARD ACTION

The Fort Junction PUD Filing No. 1 subdivision plat was approved/recorded by Weld County in 1994. This subdivision plat created and dedicated to the public a fifty-foot gas line easement. In 1999, the Town of Firestone annexed the Fort Junction PUD Filing No. 1 subdivision into Firestone and subsequently re-subdivided the property as Del Camino Junction Business Park PUD. This re-subdivision created Lot 10, Block1, Del Camino Junction Business Park PUD with the fifty-foot gas line easement.

RECOMMENDATION

Town staff recommends the Board of Trustees approve Ordinance 1001.

ALTERNATIVES

n/a

ATTACHMENTS

1. Ordinance 1001

FINANCIAL CONSIDERATIONS

n/a

ORDINANCE NO. 1001

**AN ORDINANCE OF THE BOARD OF TRUSTEES OF THE TOWN OF
FIRESTONE, COLORADO, VACATING A PORTION OF A PUBLIC GAS
LINE EASEMENT WITHIN LOT 10, BLOCK 1, DEL CAMINO
JUNCTION BUSINESS PARK**

WHEREAS, the Fort Junction PUD Filing No.1 Subdivision plat, which was recorded in the Weld County Clerk and Recorder's Office on June 6, 1994, dedicated to the public a fifty-foot gas line easement ("Easement") across Lot 1, Fort Junction PUD Filing No. 1; and

WHEREAS, Lot 1, Fort Junction PUD Filing No. 1 was eventually annexed into the Town and subsequently re-subdivided into the Del Camino Junction Business Park in or around December 1999, creating Lot 10, Block 1, Del Camino Junction Business Park ("Property"); and

WHEREAS, the Easement presently traverses the eastern portion of the Property; and

WHEREAS, no public utility or other governmental unit currently utilizes the Easement to provide gas line infrastructure at Del Camino Junction Business Park for the benefit of the public at-large or to the Property, itself; and

WHEREAS, FlexSpace, LLC, as owner of the Property, has submitted a request to vacate a portion of the Easement traversing across the Property, as described and depicted on **Exhibit A** attached hereto; and

WHEREAS, the Board of Trustees finds and determines the public interest (i.e. the Easement) encumbering the Property is no longer necessary for the public use and convenience.

NOW, THEREFORE, BE IT ORDAINED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

Section 1. That certain public gas line easement within Lot 10, Block 1, Del Camino Junction Business Park PUD, as depicted and described in **Exhibit A**, shall be vacated.

Section 2. The Town Clerk is directed to record this ordinance with the Weld County Clerk and Recorder's Office, which shall indicate the effective date of the vacation authorized under this Ordinance No. 1001.

Section 3. The Board of Trustees directs that a certified copy of this Ordinance be filed with the Town Clerk and further, the Town Clerk index, file and make the Ordinance available to the public.

Section 4. If any article, section, paragraph, sentence, clause or phrase of this ordinance is held to be unconstitutional or invalid for any reason, such decision shall not affect the validity or constitutionality of the remaining portions of this ordinance. The Board of Trustees hereby declares that it would have passed this ordinance and each part or parts hereof irrespective of the fact that any one part or parts be declared unconstitutional or invalid.

Section 5. All other ordinances or portions thereof inconsistent or conflicting with this ordinance or any portion hereof is hereby repealed to the extent of such inconsistency or conflict.

INTRODUCED, READ, ADOPTED, APPROVED, AND ORDERED PUBLISHED IN
FULL this __th day of _____, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

APPROVED AS TO FORM:

Jessica Koenig, Town Clerk

William P. Hayashi, Town Attorney

Exhibit A
Easement to be Vacated

GASLINE EASEMENT VACATION EXHIBIT

GASLINE VACATION DESCRIPTION

THIS DESCRIPTION IS BASED ON A SCALED LOCATION OF THE 50' GASLINE EASEMENT AS SHOWN ON REC. NO. 2391966 FORT JUNCTION PUD, FIRST FILING.

THE PORTION OF THE 50' GASLINE EASEMENT OVER AND ACROSS LOT 10, FORT JUNCTION PUD, FIRST FILING, LOCATED IN THE SOUTHWEST QUARTER OF SECTION 2, TOWNSHIP 2 NORTH, RANGE 68 WEST OF THE 6TH P.M., BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

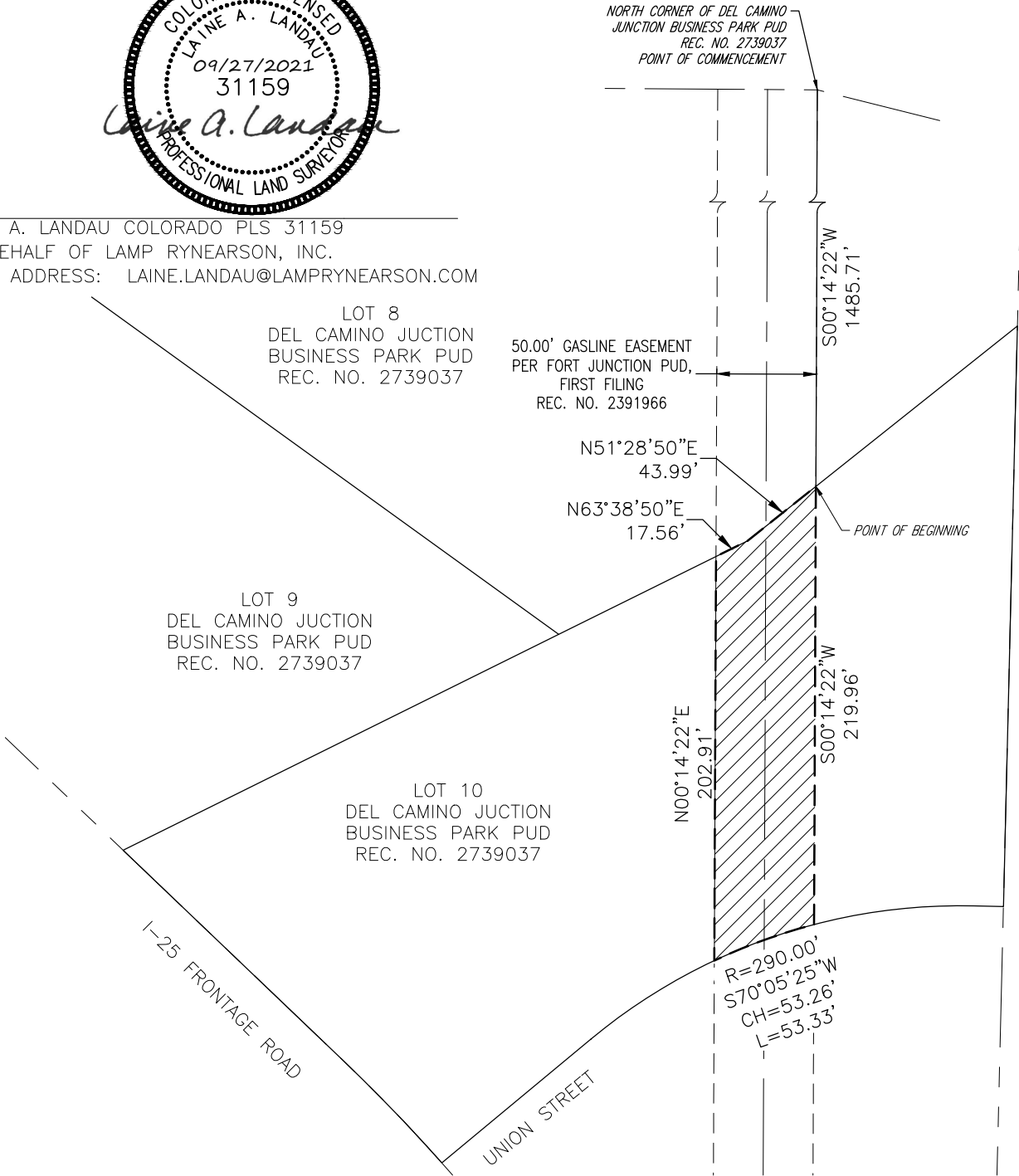
COMMENCING AT THE NORTHERLY CORNER OF THE DEL CAMINO JUCTION BUSINESS PARK PUD, REC. NO. 2739037, THENCE SOUTH 00°14'22" WEST ON THE EAST LINE OF AN EXISTING 50' GASLINE EASEMENT, REC. NO. 2391966 FOR 1485.71 FEET TO THE NORTHERLY LINE OF LOT 10 OF SAID DEL CAMINO JUCTION BUSINESS PARK PUD, SAID POINT BEING THE POINT OF BEGINNING;
THENCE CONTINUING ON THE EAST LINE OF SAID GASLINE EASEMENT SOUTH 00°14'22" WEST FOR 219.96 FEET TO THE SOUTH LINE OF SAID LOT 10, SAID POINT BEING THE BEGINNING OF A NON-TANGENT CURVE TO THE LEFT;
THENCE 53.33 FEET ON THE SOUTH LINE OF SAID LOT 10 ON THE ARC OF SAID NON-TANGENT CURVE TO THE LEFT, HAVING A RADIUS OF 290.00 FEET AND BEING SUB-TENDED BY A CHORD BEARING SOUTH 70°05'25" WEST FOR 53.26 FEET;
THENCE NORTH 00°14'22" EAST FOR 202.91 FEET TO THE NORTH LINE OF SAID LOT 10;
THENCE ON THE NORTH LINE OF SAID LOT 10 FOR THE FOLLOWING 2 COURSES:
1. THENCE NORTH 63°38'50" EAST FOR 17.56 FEET;
2. THENCE NORTH 51°28'50" EAST FOR 43.99 FEET TO THE POINT OF BEGINNING.

SAID GASLINE VACATION HAS AN AREA OF 10,447 SQUARE FEET, 0.240 ACRES MORE OR LESS.

PREPARED BY:



LAINE A. LANDAU COLORADO PLS 31159
ON BEHALF OF LAMP RYNEARSON, INC.
EMAIL ADDRESS: LAINE.LANDAU@LAMPRYNEARSON.COM



**LAMP
RYNEARSON**

LAMPRYNEARSON.COM

OMAHA, NEBRASKA
14710 W. DODGE RD., STE. 100 (402)496.2498
FORT COLLINS, COLORADO
4715 INNOVATION DR., STE. 100 (970)226.0342
KANSAS CITY, MISSOURI
9001 STATE LINE RD., STE. 200 (816)561.0440

DESIGNER / DRAFTER
JOSH CROAK

REVIEWER
LAINE LANDAU

PROJECT NUMBER
0221031.01

DATE
09/27/2021

SURFACE LOCATION

BOOK AND PAGE

GASLINE
EASEMENT VACATION
EXHIBIT

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 5.c

Consent Agenda

Meeting Date: December 8, 2021

Initiated By: Marty Ostholt

Dept: Planning & Development

AGENDA TITLE

Ordinance 1002: AN ORDINANCE OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO AMENDING ORDINANCE NO. 996 CONCERNING THE ANNEXATION OF PROPERTY KNOWN AS FIRESTONE COUNTY ROAD 19 ANNEXATION NOS. 1 THROUGH 8 TO CORRECT AN ERROR IN THE LEGAL DESCRIPTION OF ANNEXATION PARCEL NO. 8

SUMMARY

On July 14, 2021, the Board of Trustees annexed road right-of-way for a portion of County Road 19 through the adoption of Ordinance 996. Upon recordation, Weld County determined that a part of the County Road 19 Annexation No. 8 ("Annexation 8") erroneously included a part of County Road 19 that had previously been annexed into the Town of Platteville. Ordinance 1002 modifies Ordinance 996, including the legal description for Annexation 8 by removing that portion of County Road 19 previously annexed into Platteville.

HISTORY AND PREVIOUS BOARD ACTION

See summary.

RECOMMENDATION

Town staff recommends the Board of Trustees approve Ordinance 1002.

ALTERNATIVES

n/a

ATTACHMENTS

1. Ordinance 1002

FINANCIAL CONSIDERATIONS

n/a

ORDINANCE NO. 1002

AN ORDINANCE OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO AMENDING ORDINANCE NO. 996 CONCERNING THE ANNEXATION OF PROPERTY KNOWN AS FIRESTONE COUNTY ROAD 19 ANNEXATION NOS. 1 THROUGH 8 TO CORRECT AN ERROR IN THE LEGAL DESCRIPTION OF ANNEXATION PARCEL NO. 8

WHEREAS, the Board of County Commissioners of Weld County (“County”) submitted a petition for annexation of certain portions of Weld County Road 19 (“CR 19 Annexation”) to the Town Clerk of the Town of Firestone; and

WHEREAS, the Board of Trustees adopted Resolution No. 21-63, finding substantial compliance and initiating serial annexation proceedings for the CR 19 Annexation; and

WHEREAS, the Board of Trustees further adopted Resolution No. 21-84 setting forth findings of fact and determinations regarding the eligibility of the CR 19 Annexation; and

WHEREAS, on July 14, 2021, the Board of Trustees adopted Ordinance No. 996 (“Ordinance 996”), annexing the property known as Firestone County Road 19 Annexation Nos. 1 through 8, as more particularly described in Exhibit A attached and incorporated as part of Ordinance 996; and

WHEREAS, Exhibit A of Ordinance 996 includes legal descriptions for eight segments of Weld County Road 19 to be annexed in a serial manner; and

WHEREAS, the legal description of the annexation parcel identified in Exhibit A of Ordinance 996 as Annexation No. 8 (“Annexation Parcel No. 8”) erroneously included a portion of Weld County Road 19 already annexed into and lying within the corporate limits of the Town of Platteville (“Platteville”), as illustrated in the attached **Exhibit 1** (“Overlapping Annexation Parcel”); and

WHEREAS, the Board of Trustees did not intend to annex the Overlapping Annexation Parcel and therefore desires to correct such surveying error through this Ordinance; and

WHEREAS, the Board of Trustees finds that such error does not affect the overall CR 19 Annexation as Annexation No. 8 is the last segment of the serial CR 19 Annexation; and

WHEREAS, the Town’s surveyor has revised the legal description and associated map to correct the error in legal description, attached as **Exhibit A**; and

WHEREAS, in accordance with C.R.S. Section 31-12-113(2), the Town has completed the statutory filings for the CR 19 Annexation and this correction ordinance shall have no effect on the finality of the CR 19 Annexation; and

WHEREAS, the Board of Trustees finds that it is in the best interests of the Town to amend Ordinance 996 to correct the legal description for Annexation Parcel No. 8 so as to avoid any future ambiguity or conflict in the Town's or Platteville's corporate boundaries.

NOW THEREFORE, BE IT ORDAINED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, THAT:

Section 1. The recitals contained above are incorporated herein by reference and are adopted as findings and determinations of the Board of Trustees.

Section 2. The property as more particularly described in **Exhibit A** attached hereto is hereby substituted for and shall replace the legal description and map of Annexation Parcel No. 8 identified in Ordinance 996 to be annexed to and included within the corporate limits of the Town of Firestone, Colorado, in accordance with law.

Section 3. The Board of Trustees hereby directs staff to take the post-approval actions specified under Section 16.7.3 of the Firestone Municipal Code including supplementally filing for recording three certified copies of this Annexation Ordinance and the map of Annexation Parcel No. 8 containing a corrected legal description ("Annexation Map") with the Weld County Clerk and Recorder.

Section 4. Except as amended by this Ordinance, Ordinance 996 shall remain in full force and effect, and nothing herein shall affect or impair the CR 19 Annexation or the Annexation Agreement executed between the Weld County Board of County Commissioners and the Board of Trustees of the Town of Firestone.

Section 5. This Ordinance shall be published and become effective as provided by law.

Section 6. If any part, section, subsection, sentence, clause or phrase of this ordinance is for any reason held to be invalid, such invalidity shall not affect the validity of the remaining sections of the Ordinance. The Board of Trustees hereby declares that it would have passed the ordinance including each part, section, subsection, sentence, clause or phrase thereof, irrespective of the fact that one (or more) part, section, subsection, sentence, clause or phrase is declared invalid.

Section 7. All ordinances or resolutions, or parts thereof, in conflict with this ordinance are hereby repealed, provided that such repealer shall not repeal the repealer clauses of such ordinance nor revive any ordinance thereby.

INTRODUCED, READ, ADOPTED, APPROVED, AND ORDERED PUBLISHED BY
TITLE THIS 8th DAY OF DECEMBER, 2021.

ATTEST:

By: _____
Jessica Koenig, CMC, Town Clerk

TOWN OF FIRESTONE, COLORADO:

By: _____
Bobbi Sindelar, Mayor

Exhibit 1
Overlapping Annexation Parcel
(FOR ILLUSTRATION PURPOSES ONLY)

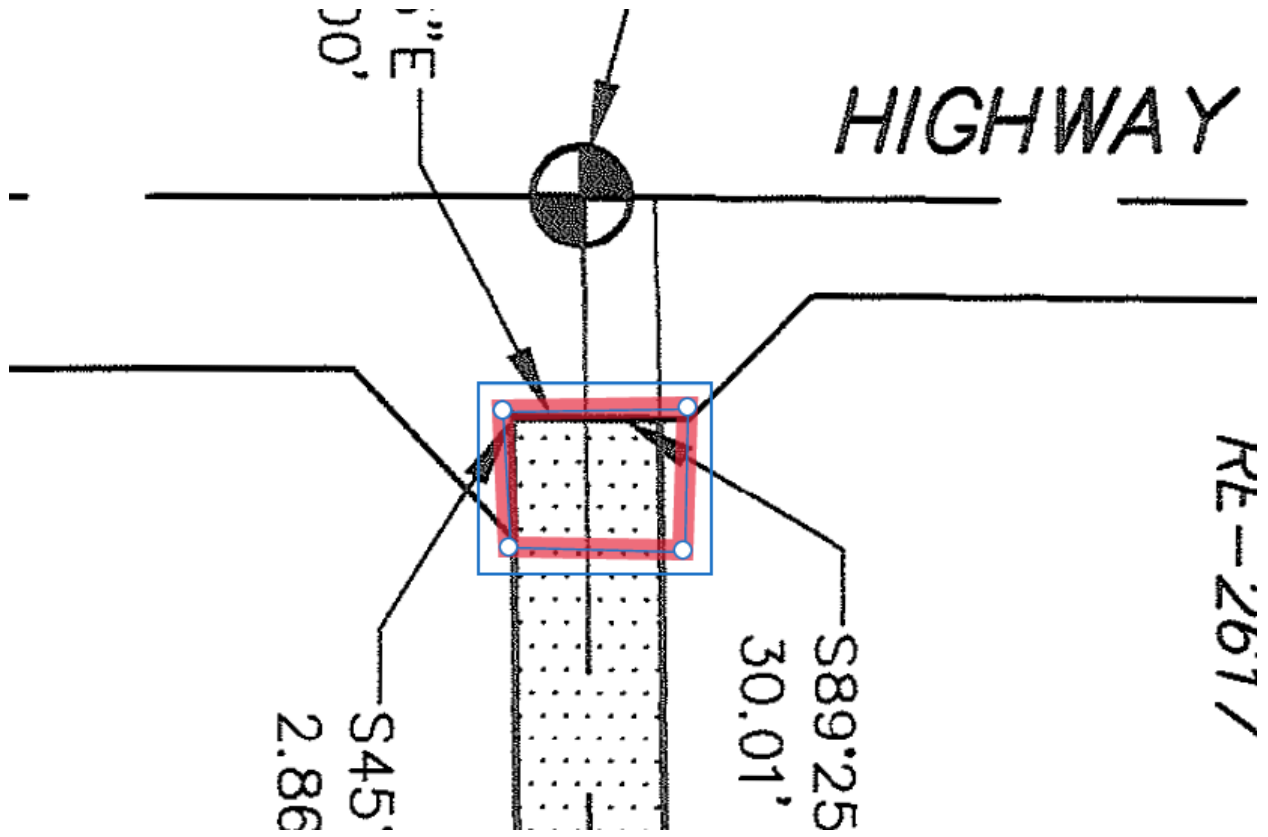


Exhibit A
County Road 19 Annexation
Corrected Legal Description of Annexation Parcel No. 8 and annexation map



EXHIBIT A

Page 1 of 3

October 25, 2021

ANNEXATION NO. 8

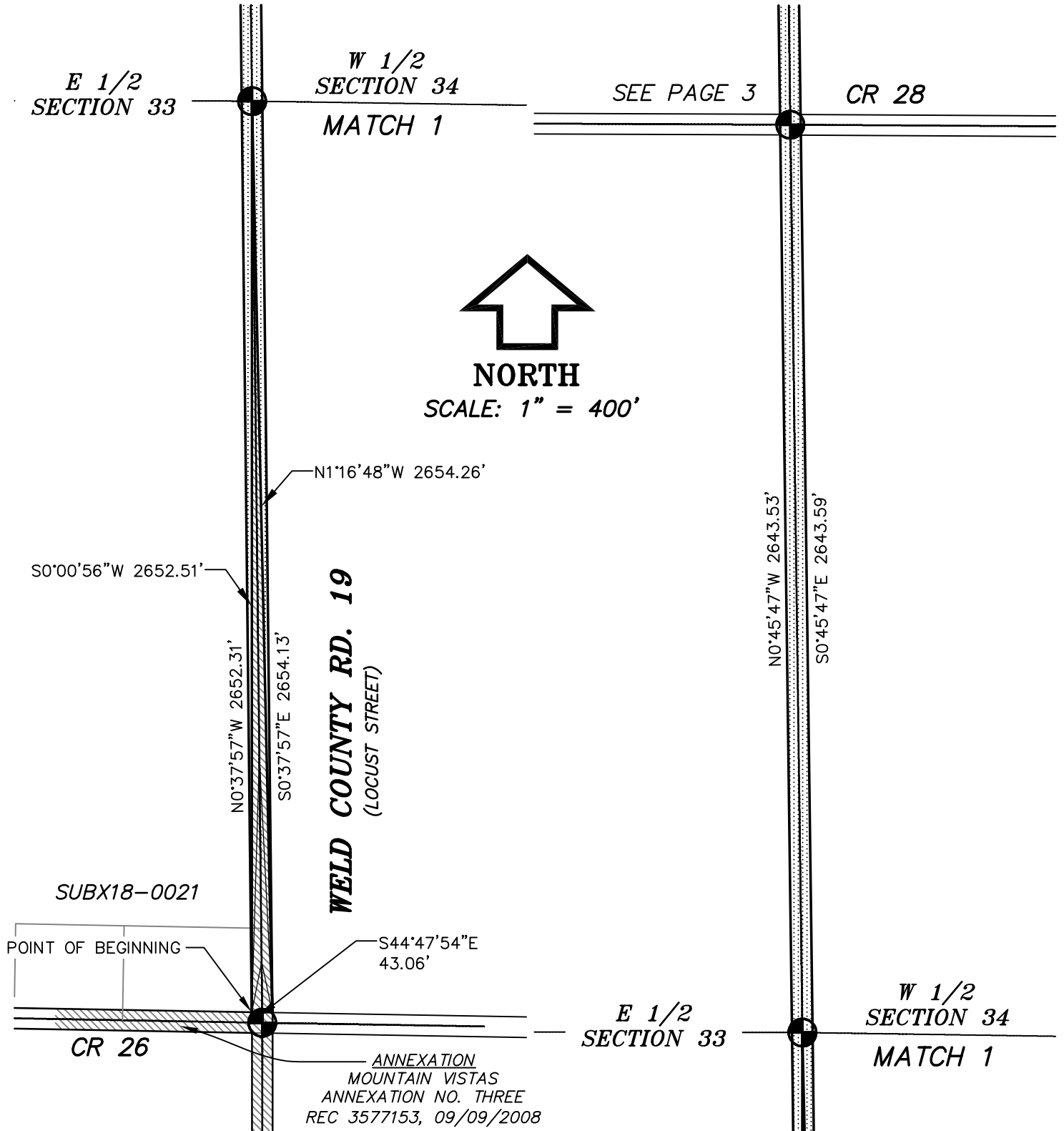
A PARCEL OF LAND LOCATED IN THE EAST HALF OF SECTIONS 33 AND 28, AND THE WEST HALF OF SECTIONS 34 AND 27, TOWNSHIP 3 NORTH, RANGE 67 WEST OF THE 6TH PRINCIPAL MERIDIAN, COUNTY OF WELD, STATE OF COLORADO, BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING AT THE INTERSECTION OF THE NORTH RIGHT OF WAY LINE OF WELD COUNTY ROAD 26 AND THE WEST RIGHT OF WAY LINE OF WELD COUNTY ROAD 19, FROM WHENCE THE SOUTHEAST CORNER OF SAID SECTION 33 BEARS S44°47'54"E A DISTANCE OF 43.06 FEET, SAID POINT BEING ON THE NORTH LINE OF THE MOUNTAIN VISTAS ANNEXATION NO. THREE, RECORDED SEPTEMBER 9, 2008 AT RECEPTION NO. 3577153; THENCE ALONG THE WEST RIGHT OF WAY LINE OF WELD COUNTY ROAD 19 FOR THE FOLLOWING FOUR (4) COURSES: 1) N00°37'57"W A DISTANCE OF 2652.31 FEET; 2) N00°45'47"W A DISTANCE OF 2643.53 FEET; 3) N00°45'12"W A DISTANCE OF 2641.76 FEET; 4) N00°54'58"W A DISTANCE OF 2496.35 FEET TO A POINT ON THE SOUTH LINE OF HIGHWAY NO. 66 ANNEXATION #7 TO THE TOWN OF PLATTEVILLE, RECORDED NOVEMBER 14, 2017 AT RECEPTION NO. 4352185; THENCE S89°05'02"E ALONG SAID SOUTH LINE A DISTANCE OF 60.00 FEET TO A POINT ON THE EAST RIGHT OF WAY LINE OF WELD COUNTY ROAD 19; THENCE ALONG THE EAST RIGHT OF WAY LINE OF WELD COUNTY ROAD 19 FOR THE FOLLOWING FOUR (4) COURSES: 1) S00°54'58"E A DISTANCE OF 2496.44 FEET; 2) S00°45'12"E A DISTANCE OF 2641.84 FEET; 3) S00°45'47"E A DISTANCE OF 2643.59 FEET; 4) S00°37'57"E A DISTANCE OF 2654.13 FEET TO A POINT ON THE NORTH LINE OF SAID MOUNTAIN VISTAS ANNEXATION NO. 3; THENCE N01°16'48"W A DISTANCE OF 2654.26 FEET TO THE EAST QUARTER CORNER OF SAID SECTION 33; THENCE S00°00'56"W A DISTANCE OF 2652.51 FEET TO THE **POINT OF BEGINNING**;

CONTAINING 546,502 SQUARE FEET OR 12.546 ACRES, MORE OR LESS.

EXHIBIT A

PAGE 2 OF 3



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(303) 828-3340 • www.coloradols.com

TOWN OF FIRESTONE

IN THE E 1/2 OF SEC. 33 AND 28
AND THE W 1/2 OF SEC. 34 AND 27
T3N, R67W OF THE 6TH P.M.
WELD COUNTY, COLORADO

DATE:

10/25/21

SCALE

1"=400'

JOB NO.:

S215049

DRAWN:

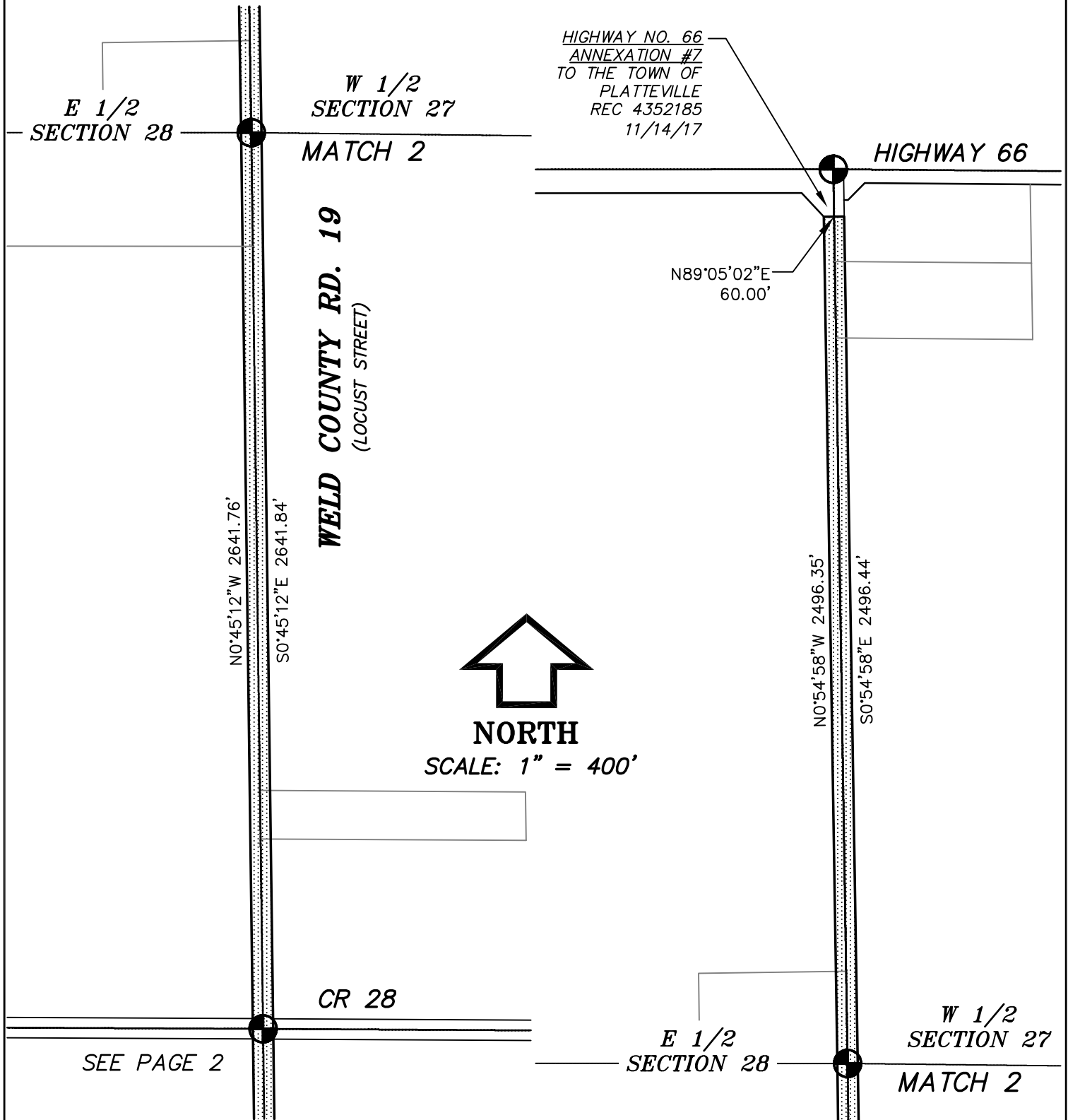
JPE

CHECKED:

OMB

EXHIBIT A

PAGE 3 OF 3



EHRHART
LAND SURVEYING

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(303) 828-3340 • www.coloradols.com

TOWN OF FIRESTONE
IN THE E 1/2 OF SEC. 33 AND 28
AND THE W 1/2 OF SEC. 34 AND 27
T3N, R67W OF THE 6TH P.M.
WELD COUNTY, COLORADO

DATE:

10/25/21

SCALE

1"=400'

JOB NO.:

S215049

DRAWN:

JPE

CHECKED:

OMB

AGENDA INFORMATION MEMORANDUM

FIRESTONE TOWN BOARD OF TRUSTEES



AIM#: 5.d

Consent Agenda

Meeting Date: December 8, 2021

Initiated By: Marty Ostholt

Dept: Planning & Development

AGENDA TITLE

Resolution 21-201: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING A FINAL SUBDIVISION PLAT; AND ACCEPTING THE PROPERTY INTERESTS DEDICATED BY THE FINAL PLAT FOR CERTAIN REAL PROPERTY LOCATED WITHIN BAREFOOT LAKES FILING NO. 4, 1ST REPLAT; AUTHORIZING A SUBDIVISION DEVELOPMENT AGREEMENT PERTAINING TO THE BAREFOOT LAKES FILING NO. 4, 1ST REPLAT

SUMMARY

Barefoot Lakes Filing No. 4, 1st Replat is proposing 28 single-family residential lots on 12.4 acres.

HISTORY AND PREVIOUS BOARD ACTION

The Barefoot Lakes Filing No. 4, 1st Replat preliminary plat was previously approved by the Board of Trustees on October 13, 2021.

RECOMMENDATION

Town staff recommends the Board of Trustees approve Resolution 21-201, a resolution approving and accepting property interests for Barefoot Lakes Filing No. 4, 1st Replat with the following conditions:

1. All minor technical corrections to the Barefoot Lakes Filing No. 4, 1st Replat final plat shall be made to the Town's satisfaction.
2. Final Construction Documents shall be approved by the Town Engineer prior to the start of construction activities.
3. Barefoot, LLC shall provide an updated title commitment for the subject property contained within the Final Plat when the mylars are provided for recording, dated no later than thirty (30) days prior to submission of mylars.
4. Barefoot, LLC shall pay applicable fees incurred as a result of the application approval, including, but not limited to, utility, remapping, public land dedication, cash-in-lieu fees, legal notice and legal review, and recording fees.

ALTERNATIVES

n/a

ATTACHMENTS

1. Barefoot Lakes Filing No. 4 1st Replat BOT Staff Report
2. Resolution 21-201 Barefoot Filing No. 4 1st Replat
3. Barefoot Lakes Filing No. 4 1st Replat Final Plat
4. Barefoot Lakes Filing No. 4 1st Replat Subdivision Agreement

FINANCIAL CONSIDERATIONS

n/a



Staff Report

Barefoot Lakes Filing No. 4, 1st Replat

Final Plat

**Prepared by the
Town of Firestone for the
Board of Trustees**

December 8, 2021

Applications

This staff report is for the Barefoot Lakes Filing No. 4, 1st Replat Final Plat (Final Plat). The applicant for the Final Plat is Barefoot, LLC.

Notice

No public notice is required for final plats conforming to an approved preliminary plat per the Firestone Development Code (FDC).

Location and Process

The approximate location of the Final Plat is south and west of the intersection of WCR 11 and Ronald Reagan Boulevard (WCR 28). The Final Plat is the final step in the Firestone Development Review process prior to the building permit process.

Site Analysis

The Final Plat is zoned as a residential planned unit development (R-A / R-B PUD) and is approximately 12.4 acres in size. The proposed development is a replat of Tracts A and H of Barefoot Lakes Filing No. 4.

The property is located in an area characterized by rolling terrain, generally sloping from north to south, towards St. Vrain Creek. The property lies due west of Filing 4 and east of Filing 2 which are currently developing. There are two vehicular access points into the Final Plat. The primary access is through Filing 4, while a second emergency access point is created for access to Ronald Reagan Blvd. Parking is consistent with other similar developments in Firestone. Pedestrian access is provided via detached sidewalks along interior residential streets, consistent with previous filings. Pedestrian access is also available via trails which are designed as part of a larger network, promoting connectivity in the neighborhood beyond Filing 4, 1st Replat. This includes the continuation of the undulating detached regional trail that runs along Barefoot Lakes Parkway and a connection into Filing 2.

Plan Analysis

The Final Plat propose 28 single family residential lots for detached homes. The project will be consistent with adjacent development and will complement the overall Barefoot Lakes development. Furthermore, the development will comply with applicable landscape, lighting, architecture and signage requirements.

Building Height

The maximum building height for the proposed residential buildings is 35 feet which is in accordance with the FDC.

Fiscal Impacts

The Final Plat will provide more rooftops for the community of Firestone and promote the livability and walkability of the Town of Firestone within an area zoned for residential use. The proximity of these homes to I-25 and Colorado Boulevard are ideal for homeowners to shop and commute in the Town of Firestone. The increase of residential options in this area will lead to increased property tax revenues for the Town.

Utility and Services

Public infrastructure and utilities are generally available or will be extended to the property by the developer at the time of the development.

FDC Approval Criteria

The Town Board of Trustees may approve a final plat application if it meets the following Approval Criteria from the FDC:

- A. The Final Plat is found to be in substantial compliance with all respects of the approved Preliminary Plat and incorporates all recommended changes, modifications, and conditions attached to approval of the Preliminary Plat;
- B. Plans and specifications for improvements connected with development of the subdivision comply with the subdivision development and design standards set forth in Chapter 6 of this FDC, and any other relevant Town, County, State, or Federal regulations, except to the extent modifications, variances, or exceptions have been expressly permitted by the terms of the Preliminary Plat approval. All construction plans for improvements shall be approved by the Town Engineer prior to the Board of Trustees action on the Final Plat;
- C. The applicant has either installed all required improvements or has executed a Subdivision Agreement pursuant to Section 7.16; and
- D. The applicant has paid or satisfied all applicable fees and charges.

RECOMMENDATION

Town staff recommends the Board of Trustees approve draft Resolution 21-201, a resolution approving the application with conditions.

RESOLUTION NO. 21-201

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING A FINAL SUBDIVISION PLAT; AND ACCEPTING THE PROPERTY INTERESTS DEDICATED BY THE FINAL PLAT FOR CERTAIN REAL PROPERTY LOCATED WITHIN BAREFOOT LAKES FILING NO. 4, 1ST REPLAT; AUTHORIZING A SUBDIVISION DEVELOPMENT AGREEMENT PERTAINING TO THE BAREFOOT LAKES FILING NO. 4, 1ST REPLAT

WHEREAS, Barefoot, LLC (“Applicant”), as owner of certain real property described as Tracts A and H, Barefoot Lakes Filing No. 4 (the “Property”), has submitted a proposed final plat for the Property, entitled “Barefoot Lakes Filing No. 4, 1st Replat” (the “Final Plat”); and

WHEREAS, after reviewing the evidence and argument presented at the Board of Trustees, the Board of Trustees finds the proposed Final Plat to be in substantial compliance with the technical requirements of the Firestone Development Code.

WHEREAS, the Board of Trustees of the Town of Firestone believes it is in the best interest of the Town and its citizens to accept the Barefoot Lakes Filing No. 4, 1st Replat Subdivision Agreement and to accept financial guarantees for improvements to be constructed by the Applicant.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

Section 1. The above Recitals and Findings of the Board of Trustees are hereby incorporated into this resolution.

Section 2. The Board of Trustees hereby approves the final plat for Barefoot Lakes Filing No. 4, 1st Replat, attached hereto as Exhibit A and incorporated herein by this reference, subject to and contingent upon compliance with the following conditions:

(a) All minor, technical corrections to the Barefoot Lakes Filing No. 4, 1st Replat final plat shall be made to the Town’s satisfaction.

(b) Final Construction Documents shall be approved by the Town Engineer prior to the start of construction activities.

(c) Barefoot, LLC shall provide an updated title commitment for the subject property contained within the Final Plat when the mylars are provided for recording, dated no later than thirty (30) days prior to submission of mylars.

(d) Barefoot, LLC shall pay applicable fees incurred as a result of the application approval, including, but not limited to, utility, remapping, public land dedication, cash-in-lieu fees, legal notice and legal review, and recording fees.

Section 3. The Barefoot Lakes No. 4, 1st Replat Subdivision Development Agreement between the Town of Firestone and Barefoot, LLC is hereby approved in the form substantially similar to the form attached hereto as Exhibit B. The Mayor is authorized to execute the Subdivision Development Agreement on behalf of the Town.

Section 4. The dedication of all easements and all other places designated for public use as shown upon the plat Barefoot Lakes Filing No. 4, 1st Replat is hereby accepted by the Town of Firestone, subject however, to the condition that the Town shall not undertake maintenance of any easement or other place designated for public use until after construction of all necessary public improvements has been satisfactorily completed by the land owner and accepted in writing by the Town of Firestone.

Section 5. The Mayor and Town Clerk are hereby authorized and directed to certify upon the final subdivision plat the Town's approval and acceptance thereof. The Town Clerk is hereby authorized and directed to file the subdivision plat with Weld County Clerk and Recorder's office upon fulfillment of all conditions as indicated herein.

Section 6. Unless otherwise extended by resolution of the Board of Trustees, the approval of the Barefoot Lakes Filing No. 4, 1st Replat final plat shall be null and void if the conditions set forth in Section 2 are not complied with within one hundred and twenty (120) days of the date of this Resolution.

PASSED AND ADOPTED this 8th day of December, 2021.

Bobbi Sindelar, Mayor

ATTEST:

Jessica Koenig, Town Clerk

APPROVED AS TO FORM:

William P. Hayashi, Town Attorney

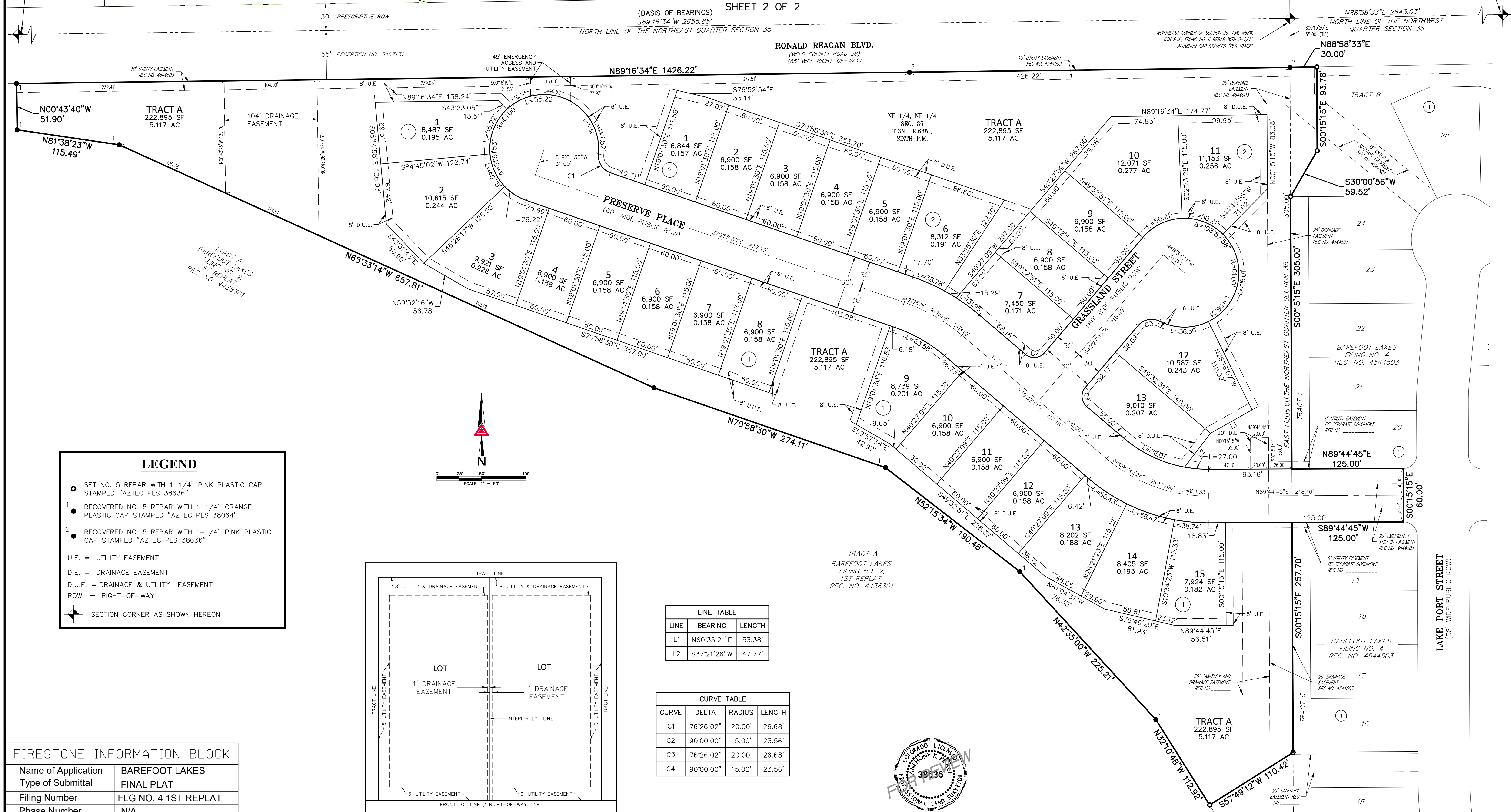
EXHIBIT A
Barefoot Lakes Filing No. 4, 1st Replat
Final Plat

EXHIBIT B
Barefoot Lakes Filing No. 4, 1st Replat
Subdivision Development Agreement

BAREFOOT LAKES FILING NO. 4, 1ST REPLAT

A REPLAT OF TRACTS A & H, BAREFOOT LAKES FILING NO. 4, LOCATED WITHIN THE NORTHEAST QUARTER OF SECTION 35 AND THE NORTHWEST QUARTER OF SECTION 36, TOWNSHIP 3 NORTH, RANGE 68 WEST OF THE SIXTH PRINCIPAL MERIDIAN, TOWN OF FIRESTONE, COUNTY OF WELD, STATE OF COLORADO
12.402 ACRES - 28 LOTS - 1 TRACT - FP-21-004

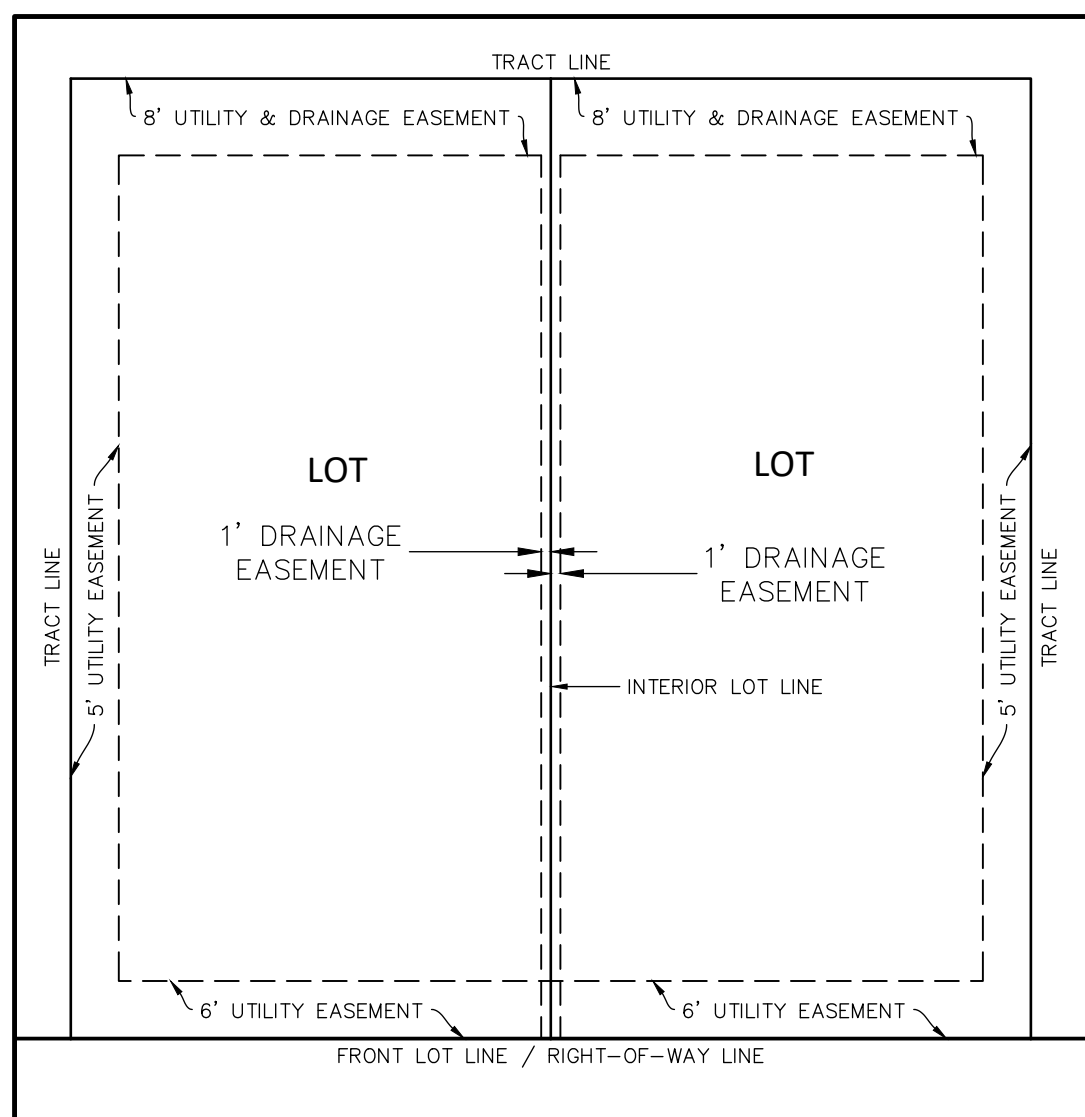
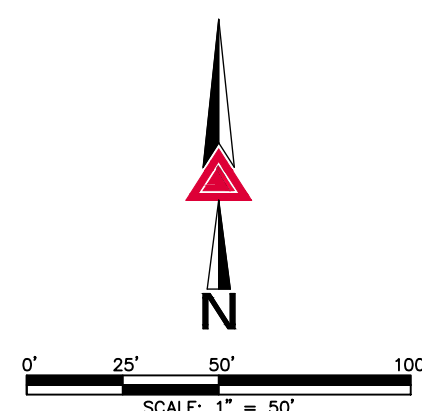
SHEET 2 OF 2



LEGEND

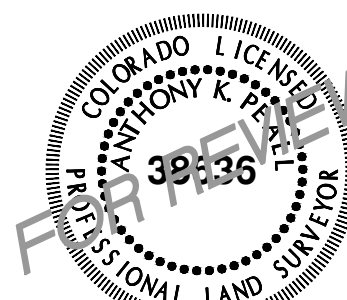
- SET NO. 5 REBAR WITH 1-1/4" PINK PLASTIC CAP STAMPED "AZTEC PLS 38636"
- RECOVERED NO. 5 REBAR WITH 1-1/4" ORANGE PLASTIC CAP STAMPED "AZTEC PLS 38064"
- RECOVERED NO. 5 REBAR WITH 1-1/4" PINK PLASTIC CAP STAMPED "AZTEC PLS 38636"

U.E. = UTILITY EASEMENT
D.E. = DRAINAGE EASEMENT
D.U.E. = DRAINAGE & UTILITY EASEMENT
ROW = RIGHT-OF-WAY
◆ SECTION CORNER AS SHOWN HEREON



LINE TABLE		
LINE	BEARING	LENGTH
L1	N60°35'21"E	53.38'
L2	S37°21'26"W	47.77'

CURVE TABLE			
CURVE	DELTA	RADIUS	LENGTH
C1	76°26'02"	20.00'	26.68'
C2	90°00'00"	15.00'	23.56'
C3	76°26'02"	20.00'	26.68'
C4	90°00'00"	15.00'	23.56'



FOR AND ON BEHALF OF
AZTEC CONSULTANTS, INC.

FIRESTONE INFORMATION BLOCK

Name of Application	BAREFOOT LAKES
Type of Submittal	FINAL PLAT
Filing Number	FLG NO. 4 1ST REPLAT
Phase Number	N/A
Preparation Date	2021/02/12
Revision Date	2021/10/14
Revision Date	2021/12/01
Revision Date	

DETAIL PAGE ~ SHEET 2 of 2



AzTec Proj. No.: 54821-05

Drawn By: RBA

300 East Mineral Ave., Suite 1
Littleton, Colorado 80122
Phone: (303) 713-1898
Fax: (303) 713-1897
www.aztecconsultants.com

DEVELOPER
BROOKFIELD RESIDENTIAL

6465 S. GREENWOOD PLAZA BLVD., SUITE 700
CENTENNIAL, COLORADO 80111
(303) 706-9451

DATE OF PREPARATION: 2021/02/12

SCALE: 1" = 50'

SHEET 2 OF 2

SUBDIVISION AGREEMENT
[Barefoot Lakes Filing No. 4, 1st Replat]

THIS AGREEMENT is made and entered into this _____ day of _____, 20____, by and between the **TOWN OF FIRESTONE**, a Colorado municipal corporation, whose address is 151 Grant Avenue, Firestone, CO 80520 ("Town"), and **BAREFOOT, LLC**, whose address is 6465 S. Greenwood Plaza Boulevard, Suite 700, Centennial, CO 80111 ("Subdivider").

WHEREAS, Subdivider has submitted a final subdivision plat for the Barefoot Lakes Filing No. 4, 1st Replat subdivision ("Subdivision" or "Plat"), including utility plans for the Subdivision, a copy of which Plat is attached hereto as **Exhibit A** and incorporated herein by reference, and which Plat has been reviewed and approved by the Planning Commission and Town Board of Trustees; and

WHEREAS, the Town and Subdivider have entered into a Development and Vested Rights Agreement for the Barefoot Lakes Annexation dated May 27, 2015 (the "DVR Agreement"), which agreement was recorded with the Weld County Clerk and Recorder on October 12, 2015 at Reception No. 4149333; and

WHEREAS, the Subdivision is to be developed as a planned unit development and a large scale development within the Town, pursuant to applicable provisions of the Firestone Municipal Code and Development Regulations; and

WHEREAS, additional filings are anticipated, and this Agreement applies only to Barefoot Lakes Filing No. 4, 1st Replat;

WHEREAS, the subdivision regulations of the Town require that the Subdivider enter into a Subdivision Agreement ("Agreement") with the Town relative to improvements related to the Subdivision;

NOW, THEREFORE, in consideration of the foregoing, the parties hereto promise, covenant and agree as follows:

1.0 GENERAL CONDITIONS

1.1 Subdivision Obligation. Subdivider shall be responsible for performance of the covenants set forth in this Agreement.

1.2 Engineering Services. Subdivider agrees to furnish, at its expense, all necessary engineering services relating to the design and construction of the Subdivision and the Schedule of Improvements described in **Exhibit B**, attached hereto and incorporated herein by this reference. Said engineering services shall be performed by or under the supervision of a Registered Professional Engineer or Registered Land Surveyor, or other professionals as appropriate, licensed by the State of Colorado, and in accordance with applicable Colorado law; and, except as otherwise provided in this Agreement, shall conform to the standards and criteria for public improvements as established and

2020 11-29 Barefoot Lakes Filing 4, 1st Replat

approved by the Town as of the date of submittal to the Town.

1.3 Construction Standards and Deadline. (a) Subdivider shall construct, or shall cause a metropolitan district or special district with jurisdiction to construct, all improvements required by this Agreement, including but not limited to all water lines, sanitary sewer collection lines, storm sewer lines, streets, curbs, gutter, sidewalks, landscaping, bikepaths, and any other improvements constructed in relation to the Subdivision, in accordance with plans and specifications approved in writing by the Town, the Plat, this Agreement, and in full conformity with the Town's construction specifications applicable at the time of construction plan approval ("Construction Approval"). Construction Approval shall continue in effect for three (3) years from the effective date of this agreement. In the event that the Subdivider commences or performs any construction after such three (3) year period, the Subdivider shall resubmit the project utility plans to the Town for reexamination in accordance with Section 1.5. The Town may require the Subdivider to comply with the approved Town standards and specifications that are in effect at the time of resubmittal.

(b) Construction of public improvements shall be complete, and conditional acceptance of the public improvements shall be requested, by no later than three (3) years from the date of such Construction Approval, weather permitting. If Subdivider has not completed the improvements and requested conditional acceptance on or before the completion date, the Town may exercise its rights to secure performance as provided in Section 8.1 of this Agreement.

1.4 Development Coordination. Unless specifically provided in this Agreement to the contrary, all submittals to the Town shall be made to the Director of Planning & Development, and all approvals required of the Town in connection with this Agreement shall be rendered by the Town Manager, or the Manager's designee. The Town Engineer shall have general responsibility for coordinating development with Subdivider.

1.5 Plan Submission and Approval. (a) Subdivider shall furnish to the Town complete plans for public improvements for the Subdivision, and obtain approval of such plans prior to the commencement of any construction work thereon. The Town shall issue its written approval or disapproval of said plans as expeditiously as reasonably possible. Said approval or disapproval shall be based upon the standards and criteria for public improvements as established and approved by the Town, and the Town shall notify Subdivider of all deficiencies which must be corrected prior to approval. All deficiencies shall be corrected and said plans shall be resubmitted to, and approved by, the Town prior to the construction of any improvements. In addition to the foregoing, prior to the commencement of any construction work on the sanitary sewer or water improvements, all sanitary sewer plans shall be submitted to and shall require the approval of the St. Vrain Sanitation District, and all water service plans shall be submitted to, and shall require the approval of the Little Thompson Water District.

(b) Except as provided in this subsection (b), building permits shall be issued only after improvements have been completed and have been granted conditional acceptance. The Subdivider may request and, provided there is no breach of this Agreement by Subdivider, the Town shall issue its approval of the following permits:

2020 11-29 Barefoot Lakes Filing 4, 1st Replat

(1) Upon receipt of a letter of credit to secure performance of erosion control, dust management, and site stabilization work, the Town shall issue a grading permit.

(2) Following approval of plans for sanitary utility construction by the St. Vrain Sanitation District, Town permits required for construction of the sanitary sewer system (such as right-of-way permits) shall be issued.

(3) Following approval of plans for water utility construction by the Little Thompson Water District, Town permits required for construction of the water system (such as right-of-way permits) shall be issued.

1.6 Conditional Acceptance. (a) No later than fourteen (14) days after improvements are completed for the Subdivision, Subdivider shall request inspection by the Town. If Subdivider does not request this inspection within fourteen (14) days of completion of improvements, the Town may conduct the inspection without the approval of Subdivider. Subdivider shall provide "as-built" drawings, in both hard copy and electronic file format acceptable to the Town, and a certified statement of construction costs no later than forty-five (45) days after improvements are completed. If improvements completed by Subdivider are satisfactory, the Town shall grant "conditional acceptance", which shall be subject to "final acceptance" as set forth herein. If improvements completed by Subdivider are unsatisfactory, the Town shall provide written notice to Subdivider of the repairs, replacements, construction or other work required to receive "conditional acceptance." Subdivider shall complete all needed repairs, replacements, construction or other work within thirty (30) days of said notice, weather permitting. After Subdivider completes the repairs, replacements, construction, or other work required, Subdivider shall request of the Town a re-inspection of such work to determine if conditional acceptance can be granted, and the Town shall provide written notice to Subdivider of the acceptability or unacceptability of such work. If Subdivider does not complete the repairs, replacements, construction or other work required within thirty (30) days of said notice, the Town may exercise its rights to secure performance as provided in Section 8.1 of this Agreement. The Town reserves the right to schedule reinspections, depending upon scope of deficiencies.

(b) Except as provided in Section 1.5(b)(2), no building permit for the construction of any structure shall be issued by the Town until all the water lines, fire hydrants, sanitary sewer lines and streets (including curb, gutter, sidewalk and pavement) serving such structure have been completed and granted conditional acceptance. Subdivider may delay the installation of the final lift of asphalt on streets until after conditional acceptance of such streets, but the installation of the final lift of asphalt shall be condition precedent to final acceptance of the improvements. If Subdivider elects to delay installation of the final lift of asphalt, then Subdivider shall provide security to the Town in the form of cash or letter of credit in an amount equal to one hundred percent (100%) of the estimated cost to install the final lift of asphalt as approved by the Town. Such letter of credit shall not be released until final acceptance of the improvements has been granted by the Town. Notwithstanding any provision herein to the contrary, the right to delay the installation of the final lift of asphalt on streets until after conditional acceptance of such streets is personal to Barefoot LLC, a Colorado limited liability company, as Subdivider, and may be exercised by Barefoot LLC only for so long as

Barefoot LLC is a wholly owned subsidiary of Brookfield Residential Properties, Inc., and Barefoot LLC does not have the right to assign this right to any third party. Notwithstanding any provision herein to the contrary, successors and/or assigns of Barefoot LLC shall be required to install the full depth of asphalt required by approved constructions plans, including the final lift of asphalt on all streets, prior to conditional acceptance of the improvements.

1.7 Maintenance and Warranty of Improvements. For a minimum two (2) year period from the date of “conditional acceptance” of improvements of the Subdivision or until Final Acceptance is issued, whichever is greater, Subdivider shall warrant all said improvements and, at its own expense, take all actions necessary to maintain said improvements and make all needed repairs or replacements which, in the reasonable opinion of the Town, shall become necessary. If within thirty (30) days after Subdivider’s receipt of written notice from the Town requesting such repairs or replacements, the Subdivider has not completed such repairs, the Town may exercise its rights to secure performance as provided in Section 8.1 of this Agreement.

1.8 Final Acceptance. At least thirty (30) days before two (2) years has elapsed from the issuance of conditional acceptance, or as soon thereafter as weather permits, Subdivider shall request a “final acceptance” inspection of the improvements. The Town shall inspect the improvements and shall notify the Subdivider in writing of all deficiencies and necessary repairs, if any. If there are no deficiencies, or after Subdivider has corrected all deficiencies and made all necessary repairs identified in said written notice, the Town shall issue to Subdivider a letter of “final acceptance.” If Subdivider does not correct all deficiencies and make repairs identified in said inspection to the Town's satisfaction within thirty (30) days after receipt of said notice, weather permitting, the Town may exercise its rights to secure performance as is provided in Section 8.1 of this Agreement.

1.9 Reimbursement to Town. The Town may complete construction, repairs, replacements, or other work for Subdivider pursuant to Sections 1.6, 1.7, 1.8, or 8.1 of this Agreement with funds other than the Improvement Guarantee, in which event Subdivider shall reimburse the Town within thirty (30) days after receipt of written demand and supporting documentation from the Town. If Subdivider fails to so reimburse Town, then Subdivider shall be in default of the Agreement and the Town may exercise its rights under Section 8.1 of this Agreement.

1.10 Testing and Inspection. (a) Subdivider shall employ, at its own expense, a licensed and registered testing company, previously approved by the Town in writing, to perform all testing of materials or construction that may be reasonably required by the Town, including but not limited to compaction testing for embankment fills, structural backfills, pipe bedding, trench backfills, subgrades, road base course and asphalt, and concrete strength testing, and shall furnish copies of test results to the Town on a timely basis for Town review and approval prior to commencement or continuation of construction to which the testing is applicable. In addition, at all times during said construction the Town shall have access to inspect the materials and workmanship of said construction, determine the progress of the work, and determine compliance of the work with the approved plans and the Town’s construction regulations, and all materials and work not conforming to such regulations, plans and specifications shall be repaired or removed and replaced at Subdivider's expense so as to conform to such regulations, plans and specifications. The Subdivider shall be

responsible for, and shall promptly pay upon receipt of invoice therefor, all actual costs incurred by the Town for engineering, planning, inspection, testing, and legal services related to the Subdivision improvements to be constructed under this Agreement or to the administration of this Agreement. The Town and Subdivider shall in good faith cooperate to control such costs.

(b) All work shown on the Plat and approved construction plans shall be subject to inspection by the Town. Inspection by the Town shall not relieve the Subdivider from compliance with the approved plans and specifications or the Town's construction regulations. Inspection services requiring the presence of the Town are provided Monday through Friday, except legal holidays, from 9:00 a.m. to 4:00 p.m. During the hours listed above, inspections shall be scheduled a minimum of forty-eight (48) hours in advance with the Town. Requests for inspection services beyond the hours listed above, shall be submitted a minimum of forty-eight (48) hours in advance to the Town for approval. All requests for after-hours inspection services shall be made in writing to the Town. If the request is denied, the work shall not proceed after the time requested until an inspection has been performed during the hours listed above. The Subdivider shall comply with all notification and inspection requirements of the sanitation district serving the property with regard to sanitary sewer improvements.

1.11 Financing and Improvement Guarantees. (a) Except as otherwise specially agreed herein, the Subdivider agrees to install and pay for all improvements described in **Exhibit B** or otherwise required by this Subdivision as shown on the approved plat, utility plans, and other approved documents on file with the Town. Said Improvement Guarantee shall include, but not be limited to, street construction, landscaping, fencing, street lights, water, sewer, storm sewer and drainage improvements.

(b) Prior to commencing construction of the public improvements, Subdivider shall submit to the Town the following Improvement Guarantees:

(1) Infrastructure Improvement Guarantees. With respect to all of the public improvements described in **Exhibit B** aside from landscaping improvements (the "Infrastructure Improvements"), Subdivider shall submit to the Town the following Improvement Guarantees:

- (i) Subdivider shall provide a single letter of credit in form and substance as shown in **Exhibit C** as the Improvement Guarantee in an amount equal to one hundred percent (100%) of the total estimated cost, including labor and materials, to secure the performance of erosion control, dust management, and site stabilization work in the amount shown in **Exhibit B** for the Infrastructure Improvements; and
- (ii) For the remainder of the Infrastructure Improvements set forth in **Exhibit B**, Subdivider shall provide a single improvement guarantee as cash, letter of credit in form and substance as shown in **Exhibit**

C, or a bond, in an amount equal to one hundred percent (100%) of the total estimated cost, including labor and materials, of the Infrastructure Improvements not secured by the letter of credit provided pursuant to subsection (b)(1), above. If Subdivider provides a bond, the bond must be in accordance with the requirements set forth in the DVR Agreement.

(2) Landscaping Improvement Guarantee. With respect to all of the landscaping public improvements described in Exhibit B (the “Landscaping Improvements”), Subdivider shall submit to the Town the following Improvement Guarantees:

- (i) Subdivider shall provide a single letter of credit in form and substance as shown in Exhibit C as the Improvement Guarantee in an amount equal to one hundred percent (100%) of the total estimated cost, including labor and materials, to secure the performance of erosion control, dust management, and site stabilization work in the amount shown in Exhibit B for the Landscaping Improvements; and
- (ii) For the remainder of the Landscaping Improvements, including all irrigation and other landscaping not specifically intended for construction related erosion control, dust management and site stabilization, set forth in Exhibit B, Subdivider shall provide a single improvement guarantee as cash, letter of credit in form and substance as shown in Exhibit C, or a bond, in an amount equal to one hundred percent (100%) of the total estimated cost, including labor and materials, of the Landscaping Improvements not secured by the letter of credit provided pursuant to subsection (b)(2), above. If Subdivider provides a bond, the bond must be in accordance with the requirements set forth in the DVR Agreement.

(c) The term of every Improvement Guarantee provided by Subdivider shall be for a period of time sufficient to cover the completion of construction of all of the specific, associated public improvements to which such Improvement Guarantee applies, and, except as set forth in subsection (d) below, shall not be released until conditional acceptance of all of the public improvements to which the specific Improvement Guarantee applies has been granted by the Town. If the Subdivider provides a letter of credit, the letter of credit shall not expire during the winter season (November 1 – March 1).

(d) At the time of conditional acceptance of the Infrastructure Improvements, the Town shall reduce the amount of the Improvement Guarantees set forth in subsection (b)(1) above to fifteen percent (15%) of the certified statement of construction costs for the Infrastructure Improvements. At

the time of conditional acceptance of the Landscaping Improvements, the Town shall reduce the amount of the Improvement Guarantees set forth in subsection (b)(2) above to fifteen percent (15%) of the certified statement of construction costs for the Landscaping Improvements.

(e) The remaining Improvement Guarantees set forth in subsection (b)(1) above shall be released upon final acceptance of the Infrastructure Improvements by the Town, and the remaining Improvement Guarantees set forth in subsection (b)(2) above shall be released upon final acceptance of the Landscaping Improvements by the Town, provided no mechanics' liens have been filed with respect to the public improvements and the Subdivider is not otherwise in breach of this Agreement. If any mechanics' liens have been filed with respect to the public improvements, the Town may retain all or a portion of the associated Improvement Guarantee up to the amount of such liens. If Subdivider fails to have such improvements finally accepted within one (1) year of the date of the issuance of conditional acceptance or any improvements are found not to conform to this Agreement, or to applicable Town standards and specifications, then Subdivider shall be in default of the Agreement and the Town may exercise its rights under Section 8.1 of this Agreement.

(f) In addition to any other remedies it may have, the Town may, at any time prior to Final Acceptance, draw on any Improvement Guarantee issued or provided pursuant to this Agreement if Subdivider fails to extend or replace any such Improvement Guarantee at least thirty (30) days prior to expiration of such Improvement Guarantee. If the Town draws on the guarantee to correct deficiencies and complete improvements, any portion of said guarantee not utilized in correcting the deficiencies and/or completing improvements shall be returned to Subdivider within thirty (30) days after said final acceptance. In the event that the Improvement Guarantee expires or the entity issuing the Improvement Guarantee becomes non-qualifying, or the cost of improvements and construction is reasonably determined by the Town to be greater than the amount of the security provided, then the Town shall furnish written notice to the Subdivider of the condition, along with supporting documentation, and within thirty (30) days of receipt of such notice the Subdivider shall provide the Town with a substituted qualifying Improvement Guarantee, or augment the deficient security as necessary to bring the security into compliance with the requirements of this Section 1.11. If such an Improvement Guarantee is not submitted or maintained, then Subdivider is in default of this Agreement and is subject to the provisions of Section 8.1 of this Agreement, as well as the suspension of development activities by the Town including, but not limited to, the issuance of building permits and certificates of occupancy; provided, however, that no additional 30-day notice to cure under Section 8.1 is required prior to the suspension of the issuance of building permits and certificates of occupancy.

(g) Notwithstanding any provision herein to the contrary, the right to provide a bond as security for the completion of public improvements as set forth in subsections (b)(1)(ii) and (b)(2)(ii) above, is personal to Barefoot LLC, a Colorado limited liability company, as Subdivider and may be exercised by Barefoot LLC only for so long as Barefoot LLC is a wholly owned subsidiary of Brookfield Residential Properties, Inc., and Barefoot LLC does not have the right to assign this right to any third party. Notwithstanding any provision herein to the contrary, successors and/or assigns of Barefoot LLC shall not be able to provide a bond or bonds as security for the completion of public improvements, but shall provide a letter of credit in a form and substance acceptable to the

Town in its sole discretion.

1.12 Indemnification and Release of Liability. Subdivider agrees to indemnify and hold harmless the Town, its officers, employees, agents, and servants, and to pay any and all judgments rendered against said persons on account of any suit, action, or claim caused by, arising from, or on account of acts or omissions by the Subdivider, its officers, employees, agents, consultants, contractors, and subcontractors, and to pay to the Town and said persons their reasonable expenses, including, but not limited to, reasonable attorney fees and reasonable expert witness fees, incurred in defending any such suit, action or claim; provided, however, that Subdivider's obligation herein shall not apply to the extent said suit, action or claim results from any acts or omissions of officers, employees, agents or servants of the Town or conformance with requirements imposed by the Town. Said obligation of Subdivider shall be limited to suits, actions or claims based upon conduct prior to "final acceptance" by the Town of the construction work. Subdivider acknowledges that the Town's review and approval of plans for development of the property is done in furtherance of the general public's health, safety and welfare and that no immunity is waived and no specific relationship with, or duty of care to, the Subdivider or third parties is assumed by such review or approval.

1.13 Insurance; OSHA. Subdivider shall, through contract requirements and other normal means, guarantee and furnish to the Town proof thereof that all employees and contractors engaged in the construction of improvements are covered by adequate Workers' Compensation Insurance and Public Liability Insurance, and shall require the faithful compliance with all provisions of the Federal Occupational Safety and Health Act (OSHA).

1.14 Issuance of Building Permits and Certificates of Occupancy. Subdivider shall complete improvements and request conditional acceptance thereof on or before the completion deadline set forth in Section 1.3(b). In addition:

(a) No building permits shall be issued until the full amount of the Improvement Guarantee has been provided to the Town;

(b) No building permits shall be issued for the construction of any habitable structure until all the water lines, fire hydrants, sanitary sewer lines and streets (including curb, gutter, and sidewalk pavement with at least the base course completed) serving the Subdivision have been completed and granted conditional acceptance; and

(c) No building permits shall be issued for any structure located in excess of nine hundred feet from a single point of access.

(d) No certificates of occupancy shall be issued within the Subdivision until all infrastructure improvements identified on Exhibit B have been completed and have been granted conditional acceptance.

2.0 CONSTRUCTION OF IMPROVEMENTS

2020 11-29 Barefoot Lakes Filing 4, 1st Replat

2.1 Rights-of-way, Easements and Permits. Prior to commencing construction of any improvements set forth herein, Subdivider shall acquire at its own expense and convey to the Town all necessary land, rights-of-way and easements required by the Town for Subdivider's construction of the proposed improvements related to the Subdivision. All such conveyances shall be free and clear of liens, taxes and encumbrances and shall be by Special Warranty Deed in form and substance acceptable to the Town Attorney. All title documents shall be recorded by the Town at the Subdivider's expense. The Subdivider shall also furnish, at its own expense, an ALTA title policy for all interest(s) so conveyed, subject to approval by the Town Attorney.

2.2 Construction. Subdivider shall furnish and install, at its own expense, the improvements listed on the "Schedule of Improvements" attached as **Exhibit B**, in conformance with the Plat and approved construction plans. If Subdivider does not meet the above obligations, then Subdivider shall be in default of the Agreement and the Town may exercise its rights under Section 8.1 of this Agreement. The Subdivider shall provide the Town Engineer with certified Record Drawings upon completion of the construction of public improvements and other documents as required by the Town. These documents shall show "as-built" locations of such improvements.

2.3 Utility Coordination and Installation. In addition to the Improvements described on **Exhibit B**, Subdivider shall also be responsible for coordination of and payment for installation of on-site and off-site electric, street lights, natural gas, telephone and utilities. All utilities shall be placed underground to the extent required by the Town Code.

3.0 STREET IMPROVEMENTS

3.1 Street Improvements. For the purposes of this Agreement, "street improvements" shall be defined to include, where applicable, but not limited to, all improvements within the right-of-way such as bridges, sub-base preparation, road base, asphalt, concrete, seal coat, curb and gutter, medians, entryways, underground utilities, sidewalks, bicycle paths, traffic signs, street lighting, street name signs, landscaping and drainage improvements. Street improvements other than curbs, gutters, walks and signs, shall not be installed until all utility lines to be placed within the right-of-way have been completely installed, including individual lot service lines leading in from the main to the property line. All street improvements shall be constructed and installed, at the minimum, pursuant to the Plat, approved construction plans, and the Schedule of Improvements attached as **Exhibit B**.

3.2 Street Signs, Traffic Signs and Striping. Subdivider will install, at Subdivider's expense, striping, street name signs, stop signs, speed limit signs and other signs on local, collector and arterial streets. Signs and striping shall be installed in a manner reasonably approved by the Town and in accordance with the Model Traffic Code, as from time to time amended, and other applicable legal requirements.

4.0 PUBLIC USE DEDICATION AND LANDSCAPING

4.1 Public Use Dedication. (a) Subdivider shall convey to the St. Vrain Lakes Metropolitan

District No. 1, prior to the issuance of any building permits, those tracts as shown on the Plat as to be owned by the St. Vrain Lakes Metropolitan District.

(b) The Subdivider specifically represents that to the best of its knowledge, all portions of the Subdivision either dedicated to the Town or comprising rights-of-way to be owned and maintained by the Town are in compliance with all environmental protection and anti-pollution laws, rules, regulations, orders, and requirements, including solid waste requirements, as defined by the US Environmental Protection Agency Regulations at 40 C.F.R., Part 261, and that such portions of the property as are dedicated to the Town pursuant to this development, are in compliance with all such requirements pertaining to the disposal or existence in or on such dedicated property of any hazardous substances, pollutants, or contaminants, as defined by the Comprehensive Environmental Response Compensation and Liability Act of 1980, as amended, and regulations promulgated thereunder. The Subdivider does hereby indemnify and hold harmless the Town from any liability whatsoever that may be imposed upon the Town by any governmental authority, pertaining to the disposal of hazardous substances, pollutants or contaminants, and cleanup necessitated by leaking underground storage tanks, excavation and/or backfill of hazardous substances, pollutants or contaminants, or environmental cleanup responsibilities of any nature whatsoever on, of or related to any property dedicated to the Town pursuant to this development. The Subdivider further agrees to indemnify and hold harmless the Town from any claims or actions based directly, indirectly or in any manner on any of the aforementioned environmental risks brought against the Town by third parties arising as a result of the dedication of portions of the Property to the Town pursuant to this development. Said indemnification shall not extend to claims, actions or other liability arising as a result of any hazardous substance, pollutants or contaminants generated or deposited by the Town, its agents or representatives, upon portions of the property dedicated to the Town pursuant to this development.

4.2 Landscape Improvements. For public lands and rights-of-way within the Subdivision, Subdivider shall furnish to the Town complete final landscape and irrigation plans and obtain approval thereof by the Town prior to commencement of Public Improvements. Subdivider shall construct the landscape improvements as required in landscape and irrigation plans approved by the Town.

5.0 WATER LINES

5.1 Specifications. (a) All water mains, lines and appurtenances thereto shall be constructed and installed by the Subdivider, at the minimum, pursuant to Town-approved plans, Little Thompson Water District specifications, and the Schedule of Improvements attached as **Exhibit B**, including both on-site and off-site improvements.

(b) All of the water lines, fire hydrants, valves, fittings, and appurtenances as shown on the approved utility plans shall be installed by the Subdivider prior to issuance of any building permits. This shall include all water services for all of the lots shown on the Plat.

6.0 SEWER LINES

6.1 Specifications. All sewer lines and appurtenances thereto shall be constructed and installed by the Subdivider, at the minimum, pursuant to Town-approved plans, St. Vrain Sanitation District specifications, and the Schedule of Improvements attached as **Exhibit B**, and shall meet the requirements and have the approval of the sanitation district serving the property, including both on-site and off-site improvements.

7.0 OTHER IMPROVEMENTS

7.1 Street Lights. The total cost of street light installation shall be the Subdivider's obligation. Subdivider shall cause, at its own expense, the provider of electric and power service to install all required street lighting pursuant to Town-approved plans and specifications. Said street lights shall be installed concurrently with the streets on which they are located.

7.2 Drainage Improvements. (a) Drainage improvements for the Subdivision shall be constructed by Subdivider and, at the minimum, in accordance with plans and specifications approved by the Town and in accordance with the minimum requirements for storm drainage facilities as have been established by the Town. All storm drainage facilities shall be so designed and constructed by the Subdivider as to protect downstream and adjacent properties against injury and adequately serve the Subdivision. No overlot grading shall be initiated by Subdivider until the Town issues a grading permit in accordance with Section 1.5(b)(1).

(b) Drainage improvements shall be completed and granted conditional acceptance by the Town prior to the issuance of building permits. Completion of the improvements shall include the certification by a licensed professional engineer that the drainage facilities which serve the development have been constructed in conformance with said approved plans. Any deviation from the approved plans shall be the responsibility of the Subdivider to correct. Said certification shall be submitted to the Town at least two (2) weeks prior to the date of issuance for any subsequent building permit.

(c) Drainage improvements for each lot shall be constructed by the Subdivider, at the minimum, in accordance with the approved construction plans. Subdivider shall furnish copies of approved plans to subsequent purchasers (other than homeowners) of lots. Any changes from the approved plans with respect to grade elevation or storm drainage facility configuration that occur as a result of the construction of houses and or other development of lots, whether by the Subdivider or other parties, shall require the approval of the Town. The Town may withhold the issuance of building permits and certificates of occupancy until the Town has approved such changes as being acceptable for the safe and efficient delivery of storm drainage water.

7.3 Trash, Debris, Mud. Subdivider agrees that during construction of the Subdivision and improvements described herein, Subdivider shall take any and all steps necessary to control trash, debris and wind or water erosion in the Subdivision. If the Town determines that said trash, debris or wind or water erosion causes damage or injury or creates a nuisance, Subdivider agrees to abate said nuisance and/or to correct any damage or injury within five (5) working days after notification by Town. If Subdivider does not abate said nuisance or if an emergency situation exists, to be determined

by the Town in its sole discretion, the Town may abate the nuisance and/or correct any damage or injury without notice to Subdivider at Subdivider's expense. Subdivider also agrees to take any and all steps necessary to prevent the transfer of mud or debris from the construction site onto public rights-of-way and to immediately remove such mud and debris from public rights-of-way after notification by the Town. If Subdivider does not abate such mud or debris, or if an emergency exists, Town may abate the same at Subdivider's expense.

7.4 Limitation of Construction Hours. The operation of construction equipment shall be prohibited between the hours of 7:00 p.m. and 7:00 a.m. The Town Manager may, upon written application and for good cause, alter the hours of operation for a defined period of time.

8.0 MISCELLANEOUS TERMS

8.1 Breach of Agreement. In the event that the Subdivider should fail to timely comply with any of the terms, conditions, covenants and undertakings of the Agreement, and if such noncompliance is not cured and brought into compliance within thirty (30) days of written notice of breach of the Subdivider by the Town, unless the Town in writing and in its sole discretion designates a longer cure period, then the Town may draw upon the Improvement Guarantee and may complete some or all the public improvements associated with such Improvement Guarantee at Subdivider's expense. Subdivider's expense shall be limited to the costs incurred by the Town, as defined herein. Notice by the Town to the Subdivider will specify the conditions of default. In the event that no Improvement Guarantee has been posted or the Improvement Guarantee has been exhausted or is insufficient, then the Town has the right enforce the restrictions on the issuance of building permits and other approval or permits, and, if it chooses, to begin work on the Improvements at the expense of the Subdivider. If the Town determines in its sole discretion that an emergency exists, such that the improvement must be completed in less than seven (7) days, the Town may immediately draw upon the Improvement Guarantee if available and may complete the Improvements at Subdivider's expense even if the improvement guaranty is not available; in such event, the Town shall use its best efforts to notify Subdivider at the earliest practical date and time. The Town may also, during the cure period and until completion of the improvements in compliance with this Agreement, withhold any additional building permits, certificates of occupancy, or provision of new utilities fixtures or services. Nothing herein shall be construed to limit the Town from pursuing any other remedy at law or in equity which may be appropriate under municipal, state or federal law. Failure to timely complete construction of improvements which is solely due to inclement weather, acts of God, material shortages, labor strikes, and other matters not within the Subdivider's control shall not be considered a breach of the Agreement. Any costs incurred by the Town, including, but not limited to, administrative costs and reasonable attorney fees, in pursuit of any remedies due to the breach by the Subdivider shall be the responsibility of the Subdivider. The Town may deduct these costs from the Improvement Guarantee.

8.2 Recording of Agreement. The Town shall record this Agreement at Subdivider's expense in the office of the Clerk and Recorder, County of Weld, State of Colorado, and the Town shall retain the recorded Agreement.

8.3 Binding Effect of Agreement. This Agreement shall run with the land included within the Subdivision, shall be binding upon the successors and assigns of the parties hereto, and except as provided herein to the contrary, shall inure to the benefit of the successors and assigns of the parties hereto.

8.4 Assignment, Delegation and Notice. There shall be no transfer or assignment of any of the rights or obligations of the Subdivider under this Agreement without the prior written approval of the Town, and the Subdivider agrees to provide the Town with at least fourteen (14) days' advance notice of any such proposed transfer or assignment. Subdivider shall not sell or transfer any lots within the Subdivision before the Improvement Guarantee has been posted, or during any period Subdivider has been notified by the Town that the Improvement Guarantee is not in compliance with this Agreement. If such a sale or transfer is made, Subdivider shall be in default of this Agreement and is subject to the provisions of Section 8.1, and the Town may suspend all development activities relating to the Subdivision or Subdivider, or both, including but not limited to staff development reviews, public hearings, and issuance of building permits and certificates of occupancy. Subdivider and successor shall, until written Town approval of the proposed transfer of title and delegation of obligations, be jointly and severally liable for the obligations of Subdivider under this Agreement.

8.5 Modification and Waiver. No modification of the terms of this Agreement shall be valid unless in writing and executed with the same formality as this Agreement, and no waiver of the breach of the provisions of any section of this Agreement shall be construed as a waiver of any subsequent breach of the same section or any other sections which are contained herein.

8.6 Addresses for Notice. Any notice or communication required or permitted hereunder shall be given in writing and shall be personally delivered, or sent by United States mail, postage prepaid, registered or certified mail, return receipt requested, addressed as follows:

TOWN:

Town of Firestone
Town Clerk
151 Grant Avenue
P.O. Box 100
Firestone, CO 80520

SUBDIVIDER:

Barefoot LLC
6465 Greenwood Plaza Blvd #700
Centennial, CO 80111

With a required copy to:

Williamson & Hayashi, LLC
Attn: William Hayashi
1650 38th Street, Suite 103 West
Boulder, CO 80301

Lyons Gaddis Kahn Hall Jeffers
Dworak & Grant, P.C.
515 Kimbark Street
Longmont, CO 80501

or to such other address or the attention of such other person(s) as hereafter designated in writing by the applicable parties in conformance with this procedure. Notices shall be effective upon mailing or personal delivery in compliance with this paragraph.

8.7 Force Majeure. Whenever Subdivider is required to complete construction, maintenance, repair, or replacement of improvements by an agreed upon deadline, said deadline shall be extended for a reasonable time if the performance cannot as a practical matter, be completed in a timely manner due to Acts of God or other circumstances constituting force majeure or beyond the reasonable control of Subdivider.

8.8 Approvals. Whenever approval or acceptance of a matter is required or requested of the Town pursuant to any provisions of this Agreement, the Town shall act reasonably in responding to such matter.

8.9 Previous Agreements. All previous written and recorded agreements between the parties, their successors, and assigns, including, but not limited to, the Annexation Agreement and Development and Vested Rights Agreement, shall remain in full force and effect and shall control this Subdivision. If any prior agreements conflict with this Agreement, then this Agreement controls.

8.10 Title and Authority. Subdivider warrants to the Town that it is the record owner for the property within the Subdivision or is acting in accordance with the currently valid and unrevoked power of attorney of the record owner hereto attached. The undersigned further warrants to have full power and authority to enter into this Agreement on behalf of Subdivider.

8.11 Severability. This Agreement is to be governed and construed according to the laws of the State of Colorado. In the event that upon request of Subdivider or any agent thereof, any provision of the Agreement is held to be violative of the municipal, state, or federal laws and hereby rendered unenforceable, the Town, in its sole discretion, may determine whether the remaining provisions will or will not remain in force.

8.12 Agreement Status After Final Acceptance. Upon final acceptance by Town of all improvements and compliance by Subdivider with all terms and conditions of this Agreement, and provided that no litigation or claim is pending relating to this Agreement, the provisions of this Agreement relating to the construction of public improvements shall no longer be in effect except for the provisions of Sections 1.12 and 4.1(b) hereof, which provisions shall remain in effect and survive any expiration or termination of this Agreement.

[SIGNATURES ON FOLLOWING PAGE]

IN WITNESS WHEREOF, the parties have executed this Agreement as of the date first set forth above.

TOWN:
TOWN OF FIRESTONE, COLORADO

By: _____
Bobbi Sindelar, Mayor

ATTEST:

Jessica Koenig, Town Clerk

SUBDIVIDER:
BAREFOOT, LLC

By: [Signature]
Title: Jeff McGovern
Division President

and

By: [Signature]
Title: Ashley Taruffelli
CFO

ACKNOWLEDGMENT

STATE OF COLORADO)
) ss.
COUNTY OF ARAPAHOE)

The foregoing instrument was acknowledged before me this 2ND day of DECEMBER, 2021, by JEFF MCGOVERN as DIVISION PRESIDENT and ASHLEY TARUFFELLI as CFO of Barefoot, LLC.

Witness my hand and official seal.

My commission expires: 2/5/2023

(SEAL)

[Signature]
Notary Public

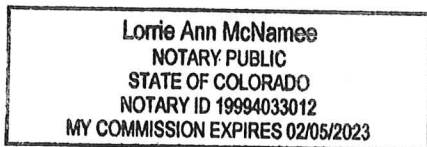


EXHIBIT A
(reduced copy of Filing 4, 1st Replat)

EXHIBIT B
(list of Public Improvements)

EXHIBIT C

IRREVOCABLE LETTER OF CREDIT
REQUIRED FORM

[date of Letter of Credit - the date the credit is opened]

Town of Firestone, CO
151 Grant Avenue
P.O. Box 100
Firestone, CO 80520

Attn: Town Clerk:

We hereby issue our Irrevocable Letter of Credit Number _____ in your favor for the account of _____, in an amount not to exceed _____ effective immediately and expiring at our counters on (except November 1 - March 1) or any extended expiration date as indicated below.

Funds under this Letter of Credit are available for payment by sight, by presentation of your sight draft(s) substantially in the form of Exhibit "A" accompanied by your written certificate substantially in the form of Exhibit "B".

Partial and multiple drawings are permitted.

This Letter of Credit will automatically be extended for a period of one (1) year from the present or any future expiration date unless we notify you in writing by certified mail ninety (90) days prior to any expiration date that we elect not to renew this Letter of Credit for any additional period.

We hereby engage with you that all drawings in conformity with terms and conditions of the Letter of Credit will be duly honored upon presentation to our counters on or before any expiration date as indicated above.

All bank charges, including any advising bank charges, are to be charged to (account party's name).

If a demand for payment by you hereunder does not, in any instance, conform to the terms and conditions of this Letter of Credit, the bank shall give the Town written notice, and send copy of this notice by FAX to the Town of Firestone (Attn: Town Clerk), within three business days of presentment of any nonconforming draft that the purported negotiation was not effective in accordance with the terms and conditions of the Letter of Credit, stating with particularity the reasons therefore. The bank will hold all documents at the bank for the Town, or send them to the Town, at the Town's option. Any such nonconforming demand may be corrected and resubmitted within three

(3) business days of receipt of the bank's mailed notice of nonconformity. A resubmittal will be deemed to have been presented to the bank on the date of the original demand for payment.

We are a current member of (FDIC) (FSLIC).

This credit is subject to the Uniform Customs and Practice for Documentary Credits, 2007 revision, ICC publication number 600.

This Irrevocable Letter of Credit sets forth in full the terms of our undertaking and such undertaking shall not in any way be modified, amended or amplified by reference to any document or instrument referred to herein or in which the Irrevocable Letter of Credit relates and any such reference shall not be deemed to incorporate herein by reference any document or instrument.

Sincerely,

(Bank)

EXHIBIT A TO LETTER OF CREDIT
DRAFT FOR PAYMENT DRAWN UNDER

IRREVOCABLE LETTER OF CREDIT NO. _____

DATE: _____, 20 ____.

PAY TO: The account of the Town of Firestone, Colorado, Account

No. _____, at _____,

Colorado, THE SUM OF _____ DOLLARS

(\$ _____).

TOWN OF FIRESTONE, COLORADO

By: _____
Town Clerk

EXHIBIT B TO LETTER OF CREDIT

To: _____

CERTIFICATE FOR PAYMENT

The undersigned, a duly appointed officer of the Town of Firestone, Colorado (the "Town"), hereby certifies to _____ (the "Bank"), with reference to the Bank's Irrevocable Letter of Credit No. _____ (the "Letter of Credit"), issued by the Bank in favor of the Town, that:

- (1) The undersigned is the Town Clerk for the Town.
- (2) The Town is authorized to make a drawing under the Letter of Credit.
- (3) The amount which is due and payable from the Letter of Credit is \$_____, and the amount of the sight draft accompanying this certificate does not exceed such amount.

IN WITNESS WHEREOF, the undersigned has executed and delivered this certificate as of the _____ day of _____, 20____.

TOWN OF FIRESTONE, COLORADO

By: _____
Town Clerk

AGENDA INFORMATION MEMORANDUM

FIRESTONE TOWN BOARD OF TRUSTEES



AIM#: 5.e

Consent Agenda

Meeting Date: December 8, 2021

Initiated By: Todd Bjerkaas

Dept: Planning & Development

AGENDA TITLE

Resolution 21-211: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO APPROVING THE PARTIAL ASSIGNMENT OF INTEREST IN THE SUBDIVISION AGREEMENT FOR BAREFOOT LAKES, FILING NO. 4, 1ST REPLAT FROM BAREFOOT, LLC TO RICHMOND AMERICAN HOMES OF COLORADO, INC.

SUMMARY

On December 8, 2021, the Board of Trustees of the Town of Firestone considered the Subdivision Agreement with Barefoot, LLC for Barefoot Lakes Filing No. 4, 1st Replat Final Plat Subdivision. The Subdivision Agreement details the rights and obligations of the developer and the Town in order to construct Filing No. 4, 1st Replat of the subdivision.

At closing, Barefoot, LLC desires to convey lots and tracts and assign portions of the Subdivision Agreement along with its rights and obligations including the improvement surety to Richmond American Homes of Colorado, Inc. Consistent with Section 8.4 of the Subdivision Agreement, Barefoot, LLC has provided advance notice of this assignment and has requested written approval by the Town.

HISTORY AND PREVIOUS BOARD ACTION

RECOMMENDATION

Staff recommends that the Board approve the attached resolution authorizing the Mayor to sign the Partial Assignment of Subdivision Agreement, Barefoot Lakes Filing No. 4, 1st Replat.

ALTERNATIVES

ATTACHMENTS

1. Resolution 21-211 Barefoot Lakes F4 R1 Partial Assignment

FINANCIAL CONSIDERATIONS

RESOLUTION NO. 21-211

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO APPROVING THE PARTIAL ASSIGNMENT OF INTEREST IN THE SUBDIVISION AGREEMENT FOR BAREFOOT LAKES, FILING NO. 4, 1ST REPLAT FROM BAREFOOT, LLC TO RICHMOND AMERICAN HOMES OF COLORADO, INC.

WHEREAS, Barefoot, LLC (“Barefoot”), a Colorado limited liability company, and the Town of Firestone (“Town”) entered into that certain Subdivision Agreement (“Agreement”) for Barefoot Lakes Filing No. 4, 1st Replat recorded in the records of the Clerk and Recorder of Weld County, Colorado at Reception No. _____ on _____, 2021; and

WHEREAS, Section 8.4 of the Agreement permits the assignment of the Agreement to other parties upon written approval of the Town; and

WHEREAS, Barefoot provided advance notice as required in Section 8.4 of the Agreement to the Town of its intent to convey lots and tracts in Barefoot Lakes Filing No. 4, 1st Replat to Richmond American Homes of Colorado, Inc. (“Richmond”), and assign certain rights and obligations of the Agreement to Richmond; and

WHEREAS, Barefoot and Richmond, who desires to fulfill the Agreement’s obligations, to the extent such obligations apply to the property within the Subdivision that is being acquired by Richmond, request the Town approve the proposed assignment of the Agreement; and

WHEREAS, the Board of Trustees of the Town of Firestone, Colorado has considered the proposed Assignment Agreement, attached here to as Exhibit A, on December 8, 2021; and

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

Section 1. The Board of Trustees of the Town of Firestone hereby approves the Partial Assignment Agreement, in substantially the same form as the copy attached hereto as Exhibit A and incorporated herein. The Mayor is authorized to execute the Partial Assignment Agreement on behalf of the Town upon the Town receiving notification from Barefoot and Richmond that the agreement has been duly executed by each party.

INTRODUCED, READ AND ADOPTED this 8th day of December, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

Jessica Koenig, Town Clerk

Exhibit A
Partial Assignment Agreement

**PARTIAL ASSIGNMENT OF SUBDIVISION AGREEMENT
BAREFOOT LAKES FILING NO. 4, 1ST REPLAT**

THIS PARTIAL ASSIGNMENT OF SUBDIVISION AGREEMENT (“Assignment”) is made and entered into this _____ day of _____, 2021, by and between the **TOWN OF FIRESTONE**, a Colorado municipal corporation (“Town”), **BAREFOOT, LLC**, a Colorado limited liability company (“Barefoot” or “Assignor”), and **RICHMOND AMERICAN HOMES OF COLORADO**, a Delaware corporation (“Richmond” or “Assignee”).

WHEREAS, Barefoot, LLC and the Town entered into that certain SUBDIVISION AGREEMENT for BAREFOOT LAKES FILING NO. 4, 1ST REPLAT (the “Agreement”), recorded on December __, 2021 at Reception No. _____ in the Office of the Weld County Clerk and Recorder, whereby Barefoot LLC, as the Subdivider defined in the Agreement, agreed to plan for, install and construct public improvements required to serve the Barefoot Lakes Filing No. 4, 1st Replat subdivision (the “Subdivision”), as legally described in the Agreement;

WHEREAS, Barefoot is under contract to sell to Richmond all of the platted lots within the Subdivision which platted lots are identified and described on **Exhibit A**, attached hereto and incorporated herein (“Richmond Property”); and

WHEREAS, under the contract for sale, Richmond has agreed to complete the public improvements required to be constructed by Barefoot under the Agreement that are described and identified in **Exhibit B** to the Agreement (“Richmond-Provided Public Improvements”);

WHEREAS, Barefoot desires to assign to Richmond a portion of its rights, title, interest, and obligations under the Agreement, but only to the extent such rights and obligations apply to the Richmond Property and the Richmond-Provided Public Improvements, and Richmond desires to fulfill the Agreement’s obligations to the extent such obligations apply to the Richmond Property and Richmond-Provided Public Improvements; and

WHEREAS, Section 8.4 of the Agreement requires Barefoot to provide to the Town written notice of any proposed transfer, assignment or delegation of all or any portion of Barefoot’s rights and obligations under the Agreement to any successor; and

WHEREAS, Section 8.4 of the Agreement further provides that any of the rights and obligations of Barefoot under the Agreement may not be assigned without the written consent of the Town; and

WHEREAS, as required by Section 1.11 of the Agreement, Barefoot has posted sureties in the amount of \$_____. to guarantee completion of the improvements required by the Agreement (“Improvement Guarantee”)

WHEREAS, the Town consents to the proposed Assignment of the Agreement from Barefoot to Richmond upon the terms and conditions set forth herein.

AGREEMENT

NOW THEREFORE, in consideration of the recitals, promises, covenants and undertakings herein set forth, and other good and valuable consideration, which is hereby acknowledged and receipted for, the Town, Barefoot and Richmond agree as follows:

1. Incorporation of Recitals. The Parties hereby incorporate the recitals above as part of their agreement as if fully set forth herein.

2. Partial Assignment. For good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, Barefoot hereby assigns, sets over and transfers to Richmond all right, title, interest and obligations under the Agreement to the extent such right, interest and obligations apply to the Richmond Property and Richmond -Provided Public Improvements (“Assigned Rights and Obligations”). Notwithstanding the foregoing, Assignor shall retain all rights, title, obligations and interest in all sections of the Agreement other than the Assigned Rights and Obligations and that apply to any and all portions of the Subdivision not otherwise acquired by or conveyed to Assignee. Assignor shall further retain all obligations in the following sections of the Agreement and agrees to perform the same: Sections 2.1 and 4.1.

3. Assumption of Obligations. Assignee hereby assumes and agrees to perform all of the commitments, obligations, terms, provisions, conditions and covenants of the Assigned Rights and Obligations.

4. Replacement of Improvement Guarantee. Richmond warrants that it shall replace Assignor’s Improvement Guarantee with new security of its own in a form and in the amount required by Section 1.11 of the Agreement, but no less than the amount of Assignor’s Improvement Guarantee, unless the Town determines at its sole discretion that such new security can be issued at a lesser amount. Richmond shall provide the Town a new Improvement Guarantee within 30 days of execution of this Assignment. Such Improvement Guarantee shall be maintained in accordance with and shall otherwise be subject to all terms and requirements of the Agreement. Upon receipt of Assignee’s Improvement Guarantee meeting the requirements of the Agreement, the Town shall return to Barefoot the Improvement Guarantee posted by it.

5. Effect. Notwithstanding anything in this Assignment to the contrary, this Assignment shall become effective upon the later of full execution by the parties hereto or the date Richmond closes on the purchase of the Richmond Property.

6. Section Headings. The section of headings are inserted herein only for convenience or reference, and in no way shall be defined to limit or describe the scope or intent of any of the provisions in this Assignment.

7. Successors and Assigns. This Assignment shall be binding upon the parties and the successor entity of any party and will be deemed a covenant running with land included within the Subdivision and will be binding upon all successors in ownership of the land within the Subdivision; provided, however, that in no event will the purchaser of any platted lot within the

Subdivision upon which a dwelling has been constructed and issued a certificate of occupancy be deemed to be a successor to Assignee hereunder.

8. Counterparts. This Agreement may be executed in any number of counterparts, and, when so executed, shall constitute a single, binding agreement between those persons who have executed such counterparts.

IN WITNESS WHEREOF, the parties hereto have executed this Assignment of Subdivision Agreement as of the day and year first above set forth.

[signature page follows]

**RICHMOND AMERICAN HOMES OF
COLORADO, INC, A DELAWARE
CORPORATION**

By: _____

Printed Name: _____

Title: _____

ACKNOWLEDGMENT

STATE OF COLORADO)
) ss.
COUNTY OF _____)

The foregoing instrument was acknowledged before me this ____ day of _____, 2021, by _____, as _____ of Richmond American Homes of Colorado, Inc., a Delaware corporation.

Witness my hand and official seal.

My commission expires: _____

(SEAL)

Notary Public

BAREFOOT, LLC
a Colorado limited liability company

By: _____

Printed Name: _____

Title: _____

ACKNOWLEDGMENT

STATE OF COLORADO)
) ss.
COUNTY OF _____)

The foregoing instrument was acknowledged before me this ____ day of _____, 2021, by _____, as _____ of **BAREFOOT, LLC**, a Colorado limited liability company.

Witness my hand and official seal.

My commission expires: _____

(SEAL)

Notary Public

ACKNOWLEDGEMENT OF NOTICE AND CONSENT TO ASSIGNMENT

The Town of Firestone acknowledges receipt of notice of this Assignment, and acknowledges to Assignor and Assignee that the foregoing Assignment is consented to by:

TOWN OF FIRESTONE, COLORADO

By: _____
Bobbi Sindelar, Mayor

ATTEST:

Jessica Koenig, Town Clerk

Exhibit A
Richmond Property

Lots 1 through 15, Block 1,
Lots 1 through 13, Block 2,
Barefoot Lakes Filing 4 No. 4, 1st Replat
Town of Firestone, Weld County, State of Colorado

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 5.f

Consent Agenda

Meeting Date: December 8, 2021

Initiated By: Julie Pasillas

Dept: Public Works

AGENDA TITLE

Resolution 21-202: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING A PROFESSIONAL SERVICES CONTRACT MASTER SERVICES AGREEMENT BETWEEN THE TOWN OF FIRESTONE AND LEONARD RICE CONSULTING WATER ENGINEERS, INC.

SUMMARY

This Agreement is to continue Leonard Rice Engineers, Inc.'s (LRE Water) representation of the Town in 2022. LRE Water has been serving the Town as a Program Manager for water resources matters, reporting to Julie Pasillas, Director of Public Works, since 2017.

The Agreement covers general representation and ten specific Task budgets, as described in Schedule A. All of the Tasks included in Schedule A of the Agreement will be completed in 2022.

HISTORY AND PREVIOUS BOARD ACTION

The Board of Trustees approved Agreements on June 14, 2017; December 18, 2017; December 12, 2018; December 11, 2019; and December 9, 2020, to retain LRE Water to serve the Town in a Program Management role. From February 2017 through May 2017, LRE Water worked under an Agreement signed by the Town Manager.

RECOMMENDATION

Staff recommends approval of Resolution 21-202, approving a Professional Services Contract Master Service Agreement with Leonard Rice Consulting Water Engineers, Inc.

ALTERNATIVES

The Board may choose not to approve Resolution 21-202 and provide Staff with additional direction.

ATTACHMENTS

1. Res 21-202 2022 Leonard Rice Services Agmt
2. 2022 Master Services Agreement Leonard Rice with Schedule A

FINANCIAL CONSIDERATIONS

This Agreement is for a total of \$607,000.00, including \$433,000.00 for 10 Tasks. This has been included in the 2022 budget.

The \$607,000.00 budget will not be exceeded unless the Board approves additional Tasks or specific Change Orders.

RESOLUTION NO. 21-202

**A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE,
COLORADO, APPROVING A PROFESSIONAL SERVICES CONTRACT MASTER
SERVICES AGREEMENT BETWEEN THE TOWN OF FIRESTONE AND LEONARD
RICE CONSULTING WATER ENGINEERS, INC.**

WHEREAS, Leonard Rice Consulting Water Engineers, Inc., (“LRE”), currently serves as consultants for the Town of Firestone (“Firestone”) and are involved in developing strategies and tactics, and manage and direct projects and initiatives related to: water rights and water supply, water delivery and water treatment projects, and work with other parties as needed; and evaluate and create other initiatives; and

WHEREAS, LRE has performed such services for Firestone since 2017, and given LRE’s skill, experience, expertise and qualifications, Firestone desires to continue its relationship with LRE.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

The Professional Services Contract Master Services Agreement between the Town of Firestone and Leonard Rice Consulting Water Engineers, Inc., is approved in substantially the same form as the copy attached hereto and made a part of this resolution and the Mayor is authorized to sign the Agreement.

INTRODUCED, READ AND ADOPTED this 8th day of December, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

Jessica Koenig, CMC, Town Clerk

APPROVED AS TO FORM:

William P. Hayashi, Town Attorney



PROFESSIONAL SERVICES CONTRACT MASTER SERVICE AGREEMENT

THIS AGREEMENT ("Agreement"), made this 8th day of December, 2021, between the Town of Firestone, a statutory Colorado town, whose address is 9950 Park Avenue, Firestone, CO 80504, hereinafter referred to as "FIRESTONE," and Leonard Rice Consulting Water Engineers, Inc. (dba LRE Water), an independent contractor, whose address is 1221 Auraria Parkway, Denver, CO 80204, hereinafter referred to as "CONSULTANT," provides as follows:

ARTICLE I SCOPE OF SERVICES

Section 1.1 Services: FIRESTONE retains CONSULTANT, and CONSULTANT agrees to perform the services as described in Schedule A, hereinafter referred to as the "Services". Schedule A is hereby incorporated by reference and made a part of this Agreement. To the extent that this Agreement and Schedule A conflict, the provisions of this Agreement shall prevail. Additional goods or services beyond those set out in Schedule A, if requested, shall be provided only when authorized in writing by FIRESTONE.

- (a) In addition to the services described in Schedule A, FIRESTONE may prepare, with the assistance of CONSULTANT, work orders, containing, at a minimum, the following information: (1) the specific tasks and deliverables CONSULTANT must perform; (2) CONSULTANT's budget; (3) FIRESTONE's maximum payment obligation under the subject work order; (4) the completion date for the subject work order; and (5) CONSULTANT's schedule of fees to remain in effect until the identified completion date of the subject work order. Notwithstanding the foregoing, if a work order is a multi-year work order, CONSULTANT may revise its schedule of fees annually. After the work order has been finalized and agreed to by FIRESTONE and CONSULTANT, FIRESTONE may issue a notice to proceed obligating CONSULTANT to begin performance of the subject work order. CONSULTANT shall not commence work on any work order until it has received the applicable notice to proceed. Notice to proceed may be sent by email.

- (b) FIRESTONE reserves the right to amend any work order that has been issued under this Contract by altering, reducing, increasing, or eliminating specific tasks and deliverables. If FIRESTONE desires to amend a work order that has been issued, then FIRESTONE shall notify CONSULTANT of the contemplated change ("Notice of Change Order"). Upon receiving the Notice of Change Order CONSULTANT shall provide: (1) an estimate of the increase or decrease, if any, to CONSULTANT's budget due to the contemplated change and (2) the estimated change in the completion date of the subject work order, if any. FIRESTONE may instruct CONSULTANT in the Notice of Change Order to suspend work on any identified task or deliverable affected by a contemplated change, pending FIRESTONE's decision to proceed with the change. When instructed, CONSULTANT shall suspend work on any identified task or deliverable affected by a contemplated change. If it elects to make the change, FIRESTONE shall issue a change order amending the subject work order and providing CONSULTANT with a corresponding Notice to Proceed. CONSULTANT shall not commence work on any change order until it has received the applicable notice to proceed

Section 1.2 Contract Time: CONSULTANT shall commence work upon direction to proceed from FIRESTONE and complete the Services on or before December 31, 2022.

Section 1.3 Independent Contractor: CONSULTANT shall at all times control the means and manner by which CONSULTANT performs the work, subject to FIRESTONE's right to monitor, evaluate and improve such work. CONSULTANT shall at all times be and act as an independent contractor and not as an employee of FIRESTONE.

Section 1.4 Warranty of Consultant: CONSULTANT warrants that it is qualified to assume the responsibilities and render the services described herein and has all requisite corporate authority and professional licenses required by law. All professional services shall be performed timely in accordance with generally accepted professional practices and the level of competency presently maintained by other professionals providing the same general type of work as set forth in Schedule A.

ARTICLE II **CONTRACT PRICE**

Section 2.1 Contract Price: In consideration for the completion of the Project by CONSULTANT in accordance with the terms of this Agreement, FIRESTONE shall pay CONSULTANT (check and initial below as applicable):

☒ _____ As described in Schedule A.

☐ _____ As described in Schedule A, but in no event shall the total compensation to CONSULTANT under this Agreement exceed \$_____.

☐ _____ A fixed sum of \$_____.

☐ _____ Based upon a time, materials and expenses basis, pursuant to the rate schedule attached hereto as Schedule A, but in no event shall the total compensation to CONSULTANT under this Agreement exceed \$_____.

☐ _____ On a unit-price basis, in an amount equal to the sum of the unit price set forth in Schedule A for each separately identified item of unit price work, times the quantity of that item, as estimated in Schedule A, but in no event shall the total compensation to CONSULTANT under this Agreement exceed \$_____.

Section 2.2 Payment: FIRESTONE will make payment due to CONSULTANT for compensation for completed work within thirty (30) days after invoices submitted by CONSULTANT, which invoice(s) may not be submitted more frequently than monthly. Invoices shall indicate the basis upon which payment is requested, such as percentage of the Project completed, or actual time, materials and expenses. FIRESTONE shall submit invoice disputes, if any, to CONSULTANT within thirty (30) days for resolution by mutual consent.

Section 2.3 Expenses: FIRESTONE ☒ shall ☐ shall not reimburse CONSULTANT for actual cost of administrative expenses associated with this Agreement such as long distance telephone, facsimile transmissions, photocopies, reproduction of exhibits, travel expenses and laboratory fees for Task 3 are included in the budget in Schedule A.

Section 2.4 No Multi-Year Fiscal Obligation. Nothing herein shall constitute a multiple fiscal year obligation pursuant to Colorado Constitution Article X, Section 20. Notwithstanding any other provision of this Agreement, FIRESTONE's obligations under this Agreement are subject to annual appropriation by FIRESTONE's Board of Trustees. Any failure of FIRESTONE's Board of Trustees to annually appropriate adequate monies to finance FIRESTONE's obligations under this Agreement shall terminate this Agreement at such time as such then-existing appropriations are to be depleted. Notice shall be given promptly to CONSULTANT of any failure to appropriate such adequate monies.

Section 2.5 Appropriation: If this is a contract for the design or construction, or both the design and construction, of a public works project, FIRESTONE has appropriated funds equal to or in excess of the Contract Price.

ARTICLE III

ADMINISTRATION OF THIS AGREEMENT

Section 3.1 Project Performance: In consideration of the compensation provided for in this Agreement, CONSULTANT agrees to perform or supply the Project, in accordance with generally accepted standards and practices of the industry, and warrants all materials incorporated in the Project to be free from defect of material or workmanship and conform strictly to the specifications, drawings or samples specified or furnished. This Section 3.1 shall survive any inspection, delivery, acceptance or payment by FIRESTONE.

Section 3.2 Oversight: All of the work associated with the Project shall be performed under the direction of Brett Gracely and/or Gregg S. Ten Eyck; it is expressly understood and agreed that some of the work may have commenced prior to the formal execution of this Agreement, in which event such work is incorporated into the Project and is deemed to have been and is authorized by this Agreement.

Section 3.3 Ownership and Use of Documents: (check and initial all that apply)

☒ _____ (a) The following Sections 3.3(a)(1) and (2) are applicable to *design professionals* (architects, engineers, etc.):

(1) The documents prepared by CONSULTANT in connection with the Project and copies thereof furnished to other parties are for use solely with respect to the Project. Such documents are not to be used by any other contractor or subcontractor on other projects or for additions to this Project outside the scope of the work under this Agreement without the specific written consent of FIRESTONE and CONSULTANT. Other contractors and subcontractors are authorized to use and reproduce applicable portions of the documents prepared by CONSULTANT appropriate to and for use in the execution of their work under this Agreement. All copies made under this authorization shall bear the statutory copyright notice, if any, shown on the documents prepared by CONSULTANT.

(2) Notwithstanding the provisions of Section 3.3(a)(1) above, FIRESTONE may utilize any such documents generated in connection with the Project by CONSULTANT for other projects, provided that CONSULTANT is not held liable for future project applications other than the Project described pursuant to this Agreement.

Section 3.4 Insurance:

(a) CONSULTANT shall at its own expense procure a policy or policies of insurance sufficient to insure against all liability, claims, demands, and other obligations assumed by

CONSULTANT under this Agreement. Such insurance shall be in addition to the insurance requirements below or otherwise imposed by law.

(b) CONSULTANT shall at its own expense keep in full force and effect during the term of this Agreement and during the term of any extension or amendment of this Agreement, insurance as stated below:

(1) Commercial General Liability Insurance with minimum combined single limits of One Million Dollars and No Cents (\$1,000,000.00) for each occurrence and One Million Five Hundred Thousand Dollars and No Cents (\$1,500,000.00) aggregate. The policy shall be applicable to all premises and operations. The policy shall include coverage for bodily injury, broad form property damage (including completed operations), personal injury (including coverage for contractual and employee acts), blanket contractual, independent contractors, products, completed operations, explosion, collapse, and underground hazards.

(2) If professional services (architecture, engineering, design, etc.) are provided, Professional Liability Insurance with limits of One Million Dollars and No Cents (\$1,000,000.00) per claim and One Million Five Hundred Thousand Dollars and No Cents (\$1,500,000.00) aggregate. This policy shall remain in force for the period of design and construction and shall include a discovery period of three years, to commence upon substantial completion of the Project.

(3) Workers' Compensation Insurance to cover all obligations imposed by applicable laws for all of CONSULTANT's employees engaged in the performance of work under this Agreement, based on statutory limits prescribed by and in accordance with Colorado law. In the event any services are performed by a subcontractor, CONSULTANT shall require such subcontractor to provide workers' compensation insurance for its employees.

(4) Comprehensive Automotive Liability Insurance for the duration of this Agreement covering all owned, non-owned, and hired vehicles used in connection with the work performed by or on behalf of CONSULTANT under this Agreement in an amount not less than Five Hundred Thousand Dollars and No Cents (\$500,000.00) combined single limit per occurrence for bodily injury and property damage.

(c) The insurance policies required by Subsection 3.4(b)(1) shall name FIRESTONE and its employees as additional insureds and shall contain waiver of subrogation provision. No additional insured endorsement to a policy shall contain any exclusion for bodily injury or property damage arising from completed operations.

(d) The General Liability policy required under this Section shall provide that such insurance is primary coverage with respect to work contemplated under this Agreement by all insureds and additional insureds, and that any insurance carried by FIRESTONE, its officers, or its employees, or carried by or provided through any insurance pool of FIRESTONE, shall be

excess and not contributory insurance to that provided by CONSULTANT. CONSULTANT shall be solely responsible for any deductible losses under any policy required above. Any insurance policy required under this Agreement shall be written by a responsible company or companies authorized to do business under the laws of the State of Colorado, subject to the approval of FIRESTONE.

(e) Prior to commencement of work under this Agreement, CONSULTANT shall provide FIRESTONE with certificate(s) of insurance completed by CONSULTANT's insurer(s) as evidence that policies providing the required coverage, conditions, and minimum limits are in full force and effect. The certificate shall identify this Agreement and shall provide that the coverage afforded under the policies shall not be canceled until at least thirty (30) days' prior written notice has been given to FIRESTONE. The completed certificate(s) of insurance shall be sent to:

TOWN OF FIRESTONE
9950 Park Avenue
Firestone, CO 80504

Attn: Raelynn Ferrera

(f) CONSULTANT shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to this Section by reason of CONSULTANT's failure to procure or maintain insurance, or by reason of its failure to procure or maintain insurance in sufficient amount, duration or type. Failure on the part of CONSULTANT to procure or maintain policies providing the required coverage, conditions and minimum limits shall constitute a material breach of contract upon which FIRESTONE may immediately terminate this Agreement, or at its discretion FIRESTONE may procure or renew any such policy or any extended reporting period thereto and may pay any and all premiums in connection therewith, and all monies so paid by FIRESTONE shall be repaid by CONSULTANT to FIRESTONE upon demand, or FIRESTONE may withhold the cost of the premiums from any monies due to CONSULTANT from FIRESTONE.

Section 3.5 Colorado Governmental Immunity Act: The parties hereto understand and agree that FIRESTONE is relying on, and does not waive or intend to waive by any provision of this Agreement, the monetary limitations or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, Sections 24-10-101 *et seq.*, C.R.S., as may be amended, or those otherwise available to FIRESTONE, its officers, or its employees.

Section 3.6 Indemnification: CONSULTANT shall indemnify, defend, and hold harmless FIRESTONE and employees from and against claims, damages, losses and expenses, including but not limited to reasonable attorneys' fees which are incurred by Firestone, arising out of or resulting from this Agreement, but only to the extent that any such claim, damage, loss, or expense is caused, or alleged to have been caused, in whole or in part, by any negligent act or omission of CONSULTANT or anyone directly employed by CONSULTANT or anyone for whose acts CONSULTANT is legally liable. Such obligation shall not be construed to negate,

abridge, or otherwise reduce any other right or obligation of indemnity that would otherwise exist as to any person described in this Section.

In any and all claims against FIRESTONE or any of its employees by any employee of CONSULTANT, any subcontractor of CONSULTANT, anyone directly employed by any of them or anyone for whose act CONSULTANT is legally liable, the indemnification obligation under this Section 3.6 shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for CONSULTANT or any subcontractor under worker's or workman's compensation actions, disability benefit acts, or other employee benefit acts.

Section 3.7 Subcontractor(s): CONSULTANT shall, as soon as practicable after the signing of this Agreement, notify FIRESTONE in writing for FIRESTONE's approval, of any subcontractors who may be involved in the Project and the general scope of work to be performed by each subcontractor. FIRESTONE may, in its reasonable discretion, reject any proposed subcontractor; in which case CONSULTANT shall either perform such component of the work itself, or secure a subcontractor acceptable to FIRESTONE.

Section 3.8 Termination of Agreement for Convenience: This Agreement may be terminated by either party without cause upon twenty-one (21) days written notice to the other party. In the event of termination, FIRESTONE will pay CONSULTANT for all services satisfactorily performed and for goods provided to date of termination. If payment is otherwise due in a fixed sum, FIRESTONE will pay CONSULTANT for the pro rata value of the completed portion of the Project. If, however, CONSULTANT has substantially or materially breached the standards or terms of this Agreement, FIRESTONE shall have any remedy or right to set off available at law and equity.

Section 3.9 Binding Effect: FIRESTONE and CONSULTANT each bind itself, its successors and assigns to the other party to this Agreement with respect to all rights and obligations under this Agreement. Neither FIRESTONE nor CONSULTANT shall assign or transfer its interest in, or obligation under, this Agreement without the written consent of the other.

Section 3.10 Compliance with Law: CONSULTANT agrees to perform the work in compliance with all applicable federal, state, county and Town laws, ordinances, rules and regulations, including, without limitations, any preference for Colorado labor as may be required pursuant to Article 17, of Title 8 of the Colorado Revised Statutes ("Keep Jobs in Colorado Act") as may be amended.

Section 3.11 Worker Without Authorization:

(a) CONSULTANT certifies, through signature of its authorized representative executing this Agreement, that it does not knowingly employ or contract with a worker without authorization who will perform work under the public contract for services and that the CONSULTANT will participate in the United States Government's E-Verify Program or the State of Colorado Department of Labor and Employment Program ("Department Program") in order to confirm the employment eligibility of all employees who are newly hired for employment to

perform work under the public contract for services.

(b) CONSULTANT shall not:

(1) Knowingly employ or contract with a worker without authorization to perform work under this Agreement; or

(2) Enter into a contract with a subcontractor that fails to certify to the contractor that the subcontractor shall not knowingly employ or contract with a worker without authorization to perform work under the public contract for services.

CONSULTANT shall affirm as required by C.R.S. § 8-17.5-102 (c) (II), as may be amended, the employment eligibility of all employees who are newly hired for employment to perform work under the public contract for services through participation in either the E-Verify Program or the Department Program.

(c) CONSULTANT is prohibited from using the E-Verify Program or Department Program procedures to undertake pre-employment screening of job applicants while the public contract for services is being performed.

(d) If CONSULTANT obtains actual knowledge that a subcontractor performing work under the public contract for services knowingly employs or contracts with a worker without authorization, CONSULTANT shall be required to:

(1) Notify the subcontractor and FIRESTONE within three days that the CONSULTANT has actual knowledge that the subcontractor is employing or contracting with a worker without authorization; and

(2) Terminate the subcontract with the subcontractor if within three days of receiving the notice required pursuant to sub-subparagraph (B)(2) the subcontractor does not stop employing or contracting with the worker without authorization; except that the CONSULTANT shall not terminate the contract with the subcontractor if during such three days the subcontractor provides information to establish that the subcontractor has not knowingly employed or contracted with a worker without authorization.

(e) CONSULTANT shall comply with all rules and regulations and any reasonable request by the State Department of Labor and Employment made in the course of the Department's performance of its lawful duties pursuant to C.R.S. 8-17.5-101 et.seq., as may be amended.

(f) If CONSULTANT violates any of the provisions set forth in this section, FIRESTONE may terminate the Agreement and CONSULTANT shall be liable for all actual and consequential damages incurred by FIRESTONE.

Section 3.12 Notice and Communications: Any notice to the parties required under this Agreement shall be in writing, delivered to the person designated below for the parties at the

indicated address unless otherwise designated in writing. Only mailing by United States mail or hand delivery shall be utilized for notice required to be given under this Agreement. Facsimile and e-mail addresses are provided for convenience only. However, copies of mailed or hand-delivered notices may be sent to the parties via e-mail or facsimile.

FIRESTONE:

TOWN OF FIRESTONE
9950 Park Avenue
Firestone, Colorado 80504
Attn: Julie Pasillas
Telephone: 303-531-6258
Facsimile:
E-mail: jpasillas@firestoneco.gov

CONSULTANT:

Leonard Rice Consulting Water
Engineers, Inc.
1221 Auraria Parkway
Denver, CO 80204
Attn: Brett Gracely
Telephone: 303-455-9589
Facsimile: 303-455-0115
E-mail:
Brett.Gracely@LREWater.com
Gregg.TenEyck@LREWater.com

ARTICLE IV
RESPONSIBILITIES OF FIRESTONE

Section 4.1 Project Materials: FIRESTONE shall make available data related to the Service, including design specifications, drawings and other necessary information.

Section 4.2 Access to Property and Records: FIRESTONE shall provide CONSULTANT with access to its property as required and necessary to complete the contract. To the extent required by law, FIRESTONE and CONSULTANT agree to make this Agreement and any related records available for public disclosure pursuant to any open records law, including, without limitation, the Colorado Open Records Act, C.R.S. §§ 24-72-101, *et seq.* as may be amended. CONSULTANT agrees to hold FIRESTONE harmless from the disclosure of any records that FIRESTONE reasonably believes it is legally required to disclose.

Section 4.3 FIRESTONE's Representative: FIRESTONE shall designate, in writing, a representative who shall have authority to act for FIRESTONE with respect to the services to be rendered under this Agreement. Such person shall have complete authority to transmit instructions, receive information, interpret and define FIRESTONE's policies and decisions with respect to materials, equipment, elements and systems pertinent to CONSULTANT's services.

Section 4.4 Verbal Agreement or Conversation: No verbal agreement or conversation with any officer, agent or employee of FIRESTONE, either before, during or after the execution of this Agreement, shall affect or modify any of the terms or obligations herein contained, nor shall such verbal agreement or conversation entitle CONSULTANT to any additional payment whatsoever under the terms of this Agreement.

ARTICLE V
MISCELLANEOUS

Section 5.1 Colorado Law: This Agreement is to be governed by the laws of the State of Colorado. Venue for any litigation shall be in Weld County.

Section 5.2 Amendments; Change Orders: This Agreement may only be amended, supplemented or modified in a written document signed by both parties (a "Change Order").

(a) Any other provision of this Agreement notwithstanding, for purposes of this Section 6.2, and only for purposes of this Section 6.2, the term "FIRESTONE" shall have the following meaning with respect to the approval and execution of Change Orders.

(1) With respect to any Change Order that results in an increase in the Contract Price of an amount equal to five percent or less of the Contract Price, the department director who has responsibility over the Project may act as "FIRESTONE" with respect to the approval and execution of such Change Order up to and until such time as the total dollar amount of all Change Orders exceeds Ten Thousand Dollars (\$10,000.00), at which time such Change Order shall be subject to approval and execution pursuant to the provisions of Subsection (2) of this Section 6.2(a);

(2) With respect to any Change Order that results in an increase in the Contract Price of an amount greater than five percent (5%) but less than ten percent (10%) of the Contract Price, the FIRESTONE Town Manager may act as "FIRESTONE" with respect to the approval and execution of such Change Order up to and until such time as the total dollar amount of all Change Orders exceeds Fifty Thousand Dollars (\$50,000.00), at which time such Change Order shall be subject to approval and execution pursuant to the provisions of Subsection (3) of this Section 6.2(a);

(3) With respect to any Change Order that results in an increase in the Contract Price of an amount equal to or greater than ten percent (10%) of the Contract Price and further, with respect to any Change Order which results in any increase in the Contract Price when the total dollar amount of all Change Orders exceeds Fifty Thousand Dollars (\$50,000.00), the FIRESTONE Board of Trustees shall act as "FIRESTONE" with respect to the approval and execution of such Change Order.

(b) Nothing within Section 6.2(a) or any subsection thereof shall prevent the FIRESTONE Town Council from acting as "FIRESTONE" with respect to the approval and execution of any Change Order of any amount whatsoever; it is the intent of Section 6.2(a) and the subsections thereof only to authorize the department director who has responsibility for the Project and the FIRESTONE Town Manager, in the absence of FIRESTONE Board of Trustees approval and execution, to approve and execute certain Change Orders under the circumstances detailed above.

(c) Notwithstanding the foregoing, no change in the Contract Price requiring additional compensable services to be performed, which work causes the aggregate amount payable under this Agreement to exceed the amount appropriated for the original Agreement, shall be valid, unless FIRESTONE gives CONSULTANT written assurance that the lawful appropriations to cover the costs of the additional services have been made and the appropriations are available prior to the performance of the additional services, or unless such services are covered under a remedy-granting provision in this Agreement.

Section 5.3 Counterparts: This Agreement may be executed in two or more counterparts, using manual or facsimile signature, each of which shall be deemed an original and all of which together shall constitute one and the same document.

Section 5.4 No Third Party Benefit: This Agreement is between FIRESTONE and CONSULTANT and no other person or organization shall be entitled to enforce any of its provisions or have any right under this Agreement.

Section 5.5 Severability: If any term, covenant, or condition of this Agreement is deemed by a court of competent jurisdiction to be invalid, void or unenforceable, the remaining provisions of this Agreement shall be binding upon the parties.

Section 5.6 Entire Agreement: This Agreement constitutes the entire agreement between the parties and supersedes all other prior and contemporaneous agreements, representations, and understandings of the parties regarding the subject matter of this Agreement. No supplement, modification, or amendment of this Agreement shall be binding unless executed in writing by the parties. No representations or warranties whatever are made by any party to this Agreement except as specifically set forth in this Agreement or in any instrument delivered pursuant to this Agreement.

Section 5.7 Litigation: In that event that either party commences litigation against the other regarding this Agreement the prevailing party shall be entitled to reasonable attorney fees and costs of litigation.

Section 5.8 No Waiver: Delays in enforcement or the waiver of any one or more defaults or breaches of this Agreement by either party shall not constitute a waiver of any of the other terms or obligations of this Agreement.

IN WITNESS WHEREOF, the parties hereto have signed and executed this Agreement the day first written above.

TOWN OF FIRESTONE

ATTEST:

By: _____
Name: Bobbi Sindelar
Title: Mayor

Town Clerk

APPROVED AS TO FORM:

William P. Hayashi, Town Attorney

CONSULTANT:

By: 
Name: Cortney Brand
Title: President

SCHEDULE A

(Attached to and made a part of the Agreement between the Town of Firestone and Leonard Rice Consulting Water Engineers, Inc. dated December 8, 2021)

LRE Water Project Number 1527TWF02-22:

Program Management: Brett Gracely and Gregg Ten Eyck will work at the direction of Julie Pasillas as members of the Water Team to develop strategies and tactics and to manage and direct projects and initiatives related to water rights, water supply, water delivery and other water projects; to work with other parties as needed; and to evaluate and create other initiatives. The specific tasks Consultant shall perform, include but are not limited to:

Participate in weekly water team meetings.

Review and update as necessary strategies for delivery of C-BT, Windy Gap, NISP, Godding Ditch, Coal Ridge Ditch, Rural Ditch, Lower Boulder Ditch and other sources to Firestone.

Develop strategies for reuse of those water supplies that will be reusable to extinction (Windy Gap, NISP, certain native St. Vrain rights, for example).

Work with the water team to create or update and amend intergovernmental agreements as needed.

Respond to inquiries from other Firestone staff or consultants on water rights, water supply, and storage infrastructure projects.

Continue to evaluate opportunities for other water supplies such as additional NISP water, additional raw water storage facilities or additional senior water rights as they are presented to the Town or as the water team develops strategies.

Budget for 1527TWF02 is \$174,000.00 to be billed in 12 installments of \$14,500.00 each.

LRE Water Project 1527TWF09 Task 1

Task 1 is for LRE to support Lawrence Jones Custer Grasmick & Donovan with Case No. 19CW3236.

Budget for 1527TWF09 Task 1 is \$75,000.00, to be billed at the hourly rates attached to this Agreement.

LRE Water Project 1527TWF09 Task 2

Task 2 is for LRE to support counsel and staff in developing a Substitute Water Supply Plan (SWSP) based on Case No. 19CW3236.

Budget for 1527TWF09 Task 2 is \$9,000.00, to be billed at the hourly rates attached to this Agreement.

LRE Water Project 1527TWF09 Task 3

Task 3 is for LRE to continue and to update the water quality monitoring program, including collection of water quality samples for laboratory analysis; and to report on laboratory results. Laboratory costs are included in the budget below.

Budget for 1527TWF09 Task 3, which covers both professional fees and laboratory fees, is \$72,000.00, to be billed in 12 equal installments of \$6,000.00 each.

LRE Water Project 1527TWF09 Task 4

Task 4 is for LRE to implement the water rights and water supply accounting system as needed to support the substitute water supply plan and to support negotiations related to the accounting systems with objectors in Case No. 19CW3236.

Budget for 1527TWF09 Task 4 is \$36,000.00, to be billed at the hourly rates attached to this Agreement.

LRE Water Project 1527TWF09 Task 5

Task 5 is for LRE to review and evaluate water rights offered to the Town for use in water dedication agreements and to assist counsel in developing agreements.

Budget for 1527TWF09 Task 5 is \$35,000.00, to be billed at the hourly rates attached to this Agreement.

LRE Water Project 1527TWF09 Task 6

Task 6 is for LRE to assist Lawrence Custer Grasmick Jones & Donovan LLP in development of a water court filing in 2022.

Budget for 1527TWF09 Task 6 is \$50,000.00, to be billed at the hourly rates attached to this Agreement.

LRE Water Project 1527TWF09 Task 7

Task 7 is for LRE to conduct preliminary engineering analysis of the historical use of the Last

Chance Ditch to develop a strategy and plan to change water rights from irrigation to new uses, including municipal uses.

Budget for 1527TWF09 Task 7 is \$50,000.00, to billed at the hourly rates attached to this Agreement.

LRE Water Project 1527TWF09 Task 8

Task 8 is for LRE to conduct preliminary engineering analysis of Godding Ditch shares to develop a strategy and plan to change water rights from irrigation to new uses, including municipal uses.

Budget for 1527TWF09 Task 8 is \$50,000.00, to billed at the hourly rates attached to this Agreement.

LRE Water Project 1527TWF09 Task 9

Task 9 is for LRE to conduct preliminary engineering analysis of historical use of New Coal Ridge ditch shares to develop a strategy and plan to change water rights from irrigation use to new uses, including municipal uses.

Budget for 1527TWF09 Task 9 is \$50,000.00, to billed at the hourly rates attached to this Agreement.

LRE Water Project 1527TWF09 Task 10

Task 10 is for LRE to assist the Town with St. Vrain Water Authority matters, including development of Intergovernmental Agreements and attendance at selected Board meetings.

Budget for 1527TWF09 Task 10 is \$6,000.00, to be billed in 12 equal installments of \$500.00 each.

Summary Table

Projects	LRE Water 2022 Budget
General Services	\$ 174,000.00
Task 1: Support Lawrence Jones Custer Grasmick change of water rights Case No. 19CW3236.	\$ 75,000.00
Task 2: Substitute water supply plan support.	\$ 9,000.00
Task 3: Water quality sample collection.	\$ 72,000.00
Task 4: Implement the water rights and water supply accounting system as per decree in 19CW3236 and for SWSP.	\$ 36,000.00
Task 5: Assist with the review and analysis, and negotiations or other efforts related to native water dedication agreements.	\$ 35,000.00
Task 6: Assist Lawrence Custer Grasmick Jones & Donovan LLP in development of a water court filing in 2022.	\$ 50,000.00
Task 7: Preliminary engineering for Last Chance Ditch change of water rights.	\$ 50,000.00
Task 8: Preliminary engineering for Godding Ditch change of water rights.	\$ 50,000.00
Task 9: Conduct preliminary engineering analysis of historical use of New Coal Ridge ditch shares to develop a strategy and plan to change water rights from irrigation use to new uses, including municipal uses.	\$ 50,000.00
Task 10: Assist the Town with matters related to Firestone's membership in the St Vrain Water Authority.	\$ 6,000.00
Total	\$ 607,000.00

LRE WATER 2022 RATE SCHEDULE
Effective December 26, 2021
Hourly Rate

Student Intern.....	\$65- \$95
Data Processor/Admin Support.....	\$75 - \$135
Technician/IT Support	\$100 - \$140
Staff I Engineer/Hydrologist/Geologist/Scientist	\$100 - \$140
Staff II Engineer/Hydrologist/Geologist/Scientist.....	\$115 - \$150
Staff III Engineer/Hydrologist/Geologist/Scientist.....	\$135 - \$175
Project Engineer/Hydrologist/Geologist/Scientist.....	\$155 - \$185
Senior Project Engineer/Hydrologist/Geologist/Scientist.....	\$160 - \$195
Project Manager	\$165 - \$205
Senior Project Manager.....	\$170 - \$260
Principal, Senior Advisor\$200.....	\$275

Expenses such as laboratory analysis, obtaining aerial photos, or other special services incurred directly in connection with the project are billed at cost plus 5 percent to cover handling and administration. Reimbursable expenses billed at cost include airfare, automobile rental, and other travel or per diem costs including mileage billed at the current IRS rate (rounded up to the nearest \$0.05). Subconsultants to LRE are billed at cost plus 10 percent.

December, 2021

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 5.g

Consent Agenda

Meeting Date: December 8, 2021

Initiated By: Julie Pasillas

Dept: Public Works

AGENDA TITLE

Resolution 21-203: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING AN AGREEMENT BETWEEN THE TOWN OF FIRESTONE AND BISHOP LAYTON INC DBA DESIGN CONCEPTS FOR THE PREPARATION OF FRONT END SPECIFICATIONS FOR PARKS CONSTRUCTION PROJECTS AND PARKS TRAILS AND OPEN SPACE STANDARDS

SUMMARY

The Professional Service Agreement with Design Concepts is for the preparation of Front End Specifications for Park Construction Projects and Parks Trails and Open Space Standards for the Town of Firestone. Standards and Specs provide the guide to the development of future parks and recreational amenities and the enhancement of existing resources that will best meet the needs of this growing community.

HISTORY AND PREVIOUS BOARD ACTION

No previous Board action.

RECOMMENDATION

Staff recommends approval of Resolution 21-203, approving a Professional Services Agreement with Bishop Layton, Inc dba Design Concepts.

ALTERNATIVES

The Board may choose not to approve Resolution 21-203 and provide staff with additional direction.

ATTACHMENTS

1. Res 21-203 Professional Service Agreement for Park Open Space Trails Standards and Specs-Design Concepts
2. Professional Services Agreement for Park Open Space Trails Standards and Specs-Design Concepts

FINANCIAL CONSIDERATIONS

The contract includes an amount not to exceed \$15,420.00. Sufficient funds have been budgeted and appropriated in the General Fund.

RESOLUTION NO. 21-203

**A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF
FIRESTONE, COLORADO, APPROVING AN AGREEMENT
BETWEEN THE TOWN OF FIRESTONE AND BISHOP LAYTON INC
DBA DESIGN CONCEPTS FOR THE PREPARATION OF FRONT END
SPECIFICATIONS FOR PARKS CONSTRUCTION PROJECTS AND
PARKS TRAILS AND OPEN SPACE STANDARDS**

WHEREAS, as part of its services for the Town staff requested that Design Concepts prepare Front End Specifications for Park Construction Projects and Parks Trails and Open Space Standards; and

WHEREAS, Design Concepts which has the qualifications and experience to perform such tasks presented the Town a Scope of Work which addresses the Towns requests in a cost effective manner.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

The Agreement for the preparation of Front End Specifications for Park Construction Projects and Parks Trails and Open Space Standards is approved in substantially the same form as the copy attached hereto and made a part of this resolution, and the Mayor is authorized to execute the Agreement on behalf of the Town.

INTRODUCED, READ AND ADOPTED this 8th day of December, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

Jessica Koenig, CMC, Town Clerk

APPROVED AS TO FORM:

William P. Hayashi, Town Attorney

AGREEMENT FOR PROFESSIONAL SERVICES

THIS AGREEMENT FOR PROFESSIONAL SERVICES (the "Agreement") is made and entered into this 8th day of December, 2021 (the "Effective Date"), by and between the TOWN OF FIRESTONE, a Colorado municipal corporation with an address of 9950 Park Avenue, Firestone, Colorado 80504 (the "Town"), and BISHOP LAYTON INC DBA DESIGN CONCEPTS, an independent contractor with a principal place of business at 211 North Public Road Suite 200 Lafayette, Colorado 80026 ("Contractor") (each a "Party" and collectively the "Parties").

WHEREAS, the Town requires professional services; and

WHEREAS, Contractor has held itself out to the Town as having the requisite expertise and experience to perform the required professional services.

NOW, THEREFORE, for the consideration hereinafter set forth, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

I. SCOPE OF SERVICES

A. Contractor shall furnish all labor and materials required for the complete and prompt execution and performance of all duties, obligations, and responsibilities which are described or reasonably implied from the Scope of Services set forth in Exhibit A, attached hereto and incorporated herein by this reference and known as: Park Standards and Specs.

B. A change in the Scope of Services shall not be effective unless authorized as an amendment to this Agreement. If Contractor proceeds without such written authorization, Contractor shall be deemed to have waived any claim for additional compensation, including a claim based on the theory of unjust enrichment, quantum merit or implied contract. Except as expressly provided herein, no agent, employee, or representative of the Town is authorized to modify any term of this Agreement, either directly or implied by a course of action.

II. TERM AND TERMINATION

A. This Agreement shall commence on the Effective Date, and shall continue until Contractor completes the Scope of Services to the satisfaction of the Town, or until terminated as provided herein.

B. Either Party may terminate this Agreement upon 30 days advance written notice. The Town shall pay Contractor for all work previously authorized and completed prior to the date of termination. If, however, Contractor has substantially or materially breached this Agreement, the Town shall have any remedy or right of set-off available at law and equity.

III. COMPENSATION

In consideration for the completion of the Scope of Services by Contractor, the Town shall pay Contractor \$15,420.00. This amount shall include all fees, costs and expenses incurred by Contractor, and no additional amounts shall be paid by the Town for such fees, costs and expenses. Contractor may submit periodic invoices, which shall be paid by the Town within 30 days of receipt.

IV. PROFESSIONAL RESPONSIBILITY

A. Contractor hereby warrants that it is qualified to assume the responsibilities and render the services described herein and has all requisite corporate authority and professional licenses in good standing, required by law. The work performed by Contractor shall be in accordance with generally accepted professional practices and the level of competency presently maintained by other practicing professional firms in the same or similar type of work in the applicable community. The work and services to be performed by Contractor hereunder shall be done in compliance with applicable laws, ordinances, rules and regulations.

B. The Town's review, approval or acceptance of, or payment for any services shall not be construed to operate as a waiver of any rights under this Agreement or of any cause of action arising out of the performance of this Agreement.

C. Because the Town has hired Contractor for its professional expertise, Contractor agrees not to employ subcontractors to perform any work except as expressly set forth in the Scope of Services.

V. OWNERSHIP

Any materials, items, and work specified in the Scope of Services, and any and all related documentation and materials provided or developed by Contractor shall be exclusively owned by the Town. Contractor expressly acknowledges and agrees that all work performed under the Scope of Services constitutes a "work made for hire." To the extent, if at all, that it does not constitute a "work made for hire," Contractor hereby transfers, sells, and assigns to the Town all of its right, title, and interest in such work. The Town may, with respect to all or any portion of such work, use, publish, display, reproduce, distribute, destroy, alter, retouch, modify, adapt, translate, or change such work without providing notice to or receiving consent from Contractor.

If the Town reuses or makes any modification to Consultant's designs, documents or work product without the prior written authorization of Consultant, the Town agrees, to the fullest extent permitted by law, to release the Consultant, its officers, directors, employees and sub-consultants from all claims and causes of action arising from such uses, and shall indemnify and hold them harmless from all costs and expenses, including the cost of defense, related to claims and causes of action to the extent such costs and expenses arise from the Town's modification or reuse of the documents.

The Town expressly acknowledges and agrees that the documents and data to be provided by Consultant under the Agreement may contain certain design details, features and concepts from the Consultant's own practice detail library, which collectively may form portions of the design for the Project, but which separately, are, and shall remain, the sole and exclusive property of Consultant. Nothing herein shall be construed as a limitation on the Consultant's right to re-use such component design details, features and concepts on other projects, in other contexts or for other clients.

VI. INDEPENDENT CONTRACTOR

Contractor is an independent contractor. Notwithstanding any other provision of this Agreement, all personnel assigned by Contractor to perform work under the terms of this Agreement shall be, and remain at all times, employees or agents of Contractor for all purposes. Contractor shall make no representation that it is a Town employee for any purposes.

VII. INSURANCE

A. Contractor agrees to procure and maintain, at its own cost, a policy or policies of insurance sufficient to insure against all liability, claims, demands, and other obligations assumed by Contractor pursuant to this Agreement. At a minimum, Contractor shall procure and maintain, and shall cause any subcontractor to procure and maintain, the insurance coverages listed below, with forms and insurers acceptable to the Town.

1. Worker's Compensation insurance as required by law.
2. Commercial General Liability insurance with minimum combined single limits of \$1,000,000 each occurrence and \$2,000,000 general aggregate. The policy shall be applicable to all premises and operations, and shall include coverage for bodily injury, broad form property damage, personal injury (including coverage for contractual and employee acts), blanket contractual, products, and completed operations. The policy shall contain a severability of interests provision, and shall include the Town and the Town's officers, employees, and contractors as additional insureds. No additional insured endorsement shall contain any exclusion for bodily injury or property damage arising from completed operations.
3. Professional liability insurance with minimum limits of \$1,000,000 each claim and \$2,000,000 general aggregate.

B. Such insurance shall be in addition to any other insurance requirements imposed by law. The coverages afforded under the policies shall not be canceled, terminated or materially changed without at least 30 days prior written notice to the Town. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage. Any insurance carried by the Town, its officers, its employees or its contractors shall be excess and not contributory insurance to that provided by Contractor. Contractor shall be solely responsible for any deductible losses under any policy.

C. Contractor shall provide to the Town a certificate of insurance as evidence that the required policies are in full force and effect. The certificate shall identify this Agreement.

VIII. INDEMNIFICATION

A. Contractor agrees to indemnify and hold harmless the Town and its officers, insurers, volunteers, representative, agents, employees, heirs and assigns from and against all claims, liability, damages, losses, expenses and demands, including attorney fees, on account of injury, loss, or damage, including without limitation claims arising from bodily injury, personal injury, sickness, disease, death, property loss or damage, or any other loss of any kind whatsoever, which arise out of or are in any manner connected with this Agreement if such injury, loss, or damage is caused in whole or in part by, the act, omission, error, professional error, mistake, negligence, or other fault of Contractor, any subcontractor of Contractor, or any officer, employee, representative, or agent of Contractor, or which arise out of a worker's compensation claim of any employee of Contractor or of any employee of any subcontractor of Contractor. Contractor's liability under this indemnification provision shall be to the fullest extent of, but shall not exceed, that amount represented by the degree or percentage of negligence or fault attributable to Contractor, any subcontractor of Contractor, or any officer, employee, representative, or agent of Contractor or of any subcontractor of Contractor.

B. If Contractor is providing architectural, engineering, surveying or other design services under this Agreement, the extent of Contractor's obligation to indemnify and hold harmless the Town may be determined only after Contractor's liability or fault has been determined by adjudication, alternative dispute resolution or otherwise resolved by mutual agreement between the Parties, as provided by C.R.S. § 13-50.5-102(8)(c).

IX. WORKERS WITHOUT AUTHORIZATION

A. Certification. By entering into this Agreement, Contractor hereby certifies that, at the time of this certification, it does not knowingly employ or contract with a worker without authorization, as that term is defined in C.R.S. § 8-17.5-101(9), as amended, who will perform work under this Agreement and that Contractor will participate in either the E-Verify Program administered by the United States Department of Homeland Security and Social Security Administration or the Department Program administered by the Colorado Department of Labor and Employment to confirm the employment eligibility of all employees who are newly hired to perform work under this Agreement.

B. Prohibited Acts. Contractor shall not knowingly employ or contract with a worker without authorization, as that term is defined in C.R.S. § 8-17.5-101(9), as amended, to perform work under this Agreement, or enter into a contract with a subcontractor that fails to certify to Contractor that the subcontractor shall not knowingly employ or contract with a worker without authorization, as that term is defined in C.R.S. § 8-17.5-101(9), as amended, to perform work under this Agreement.

C. Verification.

1. If Contractor has employees, Contractor has confirmed the employment eligibility of all employees who are newly hired to perform work under this Agreement through participation in either the E-Verify Program or the Department Program.

2. Contractor shall not use the E-Verify Program or Department Program procedures to undertake pre-employment screening of job applicants while this Agreement is being performed.

3. If Contractor obtains actual knowledge that a subcontractor performing work under this Agreement knowingly employs or contracts with a worker without authorization, as that term is defined in C.R.S. § 8-17.5-101(9), as amended, who is performing work under this Agreement, Contractor shall: notify the subcontractor and the Town within 3 days that Contractor has actual knowledge that the subcontractor is employing or contracting with a worker without authorization, as that term is defined in C.R.S. § 8-17.5-101(9), as amended, who is performing work under this Agreement; and terminate the subcontract with the subcontractor if within 3 days of receiving the notice required pursuant to subsection 3 hereof, the subcontractor does not stop employing or contracting with the worker without authorization who is performing work under this Agreement; except that Contractor shall not terminate the subcontract if during such 3 days the subcontractor provides information to establish that the subcontractor has not knowingly employed or contracted with a worker without authorization, as that term is defined in C.R.S. § 8-17.5-101(9), as amended, who is performing work under this Agreement.

D. Duty to Comply with Investigations. Contractor shall comply with any reasonable request by the Colorado Department of Labor and Employment made in the course of an investigation conducted pursuant to C.R.S. § 8-17.5-102(5)(a) to ensure that Contractor is complying with the terms of this Agreement.

E. Affidavits. If Contractor does not have employees, Contractor shall sign the "No Employee Affidavit" attached hereto. If Contractor wishes to verify the lawful presence of newly hired employees who perform work under the Agreement via the Department Program, Contractor shall sign the "Department Program Affidavit" attached hereto.

X. MISCELLANEOUS

A. Governing Law and Venue. This Agreement shall be governed by the laws of the State of Colorado, and any legal action concerning the provisions hereof shall be brought in Weld County, Colorado.

B. No Waiver. Delays in enforcement or the waiver of any one or more defaults or breaches of this Agreement by the Town shall not constitute a waiver of any of the other terms or obligation of this Agreement.

C. Integration. This Agreement constitutes the entire agreement between the Parties, superseding all prior oral or written communications.

D. Third Parties. There are no intended third-party beneficiaries to this Agreement.

E. Notice. Any notice under this Agreement shall be in writing, and shall be deemed sufficient when directly presented or sent pre-paid, first class United States Mail to the Party at the address set forth on the first page of this Agreement.

F. Severability. If any provision of this Agreement is found by a court of competent jurisdiction to be unlawful or unenforceable for any reason, the remaining provisions hereof shall remain in full force and effect.

G. Modification. This Agreement may only be modified upon written agreement of the Parties.

H. Assignment. Neither this Agreement nor any of the rights or obligations of the Parties shall be assigned by either Party without the written consent of the other.

I. Governmental Immunity. The Town and its officers, attorneys and employees, are relying on, and do not waive or intend to waive by any provision of this Agreement, the monetary limitations or any other rights, immunities or protections provided by the Colorado Governmental Immunity Act, C.R.S. § 24-10-101, *et seq.*, as amended, or otherwise available to the Town and its officers, attorneys or employees.

J. Rights and Remedies. The rights and remedies of the Town under this Agreement are in addition to any other rights and remedies provided by law. The expiration of this Agreement shall in no way limit the Town's legal or equitable remedies, or the period in which such remedies may be asserted, for work negligently or defectively performed.

K. Subject to Annual Appropriation. Consistent with Article X, § 20 of the Colorado Constitution, any financial obligation of the Town not performed during the current fiscal year is subject to annual appropriation, shall extend only to monies currently appropriated, and shall not constitute a mandatory charge, requirement, debt or liability beyond the current fiscal year.

L. Representative Authority. Each person signing this Agreement represents and warrants that he or she is duly authorized and has the legal capacity to execute the Agreement.

IN WITNESS WHEREOF, the Parties have executed this Agreement as of the Effective Date.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

Jessica Koenig, Town Clerk

APPROVED AS TO FORM:

William P. Hayashi, Town Attorney

BISHOP LAYTON INC DBA DESIGN CONCEPTS

By:



12.1.2021

NO EMPLOYEE AFFIDAVIT

To be completed only if Contractor has no employees

1. Check and complete one:

☐ I, _____, am a sole proprietor doing business as _____. I do not currently employ any individuals. Should I employ any employees during the term of my Agreement with the Town of Firestone (the "Town"), I certify that I will comply with the lawful presence verification requirements outlined in that Agreement.

OR

☐ I, _____, am the sole owner/member/shareholder of _____, a _____ [specify type of entity – i.e., corporation, limited liability company], that does not currently employ any individuals. Should I employ any individuals during the term of my Agreement with the Town, I certify that I will comply with the lawful presence verification requirements outlined in that Agreement.

2. Check one.

☐ I am a United States citizen or legal permanent resident.

The Town must verify this statement by reviewing one of the following items:

- *A valid Colorado driver's license or a Colorado identification card;*
- *A United States military card or a military dependent's identification card;*
- *A United States Coast Guard Merchant Mariner card;*
- *A Native American tribal document;*
- *In the case of a resident of another state, the driver's license or state-issued identification card from the state of residence, if that state requires the applicant to prove lawful presence prior to the issuance of the identification card; or*
- *Any other documents or combination of documents listed in the Town's "Acceptable Documents for Lawful Presence Verification" chart that prove both Contractor's citizenship/lawful presence and identity.*

OR

☐ I am otherwise lawfully present in the United States pursuant to federal law.

Contractor must verify this statement through the federal Systematic Alien Verification of Entitlement ("SAVE") program, and provide such verification to the Town.

Signature

Date

DEPARTMENT PROGRAM AFFIDAVIT

To be completed only if Contractor participates in the Department of Labor Lawful Presence Verification Program

I, _____, as a public contractor under contract with the Town of Firestone (the "Town"), hereby affirm that:

1. I have examined or will examine the legal work status of all employees who are newly hired for employment to perform work under this public contract for services ("Agreement") with the Town within 20 days after such hiring date;

2. I have retained or will retain file copies of all documents required by 8 U.S.C. § 1324a, which verify the employment eligibility and identity of newly hired employees who perform work under this Agreement; and

3. I have not and will not alter or falsify the identification documents for my newly hired employees who perform work under this Agreement.

Signature

Date

STATE OF COLORADO)

) ss.

COUNTY OF _____)

The foregoing instrument was subscribed, sworn to (or affirmed) before me this ____ day of _____, 2021, by _____ as _____ of _____.

My commission expires:

(S E A L)

Notary Public

EXHIBIT A
SCOPE OF SERVICES

Contractor's Duties

During the term of this Agreement, Contractor shall perform the following duties, as directed by the Town:

- Please see attached

Contractor's Deliverables

In performance of the duties described above, Contractor shall deliver the following items to the Town, during the timeframes established by the Town:

- Please see attached



DESIGN CONCEPTS

Community + Landscape Architects

Exhibit A
Attachment

July 14, 2021

Chuck Bradt
Park Division Manager
Town of Firestone, Colorado
303.901.0227
Cbradt@FirestoneCo.gov

Re: Town of Firestone's Standard Specifications

Dear Chuck:

Thank you for giving us this opportunity to provide services in preparing The Town of Firestones Front End Specifications, Landscape/Irrigation, Park amenities, Playground equipment and Trails standards and specifications. Proper coordination of all documents will be critical to the overall success of every parks, trails and open space project the Town decides to design and construct.

Our understanding and project scope includes two parts with:

- 1) writing and assembling Front End Specifications which represents the administrative, organizational, performance and payment requirements for construction projects. Front End Specifications typically would include:
 - Invitation to Bid
 - Bid Proposal Form
 - Schedule of Unit Prices
 - Construction Agreement
 - General Conditions of Contract
 - Instructions to Bidders
 - Supplementary Instructions to Bidders
 - Bid Bond
 - Performance Bond
 - Payment Bond
- 2) writing and assembling landscape/irrigation, park amenities, playground equipment and trail standards that are intended to indicate the requirements of the Town of Firestone's park development and are an accurate description of the minimum standards acceptable. These standards typically would include:
 - Plan submittals
 - Site preparation
 - Soil preparation
 - Seeding specifications
 - Sodding specifications
 - Planting specifications
 - Tree Recommendation List
 - Protection of existing vegetation
 - Shrub Bed mulch specifications
 - Fertilization specifications
 - Irrigation specifications
 - Maintenance Procedures

Page 1 of 4

- Warranty specifications

Included would be a Park Amenities and Playground equipment section that will consist of:

- Soft ball, baseball, sports equipment (field specifications)
- Playground equipment

Also, a trails, walkways and maintenance paths section that includes:

- Soft trails
- Trail specifications
- Types of trails

Design standards and technical specifications for parks, trails and open space signage is not included in this proposal but can be written and assembled for an additional fee.

We would like to offer the following proposal for our services:

Basic Services

The composition for both documents will follow the same process.

Front End Specification document

- Compose a draft Front-End Specification document for review by Town Attorney
- Review meeting with Town to go over comments and revisions
- Revise Front-End Specifications based on edits
- Finalize Front-End Specifications
- Provide electronic files for future use by Town

Parks, Trails and Open Space Standards document

- Create a parks, trails, open space and landscape preference sheet for Town input
- Collect Town input on the irrigation preference sheet
- Compose a draft Parks, Trails and Open Space standards document
- Review meeting with Town to go over comments and revisions
- Revise standards/specifications based on edits
- Final Town review
- Finalize standards/specifications document
- Provide electronic files for future use by Town

Fee Proposal

Basic Services

Front End Specifications	\$ 4,240.00
Parks, Trails, Open Space Standards	\$ 11,180.00
Total Fee	\$ 15,420.00

Additional Services

Services not included in Basic Services listed above, but which may become necessary in the course of the project will be billed as Additional Services on an hourly basis as is in accordance with the attached Schedule of Fees. The Town of Firestone will be notified when Additional Services are required, and an estimate provided prior to beginning work.

Reimbursable Expenses

Reimbursable items include delivery, printing, and reproduction to be used outside our office and will be billed as part of the lump sum fee for Basic Services.

Project Restart

Once the project is underway, should it be halted at any time for more than 30 calendar days by Client, for any reason, Design Concepts shall have the option of assessing a project restart fee and renegotiating the contract fee, hourly rate, and reimbursable schedule.

Terms

This fee proposal as submitted is valid until the end of year 2022. Payment for services rendered is billed monthly on the fifth day or at the termination of the project. Payment is due within 30 days of billing date. Any portion of a billing not paid within 60 days of the billing date shall be considered delinquent and shall bear a delinquency charge of one and a half percent (1.5%) per month (annual percentage rate 18%) on the unpaid balance. Rates subject to change without notice.

Insurance

Design Concepts currently carries and will maintain Professional Liability Insurance with a \$2,000,000 limit per claim/\$2,000,000 aggregate; General Liability Insurance with a \$2,000,000 general limit; Auto Liability Insurance with a combined single limit of \$1,000,000 and Workers' Compensation Insurance with a \$2,000,000 limit each for accident and disease. Certificates will be provided upon request.

Please contact me if you would like to further discuss any of our proposed services and fees or need further clarification.

Very Truly Yours,



Shanen Weber, PLA, ASLA
Principal
shanen@dcla.net
d - 720.573.6502, Cell - 720.273.3882
July 14, 2021

Proposal Approval

Please sign and date below to authorize acceptance of this proposal and return an executed copy to our office.

Signature

Printed Name

Schedule of Fees

Landscape Architectural Services



January, 2021

The following schedule of fees is used by Design Concepts for billing purposes. These fees are in effect for all services rendered unless other terms have been negotiated.

Landscape Architecture + Design Fees

Principal Landscape Architect	\$185.00/hour
Sr. Project Manager	\$130.00/hour
Project Manager	\$115.00/hour
Designer/Graphic Designer	\$105.00/hour
Administrative Staff	\$80.00/hour
Intern	\$55.00/hour

Transportation Expenses

Mileage	\$0.58/mile
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Reimbursement Costs

Posting, Shipping, Couriers	at cost
Prints, Reproductions, Scanning	at cost
Direct Expenses	at cost

Outside Consultants

Any consultants required to perform the work are charged at cost plus a 10% administrative fee.

Terms

Payment for services rendered is billed monthly on the fifth day or at the termination of the project. Payment is due within 30 days of billing date. Any portion of a billing not paid within 60 days of the billing date shall be considered delinquent and shall bear a delinquency charge of one and a half percent (1.5%) per month (annual percentage rate 18%) on the unpaid balance. Rates subject to change without notice.

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 5.h

Consent Agenda

Meeting Date: December 8, 2021

Initiated By: Julie Pasillas

Dept: Public Works

AGENDA TITLE

Resolution 21-204: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING AN ENGINEERING SERVICES AGREEMENT BETWEEN THE TOWN OF FIRESTONE AND PLUMMER ASSOCIATES, INC., REGARDING THE WATER TREATMENT PLANT PROJECT

SUMMARY

The 2022 Engineering Services Agreement is to continue Plummer Associates, Inc. services on the construction phase services with full-time onsite observation, including project management, progress meetings, office engineering, full-time resident project representation, submittal reviews, CMAR application for payment reviews, and project close-out for the St. Vrain Water Treatment Plant project for the Town of Firestone.

HISTORY AND PREVIOUS BOARD ACTION

During 2018, FEI provided services to the Town of Firestone through Work Order Agreements between Leonard Rice Engineering, Inc. and the Town of Firestone.

In December 2018, the Board of Trustees approved the 2019 Independent Consulting Agreement directly with FEI Engineering, Inc. for services related to the design of the St. Vrain Water Treatment Plant. In January 2019, the Board of Trustees consented to FEI Engineering Inc's assignment of the agreement to Plummer Associates, Inc. In December 2019 and 2020, the Board of Trustees approved the 2020 Engineering Services Agreement to complete the design phase and the 2021 Engineering Services Agreement to complete the construction phase with Plummer Associates, Inc. for St. Vrain Water Treatment Plant.

RECOMMENDATION

Staff recommends the Board approve Resolution 21-204 and the attached Engineering Agreement with Plummer Associates, Inc. for the St. Vrain Water Treatment Plant.

ALTERNATIVES

The Board may choose not to approve Resolution 21-204 and provide staff with additional direction.

ATTACHMENTS

1. Res 21-204 2022 Plummer Assoc Eng Services Agreement
2. 2022 Engineering Services Agreement-Plummer

FINANCIAL CONSIDERATIONS

The contract includes an amount not to exceed \$285,358.00. Sufficient funds have been budgeted and appropriated in the Water Fund.

RESOLUTION NO. 21-204

**A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF
FIRESTONE, COLORADO, APPROVING AN ENGINEERING SERVICES
AGREEMENT BETWEEN THE TOWN OF FIRESTONE AND PLUMMER
ASSOCIATES, INC., REGARDING THE WATER TREATMENT PLANT
PROJECT**

WHEREAS, Plummer Associates, Inc., (“Plummer”), currently serves as a consultant for the Town of Firestone (“Firestone”) and are involved in construction phase services including project management, progress meetings, office engineering, full-time resident project representation services, submittal reviews and CMAR application for payment reviews for the St. Vrain Water Treatment Plant project; and

WHEREAS, as the Project’s Construction remains to be completed and as Plummer Associates, Inc., having special expertise, qualifications, and background to complete the Project, the parties desire to continue the Engineering Services Agreement.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

The Engineering Services Agreement between the Town of Firestone and Plummer Associates, Inc., regarding the Water Treatment Plant Project, is approved in substantially the same form as the copy attached hereto and made a part of this resolution and the Mayor is authorized to sign the Agreement.

INTRODUCED, READ AND ADOPTED this 8th day of December, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

Jessica Koenig, CMC, Town Clerk

APPROVED AS TO FORM:

William P. Hayashi, Town Attorney

**AN AGREEMENT BY AND BETWEEN THE TOWN OF FIRESTONE
AND PLUMMER ASSOCIATES, INC.
FOR ENGINEERING SERVICES**

1. PARTIES

The parties to this Agreement are the **Town of Firestone**, a Colorado municipal corporation, hereinafter referred to as the "Town", and **Plummer Associates, Inc.**, a Texas corporation, hereinafter referred to as the "Consultant".

2. RECITALS AND PURPOSE

- 2.1. The Town desires to engage the Consultant for the purpose of providing engineering services as further set forth in the Consultant's Scope of Services (which services are hereinafter referred to as the "Services").
- 2.2. The Consultant represents that it has the special expertise, qualifications and background necessary to complete the Services.

3. SCOPE OF SERVICES

- 3.1. The Consultant agrees to provide the Town with the specific Services and to perform the specific tasks, duties and responsibilities set forth in Scope of Services attached hereto as Exhibit "A" and incorporated herein by reference. The Consultant shall furnish all tools, labor and supplies in such quantities and of the proper quality as are necessary to professionally and timely perform the Services. The Consultant acknowledges that this Agreement does not grant any exclusive privilege or right to supply Services to the Town. In its sole discretion, the Town may contract with other consultants to provide the same or similar services during the term of this Agreement.
- 3.2. In addition to the Services described in Exhibit A, the Town may prepare, with the assistance of Consultant, work orders, containing, at a minimum, the following information: (1) the specific tasks and deliverables Consultant must perform; (2) Consultant's budget; (3) the Town's maximum payment obligation under the subject work order; and (4) the completion date for the subject work order. Consultant shall be compensated for work orders on an hourly basis at the hourly rates set forth in Exhibit A, subject to the agreed upon maximum payment obligation. After the work order has been finalized and agreed to by the Town and Consultant, the Town may issue a notice to proceed obligating Consultant to begin performance of the subject work order. Consultant shall not commence work on any work order until it has received the applicable notice to proceed. Notice to proceed may be sent by email.
- 3.3. The Town reserves the right to amend any work order that has been issued under this Agreement by altering, reducing, increasing, or eliminating specific tasks and deliverables. If the Town desires to amend a work order that has been issued, then the Town shall notify Consultant of the contemplated change ("Notice of Change Order"). Upon receiving the Notice of Change Order Consultant shall provide: (1) an estimate of the increase or decrease, if any, to Consultant's budget due to the contemplated change and (2) the estimated change in the completion date of the subject work order, if any. The Town may instruct Consultant in the Notice of Change Order to suspend work on any identified task or deliverable affected by

a contemplated change, pending the Town's decision to proceed with the change. When instructed, Consultant shall suspend work on any identified task or deliverable affected by a contemplated change. If it elects to make the change, the Town shall issue a change order amending the subject work order and providing Consultant with a corresponding Notice to Proceed. Consultant shall not commence work on any change order until it has received the applicable notice to proceed.

4. COMPENSATION

- 4.1. The Town shall pay the Consultant for services requested and rendered under this Agreement as set forth in Exhibit "A". The Town's maximum payment obligation under this Agreement, excluding work orders finalized and agreed to by the Town and Consultant, shall not exceed the not-to-exceed amount set forth in Exhibit A. The Town shall pay mileage and other reimbursable expenses (such as meals, parking, travel expenses, necessary memberships, etc.) which are deemed necessary for performance of the services and which are pre-approved by the Town Manager. The foregoing amounts of compensation shall be inclusive of all costs of whatsoever nature associated with the Consultant's efforts, including but not limited to salaries, benefits, overhead, administration, profits, expenses, and outside consultant fees. The Scope of Services and payment therefor shall only be changed by a properly authorized amendment to this Agreement. No Town employee has the authority to bind the Town with regard to any payment for any services which exceeds the amount payable under the terms of this Agreement.
- 4.2. The Consultant shall submit monthly an invoice to the Town for the per-month amount set forth in Exhibit A for Services rendered in the previous month, and a detailed expense report for pre-approved, reimbursable expenses incurred during the previous month. The invoice shall document the Services provided during the preceding month, identifying by work category and subcategory the work and tasks performed and such other information as may be required by the Town. The Consultant shall provide such additional backup documentation as may be required by the Town. The Town shall pay the invoice within thirty (30) days of receipt unless the Services or the documentation therefor are unsatisfactory. Payments made after thirty (30) days may be assessed an interest charge of one percent (1%) per month unless the delay in payment resulted from unsatisfactory work or documentation therefor.

5. PROJECT REPRESENTATION

- 5.1. The Town designates Julie Pasillas, Director of Public Works, as the responsible Town staff to provide direction to the Consultant during the conduct of the Services. The Consultant shall comply with the directions given by the Director of Community Development and such person's designees.
- 5.2. The Consultant designates Patrick O'Brien, Principal, as its principal in charge who shall be providing the Services under this Agreement. Should any of the representatives be replaced, particularly Patrick O'Brien, and such replacement require the Town or the Consultant to undertake additional reevaluations, coordination, orientations, etc., the Consultant shall be fully responsible for all such additional costs and services.

6. TERM

The term of this Agreement shall be December 26, 2021 to December 25, 2022, unless sooner terminated pursuant to Section 13, below. The Consultant's services under this Agreement shall commence upon execution of this Agreement by the Town and shall progress so that the Services are completed in a timely fashion consistent with the Town's requirements. Nothing in this Agreement is intended or shall be deemed or construed as creating any multiple-fiscal year direct or indirect debt or financial obligation on the part of the Town within the meaning of Colorado Constitution Article X, Section 20 or any other constitutional or statutory provision. All financial obligations of the Town under this Agreement are subject to annual budgeting and appropriation by the Firestone Board of Trustees, in its sole discretion. Notwithstanding anything in this Agreement to the contrary, in the event of non-appropriation, the Town shall immediately notify Consultant of such occurrence, and this Agreement shall terminate effective December 31 of the then-current fiscal year.

7. INSURANCE

- 7.1. The Consultant agrees to procure and maintain, at its own cost, the policies of insurance set forth in Subsections 7.1.1 through 7.1.4. The Consultant shall not be relieved of any liability, claims, demands, or other obligations assumed pursuant to this Agreement by reason of its failure to procure or maintain insurance, or by reason of its failure to procure or maintain insurance in sufficient amounts, durations, or types. The coverages required below shall be procured and maintained with forms and insurers acceptable to the Town. All coverages shall be continuously maintained from the date of commencement of services hereunder. The required coverages are:
- 7.1.1. Workers' Compensation insurance to cover obligations imposed by the Workers' Compensation Act of Colorado and any other applicable laws for any employee engaged in the performance of work under this contract. Evidence of qualified self-insured status may be substituted.
 - 7.1.2. Automobile liability and physical damage insurance for any vehicle used in performing services for the Town, in amounts not less than prescribed by Colorado law (currently \$25,000 per person/\$50,000 per accident bodily injury and \$15,000 per accident property damage).
 - 7.1.3. Professional liability insurance against errors and omissions with minimum combined single limits of \$2,000,000.00 each occurrence and \$2,000,000.00 aggregate.
 - 7.1.4. General liability insurance with minimum combined single limits of \$2,000,000.00 each occurrence and \$2,000,000.00 aggregate.
- 7.2. The Consultant's general liability insurance and automobile liability and physical damage insurance shall be endorsed to include the Town, and its elected and appointed officers and employees, as additional insureds, unless the Town in its sole discretion waives such requirement. Every policy required above shall be primary insurance, and any insurance carried by the Town, its officers, or its employees, shall be excess and not contributory insurance to that provided by the Consultant. Such policies shall contain a severability of interests' provision. The Consultant shall be solely responsible for any deductible losses under each of the policies required above.
- 7.3. Certificates of insurance shall be provided by the Consultant as evidence that policies providing the required coverages, conditions, and minimum limits are in full force and effect,

and shall be subject to review and approval by the Town. No required coverage shall be cancelled, terminated or materially changed until at least 30 days prior written notice has been given to the Town. The Town reserves the right to request and receive a certified copy of any policy and any endorsement thereto.

- 7.4. Failure on the part of the Consultant to procure or maintain policies providing the required coverages, conditions, and minimum limits shall constitute a material breach of contract upon which the Town may immediately terminate the contract, or at its discretion may procure or renew any such policy or any extended reporting period thereto and may pay any and all premiums in connection therewith, and all monies so paid by the Town shall be repaid by Consultant to the Town upon demand, or the Town may offset the cost of the premiums against any monies due to Consultant from the Town.
- 7.5. The parties understand and agree that the Town is relying on, and does not waive or intend to waive by any provision of this contract, the monetary limitations or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, § 24-10-101 et seq., C.R.S., as from time to time amended, or otherwise available to the Town, its officers, or its employees.

8. INDEMNIFICATION

To the fullest extent permitted by law, the Consultant agrees to defend, indemnify and hold harmless the Town, and its elected and appointed officers and its employees, from and against all liability on account of any injury, loss, or damage, which arise out of or are connected with the services hereunder, if and to the extent such injury, loss, or damage is caused by the negligent act, or omission, of the Consultant or any subcontractor of the Consultant, or any officer, employee, or agent of the Consultant or any subcontractor, or any other person for whom Consultant is responsible. The Consultant shall bear all other costs and expenses incurred by the Town or Consultant and related to any such liability including but not limited to court costs, expert witness fees and reasonable attorneys' fees if the court determines that these incurred costs and expenses are related to such negligent acts, errors, and omissions or other fault of the Consultant. Notwithstanding the foregoing, Consultant's duty to defend, indemnify and hold harmless the Town, and its elected and appointed officials and its employees as set forth in this section shall only arise upon determination, by adjudication, alternative dispute resolution, or mutual agreement between Consultant and the Town, of the Consultant's liability or fault. The Consultant's indemnification obligation shall not be construed to extend to any injury, loss, or damage which is caused by the act, omission, or other fault of the Town or its elected and appointed officers and its employees.

9. QUALITY OF WORK

Consultant's professional services shall be in accordance with the prevailing standard of practice normally exercised in the performance of services of a similar nature in the Denver metropolitan area.

10. INDEPENDENT CONTRACTOR

Consultant and any persons employed by Consultant for the performance of work hereunder shall be independent contractors and not agents of the Town. Any provisions in this Agreement that may appear to give the Town the right to direct Consultant as to details of doing work or to exercise a measure of control over the work mean that Consultant shall follow the direction of the Town as to end results of the work only. **As an independent contractor, Consultant is not entitled to workers' compensation benefits except as may be provided by the independent contractor nor to unemployment insurance benefits unless unemployment compensation coverage is provided by the independent contractor or some other entity. The Consultant is obligated to pay all federal and state income tax on any moneys earned**

or paid pursuant to this contract.

11. ASSIGNMENT

Consultant shall not assign or delegate this Agreement or any portion thereof, or any monies due or to become due hereunder without the Town's prior written consent.

12. DEFAULT

Each and every term and condition hereof shall be deemed to be a material element of this Agreement. In the event either party should fail or refuse to perform according to the terms of this Agreement, such party may be declared in default.

13. TERMINATION

13.1. This Agreement may be terminated by either party for material breach or default of this Agreement by the other party not caused by any action or omission of the other party by giving the other party written notice at least thirty (30) days in advance of the termination date. Termination pursuant to this subsection shall not prevent either party from exercising any other legal remedies which may be available to it.

13.2. In addition to the foregoing, this Agreement may be terminated by the Town for its convenience and without cause of any nature by giving written notice at least fifteen (15) days in advance of the termination date. In the event of such termination, the Consultant will be paid for the reasonable value of the services rendered to the date of termination, not to exceed a pro-rated daily rate, for the services rendered to the date of termination, and upon such payment, all obligations of the Town to the Consultant under this Agreement will cease. Termination pursuant to this Subsection shall not prevent either party from exercising any other legal remedies which may be available to it.

14. INSPECTION AND AUDIT

The Town and its duly authorized representatives shall have access to any books, documents, papers, and records of the Consultant that are related to this Agreement for the purpose of making audits, examinations, excerpts, and transcriptions.

15. DOCUMENTS

All computer input and output, analyses, plans, documents photographic images, tests, maps, surveys, electronic files and written material of any kind generated in the performance of this Agreement or developed for the Town in performance of the Services ("Consultant Deliverables") are and shall remain the exclusive property of the Town. All Consultant Deliverables shall be promptly provided to the Town upon request therefor and at the time of termination of this Agreement, without further charge or expense to the Town. Consultant shall not provide copies of any such material to any other party without the prior written consent of the Town.

The Town shall not make any modification to the Consultant Deliverables without the prior written authorization of the Consultant. Any and all liability arising out of unauthorized changes made to Consultant Deliverables by the Town or persons other than Consultant, its employees, officers, agents or subcontractors, is waived against Consultant.

16. ENFORCEMENT

In the event that suit is brought upon this Agreement to enforce its terms, the prevailing party shall be entitled to its reasonable attorneys' fees and related court costs.

17. COMPLIANCE WITH LAWS; WORK BY ILLEGAL ALIENS PROHIBITED

- 17.1. Consultant shall be solely responsible for compliance with all applicable federal, state, and local laws, including the ordinances, resolutions, rules, and regulations of the Town; for payment of all applicable taxes; and obtaining and keeping in force all applicable permits and approvals.
- 17.2. Exhibit B, the "Town of Firestone Public Services Contract Addendum-Prohibition Against Employing Illegal Aliens", is attached hereto and incorporated herein by reference. There is also attached hereto a copy of Consultant's Pre-Contract Certification which Consultant has executed and delivered to the Town prior to Consultant's execution of this Agreement.

18. INTEGRATION AND AMENDMENT

This Agreement represents the entire Agreement between the parties and there are no oral or collateral agreements or understandings. This Agreement may be amended only by an instrument in writing signed by the parties.

19. NOTICES

All notices required or permitted under this Agreement shall be in writing and shall be given by hand delivery, by United States first class mail, postage prepaid, registered or certified, return receipt requested, by national overnight carrier, or by email, addressed to the party for whom it is intended at the following addresses:

If to the Town:

Town of Firestone
Attn: Director of Public Works
9950 Park Avenue
Firestone, Colorado 80520
Telephone: (303) 833-3291
Email: jpasillas@firestoneco.gov

If to the Consultant:

Patrick O'Brien
Plummer Associates, Inc.
1221 Auraria Parkway
Denver, CO 80204
Telephone: (720) 774-6140
Email: pobrien@plummer.com

Any such notice or other communication shall be effective when received as indicated on the delivery receipt, if by hand delivery or overnight carrier; on the United States mail return receipt, if by United States mail; or on email receipt. Either party may by similar notice given, change the address to which future notices or other communications shall be sent.

20. EQUAL OPPORTUNITY EMPLOYER

- 20.1. Consultant will not discriminate against any employee or applicant for employment because

of race, color, religion, age, sex, disability or national origin. Consultant will take affirmative action to ensure that applicants are employed and that employees are treated during employment without regard to their race, color, religion, age, sex, disability, or national origin. Such action shall include but not be limited to the following: employment, upgrading, demotion or transfer, recruitment or recruitment advertising, layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Consultant agrees to post in conspicuous places, available to employees and applicants for employment, notice to be provided by an agency of the federal government, setting forth the provisions of the Equal Opportunity Laws.

20.2. Consultant shall be in compliance with the applicable provisions of the American with Disabilities Act of 1990 as enacted and from time to time amended and any other applicable federal, state, or local laws and regulations. A signed, written certificate stating compliance with the Americans with Disabilities Act may be requested at any time during the life of this Agreement or any renewal thereof.

21.0 GOVERNING LAW, DISPUTE RESOLUTION, VENUE & SEVERABILITY

The laws of the State of Colorado shall govern the interpretation, validity, performance and enforcement of this Agreement. For the resolution of any dispute arising hereunder that cannot be resolved through negotiation between the parties, the Town and the Consultant agree that the dispute shall be submitted to nonbinding mediation prior to either party resorting to litigation. Mediation costs shall be borne equally by the parties. Notwithstanding the foregoing, nonbinding mediation shall not be required for determinations of liability or fault pursuant to section 8 of this Agreement. Any dispute not resolved through negotiation or mediation shall be resolved in the District Court of Weld County of the State of Colorado, and in no other court. If any provision of this Agreement shall be held to be invalid or unenforceable, the validity and enforceability of the remaining provisions of this Agreement shall not be affected thereby.

22.0 NO THIRD PARTY BENEFICIARIES

Nothing contained in this Agreement shall create a contractual relationship with or a cause of action in favor of a third party against either the Town or the Consultant. The Consultant's services under this Agreement are being performed solely for the Town's benefit, and no other party or entity shall have any claim against the Consultant because of this Agreement or the performance or nonperformance of Services hereunder.

In witness whereof, the parties have executed this Agreement to be effective as of the day and year of signed by the Town.

Town:

Town of Firestone

By: _____

Print Name: _____

Title: _____

Date Signed: _____

Consultant:

Plummer Associates, Inc.

By: _____

Patrick O'Brien, Area Leader

Digitally signed by Patrick O'Brien, Area Leader
DN: C=US, E=poobrien@plummer.com, O=Plummer
Associates, OU=Mountain West Area, CN=Patrick
O'Brien, Area Leader
Date: 2021.12.03 07:21:40-0700

Print Name: _____

Patrick O'Brien

Title: _____

Principal

Date Signed: _____

December 3, 2021

Attest

Print Name: _____

Title: _____

Attest

Kelly Fearney

Digitally signed by Kelly Fearney
DN: C=US, E=kfearney@plummer.com,
O=Plummer, OU=Mtn West, CN=Kelly
Fearney
Reason: I have reviewed this document
Date: 2021.12.03 09:05:50-0700

Print Name: _____

Kelly Fearney

Title: _____

Project Manager

Exhibit A – Scope of Services

Plummer will provide professional services based upon our understanding of the project and its objectives. The 2022 scope of services includes construction phase services including full-time onsite observation up to the scheduled final completion date of April 25, 2022. Office Engineering with final pay app review and project close-out to occur through May of 2022. The Construction Phase services for the St. Vrain Water Treatment Plant will include:

- Project Management
- Progress Meetings (participation in weekly progress meeting with the Contractor and coordination of monthly Owner-Engineer progress meetings)
- Office Engineering (Submittal Review, RFI's, WCD's, FO's, RFCO's)
- Full time Resident Project Representative services
- Submittal Reviews
- CMAR Application for Payment Reviews

The services included in this scope of work include Resident Project Representative (RPR) services. RPR services are used to provide onsite representation of the Engineer and Owner during the Construction phase and to provide more extensive observation of the Contractor's work.

Resident Project Representative (RPR) Services

Plummer will provide Resident Project Representative (RPR) services professional services based upon our understanding of the project and its objectives and in accordance with EJCDC E-500, Agreement Between Owner and Engineer for Professional Services and in-particular Exhibit D Duties, Responsibilities, and Limitations of Authority of Resident Project Representative. In summary, the duties are to:

- 1) Provide regular representation onsite, including field checks of materials and installed equipment and to provide further protection for Owner against defects and deficiencies in the Work.
- 2) Review and confirm progress schedule, shop drawings, schedule of values, and verification of completion of work included on pay applications.
- 3) Serve as onsite liaison between the Engineer's, Contractor, and Owner.
- 4) Receive from Contractor any request for information (RFI). Report to Engineer regarding such RFIs. Report to Engineer when clarifications and interpretations of the Construction Contract Documents are needed, whether as the result of a Contractor RFI or otherwise. Transmit Engineer's clarifications, interpretations, and decisions to Contractor.
- 5) Receive and Review Samples and Contractor-approved Shop Drawings.
- 6) Consider and evaluate Contractor's suggestions for modifications to the Drawings or Specifications, and report such suggestions, together with RPR's recommendations, if any, to Engineer. Transmit Engineer's response (if any) to such suggestions to Contractor.

- 7) Review work for compliance with the Construction Contract Documents and report any defective work.
- 8) Verify inspections, tests, and system start-ups.
- 9) Maintain record of correspondence, conferences, and progress reports
- 10) Review applications for payment with Contractor for compliance with the established procedure for their submission and forward with recommendations to Engineer, noting particularly the relationship of the payment requested to the schedule of values, Work completed, and materials and equipment delivered at the Site but not incorporated in the Work.
- 11) Participate in issuance of Substantial Completion and Final Completion and review of punch list items.

Exclusions and Assumptions

- 1) RPR services does not include geotechnical services; geotechnical services are typically included as an allowance in the Construction Contract.
- 2) RPR services do not include any lab or testing fees.
- 3) Resident Project Representative shall not:
 - a) Authorize any deviation from the Construction Contract Documents or substitution of materials or equipment (including "or-equal" items).
 - b) Exceed limitations of Engineer's authority as set forth in this Agreement.
 - c) Undertake any of the responsibilities of Contractor, Subcontractors, or Suppliers, or any Constructor.
 - d) Advise on, issue directions relative to, or assume control over any aspect of the means, methods, techniques, sequences or procedures of the Work, by Contractor or any other Constructor.
 - e) Advise on, issue directions regarding, or assume control over security or safety practices, precautions, and programs in connection with the activities or operations of Owner or Contractor.
 - f) Participate in specialized field or laboratory tests or inspections conducted off-site by others except as specifically authorized by Engineer.
 - g) Accept Shop Drawing or Sample submittals from anyone other than Contractor.
 - h) Authorize Owner to occupy the Project in whole or in part.

Budget: \$285,358

This Agreement will be billed under Plummer Associates, Inc. Project: 4120-002-06.

Consideration

We will invoice the Town of Firestone on a time and material basis for the period of December 26, 2021 through December 25, 2022, not to exceed \$ **285,358**. Compensation for periods less than one month shall be prorated based on the number of working days in the month. Consultant's lump sum fee is based on the following hourly rates for its employees:

Staff Description	Staff Code	2022 Rate
Admin Staff	A1 – A2	\$90.00
Admin Staff III	A3	\$95.00
Senior Admin Staff	A4	\$100.00
Designer/Technician	C1-C2	\$90.00
Designer/Technician III	C3	\$120.00
Senior Designer/Technician	C4	\$140.00
Construction Manager in Training (CMIT)	CM1	\$115.00
Construction Manager in Training II	CM2	\$125.00
Construction Manager in Training III	CM3	\$140.00
Construction Manager IV	CM4	\$145.00
Construction Manager V	CM5	\$175.00
Construction Manager	CM6	\$215.00
Senior Construction Manager	CM7	\$240.00
Principal Construction Manager	CM8	\$260.00
Resident Project Rep. I	RR1	\$80.00
Resident Project Rep. II	RR2	\$110.00
Resident Project Rep. III	RR3	\$130.00
Lead Resident Project Rep.	RR4	\$135.00
Field Tech I	LS1	\$80.00
Field Tech II	LS2	\$95.00
Survey Specialist I	LS3	\$105.00
Survey Specialist II	LS4	\$115.00
Survey Analyst	LS5	\$135.00
Chief of Parties	LS6	\$150.00
Engineer/Scientist Intern	ES0	\$60.00
Engineer-in-Training/Scientist-in-Training	ES1	\$115.00
Engineer-in-Training/Scientist-in-Training II	ES2	\$125.00
Engineer-in-Training/Scientist-in-Training III	ES3	\$140.00
Project Engineer/Scientist	ES4	\$145.00
Senior Project Engineer/Scientist	ES5	\$175.00
Project Manager	ES6	\$215.00
Senior Project Manager	ES7	\$240.00
Principal I	ES8	\$305.00
Principal II	ES9	\$320.00
Electrical Engineer in Training I	EE1	\$95.00
Electrical Engineer in Training II	EE2	\$120.00

Staff Description	Staff Code	2022 Rate
Electrical Engineer in Training III	EE3	\$135.00
Electrical Specialist	EE4	\$145.00
Programmer	EE5	\$175.00
Programmer II	EE6	\$200.00
Senior Electrical Engineer	EE7	\$280.00

- Billing rates may be adjusted by up to 4 percent annually (at the beginning of each calendar year) during the term of this agreement.
- A multiplier of 1.15 will be applied to all direct expenses.
- A technology charge will be billed at \$5 per labor hour.

Any changes to Consultant's hourly rates will be communicated to the Town, and shall not take effect unless and until such changes are approved by the Firestone Town Board.

Exhibit B

Town of Firestone Public Services Contract Addendum Prohibition Against Employing Workers Without Authorization

Prohibition Against Employing Workers Without Authorization. Contractor shall not knowingly employ or contract with a worker without authorization to perform work under this contract. Contractor shall not enter into a contract with a subcontractor that fails to certify to the Contractor that the subcontractor shall not knowingly employ or contract with a worker without authorization to perform work under this contract.

Contractor will participate in either the E-verify program or the Department program, as defined in C.R.S. § 8-17.5-101(3.3) and 8-17.5-101(3.7), respectively, in order to confirm the employment eligibility of all employees who are newly hired for employment to perform work under the public contract for services. Contractor is prohibited from using the E-verify program or the Department program procedures to undertake pre-employment screening of job applicants while this contract is being performed.

If Contractor obtains actual knowledge that a subcontractor performing work under this contract for services knowingly employs or contracts with a worker without authorization, Contractor shall:

- a. Notify the subcontractor and the Town within three days that the Contractor has actual knowledge that the subcontractor is employing or contracting with a worker without authorization: and
- b. Terminate the subcontract with the subcontractor if within three days of receiving the notice required pursuant to this paragraph the subcontractor does not stop employing or contracting with the worker without authorization; except that the Contractor shall not terminate the contract with the subcontractor if during such three days the subcontractor provides information to establish that the subcontractor has not knowingly employed or contracted with a worker without authorization.

Contractor shall comply with any reasonable request by the Department of Labor and Employment made in the course of an investigation that the Department is undertaking pursuant to the authority established in C.R.S. § 8-17.5-102(5).

If Contractor violates a provision of this Contract required pursuant to C.R.S. § 8-17.5-102, Town may terminate the contract for breach of contract. If the contract is so terminated, the Contractor shall be liable for actual and consequential damages to the Town.

**Pre-Contract Certification
in Compliance with C.R.S. Section 8-17.5-102(1)**

From: Plummer Associates, Inc. (Prospective Contractor)

To: Town of Firestone

As a prospective independent contractor for the above-identified project, I (we) do hereby certify that, as of the date of this certification, the undersigned does not knowingly employ or contract with a worker without authorization; and that the undersigned will participate in the E-Verify employment verification program administered jointly by the United States Department of Homeland Security and the Social Security Administration or the employment verification program of the Colorado Department of Labor and Employment Program, as defined in C.R.S. § 8-17.5-101(3.3) and 8-17.5-101(3.7), respectively, in order to confirm the employment eligibility of any employees hired since the date of this contract to perform work under this contract.

Executed this _____ day of _____, 20 ____.

PROSPECTIVE CONTRACTOR

 Digitally signed by Patrick O'Brien, Area Leader
DN: C=US, E=pobrien@plummer.com, O=Plummer Associates, OU=Mountain West Area, CN=Patrick O'Brien, Area Leader
Date: 2021.12.03 07:20:35-07'00'

December 3, 2021

Signature _____ Date _____

Patrick O'Brien _____ Principal

Printed Name _____ Title _____

(720) 774-6140

Phone _____

pobrien@plummer.com

Email _____

ATTEST

 Digitally signed by Kelly Fearney
DN: C=US, E=kfearney@plummer.com, O=Plummer, OU=Mountain West, CN=Kelly Fearney
Reason: I have reviewed this document
Date: 2021.12.03 09:07:02-07'00'

November 19, 2021

Signature _____ Date _____

Kelly Fearney _____ Project Manager

Printed Name _____ Title _____

(970) 769-7422

Phone _____

kfearney@plummer.com

Email _____

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 5.i

Consent Agenda

Meeting Date: December 8, 2021

Initiated By: Matt Wiederspahn

Dept: Engineering - Town

AGENDA TITLE

Resolution 21-205: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, ADOPTING THE TOWN OF FIRESTONE DESIGN STANDARDS AND CONSTRUCTION SPECIFICATIONS FOR PUBLIC IMPROVEMENTS, 2022 EDITION

SUMMARY

The Town's current Design Standards and Construction Specifications For Public Improvements, commonly just referred to as Standards and Specifications, were originally adopted by the Board of Trustees in April of 2020. As was discussed at that time, it is Engineering Staff's opinion that the document be regularly updated for changes to industry standards, materials and construction practices; clarification of common questions and contradictions; and operational improvements identified by the Town's Public Work's and Engineering Staff. The changes proposed for the 2022 Edition almost solely deal with clarification of common questions and contradictions.

For background, the Standards and Specifications are an important document as it is the guiding document that requires that Town owned public improvements (roads, water lines, storm sewer, etc.) are designed and constructed in a safe and quality manner that ensures Town improvements meet an expected service life and maintenance scheduled. As the vast majority of Town improvements will be constructed by private developers and their contractors, it is vital to have a document that sets certain design and construction minimums to ensure the Town can accept long lasting improvements. In addition, having clear, concise, and consistent Standards and Specifications allows developers to have clearer and more accurate improvement costs earlier in their development processes and provides contractors with clear direction during construction.

A summary of the proposed changes is attached.

HISTORY AND PREVIOUS BOARD ACTION

The Board previously adopted the Town's Design Standards and Construction Specifications For Public Improvements, 2020 Edition, on April 8th, 2020.

RECOMMENDATION

Approve the Resolution adopting the Town of Firestone Design Standards and Construction Specifications for Public Improvements, 2022 Edition

ALTERNATIVES

ATTACHMENTS

1. Standards & Specifications Adoption Reso 2021
2. SS Proposed Updates and Changes for 2022 Edition
3. Firestone Design Standards and Construction Specifications for Public Improvements, 2022 EDITION

FINANCIAL CONSIDERATIONS

N/A

RESOLUTION NO. 21-XX

**A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF
FIRESTONE, COLORADO, ADOPTING THE TOWN OF FIRESTONE
DESIGN STANDARDS AND CONSTRUCTION SPECIFICATIONS FOR
PUBLIC IMPROVEMENTS 2022 EDITION**

WHEREAS, the Town of Firestone (“Town”) Design Criteria and Construction Regulations (“Standards and Specifications”) were adopted by the Town’s Board of Trustees in 2020; and

WHEREAS, over the last two years there have been updates regarding industry standards, materials, and construction practices; and

WHEREAS, it is, thus, essential that the Town updates its Standards and Specifications to ensure that Town-owned public improvements, which include, for example, roadways, curbs, gutters and sidewalks, water, sanitary sewer, and storm drainage systems, and traffic signal improvements, are designed, constructed, operated and maintained in a manner that both provides high-quality facilities and ensures public safety.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

The Town of Firestone Design Standards and Construction Specifications for Public Improvements 2022 Edition is approved in substantially the same form as the copy attached hereto and made a part of this resolution and the Mayor is authorized to execute same on behalf of the Town.

INTRODUCED, READ AND ADOPTED this __ day of _____, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

Jessica Koenig, Town Clerk

APPROVED AS TO FORM:

William P. Hayashi, Town Attorney

Standards and Specifications Changes & Updates

2022 Edition

The following updates/changes to the Town of Firestone Design Standards and Construction Specifications for Public Improvements have been PROPOSED:

COVER SHEET-

- Updated edition date.

TABLE OF CONTENTS-

- None

SECTIONS-

SECTION 100- *General Requirements*

- **151.02** – Correct numbering
- **151.03** – Correct numbering
- **Add Section 151.04** – Investigation Fees (Working without a Permit)

SECTION 200 – *Acceptance Procedures*

- **No changes**

SECTION 300 – *Site Work*

- **No changes**

SECTION 400 – *Concrete Work*

- **No Changes**

SECTION 500 – *Roadway & Asphalt Design*

- **Section 521.00** – Corrected reference of Town of Firestone Master Plan to Town of Firestone's Transportation Master Plan.
- **Section 521.01** – Added "Any more restrictive requirements by the Fire Department shall supersede these standards."
- **Table 500-3:** Clarified on table to remove intersection design criteria for Local and Arterial street.

SECTION 600 – *Water System*

- **Section 642.17** – Changed curb stop box requirements to align with historical use and current details.

SECTION 700 – *Sanitary Sewer System*

- **No changes**

SECTION 800 – *Storm Drainage System*

- **Section 813.01** – Revised the Initial Storm to be a 5 year storm for all land uses.

- **Section 813.02** – Revised to reference section 813.01 for major and initial storms.
- **Table 800-1** – Removed table.

SECTION 900 – *Traffic Signals*

- No changes

STANDARD DETAILS:

Curb/Gutter and Sidewalk Details

- No changes

Streets Details

- **ST6** – Corrected attached sidewalk dimension to 7’6” instead of 12’6”

Sanitary Sewer Details

- **Drawing SS3** – Corrected dimensions, and added East Jordan Frame and Cover to specified product list.

Storm Sewer Details

- **Drawing STM8B** – Corrected dimensions, and added East Jordan Frame and Cover to specified product list.

Water Details

- **Drawing W4** – Corrected dimensions, and added East Jordan Frame and Cover to specified product list.
- **Drawing W9** – Added note clarifying compaction around water meter pit.

Traffic Signal Details

- No changes

GENERAL NOTES:

Construction

- No Changes

Grading

- No Changes

Roadway

- No Changes

Sewer

- No Changes

Storm Drain

- No Changes

Water

- No Changes

**Design Standards and Construction
Specifications
For
Public Improvements**



2022 EDITION



DESIGN STANDARDS AND CONSTRUCTION SPECIFICATIONS FOR PUBLIC IMPROVEMENTS

SECTIONS

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CONCRETE WORK	400
ROADWAY & ASPHALT DESIGN	500
WATER SYSTEM	600
SANITARY SEWER SYSTEM	700
STORM DRAINAGE SYSTEM	800
TRAFFIC SIGNALS	900

STANDARD DETAILS

CURB/GUTTER & SIDEWALKS
STREETS
SANITARY SEWER
STORM SEWER
TRAFFIC SIGNALS
WATER

GENERAL NOTES

CONSTRUCTION
GRADING
ROADWAY
SANITARY SEWER
STORM SEWER
WATER

SECTION 100 GENERAL REQUIREMENTS

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120.00 SCOPE	100-4
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SECTION 100 GENERAL REQUIREMENTS

110.00 TITLE

These regulations shall be known as the Town of Firestone Design Standards and Construction Specifications for Public Improvements 2020 Edition and may be cited as such and will be referred to herein as the STANDARDS AND SPECIFICATIONS.

111.00 Purpose

The purpose of these STANDARDS AND SPECIFICATIONS is to provide acceptable standards of design, construction, quality of materials, use, location, and maintenance of all public improvements and common facilities including, but not limited to, sanitary sewer systems, water supply systems, storm drainage systems, streets, open space, parking lots and appurtenances thereto.

120.00 SCOPE

The provisions of these STANDARDS AND SPECIFICATIONS shall apply to the construction, enlargement, alteration, moving, removal, conversion, demolition, repair, and excavation of any public improvements or common facilities specifically regulated herein except where an approved P.U.D. plan specifically states otherwise. The provisions of these STANDARDS AND SPECIFICATIONS apply to Town contracts, Developer contracts and private contracts.

Alterations, additions, or repairs to existing improvements shall comply with all requirements of these STANDARDS AND SPECIFICATIONS unless specifically exempted in writing, by the Town Engineer.

121.00 Alternate Materials and Methods of Construction

The provisions of these STANDARDS AND SPECIFICATIONS are not intended to prevent the use of any material or method of construction not specifically prescribed by these procedures, provided any alternate has been approved and its use authorized by the Town Engineer.

The Town shall require that sufficient evidence or proof be submitted to substantiate any claims that may be made regarding the alternate. The details of any action granting approval of an alternate shall be recorded and entered in the files of the Town.

122.00 Modifications

Whenever there are practical difficulties involved in carrying out the provisions of these procedures, for example in existing Town subdivisions, or a request for a change in the provisions, the Town may grant modifications for individual cases, provided the Town shall first find that a special individual reason makes these procedures impractical, that the request is in the best interest of the Town, that the modification is in conformity with the intent and purpose of these procedures, and providing that such modification does not lessen any design requirement or any degree of integrity or safety. The details of any action granting modifications shall be recorded and entered in the files of the Town. The Town Engineer shall make the interpretation and the interpretation shall be binding and controlling in its application.

123.00 Quality Control and/or Quality Assurance Testing

Whenever there is insufficient evidence of compliance with any of the provisions of these STANDARDS AND SPECIFICATIONS or evidence that any material or construction does not conform to the requirements herein, the Town Engineer shall require that the Contractor have tests performed which will be used as proof of compliance. Test methods will be as specified by these STANDARDS AND SPECIFICATIONS or by other recognized test standards. If there are no recognized and accepted test methods for the proposed alternate, the Town Engineer will determine test procedures. All tests will be made by an approved agency and all costs shall be the responsibility of the contractor. Reports of such tests shall be submitted and retained by the Town.

The person responsible for the Quality Control Testing and/or Quality Assurance Testing shall be registered as a professional engineer in the State of Colorado and practicing in this field.

Technicians shall be:

- A. Certified as Level II or higher NICET in the specific area where they perform tests, i.e. soils, concrete, etc.
 - 1. Technicians taking concrete samples and conducting field tests must have a valid ACI Field certification or equivalent.
 - 2. Technicians conducting tests of Portland Cement Concrete for compressive strength shall possess a valid ACI Laboratory Grade I certification or equivalent.
 - 3. Technicians conducting tests of Portland Cement Concrete for flexural strength and determining mixture design characteristics shall possess a valid ACI Laboratory Grade II certifications or equivalent.
- B. Technicians performing Quality Control and Quality Assurance sampling, splitting or testing on Hot Mix Asphalt Pavement materials in the field and laboratory must possess one or more of the following qualifications:
 - 1. Technicians sampling hot mix asphalt materials or conducting nuclear asphalt density tests must possess a valid LabCat Level A certification or equivalent.
 - 2. Technicians conducting tests of Asphalt Content, Bulk Specific Gravity, Maximum Specific Gravity or Aggregate Gradation for hot mix asphalt must possess a valid LabCat Level B certification or equivalent.
 - 3. Technicians determining Asphalt Mixture Volumetric Properties, Hveem Stability or Resistance to Moisture Induced Damage must possess a valid LabCat Level C certification or equivalent.

Recognized equivalent certifications such as CDOT or Western Alliance for Quality Transportation Construction (WAQTC) certifications for each specified field can be submitted and will be reviewed on an individual basis.

124.00 Organization, Enforcement and Interpretation

The Town Engineer is authorized and directed to enforce all provisions of these STANDARDS AND SPECIFICATIONS and for such purposes he/she will have the powers of a peace officer. The Town Engineer may appoint a civil engineer, construction inspector, or other related technical officer or inspector, or other employee or consultant to act in his/her behalf.

Whenever any work is being done contrary to the provisions of these STANDARDS AND SPECIFICATIONS, the Town Engineer may order the work stopped by verbal notice by his appointed representative as defined above, followed by a written notice which will be served on any

persons engaged in the doing or causing of such work to be done, and any such persons will forthwith stop such work until authorized by the Town Engineer to proceed.

These STANDARDS AND SPECIFICATIONS are composed of written engineering standards, materials specifications and standard drawings. The Town Engineer shall make the interpretation of any Section, or of any difference between Sections, when appropriate, and his/her interpretation shall be binding and controlling in its applications.

125.00 Liability

The Town Engineer, or his authorized representative charged with the enforcement of these STANDARDS AND SPECIFICATIONS, acting in good faith and without malice in the discharge of his duties, will not thereby render himself personally liable for any damage that may accrue to persons or property as a result of any act or by reason of any act or omission in the discharge of his duties.

126.00 Violations

It shall be unlawful for any person, firm, or corporation to construct, enlarge, alter, repair, move, improve, remove, excavate, convert, demolish or operate any public improvements or common facilities or permit the same to be done in violation of these STANDARDS AND SPECIFICATIONS.

127.00 No Waiver of Legal Rights

The Town will not be precluded or stopped by any measurement, estimate, or certificate made either before or after the completion and acceptance of the work from showing the true amount and character of the work performed and materials furnished by the Contractor, or from showing that any such measurement, estimate or certificate is untrue or incorrectly made, or that the work or materials do not conform in fact to these STANDARDS AND SPECIFICATIONS.

128.00 Contractor's License

Any person performing work that requires a permit as detailed in Section 151.00 of these STANDARDS AND SPECIFICATIONS shall obtain a Contractor's License as set forth in the Town of Firestone's Municipal Code.

130.00 SCOPE OF WORK

131.00 Work Conditions

131.01 Working Hours

All work to be completed on the project shall be performed during regular working hours as defined in Section 171.00 of these STANDARDS AND SPECIFICATIONS as adopted by Municipal Code. The Contractor will not permit overtime work outside of regular working hours or the performance of work on Saturday, Sunday or any legal holiday without receiving written consent from the Town Engineer. Requests for weekend work approval must be submitted, in writing to the Town of Firestone no later than Wednesdays at 3:30pm for subsequent weekend and requests for Holiday work approval must be submitted, in writing to the Town of Firestone no later than 7:00am two (2) business days prior to the Holiday. All expenses incurred by the Town shall be reimbursed at a rate to be determined by the Director of Finance.

131.02 Emergency Work

When, in the opinion of the Town, the Contractor has not taken sufficient precautions to ensure the safety of the public or the protection of the work to be constructed, or of adjacent structures or property which may be injured by processes of construction on account of such neglect, and an emergency may arise and immediate action is considered necessary in order to protect public or private, personal or public interests, the Town, WITH OR WITHOUT NOTICE to the Contractor or the Developer, may provide suitable protection by causing such work to be done and material to be furnished and placed as the Town may consider necessary and adequate. The cost and expense of such work and material so furnished will be borne by the Contractor or Developer and will be paid on presentation of the bills.

The performance of such emergency work under the direction of the Town will in no way relieve the Contractor of responsibility for damages which may occur during or after such precaution has been taken.

In an emergency threatening loss of life or extensive damage to the work or to adjoining property, and where the Developer or Contractor is unable to obtain special instructions or authorization from the Town after diligent attempts to obtain such special instruction or authorization in sufficient time to take the necessary action, the Developer or Contractor is hereby permitted to act at his own discretion to prevent such threatening loss or damage.

131.03 Final Cleanup

Upon completion of the work, the Contractor shall remove from the project area all surplus and discarded materials, rubbish, and temporary structures, and leave the project area in a neat and presentable condition. The Contractor shall restore all work that has been damaged by his/her operations, to general conformity with the specifications for the item or items involved.

The Contractor shall inspect the interior of all manholes, valve boxes, and catch basins within the construction limits for construction materials, dirt, stones, or other debris deposited therein by the activities of the Contractor.

132.00 Control of Work**132.01 Authority of Town Engineer**

The Town Engineer will have the authority to stop the work whenever such stoppage may be deemed necessary. The Town Engineer will resolve all questions which arise as to the quality and acceptability of materials furnished, work performed, interpretation of the plans and specifications, and acceptable fulfillment of the requirements of these STANDARDS AND SPECIFICATIONS.

The Town Engineer may, when he/she deems it necessary, define the schedule and/or priority of the work to be completed on the project. The Contractor shall comply with this schedule. The Town Engineer must authorize any revision to the schedule in writing.

The Town Engineer shall resolve all questions that may arise relative to the performance of the work with respect to these STANDARDS AND SPECIFICATIONS.

132.02 Authority and Duties of Inspector

Inspectors are authorized to inspect all work completed and all material furnished. Inspections may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the

materials to be used. The inspector is not authorized to revoke, alter, or waive any requirements of these STANDARDS AND SPECIFICATIONS. He/she is authorized to call the attention of the Contractor to any failure of the work or materials to conform to these STANDARDS AND SPECIFICATIONS. Inspectors are authorized to serve a "Field Order" when inspection of the project reveals violation(s) of these STANDARDS AND SPECIFICATIONS. The inspector will have the authority to reject materials until the Town Engineer can resolve any questions at issue.

The inspector will, in no case, act as foreman or perform other duties for the Contractor, nor interfere with the management of the work done by the Contractor. Any "advice" which the inspector may give the Contractor will not be construed as binding upon the Town Engineer or the Town in any way, or release the Contractor from fulfilling all of the terms of these STANDARDS AND SPECIFICATIONS.

The presence or absence of the inspector will not relieve, in any degree, the responsibility or the obligation of the Contractor.

The Town Engineer and inspector will, at all times, have reasonable and safe access to the work whenever it is in preparation or progress and the Contractor will provide proper facilities for such access and inspection.

132.03 Contractor's Responsibility for Work

In case of suspension of work for any cause, the Contractor, before leaving the job site, shall take such precautions as may be necessary to prevent damage to the project, provide for normal drainage and erect any necessary barricades, signs, or other facilities, at his/her expense, as directed by the Town Engineer and required by these STANDARDS AND SPECIFICATIONS.

132.04 Removal of Unauthorized and Unacceptable Work

Work, which does not conform to the plans and specifications, and results in an inferior or unsatisfactory product, will be considered unacceptable work.

Unacceptable work, whether the result of poor workmanship, poor design, use of defective materials, damage through carelessness or any other cause, found to exist prior to the final acceptance of the work will be immediately removed and acceptably replaced or otherwise satisfactorily corrected by and at the expense of the Developer or Contractor. This expense includes total and complete restoration of any disturbed surface to original or better than the original condition that existed before the repairs or replacement, regardless of improvements on lands where the repairs or replacement are required.

133.00 Control of Materials

133.01 Samples and Tests

To ascertain that materials comply with contract requirements, samples will be taken and/or tests made at the source or at the job destination, at the discretion of the Town Engineer and as often as he deems it advisable or necessary. Taking of samples and completion of tests will be in accordance with standard practices except where methods and procedures for sampling materials are otherwise set forth in these STANDARDS AND SPECIFICATIONS.

The Contractor shall furnish, without charge, all samples, tests and reports required by the Town Engineer and will afford such facilities as may be necessary for collecting and forwarding them. The contractor may be required to furnish, when requested by the Town Engineer, a written statement giving the origin, composition and process of manufacture of a material.

133.02 Storage of Materials

Materials shall be stored so as to insure the preservation of their quality and suitability for the work. Stored materials, even though approved prior to storage, will be subject to inspection prior to their use in the work and will meet all requirements of these STANDARDS AND SPECIFICATIONS at the time they are used. Stored materials will be located so as to facilitate inspection. With the Town Engineer's approval, portions of the right-of-way not required for public travel may be used for storage purposes and for the placing of the Contractor's materials and equipment but any additional space required will be provided by the Contractor at his expense.

133.03 Defective Materials

Materials not in conformance with requirements of these STANDARDS AND SPECIFICATIONS will be considered defective and will be rejected. Rejected materials shall be removed from the work site in the time indicated by the Town Engineer.

140.00 GENERAL REQUIREMENTS**141.00 Protection of Public and Utility Interests****141.01 Public Convenience and Safety**

Fire hydrants will be visible and accessible to the Fire Department from the street at all times. No obstructions will be placed within five (5) feet of a fire hydrant.

Unless otherwise specified, the Contractor will give notice, in writing, to the proper authorities in charge of streets, gas and water pipes, electric service, cable television and other conduits, railroads, poles, manholes, valve boxes, catch basins and all other property that may be affected by the Contractor's operations, at least seventy-two (72) hours before breaking ground. The Contractor will not hinder or interfere with any person in the protection of such property, or with the operation of utilities at any time. The Contractor must obtain all necessary information in regard to existing utilities, protect such utilities from injury, and avoid unnecessary exposure so that they will not cause injury to the public.

If a temporary utility outage is required to perform the work, the contractor shall be responsible to coordinate with the Town of Firestone for determination of minimum notification time requirements and maximum time allowed for the outage. Once determined, the contractor shall notify the affected utility customers.

The Contractor shall obtain all necessary information in regard to the planned installation of new utilities and cables, conduits and transformers, make proper provision and give proper notification so that new utilities and electrical equipment can be installed at the proper time without delay to the Developer or Contractor or unnecessary inconvenience to the owner. The location of new underground utilities and electrical equipment shall not be covered with pavement prior to the installation of such facilities.

When the work involves excavation adjacent to any building or wall along the work, the Contractor will give property owners due and sufficient notice thereof, in writing with a copy to the Town.

141.02 Protection and Restoration of Property and Survey Monuments

The Developer and Contractor shall use every reasonable precaution to prevent the damage or destruction of public or private property such as poles, trees, shrubbery, crops, fences, and survey

monuments adjacent to or interfering with the work, and all overhead structures such as wires, cables, within or outside of the right-of-way.

The Contractor shall protect and support all water, gas, sanitary sewer, storm sewer or electrical pipes or conduits, and all railway tracks, buildings, walls, fences or other properties that are liable to be damaged during the execution of his work. He will take all reasonable and proper precautions to protect persons, animals, and vehicles from injury, and wherever necessary, will erect and maintain a fence or railing around any excavation and place a sufficient number of amber lights about the work and keep them burning from twilight until sunrise. He will employ one or more watchmen as an additional security wherever they are needed or required by the Town Engineer.

The Contractor shall not prevent the flow of water in the gutters of the street and will use proper means to permit the flow of surface water along the gutters while the work is progressing.

The Contractor must protect and carefully preserve all land boundary and Town survey control monuments. Any monument that may be disturbed shall be referenced and replaced by a Professional Land Surveyor registered in the State of Colorado. All monuments disturbed or removed by the Contractor, through negligence or carelessness on his part or on the part of his employees or subcontractors, shall be replaced at the Contractor's expense. Replacement of any monument shall be completed in accordance with the requirements set forth in Section 141.04 of these STANDARDS AND SPECIFICATIONS.

No person shall remove or disturb any grade or line stakes or marks set by the Town Engineer for all construction.

Developer and Contractor shall be responsible for the damage or destruction of property resulting from neglect, misconduct, or omission in his/her manner or method of execution or non-execution of the work, or caused by defective work or the use of unsatisfactory materials. They will restore such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, rebuilding, or replacing it as may be directed, or they will otherwise make good such damage or destruction in an acceptable manner. Developer and Contractor will be responsible for the repair of underground pipes, wires, or conduits damaged by them or their subcontractors.

Developer and Contractor shall be liable for all damage caused by storms and fire, and will under no circumstances, start fires without first securing the necessary permits and approval of the authority having jurisdiction even though they may be ordered or required to do such burning. In burning brush, stumps, or rubbish, care must be taken not to damage any standing trees, shrubs or other property.

141.03 Surveys

Surveys will conform to Colorado Bylaws and Rules of Procedures and rules of Professional Conduct of the State Board of Registration for Professional Engineers and Profession Surveyors "Revised".

141.04 Survey Monuments

Permanent survey monuments (including the replacement of monuments) range points and lot pins shall be set in accordance with the requirements of Articles 51 and 53 of Title 38, Colorado Revised Statutes, and as required by the Bylaws and Rules of Procedure of the Colorado State Board of Registration for Professional Engineers and Professional Land Surveyors.

141.05 Protection of Streams, Lakes and Reservoirs

The Developer and Contractor will take all necessary precautions to prevent pollution of streams, lakes, and reservoirs with fuels, oils, bitumen's, calcium chloride, or other harmful materials. They will conduct and schedule their operations so as to avoid or minimize siltation of streams, lakes and reservoirs. See Section 151.00 Grading and Stormwater Quality Permit.

141.06 Dust proofing

The Contractor will take all necessary steps to control dust arising from operations connected with the work. Unless otherwise directed by the Town Engineer, a water truck shall always be on-site and all disturbed areas of a project shall be watered to prevent dust and wind-caused erosion.

141.07 Traffic Control, Barricades and Warning Signs

All construction, maintenance, park or utility work being completed within the Public Right-of-Way must have a Traffic Control Plan (TCP) accepted by the Town Engineer. The TCP is a plan for guiding and handling traffic safely through the construction work zone. The TCP must provide safe methods for movement of pedestrians and motorists that travel through the work zone and a safe area for all workers engaged in the construction activity. The TCP shall show the location, spacing and scheduling of the usage of advance warning signs, barricades, pavement markings and other control devices. All control devices must be installed and maintained in accordance with the "Manual on Uniform Traffic Control Devices" (MUTCD) and the "CDOT Work Zone Safety Handbook", latest editions.

Requirements contained in these manuals will be strictly enforced during the progress of the work.

The TCP must be job specific. In order for a TCP to be accepted by the Town Engineer it must contain, as a minimum, a drawing showing the project area and the street(s) that may be affected by the project. The drawing shall include the following information:

- A. Location and spacing of properly planned traffic control devices.
- B. The length of time that the construction will be in progress.
- C. The name and phone number(s) for twenty-four (24) hour contact of the Contractor's designated traffic control supervisor.
- D. Any special notes or information on how the traffic control operation is to be handled.

The responsibilities of the Contractor shall include the following:

- A. Obtain a Public Improvement Permit or Right of Way Permit from the Town of Firestone Engineering Division.
- B. Provide timely notification to, and coordination with, all affected agencies including the following:
 - 1. Frederick-Firestone Fire Protection District
 - 2. Firestone Police Department
 - 3. Firestone Public Works Department.
 - 4. CDOT
 - 5. Utility Companies.
 - 6. RTD
 - 7. St. Vrain Valley School District
 - 8. Post Office
- C. Inform occupants of abutting properties of access limitations made necessary by the work.

- D. Schedule and expedite the work to cause the least inconvenience to the public. Construction or repair work will not be permitted at or in the vicinity of signalized intersections or on major streets and State Highways without advance approval of the Town Engineer and CDOT as applicable.
- E. Furnish, install and maintain required traffic control devices and facilities, as required throughout the life of the contract (including periods of suspension).
- F. Provide flagmen when required.
- G. Assure that survey crews and other employees working in or adjacent to a traveled roadway wear flagging garments as required for flagmen.
- H. Provide adequate safeguards for workers and the general public.
- I. Patrol the construction site as required insuring that all devices are in place and operating at all times.
- J. Remove traffic control devices when they are no longer needed.

Intersections and driveways will be closed only for a minimum amount of time. The Contractor shall coordinate driveway closures with property owners with final approval by the Town Engineer.

All temporary traffic lanes shall be a minimum of ten (10) feet in width unless otherwise authorized. In addition, lane clearance shall be a minimum of five (5) feet from an open excavation and two (2) feet from a curb or other vertical obstruction.

Suitable surfacing must be provided for the temporary traffic lanes in work areas. When traffic is diverted from the existing pavement, temporary surfacing shall be provided as required by the Town Engineer.

Construction equipment not actively engaged in the work, employee vehicles and official vehicles of the agency shall not be parked in the vicinity of the work in such a manner as to further restrict traffic flow.

Vehicles and equipment in continuous or frequent use may be operated or parked in the same traffic lane as the work obstruction. Construction spoil or materials may be similarly stored in this area or on the nearby parkway or sidewalk area, provided four (4) feet of sidewalk is kept clear for pedestrian use. To prevent the spoil bank from occupying too great a space at its base, toe boards may be used to keep it two (2) feet from the edge of the excavation on one side and two (2) feet from the edge of the traffic lane on the other.

Whenever necessary, trenches and excavation shall be bridged to permit an unobstructed flow of traffic.

- A. Bridging must be secured against displacement by using adjustable cleats, angles, bolts, or other devices.
- B. Bridging shall be installed to operate with minimum noise.
- C. The trench must be adequately shored, to support the bridging and traffic.
- D. Temporary paving materials (premix) shall be used to feather the edges of the plates to minimize wheel impact.
- E. Bridges shall be designed by a P.E.

When the work area encroaches upon a sidewalk, walkway or crosswalk area, special consideration must be given to pedestrian safety. Since the pedestrian moves at a relatively slow rate, a minimum of advance warning is required. However, effort must be made to separate him from the work area.

All work shall be barricaded at all times and between the hours of sunset and sunrise and shall be properly lighted so as to warn all persons. The Contractor will be responsible for all damages to the

work due to failure of barricades, signs, lights, and flagmen and watchmen to protect it, and whenever evidence of such damage is found prior to acceptance the Town Engineer may order the damaged portion immediately removed and replaced by the Contractor.

142.00 Use of Town Water

If the Contractor requires Town water for any part of the project, he/she must request a "Town Fire Hydrant Meters Rental Agreement" from the Public Works Department. Any theft of water, including meter jumpers, hose connections in meter pits, drawing water from fire hydrants without a Town of Firestone hydrant meter installed, or any other unauthorized use of Town water will be considered a violation of both this manual and the current adopted Town of Firestone Municipal Code. Uncontrolled usage by contractors and subcontractors will be reported to the responsible property owner. Violations will be enforced in conjunction with the Town of Firestone Municipal Code and/or building permits and inspections may be withheld until such time as violations are corrected and the Town is satisfied that proper control channels are established.

143.00 Pavement Cuts

Boring, except for emergency repairs, shall be done for all underground utility installations crossing arterials or streets. An exception may also be granted when a plan is submitted to overlay the entire street (block to block), or the Town Engineer accepts such other plan. All street cuts when accepted must be saw-cut prior to street patching and an approved hot/cold mix asphalt patch shall be placed the same day the cuts are employed. Street cuts when completed shall have permanent patching within five working days, unless otherwise directed. Permittee shall be responsible for maintenance of the permanent patch for a period of two years.

If a pavement cut is required, the Contractor will make every effort to install a permanent, hot mix, asphalt patch within twenty-four (24) hours. The Contractor will place a temporary, all weather surface patch in all street cuts immediately after completing backfill and compaction if a permanent patch cannot be installed within twenty-four (24) hours. The Contractor will submit a schedule for the hot mix patch installation to the Town Engineer for approval in the latter case. Refer to Standard Drawings for details.

When street cuts are required, the following conditions will be met so as to avoid interference with traffic:

- A. Street service cuts will be open only between 9:00 a.m. and 4:00 p.m.; and
- B. Two-way traffic will be maintained at all times around the construction area. A Traffic Control Plan (TCP) must be prepared in accordance with Section 141.08, Traffic Control, Barricades and Warning Signs, of these STANDARDS AND SPECIFICATIONS and submitted to the Town Engineer for his/her acceptance prior to the commencement of construction.

143.01 Pavement Replacement Construction Requirements

Pavement replacement for street cuts will be constructed according to the Standard Details.

144.00 Public Utility Easements

Easements must be dedicated for public utility mains and fire hydrants that extend onto or are looped through private property. Utility services that extend onto private property and service a single property are private and will be maintained by the property owner.

150.00 PERMITS AND INSPECTIONS**151.00 Stormwater Quality Permit**

It shall be unlawful for any person, firm or corporation to conduct any construction activity resulting in the disturbance of one acre or more or the disturbance is less than one acre but is part of a larger common plan of development without first obtaining a Stormwater Quality Permit (SQP) for such work from the Town of Firestone.

151.01 Application for Permit

Applicants for SQPs shall complete an application in writing on a form furnished by the Engineering Department. In support of the application, the applicant shall submit:

- A. All information required on the SQP permit and any additional information requested by the Town.
- B. The application signed by the person or person responsible for compliance with the permit.
- C. Documentation of an application for a CDPHE stormwater general permit for construction activities
- D. A stormwater management plan (SWMP) that, in addition to the requirements of the CDPHE stormwater general permit, shall contain:
 1. At a minimum, pollutant sources associated with the following construction activities must be addressed:
 - a) All areas of land disturbance and storage of soils
 - b) Vehicle tracking
 - c) Loading and unloading operations
 - d) Outdoor storage of construction site materials, building materials, fertilizers and chemicals
 - e) Bulk storage of materials
 - f) Vehicle and equipment maintenance and fueling
 - g) Significant dust or particulate generating processes
 - h) Routine maintenance activities involving fertilizers, pesticides, detergents, fuels, solvents, and oils
 - i) Concrete truck/equipment washing, including the concrete truck chute and associated fixtures and equipment
 - j) Dedicated asphalt and concrete batch plants
 - k) Other areas or operations where spills can occur
 - l) Other non-stormwater discharges including construction dewatering not covered under the construction Dewatering Discharges general permit and wash water that may contribute pollutants to the MS4 work, access points with vehicle tracking, temporary/haul roads, and storage and staging areas.
 2. Specifications and details for installation and implementation of stormwater control measures. Appropriate control measures must be implemented prior to the start of construction activities, must control potential pollutants during each phase of construction, and must be continued through final stabilization. Appropriate structural control measures must be maintained in operational condition.
 3. A narrative description of non-structural control measures.
 4. An erosion control plan that contains control measures for each phase of construction. All developments that include public improvements shall require a phased (initial, interim, and final) erosion control plan.

151.02 Permit Issuance

The Town Engineer shall review the application, plans, specifications and other data filed by an applicant for a permit. Other departments of this jurisdiction may review the plans to verify compliance with any applicable laws. If the Town Engineer finds that the work described in an application for a permit and the plans and other data filed therewith conform to the requirements of these STANDARDS AND SPECIFICATIONS and other pertinent laws and Municipal Codes and that all required fees have been paid, he/she will issue a permit to the applicant.

The issuing of a permit based on plans, specifications or other data will not prevent the Town Engineer from requiring the correction of errors in said plans, specifications and other data, or from stopping construction operations which are in violation of these STANDARDS AND SPECIFICATIONS or any other regulations of this jurisdiction.

A pre-construction conference shall be required prior to the issuance of any permits for construction and may be held in conjunction with pre-construction conferences for other permits. Attendance shall include the Town Engineer or his representative, the Town Inspector, and the Developer/Owner. The Town Engineer will be notified two (2) working days (forty-eight [48] hours) before the planned construction is to begin.

151.03 Permit Suspension or Revocation

The Town Engineer may suspend or revoke any permit in writing, issued under the provisions of these STANDARDS AND SPECIFICATIONS whenever the permit is issued in error, or on the basis of incorrect information supplied by the applicant, or whenever such permit may have been issued in violation or is in violation of any Municipal Code or regulation of any of the provisions of these STANDARDS AND SPECIFICATIONS. In the event a permit is suspended or revoked, no refund of permit fees will be made.

152.04 Investigation Fees (Working without a Permit)

All work for which the required permit is not obtained shall cease upon written notice of the Town Engineer. A special investigation shall be made before a permit may be issued for such work.

An investigation fee shall be collected whether or not a permit is then or subsequently issued. The investigation fee shall be equal to the amount of the plan review fee, the Public Improvement Permit fee, and the fees for the inspection time required for the investigation. The payment of such investigation fees shall not exempt any person from compliance with all other provisions of these STANDARDS AND SPECIFICATIONS nor from any penalty prescribed by law.

152.00 Public Improvement Permit

It shall be unlawful for any person, firm or corporation to construct, enlarge, alter, repair, move, improve, remove, excavate, convert or demolish any public improvements or common facilities regulated by these STANDARDS AND SPECIFICATIONS without first obtaining a Public Improvement Permit for such work from the Town Engineer.

152.01 Application for Permit

Applicants for public (and private) improvement permits shall complete an application in writing on a Public Improvement Permit Fees (PIP) form furnished by the Engineering Division. Each application shall:

- E. Identify and describe the work to be covered by the permit for which the application is made.
- F. Describe the land on which the proposed work is to be done by legal description, street address, or similar description that will readily identify and definitely locate the proposed work.
- G. Indicate the type of work or improvement intended.
- H. Be accompanied by plans, diagrams, computations and specifications, and other data as required in Section 160.00 of these STANDARDS AND SPECIFICATIONS.
- I. Be accompanied by a Construction Traffic Routing Plan as defined in Section 162.02 of these STANDARDS AND SPECIFICATIONS.
- J. State the valuation and the quantities of the work to be performed.
- K. Be signed by the applicant or his/her authorized agent, who may be required to submit evidence to indicate such authority.
- L. Submit a starting and completion date and give such other data and information as may be required by the Town Engineer.

152.02 Permit Issuance

The Town Engineer shall review the application, plans, specifications and other data filed by an applicant for a permit. Other departments of this jurisdiction may review the plans to verify compliance with any applicable laws. If the Town Engineer finds that the work described in an application for a permit and the plans and other data filed therewith conform to the requirements of these STANDARDS AND SPECIFICATIONS and other pertinent laws and Municipal Codes and that all required fees have been paid, he/she will issue a permit to the applicant.

When the Town Engineer issues a permit for which plans are required, he will endorse the plans in writing or by stamping the plans and specifications "ACCEPTED FOR CONSTRUCTION". The accepted plans and specifications will not be changed, modified, or altered without authorization from the Town Engineer, and all work will be done in conformance with the accepted plans. Two sets of accepted plans, specifications, and computations will be retained by the Town and one set will be returned to the applicant and will be maintained at the work site at all times during the progress of the work.

A pre-construction conference shall be required prior to the issuance of any permits for construction. Attendance shall include the Town Engineer or his representative, the Town Inspector, the Developer/Owner, Design Engineer, General Contractor, and Sub-contractors including: earthwork, utilities, curb and gutter, paving, and signing. The Town Engineer will be notified two (2) working days (forty-eight [48] hours) before the planned construction is to begin.

The issuing and granting of a permit will not be construed to be a permit for, or an approval of, any violation of any of the provisions of these STANDARDS AND SPECIFICATIONS or of any regulations of this jurisdiction. No permit presuming to give authority to violate or cancel the provisions of these STANDARDS AND SPECIFICATIONS shall be valid.

The issuing of a permit based on plans, specifications or other data will not prevent the Town Engineer from requiring the correction of errors in said plans, specifications and other data, or from stopping construction operations which are in violation of these STANDARDS AND SPECIFICATIONS or any other regulations of this jurisdiction.

152.03 Permit Expiration

Every permit issued by the Town Engineer under the provisions of this section shall expire if the work authorized by such a permit is not substantially completed by the date noted on the permit. Before

such work can be recommenced, a new permit must be obtained and the fee required will be one-fourth (1/4) of the amount required for a new permit to do such work, provided no changes have been made or required by the Town in the original plans and specifications, and, provided further, such suspension or abandonment has not exceeded one year from the completion date noted on the permit. If substantial changes have been made or required by the Town during this period, or should more than one year have expired, the permittee shall pay a new, full permit fee.

Any permittee holding a valid permit may apply, in writing, for an extension of the completion date noted on the permit if he/she is unable to complete the work by the completion date. The request must be based on good cause and the cause must be acceptable to the Town. The Town Engineer may extend the completion date for a period not to exceed one year, provided that circumstances beyond the control of the permittee have prevented action from being taken. No permit will be extended more than one (1) time.

152.04 Permit Suspension or Revocation

The Town Engineer may suspend or revoke any permit, in writing, issued under the provisions of these STANDARDS AND SPECIFICATIONS whenever the permit is issued in error, or on the basis of incorrect information supplied by the applicant, or whenever such permit may have been issued in violation of any Municipal Code or regulation of any of the provisions of these STANDARDS AND SPECIFICATIONS. In the event a permit is suspended or revoked, no refund of permit fees will be made.

152.05 Plan Review Fees

Plan review fees shall be paid in full at the time the Town Engineer accepts the plans and specifications and the Public Improvement Permit is issued. The plan review fees shall be sixty five (65) percent of the Public Improvement Permit fees. Applications for which no permit is issued within one hundred eighty (180) days following the date of the application shall expire, and plans and other data submitted for review may be returned to the applicant or destroyed by the Town Engineer. The Town Engineer may extend the time for action by the applicant for a period not exceeding one hundred eighty (180) days, upon receiving written request from the applicant showing that circumstances beyond the control of the applicant have prevented action from being taken. No application shall be extended more than once. In order to renew action on an application after expiration, the applicant shall resubmit plans and pay a new plan review fee.

152.06 Public Improvement Permit Fees

These fees shall be calculated on a cumulative basis. Public Improvement Permit fees shall be paid in full at the time the Town Engineer accepts the plans and specifications and the Public Improvement Permit is issued. A Public Improvement Permit shall be required for all construction work in the public right-of-way or in a public easement. However, the fee for construction of the Town's Capital Improvement Projects may be waived by the Town Engineer.

152.07 Investigation Fees (Working without a Permit)

All work for which the required permit is not obtained shall cease upon written notice of the Town Engineer. A special investigation shall be made before a permit may be issued for such work.

An investigation fee shall be collected whether or not a permit is then or subsequently issued. The investigation fee shall be equal to the amount of the plan review fee, the Public Improvement Permit fee, and the fees for the inspection time required for the investigation. The payment of such

investigation fees shall not exempt any person from compliance with all other provisions of these STANDARDS AND SPECIFICATIONS nor from any penalty prescribed by law.

153.00 Right of Way Permit

For work not covered by a Public Improvement Permit, it shall be unlawful for any person, firm or corporation to do any work including but not limited to; excavation, pothole underground facilities, install, repair or modify; utilities, drive access, curb, walk, or other underground or surface improvements, within the Town's property or right-of-way without first obtaining an Right of Way Permit for such work from the Town Engineer.

153.01 Application for Permit

Applicants for Right of Way permits shall complete an application in writing on a Right of Way Permit form furnished by the Engineering Division. Each application shall:

- A. Identify and describe the work to be covered by the permit for which the application is made.
- B. Describe the property or right of way location on which the proposed work is to be done by street address, or similar description that will readily identify and definitely locate the proposed work.
- C. Indicate the type of work or improvement intended.
- D. Be accompanied by plans, diagrams, computations and specifications, and other data as required in Section 160.00 of these STANDARDS AND SPECIFICATIONS.
- E. Be accompanied by a Construction Traffic Routing Plan as defined in Section 162.02 of these STANDARDS AND SPECIFICATIONS.
- F. Be signed by the applicant or his/her authorized agent, who may be required to submit evidence to indicate such authority.
- G. Submit a starting and completion date and give such other data and information as may be required by the Town Engineer.

153.02 Permit Issuance

The Town Engineer shall review the application, plans, specifications and other data filed by an applicant for a permit. Other departments of this jurisdiction may review the plans to verify compliance with any applicable laws. If the Town Engineer finds that the work described in an application for a permit and the plans and other data filed therewith conform to the requirements of these STANDARDS AND SPECIFICATIONS and other pertinent laws and Municipal Codes and that all required fees have been paid, he/she will issue a permit to the applicant.

The Town Engineer will be notified a minimum of two (2) working days (forty-eight [48] hours) before the planned construction is to begin. The issuing and granting of a permit will not be construed to be a permit for, or an approval of, any violation of any of the provisions of these STANDARDS AND SPECIFICATIONS or of any regulations of this jurisdiction. No permit presuming to give authority to violate or cancel the provisions of these STANDARDS AND SPECIFICATIONS shall be valid.

The issuing of a permit based on plans, specifications or other data will not prevent the Town Engineer from requiring the correction of errors in said plans, specifications and other data, or from stopping construction operations which are in violation of these STANDARDS AND SPECIFICATIONS or any other regulations of this jurisdiction.

153.03 Permit Expiration

Every permit issued by the Town Engineer under the provisions of this section shall expire if the work authorized by such a permit is not substantially completed by the date noted on the permit. Before such work can be recommenced, a new permit must be obtained.

Any permittee holding a valid permit may apply, in writing, for an extension of the completion date noted on the permit if he/she is unable to complete the work by the completion date. The request must be based on good cause and the cause must be acceptable to the Town. The Town Engineer may extend the completion date for a period not to exceed one year, provided that circumstances beyond the control of the permittee have prevented action from being taken. No permit will be extended more than one (1) time.

153.04 Permit Suspension or Revocation

The Town Engineer may suspend or revoke any permit, in writing, issued under the provisions of these STANDARDS AND SPECIFICATIONS whenever the permit is issued in error, or on the basis of incorrect information supplied by the applicant, or whenever such permit may have been issued in violation of any Municipal Code or regulation of any of the provisions of these STANDARDS AND SPECIFICATIONS. In the event a permit is suspended or revoked, no refund of permit fees will be made.

154.00 Access Permit

No person shall construct any access providing direct vehicular movement to or from any street from or to property in close proximity or abutting a street without an access permit issued by the Town Engineer. Access permits shall be issued only in compliance with the Access Code adopted pursuant to Section 12.06 of the Town of Firestone Municipal Code. In no event shall an access permit be issued if it is detrimental to the public health, welfare and safety. Direct access from a subdivision to a street shall be permitted only if the proposed access meets the purposes and requirements of the Access Code. Local traffic from a subdivision in close proximity to or abutting a street shall be served by an internal street system of adequate capacity, intersecting and connecting with the general street system in a manner that is safe and is consistent.

154.01 Application for Permit

Applicants for Access Permits shall complete an application in writing on a Access Permit form furnished by the Engineering Division. Each application shall:

- A. Identify and describe the work to be covered by the permit for which the application is made.
- B. Describe the property or right of way location on which the proposed work is to be done by street address, or similar description that will readily identify and definitely locate the proposed work.
- C. Indicate the type of work or improvement intended.
- D. Be accompanied by plans, diagrams, computations and specifications, and other data as required in Section 160.00 of these STANDARDS AND SPECIFICATIONS.
- E. Be accompanied by a Construction Traffic Routing Plan as defined in Section 162.02 of these STANDARDS AND SPECIFICATIONS.
- F. Be accompanied by a subdivision zoning or development plan.
- G. Be accompanied by a property map indicating other nearby or abutting accesses and public roads and streets.
- H. Be signed by the applicant or his/her authorized agent, who may be required to submit evidence to indicate such authority.

- I. Submit a starting and completion date and give such other data and information as may be required by the Town Engineer.

154.02 Permit Issuance

The Town Engineer shall review the application, plans, specifications and other data filed by an applicant for a permit. Other departments of this jurisdiction may review the plans to verify compliance with any applicable laws. If the Town Engineer finds that the work described in an application for a permit and the plans and other data filed therewith conform to the requirements of these STANDARDS AND SPECIFICATIONS and other pertinent laws and Municipal Codes and that all required fees have been paid, they will issue a permit to the applicant.

When the Town Engineer issues a permit for which plans are required, he will endorse the plans in writing or by stamping the plans and specifications "ACCEPTED FOR CONSTRUCTION". The accepted plans and specifications will not be changed, modified, or altered without authorization from the Town Engineer, and all work will be done in conformance with the accepted plans. Two sets of accepted plans, specifications, and computations will be retained by the Town and one set will be returned to the applicant and will be maintained at the work site at all times during the progress of the work.

The issuing and granting of a permit will not be construed to be a permit for, or an approval of, any violation of any of the provisions of these STANDARDS AND SPECIFICATIONS or of any regulations of this jurisdiction. No permit presuming to give authority to violate or cancel the provisions of these STANDARDS AND SPECIFICATIONS shall be valid.

The issuing of a permit based on plans, specifications or other data will not prevent the Town Engineer from requiring the correction of errors in said plans, specifications and other data, or from stopping construction operations which are in violation of these STANDARDS AND SPECIFICATIONS or any other regulations of this jurisdiction.

154.03 Permit Expiration

Every permit issued by the Town Engineer under the provisions of this section shall expire if the work authorized by such a permit is not substantially completed within 1 year of permit issuance.

Any permittee holding a valid permit may apply, in writing, for an extension of the completion date noted on the permit if he/she is unable to complete the work by the completion date. The request must be based on good cause and the cause must be acceptable to the Town. The Town Engineer may extend the completion date for a period not to exceed one year, provided that circumstances beyond the control of the permittee have prevented action from being taken. No permit will be extended more than one (1) time.

154.04 Permit Suspension or Revocation

The Town Engineer may suspend or revoke any permit, in writing, issued under the provisions of these STANDARDS AND SPECIFICATIONS whenever the permit is issued in error, or on the basis of incorrect information supplied by the applicant, or whenever such permit may have been issued in violation of any Municipal Code or regulation of any of the provisions of these STANDARDS AND SPECIFICATIONS. In the event a permit is suspended or revoked, no refund of permit fees will be made.

155.00 Inspections

All construction work for which a Public Improvement Permit, Right of Way Permit, or Access Permit is required shall be subject to inspection by the Town Engineer.

It shall be the responsibility of the person performing the work authorized by a permit to notify the Town Engineer or his/her authorized representative that such work is ready for inspection. Every request for inspection shall be filed at least one (1) working day (twenty-four [24] hours) before such inspection is desired unless otherwise stated in these STANDARDS AND SPECIFICATIONS. Such request may be in writing or by telephone, at the option of the Town Engineer.

It shall be the responsibility of the person requesting inspections required by these STANDARDS AND SPECIFICATIONS to provide access to and means for proper inspection of all work. The Town Engineer will have the authority to halt construction when, in his/her opinion, these STANDARDS AND SPECIFICATIONS and/or standard construction practices are not being followed, or the work is otherwise defective will inspect all work. Whenever any portion of these STANDARDS AND SPECIFICATIONS are violated, the Town Engineer shall give the Contractor written notice listing deficiencies to be corrected and may order further construction to cease until all deficiencies are corrected. If the deficiencies are not corrected within the time limit specified in the notice, the Town Engineer may evoke enforcement options authorized by the Town of Firestone Municipal Code and/or performance guarantees under which the work is being performed.

The procedure for final inspection and acceptance will be as specified in the contract documents or in Section 200, Acceptance Procedures, of these STANDARDS AND SPECIFICATIONS.

155.01 Additional Inspections and Re-inspections

The Town Engineer may make or require other inspections of any work as deemed necessary to ascertain compliance with the provisions of these STANDARDS AND SPECIFICATIONS and other provisions of the Town of Firestone Municipal Code.

A re-inspection fee may be assessed for each inspection or re-inspection when such portion of work for which inspection is called is not complete or when corrections called for have not been made.

Re-inspection fees may be assessed when the permit is not in the possession of the permit holder or his/her agent at the work site, when the accepted plans are not readily available to the inspector, or failure to provide access on the date for which inspection is requested, or for deviating from plans accepted by the Town Engineer.

This subsection is not to be interpreted as requiring re-inspection fees the first time a job is rejected for failure to comply with the requirements of these STANDARDS AND SPECIFICATIONS, but rather as controlling the practice of calling for inspections before a job is ready for such inspection or re-inspection.

To obtain a re-inspection, the applicant must file an application in writing upon a form furnished for that purpose and pay the re-inspection fee. In instances where re-inspection fees have been assessed, no additional inspection of the work will be performed until the required fees have been paid.

160.00 PLANS AND SPECIFICATIONS

Three (3) sets of plans, engineering calculations, diagrams and other data shall be submitted with each application for a permit. The Town will require that plans, computations and specifications be prepared and designed by a Registered Professional Engineer, licensed to practice in the State of Colorado.

EXCEPTION: THE TOWN ENGINEER MAY WAIVE THE SUBMISSION OF PLANS, CALCULATIONS, ETC., IF THEY FIND THAT THE NATURE OF THE WORK APPLIED FOR IS SUCH THAT REVIEWING OF PLANS IS NOT NECESSARY TO OBTAIN COMPLIANCE WITH THESE STANDARDS AND SPECIFICATIONS.

161.00 Construction Plan Requirements

All construction plans will be checked for conformance to the STANDARDS AND SPECIFICATIONS prior to acceptance by the Engineering Division. This acceptance shall be for conformance to Town design standards and other requirements; engineering design or needs will remain the responsibility of the professional design engineer. Three (3) sets of the final plans will be submitted to the Engineering Division for review prior to acceptance. Either written comments or one (1) marked up plan set will be returned if changes are required or recommended. The written comments and/or the marked up plan set shall be returned to the Engineering Division with the revised plan set. Upon final acceptance of the construction plans by the Town Engineer, a minimum of three (3) sets of 22" by 34" full size plans, one (1) set of 11" by 17" half size plans and an electronic version of the full set in PDF format will be submitted. The sets of plans shall be signed and sealed by the registered professional engineer, licensed in the State of Colorado (in accordance with The 1973 Colorado Revised Statutes, Title 12, Article 25, Paragraph 117) responsible for the design, and shall be signed by the Town Engineer. One (1) of the signed plans shall be returned to the developer/owner for the Contractor's use, and the Town shall keep two (2) sets. The Contractor shall keep the set returned to the contractor on the job for the duration of the project. All drawings and prints shall be drawn in 22" x 34" format. Should circumstances warrant changes to the accepted plans or specifications, written approval must be obtained from the Town Engineer. Copies will be given to the Developer or Contractor and the Design Engineer. It will be the duty of the design engineer and the Contractor to record any and all changes on "as-built" drawings at the completion of the project in compliance with Section 222.00, Acceptance Procedures, of these STANDARDS AND SPECIFICATIONS.

161.01 General Requirements

Plans and specifications shall be drawn to scale and shall have sufficient clarity to indicate the location, nature and extent of the work proposed and show in detail that they conform to the provisions of these STANDARDS AND SPECIFICATIONS and all relevant laws, Municipal Codes, rules and regulations.

Each set of construction drawings shall include an overall utility drawing(s). The overall utility drawing(s) shall be a plan drawing at a reasonable scale (preferably 1" = 50') and shall show all of the water, sanitary sewer, storm drainage and street construction to be completed under the project.

161.02 Preliminary Construction Plan Requirements

Preliminary Construction Plans shall accompany all Preliminary Plat submittals.

The following items will be shown on all plan sheets:

- A. Title Block (lower right-hand corner preferred)

- B. Scale (both horizontal and vertical for plans and profiles)
- C. Both original date and revision date
- D. Name of professional engineer or firm
- E. Professional engineer's seal
- F. Drawing number(s)
- G. Key map

The following items will be shown on the cover sheet only:

- A. Vicinity Map
An up to date vicinity map at a scale of 1"=2000'.

161.02.01 Plan Details

- A. North arrow pointing to the top of the sheet or to the right except in special cases.
- B. Property lines; indicate lots to be served by solid lines; other property lines dotted
- C. Ownership or subdivision information
- D. Street names and easements with width dimensions
- E. Existing utility line (buried) locations and depth, water, gas, telephone, storm drain, irrigation ditches, and sanitary sewers.
- F. Other pertinent details, i.e. houses, curbs, water courses, etc.

161.02.02 Water Supply Construction Details

- A. Proposed water mains;
 - 1. Size
 - 2. Length
- B. Valves – Including hydrant and blow-off valves
- C. Fire Hydrants
- D. Plan for off-site transmission mains, pump stations, special valves, and vaults, tanks, etc.

161.02.03 Sanitary Sewer Construction Details

Details shall only be provided for sanitary sewer improvements proposed to be in Town right-of-way, easements, or any other Town owned property.

- A. Proposed sanitary sewer mains;
 - 1. Diameters
 - 2. Length between manholes
- B. Proposed manholes and cleanouts;
- C. Proposed future extensions
- D. Note if a proposed private under-drain will be needed

161.02.04 Storm Drainage Construction Details

- A. Drainage area plan; an overall plan of the area under study showing:
 - 1. North arrow
 - 2. Contours – existing and proposed finished (maximum two foot intervals)
 - 3. Location and elevation of benchmarks
 - 4. Property lines
 - 5. Boundary lines (counties, districts, tributary area, etc.)
 - 6. Streets and street names and approximate grades

7. Subdivision (name and location by section)
 8. Existing irrigation ditches
 9. Existing drainage ways including gutter flow directions
 10. Drainage sub-area boundaries
 11. Easements required
 12. Proposed curbs and gutters and gutter flow directions
 13. Proposed cross pans and flow directions
 14. Proposed piping and open drainage ways
 15. Flow calculations for 2, 5, and 100-year storm runoff
 16. Path of 100-year storm runoff flows
 17. Proposed inlet locations and inlet sizes
 - B. Proposed pipes;
 1. Plan
 2. Size, lengths between manholes and type of pipe
 - C. Proposed open channels;
 1. Plan
 2. Grades
 3. Typical cross section
 - D. Proposed special structures (manholes, headwalls, inlets, trash gates, etc.)
 1. Plan
- 161.02.05 Street Construction Details
- A. Existing irrigation ditches to be removed or piped
 - B. Proposed curb, gutter and sidewalk
 - C. Proposed cross-pans
 - D. Storm drainage facilities
 - E. Horizontal curve data, with radii, tangents, points of curvature, (P.C.), intersection (P.I.), tangency (P.T.), length of curve, and delta angle.
 - F. Typical section of street construction showing structure and dimensions
 - G. Stations and elevations of radius points flow line of curve.
 - H. Proposed profile of centerlines with horizontal stationing
 - I. Stations, lengths, and elevations of vertical curve P.C., P.I. and P.T.
 - J. Percent slope of tangent lines
 - K. Identify street classification, such as local, collector arterial, etc.
- 161.02.06 Easement Widths

Water, sanitary sewer, and storm sewer easements shall be a minimum of thirty feet (30') in width. Utility locations within easements shall be a minimum of ten feet (10') from the edge of the easement to the center of pipe and 10 feet from center of pipe to center of pipe for more than one utility. For utility lines buried greater than ten feet (10'), the Engineer shall submit proposed easement width for approval by the Town Engineer.

161.02.07 Specifications and Support Documentation

The following items shall also be included with submitted construction plans:

- A. Reference on plans to other agencies potential impacted by the project

161.03 Final Construction Plan Requirements

Final Construction Plans shall accompany all Final Plat submittals.

The following items will be shown on all plan sheets:

- A. Title Block (lower right-hand corner preferred)
- B. Scale (both horizontal and vertical for plans and profiles)
- C. Both original date and revision date
- D. Name of professional engineer or firm
- E. Professional engineer's seal
- F. Drawing number(s)
- G. Key map

The following items will be shown on the cover sheet only:

- A. Vicinity Map
An up to date vicinity map at a scale of 1"=2000'.
- B. Signature block for the Sanitary Sewer Service Provider.
- C. Signature block for Little Thompson Water District (Barefoot Lakes Subdivision only).
- D. Drawing Acceptance:

All work shall be constructed to *Town of Firestone Design Standards and Construction Specifications*. This drawing has been reviewed and found to be in general compliance with these STANDARDS AND SPECIFICATIONS and other Town requirements. **THE ENGINEERING DESIGN AND CONCEPT REMAINS THE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEREON.**

Accepted by: _____
Town Engineer Date

- E. Variance Statement (if necessary)

The applicant is requesting a variance from the Town of Firestone Design Standards and Construction Specifications for the following:

1. (list all applicable items)

Accepted by: _____
Town Engineer Date

161.03.01 Plan Details

- A. North arrow pointing to the top of the sheet or to the right except in special cases.
- B. Property lines; indicate lots to be served by solid lines; other property lines dotted
- C. Ownership or subdivision information
- D. Street names and easements with width dimensions
- E. Existing utility line (buried) locations and depth, water, gas, telephone, storm drain, irrigation ditches, and sanitary sewers.
- F. Other pertinent details, i.e. houses, curbs, water courses, etc.

161.03.02 Profile Details

- A. Vertical and horizontal grids with scales
- B. Ground surface existing (dotted) and proposed (solid)
- C. Existing utility lines where crossed
- D. Bench marks
- E. Existing manhole inverts and rim elevations

161.03.03 Water Supply Construction Details

In addition to the above general plan and profile details, all water supply construction plans will include the following items:

- A. Proposed water mains;
 - 1. Size
 - 2. Length
 - 3. Materials and types of joints
 - 4. Location dimensions
- B. Fittings;
 - 1. Tees
 - 2. Crosses
 - 3. Reducers
 - 4. Bends
 - 5. Plugs
 - 6. Blow-offs
- C. Valves – Including hydrant and blow-off valves
- D. Fire Hydrants
- E. Plan, profile and complete details for off-site transmission mains, pump stations, special valves, and vaults, tanks, etc.
- F. Standard bedding detail (cross-section)

161.03.04 Sanitary Sewer Construction Details

Details shall only be provided for sanitary sewer improvements proposed to be in Town right-of-way, easements, or any other Town owned property. In addition to the general plan and profile details, all sanitary sewer construction plans will include the following:

- A. Proposed sanitary sewer mains;
 - 1. Diameters
 - 2. Materials
 - 3. Gradients
 - 4. Length between manholes
- B. Proposed manholes and cleanouts;
 - 1. Stationing and other number designation
 - 2. Elevation of inverts in and out of manhole
 - 3. Elevation of manhole rim
- C. Location control dimensions
- D. Proposed future extensions
- E. Proposed service connections or stub-ins
- F. Proposed private under-drain and outfall
- G. Standard bedding cross-section
- H. Proposed concrete encasement
- I. Proposed cut-off walls

161.03.05 Storm Drainage Construction Details

In addition to the above general plan and profile details, all storm drainage construction plans will include the following:

- A. Drainage area plan; an overall plan of the area under study showing:
 - 1. North arrow
 - 2. Contours – existing and proposed finished (maximum two foot intervals)
 - 3. Location and elevation of benchmarks
 - 4. Property lines
 - 5. Boundary lines (counties, districts, tributary area, etc.)
 - 6. Streets and street names and approximate grades
 - 7. Subdivision (name and location by section)
 - 8. Existing irrigation ditches
 - 9. Existing drainage ways including gutter flow directions
 - 10. Drainage sub-area boundaries
 - 11. Easements required
 - 12. Proposed curbs and gutters and gutter flow directions
 - 13. Proposed cross pans and flow directions
 - 14. Proposed piping and open drainage ways
 - 15. Flow calculations for 2, 5, and 100-year storm runoff
 - 16. Path of 100-year storm runoff flows
 - 17. Critical minimum finished floor elevations for protection from 100-year runoff
 - 18. Proposed inlet locations and inlet sizes
- B. Proposed pipes;
 - 1. Plan showing stationing
 - 2. Profile
 - 3. Size, lengths between manholes and type of pipe
 - 4. Grades
 - 5. HGL for design storm
 - 6. Inlet and outlet details
 - 7. Manhole details (station number and invert elevations)
 - 8. Typical bedding detail
- C. Proposed open channels;
 - 1. Plan showing stationing
 - 2. Profile
 - 3. Grades
 - 4. Typical cross section
 - 5. Lining details
- D. Proposed special structures (manholes, headwalls, inlets, trash gates, etc.)
 - 1. Plan
 - 2. Elevation
 - 3. Details of design and appurtenances

161.03.06 Street Construction Details

In addition to the above general plan and profile details, all street construction plans will include the following:

- A. Existing irrigation ditches to be removed or piped
- B. Proposed curb, gutter and sidewalk
- C. Proposed cross-pans including spot elevation and flow direction
- D. Storm drainage facilities

- E. Slope of curb return
- F. Location and elevation of bench marks
- G. Horizontal curve data, with radii, tangents, points of curvature, (P.C.), intersection (P.I.), tangency (P.T.), length of curve, and delta angle.
- H. Typical section of street construction showing structure and dimensions
- I. Stations and elevations of radius points flow line of curve.
- J. Proposed profile of centerlines and flow lines of curb with horizontal stationing
- K. Stations, lengths, and elevations of vertical curve P.C., P.I. and P.T.
- L. Percent slope of tangent lines
- M. Limits of construction
- N. Show sufficient existing or future construction to assure continuity of construction
- O. Stations and elevations of drainage facilities and other structures
- P. Street light and underground service cable locations
- Q. Identify street classification, such as local, collector arterial, etc.
- R. Signing and striping plan
- S. Traffic control plan – as needed

161.03.07 Area Grading Plan Details

All subdivisions shall include an Area Grading Plan that shall include all pertinent information necessary to construct a dwelling on each lot. At a minimum, the following shall be included:

- A. Grading and drainage patterns of existing lots adjacent to subdivision
- B. Lot corner elevations
- C. Building finished floor or top of foundation elevations
- D. Elevations of ground outside of building to ensure proper drainage away from the foundation
- E. Elevations and grades of all drainage swales and side lot lines
- F. Elevations of all high points
- G. One foot contours for lots over .25 acres.

The Area Grading Plan must follow the accepted Drainage Plan.

161.03.08 Erosion Control Plan Details

All subdivisions shall include an erosion control plan as specified in Section 151.00 of these Standards and Specifications. Erosion control plan drawings will use the same base map as that for the Drainage Plan and shall include, at a minimum, the following information:

1. A general location map with sufficient detail to identify drainage flow entering and leaving the development and general drainage patterns.
2. Major construction (i.e., development, irrigation ditches, existing detention facilities, culverts, storm sewers) along the path of drainage.
3. Basins and divides identified with topographic contours.
4. Specifications and details for erosion control measures.
5. A transition grading/drainage plan for construction activities that are phased or sequenced. All residential developments shall require a transition-grading plan.

161.03.09 Easement Widths

Water, sanitary sewer, and storm sewer easements shall be a minimum of thirty feet (30') in width. Utility locations within easements shall be a minimum of ten feet (10') from the edge of the easement

to the center of pipe and 10 feet from center of pipe to center of pipe for more than one utility. For buried utility lines greater than ten feet (10'), the Engineer shall submit proposed easement width for approval by the Town Engineer.

161.03.10 Specifications and Support Documentation

The following items shall also be included with submitted construction plans:

- A. Town of Firestone General Notes and Standard Details.
- B. Reference on plans to other agency standards and specifications that are required or proposed
- C. Where reference to other commonly available standards and specifications will not suffice, copies of specifications are to be provided.
- D. Copies of written approval from other affected agencies as required.
- E. Soils and other test data and design calculations for street structural sections, drainage facilities and other appurtenances as required.

162.00 Engineering Reports

All engineering reports shall include on the title page 1) the type of report (preliminary or final; Phase I, II, or III for Drainage Reports), 2) the project name, 3) the preparer's name, date, and firm, and 4) P.E. seal of preparer.

162.01 Preliminary Reports

The following preliminary reports must accompany all preliminary plats. The Phase I Drainage Report will be required will be required with the zoning and/or Sketch Plan submittal (number of copies to be determined during the application process).

- A. Preliminary Utility Report
- B. Phase II Drainage Report
- C. Traffic Analysis Report
- D. Geotechnical Studies
- E. Additional reports as required by the Town of Firestone Municipal Code

162.01.01 Preliminary Utility Report Requirements

Preliminary utility reports will include the following information and data as a minimum:

- A. Sanitary Sewer
 - 1. Layout/Connection to Sewer
- B. Water System
 - 1. Layout/Connection with Town Water
 - 2. Potable Water Demand (peak and average)

162.01.02 Preliminary Geotechnical Report Requirements

Geotechnical and soils investigation studies are required for foundation design and pavement design. These two categories may be combined into one report when the purpose of the investigation includes both facets of design. A preliminary geotechnical report shall include the following information at a minimum:

- A. General Information
 - 1. Past and present land uses and features

2. Proposed use of the land when developed
3. Surface drainage characteristics
4. A general geologic report on the area and a discussion of the soil profiles and subsurface features
5. Potential slope instability
6. High groundwater elevation
- B. Unusual Land Uses/Conditions
 1. Report which identifies all unusual land uses such as landfills, open dumps, wetlands, leach fields, areas of natural springs, faults, mines, etc. These shall be presented in a written and graphical format of suitable scale.

162.01.03 Preliminary Traffic Analysis Report

Required information for the preliminary traffic report shall include, but not be limited to the following.

- A. Land use, site and study area boundaries.
- B. Existing and proposed site uses.
- C. Existing and proposed roadways and intersections.
- D. Existing and proposed roadways and intersection capacities and volumes.
- E. Trip generation and design hour volumes.
- F. Trip distribution.
- G. Trip assignments.
- H. Existing and projected traffic volumes.
- I. Levels of service of all affected intersections for the design hour.

162.01.04 Preliminary Drainage Reports

Drainage report calculations and supporting data required as set forth herein shall be prepared in accordance with the UDFCD Urban Storm Drainage Criteria Manual.

All subdivisions, re-subdivisions, planned unit developments, or other development shall submit drainage reports, construction drawings, and as-built information in accordance with these CRITERIA.

Three copies of all drainage reports shall be submitted to the TOWN for review. The TOWN will retain two copies. All submitted reports should be clearly and cleanly reproduced. Photostat copies of charts, tables, nomographs, calculations, or any other reference material must be legible. Washed out or unreadable portions of the report are unacceptable and could warrant re-submittal of the report. All reports shall be typed on 8-1/2" x 11" paper and bound. The drawings, figures, plates, and tables shall be bound with the report or included in a pocket attached to the report. The report shall be prepared by or supervised by a professional engineer licensed in Colorado.

All reports shall include a cover letter presenting the report for review as well as a declaration of the type of report submitted (i.e., Phase-I, Phase-II, or Phase-III). Incomplete or absent information may result in the report being rejected for review.

Town staff will try to review the drainage reports and provide written review comments and/or acceptance within twenty-one (21) working days of the submittal. Town staff will make every effort to effect a complete review within the review period; however, Town staff cannot guarantee the review time since the response time varies with the workload being experienced. The drainage reports and/or construction plans cannot be accepted by default.

The applicant shall note that acceptance of construction plans, specifications, and associated engineering reports by the TOWN shall only indicate that the plans, specifications, and reports are in general conformance with the Town's submittal requirements, current design criteria, standard engineering principles and practices, and previously approved plans and reports. Acceptance shall not indicate that all assumptions, calculations, and conclusions contained within the drainage reports and/or construction plans have been thoroughly verified by Town staff. **At all times, the professional engineer submitting the construction plans, specifications, and drainage reports shall be solely responsible for their accuracy and validity.**

All preliminary drainage studies shall have the following certification and acceptance statements:

Engineer's Certification

"I hereby certify that this **(report type)** for the design of **(project name)** was prepared by me (or under my direct supervision) in accordance with the provisions of the *Town of Firestone Design Standards and Construction Specifications* for the owners thereof. I understand that the Town of Firestone does not and will not assume liability for drainage facilities designed by others, including the designs presented in this report."

(Name)
Registered Professional Engineer
State of Colorado No. (#)
(Affix Seal)

Town Acceptance

This report has been reviewed and found to be in general compliance with the *Town of Firestone Design Standards and Construction Specifications* and other Town requirements. **THE ACCURACY AND VALIDITY OF THE ENGINEERING DESIGN, DETAILS, DIMENSIONS, QUANTITIES, AND CONCEPTS IN THIS REPORT REMAINS THE SOLE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEREON.**

Accepted by: _____
Town Engineer Date

If during the construction process or at any time within one year following final acceptance by the TOWN of the completed improvements, any deficiencies or errors are discovered in the construction plans, specifications, drainage reports, or the actual constructed improvements, the TOWN shall have the right to require the developer to make any and all corrections which may be deemed necessary by the TOWN. The costs associated with any such corrections shall be the sole responsibility of the developer.

Phase I Drainage Report

The Phase I Drainage Report is the first step in the approval process. A Phase I Drainage Report must be submitted during the zoning and/or sketch plan process. This report will review at a conceptual level the feasibility and design characteristics of the proposed development and drainage system.

Report Contents

The Phase I Drainage Report shall be in accordance with the following outline and contain the applicable information listed:

- I. GENERAL LOCATION AND DESCRIPTION
 - A. Location
 - 1. All streets and highways within and adjacent to the site or the area to be served by the drainage improvements
 - 2. Township, range, section, 1/4 section
 - 3. All major drainageways and storm drainage facilities within or adjacent to the site
 - 4. Names of surrounding developments
 - B. Description of Property
 - 1. Area in acres
 - 2. Type of ground cover and vegetation
 - 3. Major drainageways within the property
 - 4. Irrigation facilities such as ditches and canals
 - 5. Proposed land use
 - 6. Identification of all wetland areas and the affected area in acres.
- II. DRAINAGE BASINS
 - A. Major Basin Description
 - 1. Reference to applicable major drainageway planning studies, flood hazard area delineation reports (FHAD), and flood insurance rate maps (FIRM)
 - 2. Major drainage basin characteristics such as existing and proposed land uses within the basin
 - 3. Discussion of existing drainage patterns
 - 4. Identification of all irrigation facilities within 150-feet of the property boundary
 - 5. Identification including ownership of all lakes and ponds which either influence or may be influenced by the local drainage. Identification of all dams under the State Engineer's Office jurisdiction including the dam's current rating, status, and pertinent sections and drawings of the dam breach analysis.
 - B. Sub-Basin Description
 - 1. Discussion of any Master Plan improvements designated for the site.
 - 2. Discussion of existing drainage patterns of the property
 - 3. Discussion of the downstream drainage flow patterns and the impact of the proposed development under existing and fully developed basin conditions

III. DRAINAGE FACILITY DESIGN

A. General Concept

1. Discussion of existing drainage patterns
2. Discussion of compliance with off-site runoff considerations both upstream and downstream
3. Discussion of existing drainage problems or concerns both on-site and off-site
4. Discussion of anticipated and proposed drainage patterns and facilities
5. Discussion of wetlands issues (if any) such as mitigation or replacement
6. Discussion of the content of tables, charts, figures, plates, or drawings presented in the report
7. Discussion of assumptions, techniques, and methodologies utilized
8. Discussion of all referenced reports and studies (i.e., are they valid, complete, etc.)

B. Specific Details

1. Determine the major and minor drainage flows for the major basins
2. Discussion of potential drainage problems encountered and solutions at specific design points
3. General discussion of detention pond storage and outlet design
4. Discussion of maintenance and access aspects of the drainage facility design
5. Discussion of the drainage impacts to downstream properties

C. Adaptations from Criteria

1. Identify provisions by section number for which a adaptation is requested
2. Provide specific and detailed justification for each adaptation requested

IV. SUMMARY

- A. Overall summary including conclusions and professional opinions on the existing drainage facilities and the proposed facilities

V. REFERENCES

- A. Reference all criteria, storm water master plans, FHADs, FIRMs, and technical information used to support the conceptual design of the proposed drainage system

Drawing Contents

All drawings shall be a maximum 24" x 36" in size.

GENERAL LOCATION MAP

The map should be at a scale of 1-inch = 1000 feet to 1-inch = 4000 feet.

The map shall provide sufficient detail to identify drainage flows entering and leaving the proposed development. The map shall indicate the drainage flow paths from the upstream end of any off-site basin to the receiving major drainageway.

The map shall identify any major facilities (i.e., irrigation ditches, existing detention facilities, culverts, and storm sewers) along the flow path to the receiving major drainageway. All major drainageways shall be identified and shown on the report drawings.

Major basins are to be identified.

Topographic contours are to be included

FLOODPLAIN INFORMATION

A map showing the location of the subject property shall be included with the report

DRAINAGE PLAN

Map(s) of the proposed development at a scale of 1" = 20' to 1" = 100' shall be included. The plan shall show the following:

1. Physical Characteristics
 - (a) Existing topography with contours shown in intervals of two feet or five feet for the entire project area
 - (b) Proposed topography with contours shown in intervals of two feet or five feet for the entire project, if available
 - (c) Existing off-site topography with contours shown in intervals consistent with the on-site information. Off-site topography should extend as follows:
 - (1) For projects less than one acre in size, off-site topography for a distance of at least fifty feet in every direction
 - (2) For projects larger than one acre in size, off-site topography for a distance of at least one hundred fifty feet in every direction or as directed by the Town staff
 - (d) Approved grading plans (shown in contour intervals consistent with the on-site information) for all adjacent properties which have not yet been constructed
 - (e) Existing vegetation and location, type, and size of significant trees
 - (f) All existing wetlands areas
2. All existing drainage facilities both on-site and off-site for a distance as determined in 1(c) above.
3. Major drainageways and the approximate 100-year floodplain limits based on the most current available information
4. Proposed drainage facilities including location of detention ponds, storm sewers, channels, and corresponding outlet flow paths in a detail consistent with the proposed development plan
5. Major drainage basin boundaries and sub-basin boundaries
6. Any off-site feature influencing the proposed development and the proposed drainage system
7. Proposed drainage flow paths
8. Legend to define map symbols

Title block with revision dates in lower right corner

Phase II Drainage Report

The purpose of the Phase II Drainage Report is to refine the conceptual drainage system and identify in greater detail the problems, which may occur both on-site and off-site as a result of the proposed development. The Phase II Drainage Report shall be submitted with the application for the Preliminary Plat. The Phase II Drainage Report must be written in such a manner and contain enough detail to be self-explanatory (i.e., possession of the Phase I Drainage Report is not necessary to understand the Phase II Drainage Report).

The developer or his consultant is responsible for obtaining any and all permits, licenses, and any other documentation/correspondence that are necessary to address any additional issues such as wetlands, floodplains, irrigation facilities, groundwater dewatering, and protection of existing utilities.

Report Contents

The Phase II Drainage Report shall be in accordance with the following outline and contain the applicable information listed:

I. GENERAL LOCATION AND DESCRIPTION

A. Location

1. Township, range, section, 1/4 section
2. All streets and highways including the existing ROW widths within 150 feet of the site
3. Major drainageways and facilities within 150 feet of the site
4. Names of surrounding developments

B. Description of Property

1. Area in acres
2. Ground cover such as the type of trees, shrubs, vegetation, general soil conditions, topography, and slope
3. Major drainageways within and adjacent to the site
4. General project description
5. Irrigation facilities within and adjacent to the site
6. Proposed land use
7. Identification of all wetland areas including the affected area in acres
8. All existing easements within 150 feet of the site

II. DRAINAGE BASINS

A. Major Basin Description

1. Reference to applicable major drainageway planning studies, flood hazard area delineation reports (FHADs), and flood insurance rate maps (FIRMs)
2. Major basin drainage characteristics including existing and proposed land uses
3. Identification of all irrigation facilities within the basin
4. Identification including ownership of all lakes and ponds which either influence or may be influenced by the local drainage. Identify all dams under the State Engineer's Office jurisdiction including the dam's current rating, status, and pertinent sections and drawings of the dam breach analysis

- B. Sub-basin Description
 - 1. Discussion of historic drainage patterns of the site
 - 2. Discussion of off-site drainage flow patterns and the impact of the proposed development under existing and fully developed basin conditions

III. DRAINAGE DESIGN CRITERIA

- A. Development Criteria Reference and Constraints
 - 1. Discussion of previous drainage studies (i.e., project master plans, Phase I Drainage Reports, etc.) for the site that influence or are influenced by the proposed drainage facilities
 - 2. Discussion of drainage studies for adjacent properties and their effect on the proposed drainage system
 - 3. Discussion of the drainage impact of site constraints such as streets, utilities, and existing structures
 - 4. Discussion of wetlands issues (if any) such as mitigation or replacement.
- B. Hydrological Criteria
 - 1. Identify design rainfall for the design recurrence intervals
 - 2. Identify runoff calculation method
- C. Hydraulic Criteria
 - 1. Determination of the capacity of the downstream drainage system and its ability to handle the drainage from the development site
 - 2. Preliminary storm sewer system layout including inlets
 - 3. Identify the allowed detention discharge and storage calculation method
- D. Adaptations from Criteria
 - 1. Identify provisions by section number for which a adaptation is requested
 - 2. Provide specific and detailed justification for each adaptation requested

IV. DRAINAGE FACILITY DESIGN

- A. General Concept
 - 1. Discussion of the proposed drainage system and typical drainage patterns
 - 2. Discussion of compliance with off-site runoff considerations
 - 3. Discussion of the content of tables, charts, figures, plates, or drawings presented in the report
 - 4. Discussion of the contents of referenced reports, studies, etc.
- B. Specific Details
 - 1. Discussion of drainage problems encountered and solutions at specific design points
 - 2. Discussion of detention pond storage and outlet design
 - 3. Discussion of maintenance and access aspects of the proposed design
 - 4. Discussion of the necessity of easements and tracts for drainage purposes including the limitations of use
 - 5. Discussion of the impacts on the downstream properties of flow release from the site

6. Discussion of the impact on existing floodplains of major drainageways and the requirements if altering the existing 100-year floodplain

V. SUMMARY

- A. Discussion of compliance with CRITERIA, MANUAL, and major drainageway planning studies
- B. Drainage Concept
 1. Describe how the drainage design will control damage due to storm runoff both on-site and off-site
 2. Influence of the proposed development on the Major Drainageway Planning Studies recommendations

VI. REFERENCES

- A. Reference all criteria and technical information used

VII. APPENDICES

- A. Hydrologic Computations
 1. Land use assumptions regarding adjacent properties
 2. Major and minor storm runoff peaks at specific design points
 3. Historic and fully developed runoff peaks at specific design points
 4. Time of concentration and runoff coefficients for each basin and sub-basin
- B. Hydraulic Computations
 1. Existing and proposed culvert capacities
 2. Open channel typical sections, capacity, and depths
 3. Detention area, volume, and depth
 4. Downstream drainage system capacity to the major drainageway system
- C. Approval and/or Agreement Letter(s)
 1. Approval letter(s) from other jurisdictions, canal companies, pond owners, etc., (if required)
 2. All permits, licenses, etc., for any wetland removal or mitigation as required by the USACE.

Drawing Contents

All drawings shall be a maximum 24" x 36" in size.

I. GENERAL LOCATION MAP

- A. The map should be at a scale of 1-inch = 1000-feet to 1-inch = 4000-feet
- B. The map shall provide sufficient detail to identify drainage flows entering and leaving the site as well as the drainage flow paths from the upstream end of any off-site basin to the major drainageway
- C. The map shall identify any major facilities (i.e., irrigation ditches, existing detention facilities, culverts, and storm sewers) along the entire flow path. All major drainageways shall be identified and shown on the report drawings.
- D. Major drainage basins are to be shown

- E. Topographic contours are to be included

II. FLOODPLAIN INFORMATION

- A. A map showing the location of the subject property shall be included with the report

III. DRAINAGE PLAN

- A. Map(s) of the proposed development at a scale of 1" = 20' to 1" = 100' shall be included. The plan shall show the following:
 - 1. Physical Characteristics:
 - (a) Existing topography with contours shown in intervals of two feet for the entire site
 - (b) Proposed topography with contours shown in intervals of two feet for the entire site
 - (c) Existing off-site topography shown at a maximum of five-foot contour intervals. The off-site topography should extend as follows:
 - (1) For projects less than one acre in size, off-site topography for a distance of at least fifty feet in every direction
 - (2) For projects larger than one acre in size, off-site topography for a distance of at least one hundred fifty feet in every direction or as directed by the Town staff.
 - (d) Approved grading plans (shown at a maximum of five-foot contour intervals) for all adjacent properties which have not yet been constructed
 - (e) First-floor elevations of any existing or approved structure within one hundred fifty feet of the property line of the project.
 - (f) Cross-sections as required by the Town Engineer to illustrate the relationship between the proposed facilities and the existing or approved facilities
 - (g) All existing wetland areas including their area in acres
 - 2. Existing property lines and easements
 - 3. Streets indicating their ROW width, flow line width, curb type, sidewalk width, and approximate longitudinal slope
 - 4. Existing drainage facilities and structures including irrigation ditches, roadside ditches, cross-pans, drainageways, and culverts. All pertinent information such as material, size, shape, slope, and location shall also be included.
 - 5. Overall drainage basin boundary and sub-basin boundaries
 - 6. The outfall points and flow rates for runoff from the proposed site. Delineation of the off-site flow path to the major drainageway. The drainage facilities necessary to convey the flows to the major drainageway without damaging downstream properties
 - 7. Routing and accumulation of design flows at various critical points for the minor storm runoff using the format shown in Table 202

8. Routing and accumulation of design flows at various critical points for the major storm runoff using the format shown in Table 202
9. Required volumes and release rates for detention pond facilities and general information on the triple stage outlet design
10. 100-year floodplain delineation and corresponding water surface elevations of all existing FHAD and FEMA floodplains affecting the property
11. Locations and elevations (if known) of all existing and proposed utilities affected by or affecting the drainage system design.
12. Routing of off-site drainage flow through the site
13. Legend of map symbols
14. Title block with revision dates in lower right hand corner

162.02 Final Engineering Reports

The following final reports must accompany all site plans, minor subdivision, and final plat applications (number of copies to be determined during the application process):

- A. Utility Report
- B. Phase III Drainage Report
- C. Traffic Analysis Report
- D. Geotechnical Studies
- E. Construction Traffic Routing Plan
- F. Additional reports as required by the Town of Firestone Municipal Code

162.02.01 Final Utility Report

Final utility reports will include the following information and data as a minimum:

- A. Sanitary Sewer
 1. Layout and connection to sewer
 2. Available existing downstream capacity
- B. Water
 1. Layout and connection with Town water
 2. Potable water demand (peak and average)
 3. Fire flow demand
 4. Peak instantaneous demand and meter sizing
 5. Available pressure and capacity
 6. Irrigation water demand
 7. Network model of system serving development

162.02.02 Final Traffic Impact Study

All preliminary plats, zoning, and commercial site plans will provide a Traffic Impact Study.

Guidelines for Traffic Impact Studies

The purpose of a Traffic Impact Study is to determine existing conditions in the vicinity of the development, forecast the additional traffic that it will generate, and identify internal and external transportation improvements that will be necessary to mitigate the resulting impacts. Following these guidelines when preparing a traffic impact study will present a standard format and facilitate the review process.

The Town of Firestone encourages developers to maintain contact with Town personnel throughout the development process. Traffic consultants are highly encouraged to discuss projects with the Town and its representatives prior to study startup. An early meeting may be appropriate for large projects to identify the study area and specific roads and intersections that will be analyzed. The study report should identify the individual who conducted the study.

All traffic impact studies shall contain, as a minimum, the following information:

- A. Summary of the existing conditions in the vicinity of the project
 - 1. Current use of the site and surrounding area (include map showing the general vicinity of the site)
 - 2. Existing roadway system and traffic (daily and peak hour volumes) on roadways and intersections that will be affected (include graphic). Field traffic count data should be included in an appendix.
 - 3. Analysis of current traffic operations (include computer printouts - to appropriate level of detail - in appendix).
 - 4. Recent traffic accidents may need to be investigated and the effect of the proposed development determined.
 - 5. Discussion of other potential developments in the study area that might also affect traffic. Traffic forecasts from traffic impact studies of nearby developments may need to be included in the analysis.
- B. Description of the proposed development
 - 1. Development proposal - Parcel size(s), proposed land use, number of units, size of developed area, density, etc. A site plan detailing uses, locations, and internal roads should be included if possible.
 - 2. Trip generation tabulation. Trip generation shall be based on average rates contained in the most recent edition of the Institute of Transportation Engineers' Trip Generation. The Town shall approve any estimated rates that deviate from ITE averages or for uses where ITE information is not available. Rate and trip information shall be provided in tabular form. Any trip reductions should be calculated based on procedures outlined in ITE's most recent Trip Generation Handbook and fully documented in the report.
 - 3. Alternative modes (transit, pedestrian, and bicycle) should be considered, as appropriate.
 - 4. The Town's latest transportation master plan should be reviewed to determine the project conformance with it and any deviations that are proposed.
- C. Traffic Forecasts
 - 1. All project-generated traffic shall be assigned to existing and planned facilities in a manner consistent with accepted traffic patterns and approved by Town staff. A graphic should be included to illustrate the assumed trip distribution.
 - 2. Traffic volumes (peak hour and ADT) in graphical format should illustrate current year, short-term or build-out year, and long-term (20 year) traffic volumes for site-generated and total traffic. Phased development volumes and background traffic forecasts may also be appropriate. Long-range forecasts of background traffic may be based on the latest Firestone Transportation Plan or the current Regional Transportation Plan from DRCOG.
- D. Traffic Operations Analysis
 - 1. The operational analysis should show impacts on the existing roadway system, the expected future roadway system, and any interim roadway system that may correspond to expected development phases.

2. There should be graphical presentation(s) of the results of the level of service (LOS) analysis for intersections and/or roads, plus tabulations if necessary to show delays or v/c percentages. Output from the computer analysis should be included in an appendix.
 3. Signal warrants should be investigated at locations where signals are proposed.
 4. Progression and micro-simulation analysis may be required depending on project needs and complexity.
- E. Improvement recommendations
1. Roadway and intersection improvements necessary to mitigate the impacts of the project should be summarized in written format with supplemental tabulations and/or figures, which illustrate the locations and relationships of the recommendations.
 2. Proposed roadway cross-sections and auxiliary lanes at intersections are of particular concern. Storage and deceleration/acceleration lengths for turn lanes should be determined according to guidelines found in the State Highway Access Code, or other recognized reference.
 3. The use of low volume local road cross section within residential subdivisions should be justified.
 4. Access to arterial roadways generally follows guidelines set forth in the State Highway Access Code. Regional Arterials are classified by CDOT, Principal Arterials are considered equivalent to NR-A, and Minor Arterials are comparable to NR-B.

162.02.03 Final Geotechnical Report

Geotechnical and soils investigation studies are required for foundation design and pavement design. A Final Pavement Design Report is required following utility installation, completion of grading operations, and prior to placement of base course or paving materials. These two categories may be combined into one report when the purpose of the investigation includes both facets of design. A subsurface investigation for foundation and/or pavement design shall include the following information and data as a minimum:

- A. General Information
1. Past and present land uses and features
 2. Proposed use of the land when developed
 3. Structure type
 4. Groundwater
 5. Surface drainage characteristics
 6. A general geologic report on the area and a discussion of the soil profiles and subsurface features
 7. Potential slope instability
- B. Investigation Details
1. Type of equipment used in obtaining data
 2. Date of drilling
 3. Boring logs which show the elevation of the existing ground, the elevation of the top of each soil stratum encountered and the soil classification of each stratum encountered, the water level at the time of boring and the level at a later date and standard penetration test results for each soil stratum. Each hole shall be referenced to a fixed benchmark.
 4. A sketch of the tested area accurately showing the locations of the borings.
- C. Site Conditions/Foundation Design

1. Specific information including swell potential of the soil and the effect on foundations.
 2. A recommendation as to foundation types and any special procedures that may pertain to construction.
 3. The effect of ground water on construction and methods to deal with any problems that may exist.
 4. Recommended allowable soil bearing pressures and unconfined shearing strength.
 5. Methods of prevention of swell and shrinkage of expansive soils and minimizing their effect on structures.
 6. Natural moisture content of the soil strata.
 7. Specifications for any unusual or special construction materials required.
- D. Unusual Land Uses/Conditions
1. Report which identifies all unusual land uses such as landfills, open dumps, wetlands, leach fields, areas of natural springs, faults, mines, etc. These shall be presented in a written and graphical format of suitable scale.

162.02.04 Phase III Drainage Reports

Drainage report calculations and supporting data required as set forth herein shall be prepared in accordance with the UDFCD Urban Storm Drainage Criteria Manual.

The purpose of the Phase III Drainage Report is to finalize the proposed drainage system discussed in the Phase II Drainage Report and to present the final design details and calculations. This report shall contain sufficient detail to be self-explanatory and shall include all reports referenced. (i.e., possession of the Phase I Drainage Report or Phase II Drainage Report is not necessary to understand the Phase III Drainage Report).

The Phase III Drainage Report shall be submitted with the final construction drawings. The Phase III Drainage Report (which updates the Phase II Drainage Report) must be reviewed and accepted by the Engineering Division before the site plan, minor subdivision, or final plat will be signed by the TOWN.

The Phase III Drainage Report shall be prepared in accordance with the outline shown in Section 162.01.04 Phase II Drainage Report - **Report Contents** with the exception of Part VII-B. For the Phase III Drainage Report, Part VII-B shall read as follows:

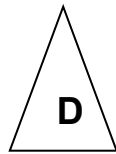
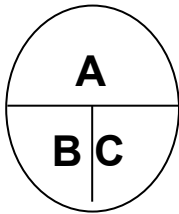
- B. Hydraulic Computations
1. Existing and proposed culvert capacities
 2. Storm sewer profiles including energy grade line (EGL) and hydraulic grade line (HGL) elevations with the associated hydraulic computations
 3. Gutter and street cross-section capacities compared to the maximum allowable street flows
 4. Storm inlet capacity including inlet control rating at connection to storm sewer
 5. Open channel design: depth, capacity, velocity, and Froude number calculations
 6. Check drop and/or channel drop structure design calculations
 7. Detention area, volume, design depths, and outlet capacity
 8. Detention pond outlet design
 9. Downstream drainage system capacity to the major drainageway
 10. Rip-rap design calculations

The report drawings shall follow the requirements presented in Section 162.01.04 Phase II Drainage Report - **Drawing Contents** with the following three items added to Part III-A:

1. Proposed gutter type, street capacity, roadside ditch, slope, flow directions, and cross-pans.
2. Proposed storm sewers including inlets, manholes, culverts, and other appurtenances
3. Proposed open channels with rip-rap protection

Table 202

Drawing Symbol Criteria and Hydrology Review Table



A = Basin Designation
 B = Area in acres
 C = Composite Runoff Coefficients
 D = Design Point Designation

Summary Runoff Table

(To be placed on the drainage plan)

Design Point	Contributing Area (acres)	Runoff Peak 5-year event (cfs)	Runoff Peak 100-year event (cfs)

All Phase III Drainage Reports shall have the following certification and acceptance statements:

Engineer's Certification

"I hereby certify that this **(report type)** for the design of **(project name)** was prepared by me (or under my direct supervision) in accordance with the provisions of the *Town of Firestone Design Standards and Construction Specifications* for the owners thereof. I understand that the Town of Firestone does not and will not assume liability for drainage facilities designed by others, including the designs presented in this report."

(Name)
 Registered Professional Engineer
 State of Colorado No. (#)
 (Affix Seal)

Town Acceptance

This report has been reviewed and found to be in general compliance with the *Town of Firestone Design Standards and Construction Specifications* and other Town requirements. **THE ACCURACY AND VALIDITY OF THE ENGINEERING DESIGN, DETAILS, DIMENSIONS, QUANTITIES, AND CONCEPTS IN THIS REPORT REMAINS THE SOLE RESPONSIBILITY OF THE PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE APPEAR HEREON.**

Accepted by: _____
Town Engineer

Date

170.00 DEFINITIONS AND ABBREVIATIONS

171.00 Definitions

Whenever the following terms are used in these STANDARDS AND SPECIFICATIONS, they will be defined as follows:

Bonds - performance, labor or material payment bonds, irrevocable letters of credit and other instruments of security furnished by the Developer or Contractor and his surety in accordance with the Subdivision Agreements or other Agreements with the Town.

Town - the Town of Firestone acting through the Town Engineer or his/her authorized designee.

Town Municipal Code - the latest, officially adopted Town of Firestone Municipal Code.

Common Facilities - facilities serving or held in common title by the owners or occupants of two or more dwelling units or commercial or industrial enterprises and covered by these STANDARDS AND SPECIFICATIONS.

Contractor - a person that undertakes to construct, alter, move, demolish, repair, replace, excavate or add to any public improvements or common facilities covered by these STANDARDS AND SPECIFICATIONS.

Days - calendar days unless otherwise specified.

Developer - the person or persons legally responsible to the Town for construction of improvements within a subdivision.

Town Engineer - The Town's Town Engineer or his/her authorized designee.

Equipment - all machinery and equipment, together with the necessary supplies for upkeep and maintenance, and tools and apparatus necessary for the proper construction and acceptable completion of the work.

Field Order – are issued in writing when there is to be a change from what is shown on the plans and/or what is called for in the specifications, can be upgraded to a change order or construction modification order (extra work order) if costs are involved

Inspector - the authorized representative of the Town Engineer assigned to make detailed inspections of construction work to assure compliance with these STANDARDS AND SPECIFICATIONS and the plans as accepted by the Town.

Plans - profiles, cross sections, drawings, and supplemental drawings, accepted by the Town that show the locations, character, dimensions or details of the work.

Public improvements - improvements under the ownership or control of the Town including but not limited to the components of the water system, sewer system, street system, park system, and storm drainage system covered by these STANDARDS AND SPECIFICATIONS. The term also includes similar improvements being built in connection with a subdivision that are intended to be dedicated to the Town.

PVC (Polyvinyl Chloride) - a strong, tough plastic based on resins made by the polymerization of vinyl chloride or co-polymerization of vinyl chloride with minor amounts (not over 50%) of other unsaturated compounds, which are fashioned into sheets, tubing, pipe, conduit, containers, insulation, etc.

Regular working hours - Seven (7) A.M. until seven (7) P.M. or dusk (whichever occurs first) of the same day, Monday through Friday. Arterial Streets - Nine (9) A.M. until four (4) P.M. of the same day, Monday through Friday unless approved by the Town Engineer.

Special provisions - special directions, provisions or requirements peculiar to the project and not otherwise detailed or set forth in the specification.

Standards and Specifications - the body of directions, provisions, and requirements contained herein, describing the method or manner of construction and the qualities and quantities of the materials and work to be furnished.

Initial Acceptance - that date, as determined by the Town Engineer, when the construction project or a specified part thereof is sufficiently completed, in accordance with these STANDARDS AND SPECIFICATIONS, so that the project or a specified part can be utilized for the purposes for which it is intended and when the warranty period begins.

Supplier - an individual, firm or corporation having a direct contract with a developer or contractor or with any subcontractor for the manufacture or furnishing of any part of the supplies and/or materials to be used at or incorporated in, work at the site.

172.00 Abbreviations

AASHTO - American Association of State Highway and Transportation Officials

ACI - American Concrete Institute

AISC - American Institute of Steel Construction

ANSI - American National Standards Institute

APWA - American Public Works Association

ASA - American Standards Association

ASTM - American Society for Testing and Materials

AWG - American Wire Gauge

AWWA - American Water Works Association

BPR - Bureau of Public Roads

CDOT - Colorado Department of Transportation

CDPHE - Colorado Department of Public Health and Environment

FCC - Federal Communications Commission

gpcd - gallons per capita per day

gpm - gallons per minute

GRC - galvanized rigid conduit

IMSA - International Municipal Signal Association

IPCEA - Insulated Power Cable Engineers Association

ITE - Institute of Transportation Engineers

MGD - million gallons per day

MUTCD - Manual of Uniform Traffic Control Devices

NAPA - National Asphalt Paving Association

NEC - National Electrical Code as approved by the American Standards Association

NEMA - National Electrical Manufacturers Association

NFPA - National Fire Protection Association

psi - pounds per square inch

UBC - Uniform Building Code

UDFCD - Urban Drainage and Flood Control District

UPC - Uniform Plumbing Code

UL - Underwriters Laboratories, Inc.

USDA - United States Department of Agriculture

173.00 Terms

Whenever, in these STANDARDS AND SPECIFICATIONS, the words "as ordered", "as directed", "as required", "as permitted", "as allowed", or words or phrases of like import are used, it will be understood that the order, direction, requirement, permission, or allowance of the Town is intended.

Similarly, the words "approved", "reasonable", "suitable", "acceptable", "accepted", "properly", "satisfactory", or words of like effect and import, unless otherwise specified herein, will mean approved, reasonable, suitable, acceptable, accepted, proper, or satisfactory in the judgment of the Town. Whenever, in these STANDARDS AND SPECIFICATIONS, the words "Town Engineer" are used, it will be understood that the Town employee named therein will be whomever the Town Manager designates or whoever may be the authorized designee of the Town Engineer.

174.00 Specifications by Reference

All specifications, i.e., ASTM, ACI, etc. made a portion of these STANDARDS AND SPECIFICATIONS shall be from the latest edition of said reference.

Throughout these STANDARDS AND SPECIFICATIONS, any section referenced shall be deemed to include all sub-sections of that section. Any portion of these STANDARDS AND SPECIFICATIONS that may be applicable to any other section, whether referenced or not, shall apply.

SECTION 200 ACCEPTANCE PROCEDURES

<u>SECTION</u>	<u>PAGE</u>
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SECTION 200**ACCEPTANCE PROCEDURES****210.00 GENERAL CONDITIONS**

Prior to requesting inspection for Initial Acceptance of the work:

- A. All temporary structures, debris, mud and waste materials shall be removed from all public property.
- B. A complete and accurate set of "as built" drawings as described in Section 222.00 shall be submitted to the Town Engineer. Changes to the original design drawings must be supported by documentation that contains the signature and seal of a Colorado Registered Professional Engineer.
- C. All relative testing certifications and documentation shall be submitted to the Town Engineer. All required certifications must contain the signature and seal of a Colorado Registered Professional Engineer.
- D. All other supporting documentation as may be required shall be submitted to the Town Engineer as described in Section 222.00.

220.00 INITIAL ACCEPTANCE PROCEDURES FOR DEVELOPMENT PUBLIC IMPROVEMENTS**221.00 INSPECTION**

Upon completion of all construction and prior to requesting Town's Initial Acceptance, the Contractor and/or Owners representative should conduct their own inspection and make all necessary corrections.

When the improvements to be accepted are complete and ready for inspection, the inspection may be initiated by:

- A. Written request from the Developer to the Town Engineer outlining which facilities are ready for inspection, or
- B. The Town Engineer, if he/she determines it to be necessary, may inform the Developer that an inspection will be made, and outline those facilities which will be inspected.

The Town Engineer will then schedule a date and time for inspection with members of the Town staff within one (1) week of request. Within two (2) weeks after the initial acceptance inspection, a list of deficiencies will be prepared by the Town Engineer and presented to the Developer. Within one (1) week of receipt of this list, the Developer shall submit a satisfactory time schedule for correction of the deficiencies. After the Developer and the Contractor have corrected the deficiencies, the developer must inform the Town that repairs have been made, and a follow-up inspection will be scheduled.

The time schedule noted above may be extended only under special circumstances with the written approval of the Town Engineer. Should the deficiencies not be corrected in the time period outlined herein, the Town has the right to prepare another list of deficiencies and/or draw upon the performance guarantee as specified in the improvement or subdivision agreement to complete the improvements.

222.00 Initial Acceptance Procedures

After the Public Improvements have passed inspection, the Developer shall request in writing an Initial Acceptance letter within fifteen (15) days of inspection.

The following items must be submitted prior to Initial Acceptance being granted:

- A. An electronic copy of "As Built or Record Drawings" plan drawings in AutoCAD (.dwg) and PDF (.pdf) format. External references must be bound to the AutoCAD file or all drawing files shall be included in a folder that will enable the drawing files to open correctly so they will not require re-mapping.
- B. Field inspection reports as required in Section 160.00 of these STANDARDS AND SPECIFICATIONS.
- C. A final sworn affidavit of construction cost; and
- D. Any other items required under the subdivision agreement.
- E. Additional "As Built or Record Drawing" information is required for entry into Town's GIS system in accordance with the current User Guide.

223.00 Warranty Period Repairs, Replacement, and Maintenance of Improvements

For a two (2) year period from the date of "Initial Acceptance" of any improvements related to the Development, the Owner shall, at his own expense, take all actions necessary to maintain said improvements and make all needed repairs or replacements which, in the reasonable opinion of Firestone, shall become necessary, except that Firestone shall be responsible for snow removal. If within thirty- (30) days after Owner's receipt of written notice from Firestone requesting such repairs or replacements, Owner has not completed such repairs, Firestone may exercise its right to secure performance as provided in the Development Agreement.

At least thirty- (30) days before the two- (2) years has elapsed from the issuance of the Initial Acceptance, the Developer must request an inspection for consideration of completion of the warranty period. Following inspection, a list of deficiencies will be prepared. After repairs have been made, a follow-up inspection must be requested. The warranty period is not over until all warranty repairs have been made. The warranty period for repairs shall be one year.

230.00 INITIAL ACCEPTANCE PROCEDURES FOR PUBLIC IMPROVEMENTS CONTRACTED BY THE TOWN

The inspection and acceptance procedures for public improvements contracted by the Town are specified in the contract documents.

240. 00 FINAL ACCEPTANCE PROCEDURES FOR DEVELOPMENT PUBLIC IMPROVEMENTS**241.00 Final Inspection**

Thirty- (30) days prior to expiration of two- (2) year warranty period and prior to requesting Town final acceptance, owner's representative should conduct their own inspection and make all necessary corrections. An inspection checklist may be obtained from the Engineering Division.

When the improvements to be accepted are complete and ready for final inspection, the final inspection may be initiated by:

- A. Written request from the Developer to the Town Engineer outlining which facilities are ready for final inspection, or
- B. The Town Engineer, if he determines it to be necessary, may outline those facilities that will be inspected.

The Town Engineer will then schedule a date and time for final inspection with members of the Town staff within one (1) week of request. Within two (2) weeks after the final inspection, a list of deficiencies will be prepared by the Town Engineer and presented to the Developer. Within one (1) week of receipt of this list, the Developer shall submit a schedule for correction of the deficiencies acceptable to the Town. After the Developer and the Contractor have corrected the deficiencies, the Developer must inform the Town that repairs have been made, and a follow-up final inspection will be scheduled.

The time schedule noted above may be extended only under special circumstances with the written approval of the Town Engineer. Should the deficiencies not be corrected in the time period outlined herein, the Town has the right to prepare another list of deficiencies and/or draw upon the performance guarantee as specified in the improvement or subdivision agreement to complete the improvements.

242.00 Final Acceptance Procedures

After the Public Improvements have passed the final inspection, the Developer shall request in writing a Final Acceptance Letter within fifteen (15) days of final inspection.

243.00 Repairs and Replacement

Upon issuance of Final Acceptance, the Town will take full responsibility of the improvements, except for repairs and replacements that, in the opinion of the Town Engineer, shall become necessary for those repaired/replaced items. At the end of the warranty, items repaired/replaced under the two (2) year warranty period will be subject to an additional one (1) year warranty. If, within ten (10) days after the Developer has received written notice from the Town Engineer requesting repairs or replacements, the Developer has not undertaken to make the repairs or replacements, the Town may make the repairs and replacements and draw upon the Developer's performance guarantee as specified in the subdivision agreement.

Approximately one (1) year following final acceptance, the Developer must request an inspection for consideration of completion of the warranty period. Following inspection, a list of deficiencies will be prepared. After repairs have been made, a follow-up inspection must be requested. The warranty period is not over until all warranty repairs have been made. The warranty period for repairs shall be one (1) year.

250.00 FINAL ACCEPTANCE PROCEDURES FOR PUBLIC IMPROVEMENTS CONTRACTED BY THE TOWN

The inspection and construction acceptance procedures for public improvements contracted by the Town are specified in the contract documents.

251.00 Final Warranty Inspection

Thirty- (30) days prior to expiration of two- (2) year warranty period and prior to requesting Town final acceptance, Contractor should conduct their own inspection and make all necessary corrections. An inspection checklist may be obtained from the Engineering Division.

When the improvements to be accepted are complete and ready for final inspection, the final inspection may be initiated by:

- A Written request from the Contractor to the Town Engineer outlining which facilities are ready for final inspection, or
- B The Town Engineer, if he determines it to be necessary, may outline those facilities that will be inspected.

The Town Engineer will then schedule a date and time for final inspection with members of the Town staff within one (1) week of request. Within two (2) weeks after the final inspection, a list of deficiencies will be prepared by the Town Engineer and presented to the Contractor. Within one (1) week of receipt of this list, the Contractor shall submit a satisfactory time schedule for correction of the deficiencies. THE DEFICIENCIES MUST BE CORRECTED WITHIN THIRTY-(30) DAYS OF THE RECEIPT OF THE LIST. After the Contractor has corrected the deficiencies, the Contractor must inform the Town that repairs have been made, and a follow-up final inspection will be scheduled.

The time schedule noted above may be extended only under special circumstances with the written approval of the Town Engineer. Should the deficiencies not be corrected in the time period outlined herein, the Town has the right to prepare another list of deficiencies and/or draw upon the performance guarantee as specified in the construction agreement to complete the improvements.

252.00 Final Acceptance Procedures

After the Public Improvements have passed the final inspection, the Contractor shall request in writing a Final Acceptance Letter within fifteen (15) days of final inspection.

253.00 Repairs and Replacement

Upon issuance of Final Acceptance, the Town will take full responsibility of the improvements, except for repairs and replacements that, in the opinion of the Town Engineer, shall become necessary for those repaired/replaced items. At the end of the warranty, items repaired/replaced under the two (2) year warranty period will be subject to an additional one (1) year warranty. If, within ten (10) days after the Contractor has received written notice from the Town Engineer requesting repairs or replacements, the Contractor has not undertaken to make the repairs or replacements, the Town may make the repairs and replacements and draw upon the Contractor's performance guarantee as specified in the construction agreement.

Approximately one (1) year following final acceptance, the Contractor must request an inspection for consideration of completion of the warranty period. Following inspection, a list of deficiencies will be prepared. After repairs have been made, a follow-up inspection must be requested. The warranty period is not over until all warranty repairs have been made. The warranty period for repairs shall be one (1) year.

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SECTION 300 SITE WORK

310.00 GENERAL

All site work and excavation shall comply with the requirements of the STANDARDS AND SPECIFICATIONS and any special criteria established by the Town. The Town Engineer, at a pre-design/pre-construction meeting, may establish special criteria. Site work shall be completed as detailed on the accepted engineering plans. Site work shall consist of demolition and removal of structures and obstructions; clearing and grubbing; overlot grading; subgrade preparation; removal of topsoil; site preparation; excavation and embankment; excavation, trenching, bedding and backfill of pipelines and service lines; excess excavation; borrow; and restoration and cleanup.

311.00 Local Laws, Ordinances and Codes

The Contractor shall comply with all current federal, state, county, and local laws, and codes pertaining to earthwork. The Contractor must obtain all necessary permits as required in Section 100, General Conditions, of these STANDARDS AND SPECIFICATIONS and/or any permits required by this Section prior to commencement of the work. The Contractor shall notify the Town Engineer forty-eight (48) hours before the start of the work or when work is to be resumed following a delay.

312.00 Protection of Public Improvements

The Contractor shall be held responsible for the protection of public improvements as stated in Section 141.00, Protection of Public and Utility Interests, of these STANDARDS AND SPECIFICATIONS. It will be the Contractor's responsibility to replace all public improvements so damaged at their own expense. Street cuts are restricted according to Section 143.00 of these STANDARDS AND SPECIFICATIONS.

312.01 Operation of Existing Valves

The Public Works Department will operate all existing valves, blow-offs, and curb stops. **The Contractor will operate no valve or other control device on any existing system for any purpose unless authorized by the Town.**

312.02 Interruption of Services

Before starting site work, the Contractor shall plan and coordinate for the disconnection or interruption of all services such as water, sewer, cable T.V., telephone, gas, electric power and traffic. Disconnection and/or interruptions shall be made in accordance with the regulations of the utility that controls the supply of the service. Whenever the flow of traffic is affected, a Traffic Control Plan shall be provided in accordance with Section 141.08, Traffic Control, Barricades, and Warning Signs, of these STANDARDS AND SPECIFICATIONS.

The Public Works Department shall provide a representative to be on site to observe and approve the Contractor's disconnection or interruption of the water services. Seventy-two (72) hours prior to the interruption of service, the Contractor will notify the Town of their plan and schedule. Twenty-four (24) hours prior to the interruption of service, the Contractor will notify all users in writing with a hand delivered notification whose service will be interrupted in order for them to make provisions for

necessary water storage. No line in service will be shut down for more than a four (4) hour period at one time. Prior approval by the Town Engineer is required for all shutdowns.

312.03 Equipment Operated on Streets

Only pneumatic-tired equipment shall be permitted to operate over paved surfaces. The Contractor shall be responsible for any damage to the street surface resulting from their operation.

320.00 DEMOLITIONS AND REMOVAL OF STRUCTURES AND OBSTRUCTIONS

The Contractor shall remove, wholly or in part and satisfactorily dispose of all foundations, signs, structures, fences, old pavements, abandoned pipelines, traffic signal material and any other obstructions which are not designated to remain, except for utilities and for those items which other provisions have been made for removal. All salvable material shall be clearly marked by the Town and will be removed, without unnecessary damage, in sections or pieces that may be readily transported and will be stored in locations approved by the Town Engineer. These materials may include, but shall not be limited to, manhole frames and covers, inlet grates, fence material, handrails, culverts, guardrail, walkway, roadway and parking appurtenances (traffic signals and attached hardware, including mast arms and span wire) and irrigation systems and appurtenances. The Contractor shall be required to replace any materials lost from improper storage methods or damaged by negligence. Removal of sign panel will include all work necessary to remove the panel and its attachment hardware from the existing installation. Concrete adhering to sign posts will be removed; pedestals and bases will be removed to one foot (1') below the surrounding ground or subgrade.

Where portions of structures are to be removed, the remaining parts shall be prepared to fit new construction. The work will be done in accordance with plan details and in such a manner that materials to be left in place will be protected from damage. The Contractor at their expense shall repair all damage to portions of structures that are to remain in place. Reinforcing steel, projecting from the remaining structure, shall be cleaned and aligned to provide bond with new extension. Dowels are to be securely grouted with approved grout. Depressions resulting from the removal of structures, footings, and other obstructions, shall be filled and compacted with clean fill materials so as to eliminate hazards of cave-in, accumulation and ponding of water.

Materials used in detour structures and supplied by the Contractor, shall be the property of the Contractor. After the detour is abandoned, they will completely remove the detour structure and will dispose of materials according to these STANDARDS AND SPECIFICATIONS.

Immediately following demolition and removal of rubbish from the site, provided additional work is not required, the Contractor shall grade the entire contract area by filling, compacting, and leveling the site to existing adjacent grades.

321.00 Bridges, Culverts and Other Drainage Structures

Bridges, culverts, and other drainage structures in use by traffic shall not be removed until the Town Engineer in accordance with Section 141.08, General Conditions, of these STANDARDS AND SPECIFICATIONS, has approved a Traffic Control Plan.

Unless otherwise directed, the substructures of existing structures will be removed down to one (1) foot below natural stream bottom or ground surface. Where such portions of existing structures lie

wholly or in part within the limits of a new structure, they will be removed as necessary to accommodate the construction of the proposed structure. Steel, pre-cast concrete and wood bridges shall be carefully dismantled without unnecessary damage. Steel members to be salvaged will be match-marked with waterproof paint.

322.00 Pipe

Unless otherwise provided, all pipe shall be carefully removed and cleaned; every precaution must be taken to avoid breaking or damaging the pipe. Pipes to be re-laid shall be removed and stored, when necessary, so that there will be no loss or damage before relaying.

Where culverts or sewers are to be left in place and plugged, the ends shall be filled with Type III concrete. Culvert and sewer ends are to be sufficiently filled to prevent future settlement of embankments.

When removing manholes, catch basins and inlets, any live sewer connected with these items will be properly reconnected, and satisfactory bypass service will be maintained during such operations.

323.00 Pavements, Sidewalks, Curbs, Etc.

All concrete or asphalt that is to remain shall have a straight, true line with a vertical face. Concrete or asphalt may be cut with a cutting wheel, jackhammer, or saw. If the Contractor cannot maintain a straight, true break line, the Town Engineer will order sawing. The sawing shall be done carefully, and the Contractor, at their expense will repair all damages to the concrete or asphalt to remain in place. The minimum depth of saw cuts in concrete will be two (2) inches.

The Contractor shall be responsible for the cost of removal and replacement of all over break as determined by the Town Engineer.

324.00 Disposal

The Contractor shall make all necessary arrangements for obtaining suitable disposal locations, and the cost involved will be included in the work. If disposal will be at other than established dumpsites, the Town Engineer may require the Contractor to furnish written permission from the property owner on whose property the materials will be placed.

330.00 SITE PREPARATION

The Contractor shall complete all work necessary to satisfactorily prepare the site as shown on the accepted drawings and as specified herein. Following this preparation, the site shall be in such a condition as to easily continue with the next operation whether it is excavating, backfilling, or any other operations that are a part of the project. Site preparation includes clearing, grubbing, grading, tree and shrub removal, native grass stripping and removing and disposing of all debris within the limits of the project and such other areas as may be indicated on the plans or required by the work, except such objects as are designated to remain or are to be removed in accordance with other sections of these STANDARDS AND SPECIFICATIONS. This work shall also include the preservation from injury or defacement of all vegetation and objects designated to remain.

331.00 Clearing

The Town shall establish construction lines and designate all trees, shrubs, plants and other things that are to remain. The Contractor shall preserve all things designated to remain. Paint required for cut or scarred surfaces of trees or shrubs selected to remain will be an approved asphalt base paint, prepared especially for tree surgery.

Branches on trees or shrubs shall be removed as directed. Branches of trees extending over the roadbed must be trimmed to give a clear working area above the roadbed surface. All trimming shall be done in accordance with Section 1000 of these Standards and Specifications.

Hedges will be pulled or grubbed in such a manner as to assure complete and permanent removal. Sod not required to be removed, must be thoroughly disked before construction of embankment.

All surface objects and trees, stumps, roots and other protruding obstructions not designated to remain will be cleared and/or grubbed as required, except nonperishable solid objects which will be a minimum of two (2) feet below subgrade.

Except in areas to be excavated, stump holes and other holes from which obstructions are removed must be backfilled with suitable material and compacted in accordance with these STANDARDS AND SPECIFICATIONS.

The Contractor will scalp areas where excavation or embankment is to be made. Scalping will include the removal of material such as brush, roots, sod, grass, residue of agricultural crops, sawdust, and other vegetable matter from the surface of the ground.

Clearing shall be performed in a careful and orderly manner with due consideration and protection of adjoining property, the public and workmen. Any damage to streets, parking lots, utilities, plants, trees, buildings or structures on private property, or to bench marks and construction staking due to the negligence of the Contractor, shall be repaired and restored to its original condition by the Contractor at their expense. Those areas which are to be saved will be clearly staked or fenced off by the Contractor per the Town's instructions and it will be the Contractor's responsibility to ensure that these areas are not damaged during the construction process. Following completion of construction, should any of these trees, shrubs or sod require replacement, it shall be done at the Contractor's expense.

332.00 Grading

A Grading and Stormwater Quality Permit shall be required as specified in Section 151.00 of these STANDARDS AND SPECIFICATIONS.

- A. If grading is in excess of 1 acre, additional requirements must be adhered to in accordance with the Town of Firestone's Standards.

Upon completion of the work, the Contractor shall provide the following information:

- A. An "as-graded" plan showing original ground surface elevations, as constructed ground surface elevations, lot drainage patterns, locations and elevations of all surface and subsurface drainage facilities.

- B. A soil grading report prepared by the soils engineer including locations and elevations of field density tests, summaries of field and laboratory tests and any other substantiating data and comments on any changes made during grading and their effect on the recommendations made in the soils engineering report.
- C. A geological report prepared by the engineering geologist including a final description of the geology of the site including any new information disclosed during the grading, and the effect of it on recommendations incorporated in the accepted grading plan.

All areas disturbed during grading operations shall have the final graded area hydro seeded or re-vegetated with native grasses in accordance with the requirements of the Town of Firestone. Seeding must be completed within sixty- (60) days of the grading completion and no longer than one hundred eighty (180) days of the commencement of grading operations at the site.

The Contractor shall insure that the dust proofing requirements of Section 141.07, General Requirements, of these STANDARDS AND SPECIFICATIONS are strictly adhered to for the duration of the project.

Grading of filled and unfilled areas shall be to the lines and grades indicated on the accepted plans. Grading shall be performed in conjunction with all of the necessary clearing, grubbing, stripping, filling, and compacting operations to the satisfaction of the Town.

Grading shall be done by approved means. Areas adjacent to structures and other areas inaccessible to heavy grading equipment shall be graded by manual methods.

Final grading shall be performed in such a manner as to provide proper drainage. In no case shall drainage from the project site be so altered or controlled as to result in damage, or the potential for damage, to adjacent property or to any portion of the work executed under the project from erosion or flooding.

333.00 Disposal

The Contractor shall make all necessary arrangements for obtaining suitable disposal locations, and the cost involved will be included in the bid price. If disposal will be at other than established dump sites, the Town Engineer may require the Contractor to furnish written permission from the property owner on whose property the materials and debris will be placed. Materials and debris shall be disposed of in a manner acceptable to the Town Engineer. Burning shall not be permitted without prior written approval of the Town Engineer and the county health department.

334.00 Topsoil

The Contractor shall salvage within the project limits, or acquire when needed, loose friable loam reasonably free of admixtures of subsoil, refuse, stumps, roots, rocks, brush, weeds, heavy clay, toxic substances or other material which would be detrimental to the proper development of vegetative growth.

Topsoil shall not be placed until the areas to be covered have been properly prepared and grading operations in the area have been completed. Topsoil shall be placed and spread at locations and to the thickness shown on the plans and shall be keyed to the underlying material.

340.00 EARTHWORK

This work shall consist of excavation, disposal, shaping or compaction of all material encountered within the limits of the project, including but not limited to excavation of ditches and channels, surface boulders, muck, rock, concrete foundations, slabs, stripping, etc. Excavation will be performed to the line and grade and typical cross sections indicated on accepted plans or as required by the Town Engineer.

Excavation, dewatering, sheeting, and bracing shall be carried out in such a manner as to eliminate any possibility of undermining or disturbing the foundation of any existing structures or any work previously completed.

This Section does not include any work that is related to trenching, backfilling and compacting (refer to Section 350.00 of these STANDARDS AND SPECIFICATIONS).

Should the project warrant, the Town Engineer may require the Contractor to provide an earth-moving diagram and haul routes.

340.01 Definitions

Bedding material - material that is installed under pipelines (other than sanitary sewer and water lines), riprap, low flow channel or any other place considered necessary by the Town Engineer. The thickness of this material will be as shown on the accepted plans and will normally be six (6) inches under structures and three (3) inches under the bell of any pipe. Bedding material shall meet the gradation of CDOT "No.67 Coarse Aggregate" as specified in Section 703.02 in the latest edition of the CDOT "Standard Specifications for Road and Bridge Construction".

Borrow - backfill or embankment material that must be acquired from designated borrow areas to make up the deficient areas that cannot be completed from excavation within work limits. All sources of borrow material must be approved by the Town Engineer.

Embankment fill - earthwork consisting of embankments, including preparation of the area upon which they are to be placed, dikes within or outside right-of-way, placing and compacting of approved material within areas where unsuitable materials have been removed, and placing and compacting of embankment materials in holes, pits and other depressions to lines and grades shown on the accepted plans. Only suitable materials shall be used in construction of embankments and backfills.

Proof rolling - the application of test loads over a sub-grade surface by means of a heavy pneumatic-tired vehicle to locate weak areas in sub grade. See Section 344.00 for specifications.

Rock excavation - Igneous, metamorphic or sedimentary rock formations that cannot be excavated with a D-9 tractor in good repair with a single hydraulic ripper.

Stabilization material - material that is to be placed in areas of over excavation of unsuitable material, or in areas of high water table to stabilize the unsuitable material. Stabilization material shall meet the gradation of "No. 4 Coarse Aggregate" as specified in Section 703.02 of the CDOT "Standard Specifications for Road and Bridge Construction".

Structure backfill - earthen material that is installed around and over any structure as illustrated on the accepted plans. Imported structure backfill (Class I) shall meet the general gradation of "Class 1 Structure Backfill Material" as specified in Section 703.08 of the CDOT "Standard Specifications for Road and Bridge Construction". On site Class 2 structure backfill shall also meet the requirements of Section 703.08 of the CDOT Specifications for Road and Bridge Construction.

Structure excavation - excavation of any and all materials over an area extending three (3) feet out from the outer most bottom edge of a proposed structure, up to existing grade or top of proposed grade (whichever comes first) at a one to one (1:1) slope. Rock formations within this area that can be removed by ripping with a D-9 tractor in good repair with a single hydraulic ripper shall be considered structure excavation.

Suitable material - any earthen material consisting of on-site or similar non-organic sands, gravels, clays, silts and mixtures thereof with a maximum size of six (6) inches. Bedrock that breaks down to specified soil types and sizes during excavation hauling and placement may be considered as suitable material.

Unclassified excavation - any and all earthen materials encountered, including rocks and boulders, during construction. Rock formations that can be removed by ripping with a D-9 tractor in good repair with a single hydraulic ripper are considered as unclassified excavation.

Unsuitable material - any earthen material containing vegetable or organic silt, topsoil, frozen materials, trees, stumps, certain man made deposits, or industrial waste, sludge or landfill, or other undesirable materials.

340.02 Grading Tolerances

All earthwork shall be carried out in such a manner that final grades, after excavation, compaction of backfill, placement of rip rap, and construction of channel lining, etc. shall conform to those illustrated by design cross sections. The final earthwork shall be considered acceptable, providing all final grade elevations do not vary from the designed elevations by more than the following:

- A. 0.3 feet at the top of any embankment where a cut side slope intersects the existing grade.
- B. 0.5 feet in all portions of the site not included in item A above.

340.03 Backfill and Embankment Material

Any suitable material or borrow as defined above. Free running water shall be drained from materials before placement.

341.00 Excavation

All excavated areas will be graded in a manner that will permit adequate drainage, will not disturb material outside the limits of slopes and will be within the tolerances noted in Section 340.02 of these STANDARDS AND SPECIFICATIONS. When practical, all suitable material removed from the excavation will be used in the formation of embankments, for backfilling, and for other purposes. Materials that are considered unsuitable material (including rock) or surplus by the Town Engineer

shall be disposed of by the Contractor at their expense, in accordance with Section 324.00 and 333.00 of these STANDARDS AND SPECIFICATIONS.

All water pumped or drained from the work shall be disposed of in a manner satisfactory to the Town Engineer, without undue interference with other work or damage to pavements, other surfaces, or property.

341.01 Excess Excavation

If in the opinion of the Town Engineer, the material at or below the depth to which excavation for structures would normally be carried is unsuitable for the required installation, it shall be removed to such widths and depths as directed by the Town Engineer and shall be replaced with stabilization material.

Where the bottom of the excavation, by error of the Contractor, have been taken to a depth greater than the depth specified, shown on the accepted plans or directed by the Town Engineer, said condition shall be corrected by refilling to the proper grade with structure backfill. Should this backfill for over excavation occur in areas of high groundwater, and then the backfill material shall be stabilization material. The Town Engineer shall approve all measures taken to rectify conditions caused by over excavation, and the cost resulting from such measures shall be borne by the Contractor.

If, through failure or neglect of the Contractor to conduct the excavation work in a proper manner, the surface of the subgrade is in an unsuitable condition for proceeding with construction, the Contractor shall, at their own expense, remove the unstable material and replace it with recycled concrete, structure backfill, or other approved material so that the condition of the subgrade meets with the approval of the Town Engineer before any work is placed thereon. Failure of the Contractor to control surface or groundwater adequately, premature excavation at the work site, or other manifestations of the Contractor's neglect or improper conduct of work, as determined by the Town Engineer, shall be grounds for requiring removal and replacement of unsuitable subgrade without additional compensation.

341.02 Excavation Near Existing Structures and Utilities

The Contractor's attention is directed to the fact that underground utilities may exist within or immediately adjacent to the areas of proposed construction. Where possible, these utilities are indicated on the accepted plans; however, all of the services may not have been shown on the accepted plans, and the completeness and accuracy of the information presented is unverified and without guarantee. This information is supplied for the purpose of providing the Contractor with an indication as to the approximate locations of utilities at the work areas so that he will be made aware of probable obstructions and the extent to which these may affect construction.

All utility lines shall be located on the ground with location equipment well ahead of the work at all times. All such locations shall be plainly marked by coded paint symbols on pavement or by marked stakes in the ground. The Contractor at no extra cost shall provide all such work.

342.00 Protection of Existing Structures and Utilities

All existing poles, pipes, wire, fences, curbs, property line markers, and other structures that, in the opinion of the Town Engineer, must be preserved in place without being temporarily or permanently

relocated, shall be carefully supported and protected from damage by the Contractor. In case of damage, the Contractor shall notify the property owner so that proper steps may be taken to repair any and all damage done. When the property owners do not wish to make the repairs themselves, the Contractor shall repair all damage; or if not promptly done by them, the Town may have the repairs made at the expense of the Contractor.

All utility services shall be supported by suitable means so that services do not fail during construction or when tamping and settling occur.

The Contractor shall be compensated for any additional work involved whenever a utility or underground structure that had not been previously anticipated is so encountered longitudinally within the excavation limits so as to severely hinder normal excavation and construction methods. The Town shall establish the cost of such work and the Contractor through a "Change Order" before any additional work is performed.

342.01 Relocation and Replacement of Existing Structures and Utilities

If, in the course of construction, the Contractor encounters utility services and/or structures of any kind not indicated on the plans, or otherwise provided for, which encroach upon or are encountered near and substantially parallel to the edge of the excavation and which, in the opinion of the Town Engineer, will impede progress to such an extent that satisfactory construction cannot proceed, they shall be relocated or removed, later to be restored or replaced as follows:

- A. Whenever the Contractor encounters any of the conditions as described above and is so ordered in writing, he shall do the whole of or such portions of the work as directed; change the location of, remove and later restore, or replace such structures; assist the Owner thereof in so doing. For such work the contractor shall be issued a change order for extra work.
- B. In removing existing pipes, or structures or utilities as described above, the Contractor shall use care to avoid damage to materials, and the Town Engineer shall include for payment only those new materials which, in their judgment, are necessary to replace those unavoidably damaged.

When fences interfere with the Contractor's operations, they may remove and, unless otherwise specified, later restore them to a condition at least as good as that in which they were found immediately before the work was begun, all without additional compensation. The restoration of fences shall be done as promptly as possible and not left until the end of the construction period.

343.00 Excavated Material

Excavated material shall be placed so as to minimize the inconvenience to occupants traveling on streets and driveways or adjoining properties. Excavated material shall not be deposited on private property unless written consent of the property owner(s) has been filed with the Town Engineer.

It is expressly understood that no excavated materials shall be removed from the site of the work or disposed of by the Contractor except as directed or approved by the Town Engineer, or as noted below.

Suitable excavated material shall be used as backfill, fill for embankments, or other parts of the work in accordance with the appropriate sections of these STANDARDS AND SPECIFICATIONS.

Disposal of surplus material shall be in accordance with Section 324.00 and 333.00 of these STANDARDS AND SPECIFICATIONS.

344.00 Proof Rolling

Proof rolling shall be required on all subgrades and aggregate base course or where required by the Town Engineer to locate weak areas. Proof rolling shall be carried out as designated with a fully loaded 2,000 gallon single axle water truck. No separate payment shall be made for proof rolling operations.

Areas of subgrade exposed and not previously disturbed but found to be weak and/or fail the test shall, at the direction of the Town Engineer, be excavated, scarified, wetted if necessary, and compacted with suitable backfill material to the requirements for density and moisture. After density and moisture requirements have been met, failed areas will require a subsequent proof roll. The Contractor shall be compensated for this work either at applicable unit bid prices or by change order.

Areas of subgrade already conditioned but upon proof rolling are found to be weak and/or fail the test shall be ripped, scarified, wetted if necessary, and compacted to requirements for density and moisture. After density and moisture requirements have been met, failed areas will require a subsequent proof roll. All reconditioning will be at the contractor's expense.

All proof rolls will be voided after twenty four (24) hours or a weather event

345.00 Embankment Fill

Earth fill shall be constructed in accordance with this Section, including placing and compacting of all embankment material, and all related work as required to ensure proper bond of materials with previously placed embankment.

No material shall be placed in any section of embankment until the foundation for that section has been cleared, stripped, and dewatered and compacted in accordance with these STANDARDS AND SPECIFICATIONS.

The suitability of each part of the foundation for placing embankment material thereon and of all materials for use in the embankment construction will be as determined by the Town Engineer or the projects' Soils Engineer. All materials shall be placed and compacted in approximately horizontal layers of the specified thickness

After subgrade has satisfactorily been prepared, the fill material shall be placed and compacted thereon and built-up in successive layers until the required elevation is reached. Fill shall be placed within the lines and grades shown on the accepted plans or as directed by the Town Engineer. No fill shall be placed on frozen surfaces, nor shall the fill material contain snow, ice, or other frozen materials.

Fill for embankment shall be a homogenous mixture of stockpiled suitable material. The characteristics of the material shall be in accordance with that of suitable material as defined in Section 340.01 of these STANDARDS AND SPECIFICATIONS.

The filling operation shall begin in the deepest part of the area to be filled and fill shall be brought up in essentially level lifts. Fill shall be placed in layers by an approved method. The entire surface of the work shall be maintained free from ruts and in a condition that will permit construction equipment to travel over any section readily.

The lifts may be discontinued, providing that the slopes of the bonding surfaces of adjoining portions of embankment shall not be steeper than 10:1 (horizontal to vertical). Previously placed material shall be moistened in such a manner and to such depths as will ensure a satisfactory bonding surface with a new material.

The Contractor shall maintain the embankment in a manner satisfactory to the Town Engineer until the Town has given final acceptance of all work.

Previously sprinkling, if required, to insure proper bond and compaction, shall moisten placed, or new materials. No compacting shall be done when the material is too wet, causing yielding. If the compacted surface of the fill layer is determined to be too smooth to provide an adequate bond with the succeeding layer, the surface shall be loosened by harrowing or by some other approved method before placement of the succeeding layer.

Excavated materials, which the Contractor desires to use for embankment, and which are otherwise suitable for embankment, except that, when excavated are too wet for immediate compaction, shall be dried such as to permit them to be placed in the embankment at the proper moisture content. No additional payment will be made for adding moisture to materials, whether added on fill, or for stockpiling, re-handling, or drying materials for use in the embankment.

The moisture content of the embankment prior to, and during, compaction shall be distributed uniformly throughout each layer of material. The placement moisture content for all materials shall be as noted below.

The Contractor will be responsible for insuring that compaction tests will be made when the Contractor has determined that he has properly compacted the embankment. Testing shall be completed in accordance with Section 354.00 of these STANDARDS AND SPECIFICATIONS.

All embankment fill shall be compacted to the percent of relative compaction shown in Table 345.00-1 and will be equal to or greater than the minimum values shown for the various types of soil. The moisture content will be maintained within $\pm$ three percent (3%) of optimum moisture for A-1 through A-5 materials and optimum to 3% above for A-6 and A-7-6 materials during compaction. Each project shall have a soils report and specifications designed for that project, site specific.

TABLE 345.00-1

Soil Classification (AASHTO M 145)	AASHTO T 99 Min. Standard Proctor Relative Compaction (Percent)	AASHTO T 180 Min. Modified Proctor Relative Compaction (Percent)
A - 1	100	95
A - 3	100	95
A - 2 - 4	100	95
A - 2 - 5	100	N/A
All Others	95	N/A

If at any time the Town Engineer judges that the degree of compaction being obtained is insufficient, they may halt operations and order that compaction tests be taken at their direction. Areas found deficient in degree of compaction shall be recompacted and regraded, if necessary. Failed compaction tests, when ordered by the Town Engineer, shall be paid for by the Contractor.

345.01 Structure Backfill

Structure backfill material shall be used to backfill behind reinforced concrete structures as illustrated on the accepted plans. Structure backfill shall comply with material as described in Section 340.01 of these STANDARDS AND SPECIFICATIONS. In addition, this material shall have a liquid limit not exceeding 35 and a plasticity index of not over 15 when determined in conformity with AASHTO T 89 and T 90.

Areas adjacent to structures and other areas inaccessible to mobile compaction equipment shall be compacted with suitable power-drive hand tampers or other acceptable devices. Compaction by the latter method shall be done in six- (6) inch layers, unless otherwise directed by the Town Engineer.

Backfilling shall consist of placing materials in horizontal, uniform layers brought up uniformly on all sides of the structure.

Backfill material shall not be deposited against the back of concrete abutments, concrete retaining walls, or the outside of cast-in-place concrete structures until the concrete has developed a strength of not less than 2,500 pounds PSI in compression. Backfill placed within two (2) feet of any structure shall be covered up evenly on all sides to avoid unequal lateral pressures.

Compaction equipment or methods that produce horizontal or vertical earth pressures which may cause excessive displacement or may damage structures, shall not be used.

Unless otherwise indicated on the accepted plans or directed by the Town Engineer, all sheeting and the Contractor prior to backfilling shall remove bracing used in making structure excavation.

THE EXCESSIVE USE OF WATER DURING BACKFILLING OPERATIONS WILL NOT BE PERMITTED.

No compacting shall be done when material is too wet to be compacted properly; at such times the compacting work shall be suspended until the previously placed and new materials have dried out sufficiently to permit proper compacting, or such other precautions shall be taken as may be necessary to obtain proper compacting. The moisture content of the embankment prior to, and during, compaction shall be distributed uniformly throughout each layer of material. The moisture content will be maintained within $\pm$ two percent (2%) of optimum moisture for A-1 through A-5 materials and optimum to three percent (3%) for A-6 and A-7-6 materials during compaction.

In the event that sufficient satisfactory backfill material is not available on the site, the Town Engineer shall direct the Contractor to import Class 1 structure materials as defined in Section 340.01 of these STANDARDS AND SPECIFICATIONS. The Contractor shall not be required to excavate below the depths of excavation indicated on the accepted plans to provide structural backfill material. However, to the extent that acceptable material is available within the excavation limits, the Contractor will be required to excavate, transport, and compact the material without compensation beyond that which may be included for "Unclassified Excavation used as Structural Backfill" or as may be allowed for in the bid documents.

Where pipe is connected to a structure being backfilled, the bedding and backfilling procedure shall conform to the requirements of Section 352.00 and 353.00 of these STANDARDS AND SPECIFICATIONS.

The Contractor shall apply the proper compactive effort and moisture control throughout the backfilling process. The Contractor shall be responsible for ensuring that compaction tests are made of the fill when the Contractor has determined that they have properly compacted the structural backfill. Testing shall be completed in accordance with Section 354.00 of these STANDARDS AND SPECIFICATIONS.

Structure backfill shall be compacted in conformance with Table 345.00-1.

If at any time the Town Engineer determines that the degree of compaction being obtained is insufficient, they may halt operations and order that compaction tests be taken at their direction. Areas found deficient in degree of compaction shall be recompacted and regraded, if necessary. Failed compaction tests, when ordered by the Town Engineer, shall be paid for by the Contractor. The Town will pay for additional tests ordered by the Town Engineer when test results meet the requirements of these STANDARDS AND SPECIFICATIONS.

345.02 Roadway Excavations, Backfill and Compaction

Roadway excavation shall be in accordance with unclassified excavation as defined in Section 340.01 of these STANDARDS AND SPECIFICATIONS, except for areas of rock excavation as defined in the same Section. The material and execution for the roadway backfill shall conform to Section 345.00 of these STANDARDS AND SPECIFICATIONS.

All roadway backfill shall be compacted to at least ninety-five percent (95%) of maximum density at optimum moisture content in accordance with ASTM Specification Designation D-698-70 (Standard Proctor). Water shall be applied uniformly during compaction to control moisture content. The moisture content will be maintained within +/- two percent (2%) of optimum moisture for A-1 through A-5 materials and optimum to two percent (2%) above for A-6 and A-7-6 materials during compaction.

Prior to placement and compaction of roadway fill, all existing rubble and organic material shall be removed down to suitable existing material. The existing material shall then be scarified and roadway fill placed in accordance with Section 345.00 of these STANDARDS AND SPECIFICATIONS.

346.00 Grading

Grading shall be completed in accordance with Sections 332.00 and 340.02 of these STANDARDS AND SPECIFICATIONS.

347.00 Moisture Control

Moisture in fill materials shall be equal to that found in the natural unexcavated condition insofar as is practicable. If the Town Engineer determines that the fill material to be used is extremely wet, the Contractor shall spread the material on the areas to be filled and the fill shall be permitted to dry to allowable moisture content. Harrowing where necessary shall assist the drying process.

If, in the opinion of the Town Engineer, additional moisture is required, water shall be applied by some sprinkling device in such a way as to provide uniform distribution over the area to be treated with accurate control of the rate and quantity of water applied. If excessive amounts of water are added or if rain should cause excessive wetness, the area shall be allowed to dry as described above.

The moisture content of the fill shall be as near to optimum moisture content as possible, to create the least compactive effort to obtain maximum density.

348.00 Borrow

It will be the Contractor's responsibility to stockpile suitable backfill material, both for embankment fill and structure backfill, in anticipation for use in other areas of the project. Only at the time that they estimate that they have sufficient suitable backfill material stockpiled to complete the project, should they proceed to haul excavated material from the site. If the Contractor should fail to preserve, on-site, sufficient suitable material, and should haul off and dispose of suitable material, they shall be responsible for recovering said suitable material to the site for use, at their sole cost.

Should there be an insufficient quantity of material available on site for completion of the necessary embankment and structure backfill operations, the Contractor shall furnish approved backfill material as defined in Section 340.01 of these STANDARDS AND SPECIFICATIONS.

350.00 TRENCHING, BACKFILLING AND COMPACTING

This work shall consist of furnishing all labor, materials, tools and equipment for trenching, bedding, backfill and compaction for all underground utilities as specified herein and shown on the accepted plans. The excavation shall be made to lines and grades shown on the accepted plans and as established by the Town Engineer. Except where shown otherwise on the accepted plans and except where the Town Engineer gives written permission to do otherwise, all trench excavation shall be made by open cut to the depth required to construct the pipelines as shown on the accepted plans. All excavation shall be unclassified.

When excavating in concrete or asphalt areas, the limits of the trench shall be string lined and the surface cut in a vertical plane by sawing, cutting wheel or jack hammering. Vertical edges shall be cut to a vertical plane to a point one (1) foot outside the limits of excavation prior to placing the resurfacing material.

The maximum size of street cut in existing major arterial or collector streets will be eight (8) feet square; pushing or boring, unless otherwise approved in writing by the Town Engineer, will install the remainder of the line under the finished street.

Surface materials such as concrete and asphalt shall be disposed of independently of the underlying soil; base course and gravels are to be salvaged to stockpile, protected from contamination and reused for suitable material for backfill. The Contractor, in accordance with Sections 324.00 and 333.00 of these STANDARDS AND SPECIFICATIONS must dispose of all unsuitable materials unacceptable for use as backfill.

All excavated material which meets the requirements for backfill materials shall be stockpiled in a manner which will not endanger the performance of the work, endanger the workers, at a sufficient

distance from the banks to avoid overloading, obstruct sidewalks, driveways, or streets, AND provide the least possible interference with traffic.

In existing developments excavation will not be permitted to advance more than one hundred fifty (150) feet ahead of pipe laying and two hundred (200) feet in advance of the backfill operations. No trench will be left open overnight without written permission of the Town Engineer.

The contractor shall provide and maintain adequate equipment to properly remove and dispose of all surface or ground water entering the trench. A Construction Dewatering permit must be obtained from the Colorado Department of Public Health and Environment (CDPHE). Water shall be disposed of in a suitable manner without damage to adjacent property or without being a nuisance to public health and convenience. The use of any sanitary sewer to dispose of trench water will not be permitted. The trench shall be dry at all times during pipe installation and so maintained until the joining operation is complete.

350.01 Special Conditions

Subsurface investigation - Prior to the connection of any planned utility line to an existing line, the Contractor shall expose the existing utility at the points of connection in order to verify the elevations and materials of construction. The Town Engineer shall be notified a minimum of two (2) working days before such an investigation is performed. The Contractor shall also expose utilities as they cross each other to allow for verification of elevation and materials of construction. The Town Engineer will evaluate this information and provide revisions, if required, within three (3) working days of the completion of the investigation.

Telephone, Fiber Optic, Cable TV, and all other "Wire Utility" lines - Where underground "wire utility" lines are encountered which were not shown on the accepted plans, they shall be relocated as directed by the Utility Company and in accordance with its specifications. The Contractor shall coordinate this work with all other phases of construction to avoid further conflicts.

Gas and electric lines - Where underground gas and electric lines are encountered which were not shown on the accepted plans, they shall be relocated as directed by the Utility Company, and in accordance with its specifications. The Contractor shall coordinate this work with all other phases of construction to avoid further conflicts.

351.00 Trench Excavation for Pipelines and Service Lines

Trenches shall be adequately supported and the safety of workers provided for as required by the most recent Occupational Safety and Health Administration (OSHA) "Safety and Health Regulations for Construction". These regulations are described in Subpart P, Part 1926 of the Code of Federal Regulations. Sheet piling and shoring shall be utilized where required to prevent any excessive widening or sloughing of the trench which may be detrimental to human safety, to the pipe being placed, to trees, or to any existing structure. Where excavations are made under severe conditions, it may be required that the contractor use an approved piling instead of sheet piling and shoring.

Excavated material shall not be placed nearer than two (2) feet from the sides of the trench. Heavy equipment shall not be used or placed near the sides of the trench unless the trench is adequately braced.

The width of the trench must comply with the requirements set forth in these STANDARDS AND SPECIFICATIONS and will be ample to permit the pipe to be laid and joined properly and backfill to be placed and tamped. The allowable trench width, regardless of the type of soil encountered, the depth of excavation or method of bedding densification, shall not exceed the outside diameter of the pipe barrel plus twenty-four (24) inches, or be less than the outside diameter of the pipe barrel plus twelve (12) inches when measured at any point below the top of the pipe bell, flange or collar.

Where the width of the lower portion of the trench exceeds the maximum width herein stated, the Contractor, at their expense, shall furnish and install special pipe embedment or concrete encasement to protect the pipe from the additional loading. The pipe supplier shall determine the type and quantities of special pipe embedment, using trench-loading criteria based upon saturated backfill weighing 120 pounds per cubic foot and allowance for truck and other superimposed live loads.

351.01 Removal of Water

The Contractor shall provide and maintain at all times ample means and devices with which to remove promptly and properly dispose of all water entering the trench excavation. Water shall be disposed of in a suitable manner without damage to adjacent property or without being a nuisance to public health and convenience.

Dewatering shall be accomplished by well points, sumping or any other acceptable methods that will insure a dewatered trench. All dewatering methods will be subject to the approval of the Town Engineer. A Construction Dewatering permit must be obtained from the Colorado Department of Public Health and Environment (CDPHE).

351.02 Preparation of Foundation for Pipe Laying

When the excavation is in firm earth, care shall be taken to avoid excavation below the established grade plus the required specified over depth to accommodate the pipe bedding material.

In case soft or otherwise unsuitable foundation material is encountered in the bottom of the trench, the Town Engineer may order its removal and replacement with stabilization material to provide a suitable foundation for the pipe. The fact that the trench bottom is wet will not be considered as evidence that the trench bottom is unstable. The bottom of sumps utilized for dewatering shall be two (2) inches minimum below the bottom of the trench excavation to prevent the upward flow of water into the excavation resulting in unstable bottom conditions.

352.00 Bedding for Pipelines and Service Lines

All pipe shall be installed on sufficient bedding material (as defined in Section 340.01 of these STANDARDS AND SPECIFICATIONS or set forth below) so as to provide a minimum of six (6) inches separation between the subsoil and the pipe and shall extend up to the spring line of the pipe. The bedding material will be tamped around the full length of the pipe barrel to assure support for the total pipe length. The pipe barrel will be uniformly supported along the entire length of the pipe. Bedding material will be placed to a depth of twelve inches (12") above the top of all PVC pipe, HDPE pipe, and ductile iron pipe and to the spring line of all other pipe unless otherwise noted on the accepted plans. Suitable backfill material, as defined in Section 340.01 and modified in Section 353.00 of these STANDARDS AND SPECIFICATIONS, shall be placed from spring line to a minimum of twelve (12) inches over the top of the pipe and carefully tamped in place. Each type of

pipe shall be installed as specified in the appropriate Section. Bedding material for sanitary sewer and water lines shall be a clean well-graded squeegee sand or 1/2" x No. 4 bedding material, and shall conform to the following limits when tested by means of laboratory sieve:

1/2" x #4 BEDDING MAT		SQUEEGEE SAND	
Sieve size	Percent Passing	Sieve size	Percent Passing
3/4 inch	100%	3/4 inch	
1/2 inch	98%	1/2 inch	
3/8 inch	70%	3/8 inch	100%
No. 4	14%	No. 4	95% - 100%
No. 8	7%	No. 8	80% - 100%
No. 16	5%	No. 16	50% - 85%
No. 30	4%	No. 30	25% - 60%
No. 50	4%	No. 50	10% - 30%
No. 100	3%	No. 100	2% - 10%
No. 200	2.1%	No. 200	.5%

Bedding material for all other pipe (except as noted below) will be as defined in Section 340.01 of these STANDARDS AND SPECIFICATIONS.

Bedding for underdrain pipe or for gravel underdrain without pipe, if required by the approved construction plans, shall be composed of washed gravel or crushed rock well graded in the size range from one-half (1/2) inch minimum to one (1) inch maximum.

352.01 Bedding Compaction

All bedding material and suitable material placed to twelve (12) inches above the top of the pipe shall be carefully compacted to at least 70% of maximum relative density in accordance with ASTM D 4253 and 4254.

353.00 Backfill for Pipelines and Service Lines

Suitable backfill shall be as defined in Section 340.01 of these STANDARDS AND SPECIFICATIONS. In addition, all wood or other organic material and deleterious substances must be removed. Clay and similar material with a liquid index in excess of 35 and a plasticity index in excess of 6 (determined in conformity with AASHTO T 89 and T 90) for import material will not be considered suitable for backfilling in trenches located in improved streets, roads, highways and thoroughfares.

When the excavated material is unsuitable for compaction, other material must be provided which will meet the requirements of the following table:

SUITABLE BACKFILL MATERIAL	
Sieve size	Total Percent Passing by Weight
2 inch	100
No. 4	30 - 100
No. 50	10 - 60
No. 200	5 - 20

Additionally, structure backfill (flow-fill) meeting the following requirements may be used to backfill pipelines and service lines when specified in the Contract.

Mix

Minimum 24-hour strength - 10 PSI
 Maximum 28-day strength - 60 PSI
 Maximum aggregate size - 1"
 Cement - Type I-II (Ideal ASTM C 150)
 Slump - 6" minimum
 8" maximum

MIX PROPORTIONS (per cubic yard of concrete)	
Cement	50 Lbs.
Water	325 Lbs. (39 gallons)
1" Aggregate (ASTM C33, Size No. 57)	1700 Lbs.
Sand - ASTM C33	1845 Lbs.
Air (Entrapped)	5.0 ounces

Theoretical Unit Weight - 143.7 lbs/yd³ @ 1.5% air
 Theoretical Yield - 27.23 ft³ @ 1.5% air
 % Sand of Total Aggregate - 52%

Note: Aggregate weights are based upon the materials being in a saturated surface-dried condition.

Materials used above the subgrade level must conform to the requirements for sub base and base course materials as defined in Section 500, Street Construction, of these STANDARDS AND SPECIFICATIONS.

Any bracing installed to prevent cave-ins will be withdrawn in a manner that will maintain the desired support during the backfill operations. Driven sheet pilings shall be cut off at or above the top of pipe, and the portion below the cut-off line will be left in the ground.

During construction the trench backfill shall be topped out with not less than nine (9) inches of CDOT Class 5 or 6 aggregate base course and maintained free of chuckholes, ruts and loose rock, until permanent asphalt surfacing is in place.

353.01 Backfill Compaction

Bedding material shall be hand placed in loose six (6) inch lifts, hand tamped, and each lift thoroughly consolidated to the level(s) described in Section 352.00 of these STANDARDS AND SPECIFICATIONS. The remainder of the trench backfill will be placed in loose six (6) inch lifts and each lift thoroughly consolidated by tamping, vibrating, or a combination thereof, until the relative compaction density is equal to or greater than the minimum value shown in Table 345.00-1 of these STANDARDS AND SPECIFICATIONS for the various classes of soil and type of compaction. The moisture content will be maintained within $\pm$ two percent (2%) of optimum moisture during compaction.

Pipes, culverts, sewer and other miscellaneous structures outside the roadway prism or sidewalk and not subject to traffic loads or heavy loads for a period of two (2) years shall be backfilled in layers as described above but shall be compacted to approximately the density of the surrounding earth.

Consolidation shall be obtained by the use of hand tampers having a minimum weight of twenty (20) pounds and a facial area in excess of twenty-four (24) square inches. Hydro hammers shall not be used in existing streets and neighborhoods. Large roller, tractor drawn equipment shall not be used within eighteen (18) inches of rigid pipe or thirty-six (36) inches of flexible pipe. Flooding or jetting of trenches will not be permitted.

353.02 Maintenance of Backfill

All backfill shall at all times during construction be maintained to the satisfaction of the Town Engineer. Access across trenches for driveways and streets shall be maintained free of hazards to traffic or pedestrians.

354.00 Compaction Testing

The compaction of the bedding and all types of backfill shall be tested at a rate of at least one (1) test per 200 cubic yards of fill material or portions thereof and at least one (1) test per 200 lineal feet per lift starting at two (2) feet above the pipe, whichever controls. The testing shall be at various depths and locations. The Town Engineer may require additional testing around structures, manholes, valve boxes, etc. The Contractor shall also have tests provided to the Town for water and/or sewer service lines as directed by the Town Inspector.

Initial test results shall be submitted to the Town Engineer within twenty-four (24) hours of the test or on the next working day.

Private engineering or geotechnical firms shall perform compaction testing at the Contractor's expense. A qualified technician who works under the direct supervision of a Registered Professional Engineer shall perform this testing. Final soils compaction reports shall be prepared and signed by a Registered Professional Engineer who is registered in the State of Colorado, and who is qualified to prepare such reports. Reports shall be submitted to the Town Engineer within one (1) week of the test.

355.00 Cable Installation

355.01 General

Unless otherwise approved in writing by the Town Engineer, all cable installation must be within public right-of-way or within a dedicated utility easement. All cable must be installed at a minimum depth of twenty-four (24) inches in accordance with the requirements of Article 300-5 of the National Electric Code (NEC).

355.02 Underground Installation

All underground installation shall be in accordance with Article 300-5 of the NEC.

355.03 Overhead Installation

All overhead installation shall be in accordance with Article 230-24-(b) of the NEC.

360.00 RESTORATION AND CLEANUP

At all times during construction, the Contractor shall maintain the site, partially finished structures, material stockpiles and other like areas in a reasonable state of order and cleanliness.

The surface grade and condition of all un-surfaced areas shall be restored to the grade and condition immediately prior to construction. The Contractor shall restore or replace all sod, trees, shrubbery, sprinkler systems, fences, and any other items, to a condition equal to that before the work began and to the satisfaction of the Town Engineer. See Section 1030.00 Seeding Specifications regarding appropriate mix for specific areas.

All roadway surfacing, curbing, sidewalks, and gutters shall be restored or replaced to a condition equal to that before the work began and to the satisfaction of the Town Engineer. All roadway surfacing between the vertical surface cuts on each side of the excavation shall be removed and replaced with base course material and/or hot mix bituminous or concrete surfacing.

Pavement repair shall be completed as described in Section 143.00, Pavement Cuts, of these STANDARDS AND SPECIFICATIONS.

Before final acceptance, the project area, material pits, and ground occupied by the Contractor in connection with the work shall be cleaned of all rubbish, excess materials, temporary structures, and equipment, and all parts of the work shall be left in acceptable conditions to the satisfaction of the Town Engineer.

In the event of the Contractor's failure to perform the above work, the Town at the expense of the Contractor may perform the work.



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SECTION 400 CONCRETE WORK

410.00 GENERAL

All Portland Cement concrete work within any street, parking lot or alley right-of-way or in any part of the water system, sewage system, or storm drainage system of the Town shall meet the requirements of these STANDARDS AND SPECIFICATIONS. Engineering, plans, licenses, permits, inspection, warranties and acceptance will be as detailed in these applicable STANDARDS AND SPECIFICATIONS for the type of construction involved.

Permits will be obtained BEFORE work begins. The Contractor shall call for inspection, giving one (1) working day (twenty-four [24] hours) notice, and inspection will be made before placement of concrete can occur. Inspector's approval to place materials will be obtained by the Contractor AFTER inspection has been made and BEFORE concrete is placed. Notice of rejection shall be given to Contractor in the event any aforementioned conditions given by the Town Engineer are not met, and work shall be halted until such time as corrective action is taken. Copies of the accepted drawings and the permit shall be on the job site and available to the inspector.

420.00 MATERIALS

Concrete will be composed of Portland Cement, aggregate, and water, and shall be reinforced with steel bars or steel wire fabric where required. Admixtures other than air-entraining agents require written permission of the Town Engineer.

421.00 Cement

All cement used in concrete work shall be Portland Cement conforming to the requirements of ASTM C-150, Type I or Type II. In general, cement meeting the requirements of ASTM C 150 Type II cement shall be used in concrete that will be in contact with the soil, unless otherwise allowed or directed by the Town Engineer. Cement, which for any reason has become partially set or which contains lumps of caked cement, shall be rejected.

The Contractor shall be responsible for the proper storage of all cement until it is used. When requested by the Town Engineer, the Contractor will, at his own cost and expense, furnish the Town Engineer with a certificate from the manufacturer or an acceptable testing laboratory for each carload of cement from which cement is taken for use in the work, stating that the cement meets the requirements of these STANDARDS AND SPECIFICATIONS for Portland Cement.

422.00 Fly Ash

Fly ash may be utilized in the design mix when allowed by the Town Engineer. Fly ash shall conform to the requirements of ASTM C 618 for Class C or Class F. The pozzolanic index shall be eighty-five (85) for Class C and Class F fly ash. Class C fly ash will not be permitted where sulfate resistant cement is required.

The Contractor shall notify the Town Engineer of the source of the fly ash for review prior to use in the project. The fly ash to be used on any project shall have been tested by the Contractor for compliance with these specifications. The results of this testing shall be submitted to the Town Engineer prior to its use on the project.

When required by the Town Engineer, the Contractor shall provide the fly ash analysis performed by the fly ash supplier along with the concrete mix proportions.

423.00 Water

Water for concrete will be clean and free from sand, oil, acid, alkali, organic matter, or other deleterious substances and will meet the requirements for mix water as published in ASTM C 94. Water from public supplies or water that has been proven to be suitable for drinking is satisfactory.

424.00 Admixtures

The Contractor will use air-entraining admixtures for all surfaces of exposed concrete. Air entraining admixtures shall meet ASTM C 260. All other chemical admixtures shall meet ASTM C 494.

425.00 Fine Aggregate

Fine aggregate shall be composed of clean, hard, durable, uncoated particles of sand, free from injurious amounts of clay, dust, soft or flaky particles, loam, shale, alkali, organic matter, or other deleterious matter. Fine aggregate will be well graded from course to fine and when tested by means of laboratory sieves will meet the requirements of ASTM C 33.

Sieve Size	Percent Passing
3/8"	100
#4	95 - 100
#8	80 - 100
#16	50 - 85
#30	25 - 60
#50	10 - 30
#100	2 - 10

426.00 Coarse Aggregate

The coarse aggregate shall consist of broken stone or gravel composed of clean, hard, tough and durable stone and will be free from soft, thin, elongated or laminated pieces, disintegrated stone, clay, loam, organic, or other deleterious matter.

Coarse aggregate shall be well graded and when tested by means of laboratory sieves will meet the requirements of AASHTO M 43 #67

Sieve Size	Percent Passing
1"	100%
3/4"	90 - 100
3/8"	20 - 55
#4	0 - 10
#8	0 - 5

427.00 Colored Patterned Concrete

Where required on the accepted plans, colored patterned concrete shall comply with all applicable portions of this Section 400. In addition, the following shall apply:

- A. Minimum twenty-eight (28) day compressive strength of concrete shall be 4,000 psi.
- B. Air-entrainment shall be six percent (6%) [$\pm$ 1%] for maximum aggregate size of three-quarter inch (3/4") or one inch (1") and shall be seven and one-half percent (7.5%) [$\pm$ 1%] for a maximum aggregate size of three-eighth inch (3/8") or one-half inch (1/2").
- C. Normal set or retarded set water reducing admixture shall comply with ASTM C 494.
- D. No calcium chloride shall be added to the concrete mix.
- E. Matching integral color shall be used as a supplement, but not as a color hardener.
- F. Color hardener; Specially formulated for installation of pattern concrete, grade "Heavy Duty". Color shall be as noted on the accepted drawings or as approved by the Town Engineer.
- G. Color curing compound shall comply with ASTM C 309 and with all applicable air pollution regulations.

When approved by the Town Engineer, reinforcing fibers may be used in the mix design. The fibers must comply with Section 441.00 of these STANDARDS AND SPECIFICATIONS.

428.00 Flowfill Concrete

The following is the specification of the flowfill concrete as directed by the Town Engineer:

Mix Specifications:		
Material	ASTM Specification	Weight
Cement	ASTM C-150	42 to 50 lbs
Sand	ASTM C-33	1845 to 1850 lbs
Aggregate	ASTM C-33	1700 to 1750 lbs
Air Entrainment	ASTM C-260	5.0 ounces
Water	ASTM C-94	39 gallons

* Slump shall be six (6) to eight (8) inches

430.00 MIXING
431.00 General

All concrete shall be thoroughly mixed in a batch mixer of an approved type and capacity for a period of not less than two (2) minutes after all the materials, including the water, have been placed in the drum. During the period of mixing, the drum shall be operated at the speed specified by the manufacturer of the equipment. The entire contents of the mixer will be discharged before recharge, and the mixer will be cleaned frequently. The concrete shall be mixed only in such quantities that are required for immediate use. No re-tempering of concrete will be permitted. Hand-mixed concrete will not be permitted except by written approval of the Town Engineer.

432.00 Design of the Mix**432.01 General**

Concrete mix information shall be prepared and submitted in accordance with ACI 301 Section 4.2. Proportions shall be submitted to the Town Engineer, along with at least two (2) sets of certified twenty-eight (28) day test results, for review and acceptance. No concrete will be incorporated into the work until the Town Engineer has accepted the proportions.

432.02 Classification

Concrete will conform to the following:

Minimum compressive strength - 28 days*	4000 psi
Minimum cement - sacks/cubic yard	6 = 564 lbs
Maximum water/cement ratio - by weight	.45
Slump - inches	1-4
Air entrainment - % by volume	5-8

* When tested in accordance with ASTM C-31

433.00 Ready-Mixed Concrete

The use of ready-mixed concrete will in no way relieve the Contractor or Developer of the responsibility for proportion, mix, delivery, or placement of concrete; all concrete must conform to all requirements ASTM C-94. The information included on the delivery system should be in accordance with ASTM C-94 section 16.

Concrete shall be continuously mixed or agitated from the time the water is added until the time of use and will be completely discharged from the truck mixer or truck agitator within one and one-half (1-1/2) hours after it comes in contact with the mixing water or with the aggregates. Retempered concrete will not be allowed.

The Town will have free access to the mixing plant at all times. The organization supplying the concrete will have sufficient plant and transportation facilities to assure continuous delivery of the concrete at the required rate. (The contractor will collect delivery, or batch, tickets from the driver for all concrete used on the project and deliver them to the Town Engineer). Batch tickets will provide the following information in accordance with ASTM C-94:

- A. Name of ready-mix batch plant
- B. Serial number of ticket
- C. Date
- D. Truck number
- E. Name of purchaser
- F. Specific designation of job (name and location)
- G. Specific class or designation of the concrete in conformance with that employed in job specifications

- H. Amount of concrete in cubic yards
- I. Time loaded or of first mixing of cement and aggregates
- J. Water added by receiver of concrete and his initials
- K. Weights of fine and coarse aggregates
- L. Type, brand, and amount of cement
- M. Type, brand and amount of admixtures
- N. Weight (in gallons) of water including surface water on aggregates

440.00 REINFORCING STEEL AND FORMS

The placing, fastening, splicing and supporting of reinforcing steel and wire mesh or bar mat reinforcement shall be in accordance with the plans and the latest edition of "CRSI Recommended Practice for Placing Reinforcing Bars". All reinforcing steel shall be epoxy coated. Before being positioned, all reinforcing steel shall be thoroughly cleaned of mill and rust scale and of coatings that will destroy or reduce the bond. Where there is delay in depositing concrete, reinforcement will be re-inspected and, if necessary, cleaned.

Reinforcement shall be carefully formed to the dimensions indicated on the accepted plans by the cold bending method. Cold bends shall be made so that the inside diameter of the bend measured on the inside of the bar shall be as follows:

Bar Size	Grade 60
#3 through #8	6 bar dia.
#9, #10, and #11	8 bar dia.
#14 and #18	10 bar dia.

The inside diameter of bend for stirrups and ties shall not be less than four bar diameters for sizes #5 and smaller, and five bar diameters for #6 and #8 inclusive. Reinforcement shall not be bent or straightened in a manner that will injure the material. Bars with kinks or bends not shown on the plans will not be used. Heating of reinforcement will not be permitted.

Reinforcing steel will be accurately placed and secured against displacement by using annealed iron wire of not less than No. 18 gauge, or by suitable clips at intersections. Where necessary, reinforcing steel will be supported by metal chairs, spacers, precast mortar blocks, or metal hangers. Splicing of bars, except where shown on the plans, will not be permitted without approval of the Town Engineer.

Welded wire fabric for concrete reinforcement shall be of the gauge, spacing, dimensions, and form specified on the plans or detailed drawings and will comply with "Specifications for Welded Steel Wire Fabric for Concrete Reinforcement" (ASTM A-185) or "Specification for Welded Deformed Steel Wire Fabric for Concrete Reinforcement" (ASTM A-497).

Contractor shall submit to the Town Engineer shop drawings of the reinforcement for his review and acceptance. The Town Engineer' acceptance of shop drawings and bar schedules will not relieve the Contractor of fulfilling his responsibilities as outlined in the plans and specifications of the contract.

Unless otherwise shown on the plans, the minimum clear cover for reinforcing steel will be the following, which is specified in ACI 301, Sec. 5.5:

Bottom bars on soil bearing foundations & slabs 3 inches

Bars adjacent to surfaces exposed to weather on earth backfill:

- For bars more than 3/4" in diameter 2 inches
- For bars 3/4" or less in diameter 1-1/2 inches

Interior Surfaces: slabs, walls, joints with 1-3/8" diameter or smaller 3/4 inches

Whenever necessary, forms will be used to confine the concrete and shape it to the required lines. Forms shall have sufficient strength to withstand, without deformation, the pressure resulting from placement and vibration of the concrete. Forms shall be constructed so that the finished concrete will conform to the shapes, lines, grades and dimensions indicated on the accepted plans. Any form which is not clean and has had the surface prepared with a commercial form oil that will effectively prevent bonding and that will stain or soften concrete surfaces must not be used.

Plywood forms, plastic coated plywood forms, or steel forms shall be used for all surfaces requiring forming which are exposed to view, whether inside or outside any structure. Surfaces against backfilled earth, interior surfaces of covered channels, or other places permanently obscured from view, may be formed with forms having sub-standard surfaces.

Forms will not be disturbed until the concrete has hardened sufficiently to permit their removal without damaging the concrete or until the forms are not required to protect the concrete from mechanical damage. Minimum time before removal of forms after placing concrete will be one (1) day for footings and two (2) days for all other concrete except in curbs, gutters, and sidewalks.

441.00 Fibrous Reinforcing

When shown on the accepted plans or approved by the Town Engineer, fibrous reinforcing may be utilized. Fibrous concrete reinforcement shall be one hundred percent (100%) virgin polypropylene fibrillated fibers specifically manufactured for use as concrete reinforcement, containing no reprocessed olefin materials. The fibers shall have the following physical characteristics:

- A. Specific gravity - 0.91
- B. Tensile strength - 70,000 to 110,000 psi
- C. Fiber length - per manufacturer's recommendation for specific use (three quarters inch [3/4"] for sidewalks)

Add fibrous concrete reinforcement to concrete materials at the time the concrete is batched in the amounts recommended by the manufacturer (1.5 lb./cubic yard for sidewalks) or as indicated on the accepted plans.

Concrete shall be mixed in strict accord with the fibrous concrete reinforcement manufacturer's instructions and recommendations to assure uniform and complete dispersion.

450.00 PLACING CONCRETE

451.00 General

Before depositing concrete, debris will be removed from the space to be occupied by the concrete and the forms, including any existing concrete surfaces, shall be thoroughly wetted. Concrete shall not be placed until all forms and reinforcing steel have been inspected and accepted by the Town

Engineer. Concrete shall be handled from the mixer to the place of final deposit as rapidly as possible by methods that prevent separation or loss of ingredients. The concrete shall be deposited in the forms as nearly as practicable in its final position to avoid rehandling.

It will be deposited in continuous layers, the thickness of which generally will not exceed twelve (12) inches. Concrete shall be placed in a manner that will avoid segregation and will not be dropped freely more than five (5) feet. If segregation occurs, the Town Engineer may require the concrete to be removed and replaced at the Contractor's expense. Concrete will be placed in one continuous operation, except where keyed construction joints are shown on the plans or as approved by the Town Engineer. Delays in excess of thirty- (30) minutes may require removal and replacement of that pour, as determined by the Town Engineer.

452.00 Vibrating

Concrete shall be thoroughly compacted or vibrated. All concrete will be compacted by internal vibration using mechanical vibrating equipment, except that concrete in floor slabs, sidewalks, or curb and gutter, not poured against form linings, will be either tamped or vibrated. Care must be taken in vibrating the concrete to vibrate only long enough to bring a continuous film of mortar to the surface. Vibration will stop before any segregation of the concrete occurs. Mechanical vibrators will be an approved type as specified in ACI Publication 309, Chapter 5. Vibrators shall not be used to move or spread the concrete.

Any evidence of lack of consolidation or over-consolidation will be regarded as sufficient reason to require the removal of the section involved and its replacement with new concrete at the Contractor's expense. The Contractor shall be responsible for any defects in the quality and appearance of the completed work.

453.00 Workability

The consistency of concrete will be kept uniform for each class of work and will be checked by means of slump tests. The workability of the concrete will be varied as directed by the Town Engineer. At all times concrete will have a consistency such that it can be worked into corners and angles of the forms and around joints, dowels and tie-bars by the construction methods which are being used without excessive spading, segregation or undue accumulation of water or laitance on the surface. If, through accident, intention, or error in mixing, any concrete fails to conform to the proportions of the approved mix design, such concrete will not be incorporated in the work but shall be discarded off the project site as waste material at the Contractor's expense. If approval is obtained and water is added at the job site, slump tests will be run and test cylinders cast following the addition of the water. Any expense incurred in excess of ordinary tests will be borne by the Contractor.

454.00 Colored Patterned Concrete

Special concrete mix with integral color shall be placed and screeded to the proper grade, and floated to a uniform surface in the normal manner for slabs on grade.

While the concrete is still plastic, the imprinting tools shall be applied to make the desired patterned surface. The pattern shall be matched at imprint edges and joints.

Color Curing Compound, thinned in the proportion of one (1) part cure to one (1) part mineral spirits (paint thinner), shall then be applied uniformly with a roller or sprayer. The coverage shall be



CONCRETE WORK

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approximately six hundred (600) to six hundred fifty (650) square feet per gallon of un-thinned curing compound. At times when the air temperature is at or near freezing, the slab shall instead be cured using a suitable curing blanket and, if possible, the slab shall later be sealed with the Color Curing Compound at such time as the air temperature is above freezing.

Use blankets and/or heaters as may be necessary to maintain the concrete at or above fifty ⁻(50) degrees Fahrenheit for three (3) days after placement.

The surface shall be cleaned to remove any residual materials.

460.00 JOINTS

461.00 Materials

Joint materials will conform to AASHTO Specifications according to type as follows:

Concrete joint sealer, hot-poured elastic.....	M 173
Preformed expansion joint filler (Bituminous Type).....	M 33
Preformed sponge rubber and cork expansion joint fillers	M 153
Preformed expansion joint fillers - non-extruding & resilient bitum.....	M 213

Non-bituminous types shall be placed in widths shown on the accepted plans or three-eighths inch (3/8") when not specified. Bituminous type shall be used for concrete paving and structural construction where joint sealers are not called for.

462.00 Spacing

462.01 Expansion Joints

Expansion joint material will be provided at the following locations and will be in place prior to the placing of concrete:

- A. at each end of curb return;
- B. between back of sidewalk and driveway slab or service walk;
- C. between new concrete and existing masonry buildings;
- D. as shown on the drawings;
- E. as directed by the Town Engineer;
- F. between new and existing concrete.

462.02 Contraction Joints

For Curb, Gutter & Sidewalks: Transverse joints will be placed at maximum intervals of ten (10) feet to control random cracking; joints will be sawed or tooled to minimum depth of one-fourth (1/4) of the total thickness (no less than one and one-half [1 ½] inches).

For Concrete Trails greater than 5' (feet): Transverse joints will be placed at maximum intervals of ten (10) feet to control random cracking; joints will be sawed to minimum depth of one-fourth (1/4) of the total thickness (no less than one and one-half [1 ½] inches).

462.03 Tool or Saw Joints

Tool or saw joints will be spaced as follows:

- A. Not more than ten (10) feet nor less than five (5) feet apart in curb and gutter and combination curb-walk
- B. Not more than ten (10) feet nor less than five (5) feet apart in sidewalk
- C. At least two joints, equally spaced at not greater than ten (10) foot intervals as applicable in driveways
- D. As directed by the Town Engineer

470.00 FINISHING AND CURING

Exposed faces of curbs and sidewalks shall be finished to true-line and grade as shown on the plans. Surface will be floated to a smooth but not slippery finish. Sidewalk and curb will be broomed or combed and edged, unless otherwise indicated by the Town Engineer. After completion of

brooming and before concrete has taken its initial set, all edges in contact with the forms will be tooled with an edger having a three-eighths inch (3/8") radius.

No dusting or topping of the surface to facilitate finishing will be permitted.

Immediately following the removal of the forms, all fins and irregular projections will be removed from all surfaces except from those that are not to be exposed or are not to be waterproofed. On all surfaces, the cavities produced by form ties, honeycomb spots, broken corners or edges, and other defects, shall be thoroughly cleaned, moistened with water and carefully pointed and trued with a mortar consisting of cement and fine aggregate. The surface must be left sound, smooth, even, and uniform in color. Mortar used in pointing will not be more than thirty (30) minutes old. All construction and expansion joints in the completed work shall be left carefully tooled and free of all mortar and concrete. The joint filler shall be left exposed for its full length with clean and true edges.

Fresh concrete shall be adequately protected from weather damage and mechanical injury during the curing periods. Curing processes described herein may be used at the option of the Town Engineer. The selected curing process shall be started as soon as it can be done without injury to the concrete surface. The use of a membrane-curing compound is recommended. The following curing procedures may be used subject to the approval of the Town Engineer:

- A. ponding (for slabs or footings)
- B. spraying
- C. wet burlap, earth, or cotton mats
- D. waterproof paper or polyethylene plastic cover

Membrane curing compound will not be used when the concrete surface will be painted. The type of membrane curing compound chosen shall not permanently discolor the concrete surface. Where membrane-curing compound is not used, the curing process will be carefully adhered to as follows:

- A. Surfaces being wetted by ponding, spraying, or wetted material will be kept completely wetted, with an excess of free water on the surface, at all times for the first seventy-two (72) hours. After this period, but for the remaining four (4) days, a wetting schedule will be followed whereby the concrete is wetted on a schedule approved by the Town Engineer.

- B. Surfaces being protected by waterproof paper or polyethylene plastic cover will receive special attention during the first seventy-two (72) hours to insure there is actually free moisture on the surface of the concrete under the waterproof surface. The Town Engineer may require the removal of the cover and a wetting of the surface when, in his judgment, there is insufficient moisture for curing. After the first seventy-two (72) hours the cover will be kept tightly in place for the remainder of the curing period.

480.00 PROTECTION**481.00 Cold Weather Concreting**

During extreme weather conditions, placing of concrete will be permitted only when the temperature of the concrete placed in the forms shall not be less than 50 degrees F nor more than 90 degrees F. To maintain this temperature range, the Contractor shall provide acceptable heating apparatus for heating the aggregates and the water. Cold weather placement of concrete shall follow the requirements and recommendations of ACI Manual 306.

Concrete may be placed when the air temperature in the shade is 35 degrees F, and rising.

No concrete shall be placed, regardless of the present temperature, when the weather forecast promises freezing weather before final set of the concrete unless special means of heating and protection are used, which must be approved by the Town Engineer. Protection against freezing is the Contractor's responsibility regardless of the weather forecast or climatic conditions at the time of placing.

Small structures and slabs may be protected by completely covering fresh concrete with blankets. Large structures or vertical walls will be protected against freezing by enclosing the structure and heating with salamanders, heaters, or other devices capable of providing uniform and even heat throughout the structure. Heaters must be vented so that combustion gases are exhausted outside the enclosure in order to avoid carbonation of the fresh concrete.

Cold weather is defined as a period when, for more than three (3) consecutive days, the following conditions exist:

- A. The average air temperature is less than 40 degrees F, and
- B. The air temperature is not greater than 50 degrees F for more than one half of any 24 hr. period.

Concrete placed in cold weather will be protected from extreme temperatures as follows:

- A. A temperature of at least 50 degrees F for the first seventy-two (72) hours will be maintained.
- B. After the first seventy-two (72) hours and until the concrete is seven (7) days old; it will be protected from freezing temperatures.
- C. Concrete adjacent to heaters or salamanders will be insulated from direct heat of the unit that may dry it out prior to being properly cured.
- D. Temperatures will be measured by maximum and minimum thermometers furnished by the Contractor and installed adjacent to the concrete.

Concrete slabs will not be placed, regardless of temperature conditions, if the supporting ground is frozen or contains frost. Use of salt or other additives to prevent concrete from freezing is not allowed. Concrete that has been frozen will be completely removed and replaced as directed by, and to the satisfaction of, the Town Engineer.

482.00 Hot Weather Concreting

Except by written authorization, concrete will not be placed if the temperature of the plastic concrete cannot be maintained at 90 degrees F or lower. The placement of concrete in hot weather shall comply with ACI 305. Forms and reinforcing shall be cooled to a maximum of 90 degrees F or lower.

490.00 MISCELLANEOUS**491.00 Repairs**

After stripping of the forms, if any concrete is found to be not formed as shown on the accepted plans or is out of alignment or level, or shows a defective surface, it will be considered as not conforming with the intent of these STANDARDS AND SPECIFICATIONS and will be removed and replaced by the Contractor at his expense unless the Town Engineer gives written permission to patch the defective area. In this case, patching shall be done as described in the following paragraphs. Defects that require replacement or repair are those that contain honeycomb, damage due to stripping of forms, loose pieces of concrete, bolt-holes, tie-rod holes, uneven or excessive ridges at form joints, and bulges due to movement of the forms. Ridges and bulges will be removed by grinding. Honeycombed and other defective concrete that does not affect the integrity of the structure shall be chipped out, and the vacated areas will be filled in a manner acceptable to the Town Engineer. The repaired area shall be patched with a non-shrink, non-metallic grout with a minimum compressive strength of five thousand (5,000) psi in twenty-eight (28) days. All repair areas treated with an epoxy-bonding agent will have the approval of the Town Engineer before the repair filling is placed.

Bolt-holes, tie-rod holes, and minor imperfections as approved by the Town Engineer, will be filled with dry-patching mortar composed of one (1) part Portland cement to two (2) parts of regular concrete sand (volume measurement) and only enough water so that after the ingredients are mixed thoroughly, the mortar will stick together on being molded. Mortar repairs will be placed in layers and thoroughly compacted by suitable tools. Care will be taken in filling rod and bolt holes so that the entire depth of the hole is completely filled with compacted mortar. The mortar mix proportions described above are approximate.

An approved mix will be prepared by a commercial testing laboratory to insure that grout has a twenty-eight (28) day compressive strength equal to that of the area on which it is placed. All costs for mix design and the Contractor will pay testing. Those areas with excessive deficiencies as determined by the Town Engineer will be removed and replaced at the Contractor's expense. Where repairs are made in existing sidewalks, all edges of the old sidewalk allowed to remain will be sawcut to a minimum depth of one half ($\frac{1}{2}$) the existing thickness of concrete. No rough edges will be permitted where new construction joins the old section. Unless directed by the Town Engineer, no section less than five (5) feet in length will be placed or left in place. Where new sidewalk construction abuts existing sidewalks, the work will be accomplished so that there is no abrupt change in grade between the old section and the new work.

492.00 Cleanup

The exposed surfaces of the concrete will be thoroughly cleaned upon completion of the work, and the site will be left in a neat and orderly condition.

493.00 Backfilling

When side forms are removed and the concrete has gained sufficient strength, the space adjoining the concrete shall be promptly backfilled with suitable material, properly compacted, and brought flush with the surface of the concrete and adjoining ground surface. In embankments, the backfill will be level with the top of the concrete for at least two (2) feet and then sloped as shown on the accepted plans or as directed by the Town Engineer. The Contractor, at his expense, will repair existing pavement that is damaged during construction. The first two (2) feet of patching to match existing asphalt or concrete will be the Contractor's responsibility.

494.00 Testing**494.01 General**

The requirements of this section will apply to testing services for all concrete curb and gutter, sidewalk, pavement, slope paving, retaining walls, structures, and for all miscellaneous concrete testing.

Concrete materials and operations will be tested as directed by the Town Engineer and as herein stipulated. The required testing services will be performed by a designated testing agency acceptable to the Town Engineer and all testing agencies will meet the requirements of ASTM E329.

A representative of the testing agency will inspect, sample, and test material and production of concrete as required by the Town Engineer. When it appears that any material furnished or work performed by the Contractor fails to fulfill specification requirements, the testing agency will report such deficiency to the Town Engineer and the Contractor.

The testing agency shall report all test and inspection results to the Town Engineer and Contractor immediately after they are performed. All test reports will include the exact location of the work at which the batch represented by a test was deposited. The report of the strength test will include detailed information on storage and curing of specimen prior to testing, the project number, and the location of the concrete (curb, manhole, inlet, sidewalk, paving, etc.).

The testing agency or its representative is not authorized to revoke, alter, relax, enlarge or release any requirements of these STANDARDS AND SPECIFICATIONS, nor approve or accept any portion of the work.

494.02 Tests Provided by the Contractor

The following services shall be performed by the designated testing agency at the expense of the Contractor or Developer:

- A. Conduct strength test of the concrete during construction in accordance with the following procedure: Secure composite samples in accordance with AASHTO T141;

mold and cure specimens from each sample in accordance with AASHTO T23. The maximum time between sampling and casting the cylinders or beams shall be forty-five (45) minutes. If they cannot be returned to the laboratory and cast within the forty-five (45) minutes, they will be cast in the field and transported to the laboratory in twelve (12) to twenty-four (24) hours. One test series will be taken per fifty (50) cubic yards (or fraction thereof) of the concrete placed per day, or as directed by the Town Engineer.

1. Field cured test series:
Four (4) cylinders; one (1) to be broken at seven (7) days; one (1) to be broken at fourteen (14) days; one (1) to be broken at twenty-eight (28) days; one (1) to be held or as directed by the Town Engineer.
2. Lab cured test series:
Four (4) cylinders; One (1) to be broken at seven (7) days; two (2) to be broken at twenty-eight (28) days*; one (1) to be broken at fifty-six (56) days if necessary.
**If the specified strength is not obtained at twenty-eight (28) days, one (1) cylinder is to be broken at fifty-six (56) days.*

- B. Determine slump of the concrete sample of each strength test whenever consistency of concrete appears to vary, or when directed by the Town Engineer, in accordance with AASHTO T119.
- C. Determine air content of the concrete sample for each strength test in accordance with AASHTO T152 (pressure method), T196 (volumetric method), or T121 (gravimetric method).
- D. Sample additional concrete at point of placement, and perform other testing or inspection service as required.
- E. When required by the Town Engineer, the Contractor or Developer will provide concrete mix designs, the results of which will be immediately reported to the Town Engineer. When pumped concrete is to be used, a separate mix design will be required. Mix designs will be in accordance with ACI 211 and 304, as applicable.
- F. Additional testing and inspection required because of changes in materials or proportions.
- G. If the work fails to pass inspection or previous tests fail to meet specifications, additional tests will be taken as directed by the Town Engineer.
- H. Core samples will be obtained and tested when samples of fresh concrete were not obtained and tested in accordance with the provisions of these STANDARDS AND SPECIFICATIONS. Obtaining and testing cores will be in accordance with ASTM C42. Concrete in the area represented by a core test will be considered adequate if the average strength of the cores is equal to at least eighty-five percent (85%) of the specified strength f'_c , and if no single core is less than seventy-five percent (75%) of the specified strength. Core holes will be filled with low slump concrete or mortar. Cores may be tested in the dry condition in accordance with ACI 301.
- I. Failure of the Contractor to furnish testing as herein described will be sufficient cause for rejection of the work in question.

494.03 Test Result Submittals

The testing agency shall submit field and laboratory test results to the contractor upon completion of sampling and testing. Any failing or sub-standard results shall be submitted to the Town



Inspector immediately. All results shall be submitted to the Town of Firestone Town Engineer prior to Initial Acceptance.

494.04 Responsibility and Duties of the Contractor

The Contractor will provide the testing agency with the following:

- A. Any labor necessary to assist the designated testing agency in obtaining and handling samples at the project or from other sources of material.
- B. Provide and maintain for the sole use of the testing agency adequate facilities for safe storage and proper curing of concrete test specimens on the project site as required by AASHTO T23.

The use of testing services shall not relieve the Contractor of the responsibility to furnish material and construct in full compliance with these STANDARDS AND SPECIFICATIONS.

SECTION 500 ROADWAY & ASPHALT DESIGN

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SECTION 500 ROADWAY & ASHPALT DESIGN**510.00 GENERAL****511.00 Applicability**

This Section contains design and testing criteria that must be met on all newly designed and constructed streets and parking lots (public or private) in the Town.

511.01 Situation Variances

Where any particular requirements contained in this Section of these STANDARDS AND SPECIFICATIONS can be shown to be inappropriate when applied to an out-of-the-ordinary situation, variances to said minimum requirements will be considered and may be authorized by the Town Engineer. The proposed variance in the requirements must result in a level of safety, service, and quality equal to or greater than that intended by the application of said requirements.

512.00 Private Street Systems

Private street systems will be subject to all requirements of these STANDARDS AND SPECIFICATIONS. The Town Engineer, as provided for in Section 511.01 of these STANDARDS AND SPECIFICATIONS, may allow variances, subject to the review and acceptance.

513.00 Town Capital Improvement Projects

It is recognized that the requirements contained in these STANDARDS AND SPECIFICATIONS are not necessarily sufficient for plans, specifications, and contract administration purposes for Town administered street capital improvement projects. Accordingly, the Town Engineer is authorized to develop and/or approve such additional requirements and procedures necessary for bidding, award, and construction administration for such projects. Additional said requirements and procedures must be consistent with these STANDARDS AND SPECIFICATIONS and all applicable provisions of other Town codes.

514.00 Final Overlay

Final Overlay shall not be scheduled until 2 years have expired since the initial construction surface was installed, at 100% built out, or as approved by the Town Engineer.

When determined necessary by the Town Engineer, prior to installation of the final bituminous surface course, the developer will furnish the Town Engineer with two (2) copies of a report, prepared by a Registered Professional Engineer licensed to practice in Colorado, utilizing non-destructive deflection testing to assess and predict the performance of the pavement.

The Professional Engineer will have a past history and knowledge in performing these tests. Qualifications of Professional Engineer must be submitted to the Town Engineer for acceptance before the start of work.

The pavement evaluation will be performed in accordance with good engineering practices. The report will generally embody the following testing and pavement evaluation techniques:

- A. Environmental study (frost cycle, drainage, etc.)
- B. Pavement surface evaluation
- C. Soil borings in areas of high deflections
- D. Pavement deflection analysis (Dynaflex, Benkelman Beam, etc.)

The report will evaluate the existing condition of the base and binder course by performance of deflection tests at a minimum of one hundred foot (100') spacing per traffic lane. The report will determine the thickness of the final lift to ensure that the pavement section will meet a twenty (20) year (or greater) pavement life.

The Pavement Evaluation Report will not be considered valid unless the wearing surface is applied during the same construction season as the testing was done.

515.00 Traffic Control Plan

Contractor will be responsible for submitting a traffic control plan that was designed and approved by a certified TCS (Traffic Control Supervisor) for review and acceptance prior to construction. The Traffic Control Plan must be in conformance with Section 141.08, Traffic Control, Barricades and Warning Signs, of these STANDARDS AND SPECIFICATIONS.

520.00 DESIGN CRITERIA

Street design, construction and right of way requirements will conform to the provisions of these STANDARDS AND SPECIFICATIONS. Street design criteria for various street types are listed in Table 500-3, Section 525.00 Vertical Alignment, and the Standard Details. The requirements of the Town's Municipal Code and Comprehensive Master Plan will be met. Throughout this Section reference to a "Qualified Soils Engineer" shall mean a soils engineer who is a Registered Professional Engineer licensed to practice in Colorado.

521.00 Geometric Cross Sections, Intersections and Street Layout

Street cross sectional elements will conform to the Town of Firestone's Transportation Master Plan. Generally, local residential cross sections will be used in areas where average daily traffic (ADT) is not likely to exceed one thousand (1,500) vehicles per day. Collector and arterial streets will be constructed whenever the alignment of the proposed street is generally the same as the collector and arterial streets shown on the Transportation Master Plan, and whenever a traffic engineering analysis of the future traffic volumes indicates the need of a cross section greater than that of a local service street.

Additional right of way may be required to satisfy other criteria contained in these STANDARDS AND SPECIFICATIONS. Areas outside the Right of Way will be graded, compacted, and sloped, as required for proper drainage, soil stability, and maintenance accessibility. Cuts and fills proposed on slopes greater than four horizontal to vertical (4:1) will require supporting calculations done by a qualified soils engineer based on a soils analysis.

521.01 Alleys

All alleys, when permitted by the Town Engineer, shall be paved to a full width and shall provide paved access to a paved street at both ends. Minimum right-of-way widths are 16' without utilities and 30' with utilities. Pavement minimum width is 12'. Dead end alleys shall be 150' maximum length

and alleys greater than 600' in length shall have a secondary access to a residential street. Any more restrictive requirements by the Fire Department shall supersede these standards.

521.02 Emergency Access

Emergency access roads shall have a minimum of right-of-way width of 20' and a minimum roadway width of 18'.

521.03 Intersection Design Guide

The purpose of this document is to identify the mandatory requirements and to provide guidelines for choice where alternatives exist. The guidelines represent a combination of material from authoritative references and research reports combined with the consensus of a broad based Technical Advisory Committee of transportation professionals.

521.03.01 Requirements and Objectives

The guidelines presented in this document are based on the premise that the design of an intersection must conform in all respects to the provisions of the Colorado Statutes and rules, plus all authoritative references that have been adopted as standards by Colorado Department of Transportation (CDOT).

In addition, the design should be such that it provides:

- Safe and convenient operation for all road users, including cyclists and pedestrians;
- Proper accessibility for pedestrians with special needs;
- Adequate capacity for peak-hour demand on all movements;
- Adequate maneuvering space for design vehicles;
- Resolution of conflicts between competing movements;
- Reasonable delineation of vehicle paths;
- Adequate visibility of conflicting traffic;
- Storage for normal queuing of vehicles;
- Appropriate access management application;
- Minimum delay and disutility to all road users;
- Proper drainage of storm water;
- Accommodation for all utilities, both above and below the ground;
- Necessary regulatory, warning and informational messages for all road users;
- Suitable advance warning of all hazards;
- Uniformity of treatment with similar locations;

521.03.02 Intersection Geometric Design Guide

General Design Analysis

Geometric design involves the proportioning of the visible elements of highway facilities. It includes the design of horizontal alignment, vertical alignment, and cross section elements such as shoulder, median, curb, barrier, sidewalk, etc. These elements provide the framework for the design of other highway elements including traffic control devices, roadway lighting, pavement design, drainage, and structural design.

Although the design of an intersection may be influenced by constraints unique to its particular location or situation, it conforms generally to the following design principles:

- The design of intersections along a given street or highway should be as consistent as possible.
- The layout of the intersection should be as simple as is practical.
- The design of all intersection elements should be consistent with the approach design speeds.
- The approach roadways should be free from steep grades or sharp horizontal or vertical curves.
- Intersections should be as close to right angle as practical.
- Sight distance should be sufficient for crossing and turning maneuvers.
- The intersection layout should encourage smooth flow and discourage wrong way movements.
- Auxiliary turn lanes should be provided on high-speed and/or high-volume facilities.
- Acceleration lanes are desirable for entrance maneuvers onto high-speed facilities.
- Design must give special attention to the provision of safe roadside clear zones and horizontal clearance.
- The intersection arrangement should not require sudden and/or complex decisions.
- The layout of an intersection should be clear and understandable.
- Special consideration should be given to requirements for accommodating bicycle and pedestrian movements.

521.03.03 Functional Classification

Functional classification is the assignment of roads into systems according to the character of service they provide in relation to the total road network. The three main categories of roads are arterials, collectors and locals. All roads on section lines shall be designed as arterial streets. Collector streets are defined as having projected traffic volumes of 1,500 vehicles per day or more. The design engineer shall consider existing and future traffic flows when designing streets and determining classification.

521.03.04 Intersection Control

At-grade intersections on that are typically controlled by stop signs (i.e., stop controlled) or traffic signals (i.e., signalized). The type of intersection control has a direct effect on a number of geometric design features, including sight distance and storage length of auxiliary lanes.

Area type is typically classified as urban or rural. Each of these area types has fundamentally different characteristics with regard to development and types of land use, density of street and highway network, nature of travel patterns and ways in which these elements are related. Consequently, the intersection design requirements for each of these areas vary.

Design speed is a principal design control that regulates the selection of many of the project standards and criteria used to design a roadway project. It must be selected very early in the design process. The selection of an appropriate design speed must consider many factors. The AASHTO Green Book has a thorough discussion on design speed and these factors.

521.03.05 Intersection Vertical Alignment Grade Considerations

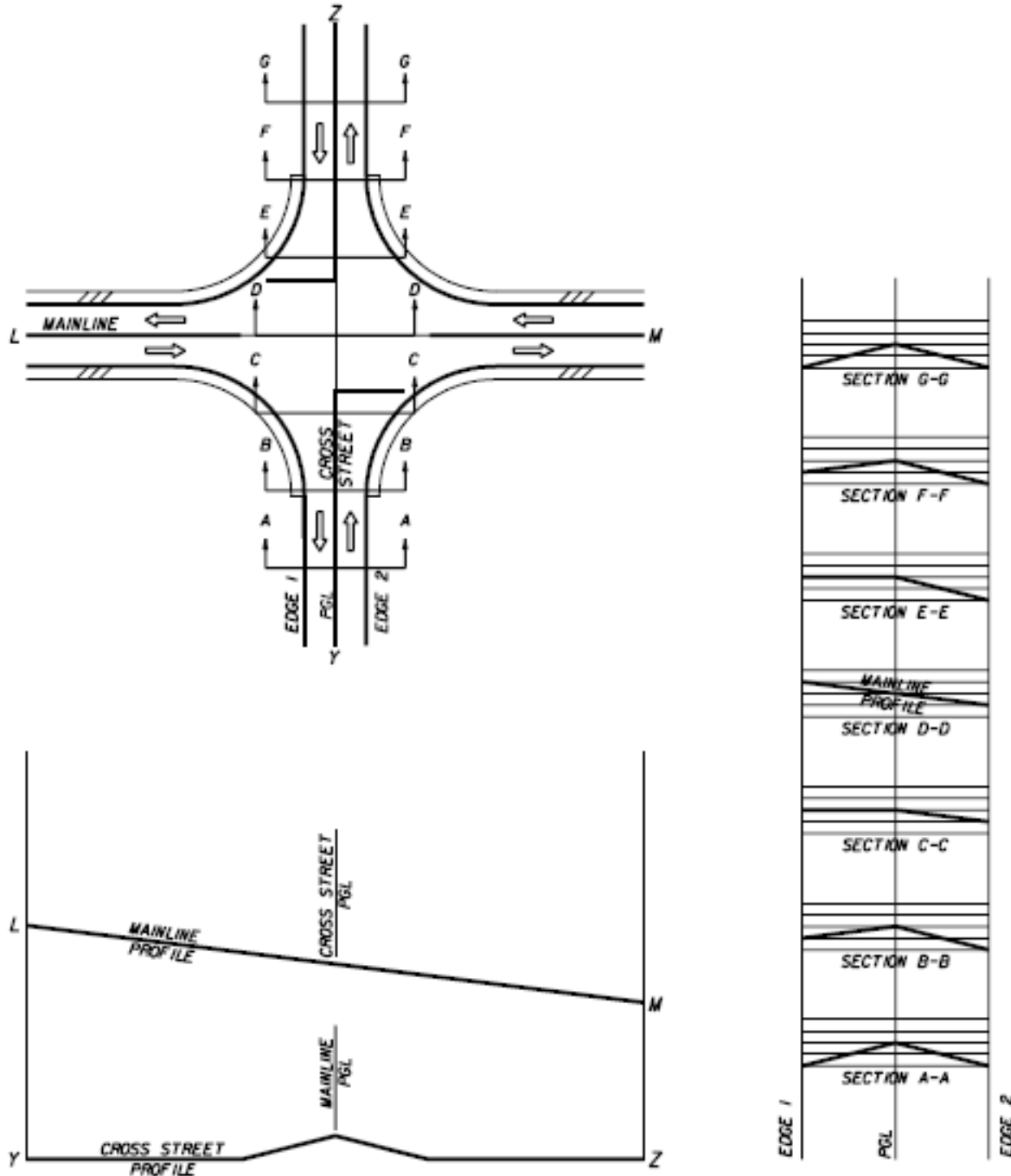
The profile grade line defines the vertical alignment for roadway and bridge construction. As with other design elements, the characteristics of vertical alignment are influenced greatly by basic controls related to design speed, traffic volumes, and functional classification, drainage, and terrain conditions. Within these basic controls, several general criteria must be considered, including minimum and maximum grades, vertical curvature, and maximum change in grade without vertical curves, vertical clearance, and design high water.

As a rule, the alignment and grades are subject to greater constraints at or near intersections than on the open road. Their combination at or near the intersection should produce traffic lanes that are clearly visible to drivers at all times and clearly understandable for any desired direction of travel, free from sudden appearance of potential conflicts and consistent in design with the portions of the highway just traveled.

Combinations of grade lines that make vehicle control difficult should be avoided at intersections. Substantial grade changes should be avoided at intersections. Adequate sight distance should be provided along both intersecting roads and across their included corners, even where one or both intersecting roads are on vertical curves. The gradients of intersecting roads should be as flat as practical on those sections that are to be used for storage of stopped vehicles.

Most drivers are unable to judge the increase and decrease in stopping or accelerating distance that is necessary because of steep grades, grades listed in Section 500 Town Street Construction should be used on intersecting roads in the vicinity of the intersection.

The profile grade lines and cross sections on the intersection legs should be adjusted for a distance back from the intersection proper to provide a smooth junction and proper drainage. Normally, the grade line of the major road should be carried through the intersection and that of the minor road should be adjusted to it. This design involves a transition in the crown of the minor road to an inclined cross section at its junction with the major road, as demonstrated in the following figure.



521.03.06 Special Intersection Profiles

To ensure a safe, efficient, well drained, and smooth roadway system, the profiles of some roadway elements requiring special analysis must be provided. These elements include pavement edges or gutter flow line at street intersections, profile grade line, intersection plateau, curb returns and roadway sections requiring special super elevation details. The special profiles shall include details at close intervals and at a scale large enough to clearly identify all construction details of these elements.

521.03.07 Intersection Plateau

The profile of the major highway generally takes precedence over the minor cross street. This results in a hump for the cross street profile which is particularly undesirable for signalized intersections where the cross street traffic may enter the intersections without stopping. In some instances the designer may determine that the cross street should receive the same profile considerations as the major highway due to similar traffic demands. To provide this "equal treatment", with respect to profile, a technique commonly known as intersection plateauing is applied. Plateauing refers to the transitioning of the roadway profiles and cross slopes at the approaches of an intersection.

521.03.08 Cross Slope

The rate of change in pavement cross slope, when warping side streets at intersections, shall not exceed one (1) percent every twenty five (25) feet horizontally on local streets/roads, one (1) percent every thirty seven and one half (37.5) feet horizontally on collector streets/roads, or one (1) percent every fifty six and one half (56.5) feet horizontally on arterial streets/roads to ensure public travel safe transition.

521.03.09 Auxiliary Lanes

Auxiliary lanes provide for the safe acceleration or deceleration of turning traffic on and off roadways and help reduce the accident potential of turning vehicles. All auxiliary lane requirements are based on the Colorado Department of Transportation's (CDOT) State Highway Access Code and the Town's Street Design Criteria found in Table 500-3 at the end of Section 500. Background traffic from adjoining developments must be considered to anticipate future street system use. The developer shall be responsible for the cost of all additional auxiliary lanes needed to comply with the Town of Firestone access code.

Right-turn Deceleration Lane

	Minimum Right-Turns to Require Deceleration Lane (vph)	Deceleration Lane and Taper Length (ft)	Taper Rate
Principal Arterial (CDOT NR-A)	25	435	13.5:1
Minor Arterial (CDOT NR-B)	25	370	12:1
Collector (CDOT NR-C)	50	310	10:1

Left-turn Deceleration Lane

	Minimum Left-Turns to Require Deceleration Lane (vph)	Deceleration Lane Including Taper Length (ft)	Taper Rate
Principal Arterial (CDOT NR-A)	10	435 + Storage	13.5:1
Minor Arterial (CDOT NR-B)	10	Storage + Taper	12:1
Collector (CDOT NR-C)	25	Storage + Taper	10:1

Storage Lengths

Turning Vehicles Per Hour	< 30	30-59	60-99	100- 199	200- 299	>300
Storage Length (ft)	25	40	50	100	200	300

Right-turn Acceleration Lane

	Minimum Right-Turns to Require Acceleration Lane (vph)	Acceleration Lane Including Taper Length (ft)	Taper Rate
Principal Arterial (CDOT NR-A)	50	550	13.5:1
Minor Arterial (CDOT NR-B)	N/A	--	--
Collector (CDOT NR-C)	N/A	--	--

521.04 Medians

All medians shall be designed so that there is no interference with traffic flow. The nose of medians shall be a minimum of 10 feet behind the flowline of the intersected street. The minimum radius shall be 2 feet to flowline. Only spill curb & gutter should be used to construct all medians unless otherwise approved by the Town Engineer.

522.00 Half Streets

Where half streets are allowed, sufficient additional right of way will be dedicated and additional width will be constructed to allow sufficient paved width to accommodate two directions of traffic and emergency parking by offsetting the geometric cross section.

523.00 Structural Sections
523.01 Structural Sections for Streets

Structural sections for streets shall be composite sections of base and asphalt.

Structural sections for streets shall be designed by a qualified soils engineer based on the Equivalent (18 Kip) Daily Load Applications (EDLA) for a twenty (20) year service life and the subgrade support analysis. The soils analysis shall be performed in accordance with AASHTO standard methods of surveying and sampling Soils. The field investigation shall consist of boring subgrade soils to a depth of at least four feet below proposed subgrade elevation (nine (9) feet below proposed subgrade on arterial roadways), at spacing of not more than two hundred fifty (250) feet, or a minimum of one boring for each section of street. The Hveem Stabilometer design method will be used for arterial streets, and either the Hveem Stabilometer or the California Bearing Ratio (CBR) design method will be used for all other streets. The *preliminary* structural section will be a twenty (20) year design section with a temporary cross slope of 1.2% - 1.6% from flow line to centerline as shown in the Standard Drawings. The following standards provide the minimum acceptable pavement sections for public roadways in the Town of Firestone. These pavement thicknesses may be used for preliminary planning purposes. Final pavement designs must be based on a geotechnical pavement design.

	EDLA	Composite Section	
		Base	Asphalt
Local Residential			
< 50 D.U.	8	8"	4"
> 50 D.U.	10	8"	4"
Collector			
70' Right-of-way Width	30	8"	4"
80' Right-of-way Width	100	9"	6"
Minor Arterial	200	9"	6"
Principal Arterial	200	12"	8"

Portland Cement concrete pavement designs may be allowed with Town Engineer approval of the design thickness.

524.00 Horizontal Alignment

Streets shall generally be aligned to bear a reasonable relationship to topography. Horizontal curves will conform to the street design criteria listed in Table 500-3 and Section 525.00 Vertical Alignment. Minimum spacing between intersection centerlines will be as follows:

Street Type	Spacing
Local Residential	150'
Collector	400'
Arterial	1000'

Where the minimum centerline radius, noted in Table 500-3 and Section 525.00 Vertical Alignment, for through local residential streets cannot be achieved due to difficult parcel configurations and other

constraints, a lesser centerline radius with a bulb on the outside of the curve as shown in the Standard Drawings will be allowed. The minimum centerline radii noted in Table 500-3 and Section 525.00 Vertical Alignment are permitted only where sufficient sight distance to the intersection is provided to enable the driver entering the curve and approaching the intersection to perceive that a stop condition exists, warranting at least a voluntary 10 m.p.h. reduction in speed before entering the curve.

Angles of intersection should, wherever possible, be maintained at ninety- (90) degrees. Horizontal and vertical alignment and right of way limits will be coordinated so as not to obstruct sight distance at intersections, in accordance with the Standard Drawings. Curb return radii will be as shown on Table 500-3 and Section 525.00 Vertical Alignment. Where two different street types connect, the larger curb return radius will apply.

525.00 Vertical Alignment

Street centerline profile grades will be as shown on Table 500-3 and Section 525.00 Vertical Alignment. Where a street is curved and minimum profile grade is desired, the centerline grade will be adjusted so that the curb line grade on the outside of the radius will be no less than the minimum street grade specified on Table 500-3 and Section 525.00 Vertical Alignment. Safe stopping sight distances are illustrated in the Standard Drawings.

Centerline profile grades will not exceed four percent (4%) for a distance of at least one hundred feet (100') either side of an intersecting centerline. Gutter flow line grades will be no less than eight-tenths percent (0.8%) along curb returns, in cul-de-sacs and bulb areas, and other areas where gutter flow line grades do not directly parallel centerline profile grades.

525.01 Roadway Functional Classification

See Section 521.03.03 for definitions.

525.02 Vertical Curve

Vertical curves to effect gradual changes between tangent grades may be any one of the crest or sag types. Vertical curves should be simple in application and should result in a design that is safe and comfortable in operation, pleasing in appearance, and adequate for drainage. The major control for safe operation on crest vertical curves is the provision of ample sight distances for the design speed selected. It is recommended that all vertical curves should be designed to provide at least the stopping sight distances shown in the approved tables within this document.

525.03 Crest Vertical Curves

Minimum lengths of crest vertical curves based on sight distance criteria generally are satisfactory from the standpoint of safety, comfort, and appearance. Computations are based on 3.5 feet for height of eye in passing sight situations and 2 feet for height of object for stopping sight situations.

The minimum lengths of vertical curves for different values of A (algebraic difference) to provide the minimum stopping sight distance for each design speed are listed below in the table. K values are based on the following formula $V = K * A$ (V – Vertical Curve Length; K – rate of vertical curvature; A – Algebraic Difference) and the designer should solve for K, to evaluate and compare to the table listed below.

For example: A design speed of 25 mph requires a minimum K value of 15 and anything less than 15 would not satisfy the required 25 mph speed limit for safety and stopping sight distance based on AASHTO criteria.

Design Controls for Stopping Sight Distance and for Crest Vertical Curves

Design Speed (mph)	Stopping Sight Distance (feet)	Rate of Vertical Curvature (K)
15	80	5
20	115	10
25	155	15
30	200	20
35	250	30
40	305	45
45	360	65
50	425	85
55	495	115

For minimum passing sight distances the lengths of crest vertical curves are substantially longer than those for stopping sight distances. Generally it is impractical to design crest vertical curves to provide for passing sight distance because of high cost. Passing sight distance on crest vertical curves may be practical on roads with unusual combinations of low design speeds and gentle grades or higher design speeds with very small algebraic differences in grades.

The minimum lengths of vertical curves for different values of A (algebraic difference) to provide the minimum passing sight distance for each design speed are listed below in the table.

Design Controls for Crest Vertical Curves Based on Passing Sight Distance

Design Speed (mph)	Stopping Sight Distance (feet)	Rate of Vertical Curvature (K)
20	710	180
25	900	290
30	1090	425
35	1280	585
40	1470	775
45	1625	945
50	1835	1205
55	1985	1410

525.04 Sag Vertical Curves

There are at least four different criteria for establishing lengths of sag vertical curves recognized to some extent. They are headlight sight distance, passenger comfort, drainage control, and general appearance. For overall safety a sag vertical curve should be long enough that the light beam distance is nearly the same as the stopping sight distance.

Drainage affects design of vertical curves in a sag condition especially in a curbed roadway section. Given a length of curve that is relatively flat with a “K” value of 51 or greater can drastically change the actual low spot in relation to the sag curve PVI.

The minimum lengths of vertical curves for different values of A (algebraic difference) to provide the minimum stopping sight distance for each design speed are listed below in the table.

K values are based on the following formula $V = K * A$ (V – Vertical Curve Length; K – rate of vertical curvature; A – Algebraic Difference) and the designer should solve for K, to evaluate and compare to the table listed below.

For example: A design speed of 25 mph requires a minimum K value of 15 and anything less than 15 would not satisfy the required 25 mph speed limit for safety and stopping sight distance based on AASHTO criteria.

Design Controls for Sag Vertical Curves

Design Speed (mph)	Stopping Sight Distance (feet)	Rate of Vertical Curvature (K)
15	80	10
20	115	20
25	155	30
30	200	40
35	250	50
40	305	65
45	360	80
50	425	100
55	495	115

The designer should further explore the narrative under “Combinations of Horizontal and Vertical Alignment” and “Other Elements Affecting Geometric Design” that is found within the AASHTO Green book starting on Page 283.

526.00 Cul-de-sacs

Cul-de-sacs will conform to the Standard Drawings. Lengths of cul-de-sacs are recommended to be between one hundred forty feet (140') and seven hundred and fifty feet (750'). Cul-de-sacs

that are proposed outside this range must be fully justified, based on the following considerations and others that may arise in the course of review:

- A. Intersection vehicular traffic capacity
- B. Emergency vehicle response time
- C. Pedestrian trip time to bus routes
- D. Reduction of double travel distances for service and patrol vehicles
- E. Utility systems, drainage, and open space access

Surface drainage shall be directed toward the intersecting street, or if this is not reasonably practical, a drainage structure and easement will be provided at the end of the cul-de-sac. Specially designed temporary cul-de-sacs may be allowed when approved by the Town Engineer.

527.00 Major Structures

Major structures, such as retaining walls, box culverts and bridges, that are appurtenant to proposed street and/or parking lot construction, will conform to the structural design and loading requirements of the Colorado Department of Transportation Standard Specifications for Road Bridge Construction and the geometric and drainage requirements of the Town Engineer. Plans and supporting calculations for a qualified structural engineer who is a Registered Professional Engineer licensed to practice in Colorado must prepare major structures.

528.00 Design Element Coordination

Horizontal and vertical alignment continuity will be provided between new and existing streets to achieve safe and aesthetically pleasing transitions. Sufficient data on existing facilities will be depicted on plans, and limits of construction will be designated so as to assure that the desired continuity will be achieved. Drainage and utility facilities are to comply with all applicable sections of these STANDARDS AND SPECIFICATIONS and are to be fully coordinated with the street design and proposed construction. These facilities will be staged to eliminate grade and alignment conflicts and unnecessary damage to existing or newly constructed facilities.

529.00 Requirements of Other Jurisdictions

Where proposed street construction will affect other agencies such as the Colorado Department of Transportation, adjacent cities and counties, utility companies or ditch companies, said construction will be subject to the review of said agencies. A copy of the governing agencies review report shall be submitted to the Town Engineer prior to Final Plat approval or the issuance of a permit. Generally, where more than one requirement is imposed, the more restrictive requirement will govern. The Town Engineer must authorize exceptions in writing.

530.00 SITE WORK AND EARTHWORK

531.00 General

Refer to Section 330.00, Site Preparation Work, and Section 340.00, Earthwork, of these STANDARDS AND SPECIFICATIONS.

All workmanship and materials will be in accordance with the requirements of these STANDARDS AND SPECIFICATIONS and in conformity with the lines, grades, quantities, and the typical cross section shown on the plans, or as directed by the Town Engineer.

532.00 Clearing

Refer to Section 331.00, Clearing, of these STANDARDS AND SPECIFICATIONS.

533.00 Demolition and Removal of Structures

Refer to Section 320.00, Demolition and Removal of Structures and Obstructions, of these STANDARDS AND SPECIFICATIONS.

533.01 Salvage

All salvageable material shown on the accepted plans will be removed without unnecessary damage in sections or pieces, which may be readily transported and will be stored by the Contractor in locations approved by the Town Engineer. The Contractor will be required to replace any materials lost from improper storage methods or damaged by negligence.

533.02 Disposal

Refer to Section 333.00, Disposal, of these STANDARDS AND SPECIFICATIONS.

533.03 Backfill

Refer to Section 345.00, Embankment Fill, of these STANDARDS AND SPECIFICATIONS.

534.00 Protection of Existing Structures and Utilities

Refer to Section 342.00, Protection of Existing Structures and Utilities, of these STANDARDS AND SPECIFICATIONS.

535.00 Protection of Public and Private Installations

Refer to Section 141.00, Protection of Public and Utility Interests, of these STANDARDS AND SPECIFICATIONS.

The Contractor will take proper precautions at all times for the protection of and replacement or restoration of driveway culverts, street intersection culverts or aprons, storm drains or inlets, fences, irrigation ditches, crossings and diversion boxes, mail boxes, shrubbery, flowers, ornamental trees, driveway approaches, and all other public and private installations that may be encountered during construction. The Contractor will have the responsibility of providing each property with access to and from the property during the time of construction. Existing driveways will be cut, filled, and graded as required and as directed by the Town Engineer to provide permanent access. Existing driveways will be resurfaced with the presently existing type of surfacing whenever the existing surface is destroyed.

536.00 Excavation and Embankment

Refer to Section 340.00, Earthwork, of these STANDARDS AND SPECIFICATIONS.

537.00 Borrow

Refer to Section 348.00, Borrow, of these STANDARDS AND SPECIFICATIONS.

538.00 Subgrade

The bottom of the excavation for the pavement, or top of the fill, will be known as the pavement subgrade and will conform to the lines, grades, and cross sections shown on the accepted plans. All applicable portions of Section 345.02, Roadway Excavation, Backfill and Compaction, of these STANDARDS AND SPECIFICATIONS, shall apply.

Prior to the street being excavated, all service cuts will be checked to confirm the backfill meets density requirements. If deficient, they will be re-compacted and brought up to specified density.

After excavation and embankment is completed and the subgrade brought to final grade, it will be rolled with a rubber-tired roller which is a minimum size of eight (8) to twelve (12) tons and other compaction equipment as required to bring the subgrade to the required density and stability. The following standards will be in effect: Soils meeting AASHTO M-145 Soil Classifications of A-1, A-2-4, A-2-5, and A-3 will be compacted to a minimum of one-hundred (100) percent of maximum dry density as determined by AASHTO T-99. All other soil classifications will be compacted to a minimum of ninety-five percent (95%) of maximum dry density as determined by AASHTO T-99. The moisture content will be maintained within +/- two percent (2%) of optimum moisture for A-1 through A-5 materials and optimum to two percent (2%) above for A-6 and A-7-6 materials during compaction. Additional wetting may be required when the minimum water requirement is not sufficient to produce a stable condition in the subgrade soil. The maximum length of any road section being worked at any one time shall not exceed three hundred feet (300') without the approval of the Town Engineer.

No paving, subgrade, or base will be placed on soft, spongy, frozen unstable subgrade, which is considered unsuitable by the Town Engineer.

Proof rolling shall be completed in accordance with Section 344.00.

Soft and yielding material and portions of the subgrade which show deflection will be scarified and re-rolled or will be removed and replaced with subgrade course material, then placed and compacted as specified herein. Subgrade will not be approved for base course construction until it is uniformly stable.

538.01 Subexcavation for Expansive Soils

Soils with a Plasticity Index (P.I.) over ten (10) and less than thirty- (30) shall be sub excavated and recompacted per the soils reports and as approved by the Town Engineer.

539.00 Subgrade Construction**539.01 Materials**

Subgrade material will be composed of granular material consisting, essentially, of sand, gravel, rock, slag, disintegrated granite or a combination of such materials. The coarse portions of the material will be sound fragments of the crushed or uncrushed materials enumerated above. Supplied material will be a well-graded mixture containing sufficient soil mortar, crushed dust, or other proper quality binding material which, when placed and compacted in the roadway structure, will result in a firm, stable foundation.

Material composed of uniform size particles, or which contains pockets of excessively fine or excessively coarse material, will not be acceptable for use.

This material need not be crushed but will be graded within the following limits:

Standard-Size of Sieve	% By Weight Passing Sieve
2-1/2 inch	100
2 inch	95 - 100
No. 4	30 - 60
No. 200	5 - 15
Liquid Limit	35 Maximum
Plasticity Index	6 Maximum

539.02 Construction

The construction of subgrade will consist of preparing the approved subgrade material to form a stable foundation on which to construct base course, in conformity with the lines, grades and typical cross sections shown on the plans, and as staked by the developer's engineer. In addition, subgrade material will be used to replace unsuitable foundation materials at locations shown on the plans, or as directed by the Town Engineer.

Each layer of material will be placed and spread so that after compaction it will conform to the width and crown of the typical cross sections. The wetting of subgrade layers will be done with sprinkling equipment of a type, which insures uniform and controlled distribution of the water. All wetting will be done by uniformly sprinkling each layer of material being placed with only that amount of water needed to obtain maximum density of the material.

Travel may be allowed over subgrade to assist in compaction of the material. Mixing and blading of the subgrade material on the street will be required if the material is spotty and non-uniform. However, blading will be held to a minimum in order to avoid the floating of the heavier rock particles to the surface.

Concurrently with the wetting operations, the material will be uniformly compacted by rolling. Rolling equipment will consist of one or more of the following: rubber tired roller, sheep foot roller and flat wheel steel roller.

539.03 Underdrain

Landscape medians and landscaping next to curb and gutter shall be provided with underdrain to handle sprinkler runoff and nuisance flows. All roads with detached sidewalk and landscaped tree lawns will require curb underdrains. See Standard Details ST 17 and ST 18.

540.00 BITUMINOUS CONSTRUCTION**541.00 General**

The intent of this section is to specify materials and methods to be used for the construction, overlaying, seal coating and pavement rejuvenating of streets, parking lots, walks, drain ways, and other miscellaneous work requiring the use of aggregates. The work covered will include general requirements that are applicable to aggregate base course, bituminous base and pavements of the plant mix type, bituminous prime coat, bituminous tack coat, rejuvenating applications, and asphalt concrete overlay. All workmanship and material will be in accordance with requirements of these STANDARDS AND SPECIFICATIONS and in conformity with the lines, grades, depths, quantity requirements, and the typical cross section shown on the plans or as directed by the Town Engineer.

542.00 Base Course

This item shall consist of a foundation course composed of crushed recycled concrete and filler, constructed on the prepared subgrade. Crushed gravel or crushed stone may be used with approval of the Town Engineer. Materials and construction will be in accordance with the requirements of Section 703.03, Table 703-2, of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction. Gradation will be Class 5 (1-1/2" maximum) or Class 6 (3/4" maximum).

The base course material shall be placed on the previously prepared subgrade at the locations and in the proper quantities to conform to the typical cross sections as shown on the accepted plans and as directed by the Town Engineer. Base course shall be placed under curb, gutter, and attached sidewalk. Placing and spreading will be done by means of a spreader machine, moving vehicle, motor grader, or by other approved equipment methods. The material will be placed without segregation. Any segregated areas will be removed and replaced with uniformly graded material at the Contractor's expense.

The base material may be placed in lifts of up to six inches (6"), providing that after compaction, uniform density is obtained throughout the entire depth of the lift. If the required depth exceeds six inches (6"), it will be placed in two or more lifts of approximate equal thickness. If uniform density cannot be obtained by six-inch (6") lifts, the maximum lift will not exceed four inches (4") in final thickness.

Base material shall not be placed on a foundation that is soft or spongy or one that is covered by ice or snow. Base material will not be placed on a dry or dusty foundation where the existing condition would cause rapid dissipation of moisture from the base material and hinder or preclude its proper compaction. Such dry foundations will have water applied to them and will be reworked or recompacted.

Rolling will be continuous until the base material has been compacted thoroughly in accordance with Section 304 of the Colorado Department of Transportation Standard Specifications for Road

and Bridge Construction. Water will be uniformly applied as needed during compaction to obtain optimum moisture content and to aid in consolidation. The surface of each layer shall be maintained during the compaction operations in such a manner that a uniform texture is produced and the aggregates are firmly placed.

The finished base course surface shall be smooth and free of ruts and irregularities, and will be true to grade and crown as shown on the plans or as directed by the Town Engineer. The base course will be maintained in this condition by watering, drying, rolling, or blading or as the Town Engineer may direct until the surfacing is placed.

543.00 Prime Coat

(Left Blank Intentionally)

544.00 Hot Bituminous Pavement

All pavements shall be hot bituminous pavement of the plant mix type unless otherwise approved in writing by the Town Engineer. Materials and construction will be in accordance with Section 403 of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction, and the following requirements:

- A. The asphalt cement shall be a Superpave Performance graded (PG) binder and content determined by the mix design. Superpave PG asphalt binders shall comply with CDOT Standard Specifications for Road and Bridge Construction. The asphalt contractor shall furnish certified test results from an independent asphalt testing laboratory to show compliance of the proposed Superpave PG asphalt binder with the Superpave requirements for that mix.
- B. The gradation of the mineral aggregate will be grading SG (1 1/2" nominal), or S (3/4" nominal) for new street construction. Grading SX (1/2" nominal) shall be used for top lifts and overlays or in special cases as required on the accepted plans or authorized in writing by the Town Engineer.
- C. All mixes shall be designed with 1% lime.
- D. A maximum of twenty percent (20%) Reclaimed Asphalt Pavement (RAP) will be allowed in (non-polymer or non-rubberized) mixes, provided that all the requirements for hot bituminous pavement are met.
- E. The mix will conform to the job mix formula specified by the Town Engineer for the pit-supplied materials, if a current job mix formula is available. A copy of the mix formula will be submitted to the Town Engineer for review and approval at least seven (7) days prior to starting paving work.

All testing done throughout this construction period, which is necessary to assure conformance of materials and workmanship to the specifications, will be at the Contractor's expense. Two copies of all test reports will be submitted directly to the Town Engineer.

In the event that a current job mix formula is not available for the materials proposed for use, the Contractor will submit a job mix formula prepared by a recognized testing laboratory for review and acceptance by the Town Engineer. A report giving the properties of the materials and certifying their conformance to or deviations from the requirements of the specifications will accompany the job mix formula.

When tested in accordance with the requirements of ASTM D-1559, the mixture will conform to the following limits:

TABLE 500-1
MIX DESIGN PROPERTIES

Low EDLA ≤ 40	
Marshall Stability (minimum) ¹	1800 lb./ S 37
Marshall Flow (minimum) hundredths of an inch	8
Flow (maximum) hundredths of an inch	18
Air voids, total mix, %	3 to 5
VMA ³	12-13-14
Percent voids filled with bitumen	65-75

High EDLA ≥ 40	
Marshall Stability (minimum) ²	2000 lb./ S 39
Marshall Flow (minimum) hundredths of an inch	8
Marshall Flow (maximum) hundredths of an inch	16
Air voids, total mix, %	3 to 5
VMA ³	12-13-14
Percent voids filled with bitumen	65-75

¹ - Marshall Stability (50 Blow)/Hveem Stability

² - Marshall Stability (75 Blow)/Hveem Stability³ - Refer to Table 500-2

TABLE 500-2
VOIDS IN THE MINERAL AGGREGATE¹

Nominal Maximum Particle Size	Mix Air Voids, Percent		
	3.0	4.0	5.0
3/4"	12.0	13.0	14.0
1/2"	13.0	14.0	15.0

¹ - Interpolate minimum voids in the mineral aggregate (VMA) for design air void values between those listed.

Determination of the effect of water on the cohesion of the bituminous mixture will be made in accordance with AASHTO T-283 (Lottman). Retained strength will be a minimum of eighty percent (80%). The use of an "anti-stripping" admixture to improve the retained strength characteristics will be permitted only by written permission of the Town Engineer. The cost of admixtures will be borne by the Contractor.

All commercial testing and laboratory work necessary to establish the job mix formula and all testing necessary to assure conformance of materials and workmanship to the requirements of the specifications throughout the construction period will be performed at the Contractor's expense. Two copies of all test reports will be submitted directly to the Town Engineer.

544.01 Asphalt/Polymer Combinations

The Contractor may submit to the Town Engineer for his review and acceptance a design for the upper three inches (3") of the pavement section utilizing a polymer modified pavement design. These

designs will be reviewed on an individual project basis and must be accepted by the Town Engineer prior to construction.

544.02 Weather Limitations

Bituminous plant mix shall be placed only on properly constructed and accepted layers that are free from water, snow, or ice. The bituminous mixtures shall be placed only when weather conditions permit the pavement to be properly placed and finished as determined by the Town Engineer. The bituminous mixtures shall be placed in accordance with Table 401-3, Placement Temperature Limitations, of the Colorado Department of Transportation Standards and Specifications for Road and Bridge Construction.

Air temperature is taken in the shade. Surface is defined as the existing base on which the new pavement is to be placed.

Under certain circumstances, the Town Engineer may waive minimum temperature requirements for placing prime coats and layers of bituminous mixtures below the top layer of the completed pavement.

545.00 Tack Coat

When tack coat is specified on the accepted plans or required by the Town Engineer, all materials and construction shall be in accordance with the requirements of Section 407 of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction. Bituminous material will be SS-1 emulsion, diluted by mixing one (1) gallon of SS-1 emulsion with one gallon of clean water, applied at the rate of five one-hundredths (0.05) to fifteen one-hundredths (0.15) gallons per square yard.

546.00 Seal Coat

When seal coat is required, all materials and construction shall be in accordance with the requirements of Section 409 of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction. The type of bituminous material, cover aggregate, and rates of application will be as shown on the accepted plans.

547.00 Rejuvenating Agent

When a rejuvenating agent is specified on the accepted plans or required by the Town Engineer, all materials and construction will be in accordance with the requirements of Section 407 of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction.

548.00 Heating and Scarifying

When heating and scarifying treatment is specified on the accepted plans or required by the Town Engineer, all materials and construction shall be in accordance with requirements of Section 405 of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction.

549.00 Grinding

Grinding will consist of “milling”, “grinding”, or “cold planning” the existing pavement surface to establish a new surface profile and cross section in preparation for a bituminous overlay. After grinding, the surface will have a grooved or ridged finish, uniform and resistant to raveling or traffic displacement. This textured surface will have grooves of one-quarter inch (1/4”) ± one-eighth inch (1/8”). The existing surface to be ground will include bituminous pavement, concrete utility patches, and a very small amount of concrete pavement.

“Wedge cut” grinding will consist of grinding the existing pavement surface a minimum of six feet (6’) wide at the existing concrete gutter. The edge of the gutter, end of the finished wedge cut will be one and one-half (1-1/2) inches below the edge of the existing concrete gutter. The centerline of street edge of the wedge cut will be cut one-eighth inch (1/8”). The depth of cut will be determined by measuring to the top of the ridges by placing a five-foot (5’) straight edge perpendicular to the grooving pattern. “Full width” grinding will consist of grinding the existing pavement surface from edge of gutter to a minimum depth of two inches (2”) unless otherwise specified in the contract or directed by the Town Engineer.

Grinding around utility castings to the depth of cut before and after encountering the castings will be included in the area of the pavement surface ground. The Contractor may choose to remove the entire existing bituminous pavement around the castings where grinding is not completed, and replace it with bituminous surface course placed and compacted in three inch (3”) lifts. The Contractor will vertically cut the limits of the area to be patched, mechanically compact the existing base course, and prime the bottom and vertical edges before backfilling.

The Contractor will remove the cuttings immediately behind the grind machine by belt loader, end loader, power sweeper and/or by hand. The removed material will be disposed of as approved by the Town Engineer.

The grinding machine shall be a power operated, self-propelled machine, having a cutting drum with lacing patterns that will attain a grooved surface and produce grinding chips of less than one inch (1”) in size. The grinding machine will be equipped with a pressurized watering system for dust control. The equipment will be a type that has successfully performed similar work.

The cleaning equipment shall be a type, which will efficiently remove all loosened material and load into trucks for hauling and spreading. Because of the nature of the streets to be ground and the traffic restrictions, a belt loader followed by a power sweeper and manual sweeper is the most desirable method. **FLUSHING INTO THE TOWN’S STORM SEWER SYSTEM AS A MEANS OF CLEANUP IS PROHIBITED.**

550.00 CONCRETE PAVEMENT

The installation of concrete pavement, including materials, equipment, foundation and construction methods must be in conformance with Section 412, “Portland Cement, Concrete Pavement” of the Colorado Department of Transportation Highways Standard Specifications for Road and Bridge Construction, except as modified herein or as modified with the approval of the Town Engineer.

Specifications for concrete work, Section 400, Concrete Work, of these STANDARDS AND SPECIFICATIONS, must be followed. Concrete pavements will be installed as shown on the accepted plans or as approved by the Town Engineer. When concrete pavement is constructed on

a curve, flexible forms will be used having a radius of two hundred feet (200') or less, unless otherwise directed by the Town Engineer. The Contractor will furnish steel pins to use in setting grades for concrete pavement.

550.01 Lime Treated Subgrade

In those instances where deemed necessary by a qualified Soils Engineer and accepted by the Town Engineer, Portland Cement treated base may be required. When required, this base shall comply with Section 307, Lime Treated Subgrade, of the Colorado Department of Transportation Standard Specifications for Roads and Bridge Construction.

560.00 APPURTENANT CONCRETE STRUCTURES

561.00 General

Curb, curb ramps, gutter, sidewalk, cross pan, and driveway construction will conform to all applicable provisions of these STANDARDS AND SPECIFICATIONS and the Standard Drawings.

562.00 Materials

562.01 Cement Concrete

All cement concrete materials, reinforcing steel, and concrete work will conform to the requirements of Section 400, Concrete Work, of these STANDARDS AND SPECIFICATIONS.

562.02 Forms

Forms may be wood or metal and will have a depth equal to or greater than the slab thickness. The face of curbs will be formed, unless otherwise permitted by the Town Engineer. Forms will have a cross section and strength and be secured so as to resist the pressure of the poured concrete without springing or settlement. The connection between sections will be performed by a method in which the joint thus formed will be free from movement in any direction. Each section of form will be straight and free from warps or bends. The maximum deviation of the top surface will not exceed one-eighth inch (1/8") inside face not more than one-fourth inch (1/4") from a straight line in ten feet (10'). Approved flexible forms will be used for construction where the radius is one hundred fifty feet (150') or less.

563.00 General Requirements

563.01 Curb and Gutter Section

The section to be constructed will be as identified on the approved plans or as shown on the Standard Drawings.

563.02 Sidewalks

Sidewalks will be six inches (6") thick where detached or attached, unless noted otherwise on the accepted plans, and shall be constructed to the dimensions shown on the accepted plans. All areas

of sidewalk that will be constructed in parks, open spaces or greenbelts as indicated on the accepted plans or required by the Town Engineer will be constructed with six inch (6") thick concrete. Six-inch (6") thick sidewalks shall be constructed to the dimensions shown on the accepted plans or as required by the Town Engineer.

563.03 Crossspans and Curb Return Fillets

Crossspans and curb return fillets will be constructed eight inches (8") thick with #4 rebar (place at 18" centers, each way) or ten inches (10") without rebar in residential, commercial and industrial areas. Typical crossspan sections are shown in the Standard Drawing. Where unusual conditions prevail, additional reinforcing steel and special joints may be required by the Town Engineer.

563.04 Curb Cuts and Driveways

Curb cuts in six-inch (6") vertical curbs will be provided at all driveway locations and at additional locations, as shown on the accepted plans for residential lots. Commercial lots shall be eight-inch (8"). Construction of curb cuts will be as shown in the Standard Drawings. Spacing will be as shown in the Standard Drawings.

563.05 Curb Ramps

Curb ramps for the handicapped will be installed at locations designated by the Town Engineer. Curb ramps will be constructed as shown in the Standard Drawings.

563.06 Sidewalk Chase Drains

Where three or more lots drain to a shared lot line swale, a sidewalk chase drain will be installed to convey drainage through the sidewalk to the gutter. In areas with detached sidewalk and trees lawns, the chase will continue through the tree lawn and curb to the gutter.

564.00 Construction Requirements

564.01 Staking and Grade Control

Control and construction stakes will be set by field parties under the supervision of a Registered Professional Engineer or a Registered Land Surveyor licensed to practice in Colorado who shall be paid by the Contractor. These field parties will be available to check field control and to provide assistance to the Contractor. The Contractor will keep a set of accepted plans on the job site at all times.

It will be the responsibility of the Contractor to maintain the grade and alignment as shown on the accepted plans. The alignment and grade elevation of forms will be checked, and any necessary corrections will be made before placing the concrete. When any form has been disturbed or any subgrade there under has become unstable, the form will be reset and rechecked after the subgrade has been replaced or recompacted.

564.02 Excavation and Embankment

Excavation or fill will be made to the required grade, and the base on which the curbing section is to be set will be compacted to a smooth, even surface. All material placed in fill and the top six inches (6") of the subgrade in cut sections will be compacted to at least ninety-five percent (95%) of maximum dry density as determined by ASTM D-698. Where spongy or unsuitable materials are encountered which will not provide a stable subgrade. The material will be removed and replaced with suitable material and compacted to the specified density.

The subgrade will be compacted within the forms by a vibratory compactor or other approved method whenever any loose subgrade material is present. Immediately prior to placing the concrete, the subgrade will be tested for conformity to the specified cross section. Materials will be removed or added to bring all portions of the subgrade to the correct elevation. The subgrade will be thoroughly compacted and again tested for proper cross section. Concrete will not be placed on any portion of the subgrade that has not been inspected by the Town Engineer for correct elevation and proper compaction. The subgrade will also be cleared of any loose material that may have fallen on it.

The subgrade will be in a moist condition to a depth of six inches (6") at the time the concrete is placed. It will be thoroughly wetted a sufficient amount of time in advance of the placing of the concrete to insure that there will be no puddles or pockets of mud when the concrete is placed.

564.03 Form Setting

Forms that have become worn, bent, or broken will not be used. The Contractor will have set and graded a minimum length of three hundred feet (300') of forms prior to placing concrete. In cases where the length of one run is less than three hundred feet (300'), the Contractor will set and grade forms for the entire run.

On curves with radii of one hundred fifty feet (150') or less, flexible forms, which can be readily formed to the desired radius, will be used. Face forms will be preformed to the proper radius. In any case, care will be exercised to insure the maintenance of the required cross section around the entire radius.

The Contractor will provide an approved metal straight edge, ten feet (10') in length, to check the alignment of the forms prior to placing the concrete and also to check the concrete surface during the finishing operation.

Forms, except for curb face, will remain in place at least twelve (12) hours after concrete has been placed against them, or for a longer period if so directed by the Town Engineer. Crowbars or other heavy tools will not be used against green concrete in removing the forms. Forms will be thoroughly cleaned before re-oiling and reuse.

564.04 Concrete Placement

When placed in the forms the concrete will be properly graded with the forms and will at no time deviate more than one-quarter inch (1/4") from an accurate straight edge ten feet (10') in length. The concrete will be placed on damp but not wet or muddy subgrade. The operation of depositing and compacting the concrete will be conducted so that the concrete will be smooth and dense, free from honeycomb and free from pockets of segregated aggregate. Sections of segregation or honeycomb revealed by removal of the forms will be removed and replaced or otherwise repaired to the satisfaction of the Town Engineer. At the end of the day, or in case of an unavoidable interruption of

more than thirty- (30) minutes, a transverse construction joint will be placed at the point of stopping work, provided that the section on which work has been suspended will not be less than five feet (5'). Sections less than five feet (5') in length will be removed. Concrete will not be placed when the weather is stormy, dusty, or otherwise inclement to the point that it precludes good workmanship.

564.05 Joints

All joints will be constructed straight and plumb and will extend through the entire section from edge to back and to the depths specified herein.

- A. Expansion Joints: Expansion joint filler, which is one-half inch (1/2") thick, preformed, non-extruding bituminous-treated fiberboard conforming to AASHTO Specification M-213, will be used to form transverse expansion joints. Expansion joints will be constructed as directed by the Town Engineer. Expansion joints will be formed at the contact of the new construction with concrete driveways, intersecting sidewalks or other unyielding structures unless otherwise directed.
- B. Block Joints: The curb and gutter or curb walk will be divided into blocks not less than six feet (6') nor more than ten feet (10') long using metal templates not less than one-sixteenth inch (1/16") nor more than one-quarter inch (1/4") thick. Templates will be a minimum of four inches (4") deep. The block length to be used will be approved by the Town Engineer prior to starting construction and will be maintained constant throughout the project. The templates will be designed to attach securely to the forms in such a manner as to prevent movement while the concrete is being placed and consolidated. Templates will be removed prior to the concrete taking its initial set.
- C. If curbing machine or other methods not requiring the use of templates is approved, dummy joints formed by a jointing tool or other acceptable means will be used. Dummy joints will extend into the concrete for at least one-third (1/3) of the depth (no less than two inches [2"]) and will be approximately one-eighth inch (1/8") wide.
- D. Construction Joints: As required at the end of a day's run, construction joints will be made at right angles to the longitudinal axis of the curb and gutter and will be located at the regular spacing designated for block joints unless otherwise specifically permitted by the Town Engineer. In no case will any length of curb and gutter be less than five feet between (5') joints. Construction joints will be formed by use of a bulkhead or divider, which will be removed before continuing with the next run. The construction joints will be edged to form a recess for sealing compound similar to that for expansion joints.

564.06 Finishing

Where applicable, finishing will be done with a metal screed designed to give proper shape to the section as detailed. Particular care will be used to finish the gutter flowline to a true, uniform grade. When using face forms, they will be left in place until the concrete has hardened sufficiently so that they can be removed without injury to the curb.

The Contractor will use at all times, a ten-foot (10") straightedge for finishing curb and gutter sections. When irregularities are discovered, they will be corrected by adding or removing concrete. All disturbed places will be floated with a wooden or metal float, which is not less than three feet (3') long and not less than six inches (6") wide, and again straightened. No water or cement will be added to the surface of the concrete to aid in finishing. Before final finishing is complete and the concrete

has taken its initial set, edges of the concrete and joints will be carefully finished with an edger having a one-eighth inch (1/8") radius. Concrete will be finally finished with a wood float and lightly broomed to a slightly roughened surface. On grades less than one percent (1%), the Contractor will check for depressions before final finish so that no water holes exist. Any water holes or "bird baths" larger than one square foot and deeper than three-eighths inch (3/8") will be cause for removal and replacement of the defective sections of concrete.

564.07 Marking

Sidewalks shall have the name of the contractor and the year of construction impressed therein, using block letters not less than one inch (1") high and three-eighths inch (3/8") deep. Impressions will be made in sidewalks at each end of each Town block, or at the end of construction if other than at the end of the block.

564.08 Curing

Curing will be accomplished in accordance with Section 400, Concrete Work, of these STANDARDS AND SPECIFICATIONS.

564.09 Protection Against Vandalism

It will be the responsibility of the Contractor to protect all concrete work against damage or vandalism. When required, a guard will be stationed over fresh work until the concrete is sufficiently set to prevent its being marked by plastic deformation of the exposed surface of the concrete. Expense of the guard will be borne by the Contractor. Concrete damaged in any way by vandals will be removed and replaced at the Contractor's expense.

564.10 Cleanup

Within forty-eight (48) hours after forms are removed, the area behind and in front of the sidewalk or curb will be cleaned, backfilled and graded to provide a smooth even surface.

564.11 Concrete Testing

Routine testing will be accomplished in accordance with Section 400.00, Concrete Work, of these STANDARDS AND SPECIFICATIONS. In the case of questionable concrete materials or work, the Town Engineer may direct that core tests be made on all questionable concrete placement. The expense of the tests will be borne by the Contractor. If the concrete tested shows inadequate strength or other deficiencies, it will be removed and replaced by the Contractor at his expense. If any core shows a deficiency of thickness greater than one-half inch (1/2"), exploratory cores will be taken in five-foot (5') increments, and all concrete deficient more than one-half inch (1/2") will be removed and replaced by the Contractor at his expense.

570.00 INSPECTION**571.00 General**

Refer to Section 154.00, Inspections, of these STANDARDS AND SPECIFICATIONS.

572.00 Required Inspections

Adequate inspections assure compliance to Town requirements and are the basis for the Town's recommendation that said streets are accepted for maintenance and for release of performance guarantees. It is the responsibility of the Contractor to contact the Town Engineer a minimum, of one (1) working day in advance of the required inspections. Required inspections include:

- A. Culverts - trenching, grade, bedding, installation, backfill and compaction. Inspection to be requested when backfill is completed to one-half (1/2) the depth of the culvert.
- B. Concrete - finished excavation, grade, forming, reinforcing steel.
- C. Structures - concrete pour, surface finish, and test cylinders. Three inspections are required: (1) prior to placing steel; (2) prior to concrete pour; and (3) during and after final pour.
- D. Street - four inspections are required; (1) subgrade; (2) base course; (3) prime &/or tack, and (4) paving, all of which are required prior to proceeding with the next phase. Locations of required samples for testing will be designated by the Town Engineer. Non-destructive deflection testing, as specified in Section 514 of these STANDARDS AND SPECIFICATIONS, will be performed.
- E. Acceptance - a request for an inspection and Initial Acceptance for maintenance or release from performance guarantee must be made only after all preceding inspections have been passed. Acceptance procedures are outlined in Section 200, Acceptance Procedures, of these STANDARDS AND SPECIFICATIONS.

573.00 Required Testing

When required by the Town Engineer, a Professional Engineer will certify the quality of materials or construction. All testing will be by recognized methods as specified in these STANDARDS AND SPECIFICATIONS and will be at the Contractor's expense.

574.00 Utility Installations

Prior to the installation of street subgrade, base, paving and concrete materials, utility installations will be made, service lines stubbed to the right-of-way line, and all trenches will be backfilled and properly compacted.

575.00 Street Lighting

At the time of inspection, all street lights will be in place as shown on the approved plans and will be operating as set forth in Section 925.00, Street Lighting Procedure, of these STANDARDS AND SPECIFICATIONS.

580.00 STREET LANDSCAPING**581.00 Installation**

All installation of landscaping and irrigation in Town Right-of-way must be done in accordance with SECTION 1000 PARKS AND RECREATION of these STANDARD and SPECIFICATIONS.

582.00 Maintenance

The maintenance of landscaping and irrigation located in and/or over Town right-of-way is the responsibility of the adjoining property owner with the exception of landscape medians on Town designated Arterial roadways which are the Town's responsibility. All landscaping shall be maintained in accordance with the follow requirements:

- A. Tree branch growth shall be maintained at a height no lower than ten (10) feet over a public sidewalk, walkway, or trail and no lower than fourteen (14) feet over the travel lanes of a street or alley.
- B. All woody plant growth lower than ten (10) feet shall not encroach upon the plane of a public road, sidewalk, walkway, or trail and must be trimmed back within the inside edge of all sidewalks, walkways, or trails.
- C. Tree branch growth shall be maintained so that branches do not interfere with the proper spread of light along the street from any street light.
- D. Trees and other woody plants growth shall be maintained not to come within three (3) feet of fire hydrants.
- E. Visibility triangle distances shall be maintained to protect visual clearances for motorists and pedestrians. No landscaping plant material shall be allowed within the visibility triangle that exceeds over thirty-six (36) inches higher than the street level in this triangle. Trees located within the visibility triangle must be trimmed at the trunk to at least eight (8) feet above the level of the ground surface, provided that such trees are spaced so that trunks do not obstruct the vision of motorists and pedestrians.

590.00 TRAFFIC CONTROL DEVICES**591.00 General**

The installation of traffic control devices and street lighting shall comply with all applicable portions, as from time to time amended, of the CDOT Standard Specifications for Road and Bridge Construction, the Manual on Uniform Traffic Control Devices (MUTCD) and the accepted plans. These STANDARDS AND SPECIFICATIONS and any other requirements determined by the Town Engineer shall apply to all materials supplied, methods and procedures of work. The Town Engineer must approve a traffic control device, sign layout plan, and a street lighting layout plan.

592.00 Signs**592.01 Street Name Signs**

Street name signs shall be bought by the Contractor or Developer and will be installed by the Contractor or Developer. Sufficient signs and posts shall be provided to allow installation on two (2) corners of each intersection in business district, on principal arterials and on one corner in the residential areas, as directed by the Town Engineer. All letters shall be Federal Highway Administration Series C2000. Please reference the Street Sign Detail of our Standards & Specifications.

All street signs shall be aluminum 5052-H38 (Conversion coated) minimum thickness of .080.

Retroreflective sheeting for letters and background shall be required in accordance with the MUTCD.

Unless directed otherwise by the Town Engineer, signs shall be installed on square stock tubing at eighteen (18) inches behind the curbwalk or curb and gutter, whichever is closest to the street. Anchors shall be galvanized (G90) 12GA steel with seven-sixteenths (7/16) inch diameter holes, one (1) inch on center, two-one fourth (2 ¼) inch square and three (3) feet in length. During installation, the anchors may only be between a minimum of four (4) and maximum of six (6) inches above the ground. Posts shall be of galvanized (G90) 12GA steel with seven-sixteenths (7/16) inch diameter holes, one (1) inch on center, two (2) inches square and to length to meet mounting requirements set forth in the M.U.T.C.D. All posts and signs shall be affixed using the appropriate size of bolts, washer and nuts (NO RIVETS).

4" diameter PVC pipe sleeves shall be placed in concrete where sign posts are to be installed to accommodate sign post installation and replacement.

592.02 Illuminated Signs

Internally illuminated street name signs shall be furnished and installed by the Contractor or Developer. Signs shall be installed on each traffic signal mast arm at each intersection. Sign lettering shall be in the ten (10) inch uppercase. Suffixes are to be five- (5) inch uppercase letters. Lettering for supplementary to indicate the type of street or section shall be at least four (4) inches where a two-line application is desired or three (3) inches where a three-line application is desired.

592.02.01 Borders

Reserved.

592.02.02 Spacing

Interline spacing shall be approximately one half (1/2) to three-fourths (3/4) the average of uppercase letter heights in adjacent lines of letters. The spacing to the top and bottom borders shall be equal. The lateral spacing to the vertical edges shall be essentially the same as the height of the largest letter. Spacing used in words, words and arrow, a letter and arrow, or a word and numeral in a line copy should be approximately one (1) to one and one half (1 1/2) times the uppercase letter height used in that line of copy.

592.02.03 Arrows

Arrows shall be in accordance to the MUTCD standards as illustrated in the Standard Highway Sign Handbook.

592.02.04 Color

Letters and numbers are to be white on a green background face. When a "Town Logo" is required, the Town approved logo shall be used.

592.02.05 Sign Housing

The street name sign shall be free swinging or limited swinging. Sign fixture and panels shall withstand 90 mph wind loading, with structural requirements meeting AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminars and Traffic Signals" latest edition. Illuminated street name housing shall be constructed of extruded aluminum. The design shall be

rigidly constructed to resist torsional twist and warp. All ferrous parts shall be galvanized or cadmium plated. The front and back sign panels of the cage shall be hinged, to provide access to

the lamps. Neoprene gaskets shall be installed between the sign panels frame and fixture housing to prevent dust and water entrance. The latching devices can be either screw type or latch type to provide a secured attachment of the sign face to the case. Screened weep holes are to be provided on the housing bottom for drainage. The overall weight of the completed sign assembly, including mounting brackets, shall not exceed 90 pounds.

592.02.06 Illumination Source

The entire surface of the sign panel shall be evenly illuminated. The illumination source shall be fluorescent lamps, powered for low temperature operation. There shall be separate ballast for each fluorescent lamp. Photoelectric controls are required and shall be the "hail resistant" type and of the load intended. The reflectors shall have a minimum reflectance of 85%.

592.02.07 Final Layout

Final layout and lettering details are to be submitted to the Town prior to fabrication.

592.03 Stop Signs

Stop signs shall be installed at all approaches to streets designated by the Town as through streets. Stop signs shall be mounted on the same support posts as street name signs where possible.

592.04 Other Signs

Twenty-five (25) MPH speed limit signs shall be installed at all subdivision entrances. Speed limit signs, school signs, and crosswalk signs shall be installed at locations designated by the Town Engineer.

592.05 Private Street Signs

All subdivisions with private streets shall install private street signs as shown in Standard Details-Streets at all entrances to the private streets.

593.00 **Striping**

The Contractor shall submit a striping plan to the Town Engineer for acceptance prior to beginning work. The striping plan shall meet the requirements for such work as outlined in the MUTCD. Yellow centerline and lane line markings shall be applied to streets designated by the Town as through streets. All temporary striping and markings of roadways shall consist of paint pavement marking materials conforming to Section 713 of the CDOT Standard Specifications for Road and Bridge Construction and installed per Section 627 of the CDOT Standard Specifications for Road and Bridge Construction all striping and markings of roadways minus the top lift shall consist of paint pavement marking materials conforming to Section 713 of the CDOT Standard Specifications for Road and Bridge Construction and installed per Section 627 of the CDOT Standard Specifications for Road and

Bridge Construction. All striping of the top-lifted roadways shall consist of epoxy pavement marking material conforming to Section 713 of the CDOT Standard Specifications for Road and

Bridge Construction and installed per Section 627 of the CDOT Standard Specifications for Road and Bridge Construction. All markings of the top-lifted roadways shall consist of preformed thermoplastic marking material conforming to Section 713 of the CDOT Standard Specifications for Road and Bridge Construction and installed per Section 627 of the CDOT Standard Specifications for Road and Bridge Construction. Standard twelve (12) inch wide stop bars shall be provided at all stop locations and intersections adjacent to schools, parks, commercial, and other areas as determined by the Town. Crosswalks will be marked with two (2) foot by eight (8) foot bars, and layout shall conform to CDOT M&S Standards, typical pavement markings, Standard Plan No. S-627-1.

594.00 Sign Supports

All sign supports or posts shall conform to specifications for perforated square steel tubing and to Standard Specifications for Cold Rolled Carbon Steel Sheets, Commercial Quality, ASTM Designation A-366. The cross section will be square and consist of ten (10) gauge or twelve (12) gauge steel (0.135" U.S.S. Gauge or 0.105" U.S.S. Gauge) carefully rolled to size and continuously welded at the corner and will conform to CDOT M&S Standards, Mounting Data, Standard Plan No. S-614-3. Sign sizes not included in this data shall be:

Total Sign Area	Side Dimensions
Less than 800 sq. inches	2" x 2"
800 to 1000 sq. inches	2" x 2"
Over 1000 sq. inch	CDOT S-614-3

The finished members shall be straight and have a smooth, uniform finish. It will be possible to telescope consecutive sizes of tubes freely with a minimum amount of play. All holes and cut-off ends shall be free from burrs. Seven-sixteenth (7/16) inch diameter holes shall be punched on one (1) inch centers on all sides of the tube. All posts shall be weather protected by galvanizing. Posts shall be formed from cold rolled steel strip that has been zinc coated and is commercial quality (1.25 oz.) conforming to ASTM Specification A-525.

595.00 Street Lighting Procedure To A High Source

The developer shall submit a written request for street light design to the electrical utility company (United Power) along with three sets of street and utility plans and one copy of the plat map. The electrical utility company shall submit the final design to the Town Engineer for review and approval. Developer shall pay the electrical utility company the total costs of installation for all street lighting within thirty (30) days of receipt of written notice.

The developer shall coordinate the location of the mail boxes and the street lighting with the United States Postal Service to ensure adequate light is available at each mail box. Lighting shall conform to the requirements of the United Postal Service.

All luminaries for street lighting must be LED and have written approval of the Director of Planning and Development prior to installation.

The spacing and illumination which will be used is set forth in Table 900-1:

TABLE 500-1

<u>Street Type</u>	<u>Average Foot Candles</u>	<u>Lamp Lumens</u>	<u>Pole Spacing</u>
Local Residential	0.15	9,500	300' ± *
Rural Residential	0.15	9,500	At Intersections
Collector	0.25	9,500 to 27,500	200' ± *
Arterial	0.50	27,500	150' ± *

* Poles shall be placed on alternating sides of the street.

595.01 Residential Street Lighting

All intersections and cul-de-sac bulbs shall have a minimum of one light. If a segment of street between intersections is greater than 450 feet and less than 600 feet, a light shall be installed at the center of the segment. A light shall also be placed at all community mailboxes and trail crossings. Residential lighting shall be 25 feet in height unless otherwise approved by the Town.

595.02 Collector Street Lighting

Collector lighting shall be 250 watt equivalent luminaries on metal or fiberglass poles 25 feet in height. The light fixture shall have a flat lens and the poles shall be dark in color unless otherwise approved by the Town. A minimum of two lights shall be placed on diagonal corners at all intersections and on all corners of a signalized locations. A light shall also be placed at all community mailboxes and trail crossings. Collector lighting shall be 25 feet in height unless otherwise approved by the Town.

595.03 Arterial Street Lighting

Arterial lighting shall be 250 watt equivalent luminaries on metal or fiberglass poles, 35 feet in height. The light fixture shall be 35 feet in height, have a flat lens, and on 10-foot long mast arms unless otherwise approved by the Town. The poles shall be dark in color unless otherwise approved by the Town. A minimum of two lights shall be placed on diagonal corners at all intersections and on all corners of signalized locations.

**TABLE 500-3
STREET DESIGN CRITERIA**

Design Element	Principal Arterial	Minor Arterial	Collector	Residential Collector	Local Street
Right-of-way Width	140'	120'	80'	70'	60'
Flow Line Curb Radius - Arterial	50	50	30	30	**
Flow Line Curb Radius - Collector	30	30	25	25	20
Flow Line Curb Radius - Local	**	**	20	20	15
Design Speed	55 mph	50 mph	45 mph	30 mph	25 mph
Typical Posted Speed Limit *	45 mph	40 mph	35 mph	25 mph	25 mph
Maximum Degree of Curve (degrees)	6	7.4	12	32.7	32.7
Minimum Curve Radius (feet)	955	775	475	300	175
Cross Slope without Super Elevation		Maximum 4% - Minimum 2%			
Super Elevation Maximum	4% required	Reverse crown	Normal crown	Normal crown	Normal crown
Maximum Street Grade	5%	5%	6%	6%	6%
Minimum Street Grade	0.4%				
Maximum Grade at Intersection	2% for 300'	3% for 300'	4% for 150'	4% for 150'	4% for 150'
Min. Approach Tangent @ Intersections	300'	300'	200'	200'	100'
Min. Tangent Between Vertical Curves	50'				

* Posted speeds limits may be changed from based on current engineering studies in accordance with the current State of Colorado Model Traffic Code.

** Intersections of Local streets and Arterial streets are not allowed.



SECTION 600 WATER SYSTEM

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SECTION 600 WATER SYSTEM

610.00 DESIGN CRITERIA

610.01 General

All water distribution systems shall comply with the requirements of the STANDARDS AND SPECIFICATIONS for water main and service line construction and may include special criteria established by the Town for the overall hydraulics of the water utility system. Special criteria shall be outlined at pre-design meetings scheduled, as determined necessary, by the Town Engineer. The requirements set forth in the latest edition of the Denver Water Board Engineering Standards shall apply for information omitted in these STANDARDS AND SPECIFICATIONS. The developer and/or developer's engineer must consult with the Fire District to review any special conditions that exist of that need to be addressed in the design of the Town's water utility system.

610.02 Water Supply

Potable water is supplied to the Town by the Central Weld County Water District (CWCWD) via the Town owned Cleveland Hill water tank (1/2 mile south of WCR 16 on WCR 17). The base of the tank is at an elevation of approximately 5100 MSL and is 40 feet tall.

611.00 Design Flow Requirements

The design of the water distribution system shall be based on the following:

UNIT WATER DEMANDS FOR FUTURE LAND USE

Land Type	Avg. Demand	Max. Day/Avg. Day	Max. Hr./Flow Ratio
Residential	140 GPCD*	2.60	3.9
Commercial	1651 GPD/Acre	2.00	3.0
Industrial	1651 GPD/Acre	1.32	3.0

*Gallons Per Capita/Day

Fire flows may be calculated from more than one hydrant, providing the hydrants used are directly accessible to all possible fire locations in the area served. Fire flows, per Frederick-Firestone Fire Protection District, shall be:

- A. Available fire flow must be 20 psi residual minimum.
- B. Minimum fire flow (2 hour duration) for any newly developed areas:
 - 1. 1 and 2 family units.....1,000 gpm
 - 2. Multi-family units1,500 gpm
 - 3. Institutional development2,000 gpm
 - 4. Commercial development2,500 gpm
 - 5. Industrial development.....3,500 gpm

Note: above fire flow requirements may be increased due to type of construction and size of building, per direction of the Fire Marshall.

612.00 Operating Pressure Requirements

All areas shall be designed to provide a maximum static head of two hundred ninety (290) feet (one hundred twenty five [125] psi) and a minimum static head of one hundred (100) feet (forty-three [43] psi). Distribution systems shall also be designed to maintain a twenty (20) psi residual pressure during required fire flow and a forty- (40) psi residential residual during peak residential flows. The maximum pressure drop from static head to either fire flow or peak residential flow shall not exceed thirty- (30) psi.

613.00 Fire Hydrant Spacing

In single-family residential areas, fire hydrants shall be spaced a maximum of five hundred (500) feet apart as measured along street curb line and at an overall spacing that will average not less than one hydrant to two hundred thousand (200,000) square feet accessible to the fire hydrant throughout an individual subdivision. A hydrant shall be placed in the end of each cul-de-sac.

In business, industrial, and high-density residential areas, hydrants shall be spaced not greater than three hundred feet (300) apart or as approved by Frederick-Firestone Fire Protection District.

614.00 Fire Lines

The property owner shall maintain all fire lines extending from the valve on the Town water main. Valves on newly constructed fire lines shall be located on the tee at the main line. Fire lines are to be used exclusively for fire protection. Domestic water taps and/or irrigation taps shall not be allowed on the fire line. Fire lines valve boxes will have "FIRE" printed on the valve lid instead of "WATER".

615.00 Distribution System Layout

Distribution mains and lateral lines shall be located as indicated on the accepted plans, and shall be a minimum of eight inch (8) diameter pipe.

Dead ends shall be minimized by looping whenever possible. Lines at ends of long cul-de-sacs shall be looped along lot lines to adjacent streets. Dead ends shall be provided with a fire hydrant. Mains and laterals shall be extended to the boundaries of Filings and completely across the frontage of individual lots.

616.00 Valve Spacing and Marking

Valves shall be placed with a maximum spacing of six hundred (600) feet in all distribution mains and lateral lines. Valve layout shall be designed such that future repairs or maintenance may be isolated with disruption of service to as few customers as possible. Valves shall also be placed to insure that only one hydrant will be out of service in the event of a line break.

Tees shall require three (3) valves. Crosses shall require four (4) valves. For a succession of short blocks perpendicular to the direction of the distribution main and without residential or commercial services between, one or more intersection(s) shall have the valve in that direction omitted, but must maintain the six hundred (600) foot maximum spacing requirement.

Valves shall also be placed at each end of a line running through an easement on private property, on each side of a major creek or channel crossing, and on each side (at property lines extended) of a distribution line that provides service to a hospital, school or large industrial user.

617.00 Air Relief Valves

Air relief valves shall be installed at each high point in all distribution mains and at high points of lateral lines as may be required by the Town Engineer.

Air relief valves shall be installed in precast manholes or vaults fitted with air vents open to the atmosphere and in accordance with the Standard Drawings. (Also see Section 632.10 Air Relief Valves).

618.00 Temporary Blow-off Valves

Provisions shall be included in the design to allow for the flushing of distribution mains and lateral lines at any low point in the system, or at any point noted on the accepted plans. Fire hydrants shall be used for all permanent blow-offs, however for temporary dead end waterlines, a temporary blow off valve may be permitted. The blow-off assembly shall be installed perpendicular to and on the downhill side of the main or line and shall drain to the nearest gutter line or drainage channel. The blow-off assembly standpipe must have a threaded end to accept a fire hose coupling. The top of the standpipe shall be between four to six inches (4" - 6") below grade in accordance with the Standard Drawings.

619.00 Pipe

All pipe used for distribution mains and lateral lines having a diameter of twelve inches (12") or less shall be PVC pipe unless otherwise approved in writing by the Town Engineer. Distribution mains in excess of twelve inches (12") in diameter shall be subject to approval and as directed by the Town Engineer. The design engineer will specify the pipe class as required for specific project conditions (see Section 632.00).

619.01 Hydraulic Design

All pipes shall be designed to provide a maximum velocity of ten feet (10') per second. Distribution mains and lateral lines shall be designed using the Hazen-Williams friction coefficients and maximum head losses noted below:

Pipe Size	Hazen-Williams Friction Coeff.	Max. Head Loss
8" - 12"	C-100	2' per 1,000'
14" - 16"	C-110	2' per 1,000'
20"	C-130	1.5' per 1,000'
Over 20"	As directed by the Town Engineer	

619.02 Location (Typical)

Water mains will typically be located ten feet (10') north or west of the centerline of the street unless otherwise approved by the Town Engineer.

At street intersections, valves will be located at tees or cross with 5' of separation between valves. Fire hydrant gate valves shall be placed at swivel tee. All fire hydrants shall have a restrained connection directly to the tee off the main (see the Standard Drawings).

In all instances, the water mains shall extend to the boundary line of the property or subdivision served. A main serving one lot shall extend the entire way across the frontage for that lot. Mains

serving a subdivision shall extend to the center of boundary streets, to boundary lines or to the outside of paved areas as may be noted on the accepted plans.

619.03 Pipe Deflection

Changes in direction of waterline pipe shall require bends in all instances. Axial deflection at the joints shall not be allowed.

619.04 Minimum Depth

All pipe shall be installed with a minimum of five feet (5') of cover from finished grade of street to the top of the pipe barrel. Trenching, backfilling and compacting shall be completed in accordance with Section 350.00, Trenching, Backfilling and Compacting, of these STANDARDS AND SPECIFICATIONS.

619.05 Service Connections

See Section 640.00 of these STANDARDS AND SPECIFICATIONS for details on Town standards for service stub-ins and house service connections.

620.00 GENERAL PROVISIONS**621.00 General**

All water main construction within the Town and all water service line construction connecting to the Town's water mains shall be done in accordance with these STANDARDS AND SPECIFICATIONS and the accepted plans and shall apply to new water system construction as well as to repairs to existing facilities.

When special conditions are encountered or deviations from these STANDARDS AND SPECIFICATIONS are required by the Town Engineer, and such changes are in the best interests of the Town, the decision of the Town Engineer shall be final.

622.00 Permits Required

A public improvement permit shall not be issued until the Town Engineer has accepted the water main plans. A pre-construction meeting with the Town Inspector and Town Engineer, the Developer and the Contractor shall be scheduled and completed prior to the commencement of any construction. The Town Engineer shall be notified two (2) working days (forty-eight [48] hours) before construction is to begin.

623.00 Maintenance of Traffic

When street cuts are required for water facilities construction, the following conditions shall be met to avoid interference with traffic:

- A. Street service cuts shall be open only between 9:00 a.m. and 4:00 p.m.
- B. Two-way traffic shall be maintained at all times around the construction area. A Traffic Control Plan (TCP) must be prepared in accordance with Section 141.08, Traffic Control, Barricades and Warning Signs, of these STANDARDS AND

SPECIFICATIONS and submitted to the Town Engineer for his approval prior to the commencement of construction.

624.00 Irrigation Rain Sensor

All new public and private irrigation systems shall include an automatic electromechanical interrupt which engages to interrupt the irrigation system during a rainfall event (i.e. rain sensor). The device shall be a Hunter model Rain-Click or approved equal.

630.00 WATER MAIN CONSTRUCTION**631.00 Site Work and Earthwork**

Earthwork shall be performed in accordance with Section 340.00, Earthwork, of these STANDARDS AND SPECIFICATIONS.

631.01 Trenching, Backfilling and Compacting

Trenching, backfilling and compacting shall be performed in accordance with Section 350.00, Trenching, backfilling and Compacting, of these STANDARDS AND SPECIFICATIONS.

631.02 Preservation of Monuments

Refer to Section 141.00, Protection of Public and Utility Interests, of these STANDARDS AND SPECIFICATIONS.

632.00 Materials**632.01 General**

All references cited in these STANDARDS AND SPECIFICATIONS as the Denver Water Board Specifications shall mean the latest edition of the Engineering Standards of the Board of Water Commissioners of Denver, Colorado.

632.02 Pipe

All pipe for waterline construction shall be as described in Section 619.00 of these STANDARDS AND SPECIFICATIONS.

PVC Pipe: All PVC pressure pipe in sizes up through twelve inches (12") in diameter shall be in conformance with AWWA C-900 or AWWA C-909 Class 150 and have a minimum working pressure of 150 psi (DR-18).

PVC pressure pipe in sizes fourteen inches (14") through forty-eight inches (48") in diameter shall be in accordance with AWWA C905-97 and have a minimum working pressure of 165 psi (DR-25). PVC pressure pipe fourteen inches (14") through forty-eight inches (48") in diameter and having an operating pressure in excess of 125 psi, or when required by the Town Engineer, shall have a minimum working pressure of 235 psi (DR-18).

Installation of PVC pipe shall be in accordance with the manufacturer's recommendations and these STANDARDS AND SPECIFICATIONS.

Ductile Iron Pipe - All ductile iron pipe shall be in compliance with AWWA C151. Class designation shall be as shown on the accepted plans or as designated by the Town Engineer for each individual project. Joints shall be mechanical or push-on, in conformance with AWWA C111. Ductile iron pipe shall have a standard cement mortar lining in conformance with AWWA C104, and a bituminous outside coating approximately one (1) mil thick. Each pipe shall be marked with the weight, class designation and size.

632.03 Polyethylene Wrap for Ductile Iron Pipe

The Polyethylene encasement material shall be in accordance with Section 632.17 of these STANDARDS AND SPECIFICATIONS.

632.04 Fittings

Ductile iron fittings shall be in conformance with AWWA C110 and/or C153. Class designation shall be compatible with the pipe class designated for the project. Joints shall be either mechanical, push-on type or integral restrained joints conforming to the requirements of AWWA, rubber gasket joints shall be in conformance with AWWA C111. A standard thickness cement mortar lining shall be applied in conformance with AWWA C104. All fittings shall receive a bituminous outside coating approximately one (1) mil thick or lined and coated with fusion banded epoxy coating in accordance with AWWA C116.

632.05 Gate Valves

Gate valves in sizes four inches (4") to twelve inches (12") shall be of the ductile iron body, non-rising bronze stem, resilient-seated type manufactured in accordance with AWWA standard C515 with the specific requirements outlined.

General: Valves shall provide zero leakage at working pressures up through two hundred and fifty (250) psi in either direction. They shall open left and be furnished with a two-inch (2") square operating nut (underground) or hand wheel (vault) as indicated. End connections shall be furnished with all necessary joint materials and shall have a full opening flow way of equal diameter to the nominal size of the connecting pipe.

Design: The disc shall have an integrally cast ASTM B-62 ductile iron stem nut to prevent twisting or angling of the stem. The disc casting shall be open on one side so as to form no cavities for the accumulation of solids and permit the application of the protective coating. The sealing mechanism shall consist of a replaceable, contoured natural rubber disc seat ring internally reinforced by a steel ring and molded separately from the disc. The seat ring shall be secured to the disc with self-locking stainless steel screws and shaped so that it cannot be installed improperly. The seat ring shall seal against an accurately formed machined surface in the valve body.

Valves shall be provided with three (3) O-ring stem seals with two (2) placed above and one (1) below the thrust collar. The two (2) upper O-rings shall be replaceable with the valve fully open and under pressure. The area between the O-rings shall be filled with a lubricant to reduce friction and to lubricate the O-ring each time the valve is operated. An anti-friction washer shall be placed above the thrust collar to further minimize operating torque. Structural design of the valve shall be such that if excessive torque is applied to the stem, failure of the pressure retaining parts will not occur. Stem failure under such conditions shall occur externally at such a point as to enable the stem to be safely turned by use of a pipe wrench or other such readily available tool after exposure of the valve. The stem shall then be replaceable through removal of the two-bolt stuffing box.

Coating: Coatings shall be equal to or exceed AWWA C550-81 and the specific requirements outlined. All internal ferrous metal surfaces shall be fully coated, holiday free, to a minimum thickness of four (4) mils. The coating shall be a two-part thermosetting epoxy suitable for field over-coating and for touchup with the same coating material without special surface preparation or extreme heat. The supplier shall furnish detailed performance tests of adhesion, hardness and abrasion resistance of the furnished coatings. Coatings shall have a successful record of performance in valves, pipe or other allied equipment, for a minimum of ten (10) years.

632.06 Butterfly Valves

All valves having a nominal diameter of greater than twelve (12) inches or greater shall be geared butterfly valves designed for direct burial and shall conform to AWWA specification C504, Class 150-B. Valves shall be of the tight closing rubber seat type with rubber seats which are bonded to the valve body. No metal-to-metal sealing surfaces will be permitted. Valves shall be bubble tight at one hundred fifty (150) psi rated pressure with flow in either direction. Valve discs shall rotate 90 degrees from the full open position to the tight shut position. Butterfly valves used with Class 200 PVC shall include a standard pipe spacer to allow for unobstructed movement of the valve. Coatings shall conform to standards specified in Section 632.04. Valve bearings shall be sleeve-type corrosion-resistant, and self-lubricating with the load not to exceed twenty-five hundred (2500) psi.

Valve operators shall be the traveling nut type designed to withstand three hundred (300) foot pounds of input torque at full open or closed positions without damage to the valve or operator; shall be fully gasketed, grease packed, and designed to withstand submersion in water to ten (10) psi; and shall close with a clockwise rotation of a two inch (2") square AWWA nut, seventeen (17) to thirty (30) turns depending upon size. Hydrostatic and leakage tests shall be conducted in accordance with AWWA C504, Section A.6.

632.07 Pressure Reducing Valves

Pressure reducing valves shall be installed at the location(s) noted on the accepted plans. This valve shall be capable of maintaining a constant downstream pressure regardless of varying inlet pressure. This valve shall be a hydraulically operated, diaphragm-actuated, globe or angle pattern valve. It shall contain a resilient, synthetic rubber disc, having a rectangular cross-section, contained on three and one-half (3-1/2) sides by a disc retainer and forming a tight seal against a single removable seat insert. The diaphragm assembly containing a valve stem shall be fully guided at both ends by a bearing in the valve cover and an integral bearing in the valve seat. This diaphragm assembly shall be the only moving part and shall form a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure. The diaphragm shall consist of nylon fabric with synthetic rubber and shall not be used as a seating surface. Packing glands and/or stuffing boxes are not permitted and there shall be no pistons operating the valve or pilot controls. All necessary repairs shall be made possible without removing the valve from the line. The valve shall be furnished with indicator rod to show valve position.

The pilot control shall be a direct-acting, adjustable, spring-loaded, normally open, diaphragm valve, designed to permit flow when controlled pressure is less than the spring setting. The control system shall include a fixed orifice.

The valves shall be Clayton 90-01BYKC and/or a Clayton 90-01ASKC Pressure Reducing Valve manufactured by Cla-Val Co., or an approved equal. The bypass valve shall be 2-inch for main line sizes up to 12-inch. Main sizes larger than 12-inch will require an engineered design submitted for review and approval.

All pressure reducing valves shall be 150 class. Distribution main and lateral line pressure reducing valves shall be installed in a vault and contain parallel valves for high and low flow ranges. Piping must be ductile iron through the vault walls extending three (3) feet past the vault walls and shall be as shown on the Standard Drawings. Oil filled differential gauges shall be installed.

The calibration of the pressure reducing valves shall be the responsibility of the Developer or Contractor installing the valves. The Town shall be notified prior to scheduling the calibration. The calibration shall be to the satisfaction of the Town.

632.08 Fire Hydrants

Fire hydrants shall conform to the requirements of AWWA standard for dry-barrel fire hydrants (ANSI\AWWA C-502-85), and in addition, shall be listed by Underwriters Laboratories and Factory Mutual Research Corporation. Casting marks or other permanent means shall be used to identify the fire hydrant as conforming to these standards.

Fire hydrants shall also conform to the following supplementary specifications:

- A. Hydrants shall be rated at 1.5 times the operating line pressure and tested at 500 PSI per Section 5.1 of AWWA C502. Production testing of each hydrant shall be performed at 500 psi to assure proper assembly and operation and detection of any imperfections. All iron parts as designated in Section 3.1.2 of AWWA C502-85 shall be ductile iron – Class 52.
- B. The bury depth (distance from ground line to insert of the hydrant inlet) shall be specified here in after or as shown on drawing.
- C. Nozzles shall be two 2-1/2" hoses 180 degrees apart and one 4-1/2" pumper. All nozzles shall be at the same elevation. Nozzle threads shall be National Standard Fire Hose coupling screw thread as described in Appendix A of AWWA C502, unless otherwise specified. Nozzles caps shall be provided with chains and gaskets. Nozzles caps shall have nut configuration the same as the hydrant-operating nut. Nozzles shall be reverse threaded into the upper barrel and mechanically locked in place.
- D. Hydrant main valve shall be 5-1/4" (or 4-1/2" specified one or the other) minimum and shall be of the full compression design, opening against and closing with the pressure. The main valve seat ring shall thread into a bronze sub-seat and all gaskets sealing the seat ring shall be on a bronze-to-bronze seating surface. The seat ring threads shall not serve as pressure seal. The entire valve and rod assembly shall be removable by use of a small lightweight seat removal wrench.
- E. The drain valves shall allow complete drainage of all residual water in the hydrant. The circumferential drain passage inside the hydrant shall be bronze on all surfaces. The draining system of the hydrant will be bronze, with a sliding bronze drain valve. Sliding drain valves made of rubber, plastic, or leather will not be allowed.
- F. All exterior bolting and fasteners below the ground line shall be plated steel.
- G. Hydrants shall be the breakaway types with a frangible ground line and rod coupling designed to break upon traffic impact to prevent further damage to the hydrant and connecting pipe. The frangible coupling shall allow the upper section to be rotated to any desired position. Couplings, which employ lug devices or a breakaway barrel, are not acceptable. Frangible bolts are not acceptable due to the possibility for the use of non-frangible bolts.

- H. Hydrant operating nut shall be ductile iron and shall be pentagonal in shape, 1-1/2" point to flat (AWWA Standard). The operating nut shall also function as a weather shield. Hydrant shall open left (counter clockwise).
- I. The operating machine shall utilize two (2) O-ring seals between the revolving nut and bronze-sheathed upper section of the valve rod. The top of the rod shall also be fitted with a travel stop nut to limit downward travel on the rod. All-weather grease shall be used to provide permanent lubrication. A thermoplastic trust washer shall be used to reduce friction in the trust collar while opening the hydrant.
- J. The hydrant inlet shall be either mechanical joint or tyton joint restraint, if specified shall be accomplished for mechanical joint by use of mechanical joint gripper glands and for tyton joints with field-lock gaskets.
- K. Hydrants shall be painted red and shall be repainted at time of final acceptance. Hydrants for non-potable use shall be painted purple.
- L. Manufacturer shall certify that the hydrants furnished meet this specification.
- M. Fire hydrants shall be Waterous Pacer WB-67-250 or Mueller Super Centurion 250, A423.

632.09 Valve Boxes

All buried valves shall be provided with a valve box. Valve boxes shall be gray cast iron, ASTM A48 Class 20A, two (2) piece adjustable screw boxes with a round base and a five and one-fourth (5-1/4) inch screw-type shaft suitable for depth of cover as required. Valve box lids for water lines shall be marked with the word "WATER," valve box lids for fire lines shall be marked "FIRE," and valve box lids for Non-Potable water lines shall be marked "NON-POTABLE WATER."

All valves set at greater than normal depth shall have an extension stem provided and installed with the valve box so that the valve may be operated with a standard seven (7) foot valve key. A valve operating nut at six (6) foot or greater below final grade shall have an extension stem provided to bring the operating nut to a depth of four (4) feet below final grade. Coatings shall conform to standards specified in Section 632.05. The Town Engineer shall accept valve boxes and final grade only when the final grade is completed.

Boxes shall be Tyler Pipe screw-type cast iron valve box assembly Series 6850, or an approved equal.

632.10 Air Relief Valves

Air relief valves shall be designed to allow large quantities of air to escape out of the orifice when the pipeline is being filled and shall close water tight when water enters the valve. To break the vacuum, the valve shall also allow large quantities of air to enter the pipeline when the pipeline is being drained, or a break has occurred.

The valve shall consist of a body, cover, baffle, float and seat. The float shall be stainless steel designed to withstand a maximum pressure of 1,000 psi. All material shall conform to ASTM A126 GR. B and ASTM A240.

Air relief valves shall be installed in a vault in accordance with the Standard Drawings. Galvanized piping or fittings shall not be allowed, see Section 617.00 Air Relief Valves.

632.11 Temporary Blow-off Assembly

The temporary blow-off shall be through a two-inch (2) ball valve with a two-inch (2) gate valve operating nut, box, piping and cover. Unless otherwise approved in writing by the Town Engineer, all piping shall be threaded copper and valves shall be brass. Galvanized piping or fittings are prohibited. Refer to the Standard Drawings.

632.12 Vaults

Vaults may be precast or poured-in-place and shall be constructed in accordance with these STANDARDS AND SPECIFICATIONS. Precast vaults shall be so designed that all joints and corners are waterproof. Precast and poured-in-place vaults shall be made waterproof after construction by use of sealants, epoxies, or other approved methods.

The vault roof shall be designed to support the overhead fill, any surcharge and an H-20 traffic loading. Particular care shall be taken in selecting precast vaults that the application not be one of either shallow or deep cover over the roof. Should the cover over the roof be less than two and one-half (2-1/2) feet or more than five (5) feet, concern for adequacy of the roof, or the ability to remove and replace a one (1) piece roof slab resting upon deflecting side walls may dictate a poured-in-place vault.

Poured-in-place meter vaults shall conform to the Standard Drawings.

632.13 (Left Blank Intentionally)**632.14 (Left Blank Intentionally)****632.15 Sump Pits for Vaults and Manholes**

Sumps with a gravity drain line or sump pump, are required for vaults or manholes in areas where there is a history of seepage into existing vaults and in all telemetry equipment and pressure regulating valve manholes and vault installations, as determined by the Town Engineer.

Normal practice in constructing a sump is to excavate a thirty- (30) inch diameter hole about three (3) feet deep. A six-inch (6) floor is poured and allowed to set. Then a twenty-four inch (24) diameter cardboard tubing is used for an inside form, and concrete is poured behind it approximately three inches (3) thick.

632.16 Vent Pipes

Unless otherwise approved by the Town Engineer, vent pipes shall be used in vaults and pits to allow gases to escape. Installations that contain electrical equipment shall have a blower attached to the vent system. Vent pipes shall be field located at the nearest intersection of the street property line and the side lot line. Refer to the Standard Drawings.

Above ground vent pipe shall be six (6) inch nominal diameter galvanized steel pipe, Grade 40, conforming to ASTM Standard Designation A 53 painted black. The vent screen shall be a three (3/4) fourths inch No. 9-11 flattened expanded galvanized metal screen painted black. Below ground vent pipe shall be six (6) inch, scheduled 40 PVC with glued joints. A PVC glued joint by standard pipe thread female adapter shall be used to connect the steel pipe to the PVC pipe at ground level.

632.17 Corrosion Protection Systems

When soil resistivity is less than two thousand five hundred (2,500) ohm-centimeters (OHM-CM), but greater than one thousand (1,000) OHM-CM, ductile iron pipe may be used, but it must be protected against corrosion.

632.17.01 Polyethylene Encasement Material

Polyethylene wrap shall be used on all cast iron or ductile iron pipe, fittings, rods, and appurtenances. Refer to the Standard Drawings. Polyethylene wrap for non-potable use shall be purple.

Twenty-four (24) inch flat width tubing shall be used with four inch (4), six (6) inch and eight (8) inch diameter pipe. Thirty inch (30) flat width tubing shall be used with all twelve (12) inch diameter pipes. Thirty-six (36) inch flat width tubing shall be used for sixteen (16) inch diameter pipe. Fifty-two (52) inch flat width tubing shall be used with twenty (20) inch and twenty-four (24) inch diameter pipe.

Harness rods shall be covered by a four (4) inch wide flat polyethylene tubing. The entire joint shall be covered by a cigarette-wrap of forty-eight (48) inch wide polyethylene sheet material over each set of lugs. Irregular shaped valves and fittings shall be covered with a forty-eight (48) inch wide flat polyethylene sheet material.

632.17.02 Insulators

Insulators shall be installed at the outlet end of the corporation stop. Insulators shall be Ford Service Insulators or an approved equal for service lines. Refer to the Standard Drawings.

632.17.03 Tape

The polyethylene seams and overlaps shall be wrapped and held in place by means of two-inch wide plastic-backed adhesive tape. The tape shall be Polyken #900 (polyethylene), Scotchrap #50 (polyvinyl) or equal. The tape shall be such that the adhesive will bond securely to both metal surfaces and polyethylene film.

632.18 Tracer Wire and Warning Tape

A No. 12 AWG insulated, single strand copper wire shall be attached to all pipes, for the purpose of future locating, as detailed in the Standard Drawings. A three (3) inch wide, detectable warning tape shall be installed above all pipe, for the purpose of warning of location of buried pipeline as detailed in the Standard Drawings. Certification of continuity testing required at time of Initial Acceptance.

632.19 Bedding Materials

Bedding materials shall be in accordance with Section 352.00, Bedding for Pipelines and Service Lines, of these STANDARDS AND SPECIFICATIONS.

632.20 Concrete

All concrete shall conform to Town Standards for Portland Cement Concrete Work as specified in Section 400 of these STANDARDS AND SPECIFICATIONS and applicable referenced portions of the Denver Water Board Specifications.

632.21 Plastic Liner Pipe (slip lining)

Water main slip lining materials shall comply with all applicable requirements of Section 732.09, Plastic Liner Pipe (slip lining), of these STANDARDS AND SPECIFICATIONS and as herein noted.

632.22 Steel Casings for Bores

Steel casing pipe shall comply with all applicable requirements of Section 732.10, Steel Casings for Bores, of these STANDARDS AND SPECIFICATIONS.

633.00 Installation**633.01 General**

All work shall conform to applicable portions of AWWA C600, "Installation of Ductile Iron Water Mains", and to the pipe manufacturer's installation instructions except as modified by these specifications.

633.02 Alignment and Grade

Field parties, under the supervision of a licensed surveyor or a professional engineer, will determine alignment and grade of the pipe and the location of fittings, valves, and hydrants. The required minimum depth of cover between the top of the pipe barrel and the finished street grade is four (4) feet six (6) inches. The water main shall be laid to the required lines and grades with fittings, valves, and hydrants at the required locations. As-built drawings of pipe alignment, verified by a licensed surveyor or a professional engineer, shall be furnished to the Town Engineer.

633.03 Protection of Existing Underground Utilities

The Contractor shall be held responsible for the protection of public improvements as stated in Section 141.00, Protection of Public and Utility Interests, of these STANDARDS AND SPECIFICATIONS. It shall be the Contractor's responsibility to replace all damaged public improvements at his own expense.

633.04 Interruption of Services

Interruption of services shall be accomplished in accordance with Section 312.00, Protection of Public Improvements, of these STANDARDS AND SPECIFICATIONS.

633.05 Pipe Installation

Proper equipment, tools, and facilities shall be provided and used by the Contractor for safe and convenient performance of the work. All pipe, fittings, valves, and hydrants shall be carefully lowered into the trench piece-by-piece in such a manner as to prevent damage to pipe materials and to protect coatings and linings. Under no circumstances shall pipe or fittings be dropped or dumped into the trench; any pipe or fittings that are dumped shall be removed from the work site and shall not be used.

All pipe and fittings shall be carefully examined for cracks and other defects, while suspended above the trench, immediately before installation in final position. The groove in the bells of ductile iron pipe shall be full and continuous or the pipe will be rejected. Defective pipe or fittings shall be removed

from the job site within twenty-four (24) hours. All foreign matter or dirt shall be removed from the interior and ends of pipe and accessories before they are lowered into position in the trench.

Every precaution shall be taken to prevent foreign material, including trench water from entering the pipe. If the pipe laying crew cannot lower the pipe into the trench and into place without getting earth into it, the representative of the Town Engineer shall require that before lowering the pipe, a heavy, tightly woven canvas bag of suitable size be placed over each end of the pipe and left there until the connection is made to the adjacent pipe. During construction, no debris, tools, clothing, gravel or other foreign materials shall be placed in the pipe. During construction the Contractor shall provide and maintain adequate equipment to properly remove and dispose of all water entering the trench or any other part of the work.

When buried, all ductile iron pipe fittings and appurtenances shall be protected with thick polyethylene film wrap. Miscellaneous steel or other ferrous pipe for blow-offs, etc., shall be similarly protected.

Methods for applying the wrap will conform to the following procedure:

- A. Take up pipe by a crane at the side of the trench using either a sling or pipe tongs, and raise the pipe about three (3) feet off the ground. Slip a section of polyethylene tube over the spigot end of the pipe and bunch-up, accordion fashion, between the ends of the pipe and the sling. The tube shall be cut to a length approximately two (2) feet longer than the length of the pipe.
- B. Lower the pipe into the trench. Seat spigot end in bell of adjacent pipe and lower pipe to the trench bottom. A shallow bell-hole shall be provided in the trench bottom to facilitate wrapping of the joint.
- C. Make up the pipe joints in the normal fashion.
- D. Remove sling from center of pipe and hook into bell cavity; raise bell end three (3) or four (4) inches to permit tube of polyethylene film to be slipped along the full length of the barrel. Enough film shall remain bunched-up, accordion fashion, at each end of the pipe to overlap adjoining pipe about one (1) foot.
- E. To make an overlap joint; (1) pull film over bell of pipe; (2) fold film around adjacent spigot and wrap with about three (3) circumferential turns of the two (2) inch wide plastic adhesive tape to seal the tube of film to the pipe. The tube of the adjacent pipe shall be pulled over the above wrap on the pipe bell and sealed in place behind the bell using about three (3) circumferential turns of the two (2) inch plastic adhesive tape.
- F. The resulting wrap on the bell of the pipe shall be loose and will be pulled firmly around the barrel of the pipe; excess material shall be folded over at the top and the fold held in place by means of six (6) inch strips of two (2) inch wide plastic adhesive tape at intervals of about three (3) feet along the pipe barrel.
- G. Fittings, valves, hydrants, etc., shall be hand-wrapped using sheet polyethylene film held in place with plastic adhesive tape. Bends, reducers, and offsets shall be wrapped with polyethylene tube in the same manner as pipe. Valves shall be wrapped by bringing tube wrap on adjacent pipe over bells or flanges of the valve and sealing with adhesive tape. The valve bodies must then be wrapped with a flat sheet of film, passed under valve bottom and brought up around body of stem, and fastened in place with adhesive tape. Hydrants shall be wrapped with polyethylene tube slipped over hydrant to encase it from the lead-in valve to the ground level of the hydrant. All fittings requiring concrete backing shall be completely wrapped prior to placement of concrete thrust block.

According to the manufacturer's recommendation, as each length of pipe is placed in the trench, the circular rubber gasket must be lubricated and installed. The plain end shall be centered in the socket with care to keep the joint from contacting the ground. The pipe shall then be properly seated and brought to correct line and grade. After installation of the polyethylene protective wrap as described above, pipe shall be secured in place by installation of backfill or bedding material, tamped under and along it up to the spring line of the pipe.

Whenever pipe laying is not in progress, the open ends of pipe shall be closed by means of a watertight plug. Cutting of pipe for inserting valves, fittings, or closures pieces shall be done in a neat and professional manner without damage to the pipe or lining, so as to assure a smooth end at right angles to the axis of the pipe. Pipe ends shall be smooth and beveled with a file or other tools according to the pipe manufacturer's recommendations.

The Town Engineer shall be notified at least one working day (twenty-four [24] hours) in advance of when pipe is to be laid in any trench. No pipes shall be covered until a representative of the Town has inspected them.

633.06 Thrust Blocking, Restrained Joints and Fittings

Thrust blocks and mechanical restraints shall be used at all valves, bends, fittings with mechanical or push-on type connections and dead ends length shall be as required by the design engineer.

Thrust blocking shall be in accordance with the Standard Drawings. Care shall be taken not to block outlets or to cover bolts, nuts, clamps or other fittings or to make them inaccessible. A bond breaker shall be placed between the pipe and the thrust block to aid in ease of future removal. Large thrust blocks shall be separated into sections by a suitable material. The thrust block shall bear against undisturbed earth. Mechanical restraints shall be required if a thrust block cannot bear against undisturbed earth.

All forming for thrust blocks and anchors shall be done by bulk heading around the shape of the thrust block or anchor with wood, burlap, or reinforced paper sacks filled with sand or earth. Wood forms shall be removed before backfilling. Newly placed thrust blocks shall be allowed to set, undisturbed, for a minimum of twenty-four (24) hours prior to any backfilling, tamping or compaction.

Mechanical restraints shall be used at all valves, bends, fittings with mechanical or push-on type connections and dead ends. Restraints shall be protected in accordance with Section 632.17 of these STANDARDS AND SPECIFICATIONS. Mechanical restraints shall be "Mega Lugs", "Star Products", "All Grip" Series 3600, uni-flange Series 1400 and 1500 or approved equal.

633.07 Setting Valves and Hydrants

Immediately prior to installation of a valve or hydrant, the following operations shall be performed. The valve or hydrant shall be carefully inspected. The interior shall be thoroughly cleaned; the valve or hydrant shall be operated as many times as necessary to determine that all parts are in proper working order with the valve seating properly and the hydrant drain valve operating properly. Valves and hydrants shall be set plumb, in a vertical position and securely braced in place.

Each hydrant shall have a six (6) inch gate valve on the inlet line and shall be connected to the main by a six (6) inch ductile iron, polyethylene wrapped pipe. The valve shall be firmly anchored to the tee. Where hydrants are connected to mains larger than eight (8) inches, the gate valve will have a restrained connection directly to the tee off the main.

Hydrants shall be set with the bury line at the established finished grade and with hose nozzles parallel to the curb with the pumper nozzle facing the curb and at least six inches (6") behind the curb or sidewalk.

Valves shall be provided with valve boxes centered and plumb over the operating nut of the valve. The boxes will be supported to prevent any shock or stress being transmitted to the valve. All valves shall be installed using a valve box adaptor to insure the proper centering of the valve box during backfill and to maintain valve box location during the life of the valve. Valve boxes shall be maintained in this position during backfilling and covers shall be set to finished position during backfilling. Valve box covers shall be set to finished grade but may be first positioned below the subgrade level to prevent damage during street construction and later adjusted to grade at the time of paving. If the top of the valve-operating nut is greater than six (6) feet below finished grade a valve nut extension shall be installed to bring the operating nut up to four (4) feet below finished grade.

Hydrants shall be provided with a drainage pit with nine (9) square feet of surface area and two (2) feet of depth below the barrel of the inlet. Pits shall be backfilled with one and one-half (1-1/2) inch, washed, crushed rock to a level six (6) inches above the barrel drain hole. A concrete thrust block will be provided at the bowl of each hydrant as shown on the Standard Drawings and shall be placed to prevent obstruction of the barrel drain hole. Hydrants and valves shall be backfilled to the ground surface as specified in Section 350.00 of these STANDARDS AND SPECIFICATIONS.

633.08 Plastic Liner Pipe (Slip lining)

Plastic liner pipe shall be installed in accordance with all applicable portions of Section 733.09, Plastic Liner Pipe, of these STANDARDS AND SPECIFICATIONS.

633.09 Steel Casing and Carrier Pipe Installation

Steel casing and carrier pipe shall be installed in accordance with Section 733.10, Steel Casing and Carrier Pipe Installation, of these STANDARDS AND SPECIFICATIONS.

633.10 Test Stations

Underground pipeline test stations shall be installed at the locations shown on the accepted plans and in accordance with the details shown on the Standard Drawings.

633.11 Plugging of Dead Ends

Standard plugs or caps shall be installed at temporary dead ends of all fittings and pipes, and an adequate thrust block will be provided. Mechanical restrained joints shall be provided as required by the Town Engineer. Dead ends on any line shall be provided with a fire hydrant and proper valve.

633.12 Filling and Venting the Line

The Town Public Works Department shall operate all valves. The line shall be slowly filled with water and all air expelled from the pipe. Care shall be taken that all available hydrants (including hydrant gate valves), air relief valves, and other vents are open during the filling of the line. Where hydrants or other vents are not available in the line, the Contractor shall make whatever taps are required for venting purposes. The rate of filling the line shall not exceed the venting capacity.

633.13 Disinfection and Flushing of Mains and Fire Lines

All mains and fire lines shall be disinfected in accordance with the requirements of the Colorado Department of Health and the procedure set forth in AWWA C651, "Standard for Disinfecting Water Mains".

The chlorine solution shall be retained in the line for at least twenty-four (24) hours. The chlorine residual at the pipe extremities and other representative points shall be at least twenty five (25) parts per million at the end of the twenty-four (24) hour period. If the test is unsatisfactory, the disinfection shall be repeated until a twenty five (25) parts per million chlorine residual is obtained.

Following chlorination, the main shall be thoroughly flushed through all extremities until the water runs clear with no chlorine residual in excess of that carried in the existing system. As a minimum, the total capacity of that portion of the line(s) being tested must be flushed.

The line shall be tested for turbidity at the discretion of the Town Engineer. If the test is above one (1) NTU, the line shall be flushed again. If the turbidity test fails a second time the line shall be re-chlorinated as noted above and then re-flushed.

Two twenty-four (24) hour Bacteriological tests, from multiple points to be determined by the Town Engineer, for total coli-form bacteria shall be performed by the Town a minimum of 24 hours apart. If either of these tests fail, the line shall be re-chlorinated, re-flushed and then retested. The Developer and/or Contractor shall be responsible for reimbursing the Town for all costs associated with the water quality testing. The Contractor shall contact both the Town and the Town's water quality lab to arrange for testing a minimum of two (2) working days (forty-eight [48] hours) prior to testing.

The Contractor shall take all necessary precautions to prevent the flow of strong chlorine solution into existing water facilities and shall assume all responsibility for damages done by heavily chlorinated water. No water mains shall be placed in service or tapped until a written release is obtained from the public health authority having jurisdiction and a copy of that release furnished to the Town Engineer.

633.14 Leakage

Pressure and leakage tests shall be conducted according to the applicable sections of AWWA C600/605 to a pressure of one hundred and fifty (150) pounds per square (psi) inch at the low point of the section being tested for the duration of two (2) hours. The maximum length of line to be tested shall be one thousand (1,000) feet. All joints in connections are to be watertight within tolerances allowed by the specifications in AWWA C600/605. Any leakage that is discovered by observation or tests shall be located and made watertight by the Contractor. Pressure and leakage tests shall be conducted before the line has passed all required disinfection tests. All bacteriological testing will follow pressure testing and leak repairs.

633.15 (Left Blank Intentionally)**633.16 Inspections**

Refer to Section 154.00, Inspections, of these STANDARDS AND SPECIFICATIONS.

634.00 NON-POTABLE WATER SYSTEM**634.01 General**

The minimum standards for the Non-Potable Water System shall be similar to those given in Section 630.00 for Water Distribution Systems with the exceptions as listed hereinafter.

634.02 Design/Sizing

Non-Potable Water Main sizing shall be to deliver not less than twenty (20) psi dynamic pressure at the Non-Potable Water Main during peak flow rate (demand) conditions. The Non-Potable Water System will not be designed to provide any fire protection flows.

634.03 Non-Potable Water Main Materials

Non-Potable Water Mains shall be purple and shall conform to AWWA C900 PVC, Purple Pressure Pipe for Non-Potable water, minimum Pressure Class 235. DR 18.

634.04 Valve Boxes:

Valve boxes shall be in accordance with Drawing No. W38. The triangular valve box covers shall be Model # 4TCI16S by Castings, Inc. or approved equal and shall have "Non-Potable Water" cast on the cover.

634.05 Warning Notification on Lines and Tape

All Non-Potable Water Mains shall be installed with warning tapes and with the warning printed directly onto the Non-Potable Water Main. The warning tape, and printing directly on the Non-Potable Water Main, shall state: "NON-POTABLE LINE – DO NOT DRINK".

634.06 Non-Potable Water Main Installation

All mains shall be flushed in accordance with Section 633.13. Disinfection of Non-Potable Water Mains is not required.

The Non-Potable Water Main shall not be installed closer than ten feet (10') horizontally to the Potable Water Main or Sanitary Sewer.

640.00 WATER SERVICE LINE CONSTRUCTION**641.00 General**

All water service line locations shall be marked on the curb with a "W" or "V" symbol where services cross under the curb. Water service shall be in a separate trench and shall be a minimum of ten (10) feet from the sewer service line. The water service line shall be a minimum of eighteen (18) inches above any sanitary sewer crossing. All service lines shall be stubbed into the lot either ten (10) feet beyond the back of the walk or five (5) feet past any utility easement, whichever is greater, and shall be marked at the end of the water service with a 2x4 painted blue.

The water service line at the curb stop shall be no deeper than five (5) feet - six (6) inches. The water service line shall be a minimum of two (2) feet from the property line and shall not be located under a driveway unless approved by the Town Engineer.

641.01 Excavation

All excavation shall be performed in accordance with Section 341.00 of these STANDARDS AND SPECIFICATIONS.

642.00 Equipment and Materials**642.01 General**

All references cited in these STANDARDS AND SPECIFICATIONS as the Denver Water Board Specifications shall mean the latest edition of the Engineering Standards of the Board of Water Commissioners of Denver, Colorado.

642.02 Service Lines

Service lines shall be of the size that is adequate to supply the requirements of the property being served. The minimum size line shall be three (3/4) fourths inch. The only acceptable materials for a service line are seamless copper tube and ductile iron pipe. Plastic pipe shall not be accepted as service pipe material for services under three (3) inches in diameter. All service pipes shall conform to one of the following specifications:

- A. Seamless copper tube of the type designated as "Type K" (soft) in the industry shall be used for service lines three (3/4) fourths inch through two (2) inches.
- B. Ductile Iron Pipe or PVC pressure pipe conforming to the Denver Water Board Specifications may be used for three-inch (3") service lines, and shall be used for all service lines larger than three inches (3").

Service lines shall be of the same type material from beginning to end, unless the appropriate insulator is installed at the junctions of dissimilar metals and unless approved by the Town Engineer.

642.03 Service Saddles

Service saddles shall be used for wet tapping of all PVC mainline for service taps. Service saddles shall be ROMAC 202 B, or approved equal.

642.04 Meters

All meters shall be shipped and installed by the Town.

642.05 (Left Blank Intentionally)**642.06 (Left Blank Intentionally)****642.07 Outside Meter Settings**

The meter shall be furnished and installed by the Town, in a pit, manhole, or vault which shall allow for free and easy access with adequate room for installation, inspection and maintenance and shall provide protection from freezing in accordance with the Standard Drawings.

642.08 Inside Meter Setting and Remote Readers

All inside meters shall only be used with special approval of the Town Engineer. All inside meter settings shall be installed in a manner which will allow free access and adequate room for inspection and maintenance and will protect the meter from freezing in accordance with the Standard Drawings.

642.09 Meter Bypass Line

A locking bypass line shall be required for all meters one and one half (1-1/2) inches and larger, unless otherwise approved by the Town Engineer, whether installed in an inside or outside setting. Bypass lines shall contain an independent control valve and shall contain no tees, plugs, or other outlets through which water could be withdrawn, as indicated on the Standard Drawings.

642.10 Meter Check Valves

Swing check valves shall be required for all meters one and one-half (1-1/2) inch and larger unless otherwise approved by the Town Engineer, whether installed in an inside or outside setting. Check valves may be required on meters smaller than one and one-half (1-1/2) inch where any condition might exist that could cause a flow of water from the property to the main.

Valves for Use With Meters-

Gate valves three (3) inch and smaller to be used with copper service pipe shall be brass, with non-rising stems and solid wedge disc, manufactured in accordance with ASTM Specification B 62-76 and Federal Specification WW-V-54 Class A 125 PSI WSP, 150 PSI, WOG Gate valves shall meet the requirements of AWWA Standard C800. Also refer to the Standard Drawings of these STANDARDS AND SPECIFICATIONS.

Valves larger than three (3) inches for use with ductile iron service pipe shall be gate valves with cast iron bodies. All gate valves larger than three (3) inches shall be supported by adjustable steel valve supports.

642.11 (Left Blank Intentionally)**642.12 Meter Yokes (Copper Setters)**

Meter Yokes (Copper Setters) shall be a Ford Series 80, McDonald Series 31, Cambridge Series 6040, Mueller Series P-2474, or James Jones Company Series J04 with an angle ball valve and a padlock wing on the inlet side of meter. Yoke shall have a dual check valve on the outlet side. Service connections shall be compression fittings, with a "110", "Cam Pack", or "Mac Pack" type fitting and shall be vertical.

642.13 Residential Meters

The standard residential meters shall be 3/4 x 5/8. 3/4 x 3/4 meters must be approved by Public Works.

642.14 Residential Meter Pits and Covers

Meter pits shall be PVC or HDPE, four (4) foot tall, twenty-four (24) inch diameter body, twenty (20) inch diameter top opening in accordance with ASTM/D1505 and ASTM/D746. Meter pit covers shall be tight-fitting with a double cover and shall be Rotec DFW 12" AMR , Nicor Read

Rite AMR or approved equal. The meter pit cover shall be installed at two (2) inches above final grade. The frost proof lid shall be per meter pit standard detail.

642.15 Corporation Stops

Corporation stops shall provide the connection for the service line to the main. Corporation stops shall be Ford model F1000, McDonald model 4701, Cambridge model 301, Mueller model 300, James Jones Company series J1949, with compression fittings with a "110", "Cam Pack", or "Mac Pack" type fitting. See the Standard Drawings.

642.16 Curb Stops

Curb stops are set on the service line on the inlet side of the meter pit to provide a means to shut off the service line. Placement of the curb stop and stop box shall be one (1) foot from the meter pit. Curb stops shall be Ford model B44-333, McDonald model 6100, Cambridge model 301, Mueller model 300, James Jones Company model J3401, with compression fittings with a "110", "Cam Pack", or "Mac Pack" type fitting. See the Standard Drawings.

642.17 Curb Stop Service Boxes

Curb stop service boxes shall be cast iron and shall be Minneapolis type. The bottom part shaped like an inverted U straddling the service line shall have a flanged bottom so as to support itself. Curb stop service boxes shall be located and be two (2) inches above grade.

643.00 Tapping the Main

ALL TAPS SHALL BE WET TAPS. SHUT DOWN OF ANY PORTION OF THE WATER SYSTEM SHALL ONLY BE ALLOWED WHEN UNCONTROLLED CIRCUMSTANCES DO NOT PERMIT A WET TAP. ANY SHUT DOWN OF THE WATER SYSTEM MUST BE APPROVED IN WRITING BY THE TOWN ENGINEER.

The Developer's contractor shall do tapping of all mains. Notification must be given to the Construction Inspector two working days (forty-eight [48] hours) in advance of the tap in order to provide ample time to schedule inspection of the work.

THE TOWN SHALL BE RESPONSIBLE FOR MAINTAINING THAT PORTION OF THE SERVICE LINE FROM THE CORP STOP UP TO AND INCLUDING THE METER PIT.

644.00 Inspection

All taps, meter sets, and inspections must be scheduled during regular working hours a minimum of two working days (forty-eight [48] hours) in advance. All installations by Contractors must meet these STANDARDS AND SPECIFICATIONS. Unnecessary recall inspections or meter installations are subject to an assessment that will equal the expenses accrued to complete the inspection. This amount will be one and one-half (1½) times that of the inspector's wages.

645.00 NON-POTABLE WATER SERVICES.**645.01 General**

The Non-Potable Water Service Lines shall be installed similarly to the standards designated in Section 640.00 for Water Service Lines; with the exceptions in materials and installation as

itemized below. Non-Potable Water Service Lines shall be marked on the curb with an "R" where the service line cross under the curb.

645.02 Non-Potable Water Service Line Materials

All Non-Potable Water Service Lines outside the meter pit shall be of plastic materials, as follows:

Three-quarter inch (3/4") through three-inch (3") size Non-Potable Water Service Lines shall be polyethylene, non-jointed, conforming to AWWA C901, minimum Class 160 psi, using HDPE 3408 material. All PE service lines shall conform to Iron Pipe Size (IPS) sharing the same O.D. as Schedule 40 and 80 PVC. The pipe shall have purple color coding, permanently co-extruded stripes on the pipe.

Non-Potable Water Service Lines four-inch (4") diameter and larger shall be AWWA C900 Purple Pressure Pipe for reclaimed water, minimum Pressure Class 235. DR 18.

645.03 Warning Notification on Non-Potable Water Service Line and with Tape

All Non-Potable Water Service Lines shall be installed with warning tapes and with the warning printed directly onto the pipe. Warning tapes shall be installed directly on top of the Non-Potable Water Service Line longitudinally and shall be centered. Acceptable tape or printing directly on the Non-Potable Water Service Line shall state: "NON-POTABLE LINE – DO NOT DRINK".

645.04 Meters and Meter Pits

Three-quarter inch (3/4") and one inch (1") meters shall be installed per Drawing W12A; one and one-half (1-1/2") and two-inch (2") meters shall be installed per Drawing W13. The requirements of Potable Water meters shall apply except; polyethylene by copper compression couplings shall be provided at the meter pit inlet and outlet, the meter color shall be purple, the pre-cast polyethylene meter pit interior color shall be purple, and by-pass piping is not needed. The ball valves shall be shall have an enlarged tee-head embossed with "Non-Potable Water". The meter and meter pit cover shall be marked for identification purposes with a color designated by the Town.

645.05 Non-Potable Water Service Line Installation

The Non-Potable Water Service Line shall not be installed closer than ten feet (10') horizontally to the Water Service Line or Sewer Service Line. No Non-Potable Water Service Lines shall be installed inside a building or within five feet (5') of a building foundation. A marking tape with the words "NON-POTABLE LINE – DO NOT DRINK" shall be installed just above the Non-Potable Water Service Line. If the meter is not installed at the time of Non-Potable Water Service Line installation, in the right-of-way, a one and one-half inch (1-1/2") black PVC or Acrylonitrile-Butadiene-Styrene marker pipe six feet (6') long, shall be installed vertically at the end of the Non-Potable Water Service Line as a marker.

650.00 PUMPING FACILITIES

651.00 General

In those locations where the Town's water distribution system may not be capable of providing adequate water pressure, the Town may require the construction of a pumping facility in order to provide proper service. The Town may not approve the installation of a pumping facility where, in

the opinion of the Town Engineer, such installation would be injurious to the operation, or future operation, of the Town's water system. The Developer must provide the Town Engineer with a set of design calculations and drawings for review and acceptance by the Town Engineer as required under Section 160.00, Plans and Specifications, of these STANDARDS AND SPECIFICATIONS.

The pumping facility must satisfy all requirements of the Colorado Department of Health and of these STANDARDS AND SPECIFICATIONS. The Town shall require that the Developer prepare a set of Mylar "as built" drawings and an AutoCAD file of the pumping facility in accordance with Section 222.00, Initial Acceptance Procedures, of these STANDARDS AND SPECIFICATIONS. Upon completion of the pumping facility, the Contractor shall also provide the Town with two (2) copies of an "Operation & Maintenance Manual" for the facility.

652.00 Design Criteria**652.01 Pumps and Pump Station**

All pertinent portions of the Denver Water Board Specifications Section 5.08, Pumping Facilities, shall apply. Applicable portions of the Denver Water Board Specifications Section 6.46, Electric Pump Motors, shall also be followed.

A STANDBY GENERATOR, CAPABLE OF OPERATING THE ENTIRE STATION, SHALL BE PROVIDED. THE GENERATOR MAY BE HOUSED INSIDE OF A SEPARATE ALL WEATHER ENCLOSURE.

652.02 Controls and Supervisory Control and Data Acquisition (SCADA)

All new controls and telemetry equipment must be compatible with and easily integrated into the Town's system. Controls and SCADA systems are subject to review and acceptance by the Town Engineer prior to installation.

652.03 Site Improvements

Refer to Section 762.04, Site Improvements, of these STANDARDS AND SPECIFICATIONS.

660.00 TRENCHING, BACKFILLING AND COMPACTING

Trenching, backfilling and compacting shall be performed in accordance with all applicable portions of Section 350.00, Trenching, Backfilling and Compacting, of these STANDARDS AND SPECIFICATIONS.

670.00 RESTORATION AND CLEANUP

Restoration and cleanup shall be completed in accordance with Section 360.00, Restoration and Cleanup, of these STANDARDS AND SPECIFICATIONS.

SECTION 700

SANITARY SEWER SYSTEM

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SECTION 700**SANITARY SEWER SYSTEM****710.00 DESIGN CRITERIA****711.00 General**

The St. Vrain Sanitation District provides sanitary sewer service to the Town. The Developer shall design and construct all of the proposed sanitary sewer facilities to the Districts standards and criteria, in addition to these STANDARDS AND SPECIFICATIONS. Any proposed resolutions of conflicts in the two standards shall be approved by the Town Engineer.

712.00 Design Details**712.01 Sewer Mains**

Sewer mains shall ordinarily have a minimum of eight (8) feet of cover to finished ground surface. Where this will provide less than nine (9) feet of elevation difference between the finished lot grade at building line and the top of the sewer main, it will be indicated on the plans that the lot is served by a "shallow sewer" and appropriate elevation information will be given. Where pipe has less than (4) feet of cover, provisions shall be made to protect the pipe from impact and loading.

Sewer mains shall be extended at least ten (10) feet uphill from the lowest lot corner of the uppermost lot to be served adjacent to the sewer main. Sewer mains will terminate in a manhole. Manholes will be stubbed out with suitable size pipe wherever future extension of the sewer is anticipated.

713.00 Location Details

Unless approved otherwise by the Town Engineer, sanitary sewer mains installed in local or collector streets shall be located ten (10) feet east or south of the centerline of these streets. Service connections will not be permitted to cross an arterial street.

714.00 Relation to Water Mains

Sewer lines will be located a minimum of ten (10) feet, horizontally, from existing or proposed water mains (centerline distance). Where sewer lines cross water mains, the sewer pipe will be a minimum of eighteen (18) inches, clear, below the water main. If this clear distance is not feasible, the crossing must be designed and constructed so as to protect the water main. The Town Engineer must approve the crossing design.

Minimum protection shall consist of the installation of an impervious and structural sewer. Sewer pipe will be encased in reinforced concrete. The encasement shall be at least six (6) inches thick around the entire pipe and will extend a distance of ten (10) feet on either side of the water main. In all cases, suitable backfill or other structural protection must be provided to preclude settling and/or failure of the higher pipe.

715.00 Underdrain Pipe - Private

Underdrain systems shall be private and will **NOT** be maintained by the Town of Firestone.

Underdrain pipe shall be installed at locations shown on the accepted plans. Underdrain pipe will be installed at those locations where excessive groundwater is encountered and the Soils Engineer recommends it. Underdrain installations will require the approval of the Town Engineer.

Should the Developer desire to install an underdrain system to specifically collect the discharge of peripheral drain systems from individual house foundations or from sump pumps installed as a part of a peripheral drain system for house foundations, such a system shall be constructed for the exclusive advantage of the Developer and will **NOT** be maintained by the Town of Firestone. Any such system shall **NOT** be tied into the sanitary sewer collection system in any manner. Clean outs shall **NOT** be installed within a sanitary sewer manhole and will **NOT** be maintained by the Town of Firestone. Any such system will require the approval of the Town Engineer and must meet all applicable portions of Sections 732.02 and 733.04 of these STANDARDS AND SPECIFICATIONS.

720.00 GENERAL PROVISIONS

721.00 Permits Required

A public improvements permit shall not be issued until the St. Vrain Sanitation District has accepted the sanitary sewer main plans.

722.00 Maintenance of Traffic

When street cuts are required for sanitary sewer facilities construction, the following conditions will be met so as to avoid interference with traffic:

- A. Street service cuts will be open only between 9:00 a.m. and 4:00 p.m.; and
- B. Two-way traffic will be maintained at all times around the construction area. A Traffic Control Plan (TCP) must be prepared in accordance with Section 141.08, Traffic Control, Barricades and Warning Signs, of these STANDARDS AND SPECIFICATIONS and submitted to the Town for approval prior to the commencement of construction.

730.00 SANITARY SEWER MAIN CONSTRUCTION

731.00 Site Work and Earthwork

731.01 General

Site work and earthwork shall be performed in accordance with Section 300.00, Site Work and Earthwork, of these STANDARDS AND SPECIFICATIONS.

731.02 Trenching, Backfilling and Compacting

Except where otherwise approved in writing by the Town Engineer, all major arterial or collector streets shall have pipe installed by pushing or boring.

Trenching, backfilling and compacting shall be performed in accordance with Section 350.00, Trenching, Backfilling and Compacting, of these STANDARDS AND SPECIFICATIONS.

731.03 Preservation of Monuments

Refer to Section 141.00, Protection of Public and Utility Interests, of these STANDARDS AND SPECIFICATIONS.

732.00 Materials

732.01 Underdrain Pipe - Private

Underdrain systems shall be private and will **NOT** be maintained by the Town of Firestone. If required as described in Section 717.00 of these STANDARDS AND SPECIFICATIONS, underdrain pipe shall be provided with joints which will prevent any shifting or misalignment of the line. Where under drains are to be constructed under sewer mains, clean-outs shall **NOT** be allowed in manholes. Suitable fittings shall be provided which will allow construction of clean-outs and bends outside of manholes.

The design engineer will determine all underdrain pipe and fittings.

732.02 Manholes

Manholes may be constructed of cast-in-place concrete or precast concrete. Concrete precast reinforced risers and tops must conform to ASTM Designation C-478 except that wall thickness may be either wall "A" or wall "B" as described in ASTM Designation C-76. Manholes shall conform to details shown on the Standard Drawings unless otherwise approved by the Town Engineer. Cones will be of the eccentric type.

The top of the manhole vault shall be a minimum of twelve (12) inches and a maximum of eighteen (18) inches below the finished street or ground surface elevation. Concrete extension risers or collars shall be used to bring the manhole ring and cover up to finished street or ground surface elevation.

Manhole rings and covers (all traffic covers shall be designed for H-20 traffic loading):

- A. Twenty-four (24) inch manhole rings and covers; cover weight = approximately one hundred sixty-five (165) pounds, ring weight = approximately two hundred forty (240) pounds.
- B. Twenty-four (24) inch by thirty-six (36) inch double ring and cover (36" cover with auxiliary 24" opening and cover);
36" cover weight = approximately two hundred fifty (250) pounds.
24" cover weight = approximately one hundred sixty five (165) pounds.
36" ring weight = approximately two hundred eighty (280) pounds.

732.03 Concrete

Concrete shall conform Section 400.00, Concrete Work, of these STANDARDS AND SPECIFICATIONS. Type II cement will be used. Concrete encasement of sewer pipe shall conform to the details outlined in Section 716.00 of these STANDARDS AND SPECIFICATIONS.

732.04 Bedding Materials

The design engineer will determine the bedding materials needed for under drains, if required by the accepted plans.

733.00 Installation**733.01 General**

Installation of PVC sewer main will conform to ASTM Designation D-3034, "Recommended Practice for Underground Installation of Flexible Thermoplastic Sewer Pipe". All work shall conform to the accepted plans, specifications, special provisions and the above designation, except as modified herein.

733.02 Alignment and Grade

Sanitary sewers and structures appurtenances shall be constructed accurately to the line and grade as shown on the accepted plans. Construction stakes shall be placed by field parties under the direct supervision of a Registered Professional Land Surveyor licensed to practice in the State of Colorado.

"As-built" drawings, as described in Section 161.00, Construction Plan Requirements, of these STANDARDS AND SPECIFICATIONS, shall be furnished to the Town Engineer.

733.03 Protection of Existing Underground Utilities

The Contractor will be held responsible for the protection of public improvements as stated in Section 141.00, Protection of Public and Utility Interests, of these STANDARDS AND SPECIFICATIONS. It will be the Contractor's responsibility to replace all public improvements so damaged at his own expense.

733.04 Underdrain Pipe - Private

Underdrain systems shall be private and will **NOT** be maintained by the Town of Firestone.

Under drains shall be installed where shown on the accepted plans as required by Section 717.00 of these STANDARDS AND SPECIFICATIONS. Under drains will be day-lighted to the nearest suitable point acceptable to the Town Engineer. The trench will be excavated to the required depth and width and backfilled with underdrain bedding material.

Underdrain pipe to be determined by the design engineer.

Where underdrain pipe is required the thickness of underdrain bedding shall be increased to provide six (6) inches of bedding material under the underdrain pipe and six (6) inches of bedding material between the underdrain pipe and the sewer pipe. The underdrain pipe shall be installed to a true line and grade and held in place with underdrain bedding material as shown on the Standard Drawings. Underdrain pipe shall be continued around manholes by use of suitable bends and other fittings and have a cleanout installed outside the manhole.

733.05 Handling Pipe and Fittings

All pipe, fittings, and specials will be unloaded, stockpiled, hauled, distributed, installed and otherwise handled in a manner that will prevent breakage or other damage thereto and which will insure delivery and installation in a sound and acceptable condition.

740.00 SANITARY SEWER SERVICE LINE CONSTRUCTION**741.00 Trenching, Backfilling and Compacting**

Trenching, backfilling and compacting shall be completed in accordance with Section 350.00, Trenching, Backfilling and Compacting, of these STANDARDS AND SPECIFICATIONS.

742.00 Materials**742.01 Polyvinyl Chloride (PVC)**

Pipe and fittings shall conform to the requirements of ASTM D3034. All joints shall be factory prepared compression type (elastomeric gasket joint), providing a watertight seal. A compression stop, as recommended by the pipe joint manufacturer, will be provided to seal the end joint of dead-end stubs.

742.02 Inspection

All pipes shall be subject to inspection at the point of delivery in Firestone. The purpose of this inspection is to reject pipe that fails to conform to the requirements of these STANDARDS AND SPECIFICATIONS. Plastic joint material damaged in any way shall be cause for rejection of that joint of pipe.

743.00 Installation**743.01 Location and Alignment of Service**

Sanitary sewer service lines shall be constructed on the shortest and straightest route possible. Unless specific approval is obtained in writing from the Town Engineer, all sanitary sewer service lines shall have a minimum depth of three (3) feet.

At no time shall the service line be closer than three (3) feet to a side property line, and no service line may be constructed through or in front of an adjoining property. Sewer service lines shall be typically located a minimum of ten (10) feet to the low side of the water service, generally five (5) feet from the centerline of the lot, or as shown on the accepted plans.

743.02 Crossing Sidewalk or Curb (Existing or Proposed)

In no instance will a trench extend beneath an existing sidewalk or curb. The pipe must be bored, jacked or tunneled through the earth under the sidewalk or curb. If the service line is installed prior to the placement of the sidewalk or curb, the trench shall be backfilled in accordance with Section 353.00, Backfilling for Pipelines and Service Lines, of these STANDARDS AND SPECIFICATIONS.

743.03 Service Stub-ins to Property Line

All sewer service lines shall be marked on the curb with an "X" or "S" symbol where the service crosses under the curb. All service stub-ins shall be stubbed into the lots, ten (10) feet beyond the back of walk or five (5) feet past any utility easement which ever is greater. All service stub-ins shall be located with the end marked with a 2x4 painted green.

750.00 RESTORATION AND CLEANUP

Restoration and cleanup shall be completed in accordance with Section 360.00, Restoration and Cleanup, of these STANDARDS AND SPECIFICATIONS.

SECTION 800 STORM DRAINAGE SYSTEM

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SECTION 800 STORM DRAINAGE SYSTEM

810.00 STORM DRAINAGE DESIGN AND TECHNICAL CRITERIA

811.00 Scope

Section 800 sets forth the design and technical criteria and specifications for the analysis and design of drainage systems. All subdivision plats, site improvement plans, planned building groups and other proposed construction submitted to the Town for acceptance will be accompanied by a storm drainage analysis. Appropriate drainage system design must be submitted to and accepted by the Town Engineer for each phase of construction. Such analysis and design will conform to the criteria set forth herein. Acceptance of the analysis and design is subject to the following conditions:

- A. Construction of the system must commence within 365 days of the date of acceptance.
- B. No construction has been completed on any adjacent property that may have affected the drainage pattern within the basin.

In either case, the Town Engineer may require a new submittal.

A large portion of the criteria and design aids included in these STANDARDS AND SPECIFICATIONS originated from the Urban Drainage and Flood Control District (UDFCD) Urban Storm Drainage Criteria Manual (USDCM). For any information not detailed in these specifications, refer to this manual.

812.00 General Provisions

812.01 General Design Criteria

Except where specified here, the procedure, criteria, and standards set forth in the latest revision of the "Urban Storm Drainage Criteria Manual" will be instituted for the analysis of any drainage system. Sound knowledge of current engineering practices and drainage methodology, as well as common sense, will be involved with the analysis of any drainage system.

All development must be in conformance with the current Master Drainage Plan or Outfall System Plan for the drainage basins where the development is located. For areas not included within a Master Drainage Plan or Outfall Systems Plan, onsite historic peak flows shall be calculated using the present land use of the site. For offsite areas draining onto the site, peak flows shall be calculated using the current land use for areas that are fully developed without an existing stormwater detention pond or for areas that are undeveloped that will be required to provide stormwater detention if improved. For offsite areas that are currently developed with an existing stormwater detention pond, the peak detention pond discharge rates shall be used for the peak flows.

Conveyance must be provided downstream of the site to the major drainageway with sufficient capacity to pass the one hundred (100) year storm event. Easements for these conveyance systems must be provided and shown on the drainage plan. If it is not possible to obtain an easement and construct drainage improvements on the downstream property, runoff must be reduced to historic rates and concentrated flows must be spread out to stimulate existing conditions to minimize the potential for erosion.

All major storm floodplain boundaries will be available from the Town Engineer and must be shown on all preliminary and final drainage plans. All pond facilities will be of the detention type. The Town Engineer will approve methods of detention. Retention facilities will only be allowed with the written approval of the Town Engineer.

Construction that will impair surface drainage will not be accepted. The Town reserves the right to issue and enforce more stringent criteria should adverse conditions exist. Designs varying from the criteria will require a variance with written approval by the Town Engineer prior to final acceptance of the plans.

812.02 Design Principals

Natural topographic features will be the basis of location for easements and future runoff calculations. In developed and undeveloped areas, average land slopes may be utilized in runoff computations. Wherever existing drainage patterns and slopes are defined, these will be used. The drainage facilities so designed must be able to handle the design flows with no erosion damage to the system.

Streets will not be used as primary floodways for major storm runoff. The amount of runoff in the streets will not exceed the limits established in Section 815.02 of these STANDARDS AND SPECIFICATIONS.

Stormwater detention facilities and natural drainageways are to be used whenever feasible. Any alteration to natural drainage patterns will not be approved unless a thorough investigation and analysis shows no hazard or liability. The Town Engineer will have final authority over any system design.

The planning and design of the drainage system will not be such as to simply transfer the problem from one location to another or create a more hazardous condition downstream. Provisions will be made in every development in the form of an easement or Right of Way for the 100-year storm to pass through that development, including tributary offsite runoff.

Enhancement of stormwater runoff quality is required for all developments within the Town of Firestone through the use of structural or nonstructural permanent control measures (CMs). Please refer to Section 815.05 for more information.

All drainage improvements will be as natural in appearance as possible to be aesthetically pleasing. Maintenance access will be provided for all drainage and flood control facilities.

Irrigation ditches cannot be used as an outfall point for the storm drainage system because of physical limitations. Variances can occur when the capacity of the irrigation ditch is adequate to carry the normal ditch flow plus the storm runoff with adequate freeboard to avoid creating a hazard to those below the ditch. Written approval must be obtained from the ditch owner stating that the owner understands the physical and legal (i.e., liability) consequences of accepting said runoff. However, without major reworking of irrigation ditches to provide major carrying capacity without undue hazard to those downstream or below the ditch, the ditches are almost always totally inadequate for such a use and should not normally be used as an outfall. Moreover, because ditches are normally privately owned, one cannot assume the perpetual existence or function of a ditch. If a variance is requested to the Town Engineer for use of a ditch as an outfall, it is the design engineer's responsibility to complete all studies and designs

deemed necessary by the Town Engineer to support the use of the ditch as well as a secondary drainage design should the ditch cease to exist.

Expressed written approval must be obtained from the managing organization for irrigation ditches being considered for crossing or easements.

813.00 Design Methods

813.01 Initial and Major Design Storms

Every urban area has two separate and distinct drainage systems whether or not they are actually planned for and designed. One is the initial system corresponding to the initial (or ordinary) storm recurring at regular intervals. The other is the major system corresponding to the major (or extraordinary storm), which is unlikely to occur more often than once in 100 or more years. Since the effects and routing of storm waters for the major storm may not be the same as for the initial storm, all storm drainage plans submitted for acceptance will detail two separate systems; one indicating the effects of the initial storm and the other showing the effects of the major storm.

- A. *Initial storm provisions:* The initial storm will be considered the 5-year storm. The objectives of such drainage system planning are to minimize inconvenience, to protect against recurring minor damage, to reduce rising maintenance costs, and to create an orderly drainage system. The initial storm drainage system may include such facilities as curb and gutter, storm sewer, swales, and other open drainageways and detention facilities.
- B. *Major storm provisions:* The major storm will be considered the 100-year storm. The objectives of the major storm planning are to eliminate substantial property damage or loss of life and will be as directed and accepted by the Town Engineer. Major drainage systems may include storm sewers, open drainageways and detention facilities. The correlation between the initial and major storm system will be analyzed to insure a well-coordinated drainage system.

813.02 Storm Return Periods

The initial and major storm design return periods will not be less than those found in section 813.01.

813.03 Runoff Computations, Colorado Urban Hydrograph Procedure (CUHP)

The CUHP method is generally applicable to drainage basins greater than 90 acres. However, the CUHP is required for watershed areas larger than 160-acres. The procedures for the CUHP, as explained in the USDCM, shall be followed in the preparation of drainage reports and storm drainage facility designs in the Town. The CUHP program requires the input of a design storm, either as a detailed hyetograph or as a 1-hour rainfall depth. The program for the latter using the 2-hour storm distribution recommended in the USDCM generates a detailed hyetograph distribution.

The hydrograph from the CUHP program must be routed through any proposed conveyance facility using the Storm Water Management Model (SWMM) or a similar method approved by the Town Engineer.

813.04 Runoff Computations, Rational Method

The Rational Method will be utilized for sizing storm sewers and for determining runoff magnitude from un-sewered areas. The limit of application of the Rational Method is approximately 160 acres. When the drainage basin exceeds 160 acres, the CUHP method shall be used. The procedures for the Rational Method, as explained in the Urban Storm Drainage Criteria Manual, shall be followed in the preparation of drainage reports in the Town.

813.05 Runoff Coefficients

Rational method runoff coefficients: The runoff coefficient (C) to be used in conjunction with the Rational Method will be calculated using the percent imperviousness shown in Table 800-3 as explained in the Urban Storm Drainage Criteria Manual.

**TABLE 800-3
PERCENT IMPERVIOUS FOR RATIONAL METHOD**

LAND USE OR SURFACE CHARACTERISTICS	PERCENT IMPERVIOUS
<u>Business</u>	
Commercial Areas	95
Neighborhood Areas	75
<u>Residential Lots (Lot Area Only):</u>	
Single-Family	
2.5 Acres or Larger	12
0.75 – 2.49 Acres	20
0.25 – 0.74 Acres	30
0.24 Acres or Less	45
Apartments	75
<u>Industrial:</u>	
Light Areas	80
Heavy Areas	90
<u>Parks, Cemeteries</u>	10
<u>Playgrounds</u>	25
<u>Schools</u>	55
<u>Railroad Yard Areas</u>	50
<u>Undeveloped Areas:</u>	
Historic Flow Analysis	2
Greenbelts, Agricultural	2
Offsite Flow Analysis (when land use not defined)	45
<u>Streets:</u>	
Paved	100
Gravel (Packed)	40
<u>Drives and Walks</u>	90
<u>Roofs</u>	90
<u>Lawns, Sandy Soil</u>	2
<u>Lawns, Clay Soil</u>	2

Note: These Rational Method coefficients may not be valid for large basins.

813.06 Rainfall Intensities

The rainfall intensities to be used in the computation of runoff using the Rational Method shall be obtained from Chapter 5, Volume 1 of the USDCM.

814.00 Detention**814.01 General**

Onsite detention is required for all new development, expansion, and redevelopment. The required minimum detention volume and maximum release rates at these volumes shall be determined in accordance with the procedure and data set forth in these criteria.

For lands where the Town has adopted a Master Drainage Plan or Outfall Systems Plan, detention facilities identified in the Master Drainage Plan or Outfall Systems Plan shall be constructed. For lands where there is no Master Drainage Plan or Outfall Systems Plan, detention is required for all development as discussed in this section. Detention facilities should be designed using hydrograph and routing methods where possible.

Full Spectrum Detention design guidelines as described in Chapter 12, Volume 2 of the USDCM shall be used for all detention facilities. For detention facilities with tributary areas less than 10 acres, the Simplified Equations for Full Spectrum Detention may be used. Hydrograph routing using CUHP and SWMM shall be used when multiple detention facilities in parallel or series are proposed. The Rational Formula-based FAA detention method shall not be used.

Offsite drainage shall be routed around the detention facility or the tributary drainage area must be included in the pond volume and release rate sizing analysis.

More stringent detention volumes and release rates may be required by the Town Engineer to avoid negatively impacting the downstream properties.

Extended Detention Basins with stormwater quality storage as defined in the Urban Storm Drainage Criteria Manual shall typically be provided.

Exemptions from the detention requirement may be granted if it can be demonstrated that the developed area does not adversely affect the downstream major drainageways (assuming the entire tributary drainage area is fully developed). This condition can typically occur for development located adjacent to a major drainageway. If an exemption is granted, a water quality only storage facility must be provided.

Parking lots that serve as detention storage facilities must not have a storage depth of more than 1 foot. Parking lots that serve as detention storage facilities must place notification signs that ponding will occur during a rainfall event. The signs shall be permanent and high quality, meeting both the Town's specifications for traffic signs and the Manual on Uniform Traffic Control Devices (MUTCD). Parking lot detention shall not be used at critical facilities as determined by the Town Engineer. Critical facilities may include, but are not limited to, hospitals, fire stations, police stations, schools, and potential gathering places that may be used in the event of an emergency.

814.02 State Engineer's Office

Any dam constructed for the purpose of storing water, with a surface area, volume, and/or dam height as specified in Colorado Revised Statutes 37-87-105, shall require the approval of the plans by the State Engineer's Office. Current legislation may revise these statutes. All detention storage areas shall be designed and constructed in compliance with current state statutes and/or criteria presented herein.

814.03 Grading Requirements

Slopes on earthen embankments shall not be steeper than 4 (horizontal) to 1 (vertical). The geotechnical engineer for the project shall verify slope stability. All earthen slopes shall be covered with topsoil and re-vegetated. For irrigated grassed detention facilities the minimum bottom slope shall be 2% measured perpendicular to the trickle channel. Wet bottom detention facilities shall be reviewed on a case-by-case basis.

When proposed lot grading has three or more lots draining to a shared lot line swale to a roadway, a sidewalk chase drain shall be installed to convey drainage through the sidewalk to the gutter. In areas with detached sidewalk and trees lawns, the sidewalk chase shall continue through the tree lawn and curb to the gutter.

814.04 Freeboard Requirements

The minimum required freeboard for grassed and parking lot detention facilities is one (1) foot above the computed 100-year water surface.

814.05 Trickle Flow Control

All grassed detention ponds shall include a trickle channel.

The base flow shall be carried in a trickle channel. The minimum capacity shall be one (1) percent to three (3) percent of the 100-year flow, but not less than one (1) cfs. Trickle channels may be constructed of concrete or other approved materials to minimize erosion and to facilitate maintenance. Trickle channels that aesthetically blend with the adjacent vegetation and are designed to be stable based on the soil conditions are preferred..

814.06 Outlet Configuration

Refer to the Urban Storm Drainage Criteria Manual for outlet configuration and sizing methods.

814.07 Embankment Protection

Whenever a detention facility uses an embankment to contain water, the embankment shall be protected from catastrophic failure due to overtopping. Overtopping can occur when the pond outlets become obstructed or when a larger than 100-year storm event occurs. Failure protection for the embankment may be provided in the form of a heavy buried riprap layer (Type M or larger) on the entire downstream face of the embankment or a separate stable emergency spillway having a minimum capacity of twice the maximum release rate for the 100-year storm event. For either case, the pond overflow velocity down the face of the embankment must be analyzed and adequate erosion protection must be provided. Structures shall not be permitted in the path of the emergency spillway or overflow. The invert of the emergency spillway should be set equal to or above the 100-year water surface elevation.

814.08 Release Rates

Refer to Chapter 12, Volume 2 of the USDCD for release rate sizing.

815.00 Design Standards**815.01 Open Channels**

Except as modified herein, open channels will be designed for the 100-year frequency storm and will conform to the criteria set forth in the Urban Storm Drainage Criteria Manual. However, the channel design will also be analyzed with respect to initial storm runoff and its effect made known. Whenever practical, the channel should have slow flow characteristics, be wide and shallow, and be natural in its appearance and functioning.

Where appropriate or required by the Town Engineer, such as for major drainageways, natural stream corridors shall be preserved and stabilized or naturalized channels shall be created in accordance with the Urban Storm Drainage Criteria Manual, Chapter 8 Open Channels.

Channels shall be designed in such a manner that critical depth and super-critical flows are avoided. Capacities for small channels may be computed from Manning's Formula for uniform flow, except at crossings and transitions where backwater effects will need to be accounted for and the Town Engineer may require the channel capacity be calculated using different methods.

The channel cross section may be almost any type suitable to the location. However, the limitations for design for the major storm and initial storm design flows shall include:

- A. The channel and overbank areas shall have adequate capacity for the 100-year storm runoff.
- B. Side slopes: Side slopes will be as flat as practical. Side slopes of 4:1 will be considered a normal minimum. Under special conditions, slopes of 3:1 may be utilized with written approval of the Town Engineer. However, a slope of no steeper than 4:1 is the practical limit for mowing equipment.
- C. Depth: The maximum design depth of flow for the major storm shall be limited to five (5) feet, not including freeboard. Any design variation exceeding the maximum depth of flow must be submitted in writing for approval by the Town Engineer. Critical depths and velocities will be investigated for both the major and initial storm runoffs and these values made available to the Town Engineer.
- D. Freeboard: Except where localized overflow in certain areas is desirable for additional ponding benefits or other reasons, the minimum allowable freeboard will be one (1) foot
- E. Bottom width: The bottom width should be designed to satisfy the hydraulic capacity of the cross-section recognizing the limitations on velocity, depth and Froude number.
- F. Slope of channel: Grass lined channel slopes are dictated by velocity and Froude number requirements. Grass-lined channels normally will have slopes of 0.2% to 0.6%. Where the natural topography is steeper than desirable, drops may have to be utilized.
- G. Curvature: The centerline curvature will not have a radius less than twice the design flow top width, but not less than one hundred (100) feet.
- H. Trickle channels: Trickle channels to carry low flows will be required for all new channels. The capacity of a trickle channel will be approximately 2.0% of the major design flow. Where 2.0% of the major design flow exceeds 90 cfs, a low flow

- channel will be required. Low flow channels shall be in accordance with the UDFCD Urban Storm Drainage Criteria Manual.
- I. Design velocity: The maximum velocity for the major storm design runoff will not exceed seven (7) feet per second for grass lined channels, except in sandy soil where the maximum velocity shall not exceed five (5) feet per second.
 - J. Erosion: All channels will be designed with the proper and adequate erosion control features.
 - K. Grass lining: The grass lining for channels shall be in accordance with the UDFCD Urban Storm Drainage Criteria Manual.
 - L. Water surface profile: A water surface profile for the major storm runoff will be computed for all channels and clearly shown on the final drawings submitted for acceptance. Computations of the water surface profile will utilize standard backwater methods such as HEC-RAS taking into consideration all losses due to velocity changes, drops, bridge and culvert openings, and other obstructions. A Computations Report shall be submitted along with the final design plan.
 - M. Roughness coefficient (n): The value of the roughness coefficient (n) to be used in Manning's Formula, HEC-RAS, and for any other hydraulic calculation will not be less than those listed in Table 800-5:
 - N. Froude number (turbulence factor) shall be less than 0.8 for grass-lined channels. Grass lined channels having a Froude number greater than 0.8 will not be permitted. Minimum velocities for all channels will not be less than two (2) feet per second for the initial storm runoff.

TABLE 800-5
MINIMUM VALUES OF ROUGHNESS COEFFICIENT (n)

Type of Channel and Description Closed Conduits:		Minimum
	Closed Conduits:	
	Concrete pipe and box culvert (new)	0.013
	Concrete pipe and box culvert (old)	0.015
	PVC pipe	0.011
	CMP pipe	0.024
	HDPE pipe	0.010
	Channels and Swales:	
	Grass-lined (native grasses)	0.035
	Grass-lined (turfgrass sod)	0.030
	Riprap-lined	0.042
	Concrete trickle channel	0.013
	Major Drainageways:	
	Natural channel preservation	See USDCM
	Naturalized channel	See USDCM
	Wetlands channel	See USDCM
	Streets:	
	Asphalt street with concrete gutter	0.016
	Concrete street and gutter	0.013
	Concrete pavement and crosspans	0.013

815.02 Street Flow Capacities

Except as modified herein, the criteria set forth in the Urban Storm Drainage Criteria Manual will be used in analyzing and approving the adequacy of streets as a function of the drainage system. The Street Classifications for Drainage Purposes are listed in Table 800-6.

Table 800-6
STREET CLASSIFICATION FOR DRAINAGE PURPOSES

Street Classification	Function	Speed/Number of Lanes	Signalization at Intersections	Street Parking
Local	Provide access to residential and industrial areas	Low speed with 2 moving lanes	Stop signs	One or both sides of the street
Collector	Collect and convey traffic between local and arterial streets	Low to moderate speed with 2 or 4 moving lanes	Stop signs or traffic signals	One or both sides of the street
Arterial	Function as primary through traffic conduits in urban areas	Moderate to high speeds with 4 to 6 lanes	Traffic signals (controlled access)	Usually prohibited
Freeway	Provide rapid and efficient transport over long distances	High speed travel with 4 lanes or more	Cloverleaves, access ramps (limited access)	Always prohibited

Both the initial storm runoff and major storm runoff must be considered, and calculations showing such runoff at critical sections will be submitted. The following criteria will apply in the determination of allowable street flow capacities:

- A. Street, curb/gutter, walks, crosspans and curb cuts shall conform to all applicable Sections of these STANDARDS AND SPECIFICATIONS.
- B. In relation to street capacity for initial storm, pavement encroachment for the initial design storm shall not exceed the limitations set forth in Table 800-7:

**TABLE 800-7
ALLOWABLE PAVEMENT ENCROACHMENT AND DEPTH OF FLOW
FOR INITIAL STORM RUNOFF**

Street Classification	Maximum Encroachment*
Local	No curb overtopping; flow may spread to crown of street.
Collector	No curb overtopping; flow spread must leave the equivalent of one 10-foot driving lane clear of water.
Arterials	No curb overtopping; flow spread must leave the equivalent of two 10-foot driving lanes clear of water - one lane in each direction.
Freeways	No encroachment is allowed on any traffic lane.

* Where no curbing exists, encroachment will not extend past property lines.

The storm sewer system will commence at the point where the maximum allowable encroachment occurs.

- C. In relation to street capacity for major storm, the allowable depth of flow and inundated area for the major design storm will not exceed the limitations set forth in Table 800-8:

**TABLE 800-8
ALLOWABLE DEPTH OF FLOW AND INUNDATED AREA FOR
MAJOR STORM RUNOFF**

Street Classification	Allowable Depth and Inundated Areas
Local & Collector	Residential dwellings and public, commercial, and industrial buildings shall be no less than 12 inches above the 100-year flood at the ground line or lowest water entry of the building. The depth of water over the gutter flow line must not exceed 12 inches.
Arterial & Freeway	Residential dwellings and public, commercial, and industrial buildings must be no less than 12 inches above the 100-year flood at the ground line or lowest water entry of the building. The depth of water must not exceed the street crown to allow operation of emergency vehicles. The depth of water over gutter flow line must not exceed twelve (12).inches

- D. Cross street flow: Cross street flow will occur by one of the following methods. One method is runoff which has been flowing in a gutter and then flows across the street to the opposite gutter or inlet. The second case is flow from some external source, such as a drainageway or conduit, which will flow across the crown of the street when the conduit capacity is exceeded. Allowable Cross Street Flow is set forth in Table 800 –9.

**TABLE 800-9
ALLOWABLE CROSS STREET FLOW**

Street Classification	Initial Storm Flow	Major Storm Flow
Local	6 inches of depth in crossspan.	12 inches of depth above gutter flow line.
Collector	Where cross-spans allowed, depth of flow must not exceed 6 inches.	12 inches of depth above gutter flow line.
Arterial/Freeway	None.	No cross flow.

815.03 Storm Sewers and Storm Inlets

Except as subsequently modified, the design of storm sewers and inlets shall conform to the criteria set forth in the Urban Storm Drainage Criteria Manual. Both the initial and major storm events shall be considered to size the storm sewer system. Storm sewers and inlets shall be of sufficient capacity to adequately carry the expected runoff from the initial design storm, minimum. There are conditions when the storm sewer system needs to be sized to convey flows greater than the initial design storm (and as much as the major storm event). The storm sewer system and subsequent storm inlets will commence at all locations where the allowable street capacity is exceeded or wherever ponding of water is likely to occur. No bubblers will be allowed. The minimum allowable pipe size to be used in storm sewers and laterals will be as listed in Table 800-10:

**TABLE 800-10
MINIMUM ALLOWABLE PIPE SIZE**

Type of Conduit	Min. Inside Pipe Dia.
Main Trunk Sewer	18"
Short Laterals	15"

Arch pipes will be allowed where design conditions dictate, provided that the minimum cross-sectional areas will not be less than the equivalent pipe size specified above. All storm sewer conduits shall be of sufficient structural strength to withstand an H-20 design load.

The maximum allowable distance between manholes or other suitable appurtenances for cleanouts shall not exceed those listed in Table 800-11:

**TABLE 800-11
MAXIMUM ALLOWABLE MANHOLE SPACING**

Inside Diameter or Minimum Head Room	Maximum Allowable Distance Between Manholes
18" - 36"	400 feet
42" - 60"	500 feet
60" & Larger	750 feet

The capacities of conduits will be computed using the criteria set forth in the Urban Storm Drainage Manual, including a hydraulic grade line (HGL) analysis, for both the initial and major

storm events. Friction, lateral, bend, exit and entrance losses shall be included in the design. The storm sewer design shall include tailwater conditions. The value of the roughness coefficient (n) to be used will not be less than those specified in Section 815.01(I), Table 800-5 of these STANDARDS AND SPECIFICATIONS. The average flow velocity for the initial storm event shall not be less than two (2) feet per second and the maximum velocity for all storm events shall not exceed 18 feet per second. The HGL for the major storm event peak flow shall be at least 1 foot below the elevation of manhole covers, inlet grates, and the flowline at inlet curb openings. For storm sewer systems designed for the initial storm event, additional runoff can be intercepted by inlets during major storm events due to greater depths of flow in the streets. Surge created by conveyance of the additional runoff must be analyzed and the HGL must meet the maximum limit as described above for the major storm event.

Allowable storm inlets will be curb opening inlets, type "R" or combination curb/grate inlets, type "13", similar and equal to the Town's Standard Storm Water Inlets or as approved by the Town Engineer. Inlets will be utilized at all points where ponding or sump conditions exist. Refer to the Standard Drawings for details.

The allowable capacity and spacing of storm inlets shall be analyzed using the criteria set forth in the Urban Storm Drainage Criteria Manual. Reduction factors are applied to the theoretical inlet capacity to determine the allowable capacity. These reduction factors compensate for debris plugging, pavement overlaying, variations in design assumptions or other factors that decrease inlet capacities. Other methods, such as nomographs, may be used to design inlets as long as appropriate reduction factors are applied. The Town Engineer must approve other design methods.

The size of outlet pipes from storm water inlets shall be based on providing at least 1 foot of freeboard from the gutter flowline to the hydraulic inlet control depth for the outlet pipe or the storm sewer hydraulic grade line at the inlet, whichever is higher.

At sump inlets, an emergency overflow channel designed to convey the major storm runoff must be provided in case the inlet becomes clogged. The emergency overflow channel shall be contained within a drainage tract or easement. If the sump inlet is designed to intercept the major storm event, the emergency overflow channel does not need to meet maximum velocity requirements. If the sump inlet is not designed to intercept the major storm event, the emergency overflow channel must meet the requirements in Section 815.01 Open Channels of these STANDARDS and SPECIFICATIONS.

Computations for storm sewer design and storm inlet designs shall be submitted on forms similar to those included in these specifications for acceptance, or computer model or spreadsheet generated results tables. Adequate details of the proposed storm sewer system, including plan and profile, details of inlets, manholes and other appurtenances shall be included in the overall drainage plan submitted for acceptance.

The storm sewer outlet shall be protected for the major storm event. The protection shall be designed as set forth in the Urban Storm Drainage Criteria Manual.

815.04 Culverts

Culvert capacities shall be at least equal to the capacities of culverts designed in accordance with the procedures outlined in the Urban Drainage Storm Criteria Manual. Culverts may be of any shape and construction required by existing topographic features, provided, however, the size, shape, location, and type of construction of culverts shall be subject to acceptance by the Town Engineer.

Culverts installed under local and collector streets shall be designed to pass at least the 10-year storm event. Culverts installed under arterials shall pass at least the 100-year storm event.

Culverts under principal arterials shall have sufficient capacity to pass all of the runoff from the major storm considering a minimum of twenty percent (20%) of the inlet plugged. Higher percentages may be required based on site-specific considerations.

Overtopping of culvert installations due to plugging must be analyzed for the 100-year storm event. The overtopping depth due to plugging must be less than one foot.

The following design criteria shall be utilized for all culvert designs:

- A. The culvert, including inlet and outlet structures, will properly take care of water, bed load and debris at all stages of flow.
- B. Inlets: Culvert inlets shall be designed to minimize entrance and friction losses. Inlets shall be provided with either flared-end sections or head walls with wing walls. Projecting ends will not be acceptable. For large structures, provisions shall be made to resist possible structural failure due to hydrostatic uplift forces.
- C. Outlets: Culvert outlets shall be designed to avoid sedimentation, undermining of culvert, or erosion of downstream channels. Outlets shall be provided with either flare-end sections or headwalls, with wingwalls and riprap or grouted boulders. Projecting outlets will not be acceptable. Outlet protection shall be designed according to the Urban Storm Drainage Criteria Manual or a method acceptable to the Town Engineer.
- D. Slopes: Culvert slopes shall be such that neither silting nor excessive velocities nor scour occur.
- E. Excessive ponding above culvert entrances will not be acceptable if such ponding appears likely to cause property or roadway damage, culvert clogging, saturation of fills, detrimental upstream deposits of debris, or inundate existing or future utilities and structures.
- F. Tailwater: The height of tailwater at the outlet shall be considered by the culvert outlet control analysis and will be subject to acceptance by the Town Engineer.
- G. Hydraulic Design: Culverts shall be analyzed to determine whether discharge is controlled by inlet or outlet conditions for both the initial storm discharge and the major storm discharge. The value of the roughness coefficient (n) used shall not be less than those specified in Section 815.01, Table 800-5 of these STANDARDS AND SPECIFICATIONS. Computations for selected culvert sizes shall be submitted for approval on forms similar to those included in these specifications, or computer model or spreadsheet generated results tables.
- H. Minimum Allowable Size: The required size of the culvert shall be based on adequate hydraulic design analysis. In no case shall approval be made for round culverts with less than an eighteen (18) inch inside diameter.
- I. Multiple Culvert Installations: Where physical conditions dictate, multiple culvert installations will be acceptable, subject to approval by the Town Engineer. Headwalls shall be used with multiple culvert installations. The minimum size of any culvert shall not be less than the requirements set forth in Section 815.03, Table 800-10 of these STANDARDS AND SPECIFICATIONS.
- J. Structural Design: The structural design of culverts shall conform to those methods and criteria recommended by the manufacturer of a specific type of culvert for the specified embankment conditions. Where appropriate, the applicable provisions of Section 815.02 of these STANDARDS AND SPECIFICATIONS will also apply to the design of culverts.

815.05 Stormwater Quality

Applicable development projects are encouraged to approach water quality planning utilizing the four-step approach outlined in Volume 3 of the Urban Storm Drainage Criteria Manual. The four steps aim for a comprehensive approach to stormwater quality by 1) reducing the amount of site runoff by employing runoff reduction practices; 2) implementing permanent CMs that provide water quality capture volume (WQCV) with slow release; ; 3) stabilizing streams; and, 4) implementing site specific source control permanent CMs.

All applicable development projects subject to the requirements of these STANDARDS AND SPECIFICATIONS must provide for water quality, unless exempted by the Town's MS4 permit, through permanent CMs. Please refer to the Urban Storm Drainage Criteria Manual (Volume 3) for guidance on selection, use and design of BMPs. Justification for the selection of one of the allowed base design standards must be included in the Phase III Drainage Report, including any allowable exclusions.

Permanent CMs shall meet one of the following base design standards listed below:

- Water Quality Capture Volume (WQCV) – this standard can be achieved through the treatment or infiltration of the WQCV. When utilizing this standard, sites must provide treatment for the entire new development or redevelopment. Some areas may be excluded from treatment when justified that a portion of the site cannot practically drain to the permanent CM (such as driveway access, perimeter sidewalks, or tree lawns). In addition, the excluded area may not be more than 20% of the site, not to exceed one acre.
- Pollutant Removal Standard – this standard can be achieved through treating stormwater runoff in a manner expected to reduce the mean concentration of total suspended solids (TSS) to a median value of 30 mg/L or less for the 80th percentile storm event, at a minimum. When utilizing this standard, sites must provide treatment for the entire new development or redevelopment. Some areas may be excluded from treatment when justified that a portion of the site cannot practically drain to the permanent CM (such as driveway access, perimeter sidewalks, or tree lawns). In addition, the excluded area may not be more than 20% of the site, not to exceed one acre.
- Runoff Reduction Standard – this standard can be achieved through the infiltration, evaporation or evapotranspiration of 60% of the sites WQCV, with the WQCV assuming all of the impervious area for the site discharges to infiltration. When utilizing this standard, additional soils analysis and recommendations from a geotechnical engineer are required to demonstrate that site geology and other factors allow appropriate infiltration to occur.
- Regional WQCV Control measure – this standard can be achieved through the treatment or infiltration of the WQCV. Stormwater from the site must not discharge to a water of the state before being discharged to the regional WQCV control measure.
- Regional WQCV Facility – this standard can be achieved through the treatment or infiltration of the WQCV. Stormwater from the site may discharge to water of the state before being discharged to the regional WQCV facility. In order to utilize this treatment option, the following apply:
 - Before discharging to waters of the state, at least 20% of the upstream imperviousness of the applicable development site must be disconnected and drain through a receiving pervious area comprising at least 10% of the upstream disconnect impervious area.
 - The facility must be implemented, functional, and maintained following good engineering, hydrologic and pollution control practices.

- The facility must be designed and maintained for 100% WQCV for its entire drainage area and have the capacity to accommodate the drainage from the applicable development site.
- The facility must be designed and implemented with flood control or water quality as the primary use. Waterbodies listed by name in surface water quality classifications and standards regulations (5 CCR 1002-38) may not be considered regional WQCV facilities.
- Constrained Redevelopment Site – This standard may be utilized if the redevelopment is greater than 75% impervious AND the Town of Firestone has determined that it is not practicable to meet any of the previous listed base design standards. Constrained Redevelopment Site permanent CMs must be designed to meeting one of the following:
 - Provide WQCV for at least 50% of the impervious area of the site.
 - Provide treatment for the 80th percentile stormwater event, where the CM is designed to treat stormwater runoff in a manner expected to reduce the even mean concentration of TSS to a median value of 30 mg/L or less. Additionally, a minimum of 50% of the applicable development area including 50% or more of the impervious area shall drain to the CM. This standard does not require that 100% of the applicable development site be directed to the CM as long as the overall goal is met or exceeded, or
 - Provide Runoff Reduction through infiltration, evaporation, or evapotranspiration, for a quantity of water equal to 30% of what the calculated WQCV would be if all impervious area for the site discharged without infiltration.

820.00 GENERAL PROVISIONS**821.00 General**

All storm drainage construction in the Town rights-of-way shall be accomplished in accordance with these STANDARDS AND SPECIFICATIONS, and these standards will cover not only new storm drainage construction but also repairs and maintenance of the existing facilities within the Town.

822.00 Accepted Plans

All storm drainage construction shall be done in accordance with engineered construction plans for the work, prepared under the direction of a Registered Professional Engineer licensed to practice in Colorado. Plans will conform to the Town's Design Criteria and must be accepted by the Town Engineer. Storm drainage plans will include an Area Grading Plan and an Erosion Control plan as defined in Section 161.00 of these STANDARDS AND SPECIFICATIONS.

Where work is to be done on an irrigation ditch, the written approval of the ditch owner is required prior to acceptance by the Town Engineer.

823.00 Permits Required

The Town Engineer will require a public improvement permit. Refer to Section 622.00, Permits Required, of these STANDARDS AND SPECIFICATIONS for additional requirements.

824.00 Maintenance of Traffic

Maintenance of traffic shall comply with Section 623.00, Maintenance of Traffic, of these STANDARDS AND SPECIFICATIONS.

830.00 EROSION CONTROL**831.00 General**

Erosion and sedimentation are natural processes, the intensity of which are increased by land disturbing activities that reduce or destroy the aesthetic and practical values of neighboring properties, streams and lakes. The purpose of these erosion criteria is to reduce intensified erosion, caused by either wind or water, to an acceptable level without placing undue burdens on the landowner, builder or community.

832.00 Requirements

Erosion control measures shall be designed in conformance with Urban Storm Drainage Criteria Manual. All land-disturbing activities within the Town of Firestone shall be in compliance with applicable Colorado Discharge Permit System (CDPS) and Colorado Air Quality Control Commission regulations to protect stormwater.

833.00 Submittal

A discussion summarizing erosion control methods shall be submitted as part of the preliminary and final drainage reports as required in Section 162.00 of these STANDARDS AND SPECIFICATIONS. A detailed erosion control plan must accompany the Area Grading Plan and approved Drainage Plan as required in Section 161.09 of these STANDARDS AND SPECIFICATIONS. The erosion control plan must be submitted to, and accepted by the Town of Firestone Public Engineering Division prior to receiving a grading permit.

834.00 Erosion Control Measures

Detailed erosion control measures must be provided to protect the following:

- A. Inlets and culverts
- B. Drainageways
- C. Streams or other water bodies that are immediately adjacent to land disturbed by construction activity.
- D. Cut and fill areas where exposed soil exists.
- E. Properties and improved streets adjacent to construction activity.
- F. Other as required by the Town Engineer.

Temporary erosion control measures such as sediment traps, hay bales or silt fences must be properly placed in accordance with the accepted Stormwater Management Plan (SWMP) prior to any earthmoving on site. Erosion control measures shall be kept in good repair and fully functional until the erosion potential from the site no longer exists. Permanent erosion control (sod, seed, mulching, etc.) will be in place prior to the request for a Certificate of Occupancy.

A water truck shall be kept on-site at all times during land disturbing activities to control wind erosion and dust.

835.00 Erosion Control Structures

Standard details and specifications are provided in the Standard Drawings. When applicable, details of additional erosion control measures should be obtained from the Urban Storm Drainage Criteria Manual.

840.00 STORM DRAINAGE CONSTRUCTION**841.00 Site Work and Earthwork****841.01 General**

Site work and earthwork shall be performed in accordance with Section 300.00, Site Work and Earthwork, of these STANDARDS AND SPECIFICATIONS.

841.02 Trenching, Backfilling and Compacting

Trenching, backfilling and compacting shall be performed in accordance with Section 350.00, Trenching, Backfilling and Compacting, of these STANDARDS AND SPECIFICATIONS.

841.03 Preservation of Monuments

Refer to Section 141.00, Protection of Public and Utility Interests, of these STANDARDS AND SPECIFICATIONS.

842.00 Materials**842.01 Pipe**

Reinforced concrete pipe (RCP): shall be manufactured in accordance with ASTM C-76. All applicable portions of Section 706, Concrete and Clay Pipe, of the CDOT Standard Specifications for Road and Bridge Construction shall apply. Rubber gasket joints shall be in accordance with ASTM C443.

Polyvinyl Chloride Pipe (PVC): shall be manufactured in accordance with ASTM F794. All applicable portions of Section 712.13, Plastic Pipe, of the CDOT Standard Specifications for Road and Construction shall apply. Use of PVC within the right-of-way is not allowed.

High-density polyethylene pipe (HDPE): shall be manufactured in accordance with ASTM D3350, ASTM D4976, ASTM F667, ASTM F894, ASTM F2306, and ASTM F2562. Requirements for test methods, dimensions and markings shall comply with AASHTO Designation M-294. Use of HDPE within the right-of-way is not allowed.

Couplings shall be corrugated to match the pipe corrugations (to be fabricated by the pipe manufacturer) and the width shall not be less than one-half (1/2) the nominal diameter of the pipe. Split couplings shall be manufactured to engage an equal number of corrugations on each side of the pipe joint. Where required by the Town Engineer, a mastic type gasket will be utilized. A manufacturer's certification that the product was manufactured, tested and supplied in accordance with this specification shall be furnished upon request of the Town Engineer.

Pipe class designation or gauge shall be as shown on the accepted plans or as designated by the Town Engineer for each individual project. Pipe material shall be chosen based on strength and soil conditions. At no time shall high-density polyethylene pipe (HDPE) be allowed under roadways.

All pipe shall be inspected by the Town Engineer to allow for rejection of pipe that fails to conform to the requirements of these STANDARDS AND SPECIFICATIONS. Defects will be marked so as not to disfigure the rejected pipe. Rejected pipe will be removed from the job site within 24 hours.

842.02 Pipe Joints

Pipe joints shall be constructed as designated on the accepted construction plans or as otherwise accepted by the Town Engineer. Rubber gasket joints for concrete pipe will conform to ASTM C-443. Corrugated metal pipe joints will be installed according to pipe manufacturer's recommendations. Cement mortar joints will be constructed with mortar mixture composed of one (1) part Portland cement to three (3) parts sand and enough water to produce a workable mix. Mortar that has started to set will be discarded and a new batch prepared.

842.03 Manholes, Inlets and Sidewalk Chases

Manholes and inlets may be constructed of cast-in-place or precast concrete. Concrete precast reinforced risers and tops must conform to ASTM Designation C-478 except that wall thickness may be either wall "A" or wall "B" as described in ASTM Designation C-76. Manholes shall conform to details shown on the Standard Drawings unless otherwise approved by the Town Engineer. Cones will be of the eccentric type.

The top of the manhole vault shall be a minimum of twelve (12) inches and a maximum of eighteen (18) inches below the finished street or ground surface elevation. Concrete extension risers or collars shall be used to bring the manhole ring and cover up to finished street or ground surface elevation.

Manhole rings and covers (all traffic covers shall be designed for H-20 traffic loading):

- A. Twenty-four (24) inch manhole rings and covers; cover weight = approximately one hundred sixty-five (165) pounds, ring weight = approximately two hundred forty (240) pounds.
- B. Twenty-four (24) inch by thirty-six (36) inch double ring and cover (36" cover with auxiliary 24" opening and cover);
36" cover weight = approximately two hundred fifty (250) pounds.
24" cover weight = approximately one hundred sixty five (165) pounds.
36" ring weight = approximately two hundred eighty (280) pounds.
- C. Manholes located in drainage ways, floodplains, near roadway sump conditions, or as otherwise directed shall be fitted with water tight lids with hinges and locking devices. Bolted manhole lids are not acceptable. A submittal detailing the water tight lid to be used must be accepted by the Town.

Steps shall have a minimum tensile strength of 38,000 psi, minimum yield strength of 35,000 psi, and have an elongation of not less than ten percent (10%) in two (2) inches. Without permanent deformation, steps must carry a load of one thousand (1,000) pounds when projected six (6) inches from the wall and fifteen hundred (1,500) pounds when projected four (4) inches from the wall. Steps shall be one-half (1/2) inch diameter steel-reinforcing rods completely encapsulated in Copolymer Polypropylene as manufactured by M.A. Industries, Inc. or an approved equal. Steps shall be spaced as shown on the Standard Drawings. All manhole steps shall be cast into the manhole barrel when the manhole is poured. The maximum distance from the finished ground (street) surface to the first step shall be twenty-four (24) inches.

Mortar for manholes shall be mixed in the following proportions by volume: One (1) part Portland cement; one-half (1/2) part hydrated lime; and three (3) parts sand or masonry cement. The cement, lime, and sand will be thoroughly mixed dry and only enough water added to form a mortar of proper

consistency. Mortar shall be used within one (1) hour after mixing with no retempering permitted. Mortar that has taken a partial set is prohibited from use.

Inlets shall conform to the Standard Drawings and to applicable Colorado Department of Transportation "M" Standards. All lids for inlets shall have the words "No Dumping – Drains to River" and "Storm Sewer".

Sidewalk chase drains are allowed and shall conform to the standard drawings.

842.04 Manhole Base Slabs & Base Beams

Manhole base slabs may be poured in place or precast. Where possible, inverts will be the PVC pipe with the top half cut out. The slab shall be designed to uniformly support the earth load and any other reasonable loads that may occur. The minimum slab thickness shall be six (6) inches. The minimum reinforcement will be #4 Rebar grid on one (1) foot centers.

If required, manhole base beams shall be precast, reinforced concrete. The beams shall be twelve (12) inches wide by nine (9) inches deep by eight (8) feet long.

The reinforcement shall consist of three (3) No. 5 bars longitudinally and No. 4 bars at twelve (12) inch centers transversely.

842.05 Concrete

Concrete shall conform to Section 400.00, Concrete Work, of these STANDARDS AND SPECIFICATIONS, for Portland cement concrete work. Type II cement will be used. Concrete encasement of pipe will conform to the details shown on the accepted plans.

842.06 Cast Iron Fittings

All cast iron manhole rings and covers, and other iron castings must be made of tough gray pig iron conforming to ASTM Designation A-48 and shall be free from cracks, holes, swells, and cold shuts, and will have a smooth workman-like finish. Fittings shall be hot dipped in asphalt varnish in such a manner as to form a firm and tenacious coating. Fittings shall conform to details shown on the Standard Drawings unless otherwise approved by the Town Engineer. Cast iron manhole rings and covers shall have a combined weight of between three hundred (300) and four hundred (400) pounds. All metal bearing surfaces between the ring and cover will be machined or fabricated to insure good seating. Manhole lids shall be provided with non-slip pattern in surface that lies flush with the elevation of the ring. Lids shall be furnished with the word "STORM" cast on top with a confined space warning in accordance with the Standard Drawings.

842.07 Bedding Material

Bedding for storm sewer mains shall meet the gradation of CDOT "No.67 Coarse Aggregate" as specified in Section 703.02 in the latest edition of the CDOT "Standard Specifications for Road and Bridge Construction". Reference the Storm Sewer Trench Detail for further detail. All applicable portions of Section 352.00, Bedding for Pipelines and Service Lines, of these STANDARDS AND SPECIFICATIONS, shall apply.

842.08 Riprap and Filter Cloth

Riprap and filter cloth shall be installed at those locations noted on the accepted plans, or in locations designated by the Town Engineer. Riprap and bedding shall meet the standards set forth in the Urban Storm Drainage Criteria Manual.

842.08.01 Riprap

Rock used for riprap shall be hard, durable, angular in shape, and be free from cracks, overburden, shale and organic matter. Neither breadth nor thickness of single stone shall be less than one-third (1/3) its length and rounded stone will not be accepted except when used for mixing void-filled riprap per the USDCM requirements. The rock shall sustain abrasion test (Los Angeles machine - ASTM C0535-69) and shall sustain a loss of not more than ten percent (10%) after twelve (12) cycles of freezing and thawing (AASHTO test 103 for ledge rock procedure A). The rock shall have a minimum specific gravity of 2.50. Classification and gradation for riprap are shown in Table 800-14.

The riprap designation and total thickness of riprap shall be as shown on the accepted plans. The maximum stone size shall not be larger than the thickness of the riprap.

**TABLE 800-14
CLASSIFICATION AND GRADATION OF RIPRAP**

Riprap Designation	% Smaller Than Given Size By Weight	Intermediate Rock Dimension (Inches)	d(50)* (Inches)
Type VL	70-100	12	
	50-70	9	
	35-50	6	6**
	2-10	2	
Type L	70-100	15	
	50-70	12	
	35-50	9	9**
	2-10	3	
Type M	70-100	21	
	50-70	18	
	35-50	12	12
	2-10	4	
Type H	70-100	30	
	50-70	24	
	35-50	18	18
	2-10	6	
Type VH	70-100	42	
	50-70	33	
	35-50	24	24
	2-10	9	

*d(50) = Mean rock size

** Bury Types VL and L with native topsoil and re-vegetate to protect from vandalism.

842.08.02 Filter Cloth

Filter cloth shall be manufactured especially for the stability of erosion control construction and made from polyethylene, polypropylene or polyester yarns in accordance with the following:

A.	Weight	3.9 oz/yd	ASTM D1910
B.	Thickness	15 mils	ASTM D1777
C.	Grab Strength	130 lbs	ASTM D1682
D.	Elongation Break	60%	ASTM D1682
E.	Mullen Burst Strength	140 psi	ASTM D3786
F.	Puncture Strength	40 lb	ASTM D751
G.	Trapezoid Tear Strength	60 lb	ASTM D751
H.	Equivalent Opening Size	70-100 U.S. Sieve	CW 02215

842.08.03 Filter Material

The filter material that shall be placed on top of the filter cloth (at specified thickness) prior to placement of the riprap shall meet the requirements of "Stabilization Material" as defined in Section 340.01, Definitions, of these STANDARDS AND SPECIFICATIONS.

When requested by the Town Engineer, the Contractor shall furnish copies of tests from a certified and acceptable testing laboratory for the following:

- A. Gradation and soundness of rock for riprap and boulders
- B. Gradation of filter material
- C. Strength and characteristic tests for filter cloth

843.00 Installation

Refer to Section 733.01, General, of these STANDARDS AND SPECIFICATIONS.

843.01 Alignment and Grade

Storm sewers and structures appurtenances shall be constructed accurately to the line and grade as shown on the accepted plans. Construction stakes shall be placed by field parties under the direct supervision of a Registered Professional Land Surveyor licensed to practice in the State of Colorado.

The grade and alignment of the storm sewer will be determined and maintained by the use of a string line, parallel to the sewer supported above the ground on grade boards spaced not more than thirty (30) feet apart and rigidly anchored to and supported by substantial posts driven into the ground. The boards will be straight and true with a minimum size of the boards of two (2) inch by six (6) inch. Where possible, not less than three (3) boards will be installed and maintained in proper position at any one time as a check on the accuracy of the grade line. If the Town Engineer approves double string lines, there will be a minimum of three (3) feet six (6) inches between strings.

The grade and alignment may also be determined by use of suitable surveying instruments (checking the invert of each piece of pipe) or laser equipment, operated continuously during the construction.

"As-built" drawings, as described in Section 161.00, Construction Plan Requirements, of these STANDARDS AND SPECIFICATIONS, shall be furnished to the Town Engineer.

843.02 Protection of Existing Underground Utilities

Refer to Section 733.03, Protection of Existing Underground Utilities, of these STANDARDS AND SPECIFICATIONS.

843.03 Wet Trench

Refer to Section 351.00, Trench Excavation for Pipelines and Service Lines, of these STANDARDS AND SPECIFICATIONS.

843.04 Handling Pipe and Fittings

Refer to Section 733.05, Handling Pipe and Fittings, of these STANDARDS AND SPECIFICATIONS.

843.05 Sewer Pipe Installation

Refer to Section 733.06, Sewer Pipe Installation, of these STANDARDS AND SPECIFICATIONS.

843.06 Connections to Existing Manholes

Refer to Section 733.07, Connections to Existing Manholes, of these STANDARDS AND SPECIFICATIONS.

843.07 Construction of Manholes, Inlets and Sidewalk Chases

Manholes and inlets shall be constructed in accordance with applicable portions of Section 733.08, Construction of Manholes, of these STANDARDS AND SPECIFICATIONS.

Refer to the Standard Drawings for manhole details, inlet details, and for sidewalk chase details. Inlets shall be per CDOT Construction Details or accepted by the Town of Firestone.

843.08 Construction of Open Channels and Special Structures

All work will conform to details shown on the accepted plans and whatever additional specifications are required. Construction will be accurately done to line and grade according to construction stakes as required by Section 843.01 of these STANDARDS AND SPECIFICATIONS.

When required, sidewalk chases will be constructed as detailed on the Standard Drawings.

843.09 Riprap and Filter Cloth

Excavation for riprap shall conform to all applicable portions of Section 300.00, Site Work and Earthwork, of these STANDARDS AND SPECIFICATIONS.

The Contractor shall complete the excavation in accordance with the accepted plans or as directed by the Town Engineer, then he shall place the filter cloth over the graded areas loosely enough so that any protrusions from underneath or applied bands to the cloth will not cause stretching of the cloth beyond elastic limits.

The outer edge of the filter cloth shall be folded vertically upward at the trench. All overlapping joints shall be a minimum of two (2) feet wide, with the upstream section overlapping the downstream portion. The overlapping joints shall be secured with staples at each edge of the adjoining sections

of cloth, and spaced at two (2) foot intervals. The Contractor, at his expense, in accordance with the manufacturer's recommendations, shall repair any holes, rips or other damage to the filter cloth.

Stabilization material, as described in Section 340.01, Definitions, of these STANDARDS AND SPECIFICATIONS, shall be placed on top of the filter cloth (where filter cloth is used) to a thickness of six (6) inches. The material shall be placed using equipment, which will not rip, tear or otherwise damage the filter cloth. Any damaged areas shall be promptly repaired at the Contractor's expense. The material shall be screeded to give a finished surface, which is within one- (1) inch of the specified thickness.

Riprap shall be placed to conform to the details shown on the accepted plans. The larger size stones shall be placed first and roughly arranged in close contact. The toe trench and foundation course shall be closed first. The spaces between the larger stones shall then be filled with smaller stone of suitable size, so placed as to leave the surface evenly stepped, conforming to the contour required. The finished surface shall be even and tight and shall not vary from the planned surface by more than one-quarter (1/4) foot per foot of depth. The material may be machine placed with sufficient handwork to accomplish the requirements noted herein.

Where boulders are to be grouted, the boulders shall be laid with care to prevent earth and sand from filling the gaps between boulders. Grout must be removed from exposed rock for aesthetic purposes. Gaps shall be filled with grout and mechanical vibrators shall be used to insure all voids are filled. The surface shall be trowel finished. Concrete for the grout shall be an approved batch meeting the following requirements:

- a. All grout shall have a minimum 28-day compressive strength equal to 3,200 psi.
- b. One cubic yard of grout shall contain a minimum of six (6) sacks of Type II Portland cement.
- c. A maximum of 25% Type F Fly Ash may be substituted for the Portland cement.
- d. Aggregate for the grout shall consist of 70% natural sand (fines) and 30% 3/8-inch rock (coarse).
- e. Slump shall be four (4) inches to six (6) inches.
- f. Air entrainment shall be 5.5% - 7.5%.
- g. Grout shall contain one and one-half (1-1/2) pounds of Fibermesh, or approved equivalent, per cubic yard of grout.
- h. Color Additive in required amounts shall be used when so specified by contract.

Except when approved in writing by the Town Engineer, the Contractor shall not be permitted to grout boulders when the air temperature away from artificial heat falls below thirty-two degrees Fahrenheit (32°F), and there is frost in the subgrade. When grouting is permitted during cold weather, the temperature of the mix shall not be less than fifty degrees Fahrenheit (50°F) at the time of placing. During hot weather conditions, the temperature of the mix shall not be more than ninety degrees Fahrenheit (90°F) at the time of placing. The Contractor shall not place filter cloth, stabilization material, or boulders on frozen ground. Blankets and heaters must be used to maintain a temperature between fifty degrees Fahrenheit (50°F) and seventy degrees Fahrenheit (70°F) for the required curing period. Concrete shall not be placed against forms exposed to heating unless the temperature of the forms is first cooled to less than or equal to ninety degrees Fahrenheit (≤90°F).

843.10 Inspections

Initial Acceptance: Prior to initial acceptance the Contractor, at the Contractor's expense, will jet-vac the storm sewer and have the lines inspected with TV video equipment (a copy of the video tape and written report must be supplied to the Town). If, after visual inspection of the storm sewer system and video, the Town Engineer suspects that there is a problem, he may require that further tests shall be completed by the Contractor at the Contractor's expense. Should any inadequacies be found, the Contractor shall make repairs deemed necessary to correct the problem.

Final Acceptance: Prior to final acceptance the Contractor, at the Contractor's expense, will jet-vac the storm sewer and have the lines inspected with TV video equipment (a copy of the video tape and written report must be supplied to the Town). If, after visual inspection of the storm sewer system and video, the Town Engineer suspects that there is a problem, he may require that further tests shall be completed by the Contractor at the Contractor's expense. Should any inadequacies be found, the Contractor shall make repairs deemed necessary to correct the problem.

850.00 TRENCHING, BACKFILLING AND COMPACTING

Refer to Section 350.00, Trenching Backfilling and Compacting, of these STANDARDS AND SPECIFICATIONS.

860.00 RESTORATION AND CLEANUP

Refer to Section 360.00, Restoration and Cleanup, of these STANDARDS AND SPECIFICATIONS.

870.00 GRADING AND EXCAVATION

Refer to Section 330.00, Site Preparation, of these STANDARDS AND SPECIFICATIONS.

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SECTION 1100 TRAFFIC SIGNALS

910.00 GENERAL REQUIREMENTS

910.01 Traffic Control and Street Closure

The Contractor or Developer will be required to maintain access to all properties throughout the period of construction for this project. The Contractor or Developer shall be required to erect, maintain, and remove all barricades, traffic control signs and devices necessary for any street closure including detour signs. Any signs not in use shall be turned away from traffic or removed from the job site. All traffic control devices shall be in good condition. Signs shall be clean, retro reflective, and free of scratches and graffiti.

Any street closure must be pre-approved by the Town Engineer. All such barricades and traffic control signs and devices shall be in accordance with the latest edition of the Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways including the Colorado Supplement. Traffic control plans shall be submitted to the Town Engineer for review no later than two (2) weeks in advance of any work.

910.02 Protection of Property

The Contractor or Developer shall assume full responsibility and expense for the protection of all public and private property, structures, water mains, sewers, utilities, etc., both above and below ground, at or near the site or sites of the work being performed under the Contract, or which are in any manner affected by the prosecution of the work or the transportation of personnel and materials in connection therewith.

The Contractor or Developer shall give notice of not less than forty-eight (48) hours to the Town Engineer and to other owner or owners of public or private property or utilities when they will be affected by the work to be performed under the Contract; and shall make all necessary arrangements with the Town, owner or owners for the removal, replacement, or protection of such property or utilities.

The Contractor or Developer shall be responsible for insuring that all work sites are properly cleaned and barricaded prior to the completion of the day's activities.

910.03 Intersection Power

The Contractor or Developer shall notify the Town Engineer a minimum of three (3) weeks prior to the signal turn-on so that orders may be issued for service inspection and power connection as applicable.

910.04 Field Location

All loops, poles, control cabinets, pull boxes, pole foundations and permanent pavement markings shall be field located by the Town Engineer.

910.05 Intersection Phasing

Intersection phasing shall be as defined in the table below regardless of direction of the coordinated vehicular movements. When intersection phasing defined in the plans and/or project specials conflicts with that defined here within, the Town Engineer shall make final determination as to the intersection phasing.

Controller Phase	Vehicular Movement
1	Main Street Left Turn (SB/WB)
2	Main Street Through (NB/EB)
3	Side Street Left Turn (NB/WB)
4	Side Street Through (SB/EB)
5	Main Street Left Turn (NB/EB)
6	Main Street Through (SB/WB)
7	Side Street Left Turn (SB/EB)
8	Side Street Through (NB/WB)

910.06 License and Permits

The Contractor or Developer shall obtain any, and all, permits as necessary from the Town's Engineering Division and CDOT as may be applicable.

910.07 Utilities

All utility locations and elevations will require field verification in cooperation with the affected companies and public agencies. The Contractor or Developer shall be responsible for locating all underground utilities, valve boxes, manholes, etc., and insuring that they are properly protected and adjusted as called for in the plans and/or project specials. When utility adjustments are required, but have not been called for in the plans and/or project specials, the Contractor or Developer shall notify the Town.

910.08 Work Hours

Working hours shall be as defined in sections 131.01 and 171.00 of these STANDARDS AND SPECIFICATIONS. The Contractor or Developer, upon approval of the traffic control plan by the Town Engineer, will only be allowed lane closures in the public roadway during normal working hours and/or at other times as requested by the Contractor or Developer, and approved by the Town Engineer via written approval.

910.09 Inspection

Prior to both Construction Acceptance and Final Acceptance, the Town Engineer will employ the services of the Town's designated Traffic Signal Maintenance Contractor to assist with the said inspection. The Contractor or Developer shall reimburse the Town for the actual cost associated with the utilization of the Town's designated Traffic Signal Maintenance Contractor for the inspections.

910.10 Design and Submittal Review

The Town Engineer may elect to employ the services of the Town's designated Traffic Signal Maintenance Contractor to review design drawings, shop drawings, and specifications for equipment and materials. In such cases, the Contractor or Developer shall reimburse the Town the actual costs associated with the utilization of the Town's designated Traffic Signal Maintenance Contractor for the review.

910.11 Regulations and Code

All materials and workmanship shall conform to the standards of the latest edition of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction. If conflicts arise between the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction and these STANDARDS AND SPECIFICATIONS, these STANDARDS AND SPECIFICATIONS shall take precedence. In addition to requirements of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction, and the Contract Documents, all material and work shall conform to the requirements of the National Electrical Line Construction of the Public Utilities Commission, the Standards of the American Society for Testing and Materials (ASTM), the American Standards Association (ASA), and any local ordinance which may apply.

910.12 Equipment Lists and Drawings

After contract award, prior to installation, and/or at the Town Engineer's request, the Contractor or Developer shall submit shop drawings and specifications for equipment and materials the Contractor or Developer proposes to furnish. The shop drawings and specifications shall be complete as to name of manufacturer, size, and catalog number of unit, and shall be supplemented by such other data as may be required. The Town Engineer's approval shall be required prior to installation.

Inspection or sampling of any materials, other than those materials already approved by the Town Engineer, must be made by the Town Engineer prior to installation. If the Contractor or Developer proposes a substitution of material called for in the plans, project specials, as specifically defined in these specifications, or as shown in approved submittals and shop drawings, the Contractor or Developer shall provide additional information to prove the substitution item is of equal or superior quality. Any material and/or equipment installed by the Contractor or Developer that is not in conformance with these specifications shall be removed and/or replaced solely at the Contractor or Developer's expense.

920.00 TRAFFIC SIGNAL CONSTRUCTION**920.01 Excavation and Backfill**

Excavations for the installation of conduit, foundations, and other appurtenances shall be performed in such a manner as to cause the least possible injury to the streets, sidewalks and other improvements. The trenches shall not be excavated wider than necessary for the proper installation of conduit, foundations, and other appurtenances. Excavating shall not be

performed until immediately before installation of conduit, foundations, and other appurtenances. The material from the excavation shall be placed in a position where the least interference with the surface drainage will occur and without obstruction to vehicular or pedestrian traffic. All excavations shall be done in conformance with OSHA regulations. Excavated material shall be removed at the completion of the project or as directed by the Town Engineer.

Excavations, after backfilling, shall be kept well filled and maintained in a smooth and well-drained condition until permanent repairs are made. The Colorado Department of Transportation latest edition of Standard Specifications for Road and Bridge Construction shall be used for standards for compaction, except as outlined in Section 5.3 herein.

Trench excavation for conduit within the roadway shall be 2-inches wider than the outside diameter of the conduit but shall not exceed 6-inches. Backfilling and patching of roadway cuts shall refer to section 500.00 of these STANDARDS AND SPECIFICATIONS.

At the end of each day's work and any other time construction operations are suspended, all construction equipment and other obstructions shall be removed from that portion of the roadway open for use by public traffic.

Excavations in streets or highways shall be performed in such a manner that, at a minimum, one (1) lane of traffic in each direction shall be open to public traffic during the approved work hours.

When excavations remain open overnight when approved by the Town Engineer, they shall be properly marked to warn motorists and/or pedestrians. The excavation shall be properly barricaded for vehicles and/or pedestrians.

Excavating and backfilling for foundations shall be incidental to the pay item for which a foundation is required. Excavating and backfilling for conduit trenches shall be paid for under the appropriate conduit trenching pay item.

920.02 Removing, Replacing, and Resetting Improvements

The Contractor or Developer shall replace or reconstruct sidewalks, curbs, gutters, rigid or flexible pavement, and any other improvements removed during construction according to section 400.00 of these STANDARDS AND SPECIFICATIONS.

Removal items shall be as indicated in the pay item list and shall consist of the items specifically identified on the plans, or in writing by the Town Engineer. It shall be the Contractor or Developer's responsibility to assure that the Contractor or Developer has a full and complete understanding of included items prior to bidding.

Removal of poles and controllers shall include foundation removal to the depth indicated by the Town Engineer. Otherwise, removal shall consist of complete elimination of the specified items. Any conduit runs associated with the foundation shall be extended or abandoned as called for on the plans.

Where traffic signal equipment and/or materials are slated for removal, the Town shall define which traffic signal equipment and/or materials are to remain property of the Town, being kept for future reuse. All traffic signal materials and/or equipment which is to remain the property of the Town shall be delivered to the Town storage site with the address being provided by the Town.

Reset pay items shall be as indicated in the pay item list and shall consist of the items specifically identified in the plans, or in writing by the Town Engineer. It shall be the Contractor or Developer's responsibility to assure that the Contractor or Developer has a full and complete understanding of included items prior to bidding.

Reset items are to be initially removed, then adjusted or modified as directed by the Town Engineer, and finally reinstalled to full operational capability. Modifications and adjustments shall be detailed on the plans or stated in writing by the Town Engineer, and shall be incidental to the reset pay item.

930.00 TRAFFIC SIGNAL MATERIALS

930.01 Foundations

All concrete foundations shall be of a class as defined by the most recent revision of the Colorado Department of Transportation latest edition of Standard Specifications for Road and Bridge Construction or as otherwise directed by the Town Engineer.

The bottom of foundations shall rest on properly compacted ground. Cast-in-place foundations shall be poured monolithically. The exposed portions shall be formed to present a neat appearance.

Pre-cast pole footings, if used, shall be used only for roadway lighting and pedestal poles. They shall be installed in drilled holes, with tamped sand backfill material.

Forms shall be true to line and grade. Tops of foundations, except as noted on plans, shall be finished to curb or sidewalk grade, or as ordered by the Town Engineer. Forms shall be rigid and securely braced in place, and inspected prior to the pouring of concrete. Conduit ends and anchor bolts shall be placed in proper position and to template until the concrete sets.

Anchor bolts shall conform to the manufacturer's specifications and each individual bolt shall have a minimum of two (2) flat washers, one (1) lock washer, and two (2) nuts. Shims or other similar devices will not be allowed for plumbing or raking.

Both forms and ground, which will be in contact with the concrete, shall be thoroughly moistened before placing concrete. Forms shall not be removed until the concrete has thoroughly set.

Reinforcing steel shall be installed in foundations as specified in the Construction Plans.

All foundations (concrete and fiberglass) shall be incidental to the pay item for which a foundation is required. Ground rods shall be provided as indicated in the standard details, and these shall be incidental to the installation pay item as well.

930.02 Conduit

All cables and conductors not shown on the plans as aerial cable shall be installed in conduit unless installed in poles, pedestals, or master arms. All metal conduits referred to in the specifications and shown on the plans shall be the rigid pipe type of ductile steel that is adequately galvanized. All PVC conduits shall be Schedule 80 or heavier. For new conduit installations, PVC or Schedule 80 polypipe shall be understood unless otherwise defined.

The Contractor or Developer, at his sole expense, may use larger conduit than specified in the plans, if desired. Where larger conduit is used, it shall be for the entire length of the run from outlet to outlet. No reducing couplings will be permitted underground.

The ends of all metal conduit, existing or new, shall be well reamed to remove burrs and rough edges. Field cuts of existing or new conduit shall be made square and true, and the ends shall butt together for the full circumference thereof. Slip joints or running threads will not be permitted for coupling metal conduit. When a standard coupling cannot be used, an approved threaded union coupling shall be used. All couplings shall be screwed up tight until the ends of the metal conduits are brought together.

Where a "stubout" is called for on the plans, a sweeping ell shall be installed in the direction indicated and properly capped. The locations of ends of all conduits in structures or terminating at curbs shall be marked by a "Y" at least three (3) inches high cut into the face of curb, gutter or wall directly above the conduit.

Conduit bends, except factory bends, shall have a radius of not less than six (6) times the inside diameter of the conduit. Where factory bends are not used, conduit shall be bent without crimping or flattening, using the longest radius practicable. Conduit bends feeding pull boxes and foundations shall have an eighteen (18) inch radius as shown on the standard details.

Conduit shall be laid at a depth of not less than thirty (30) inches below the finished roadway grade and twenty-four (24) inches below the finished grade in all other areas.

Conduit under railroad tracks shall be at the minimum depth below the bottom of tie required by the particular railroad company.

Conduit shall always enter a pedestal base, pull box, pole foundation, cabinet foundation, or any other type structure from the direction of the run only. Conduit connections at junctions shall be tightly secured.

Conduit terminating in a standard or pedestal shall extend approximately two (2) inches vertically above foundations.

All conduit runs that exceed ten (10) feet in length shall have a continuous $\frac{3}{4}$ " polyester mule tape pulled into the conduit along with the specified electrical cables. The line shall be firmly

secured at each end of the conduit run with three (3) feet of slack. The purpose of this line is to be able to pull future electrical cable through the existing conduit runs.

A 14 AWG locate wire shall be installed for the complete length of all new conduit runs installed as part of the project. No less than three (3) feet of slack shall remain in each pull box in which the conduit terminates. Where joint trenching is used, only one locate wire need be installed for each joint trench. Splicing of the locate wire within conduits shall not be permitted. Locate wires installed within interconnect conduits shall be spliced in each pull box as to provide an uninterrupted run between intersections.

Existing underground conduit to be incorporated into a new system shall be cleaned with a mandrel and blown out with compressed air.

New conduit runs shown on the plans are for bidding purposes only and may be changed at the direction of the Town Engineer.

Any spare or unused conduits shall be capped using industry standard end caps.

Polypipe to PVC coupling shall be completed with the use of "E-Loc" couplings or approved equal.

When a cabinet is defined as a master cabinet, a two (2) inch PVC conduit shall be installed from the controller cabinet to the designated telephone company demarcation point.

A two (2) inch PVC conduit shall be installed between the local utility company demarcation point and the electrical service, and additionally from the electrical service to the controller cabinet home run pull box.

A two (2) inch PVC conduit shall be installed to all signal poles for exclusive use in providing electrical power for luminaires. The conduit may be laid in trenches cut for signal wire conduit and shall run from the controller cabinet home run pull box to signal poles through associated signal pole pull boxes.

The following conduit schedule is in effect unless otherwise specified in the traffic signal plans.

Run Type	Qty	Size	Use
Street Crossing	1	3"	120VAC Signal Load Wiring
	1	3"	Low Voltage Signal Wiring & Interconnect
	1	2"	Spare
	1	2"	Luminaire Wiring
Signal Pole	1	2"	All Signal Wiring
	1	2"	Luminaire Wiring
Controller Cabinet	1	3"	120VAC Signal Load Wiring
	1	3"	Low Voltage Wiring & Interconnect
	1	2"	Spare
	1	2"	Public Service Utility Power Feed
Inductance Loop	1	2"	Inductance/Micro Loops
Interconnect	1	2"	Interconnect

Service Points	1	2"	Public Service Utility Power Feed
	1	2"	Telephone Service Feed

Conduit shall be measured and paid for by the linear foot of conduit installed from center of pull box to center of pull box, center of pull box to center of pole, or center of pull box to center of cabinet and shall include all labor, equipment, and materials necessary to install the item complete-in-place. Conduit shall be paid for under the "conduit" pay item.

930.03 Pull Box

A pull box shall be installed at all locations shown on the plans and at such additional points as ordered by the Town Engineer.

Pull boxes shall be installed so that the covers are level with curb or sidewalk grade or level with the surrounding ground when no grade is established. The bottoms of all pull boxes shall be set on twelve (12) inches of crushed rock.

Pull box size shall be as shown in the Plans. With the exception of water valves, pull boxes shall be of "Quazite" or pre-cast polymer concrete type with both boxes and lids rated for 20K lb. loads. The following pull box schedule is in effect unless otherwise specified in the traffic signal plans:

Pull Box Usage	Size	Pull Box Lid Marking
Cabinet Home Run Pull Box	24" x 36" x 18"	Traffic
Signal Pole Pull Box	13" x 24" x 12"	Traffic
Detector Pull Box (Side of Road)	12" x 12" x 12"	Traffic
Detector Water Valve	Water Valve	Traffic
Interconnect (T/S Cabinet)	30" x 48" x 18"	T/S Communications
Interconnect (Intermediate Locations)	24" x 36" x 18"	T/S Communications
Telephone Demarcation	12" x 12" x 12"	T/S Communications
Electrical Demarcation	12" x 12" x 12"	Electric

Pull box lids shall be imprinted with markings as defined in the pull box schedule. Painted markings shall not be permitted.

When a new conduit run enters an existing pull box, the Contractor or Developer shall temporarily remove the pull box, or tunnel under the side at no less than eighteen inches (18") below the pull box bottom, and enter from the direction of the run. No new conduit will be allowed to enter a new or existing pull box in any other manner than that shown on the standard details.

All interconnect pull boxes shall include wire mesh installed between the pull box and crushed rock base to prevent ingress of varmints. The wire mesh shall extend beyond the outside edges of the pull box by a minimum of 3".

Pull boxes shall be measured and paid for per unit count and shall include all labor, equipment, and materials necessary to install the item complete-in-place. Pull boxes shall be paid for under the "pull box" pay item.

930.04 Cabinet Bases

Controller cabinet bases shall be fiberglass type, sized to match with the controller cabinet, and set with approximately 50% of height extending below grade and 50% extending above grade.

Controller cabinet bases shall be set on a twelve (12) inch deep bed of crushed rock. The interior of the base shall be filled to grade level with crushed rock.

Conduits within the controller cabinet base shall extend a minimum of 6" above the crushed rock. Conduits shall be installed in such fashion as to prevent undo bend stress on cables being fed into the cabinet through these conduits.

Cabinet bases shall be incidental to the pay item for which a cabinet base is required. Ground rods shall be provided as indicated in the standard details, and these shall be incidental to the installation pay item as well.

930.05 Conductor and Cable

Wiring shall conform to appropriate articles of the Colorado Department of Transportation Standard Specifications for Road and Bridge Construction, and/or the National Electrical Code, as applicable. Wiring within cabinets, junction boxes, etc., shall be neatly arranged. Signal conductors shall be No.14 AWG stranded, conforming to IMSA Spec 20-1-1984.

Power feed cable shall be THHN/THWN copper, installed in conduit, and be sized for the electrical load served. The power feed cable shall have a minimum size of #8 and be sized such that the overall voltage drop, between the local utility company demarcation point and controller cabinet, does not exceed 5%. The Contractor or Developer shall install power feed cable from the local utility company power demarcation point to the controller cabinet thru an URD Mold connector located in the controller cabinet home run pull box. URD Mold connectors shall be installed in the home run pull box and shall be used to extend electrical service from the local utility company power demarcation point to the controller cabinet and to street lights on signal poles.

Whenever a raceway is not UL approved, direct burial type insulation shall be required on all associated wiring.

Power cable between the controller cabinet home run pull box and the street lights pole bases shall be type 12-2 UF. Daisy chaining of power cable thru the pole bases using SLK connectors shall be permitted. With the exception of the URD Mold connector in the controller cabinet home run pull box, power cable splices within pull boxes shall not be permitted.

Power cable from the end of each street light davit to the base of the signal pole shall be type 12-2 UF with ground. All street light feeds shall be independently fused at the base of each pole.

All signal cables shall be labeled with colored electrical tape based on the table below.

Direction	Tape Color
Northbound Thru	Red
Northbound Left Turn	Red + White
Northbound Right Turn	Red + Brown
Northbound Pedestrian	Red + Yellow
Southbound Thru	Green
Southbound Left Turn	Green + White
Southbound Right Turn	Green + Brown
Southbound Pedestrian	Green + Yellow
Eastbound Thru	Orange
Eastbound Left Turn	Orange + White
Eastbound Right Turn	Orange + Brown
Eastbound Pedestrian	Orange + Yellow
Westbound Thru	Blue
Westbound Left Turn	Blue + White
Westbound Right Turn	Blue + Brown
Westbound Pedestrian	Blue + Yellow

Signal circuit wiring shall be accomplished in the following manner:

A separate 25 conductor cable shall be installed between the cabinet and each signal pole. Cables shall be continuous with no splices. Conductor usage has been defined in the table below. All unused conductors shall become spare conductors and shall be coiled and taped back to minimize the chance for a short.

25 Conductor Color to Phase Assignment	
Main Street	
Color	Phase
Solid Green	Green
Solid Orange	Yellow
Solid Red	Red
Solid Blue	Left Turn Green
Solid Black	Left Turn Solid Yellow
Solid Black #2	Left Turn Flashing Yellow
Red with White Trace	Left Turn Red
Blue with White Trace	Walk
Black with Red Trace	Don't Walk
Side Street	
Green with Black Trace	Green
Orange with Black Trace	Yellow
Red with Black Trace	Red
Blue with Black Trace	Left Turn Green
Black with White Trace	Left Turn Solid Yellow
Solid Green #2	Left Turn Flashing Yellow
Red with Green Trace	Left Turn Red
Blue with Red Trace	Walk

Orange with Green Trace	Don't Walk
Right Turn	
Green with White Trace	Right Turn Green
Orange with Red Trace	Right Turn Yellow
AC Return	
Solid White	AC Return
Solid White #2	AC Return
White with Black Trace	AC Return
White with Red Trace	AC Return

Each signal head shall have its own signal cable to the base of the pole that it is mounted on. Cables shall be continuous with no splices. Conductor usage has been defined in the table below. All unused conductors shall become spare conductors and shall be coiled and taped back to minimize the chance for a short.

Conductor Color	7 Conductor (5 Section Head / 4 Section Head)	5 Conductor (3 Section Head)	5 Conductor (Pedestrian Head)
Red	Red Ball	Red Ball or Red Arrow	Don't Walk
Orange	Yellow Ball	Yellow Ball or Yellow Arrow	Spare
Green	Green Ball	Green Ball or Green Arrow	Walk
Blue	Green Arrow	Not Available	Not Available
Black	Solid Yellow Arrow	Spare	Spare
White/Black	Flashing Yellow Arrow	Not Available	Not Available
White	AC Return	AC Return	AC Return

Outboard signal heads shall use "7 Conductor" cable to accommodate for present or future left turns.

When a cabinet is defined as a master cabinet, phone cable shall be installed in conduit from the controller cabinet to the designated telephone company demarcation point. Phone cable shall be #REA-PE54 or equivalent for telephone service. The cable shall be continuous with no splices and run from the telephone service point to the controller cabinet. Adequate cable length shall remain on both cable ends to permit for proper termination.

Pedestrian push button wire shall be shielded single or multiple twisted pairs in polyethylene jacketed cable. Conductors shall be No. 18 AWG stranded copper, minimum. A stranded tinned copper drain wire shall be provided.

Pedestrian push button common wire shall not be connected to the signal neutral circuit.

Inductance detector loop lead-in cable shall be shielded single or multiple twisted pairs in polyethylene jacketed cable. Conductors shall be No. 18 AWG stranded copper, minimum. A stranded tinned copper drain wire shall be provided.

Emergency vehicle detection wiring, Opticom wiring, shall be of the type as specified by equipment manufacturer.

Splicing any conductor, cable or wiring, except loop detector wiring and power cable as defined in these specifications, shall not be permitted in conduit or in pull boxes. All signal conductor splices shall be in the signal pole near the hand hole above grade. Signal load splices shall utilize copper crimp sleeves that compress from four directions as manufactured by Buchanan Company, or approved equal. The crimped sleeve shall then be protected within a flexible rubber insulating cover as manufactured by Ideal Wrap Company, or approved equal. Detector loop lead-in splices in pull boxes below grade shall be fully waterproofed using a DBY-6 splice kit as manufactured by 3M, or approved equal. A minimum of 12-inches of slack shall be left at each splice.

Powdered soapstone, talc, or other approved lubricant shall be used in placing conductors in conduit.

A small permanent tag with the direction and phase printed on it shall be securely attached near the end of each conductor in the controller cabinet. An example is "Ø1-NBLT" where Ø1 is the phase number.

Cabling shall be paid for on a lump sum basis and shall include all labor, equipment and materials necessary to install the item complete-in-place. Cabling shall be paid for under the "wiring" pay item.

930.06 Interconnect

Interconnect shall only be installed where identified in the project plans and/or specifications. Where identified, interconnect shall be of the manufacture and model number as defined or, where no manufacturer and model number is specified, meeting or exceeding material specifications.

Where identified, interconnect shall include all cabling, hardware, and communications equipment as identified in the project plans and specifications as to provide for end-to-end communications; master to local, or to the local from the central system where a Centralized system is in use.

Where communications equipment is Ethernet based, the Contractor or Developer turn the communications equipment over to the Town for setup and programming prior to field installation. Upon completion of setup and programming by the Town, the Contractor or Developer shall complete the field installation as to provide for end-to-end communications.

930.07 Video Detection

Video detection shall be installed unless otherwise defined in the project plans and specifications.

Video detection systems shall consist of one video detection camera and one video processor. The system shall be Iteris or approved equal. For Iteris systems, the camera shall be model

RZ-4 with Wide Dynamic Range (WDR) or approved equal. The processor shall be Vantage Edge 2 or approved equal.

The system shall include software that detects vehicles in multiple lanes using only the video image with the availability for up to twenty four (24) detection zones per camera.

The camera shall be mounted on the luminaire davit when luminaire davit is present, mast arm when luminaire davit is not present, or other location as defined on the plans or as directed by the Town Engineer. The camera shall view approaching vehicles at a distance not to exceed 350 feet for reliable detection.

The camera shall be housed in an environmentally sealed enclosure and shall be equipped with a sun shield that prevents sunlight from directly entering the lens. The camera shall be less than 6 inches in diameter, less than 18 inches long and shall weight less than 6 pounds when the camera and lens are mounted inside the enclosure.

The camera enclosure shall include all required environmental controls as defined by the camera manufacturer and may include a thermostatically controlled heater and/or fan to assure proper operation of the lens iris at both low and high temperatures, and prevent moisture condensation of the optical faceplate of the enclosure. The camera shall operate within the temperature range of -30 degrees Fahrenheit to +140 degrees Fahrenheit.

When a variable focal length lens with variable focus control is supplied as part of the camera, the lens shall be adjusted to suite the site geometry without opening up the camera housing.

Control and other cables required for installation, setup, and operation of the camera and/or video detection system, shall be of the size and type required per manufacturer's specifications and the National Electric Codes. Control cables shall terminate within the controller cabinet.

The power cable shall be 16 AWG three conductor cable. The cabling shall comply with local and National Electric Codes.

The complete video detection system shall be warranted to be free of defects in material and workmanship for a period of not less than three years from the date of final acceptance and warranty initiation. During the warranty period, the Contractor or Developer shall be responsible for the repair or replacement, at no charge to the Town, of any product of the video detection system which fails to operate properly with the exception of failures as a result of vandalism, accident, and/or act of God.

Video detection systems shall be paid for on a unit basis and shall include all labor, equipment and materials necessary to install a video detection system for a single approach, complete-in-place. The video detection system shall be paid for under the "Video DetectionSystem" pay item.

930.08 Inductance Loop Detection

Inductance loops shall only be installed where/when specifically defined in project plans and specifications or as otherwise directed by the Town Engineer. When defined for use,

inductance loops shall be installed in accordance with specifications approved by the Town Engineer and the construction plans.

930.09 Pedestrian Push Buttons

Pedestrian push button assemblies shall be Pelco model SE-2005-08 (ADA pedestrian push button), or approved equal. The button housing shall be black in color. A separate 9" W x 12" H decal sign, MUTCD Reference # R10-3d, or approved equal shall be installed with each pedestrian push button.

Audible and/or tactile pedestrian push buttons shall only be used where specified in the plans and project specials, and may be considered by the Town Engineer on a per project basis. When audible and/or tactile pedestrian push buttons are requested, the audible and/or tactile function shall be integrated into the pedestrian push buttons. Pedestrian push buttons shall be of the manufacturer and model number specified, and shall conform to the MUTCD.

Pedestrian push buttons shall be paid for on a unit price basis and shall include all labor, equipment and materials necessary to install the item complete-in-place. Pedestrian push buttons shall be paid for under the "pedestrian push button" pay item.

930.10 Emergency Vehicle Detection

Global Traffic Technologies (GTT) Opticom phase selectors and detectors shall be of the most current model, or as specified herein. Opticom Detectors shall be installed as specified in the plans and may include model numbers 711, 721, and/or 722. Opticom Phase Selectors shall be model number 762.

Opticom phase selectors and detectors shall be paid for on a unit price basis based on quantities and model numbers and shall include all labor, equipment and materials necessary to install the item complete-in-place. Opticom phase selectors shall be paid for under the "Opticom Phase Selector" pay item. Opticom detectors shall be paid for under the "Opticom Detector" pay item.

930.11 Electrical Services

Electrical services shall be installed for all new signals or as otherwise directed by the Town Engineer. Services shall be 240VAC, Single Phase, providing for two separate 120VAC, Single Phase, circuits. One circuit shall be used as the traffic signal cabinet feed. The second circuit shall be used as the street light feed.

Unless otherwise directed by the utility company and agreed upon by the Town Engineer, electrical services shall be metered.

Electrical service shall be installed as per NEC or as amended by the Town. The grounding and bonding of services shall be completed in accordance with Article #250.

Electrical service shall be paid for on a unit price basis and shall include all labor, equipment and materials necessary to install the electrical service, complete-in-place. The electrical service shall be paid for under the "Electrical Service" pay item.

930.12 Bonding and Grounding

Metallic cable sheaths, conduit, metal poles and pedestals shall be effectively grounded. Bonding and grounding jumpers shall be copper wire or copper strap of the same cross-sectional area, No. 8 AWG for all systems. Loop lead-in cable for inductance loops is to be grounded in controller cabinet only. The other end of the inductance loop lead-in shall remain ungrounded, being taped back.

Bonding of standards shall be by means of a bonding strap attached to a brass bolt or a 3/16-inch or larger brass or bronze bolt installed in the lower portion of the shaft.

The controller cabinet and each individual pole and/or pedestal shall be attached to its own separate ground electrode via #6 solid bare copper wire. The ground electrodes may be placed in the foundation of the item to be grounded or may be placed in an adjacent pull box located no more than 6-feet away from said foundation. Ground electrodes shall be a one piece copper weld rod of 5/8-inch diameter, 8-feet in length.

Grounding shall be incidental to the pay item for which it is associated.

930.13 Controller and Cabinet

This specification sets forth the minimum requirements for a 170/2070 traffic control modular cabinet assembly. The cabinet assembly shall meet, as a minimum, all applicable sections here within.

All controller cabinets shall be stretched 333SD type traffic control cabinets except when used at two phase pedestrian crossings and/or fire signals. Two phase pedestrian crossing and fire signal controller cabinets shall be pole mount 303 type traffic control cabinets unless otherwise called for on the plans.

Controller cabinets shall have a powder coated finish, "silver wheel" in color, with anti-graffiti coating. All cabinets and conduits into the cabinet shall be made to be rodent resistant.

A controller shall consist of a complete electrical mechanism to control the operation of traffic control signals, including the timing mechanism and all necessary auxiliary equipment. Controllers shall be Econolite Cobalt-C. All equipment furnished shall be the manufacturers' latest, current production model, complete with all standard accessories, tested and delivered by domestic manufacture who is regularly engaged in the construction of such equipment. Each cabinet shall be furnished with a full complement of auxiliary equipment (loop amps, load switch, etc.) regardless of specific intersection design.

For base mounted cabinets, all electrical conduits running to the control cabinet shall enter from the bottom only, except as noted on the plans. No holes shall be drilled in any part of the cabinet other than the bottom, unless otherwise called for on the plans.

All controller cabinets and control equipment shall be factory wired, ready for operation. Contractor or Developer shall test cabinet and controller in his shop prior to installation. Field work will be limited to placing cabinets and equipment and the connecting of field wiring to field terminal strips. All cabinet wiring shall be neat and firm.

Controller cabinets shall be furnished with all mounting hardware.

All controller cabinets shall be equipped for and wired for two Opticom card rack mounted Global Traffic Technologies (GTT) Model 752 phase selectors. The phase selector cards, field wiring, and detectors shall not be supplied, unless called for in the Bid Schedule.

Controllers and cabinets shall be measured and paid for per unit count and shall include all labor, equipment, and materials necessary to install the item complete-in-place. Traffic signal cabinets shall be paid under the "Traffic Signal Cabinet" pay item. Traffic signal controllers shall be paid under the "Traffic Signal Controller" pay item.

930.14 On-Street Master Controller

An on-street master controller shall only be installed where identified in the project plans and/or specifications. Where identified, an on-street master controller shall be of the manufacture and model number as defined.

930.15 Traffic Signal Heads

All vehicular traffic signal heads shall be 12-inch, 100% polycarbonate, black in color, with black, detachable, tunnel visors. Use of 8-inch signal traffic signal heads shall not be permitted.

Retro-reflective back plates shall be installed on all mast arm mounted traffic signal heads and shall be louvered, black in color, with retro-reflective strip. Back plates shall not be mounted on side-of-pole mounted traffic signal heads.

All pedestrian signal heads shall be single section, 16", clam shell, black in color.

LED indications shall be furnished for all indications with the exception of side-of-pole red indications. Side-of-pole red indications shall be incandescent type to aid in snow melt during the winter. All LED indications shall be warranted for a minimum of seven years by the manufacturer.

LED ball modules shall be incorporate a clear front shell and be GE models DR6-GCFB-VLA, DR6-YCFB-VLA, and/or DR6-RCFB-VLA or approved equal.

LED arrow module shall be DR6-GGE models TAAN-17A, DR6-YTAAN-17A, and/or DR6-RTAAN-17A or approved equal.

Pedestrian signals shall 16" x 18", countdown type, and be GE model PS7-CFF1-27A or approved equal.

Incandescent bulbs, as required for the side-of-pole red indications, and as otherwise directed for use by the Town Engineer, shall be Philips, Sylvania, or Town Engineer approved alternate. They shall be 116 watt, 130 volt, with a minimum life hour rating of 8,000 hour.

All signal head locations shall be approved by the Town Engineer.

Astro-brac or Sky-brac type mounting hardware shall be used to attach all traffic signal heads mounted on mast arms.

Side of pole traffic signal heads shall use industry standard side of pole hardware on both the top and bottom traffic signal head sections for mounting.

All Band-it material, including buckles, shall be $\frac{3}{4}$ " stainless steel.

During construction, traffic signal heads that have been installed but are not ready for actual electrical connection shall be bagged with a dark opaque material.

Signal and pedestrian heads shall be paid for on a unit price basis and shall include all labor, equipment and materials necessary to install the signal head, complete-in-place. Signal and pedestrian heads shall be paid for under the "traffic signal head" and "pedestrian head" pay items respectively.

930.16 Traffic Signal Poles, Mast Arms and Luminaire Davits

Traffic poles, mast arms, and luminaire davits shall meet the requirements of the standard details, which indicate the critical dimensions that must be met exactly or within stated tolerances. The intent is to provide traffic poles, mast arms, and luminaire davits that match the overall appearance as illustrated and meet the performance requirements of the details and these specifications. Traffic pole, mast arm, and luminaire davit supplier submittals shall be required and shall demonstrate conformity with this intent.

Traffic poles, mast arms, and luminaire davits shall be wrapped for shipping from the factory in heavy duty paper or plastic to protect them from scratches and abrasions in transit.

Traffic poles, mast arms, and luminaire davits shall be paint over hot-dipped galvanized, black in color. Hot-dip galvanized shall be as per ASTM A123 and A153. Prior to the installation of traffic poles, mast arms, and/or davits, the Contractor or Developer shall wipe clean the outer surfaces. Following the installation of the traffic poles, mast arms, and/or luminaire davits, the Contractor or Developer shall touch up nicks and abrasions using paint of similar color and sheen.

Nicks and abrasions greater than 1/8 inch deep shall be spray painted with zinc rich paint (greater than 90%) that matches the galvanized finish, such as Brite Products Brite Zinc Galvanizing Compound prior to paint touch up.

Two hand holes shall be provided on each pole; one at the base, one flush hand hole behind the signal mast arm connection. The flush covers shall be flush with the base metal giving them a hidden appearance. A "J-hook" wire support shall be provided in each pole shaft above the hand hole behind the mast arm connection. One grounding attachment shall be provided in each pole shaft near the hand hole cover at the base of the pole.

Anchor bolt base covers shall be provided in a two piece, tamper-resistant style. A locking device shall be provided to prevent lifting or creeping of the base cover.

Mast arm connecting bolts shall be of sufficient strength to conform to current AASHTO specifications.

All mast arm and pole shaft end openings shall be provided with set screw caps.

All welding shall conform to AWS D1.1 Sections 1 through 8 and shall be performed by welders certified in accordance with AWS code. All butt welds shall be ground flush with base metal to provide a uniform smooth finish.

By American Provision, all steel materials permanently incorporated into the work shall be certified to have been produced in the United States. All manufacturing processes for these materials must occur in the United States and be new domestic steel. Certifications that steel has been manufactured in the United States shall be provided to the Town by the manufacturer.

All materials shall be of the ASTM type as called for in this specification. Mill certifications shall be supplied for proof of compliance to these Specifications.

Valmont brand traffic signal poles, mast arms, and luminaire davits have been pre-approved to meet Town specifications. Other brands must be approved by the Town Engineer prior to ordering the poles, mast arms, and/or luminaire davits.

Traffic signal poles, mast arms, and luminaire davits shall be measured and paid for per unit count and shall include all labor, equipment, and materials necessary to install the item complete-in-place. Traffic signal poles, mast arms, and luminaire davits shall be paid for under the "Street Light Pole, and/or "Traffic Signal Pole" pay item as appropriate.

930.17 Pedestrian Pole

Pedestrian poles shall be designed to meet the structural requirement given in the latest edition of "Standard Specifications for Structural Support for Highway Signs, Luminaires and Traffic Signals", published by AASHTO, for a wind velocity of 90 MPH.

Pedestrian poles shall be aluminum of the appropriate length of 8-feet, 12-feet, or 15-feet as required for signal equipment mounting heights in compliance with the latest MUTCD standards. When aluminum poles are not of adequate strength for the given wind load to meet the above AASHTO requirements, use of a Schedule 40 galvanized steel pole shall be required. Pedestrian poles shall be painted black in color.

With the exception of beacon assemblies, top mounting of signal heads shall not be permitted.

The pole base shall be frangible, of the same material as the pole.

After installation where galvanized steel poles have been installed, nicks and abrasions greater than 1/8 inch deep shall be spray painted with zinc rich paint (greater than 90%) that matches the galvanized finish, such as Brite Products Brite Zinc Galvanizing Compound.

Pedestrian poles shall be measured and paid for per unit count and shall include all labor, equipment, and materials necessary to install the item complete-in-place. Pedestrian poles shall be paid for under the "Pedestrian Pole" pay item.

930.18 Pedestrian Push Button Pole

Pedestrian push button pole shall be as illustrated in the standard details, constructed of Schedule 40 galvanized steel painted black. Pole base shall be frangible.

After installation, nicks and abrasions greater than 1/8 inch deep shall be spray painted with zinc rich paint (greater than 90%) that matches the galvanized finish, such as Brite Products Brite Zinc Galvanizing Compound.

Pedestrian push button poles shall be measured and paid for per unit count and shall include all labor, equipment, and materials necessary to install the item complete-in-place. Pedestrian push button poles shall be paid for under the "Pedestrian Push Button Pole" pay item.

930.19 Illuminated Street Name Signs

Illuminated street name signs shall be RAZOR Internally-Illuminated LED Street Name Signs as manufactured by Temple Edge-Lit or approved equal.

Illuminated street name signs shall be double sided unless otherwise defined in the project plans and/or specifications.

Illuminated street name signs housings shall be constructed of 6000 series aluminum.

Sheeting shall be 3M Electro Cut film #1178 with white lettering over a green background.

The sign shall be provided with a manufacturer approved under-hang mast arm mount.

Illuminated street name signs shall have a minimum wind load rating of 150 MPH with 1.14 gust factor and ice loading as per AASHTO LTS-4 2001.

LEDs shall be high-intensity, rated for a minimum of 60,000 hours.

Illuminated street name signs shall be warranted for a minimum of 5 years.

Illuminated street name signs shall be measured and paid for per unit count and shall include all labor, equipment, and materials necessary to install the item complete-in-place. Illuminated street name signs shall be paid for under the "Illuminated Street Name Sign" pay item.

930.20 Blank Out Regulatory/Warning Signs

Blank out regulatory or warning sign housings shall be constructed of aluminum unless directed otherwise by the Town Engineer. All ferrous hardware parts shall be galvanized cadmium plated, or stainless steel.

The lens panel shall be capable of removal or be swung open without the use of tools.

The sign panel shall be completely blanked out when not energized. The sign color shall not fade when exposed to an accelerated test of ultraviolet light equivalent to five years of outdoor exposure.

The entire surface of the sign panel shall be evenly illuminated. All messages shall be clearly legible attracting attention under any lighting conditions for an advance distance of at least 500 feet. When illuminated, the sign shall be visible anywhere within the approximately a 60 degree cone centered about the optic axis.

Terminal blocks shall be molded, phenolic, barrier type rated at 15 ampere, 1000 V and shall have waterproof marking strips. No wiring splices will be permitted within the sign without the permission of the Town Engineer.

The overall weight of the complete sign assembly including mounting hardware shall not exceed 90 lbs.

Blank out regulatory or warning signs shall be of LED or fiber optic light source type as specified in the project plans and specifications.

If a fiber optic light source is specified, the lamps shall be 50 watts or less, operating at 15 volts or less and shall have an average rated life of 8,000 hours or more. The color of any message shall be changeable in the field by replacement of the color filters without removing the sign from the case.

Blank out regulatory/warning signs shall be measured and paid for per unit count and shall include all labor, equipment, and materials necessary to install the item complete-in-place. Blank out regulatory/warning signs shall be paid for under the "Blank Out Regulatory/Warning Sign" pay item.

930.21 School Flashing Beacon Assembly

A school flashing beacon assembly shall be as shown in the standard details.

LED indications shall be furnished for all indications. For 120VAC installations, LED indications shall be warranted for a minimum of seven years by the manufacturer. For solar installations, LED indications shall be warranted for a minimum of five years by the manufacturer.

Each school flasher beacon assembly shall include a NEMA Type 4 enclosure for housing the associated time clock unit and electrical connections. When solar power is used in conjunction with the school flashing beacon assembly, the NEMA Type 4 enclosure shall be of sufficient size to house all associated solar power equipment, including the battery(s), as may be applicable.

The NEMA Type 4 enclosure shall be lockable and provided with a treasury type lock Corbin number R357SGS, or exact equivalent

A time clock, RTC model number AP21T, or approved equal shall be incorporated in the school flashing beacon assembly NEMA Type 4 enclosure.

Terminal blocks shall be molded, phenolic, barrier type rated at 15 ampere, 1000 V. No wiring splices will be permitted within the school flasher beacon assembly or NEMA Type 4 enclosure without the permission of the Town Engineer.

Signs shall be supplied and installed by the Contractor or Developer as an integral part of the flashing assembly.

For 120VAC installations, a main circuit breaker shall be installed in the NEMA Type 4 enclosure between the service feed and school flashing beacon assembly electronics. Fuse(s) in place of the circuit breaker shall not be permitted. A main circuit breaker shall not be required for solar type installations.

For 120VAC installations, a 120VAC receptacle shall be installed within the NEMA Type 4 enclosure.

School flashing beacon assemblies shall be paid for on a unit price basis and shall include all labor, equipment, materials, and electrical service connections necessary to install a school flashing beacon assembly, complete-in-place, on a single pole. School flashing beacon assemblies shall be paid for under the "School Flashing Beacon Assembly" pay item.

930.22 Warning or Regulatory Sign Flashing Beacon Assembly

A warning or regulatory sign flashing beacon assembly shall be as shown in the standard details.

LED indications shall be furnished for all indications. For 120VAC installations, LED indications shall be warranted for a minimum of seven years by the manufacturer. For solar installations, LED indications shall be warranted for a minimum of five years by the manufacturer.

All terminations shall be made on a terminal block located within the signal head. Terminal blocks shall be molded, phenolic, barrier type rated at 15 ampere, 1000 V. No wiring splices will be permitted within the warning or regulatory sign flashing beacon assembly without the permission of the Town Engineer.

Signs shall be supplied and installed by the Contractor or Developer as an integral part of the flashing assembly.

Warning or regulatory sign flashing beacon assemblies shall be paid for on a unit price basis and shall include all labor, equipment, materials, and electrical service connections necessary to install a warning or regulatory sign flashing beacon assembly, complete-in-place, on a single pole. Warning or regulatory sign flashing beacon assemblies shall be paid for under the "Warning/Regulatory Sign Flashing Beacon Assembly" pay item.

930.23 Solar Power System

The solar power system shall be of sufficient size to adequately support the power requirements of the attached equipment year-round. It shall incorporate a solid-state solar controller including a high output solar regulator and low voltage disconnect. The system shall operate on input voltages ranging from 11.5 VDC to 25 VDC. The solar regulator's minimum rating shall be 25A at 12 VDC, temperature compensation.

The solar panel position shall be field settable to the correct degree required at the location and shall use automatic night dimming to conserve power.

The solar power system shall not be paid for separately but shall be included in the cost for the equipment it is powering and shall include all labor, equipment, and materials necessary to install a solar power system, complete-in-place, on a single pole.

930.24 Uninterruptable Power Supply (UPS)

A UPS shall be installed for all new traffic signals and shall be a Clary SP1250LX or approved equal. It shall include a bypass switch by which the user can manually bypass the UPS and power the signal via utility power.

The UPS shall include a weatherproof generator receptacle accessible via the exterior of the traffic signal cabinet. The UPS generator receptacle shall be mounted at a minimum height of two feet as measured from the bottom of the cabinet.

The UPS shall be configured such that the UPS provides regulated 120VAC, 60 Hz, single phase output power to run the signal in full operation and recharges the UPS batteries while under generator power. The unit shall automatically sense when generator power is applied, and when generator power fails. When generator power is applied, the UPS unit shall be configured such that it automatically reverts to generator power. The unit shall be configured such that it automatically reverts back to either utility power or UPS battery power respectively, based upon the availability at the time, when the generator power falls outside of acceptable signal tolerances.

The UPS shall be supplied with a minimum of six (6) 12V, sealed, maintenance free batteries as approved for use by the manufacturer.

Programming software and manuals shall be supplied with each UPS and shall become the property of the Town at the completion of the project.

UPS units shall be initially programmed to provide two (2) hours of normal operation before transitioning to flash mode.

A UPS shall include all labor, equipment, and materials necessary to install the item complete-in-place.

UPS shall be measured by the units installed and shall include all labor, equipment, and materials necessary to install a UPS, complete-in-place. UPS shall be paid for under the pay item "Uninterruptible Power Supply".

930.24 Miscellaneous Hardware

All ferrous mounting hardware and weather heads shall be galvanized, cadmium plated, or made of stainless steel to resist corrosion.

940.00 POST CONSTRUCTION**940.01 Field Testing**

Prior to completion of the work, the Contractor or Developer shall cause the following tests to be made on all traffic signals in the presence of the Town Engineer:

Each circuit shall be tested for continuity and for grounds.

A functional test shall be made in which it is demonstrated that each and every part of the system functions as specified or intended herein. The functional test for the traffic signal installation shall consist of not less than fourteen (14) days of continuous, satisfactory operation following a three to five day mandatory flashing period, or other flash period as directed by the Town Engineer.

Signal turn-on, following the mandatory flashing period to transition into the functional test, shall be scheduled with the Town Engineer, completed Monday-Thursday during normal business hours.

940.02 Maintenance and Emergency Repairs During and After Construction

During the construction, reconstruction, fourteen-day test period, and until signal Construction Acceptance by the Town, the Contractor or Developer shall maintain the system or systems on a 24 hour basis. The cost of any maintenance necessary except electrical energy, and maintenance due to damage by public traffic, shall not be paid for separately but shall be included in the cost of the work.

Acceptance by the Town of the work performed by the Contractor or Developer shall only take place after all punch list items have been satisfactorily completed and inspected by the Town.

The Contractor or Developer shall provide the Town with a 24 hour one call phone number for reporting of any and all signal malfunctions. Fees incurred for such service shall not be paid for separately but shall be included in the cost of the work.

All malfunctions of a controller and its accessory equipment shall be considered an emergency unless otherwise identified by the Town. Equipment malfunctions and/or damage, which in the opinion of the Town Engineer constitutes a serious hazard or inconvenience to the public, shall be considered an emergency. The Contractor or Developer shall undertake emergency repairs no later than two (2) hours after the Town notifies the Contractor or Developer of the emergency.

Malfunctions of a controller and its accessory equipment, which are identified by the Town Engineer as non-emergency repairs shall be considered non-emergency. The Contractor or

Developer shall undertake non-emergency repairs no later than 24 hours after the Town notifies the Contractor or Developer of the non-emergency.

If the Contractor or Developer fails to respond within the defined response time, the Town Engineer may elect to employ the services of the Town's designated Traffic Signal Maintenance Contractor to perform the said maintenance work. In such cases, the Contractor or Developer shall reimburse the Town for labor, equipment, and material charges associated with the utilization of the Town's designated Traffic Signal Maintenance Contractor plus a fifteen percent administration fee.

<u>DRAWING NO.</u>	<u>TITLE</u>
SW1	CURB AND GUTTER JOINT DETAIL
SW2	MONOLITHIC INTEGRAL CURBWALK
SW3	CONCRETE CROSS PAN
SW4A	DRIVE CUT – DETACHED WALK
SW4B	DRIVE CUT – ATTACHED WALK
SW5	CURB RAMP TYPE 1 ATTACHED WALK
SW6	CURB RAMP TYPE 2A ATTACHED WALK
SW7	CURB RAMP TYPE 4 DETACHED WALK
SW8	CURB RAMP TYPE 3 DETACHED WALK
SW9A	CURB RAMP MID BLOCK TYPE 1 DETACHED WALK
SW9B	CURB RAMP MID BLOCK TYPE 3 DETACHED WALK
SW9C	CURB RAMP MID BLOCK TYPE 2 ATTACHED WALK
SW10	MOUNTABLE CURB SECTION
SW11	VERTICAL CURB SECTION
SW12A	6" VERTICAL CURB, GUTTER AND DETACHED WALK
SW12B	6" MOUNTABLE CURB, GUTTER AND DETACHED WALK
SW13	SIDEWALK DESIGN STANDARDS

INDEX OF CURB, GUTTER AND SIDEWALK DETAILS



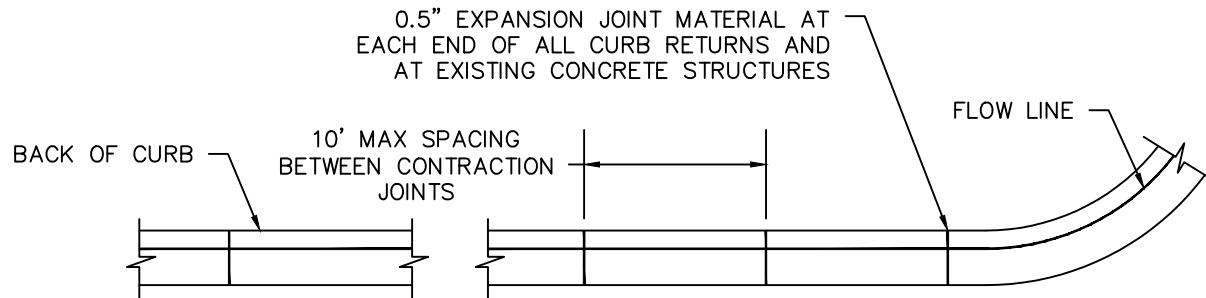
CURB, GUTTER AND SIDEWALK CONSTRUCTION DRAWINGS

BY: JME

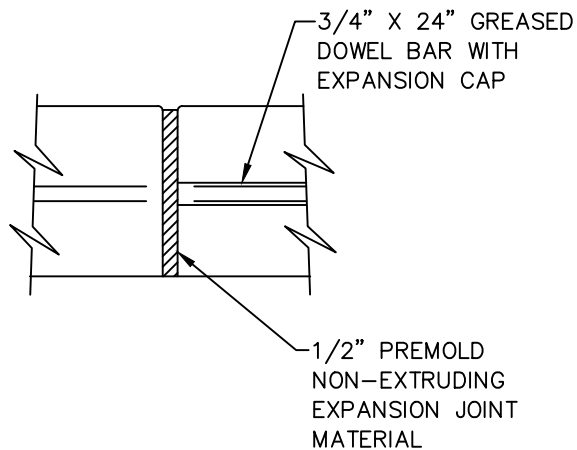
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DATE: 1/2020

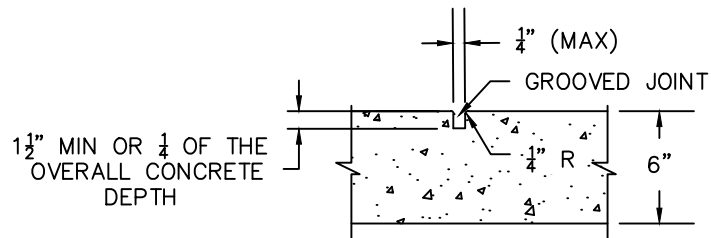
DRAWING:



LAYOUT



EXPANSION JOINT



JOINT SHALL BE TOOLED IN LIEU OF SAWCUTTING AT TIME OF RAMP INSTALLATION BEFORE CONCRETE HAS HARDENED.

NOTES:

1. EXPANSION JOINT MATERIAL SHALL BE NON-EXTRUDING AND RESILIENT TYPE TO MEET AASHTO SPEC. M-213.
2. ANY OVER-EXCAVATION SHALL BE REPLACED BY GRANULAR BACKFILL COMPACTED TO 95% MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698.

CONTRACTION JOINT

CURB AND GUTTER JOINT DETAIL

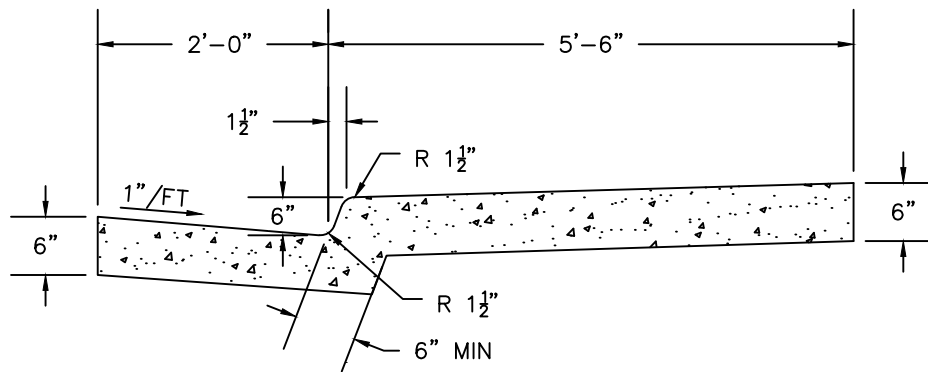


**CURB, GUTTER AND
SIDEWALK CONSTRUCTION
DRAWINGS**

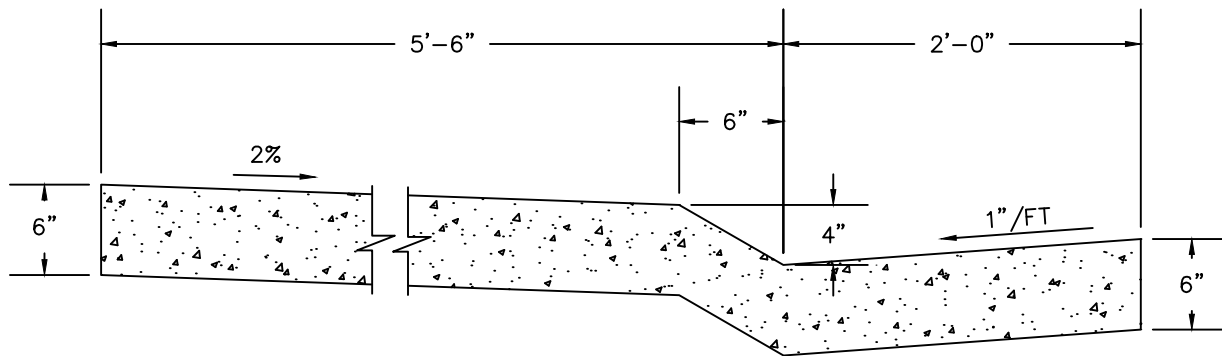
BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

SW1



VERTICAL



ROLLOVER

NOTES:

1. EXPANSION JOINT MATERIAL SHALL BE NON-EXTRUDING AND RESILIENT TYPE TO MEET AASHO SPEC. M-213.
2. ANY OVER-EXCAVATION SHALL BE REPLACED BY GRANULAR BACKFILL COMPACTED TO 95% MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698.
3. SEE DETAILS ON DRAWING SW1 FOR EXPANSION AND CONTRACTION JOINT DETAILS.
4. FOR USE IN RESIDENTIAL AREAS OR RESIDENTIAL COLLECTORS ONLY.

MONOLITHIC INTEGRAL CURBWALK

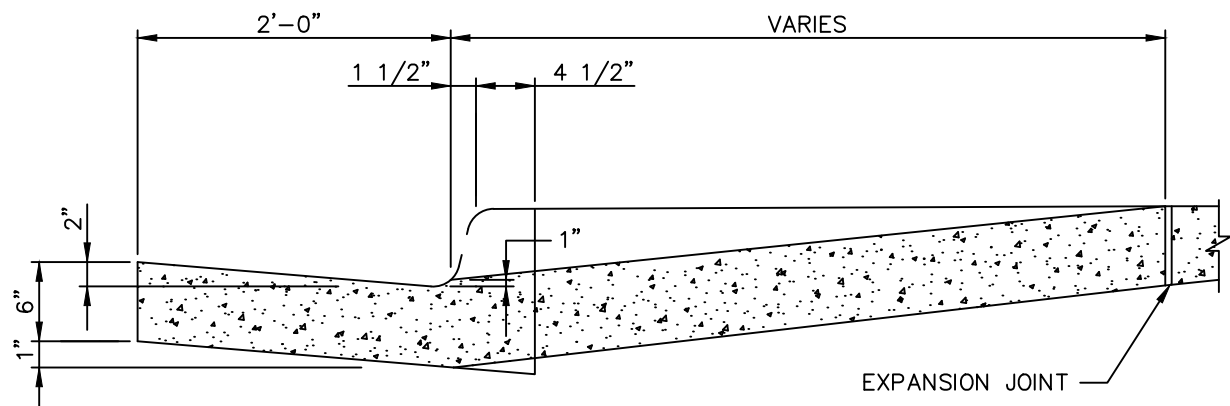
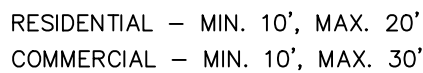


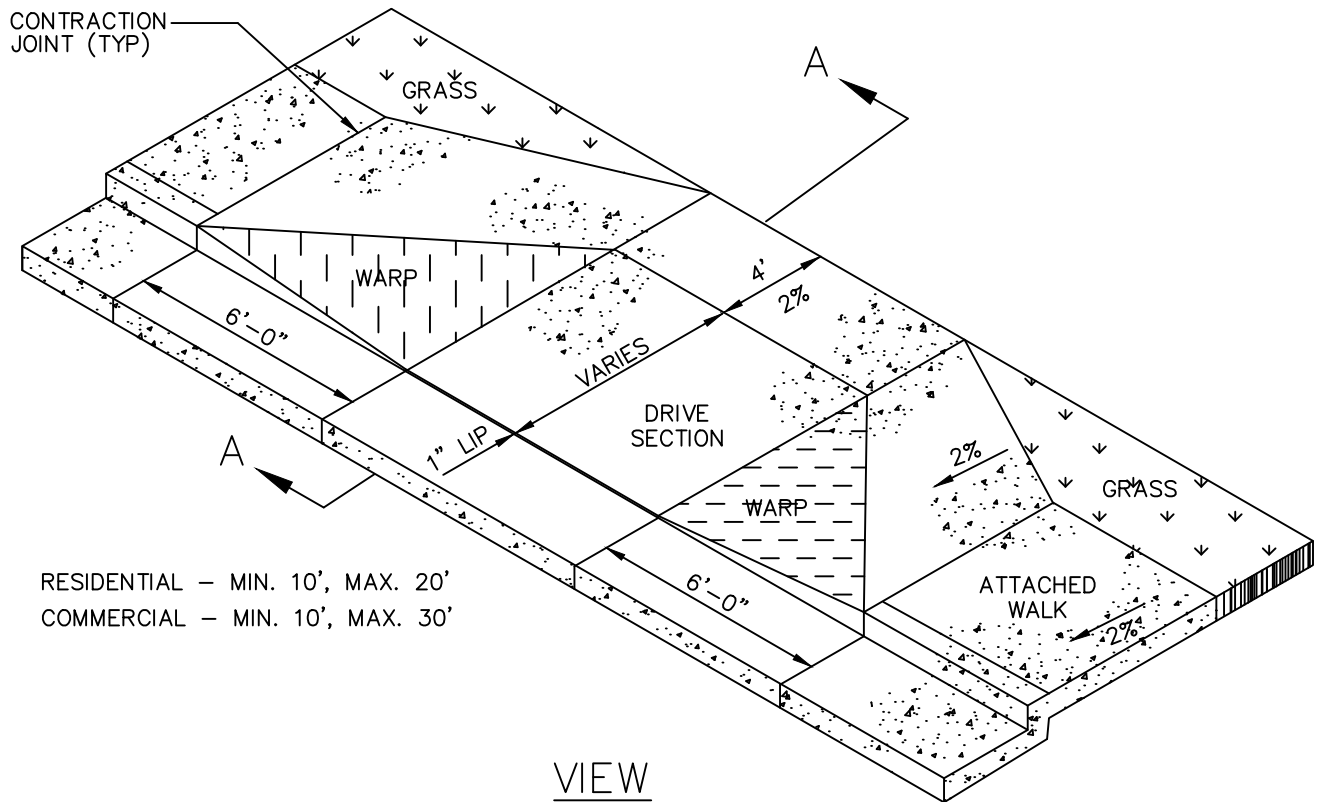
**CURB, GUTTER AND
SIDEWALK CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

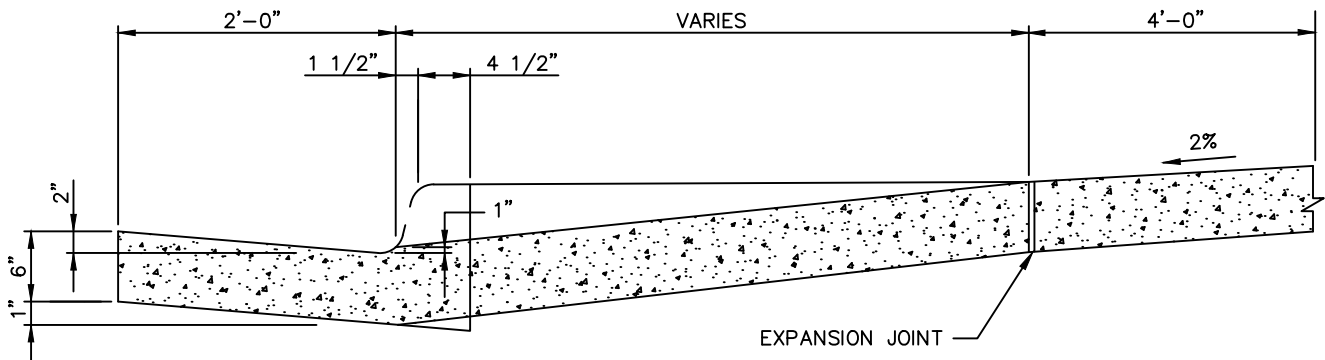
DRAWING:

SW2





RESIDENTIAL — MIN. 10', MAX. 20'
 COMMERCIAL — MIN. 10', MAX. 30'



SECTION A-A

NOTES:

1. CONTRACTION JOINTS ARE REQUIRED AT EACH SIDE OF WARPED SECTION AND EVERY 10' ALONG THE DRIVE SECTION. SEE DETAILS ON DRAWING SW1 FOR CONSTRUCTION JOINT DETAILS.
2. CHAMFER FRONT EDGE OF CURB AND DRIVE SECTION AS SHOWN IN SECTION A-A.
3. SIDEWALK THICKNESS SHALL BE 6".

DRIVE CUT - ATTACHED WALK

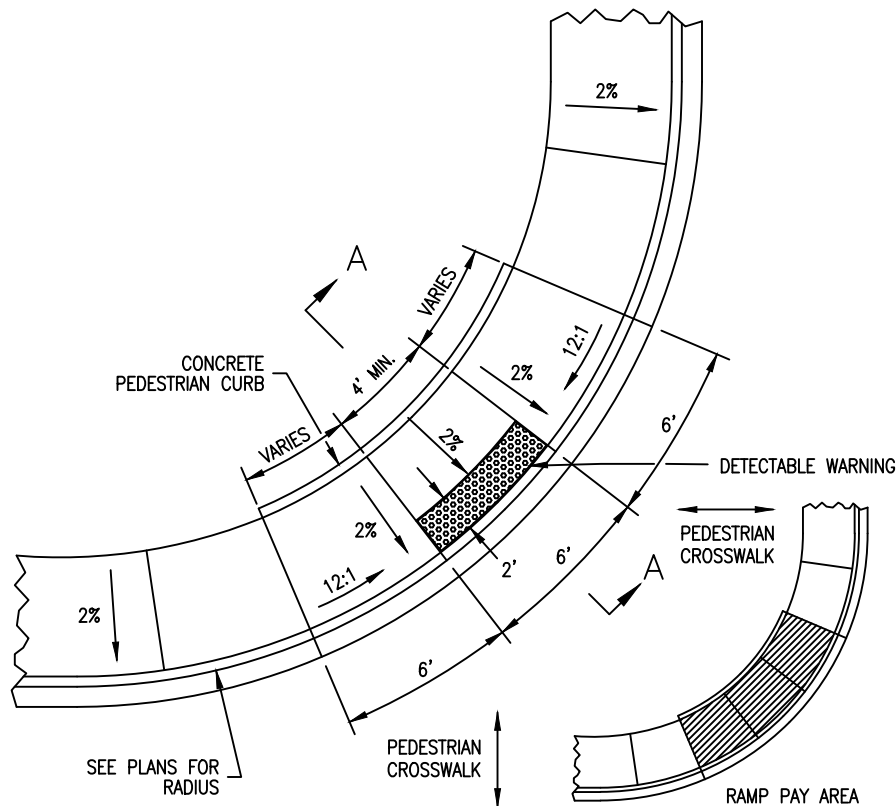


CURB, GUTTER AND
 SIDEWALK CONSTRUCTION
 DRAWINGS

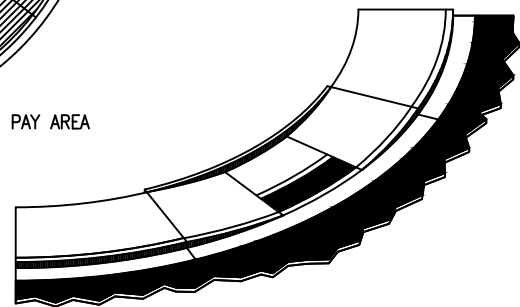
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 DATE: 1/2020

DRAWING:

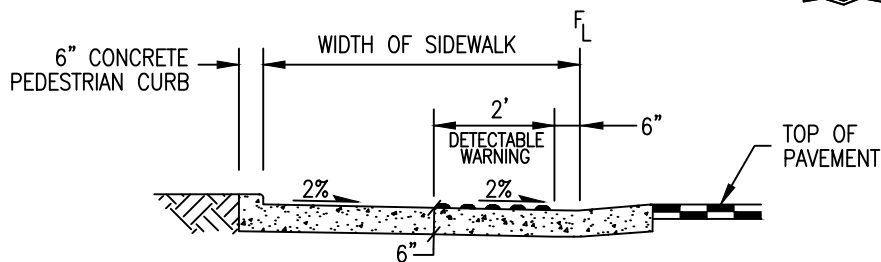
SW4B



SIDEWALK RAMP TYPE 2A
PLAN



ISOMETRIC VIEW



SECTION A-A

NOTES:

1. THE RAMP AREA SHALL RECEIVE A COARSER BRUSH TREATMENT THAN THE SIDEWALK.
2. AVOID PLACING DRAINAGE STRUCTURES, TRAFFIC SIGNAL EQUIPMENT, JUNCTION BOXES OR OTHER OBSTRUCTIONS IN FRONT OF RAMP ACCESS AREAS.
3. RAMP SLOPES SHALL NOT BE STEEPER THAN 12:1. THE DETECTABLE WARNING AREA SLOPE SHALL NOT BE STEEPER THAN 20:1.
4. CONSTRUCTION OF THE CONCRETE PEDESTRIAN CURB TO BE INCLUDED IN THE COST OF THE CURB RAMP.
5. DETECTABLE WARNINGS SHALL BE EAST JORDAN IRON WORKS 7005 SERIES DETECTABLE WARNING PLATES OR APPROVED EQUAL.

CURB RAMP TYPE 2A ATTACHED WALK

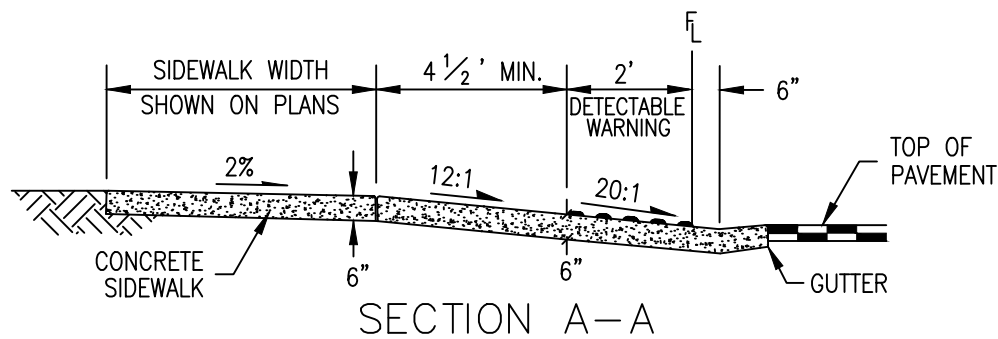
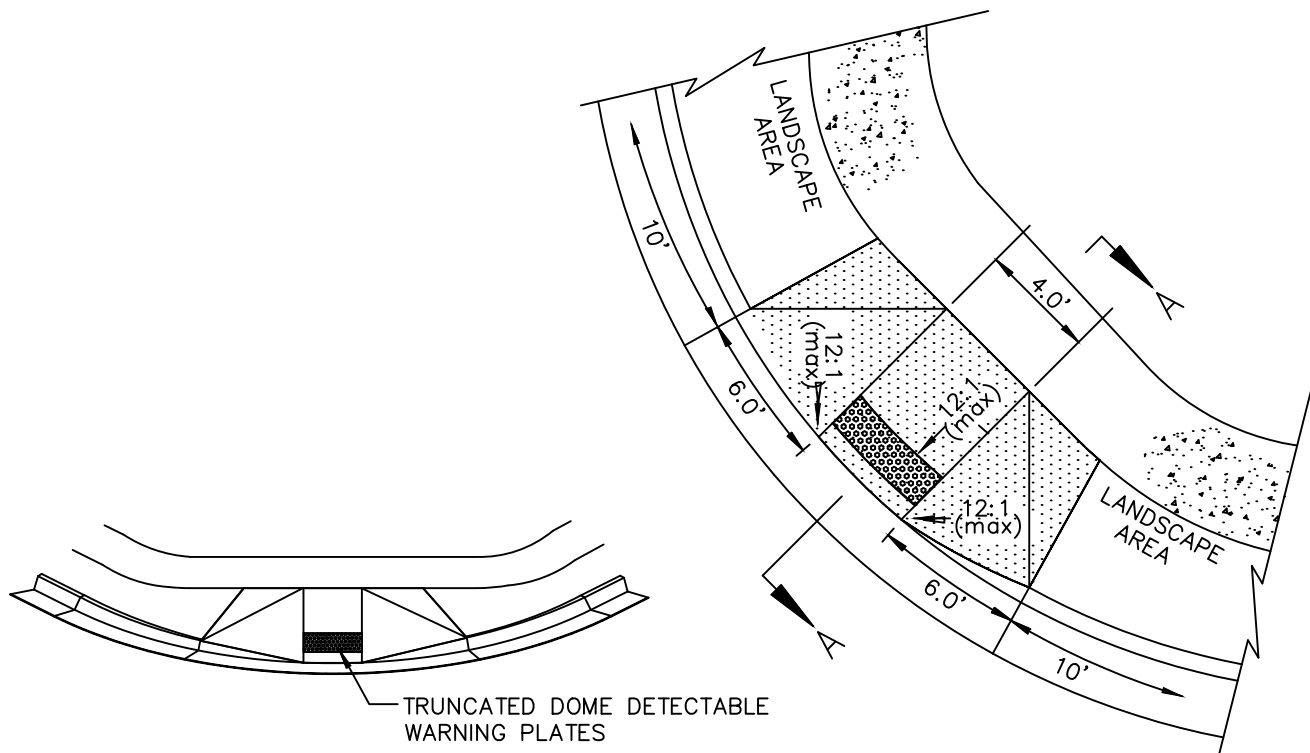


**CURB, GUTTER AND
SIDEWALK CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

SW6



NOTES:

1. THERE SHALL BE NO LIP WHERE THE RAMP MEETS THE GUTTER.
2. CURB RAMPS SHALL BE PROVIDED AT ALL CORNERS OF STREET INTERSECTIONS AND AT "T" INTERSECTIONS WHERE THERE IS EXISTING OR PROPOSED SIDEWALK AND CURB.
3. RAMP SURFACE SHALL HAVE A COARSE BROOM FINISH.
4. CURB RAMPS SHALL BE POURED MONOLITHICALLY WITH THE CURB, GUTTER AND APRON.
5. RAMP DIMENSIONS SHALL BE SPECIFIED ON THE CONSTRUCTION PLANS.
6. RAMP AND WING SLOPES SHALL NOT BE STEEPER THAN 12:1.
7. THE DETECTABLE WARNING AREA SLOPE SHALL NOT BE STEEPER THAN 20:1.
8. DETECTABLE WARNINGS SHALL BE EAST JORDAN IRON WORKS 7005 SERIES DETECTABLE WARNING PLATES OR APPROVED EQUAL.

CURB RAMP TYPE 4 DETACHED WALK

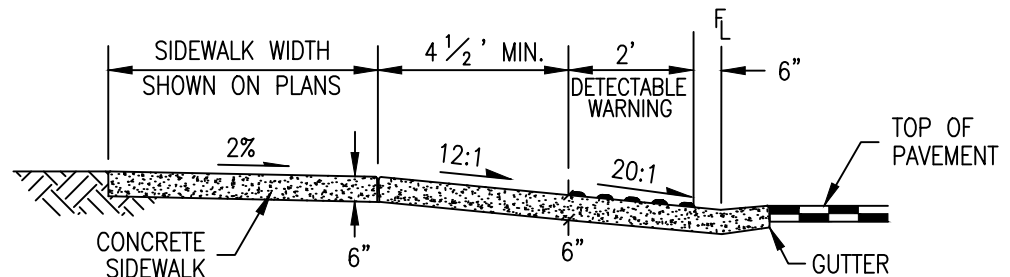
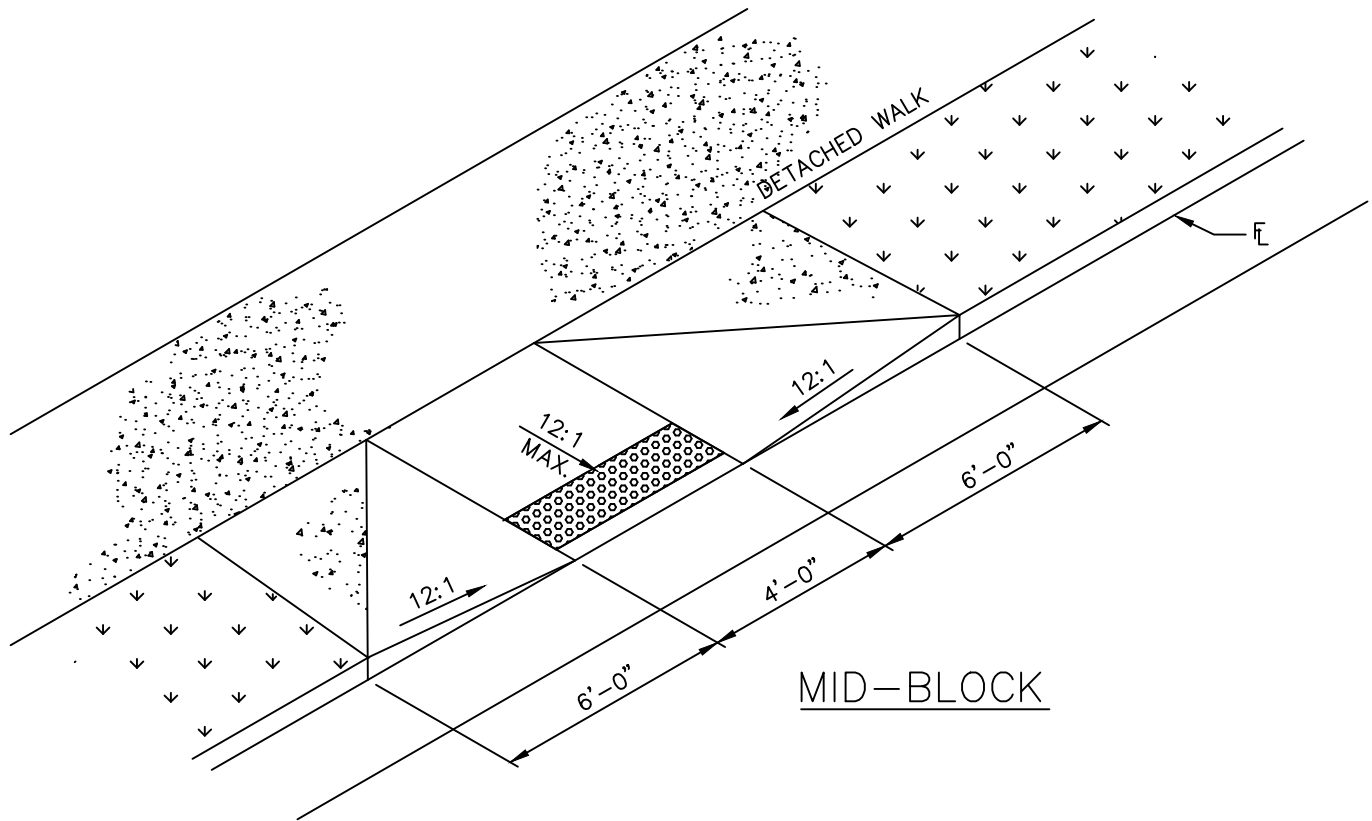


**CURB, GUTTER AND
SIDEWALK CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

SW7



NOTES:

1. THERE SHALL BE NO LIP WHERE THE RAMP MEETS THE GUTTER.
2. RAMP SURFACE SHALL HAVE A COARSE BROOM FINISH.
3. CURB RAMPS SHALL BE POURED MONOLITHICALLY WITH THE CURB, GUTTER AND APRON.
4. RAMP DIMENSIONS SHALL BE SPECIFIED ON THE CONSTRUCTION PLANS.
5. RAMP AND WING SLOPES SHALL NOT BE STEEPER THAN 12:1.
6. THE DETECTABLE WARNING AREA SLOPE SHALL NOT BE STEEPER THAN 20:1.
7. DETECTABLE WARNINGS SHALL BE EAST JORDAN IRON WORKS 7005 SERIES DETECTABLE WARNING PLATES OR APPROVED EQUAL.

CURB RAMP MID BLOCK TYPE 1 DETACHED WALK

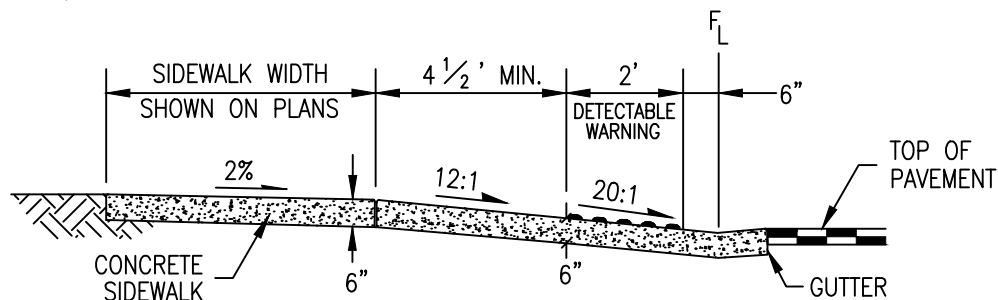
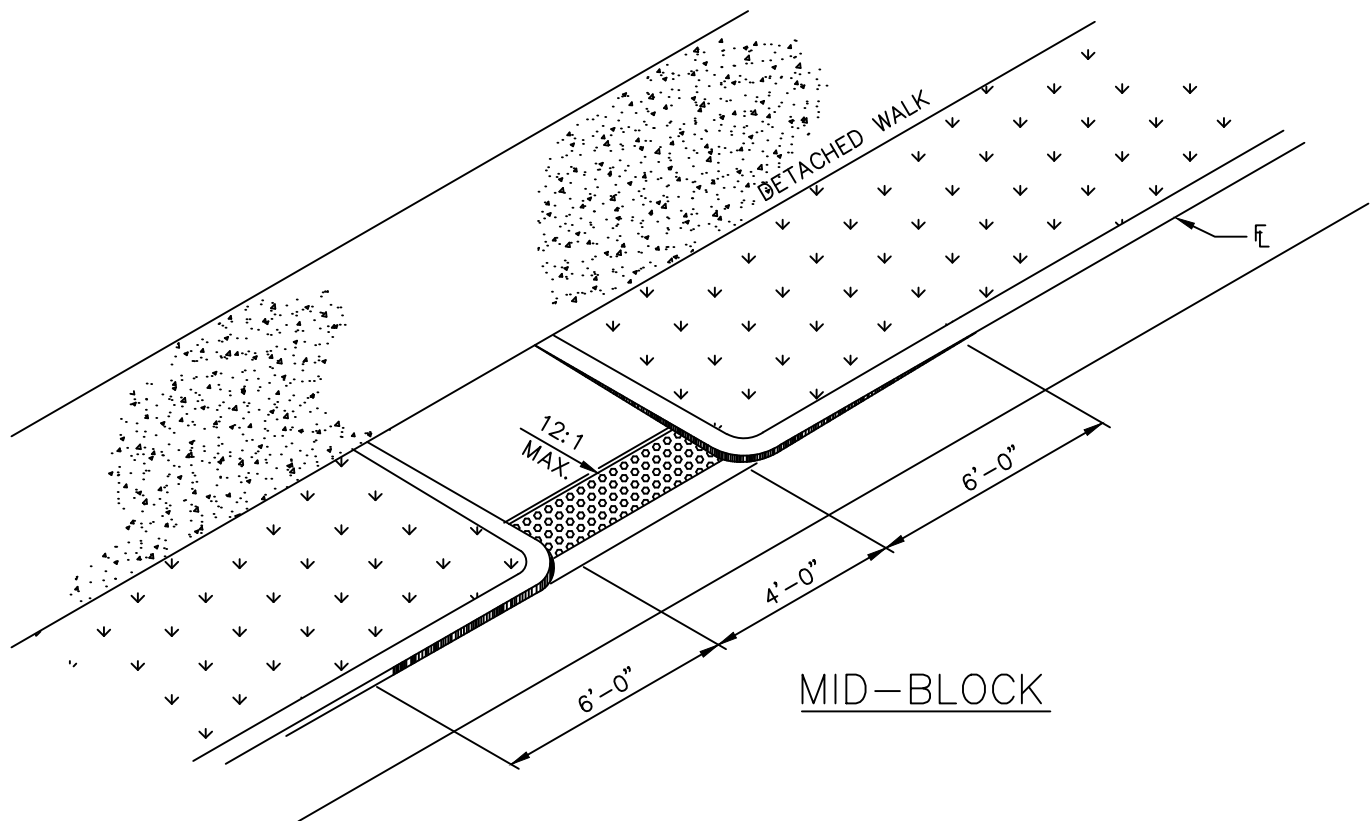


**CURB, GUTTER AND
SIDEWALK CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

SW9A



TYPICAL RAMP SECTION

NOTES:

1. THERE SHALL BE NO LIP WHERE THE RAMP MEETS THE GUTTER.
2. RAMP SURFACE SHALL HAVE A COARSE BROOM FINISH.
3. CURB RAMPS SHALL BE POURED MONOLITHICALLY WITH THE CURB, GUTTER AND APRON.
4. RAMP DIMENSIONS SHALL BE SPECIFIED ON THE CONSTRUCTION PLANS.
5. RAMP AND WING SLOPES SHALL NOT BE STEEPER THAN 12:1.
6. THE DETECTABLE WARNING AREA SLOPE SHALL NOT BE STEEPER THAN 20:1.
7. DETECTABLE WARNINGS SHALL BE EAST JORDAN IRON WORKS 7005 SERIES DETECTABLE WARNING PLATES OR APPROVED EQUAL.

CURB RAMP MID BLOCK TYPE 3 DETACHED WALK

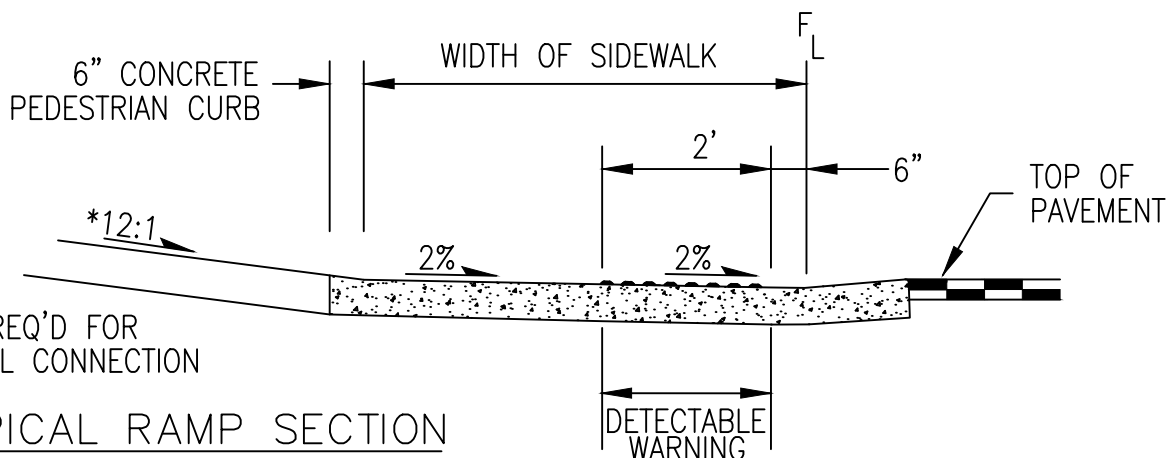
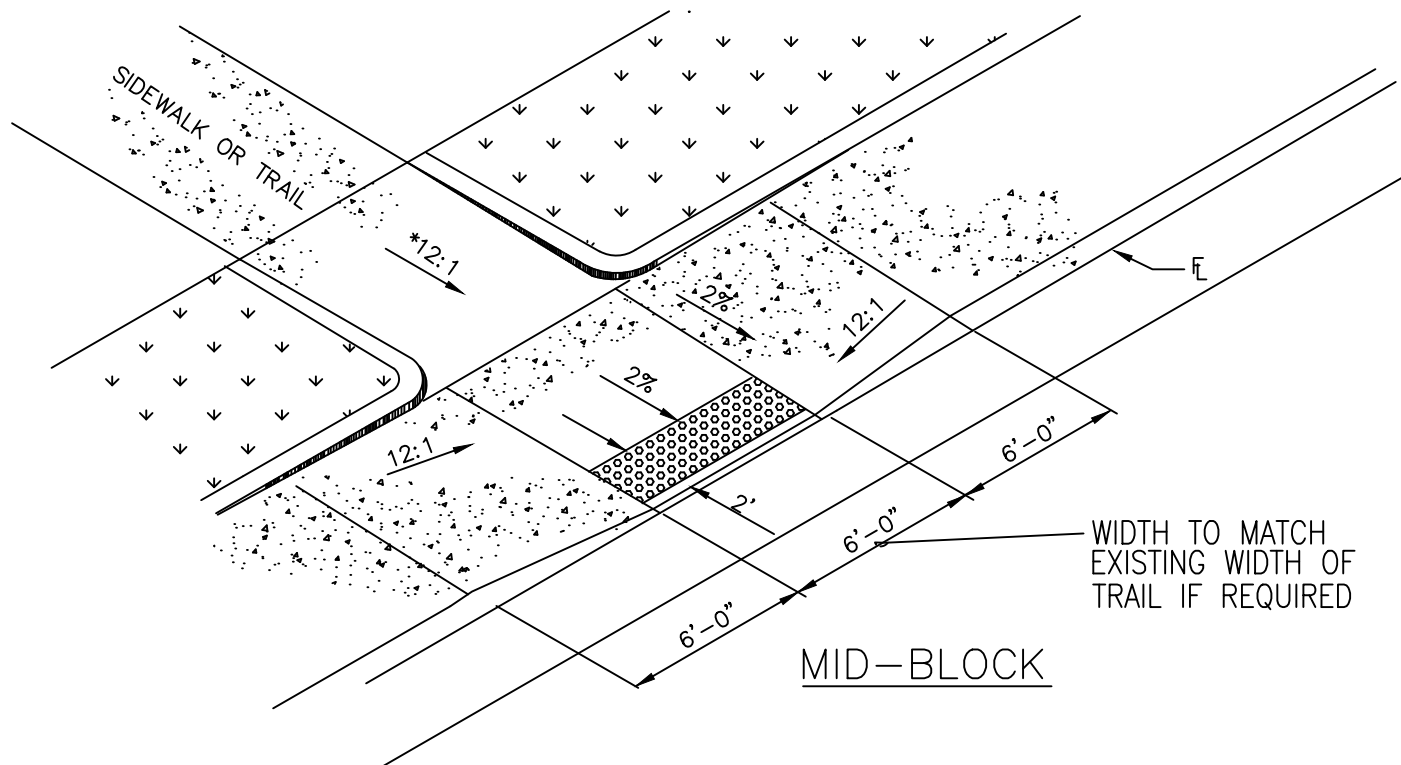


CURB, GUTTER AND
SIDEWALK CONSTRUCTION
DRAWINGS

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

SW9B



NOTES:

1. THERE SHALL BE NO LOP WHERE THE RAMP MEETS THE GUTTER.
2. RAMP SURFACE SHALL HAVE A COARSE BROOM FINISH.
3. CURB RAMPS SHALL BE POURED MONOLITHICALLY WITH THE CURB, GUTTER AND APRON.
4. RAMP DIMENSIONS SHALL BE SPECIFIED ON THE CONSTRUCTION PLANS.
5. RAMP AND WING SLOPES SHALL NOT BE STEEPER THAN 12:1.
6. THE DETECTABLE WARNING AREA SLOPE SHALL NOT BE STEEPER THAN 20:1.
7. DETECTABLE WARNINGS SHALL BE EAST JORDAN IRON WORKS 7005 SERIES DETECTABLE WARNING PLATES OR APPROVED EQUAL.

CURB RAMP MID BLOCK TYPE 2 ATTACHED WALK

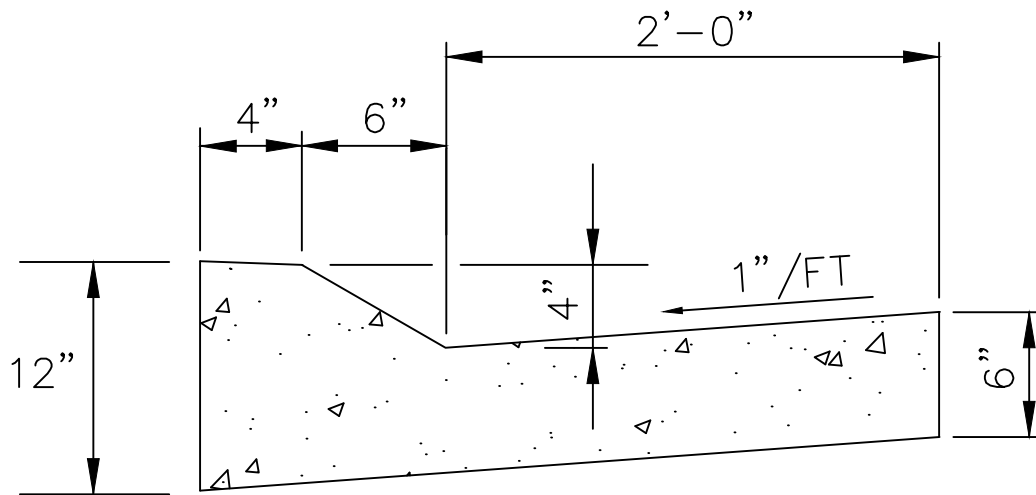


**CURB, GUTTER AND
SIDEWALK CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

SW9C



ROLLOVER

MOUNTABLE CURB & GUTTER CATCH

NOTE:

1. SUBGRADE TO BE COMPACTED TO 95% MODIFIED PROCTOR.

MOUNTABLE CURB SECTION

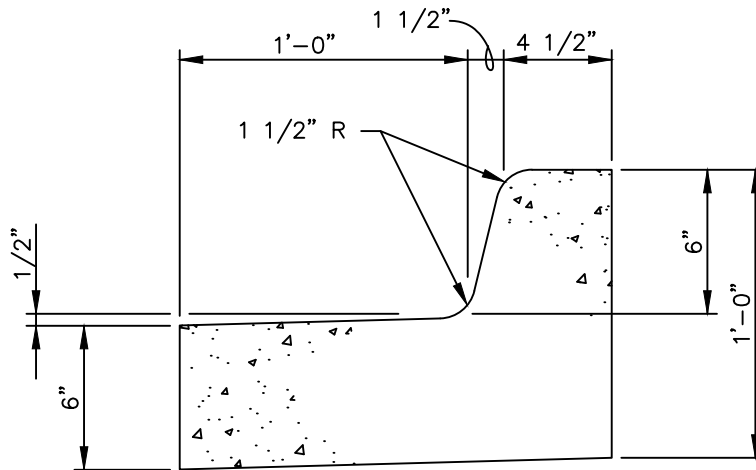


CURB, GUTTER AND
SIDEWALK CONSTRUCTION
DRAWINGS

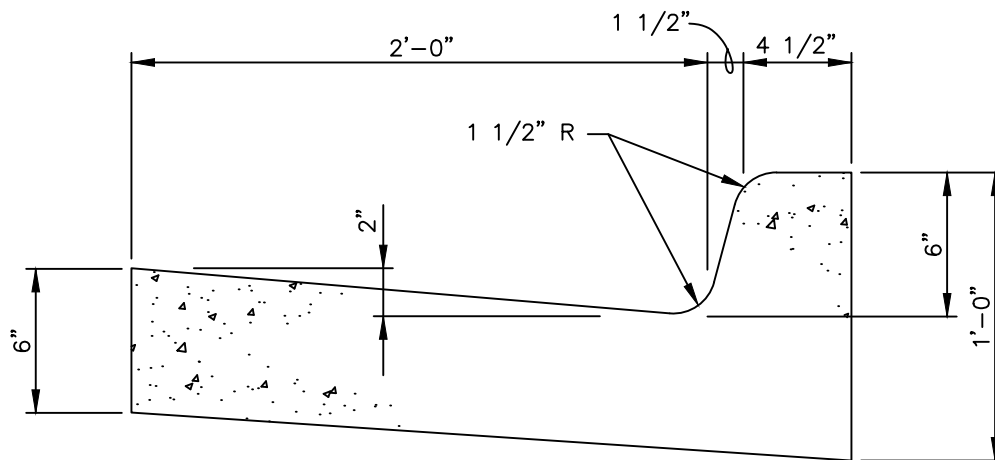
BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

SW10



MEDIAN CURB & GUTTER
SPILL



VERTICAL CURB & GUTTER
CATCH

NOTE:

1. SUBGRADE TO BE COMPACTED TO 95% MODIFIED PROCTOR.

VERTICAL CURB SECTION

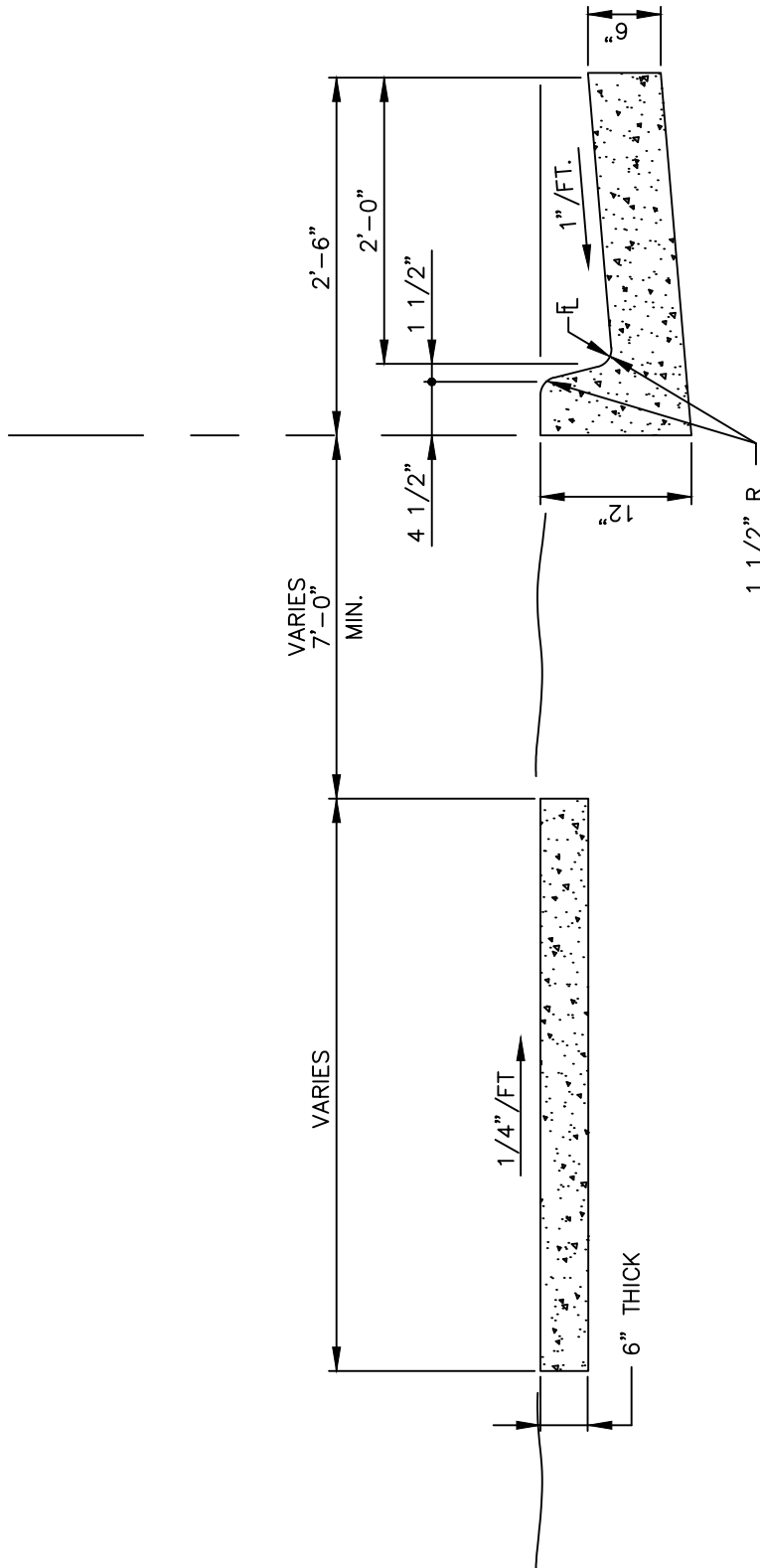


**CURB, GUTTER AND
SIDEWALK CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

SW11



NOTES:

1. SIDEWALK WIDTH SHALL BE SPECIFIED ON THE CONSTRUCTION PLANS.
2. LANDSCAPE TREATMENT MUST BE SPECIFIED.
3. 6" VERTICAL CURB, GUTTER AND SIDEWALK IS REQUIRED FOR COLLECTOR AND ARTERIAL STREETS.

6" VERTICAL CURB, GUTTER AND DETACHED WALK



**CURB, GUTTER AND
SIDEWALK CONSTRUCTION
DRAWINGS**

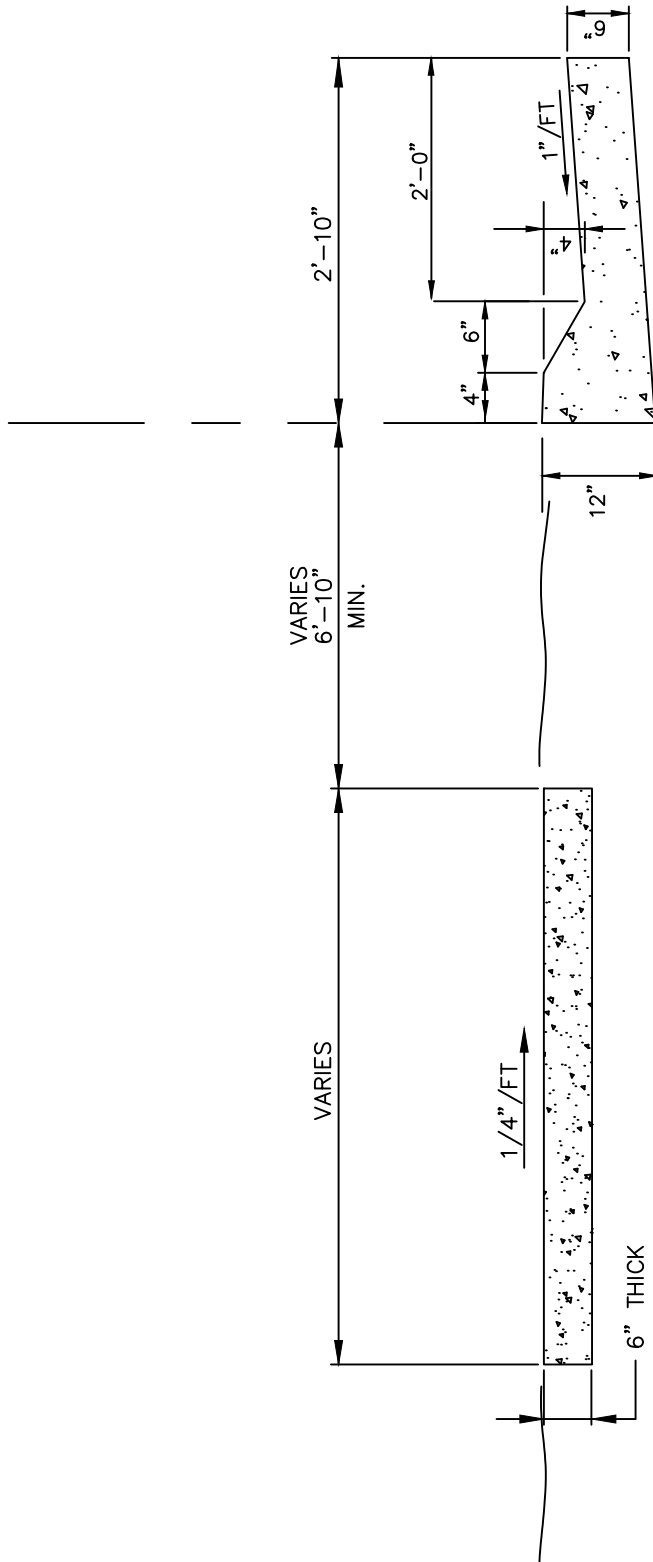
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

SW12A



MOUNTABLE CURB & GUTTER CATCH

NOTES:

1. SIDEWALK WIDTH SHALL BE SPECIFIED ON THE CONSTRUCTION PLANS.
2. LANDSCAPE TREATMENT MUST BE SPECIFIED.

6" MOUNTABLE CURB, GUTTER AND DETACHED WALK



CURB, GUTTER AND
SIDEWALK CONSTRUCTION
DRAWINGS

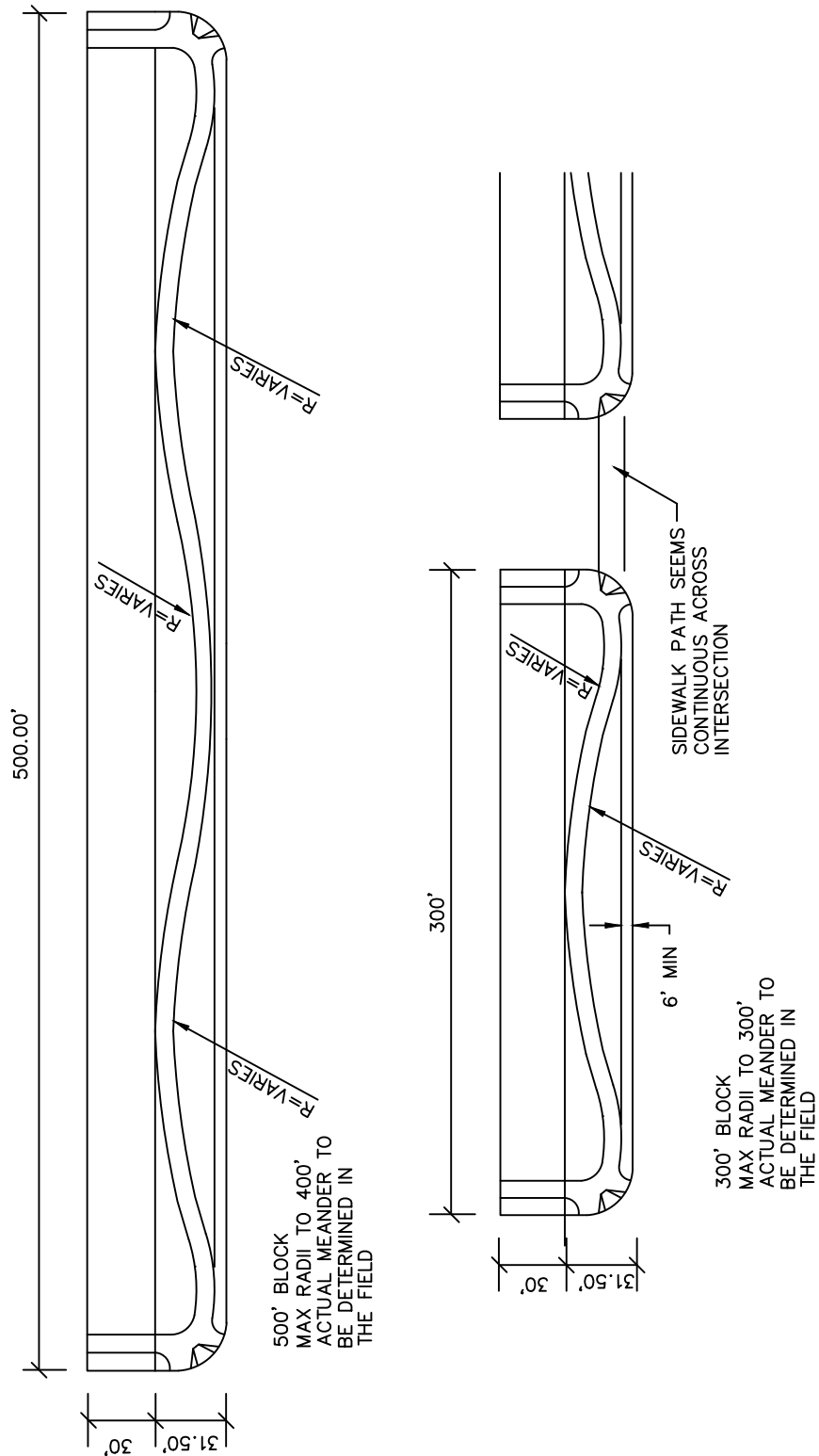
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

SW12B



SIDEWALK OPTIONS

SIDEWALK DESIGN STANDARDS



CURB, GUTTER AND
SIDEWALK CONSTRUCTION
DRAWINGS

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

SW13

<u>DRAWING NO.</u>	<u>TITLE</u>
ST1A	PRINCIPAL ARTERIAL
ST1B	PRINCIPAL ARTERIAL
ST2A	MINOR ARTERIAL
ST2B	MINOR ARTERIAL
ST3	COLLECTORS
ST4	COLLECTORS
ST5	RURAL ARTERIAL
ST6	LOCAL STREETS
ST7	PAVEMENT PHASING – NEW ROADS
ST8	TRENCH & CURB PATCH
ST9	STRUCTURE PATCH
ST10A	GROUND MOUNT STREET NAME SIGN
ST10B	ROAD AND STREET NAME SIGNS
ST10C	PRIVATE STREET SIGN
ST11	CUL-DE-SAC
ST12	SIGHT DISTANCE
ST13	DRIVEWAY APPROACHES FOR ROADS
ST14	90 DEGREE TURN – LOCAL ACCESS STREETS
ST15A	4" PERFORATED UNDERDRAIN
ST15B	4" PERFORATED MEDIAN UNDERDRAIN FOR CENTER PLANTING
ST15C	4" PERFORATED MEDIAN UNDERDRAIN FOR EDGE PLANTING
ST16	UNDERDRAIN OUTLET TREATMENT
ST17	TYPICAL STREET UTILITY LOCATION

INDEX OF STREET DETAILS



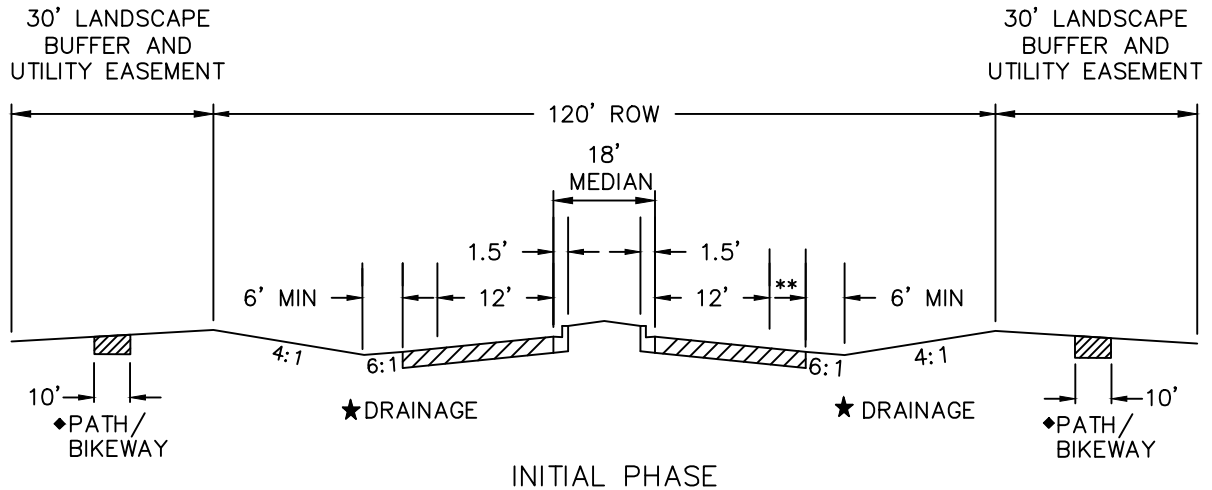
STREET CONSTRUCTION DRAWINGS

BY: JME

SCALE: NTS

DATE: 11/2019

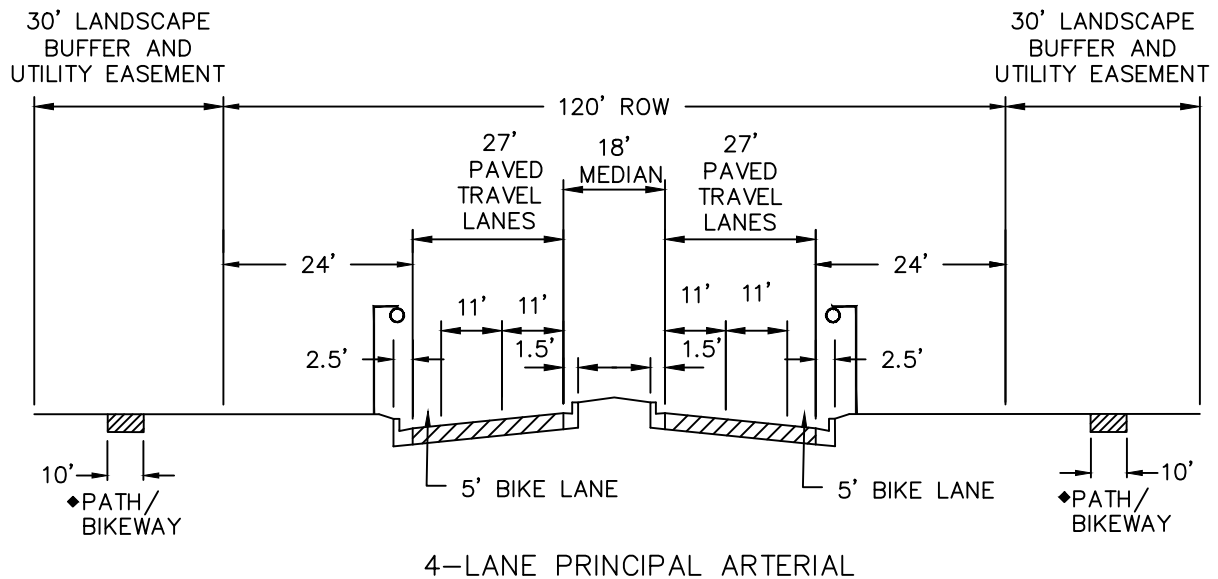
DRAWING:



** 6' SHOULDER TO ACCOMMODATE BICYCLES

★ DRAINAGE DITCH TO BE ENGINEERED AT CROSS STREETS AND DRIVEWAYS

◆ PATH MAY BE LOCATED IN LANDSCAPE BUFFER OR WITHIN ROW AND SHOULD MEANDER.



◆ PATH MAY BE LOCATED IN LANDSCAPE BUFFER OR WITHIN ROW AND SHOULD MEANDER.

PRINCIPAL ARTERIAL



STREET CONSTRUCTION
DRAWINGS

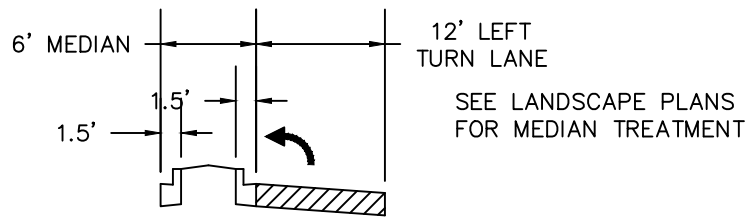
BY: JME

SCALE: NTS

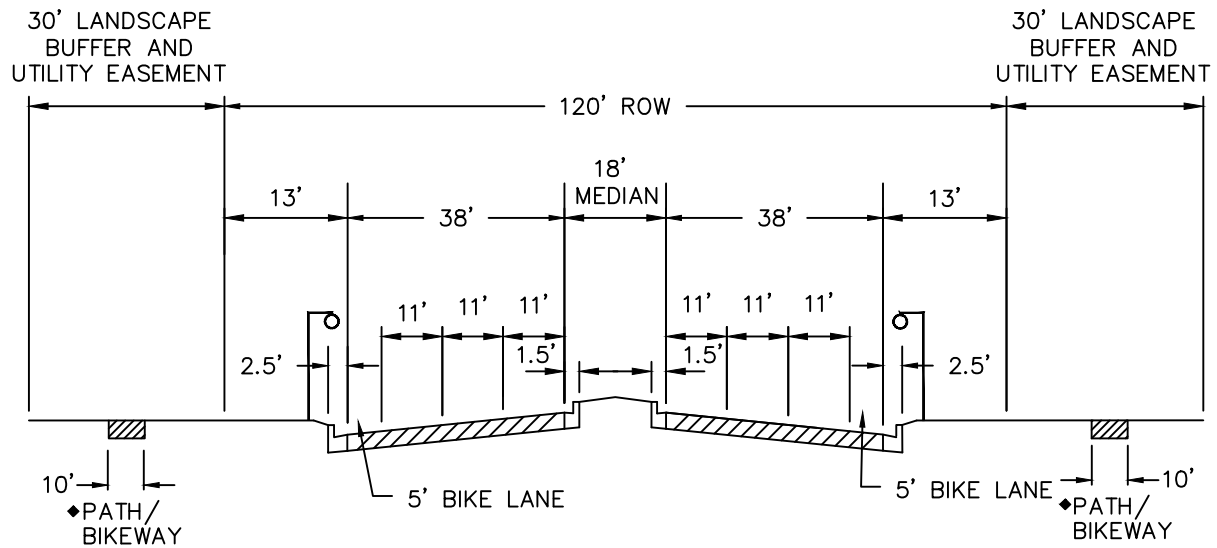
DATE: 11/2019

DRAWING:

ST1A



TYPICAL MEDIAN W/LEFT TURN LANE



6-LANE PRINCIPAL ARTERIAL

♦ PATH MAY BE LOCATED IN LANDSCAPE BUFFER OR WITHIN ROW AND SHOULD MEANDER.

PRINCIPAL ARTERIAL

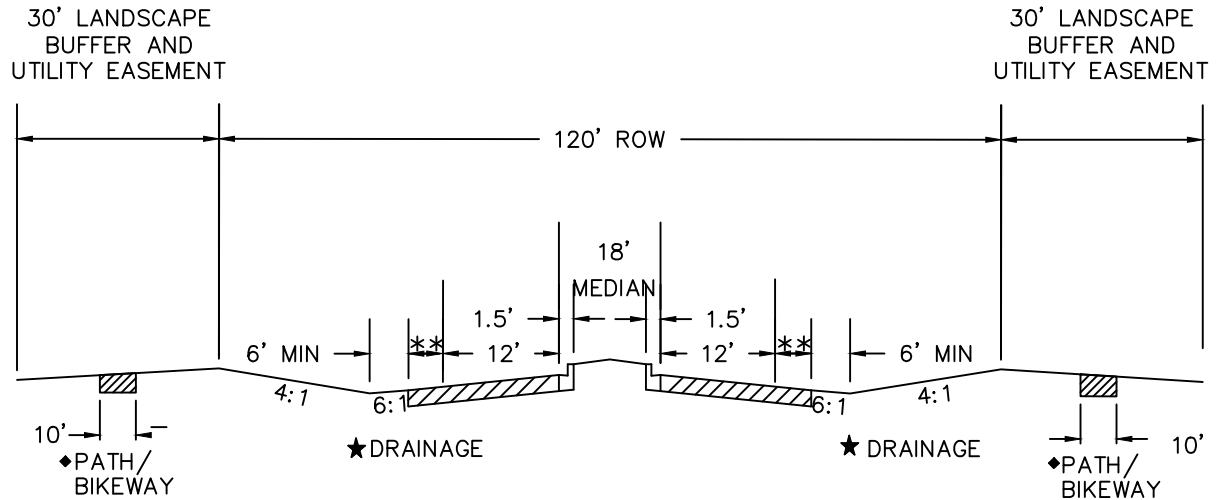


STREET CONSTRUCTION
DRAWINGS

BY: JME
SCALE: NTS
DATE: 11/2019

DRAWING:

ST1B

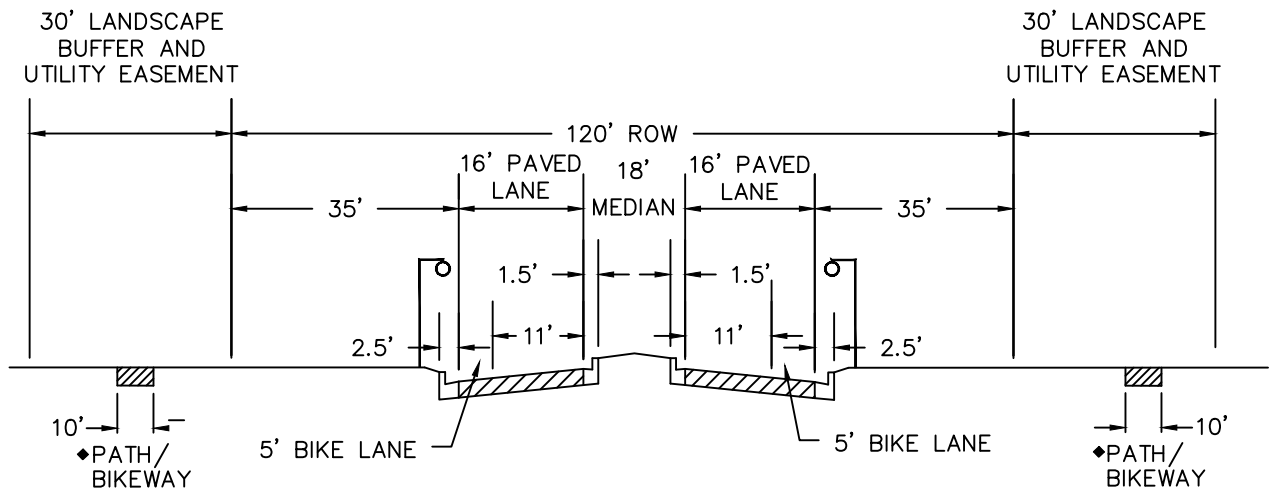


INITIAL PHASE

◆PATH MAY BE LOCATED IN LANDSCAPE BUFFER OR WITHIN ROW AND SHOULD MEANDER.

**6' SHOULDER TO ACCOMMODATE BICYCLES

★ DRAINAGE DITCH TO BE ENGINEERED AT CROSS STREETS AND DRIVEWAYS



2-LANE MINOR ARTERIAL

◆PATH MAY BE LOCATED IN LANDSCAPE BUFFER OR WITHIN ROW AND SHOULD MEANDER.

MINOR ARTERIAL



STREET CONSTRUCTION
DRAWINGS

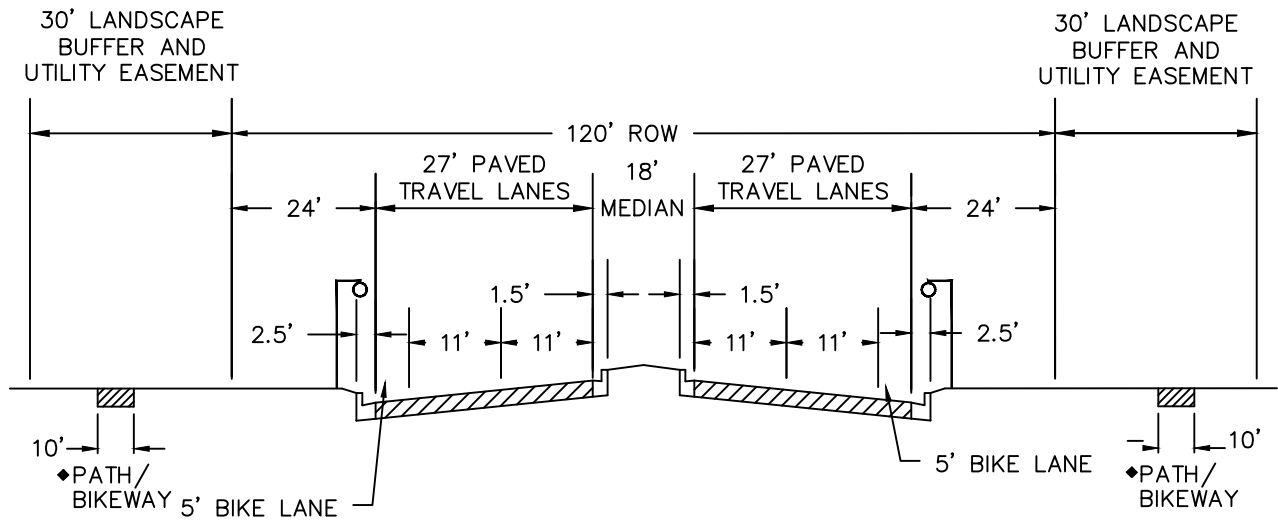
BY: JME

SCALE: NTS

DATE: 11/2019

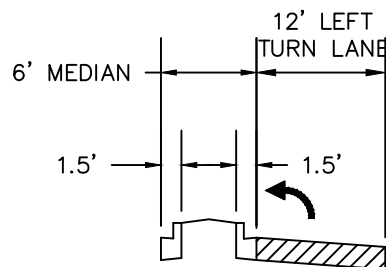
DRAWING:

ST2A



4-LANE MINOR ARTERIAL

♦PATH MAY BE LOCATED IN LANDSCAPE BUFFER OR WITHIN ROW AND SHOULD MEANDER.



TYPICAL MEDIAN W/LEFT TURN LANE

MINOR ARTERIAL



STREET CONSTRUCTION
DRAWINGS

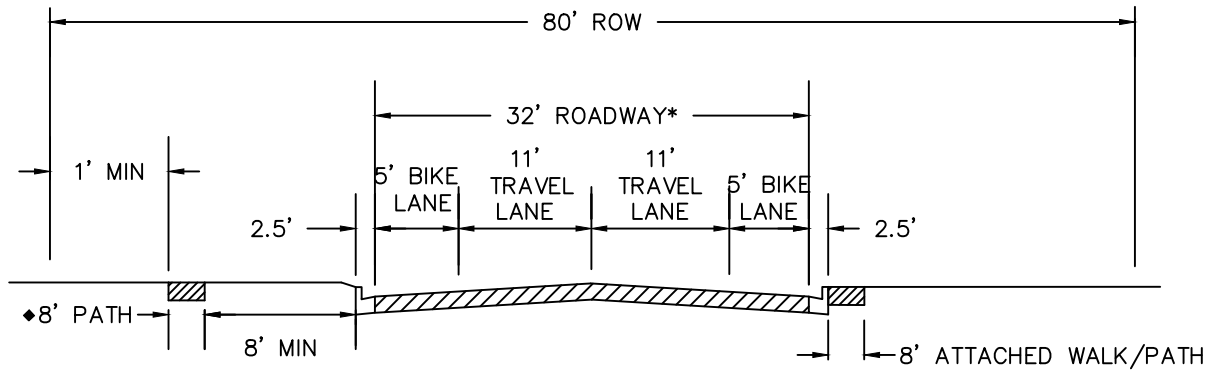
BY: JME

SCALE: NTS

DATE: 11/2019

DRAWING:

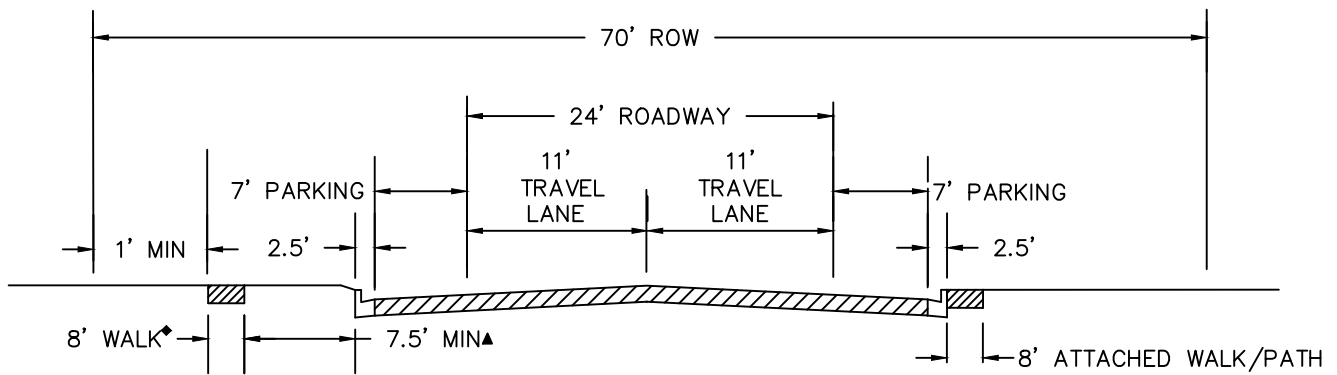
ST2B



COLLECTOR WITHOUT PARKING OR MEDIAN

NOTE:

- PRIVATE UTILITIES TO BE PLACED OUTSIDE OF THE PUBLIC RIGHT-OF-WAY
- *TURN LANES WILL BE REQUIRED AS DETERMINED BY A TRAFFIC STUDY
- ◆PATH SHOULD MEANDER.



RESIDENTIAL COLLECTOR WITH ON-STREET PARKING
(TYPICAL VOLUME: UP TO 2,000 VPD)

- ▲ 8' MINIMUM IN MULTI-FAMILY DEVELOPMENT
- ◆PATH SHOULD MEANDER.

COLLECTORS

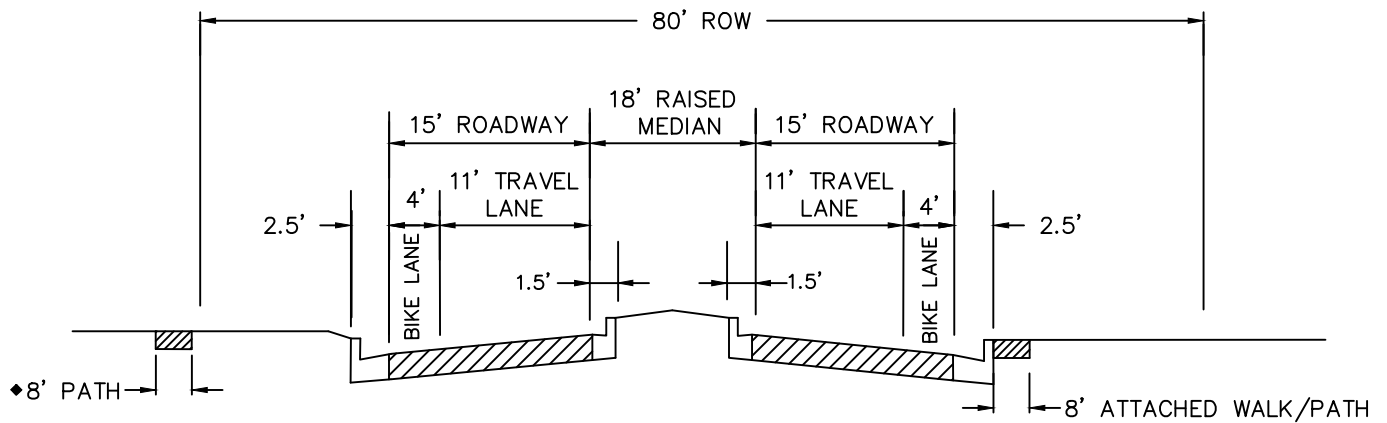


STREET CONSTRUCTION
DRAWINGS

BY: JME
SCALE: NTS
DATE: 11/2019

DRAWING:

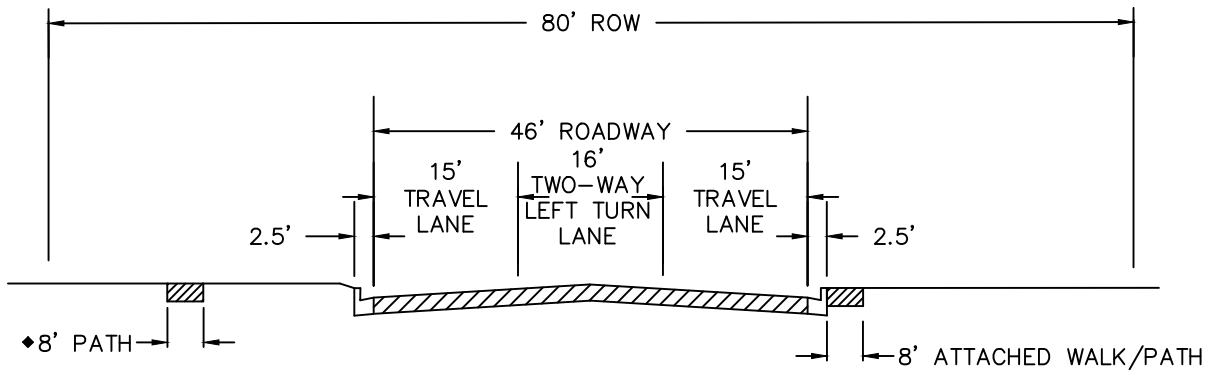
ST3



COLLECTOR WITH RAISED MEDIAN

NOTE:

- PRIVATE UTILITIES TO BE PLACED OUTSIDE OF THE PUBLIC RIGHT-OF-WAY
- ♦PATH SHOULD MEANDER.



COLLECTOR WITH FLUSH MEDIAN
(INTENDED FOR INDUSTRIAL AREAS)

NOTE:

- PRIVATE UTILITIES TO BE PLACED OUTSIDE OF THE PUBLIC RIGHT-OF-WAY
- ♦PATH SHOULD MEANDER.

COLLECTORS



STREET CONSTRUCTION
DRAWINGS

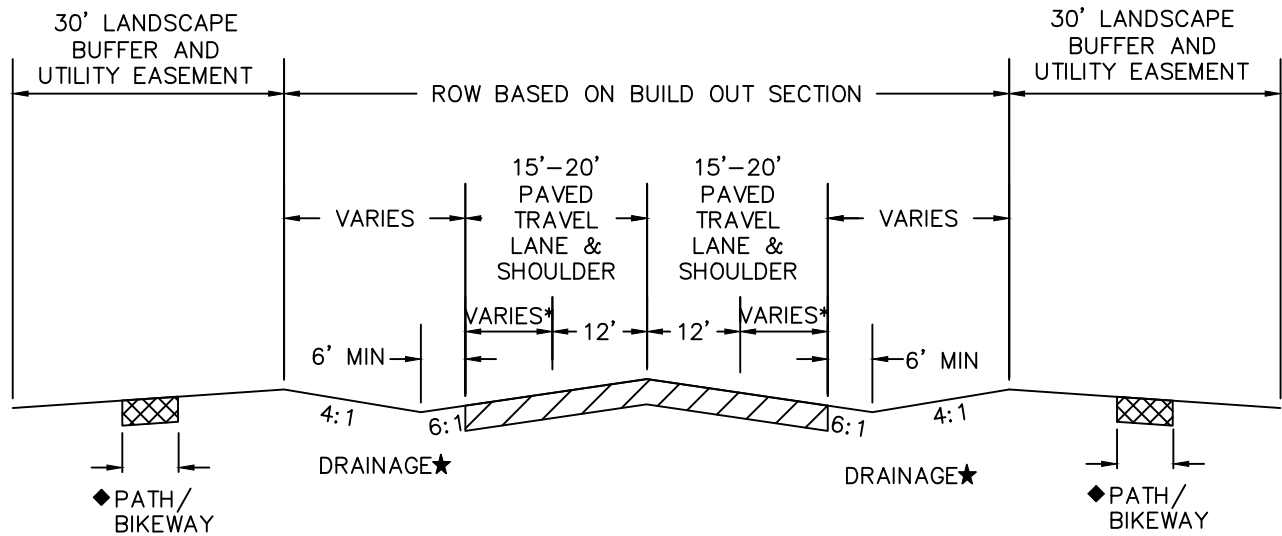
BY: JME

SCALE: NTS

DATE: 11/2019

DRAWING:

ST4



RURAL ARTERIAL

*BIKES CAN USE PAVED SHOULDERS

SHOULDER WIDTH VARIES DEPENDING ON DESIGN VOLUME:

- 4' WIDTH – UP TO 5,000 VPD
- 6' WIDTH – 5,000 TO 10,000 VPD
- 8' WIDTH – OVER 10,000 VPD

◆ PATH (5' TO 10') AT THE DISCRETION OF THE TOWN OF FIRESTONE. PATH SHOULD MEANDER.

★ DRAINAGE DITCH TO BE ENGINEERED AT CROSS STREETS AND DRIVEWAYS

RURAL ARTERIAL



STREET CONSTRUCTION
DRAWINGS

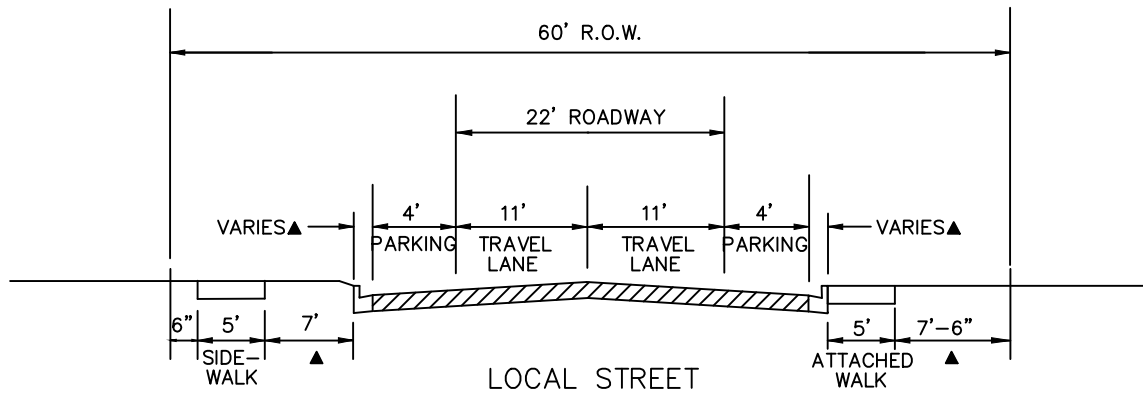
BY: JME

SCALE: NTS

DATE: 11/2019

DRAWING:

ST5



▲ WIDTH DEPENDS ON VERTICAL OR ROLLOVER CURB

NOTE:

1. PRIVATE UTILITY LINES TO BE OUTSIDE OF PUBLIC RIGHT-OF-WAY.

LOCAL STREETS



**STREET CONSTRUCTION
DRAWINGS**

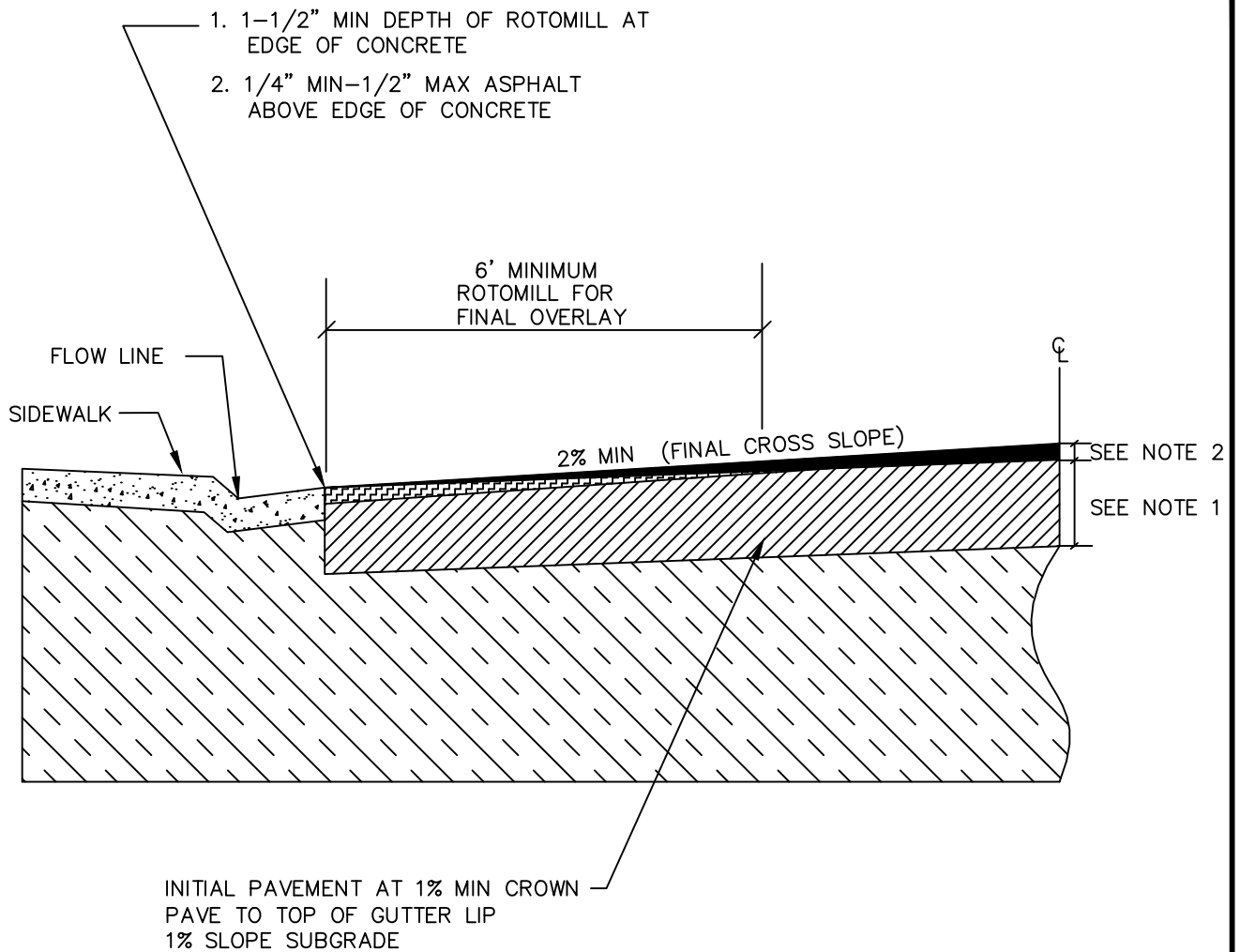
BY: PCB

SCALE: NTS

DATE: 12/2021

DRAWING:

ST6



NOTES:

1. INITIAL PAVEMENT DEPTH AT CONSTRUCTION ACCEPTANCE SHALL BE FULL DESIGN DEPTH FOR THE ENTIRE WIDTH OF THE ROAD SECTION.
2. FINAL OVERLAY DEPTH AT FINAL ACCEPTANCE IS IN ADDITION TO THE DESIGN DEPTH. THE DEPTH WILL VARY DEPENDING UPON THE PAVEMENT WIDTH TO ENSURE A MINIMUM OF A 2% PAVEMENT CROSS SLOPE.
3. THE FINAL OVERLAY SHALL BE COMPLETED AT FINAL ACCEPTANCE WHICH IS AFTER THE END OF THE 2 YEAR WARRANTY PERIOD WHEN ALL FINAL PUNCH LIST REPAIRS ARE COMPLETE.
4. THE FINAL OVERLAY MUST BE SX MIX.
5. DETERMINATION OF CROWN FOR CUL DE SAC PAVING SHALL BE EVALUATED ON A CASE BY CASE BASIS.

PAVEMENT PHASING - NEW ROADS



**STREET CONSTRUCTION
DRAWINGS**

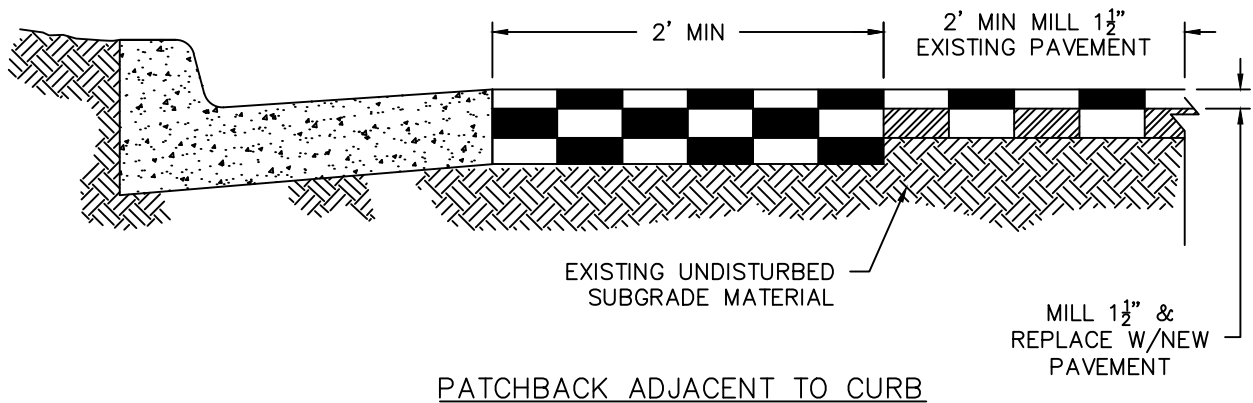
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SCALE: NTS

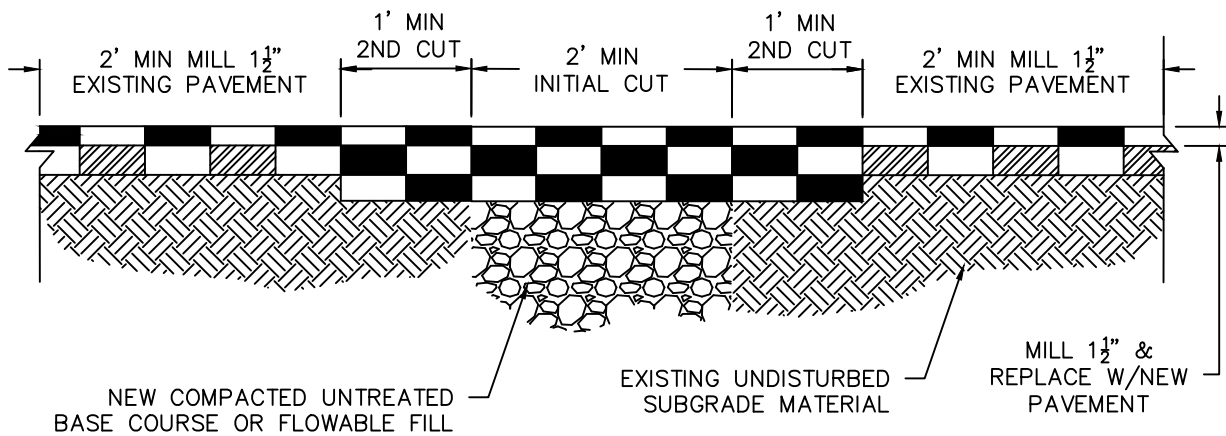
DATE: 11/2019

DRAWING:

ST7



PATCHBACK ADJACENT TO CURB



PATCHBACK FOR UTILITY AND SERVICE TRENCHES

NOTE:

1. IF ASPHALT PATCH THICKNESS IS NOT IDENTIFIED ON PLANS USE 6 $\frac{1}{2}$ " MIN ASPHALT PATCH OR EXISTING THICKNESS PLUS 1", WHICH EVER THICKNESS IS GREATER.
2. MINIMUM DEPTH OF WEARING COURSE SHALL BE 1 $\frac{1}{2}$ " AND SHALL BE GRADING SX ASPHALT.
3. MINIMUM DEPTH OF INTERMEDIATE COURSE SHALL BE 5" AND BE INSTALLED IN 2 LIFTS. INTERMEDIATE COURSE SHALL BE GRADING S OR G ASPHALT.
4. PATCH SHALL BE PLACED AND COMPACTED IN LIFTS A MAXIMUM OF 3" IN DEPTH.
5. APPLY SS-I TACK COAT TO EXISTING ASPHALT AND/OR CONCRETE VERTICAL SURFACES.
6. TRENCHES LESS THAN 2' IN WIDTH MUST RECEIVE PRIOR APPROVAL FROM THE TOWN OF FIRESTONE ENGINEERING DEPARTMENT AND SHALL BE FLOW-FILLED.
7. PROVIDE 28 DAY 60 PSI CONTROLLED LOW STRENGTH FLOWABLE FILL AS SPECIFIED. USE FILL THAT FLOWS EASILY AND VIBRATION IS NOT REQUIRED. CURE TO INITIAL SET BEFORE PLACING NEW UNTREATED BASE COURSE OR NEW ASPHALT PAVEMENT. USE FLOWABLE FILL IN EXCAVATIONS THAT ARE TOO NARROW TO RECEIVE COMPACTION EQUIPMENT.
8. REMOVE ADDITIONAL PAVEMENT TO A PAINTED LANE STRIPE, A LIP OF GUTTER, A CURB, AN EXISTING PAVEMENT PATCH, OR AN EDGE OF THE PAVEMENT IF SUCH STREET FEATURE IS WITHIN TWO FEET OF THE SECOND SAW CUT.
9. PROVIDE UNTREATED BASE COURSE MATERIAL. DO NOT USE GRAVEL OR WASHED ROCK. PLACE NEW MATERIAL IN LIFTS NOT EXCEEDING 8" AFTER COMPACTION. COMPACT TO A MODIFIED PROCTOR DENSITY OF 95% OR GREATER.
10. STRAIGHT SAWCUT OR BLADECUT THE EXISTING ASPHALT PAVEMENT WHEN JOINING WITH NEW ASPHALT PAVEMENT.

TRENCH & CURB PATCH



**STREET CONSTRUCTION
DRAWINGS**

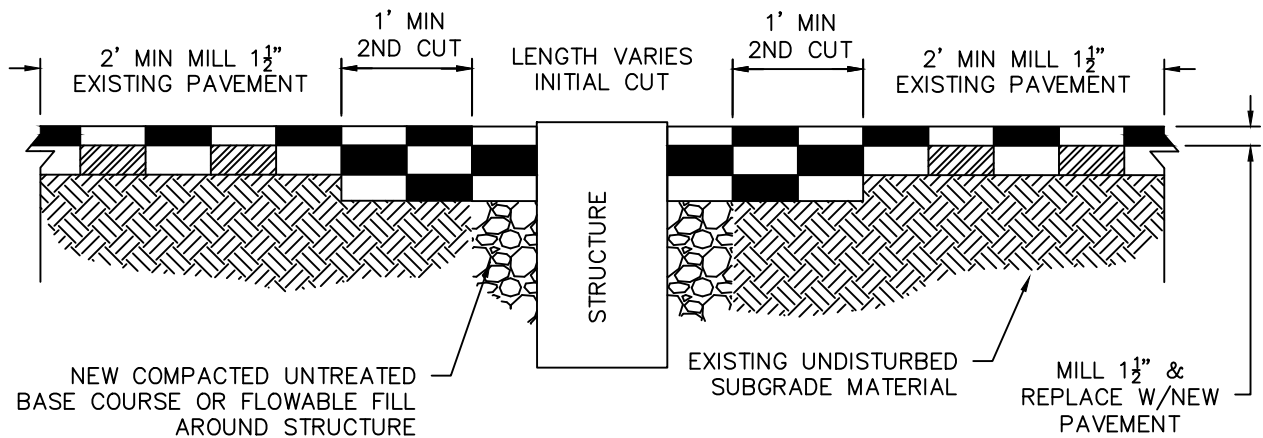
BY: JME

SCALE: NTS

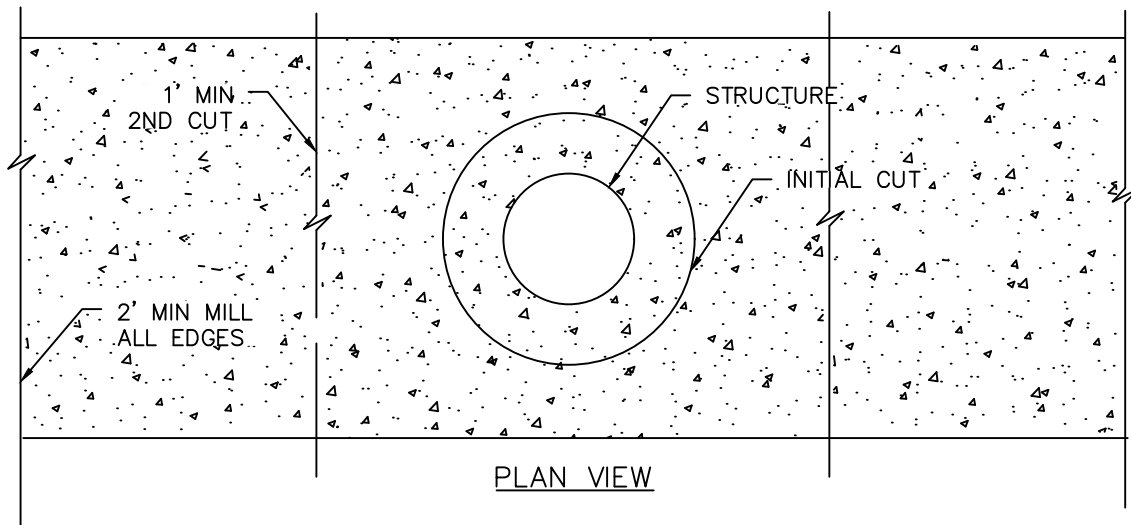
DATE: 11/2019

DRAWING:

ST8



PATCHBACK FOR STRUCTURES (MANHOLES, VALVES ETC)



NOTE:

1. IF ASPHALT PATCH THICKNESS IS NOT IDENTIFIED ON PLANS USE 6½" MIN ASPHALT PATCH OR EXISTING THICKNESS PLUS 1", WHICH EVER THICKNESS IS GREATER.
2. MINIMUM DEPTH OF WEARING COURSE SHALL BE 1½" AND SHALL BE GRADING SX ASPHALT.
3. MINIMUM DEPTH OF INTERMEDIATE COURSE SHALL BE 5" AND BE INSTALLED IN 2 LIFTS. INTERMEDIATE COURSE SHALL BE GRADING S OR G ASPHALT.
4. PATCH SHALL BE PLACED AND COMPACTED IN LIFTS A MAXIMUM OF 3" IN DEPTH.
5. APPLY SS-I TACK COAT TO EXISTING ASPHALT AND/OR CONCRETE VERTICAL SURFACES.
6. TRENCHES LESS THAN 2' IN WIDTH MUST RECEIVE PRIOR APPROVAL FROM THE TOWN OF FIRESTONE ENGINEERING DEPARTMENT AND SHALL BE FLOW-FILLED.
7. PROVIDE 28 DAY 60 PSI CONTROLLED LOW STRENGTH FLOWABLE FILL AS SPECIFIED. USE FILL THAT FLOWS EASILY AND VIBRATION IS NOT REQUIRED. CURE TO INITIAL SET BEFORE PLACING NEW UNTREATED BASE COURSE OR NEW ASPHALT PAVEMENT. USE FLOWABLE FILL IN EXCAVATIONS THAT ARE TOO NARROW TO RECEIVE COMPACTION EQUIPMENT.
8. REMOVE ADDITIONAL PAVEMENT TO A PAINTED LANE STRIPE, A LIP OF GUTTER, A CURB, AN EXISTING PAVEMENT PATCH, OR AN EDGE OF THE PAVEMENT IF SUCH STREET FEATURE IS WITHIN TWO FEET OF THE SECOND SAW CUT.
9. PROVIDE UNTREATED BASE COURSE MATERIAL. DO NOT USE GRAVEL OR WASHED ROCK. PLACE NEW MATERIAL IN LIFTS NOT EXCEEDING 8" AFTER COMPACTION. COMPACT TO A MODIFIED PROCTOR DENSITY OF 95% OR GREATER.
10. STRAIGHT SAWCUT OR BLADECUT THE EXISTING ASPHALT PAVEMENT WHEN JOINING WITH NEW ASPHALT PAVEMENT.

STRUCTURE PATCH



**STREET CONSTRUCTION
DRAWINGS**

BY: JME

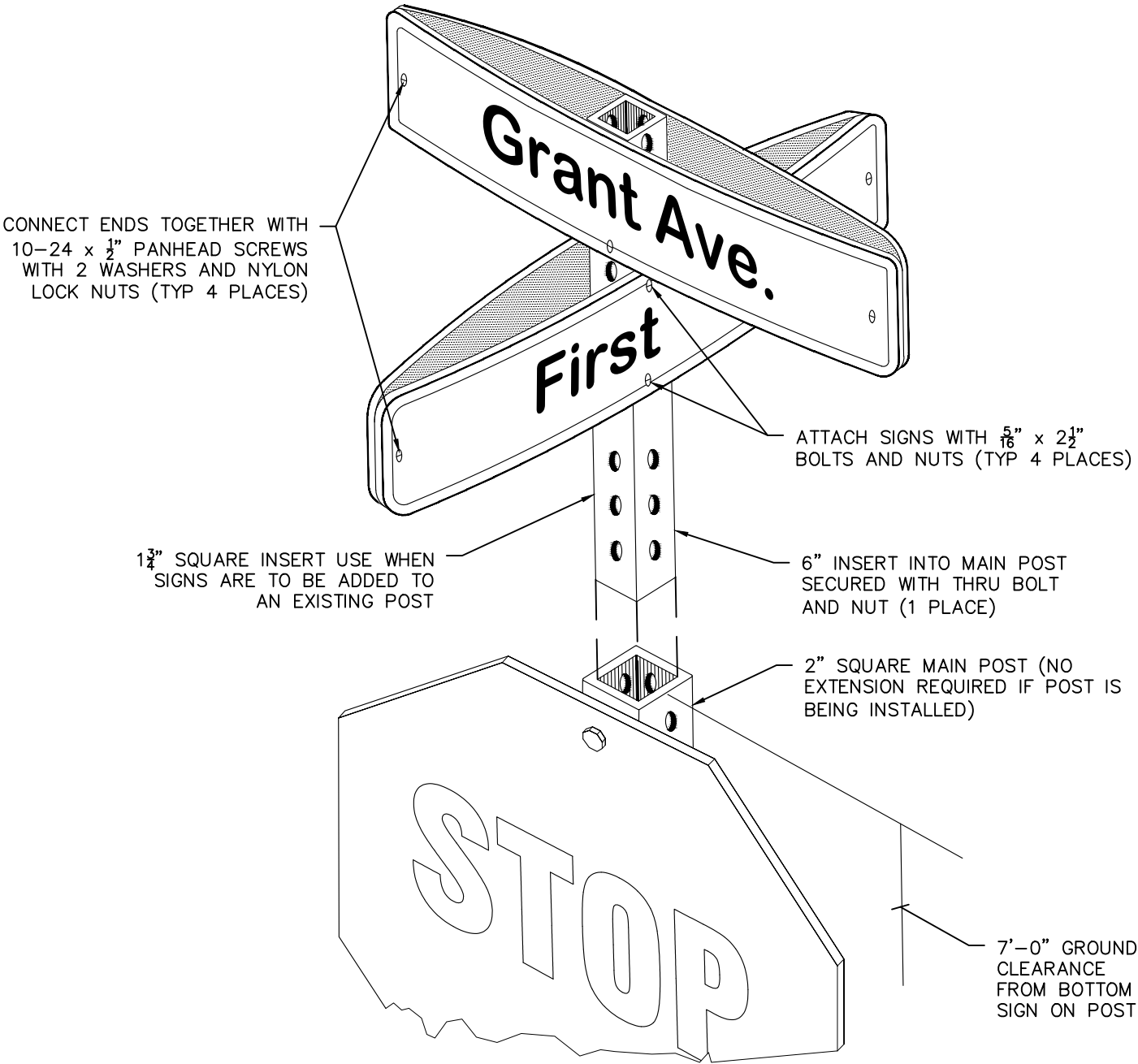
SCALE: NTS

DATE: 11/2019

DRAWING:

ST9

STANDARD ORIENTATION:
NORTH-SOUTH STREETS ON TOP
EAST-WEST STREETS ON BOTTOM



GROUND MOUNT STREET NAME SIGN

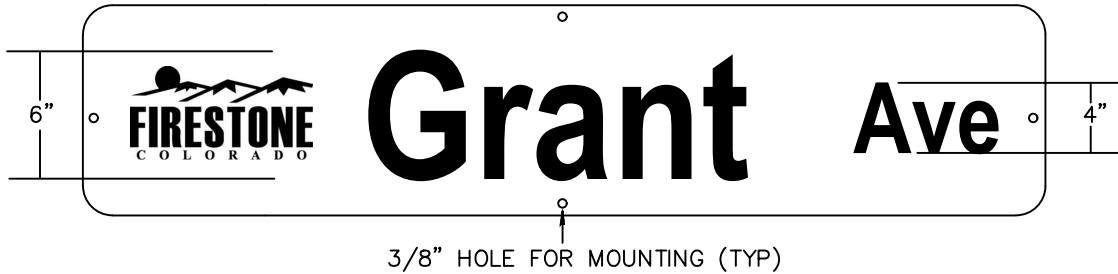


STREET CONSTRUCTION
DRAWINGS

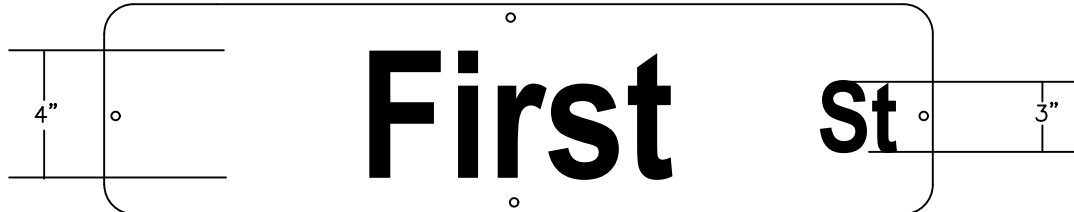
BY: JME
SCALE: NTS
DATE: 11/2019

DRAWING:
ST10A

9" STREET SIGN WITH TOWN OF FIRESTONE LOGO



6" STREET SIGN WITHOUT TOWN OF FIRESTONE LOGO



INTERSECTION TYPE	SIGN BLANK SIZE (30" MINIMUM ON ALL LENGTHS)	MOUNTING	RECOMMENDED MINIMUM			
			LETTER HEIGHT		SUFFIX (ST, AVE, CT ETC)	
			INITIAL UPPER CASE	LOWER CASE	INITIAL UPPER CASE	LOWER CASE
ARTERIALS AT SIGNAL LIGHTS WITH LOGO		OVERHEAD	12 INCHES	9 INCHES	6 INCHES	4.5 INCHES
MULTI LANE ARTERIALS AND ALL OTHERS DIRECTED BY PUBLIC WORKS DEPT WITH LOGO	10" X AS NEEDED	POST MOUNTED	8 INCHES	6 INCHES	4.5 INCHES	3.5 INCHES
ARTERIALS & COLLECTORS AND ALL OTHERS DIRECTED BY PUBLIC WORKS DEPT WITH LOGO	9" X AS NEEDED	POST MOUNTED	6 INCHES	4.5 INCHES	4 INCHES	3 INCHES
LOCAL/NO LOGO	9" X AS NEEDED	POST MOUNTED	6 INCHES	4.5 INCHES	4 INCHES	3 INCHES
*LOCAL/NO LOGO	6" X AS NEEDED	POST MOUNTED	4 INCHES	3 INCHES	3 INCHES	2.25 INCHES
*ON LOCAL TWO-LANE STREETS WITH SPEED LIMITS OF 25 MPH OR LESS, 4 INCH INITIAL UPPER-CASE LETTERS WITH 3 INCH LOWER CASE LETTERS MAY BE USED						
NO BORDERS EXCEPT ON OVERHEAD LIGHTED STREET SIGNS AT SIGNALIZED INTERSECTIONS						
WHEN LOGO IS DISPLAYED, THE HEIGHT AND WIDTH OF THE LOGO SHALL NOT EXCEED THE UPPER CASE LETTER HEIGHT OF THE PRINCIPAL LEGEND OF THE SIGN AND LOCATED LEFT OF THE STREET NAME						

NOTES:

- SIGN BLANKS SHALL BE 6061 OR 5052-H38 ALUMINUM ALLOY MIN 0.080" THICK.
- FACING SHALL BE GREEN HI-INTENSITY RETROREFLECTIVE SHEETING.
- LETTERS AND NUMBERS SHALL BE WHITE RETROREFLECTIVE SHEETING.
- TOWN OF FIRESTONE COLOR LOGO IS TO BE USED FOR COLLECTOR AND ARTERIAL STREET BLADES ONLY.
- 30" MIN. LENGTH ON ALL STREET SIGNS, SINGLE FACE FOR BACK TO BACK INSTALLATION AND 1/4" HOLES FOR PINNING ENDS OF SIGNS TOGETHER.
- THE SIZING OF ALL SIGNS AT AN INTERSECTION SHALL BE UNIFORM AND BE DETERMINED BY THE HIGHEST CLASSIFICATION ROAD AT AN INTERSECTION.

ROAD AND STREET NAME SIGNS



**STREET CONSTRUCTION
DRAWINGS**

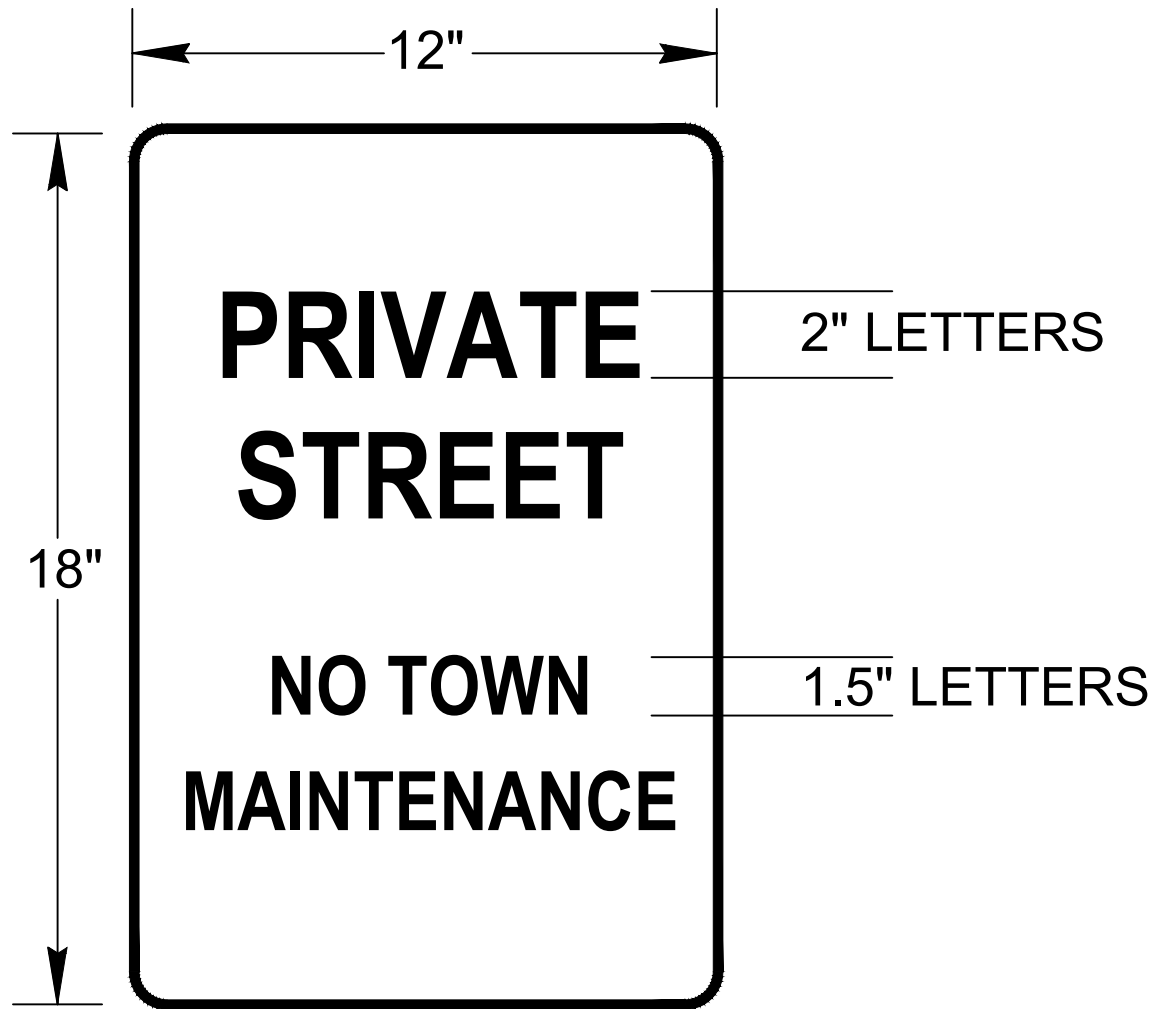
BY: JME

SCALE: NTS

DATE: 11/2019

DRAWING:

ST10B



NOTES:

1. SIGN BLANKS SHALL BE 6061 OR 5052-H38 ALUMINUM ALLOY MIN. 0.080" THICK.
2. FACING SHALL BE WHITE RETROREFLECTIVE.
3. LETTERS SHALL BE BLACK.

PRIVATE STREET SIGN



**STREET CONSTRUCTION
DRAWINGS**

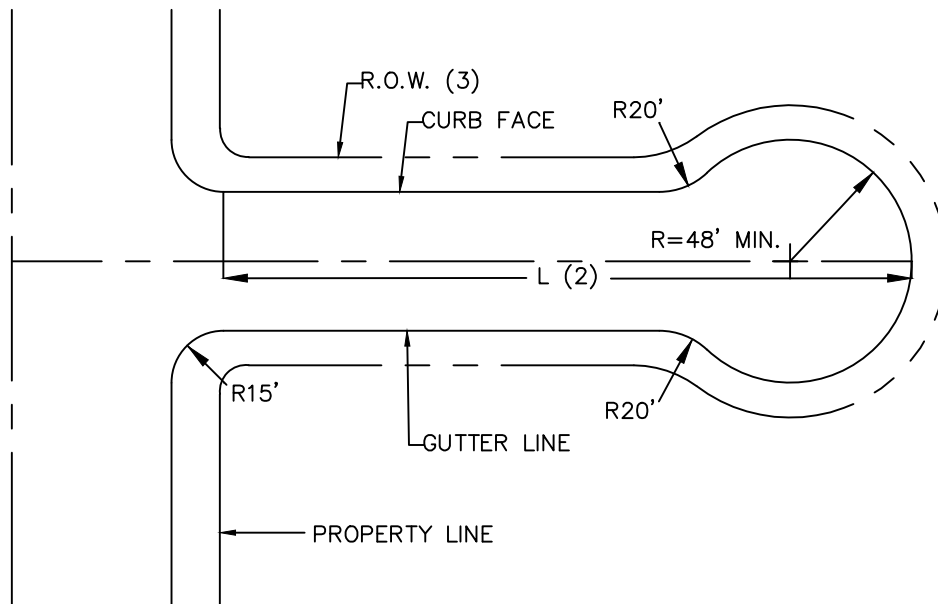
BY: JME

SCALE: NTS

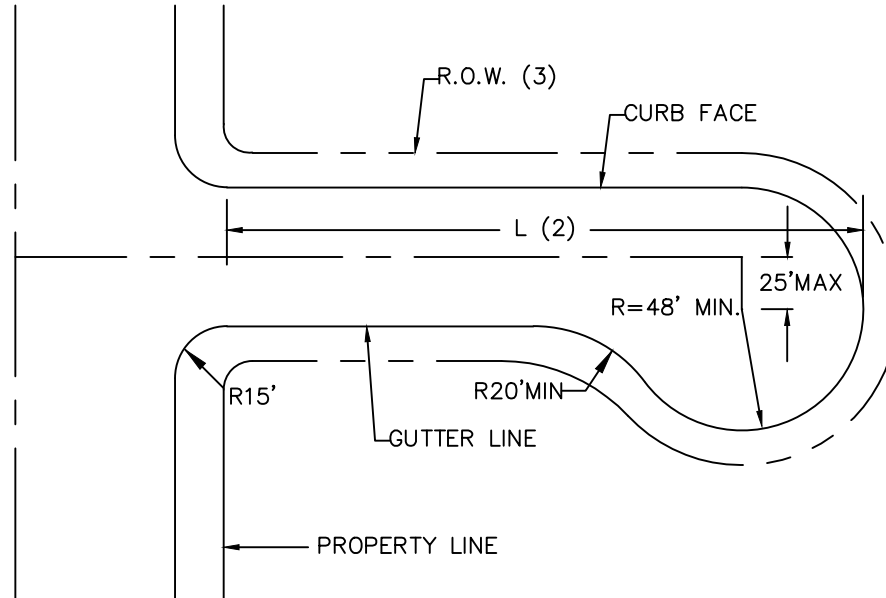
DATE: 11/2019

DRAWING:

ST10C



TYPE 1



TYPE 2

NOTES:

- (1) WIDTH OF TYPE 1 & 2 CUL-DE-SACS TO CONFORM TO APPLICABLE TYPICAL STREET CROSS SECTIONS.
- (2) SEE SECTION 526.00 CUL-DE-SACS FOR LENGTH (L) REQUIREMENTS.
- (3) R.O.W. LINES ARE TO BE PARALLEL TO AND OFFSET FROM THE CURB FACE AND THE DISTANCE SHALL MATCH THE STREET SECTION DETAIL.

CUL-DE-SAC



**STREET CONSTRUCTION
DRAWINGS**

BY: JME

SCALE: NTS

DATE: 11/2019

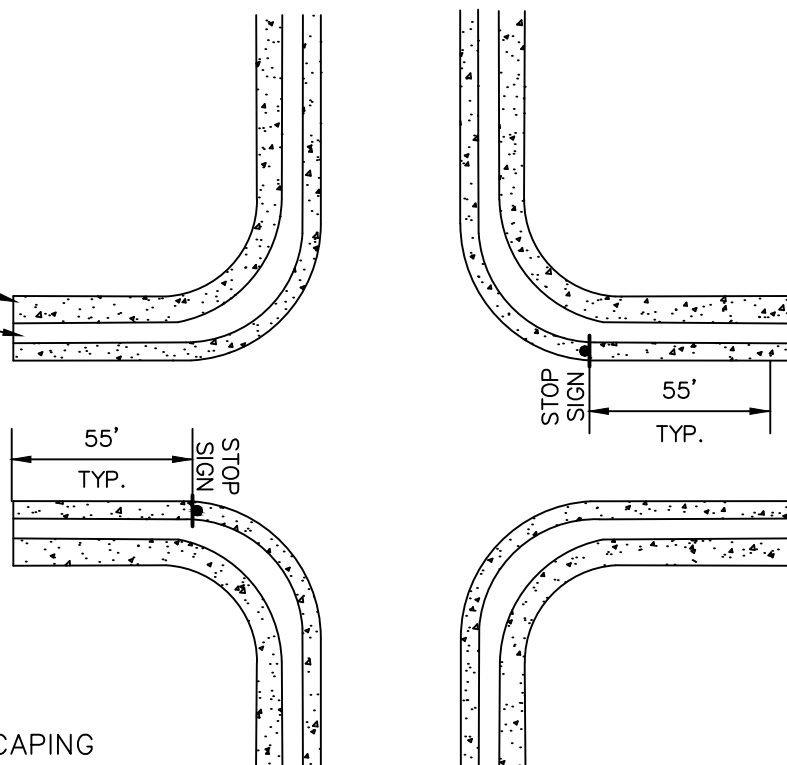
DRAWING:

ST11

DETACHED WALK
TREE LAWN (TYP)

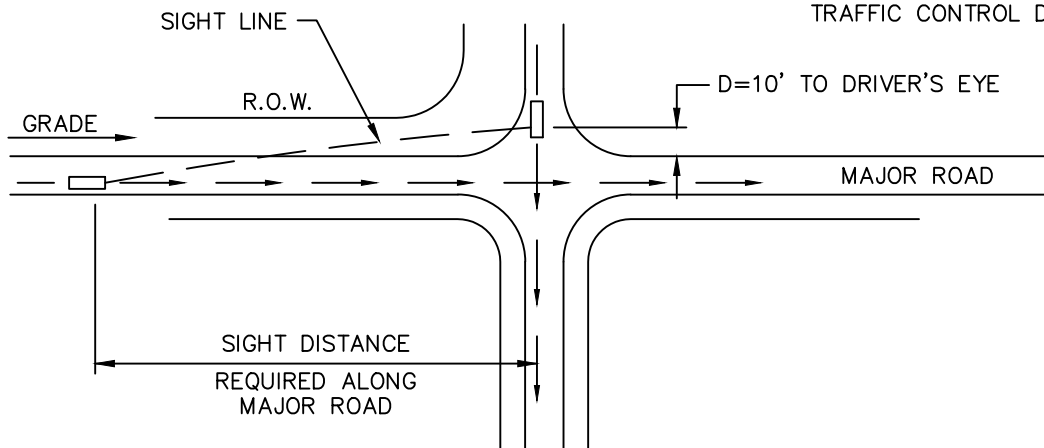
NO TREES IN TREE LAWN WITHIN
55 FEET OF SIGN. ANY OTHER
PLANTS AND LANDSCAPING
MUST BE APPROVED BY THE
PUBLIC WORKS DIRECTOR
OR DESIGNEE.

INTERSECTION LANDSCAPING



STOPPED APPROACH

SIGHT DISTANCE REQUIREMENT
FOR INTERSECTIONS WITH
TRAFFIC CONTROL DEVICES



DESIGN SPEED OF THRU ROADWAY (MPH)	MINIMUM SIGHT DISTANCE FOR STOPPED VEHICLE (FEET)	GRADE CORRECTION DISTANCE (FEET)			
		<u>SPEED</u>	<u>UPGRADE TO</u>	<u>FOR DOWNGRADES</u>	
			3% 6%	3%	6%
25	250	25	0 -10	+10	+20
30	300	30	0 -10	+10	+20
35	350	35	-10 -15	+10	+25
40	400	40	-10 -20	+10	+30
45	450	45	-15 -25	+15	+40

SIGHT DISTANCE



STREET CONSTRUCTION
DRAWINGS

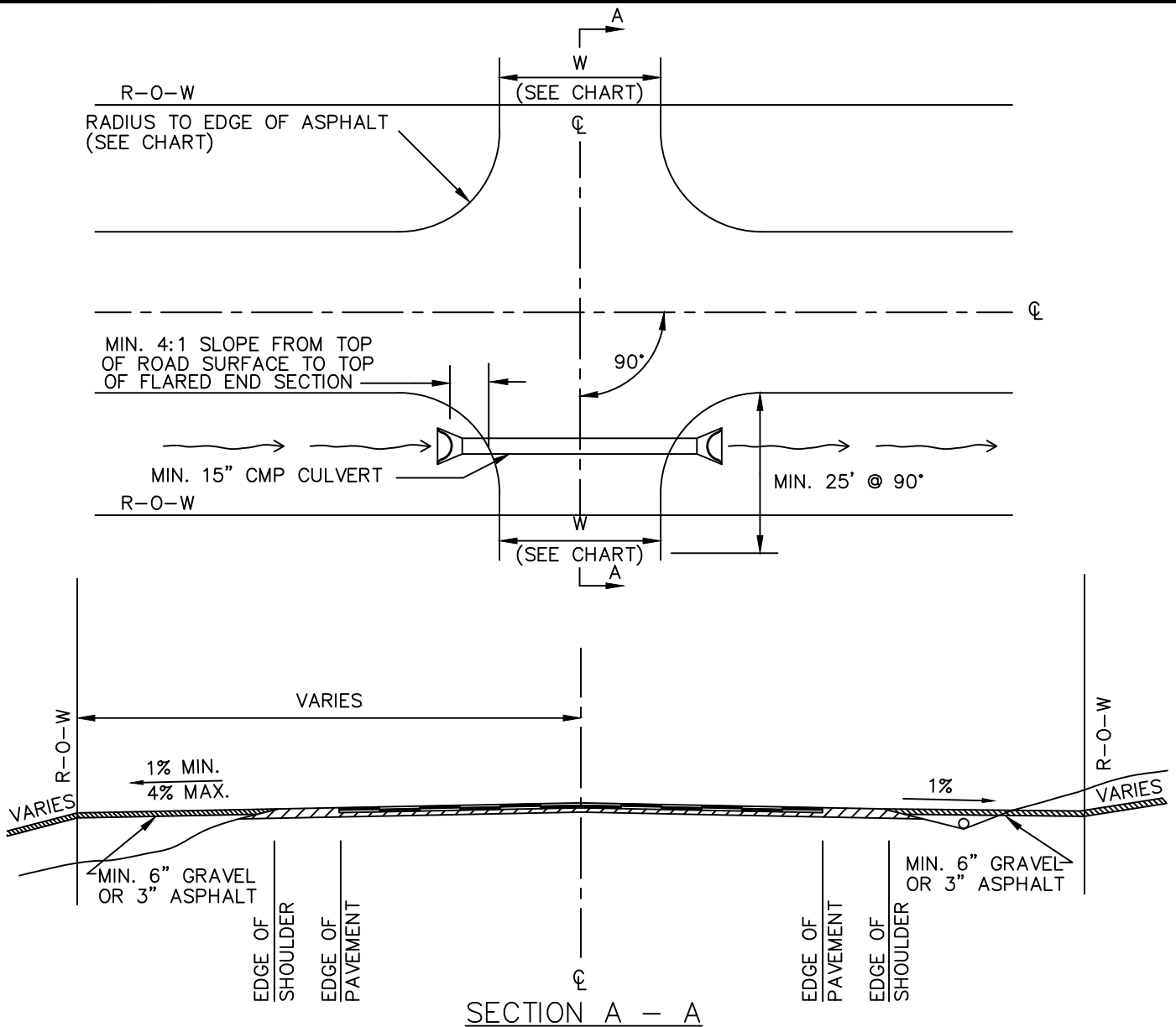
BY: JME

SCALE: NTS

DATE: 11/2019

DRAWING:

ST12



	DRIVEWAY WIDTH (FEET)	PAVEMENT RADIUS (FEET)
RESIDENTIAL	10-25	10
NON-RESIDENTIAL	15-35	15

NOTES:

1. THE TOWN OF FIRESTONE ENGINEERING DEPARTMENT WILL DETERMINE THE REQUIRED CULVERT SIZE. FLARED END SECTIONS ARE REQUIRED FOR CULVERTS 24" IN DIAMETER OR LARGER.
2. DRIVEWAY PERMITS ARE REQUIRED FROM THE TOWN OF FIRESTONE ENGINEERING DEPARTMENT.
3. THE TOWN OF FIRESTONE ENGINEERING DEPARTMENT MUST REVIEW DRIVEWAY LOCATIONS ONTO COLLECTOR AND ARTERIAL ROADS PRIOR TO A PERMIT BEING ISSUED.

DRIVEWAY APPROACHES FOR ROADS



STREET CONSTRUCTION
DRAWINGS

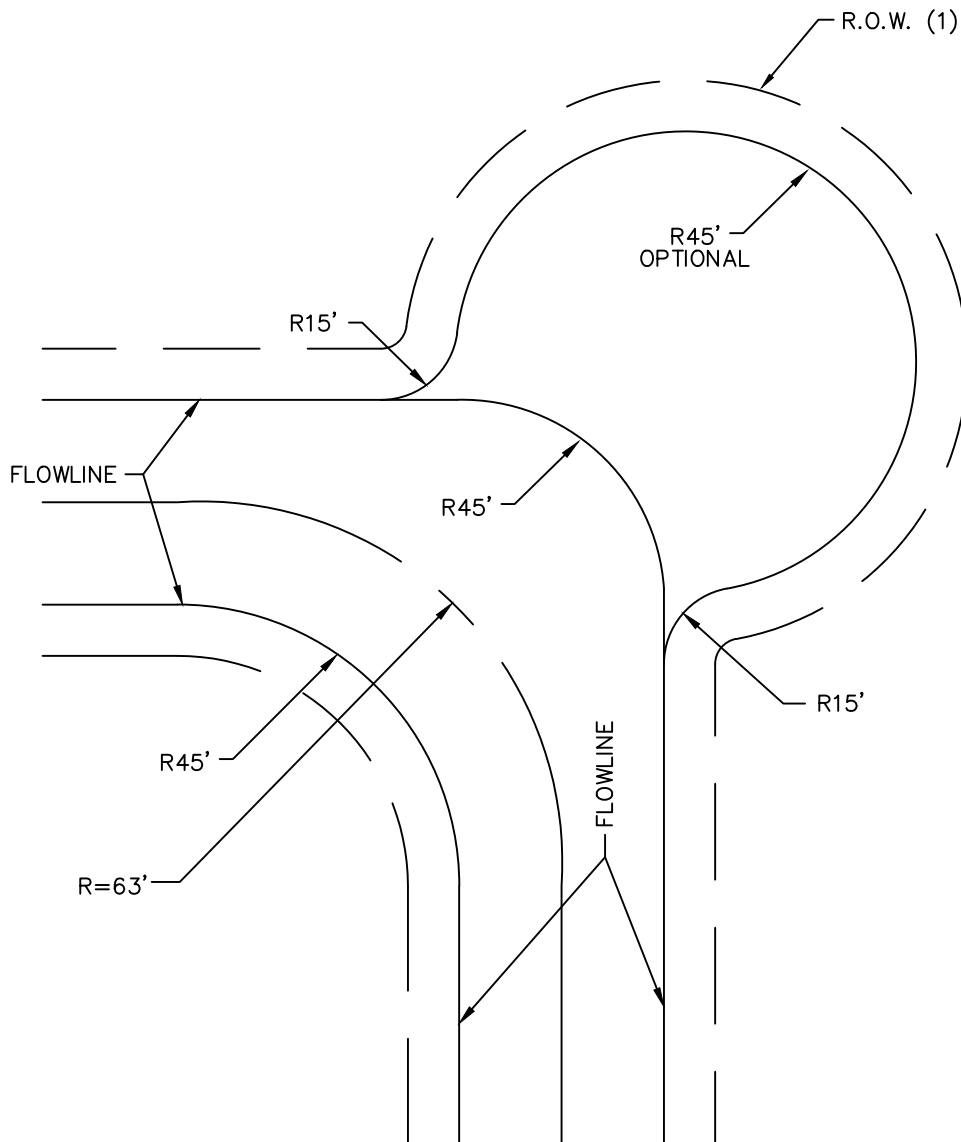
BY: JME

SCALE: NTS

DATE: 11/2019

DRAWING:

ST13



NOTE:

1. 20MPH ADVISORY SIGNS REQUIRED ON CURVE APPROACHES

90 DEGREE TURN - LOCAL ACCESS STREETS



**STREET CONSTRUCTION
DRAWINGS**

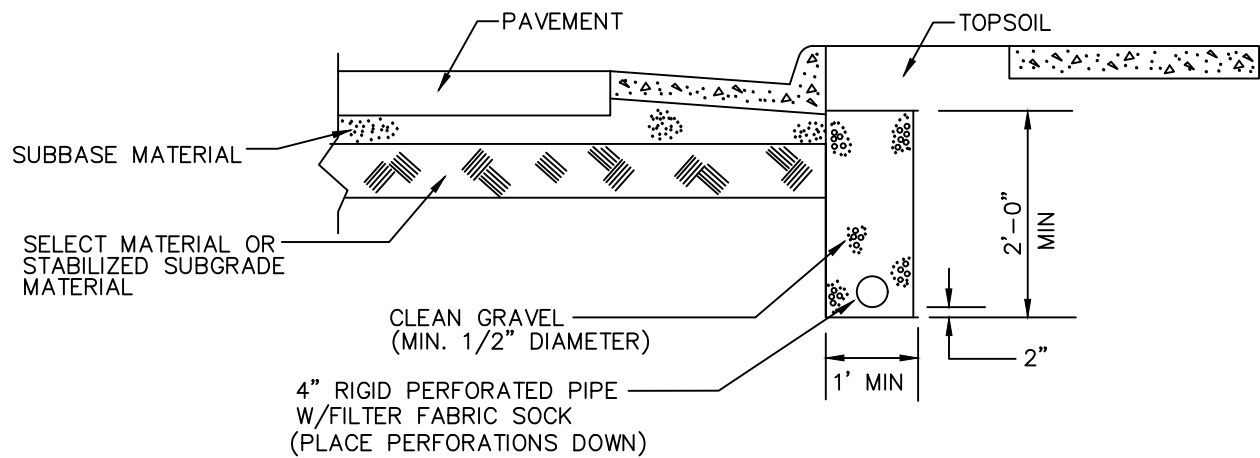
BY: JME

SCALE: NTS

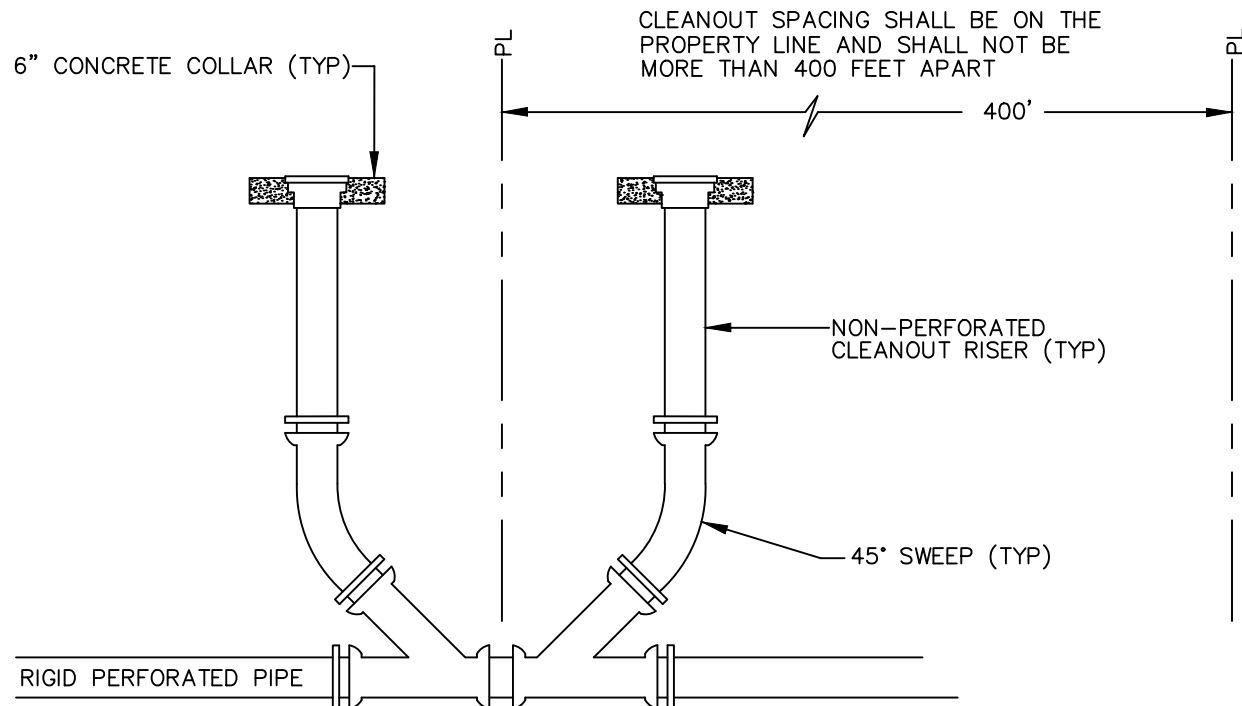
DATE: 11/2019

DRAWING:

ST14



4" PERFORATED UNDERDRAIN DETAIL



NOTES:

1. CURB STOP TO BE A MIN. OF 1' BEHIND TRENCH.
2. PERFORATED DRAIN NEEDS TO DAYLIGHT INTO DRAINAGE SYSTEM.
3. PROVIDE PLUG ON UPSTREAM END OF PIPE.
4. PERFORATED PIPE SHALL FOLLOW ESTABLISHED GRADE AND HAVE POSITIVE FLOW.
5. UNDERDRAINS WILL BE ON ALL ROADS WITH DETACHED SIDEWALKS AND IRRIGATED TREE LAWNS.
6. WHERE THE BOTTOM OF SELECT MATERIAL IS GREATER THAN 4' BELOW PAVEMENT, THE UNDERDRAIN PIPE IS TO BE COINCIDENT WITH THE BOTTOM OF SELECT MATERIAL AND THE TRENCH DEPTH AND BACKFILL QUANTITY INCREASED ACCORDINGLY.
7. PLACE A VALVE BOX TOP WITH LID AND 6" THICK CONCRETE COLLAR AT ALL 4" PERFORATED UNDERDRAIN CLEANOUTS.
8. WHEN CURB AND GUTTER IS IN PLACE, THE CLEANOUTS SHALL BE MARKED ON THE CONCRETE CURB FACE WITH A "+".

4" PERFORATED UNDERDRAIN



STREET CONSTRUCTION
DRAWINGS

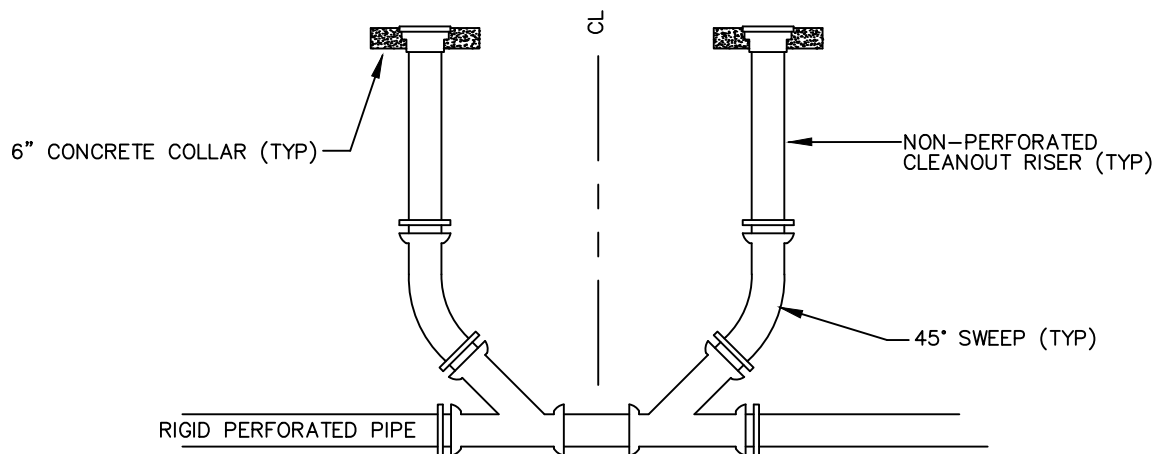
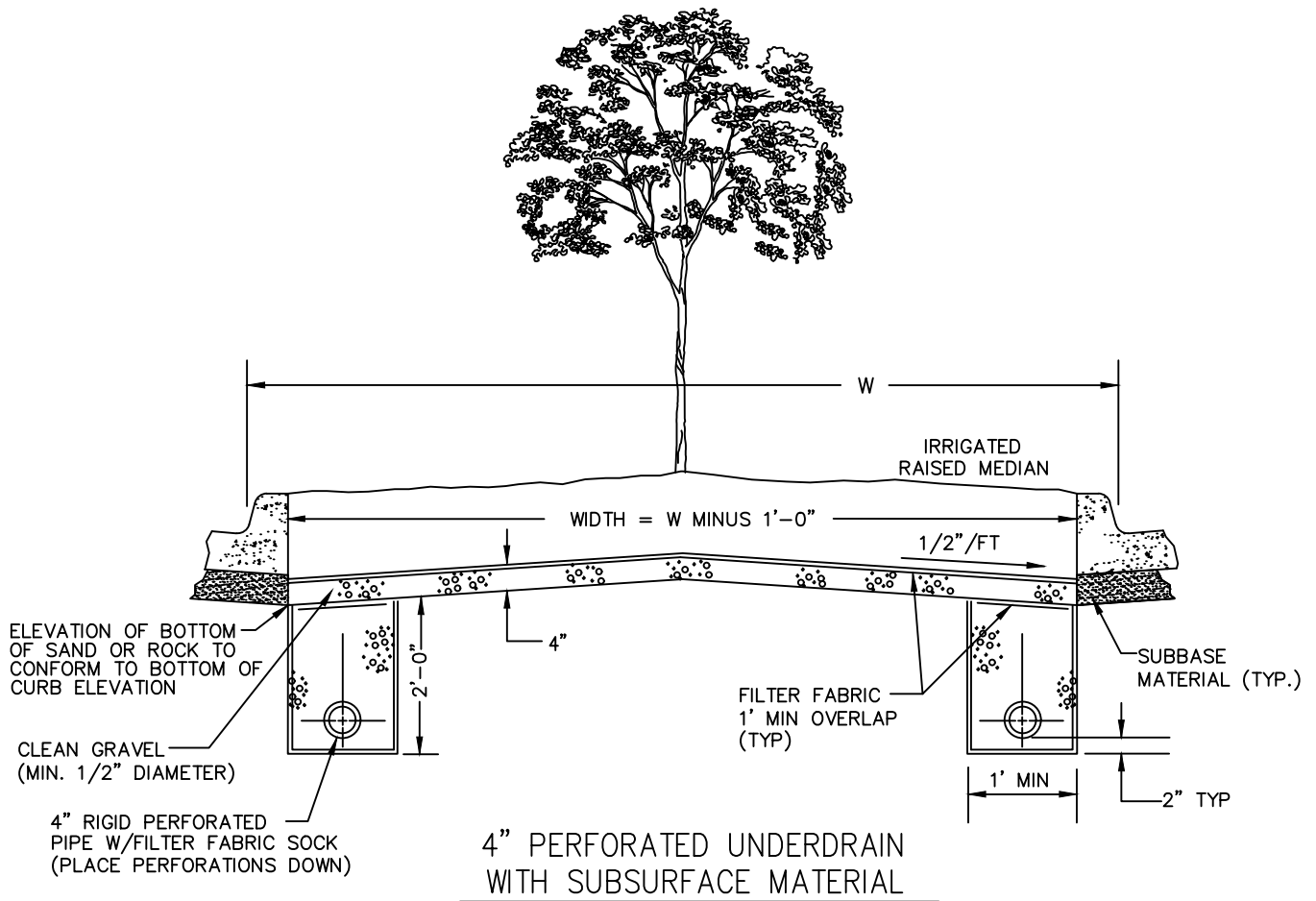
BY: JME

SCALE: NTS

DATE: 11/2019

DRAWING:

ST15A



NOTES:

1. PERFORATED DRAIN NEEDS TO DAYLIGHT INTO DRAINAGE SYSTEM.
2. CLEANOUTS SHALL BE SPACED A MAXIMUM OF 400'.
3. PERFORATED PIPE SHALL FOLLOW ESTABLISHED GRADE AND HAVE POSITIVE FLOW.
4. PLACE A VALVE BOX TOP WITH LID AND 6" THICK CONCRETE COLLAR AT ALL 4" PERFORATED UNDERDRAIN CLEANOUTS.
5. WHEN CURB AND GUTTER IS IN PLACE, THE CLEANOUTS SHALL BE MARKED ON THE CONCRETE CURB FACE WITH A "+".

4" PERFORATED MEDIAN UNDERDRAIN FOR CENTER PLANTING



**STREET CONSTRUCTION
DRAWINGS**

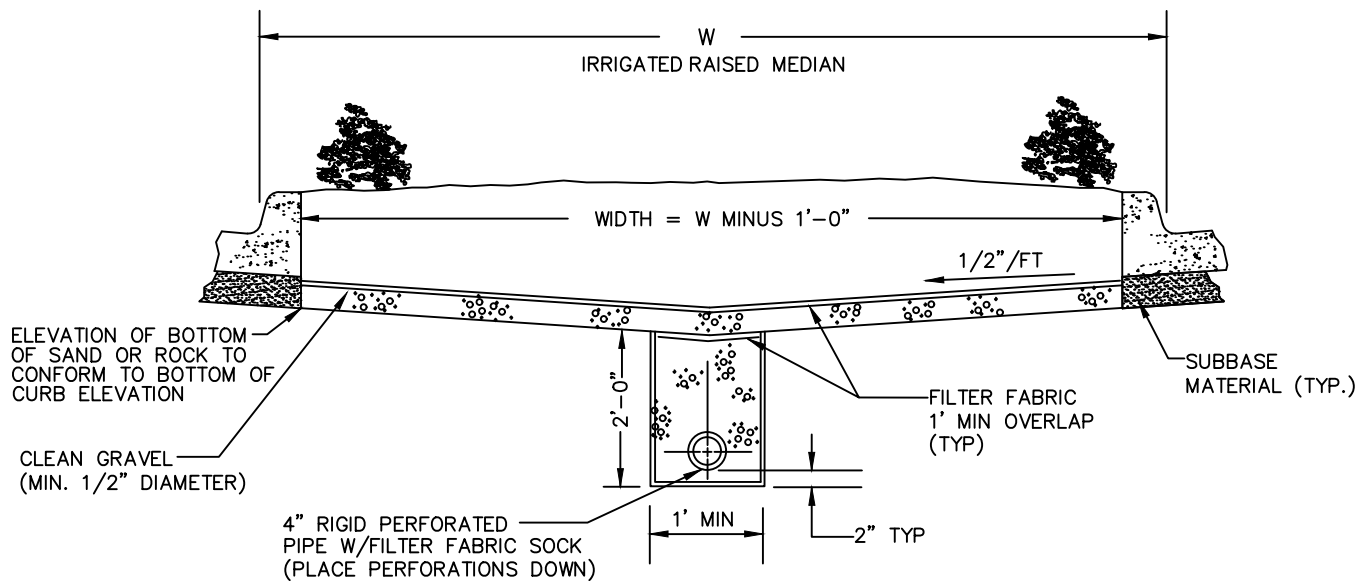
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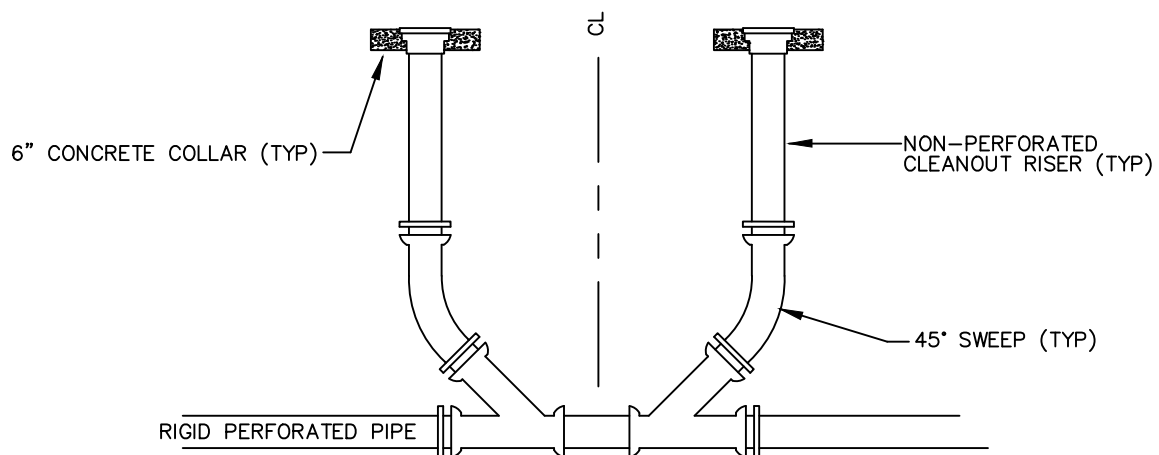
DATE: 11/2019

DRAWING:

ST15B



4" PERFORATED UNDERDRAIN WITH SUBSURFACE MATERIAL



NOTES:

1. PERFORATED DRAIN NEEDS TO DAYLIGHT INTO DRAINAGE SYSTEM.
2. CLEANOUTS SHALL BE SPACED A MAXIMUM OF 400'.
3. PERFORATED PIPE SHALL FOLLOW ESTABLISHED GRADE AND HAVE POSITIVE FLOW.
4. PLACE A VALVE BOX TOP WITH LID AND 6" THICK CONCRETE COLLAR AT ALL 4" PERFORATED UNDERDRAIN CLEANOUTS.
5. WHEN CURB AND GUTTER IS IN PLACE, THE CLEANOUTS SHALL BE MARKED ON THE CONCRETE CURB FACE WITH A "+".

4" PERFORATED MEDIAN UNDERDRAIN FOR EDGE PLANTING



STREET CONSTRUCTION
DRAWINGS

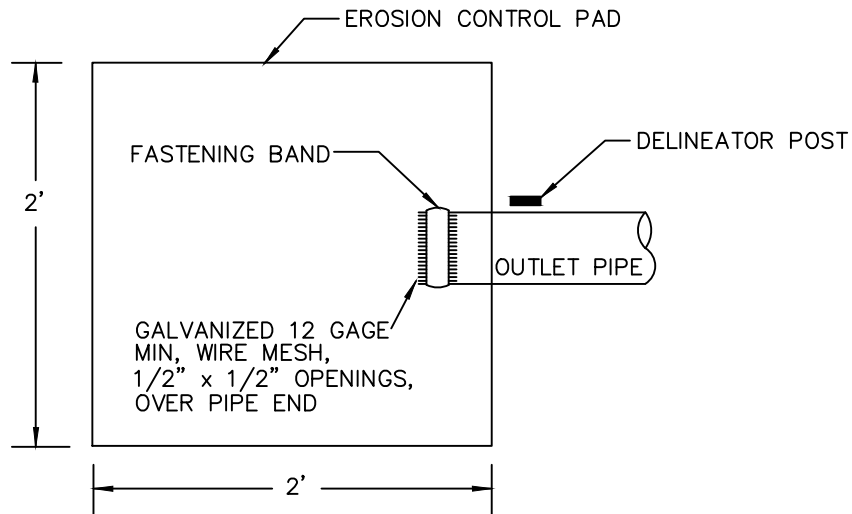
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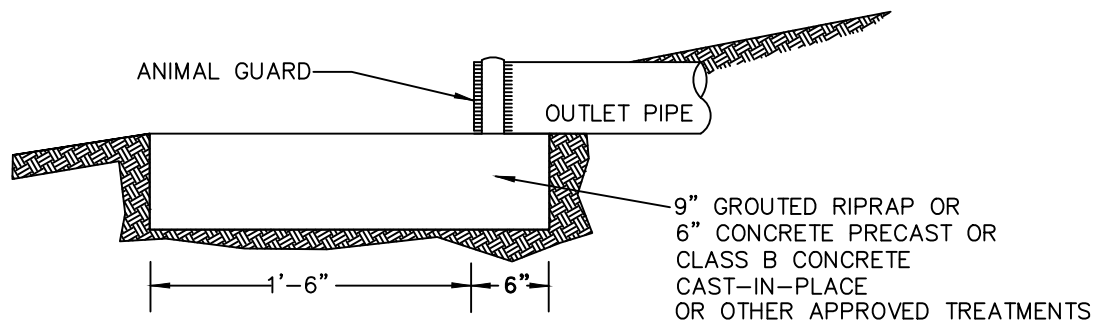
DATE: 11/2019

DRAWING:

ST15C



PLAN



PROFILE

OUTLET PIPE
END TREATMENT

UNDERDRAIN OUTLET TREATMENT



STREET CONSTRUCTION
DRAWINGS

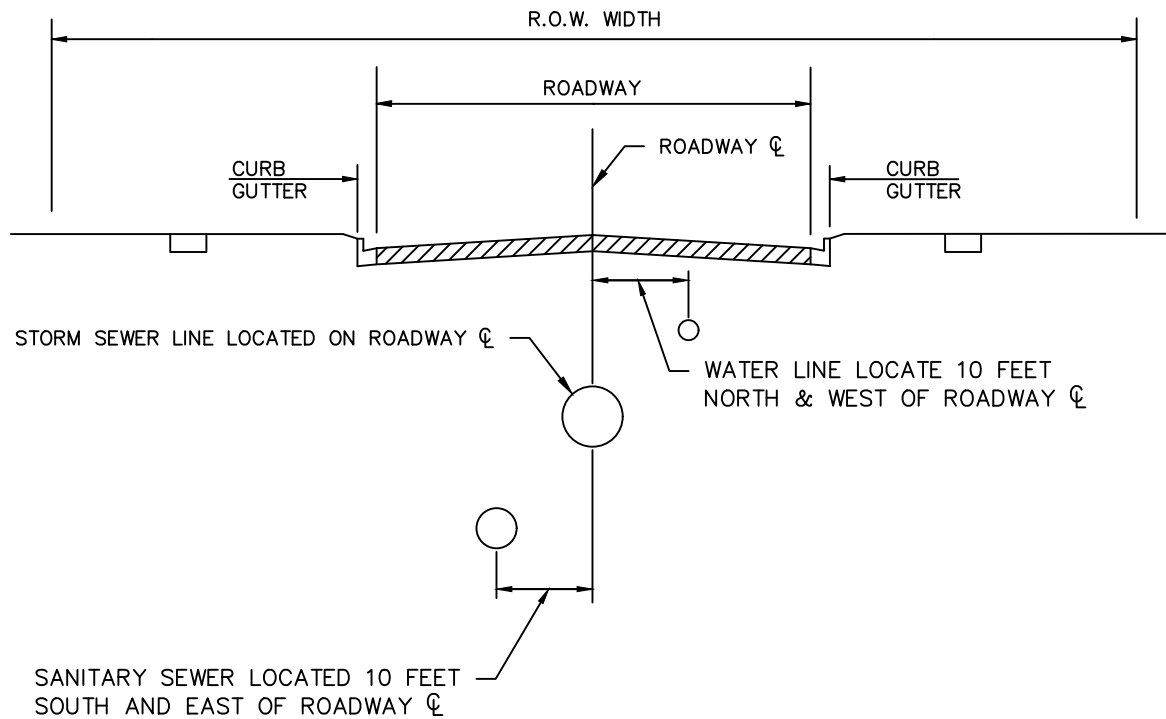
BY: JME

SCALE: NTS

DATE: 11/2019

DRAWING:

ST16



TYPICAL UTILITY LOCATIONS ON NORMAL ROADWAY

NOTES:

1. VERTICAL DEPTH LOCATION OF UTILITIES VARIES (REFER TO LATEST TOWN OF FIRESTONE STANDARDS AND SPECIFICATIONS FOR ALLOWABLE DEPTHS)
2. HORIZONTAL DIMENSIONS BASED ON C TO C OF VARIOUS PIPE UTILITIES.
3. UTILITY SEPARATION ALONG C ROADWAY RADIAL ARC REVIEWED ON AN INDIVIDUAL PROJECT BASIS (MUST MAINTAIN 10 FEET OF HORIZONTAL SEPARATION).

TYPICAL STREET UTILITY LOCATION



**STREET CONSTRUCTION
DRAWINGS**

BY: JME

SCALE: NTS

DATE: 11/2019

DRAWING:

ST17

<u>DRAWING NO.</u>	<u>TITLE</u>
SS1	STANDARD MANHOLE
SS2	SANITARY MANHOLE WITH PRIVATE UNDERDRAIN
SS3	24" MANHOLE RING AND COVER
SS4	SANITARY SEWER TRENCH DETAIL
SS5	SANITARY SEWER TRENCH WITH PRIVATE UNDERDRAIN

INDEX OF SANITARY SEWER DETAILS



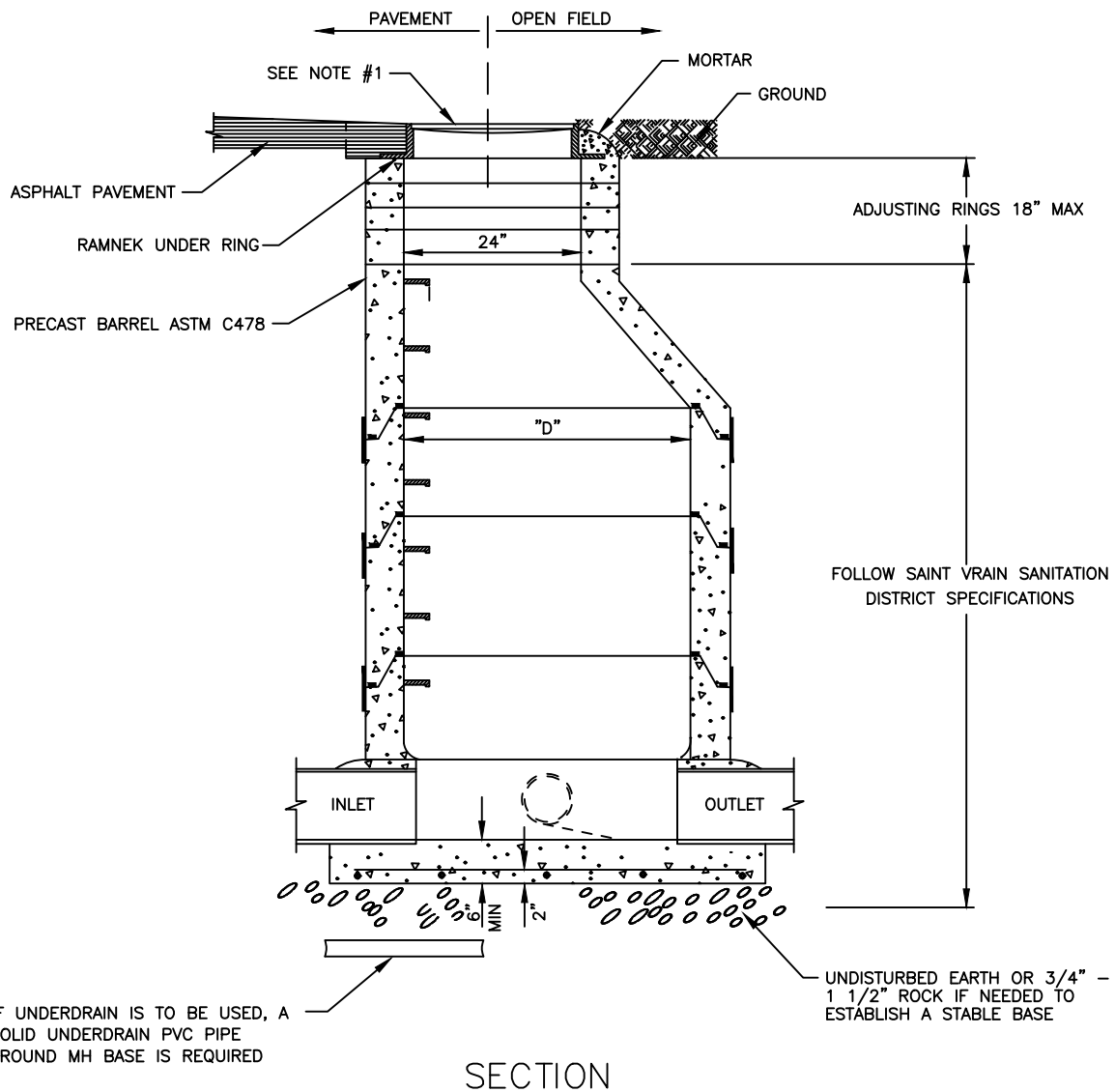
**SANITARY SEWER
CONSTRUCTION
DRAWINGS**

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:



NOTES:

1. FINAL GRADE OF MANHOLE COVERS SHALL BE $\frac{1}{4}$ " LOWER THAN FINAL STREET GRADE.
2. MANHOLES NOT IN ASPHALT OR CONCRETE SHALL BE RAISED 6" ABOVE FINAL GRADE AND A CONCRETE COLLAR INSTALLED WITH A GREEN CARSONITE POST.
3. BACKFILL TO BE HAND PLACED AND COMPACTED WITHIN FOUR FEET OF THE MANHOLE.

STANDARD MANHOLE

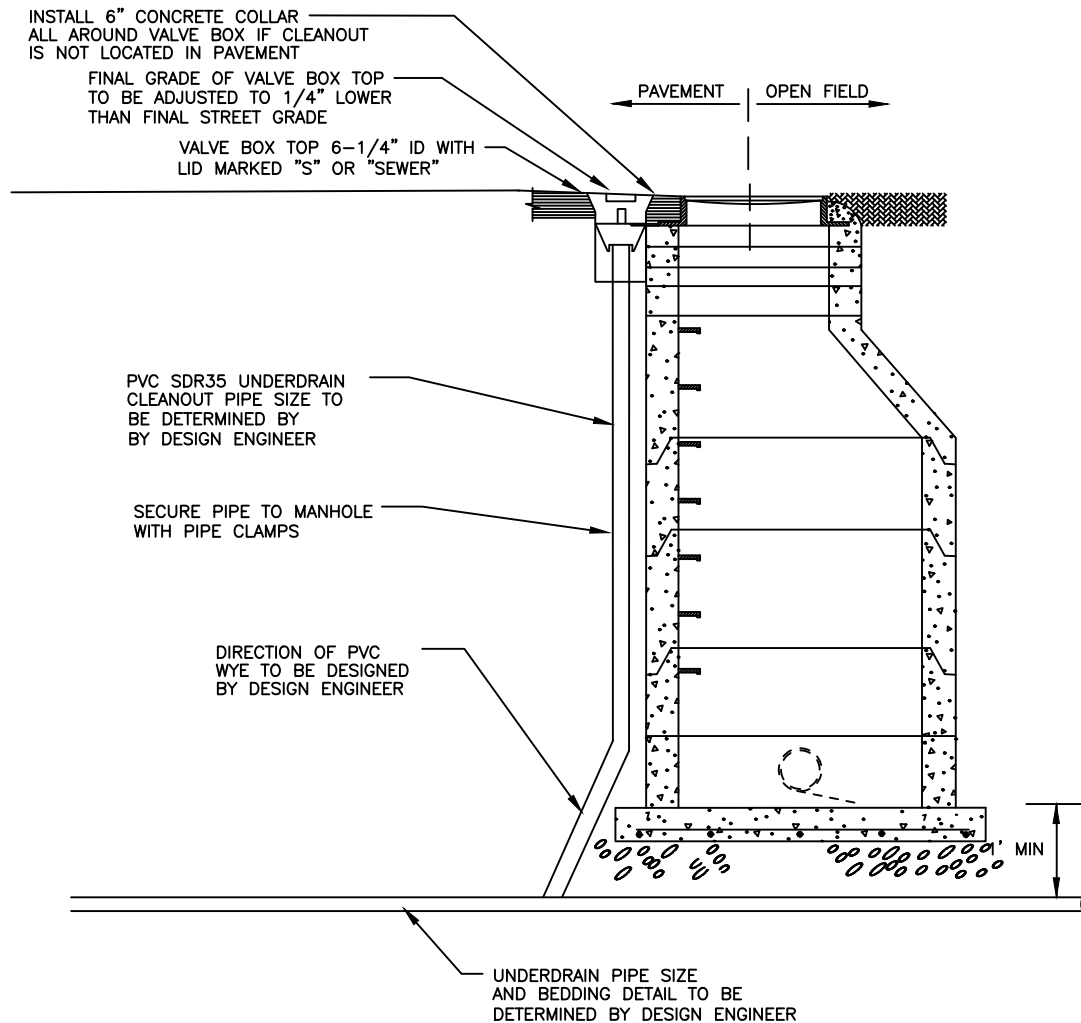


**SANITARY SEWER
CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

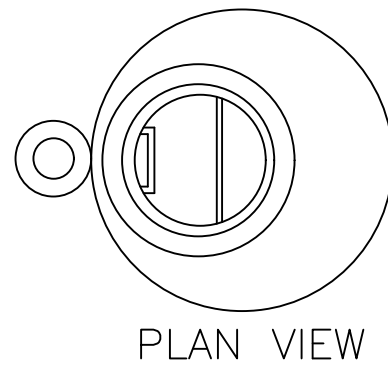
DRAWING:

SS1



NOTES:

1. FALL UNDERDRAIN SYSTEMS SHALL BE PRIVATE AND NOT MAINTAINED BY THE TOWN OF FIRESTONE.
2. PLACE UNDERDRAIN COLLECTOR PIPE AROUND CONCRETE MANHOLE BASE.
3. CLEANOUT TO BE PLACED UPSTREAM/DOWNSTREAM OF SANITARY MANHOLE AS DETERMINED BY THE DESIGN ENGINEER.
4. SEE 'TRENCH DETAIL WITH PRIVATE UNDERDRAIN' DETAIL FOR VERTICAL LOCATION OF UNDERDRAIN.



SANITARY MANHOLE WITH PRIVATE UNDERDRAIN

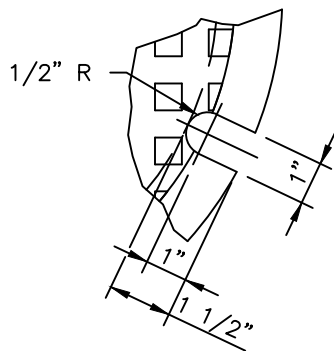
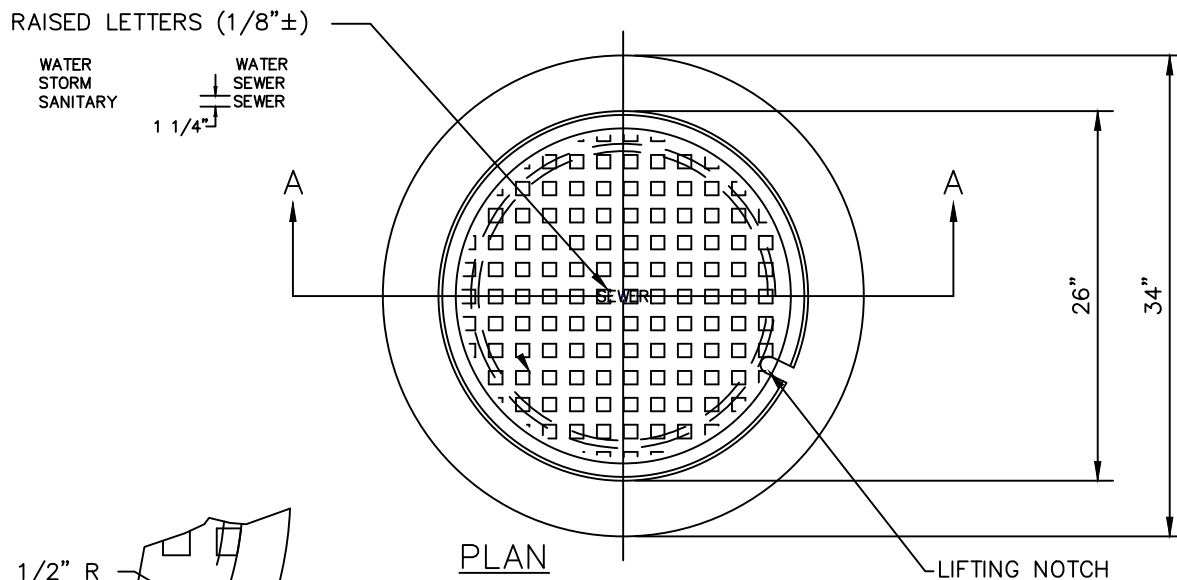


**SANITARY SEWER
CONSTRUCTION
DRAWINGS**

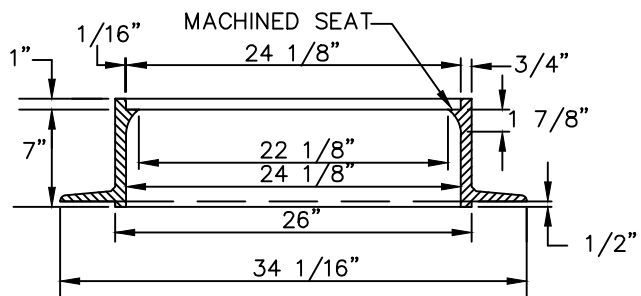
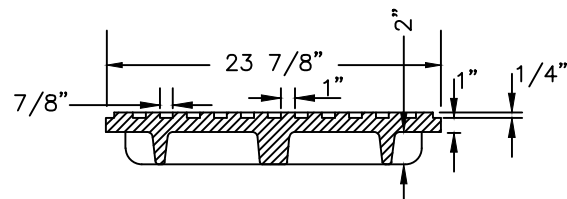
BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

SS2



LIFTING NOTCH



SECTION A-A

1. CASTING SPECIFICATIONS: ASTM A-48 WITH A MINIMUM TENSILE STRENGTH OF 25 KSI (CLASS 25)
2. ALL CASTINGS TO BE DIPPED IN ASPHALT BASE PAINT (OR APPROVED EQUAL)
3. CASTINGS SHALL BE AS SPECIFIED BELOW OR APPROVED EQUAL:

MANUFACTURERS	CAT. #
NEENAH	R-1706
CASTINGS, INC.	MH-400-24 C.I.
HUTCHINSON FDRY. & STL. INC.	MH-400
EAST JORDAN	FRAME-2420Z

4. ALL NEW MANHOLES MUST INCLUDE A PLASTIC OR VINYL TAG ATTACHED TO THE TOP STEP STATING THE FOLLOWING "CAUTION CONFINED SPACE; ENTRY PERMIT REQUIRED.

24" MANHOLE RING AND COVER

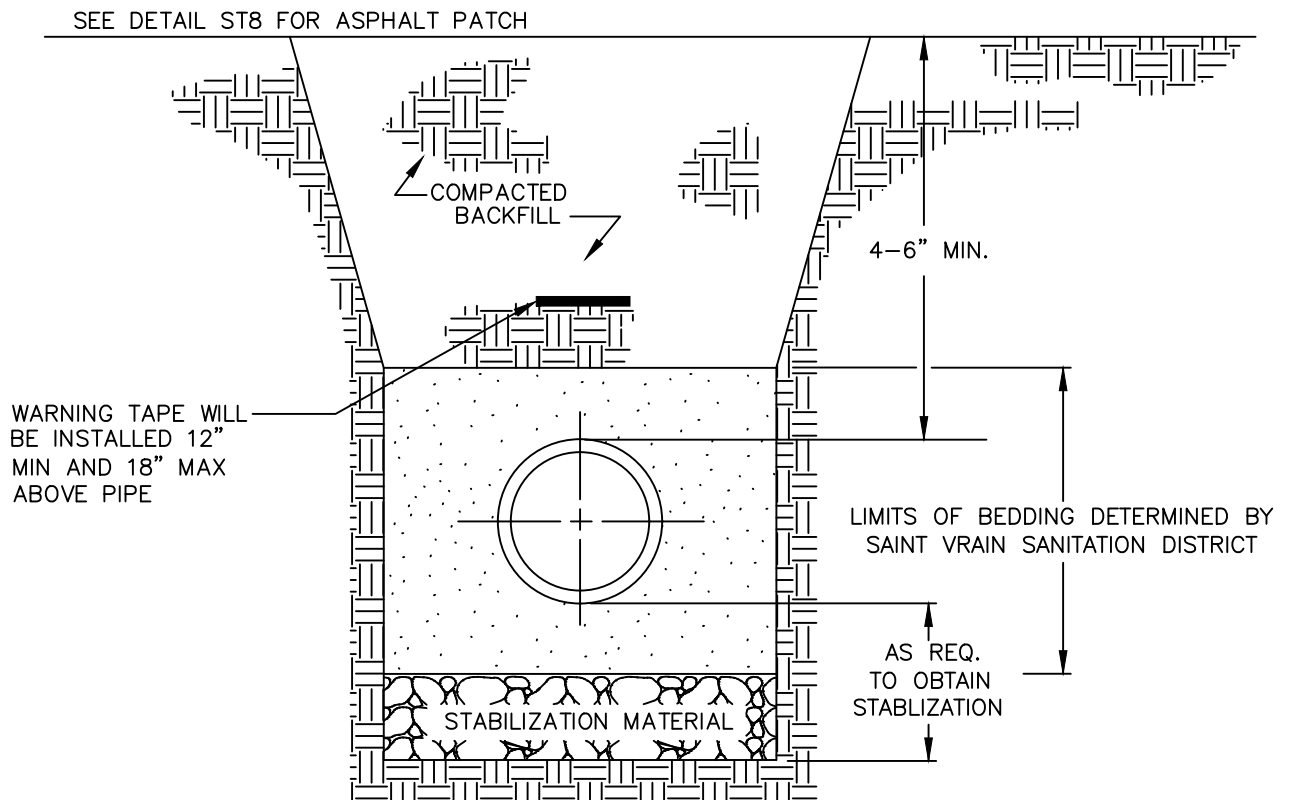


SANITARY SEWER
CONSTRUCTION
DRAWINGS

BY: PCB
SCALE: NTS
DATE: 12/2021

DRAWING:

SS3



NOTES:

1. COMPACTION SHALL BE AS FOLLOWS: PIPE ZONE BEDDING 6" UNDER AND 12" OVER PIPE WILL REQUIRE 90% S.P.D. TRENCH ZONE ABOVE BEDDING MATERIALS, FULL TRENCH SECTION IN ROADWAY OR STREET R.O.W. LIMITS WILL REQUIRE 95% S.P.D. TRENCH ZONE ABOVE BEDDING MATERIALS, OUTSIDE OF STREET R.O.W. WILL REQUIRE 90% S.P.D.
2. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKMEN AND PROTECTION OF OTHER UTILITIES IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL SAFETY REGULATIONS.
3. TRENCH WIDTH SHALL NOT BE MORE THAN 24" NOR LESS THAN 12" WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE.

SANITARY SEWER TRENCH DETAIL

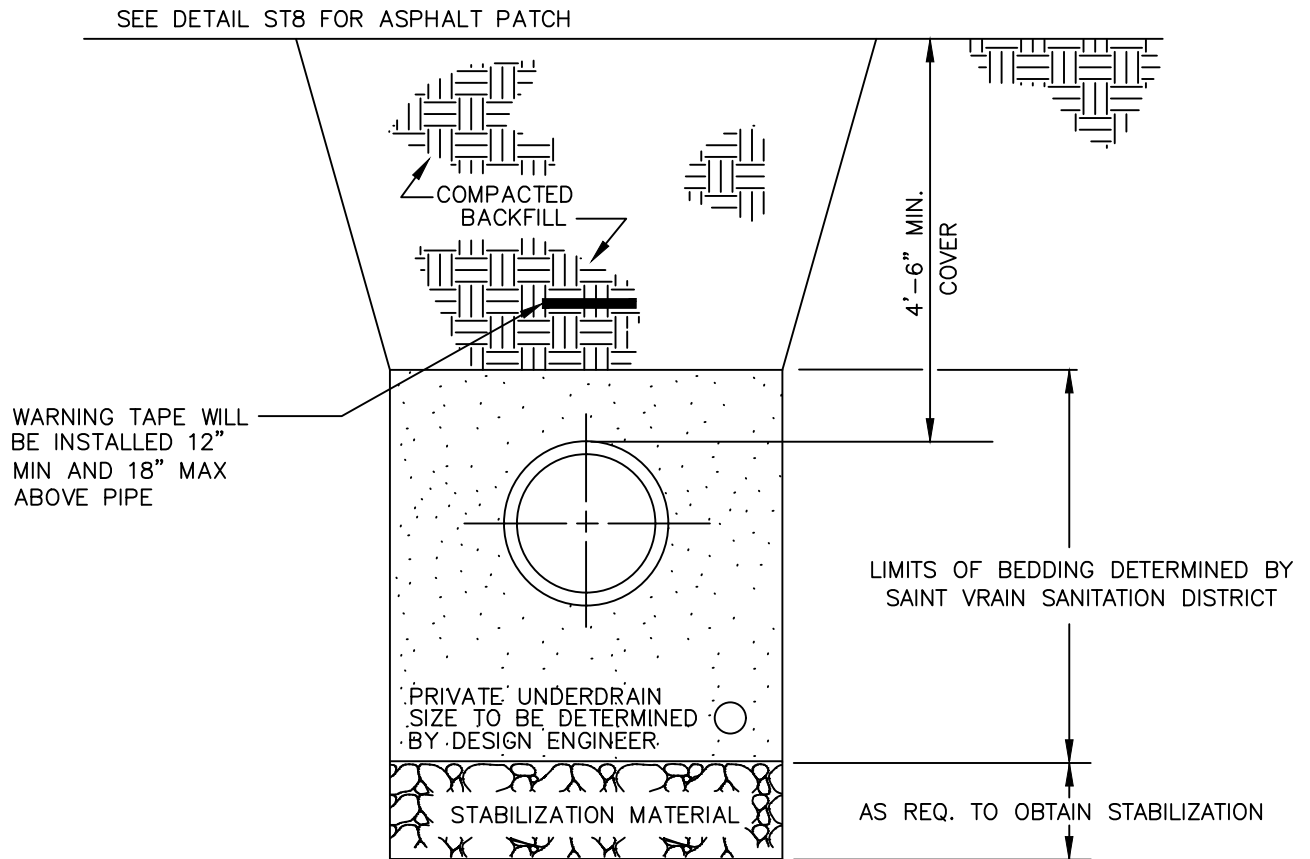


**SANITARY SEWER
CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

SS4



NOTES:

1. BACKFILL TO BE COMPACTED TO 95% ASTM D-698, OR 70% OF ASTM D-4253 AND 4254 RELATIVE DENSITY, IN ALL AREAS UNLESS OTHERWISE NOTED.
2. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKMEN AND PROTECTION OF OTHER UTILITIES IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL SAFETY REGULATIONS.
3. TRENCH WIDTH SHALL NOT BE MORE THAN 16" NOR LESS THAN 12" WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE.
4. COMPACTION SHALL BE AS FOLLOWS: PIPE ZONE BEDDING 6" UNDER AND 12" OVER PIPE WILL REQUIRE 90% S.P.D. TRENCH ZONE ABOVE BEDDING MATERIALS, FULL TRENCH SECTION IN ROADWAY OR STREET R.O.W. LIMITS WILL REQUIRE 95% S.P.D. TRENCH ZONE ABOVE BEDDING MATERIALS, OUTSIDE OF STREET R.O.W. WILL REQUIRE 90% S.P.D.
5. ALL UNDERDRAIN SYSTEMS SHALL BE PRIVATE AND WILL NOT BE MAINTAINED BY THE TOWN OF FIRESTONE.

SANITARY SEWER TRENCH WITH PRIVATE UNDERDRAIN



**SANITARY SEWER
CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

SS5

<u>DRAWING NO.</u>	<u>TITLE</u>
STM1	SMALL CONSTRUCTION PROJECT EROSION CONTROL
STM2	FLARED END SECTION OUTLET
STM3	INLET PROTECTION
STM4	SILT FENCE EROSION BARRIER
STM5	STRAW BALE EROSION BARRIER
STM6A	TRACKING CONTROL PAD – CRUSHED ROCK
STM6B	TRACKING CONTROL PAD – CATTLE GUARD
STM7	EROSION CONTROL SEQUENCE FOR SMALL CONSTRUCTION PROJECTS
STM8A	STANDARD MANHOLE
STM8B	24” MANHOLE RING AND COVER
STM9	MANHOLE STEPS
STM10	INLET AND INLET COVER
STM11A	CONCRETE PIPE JOINTS – SHIPLAP
STM11B	CONCRETE PIPE JOINTS – TYPE 'R'
STM12	STORM SEWER TRENCH DETAIL
STM13A	CONCRETE ENCASEMENT OF RIGID CONDUITS (1 OF 2)
STM13B	CONCRETE ENCASEMENT OF RIGID CONDUITS (2 OF 2)
STM14	FLARED END SECTION WITH TRICKLE CHANNEL
STM15A	TRASH GUARD FOR CONDUIT (1 OF 3)
STM15B	TRASH GUARD FOR CONDUIT (2 OF 3)
STM15C	TRASH GUARD FOR CONDUIT (3 OF 3)
STM16A	SIDEWALK CHASE DETAIL (1 OF 2)
STM16B	SIDEWALK CHASE DETAIL (2 OF 2)

INDEX OF STORM SEWER DETAILS



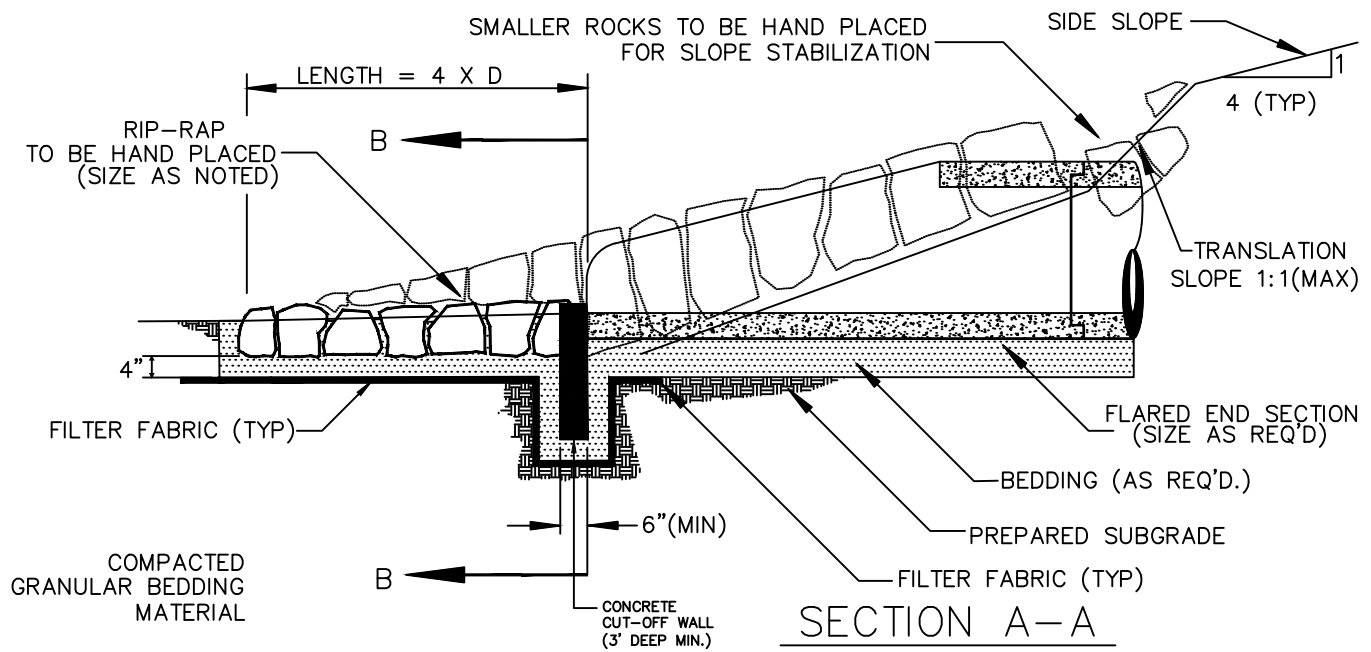
**STORM SEWER
CONSTRUCTION DRAWINGS**

BY: JME

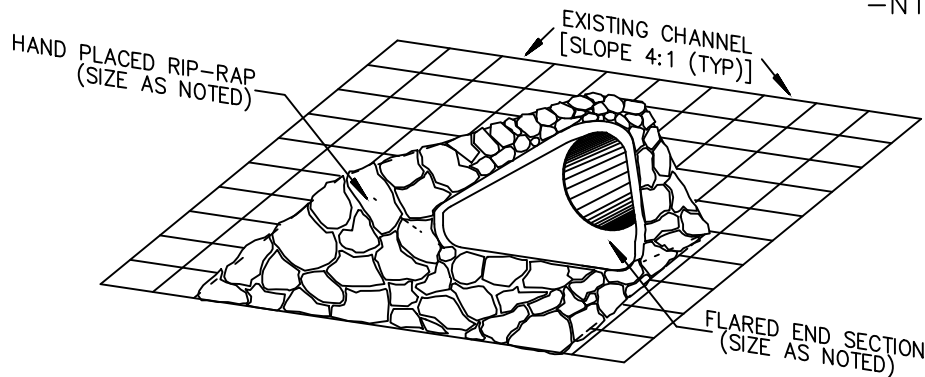
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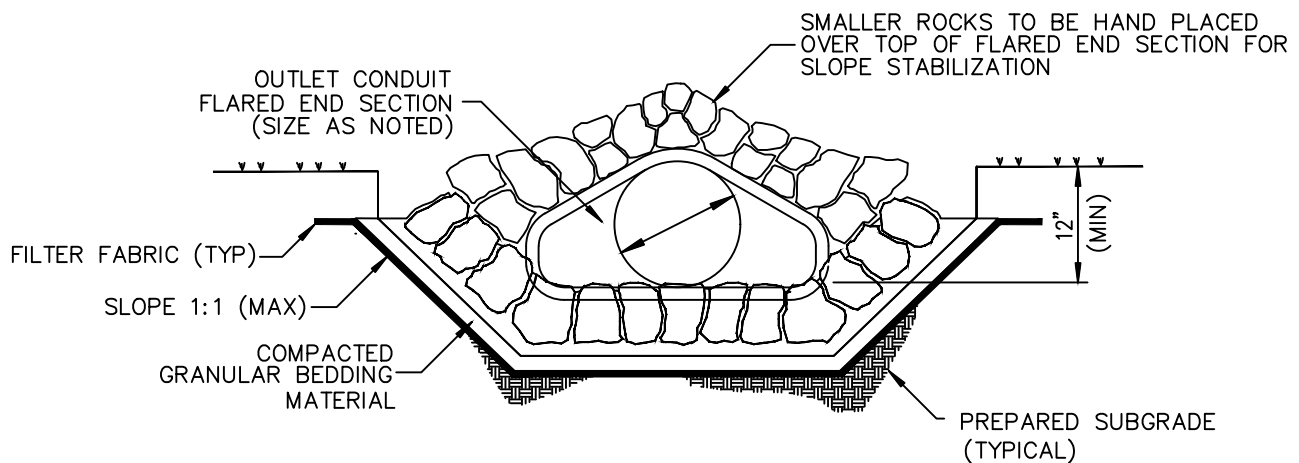


-NTS-



STORM SEWER OUTLET

ISOMETRIC VIEW



SECTION B-B

-NTS-

FLARED END SECTION OUTLET



STORM SEWER
CONSTRUCTION DRAWINGS

BY: JME

SCALE: NTS

DATE: 1/2020

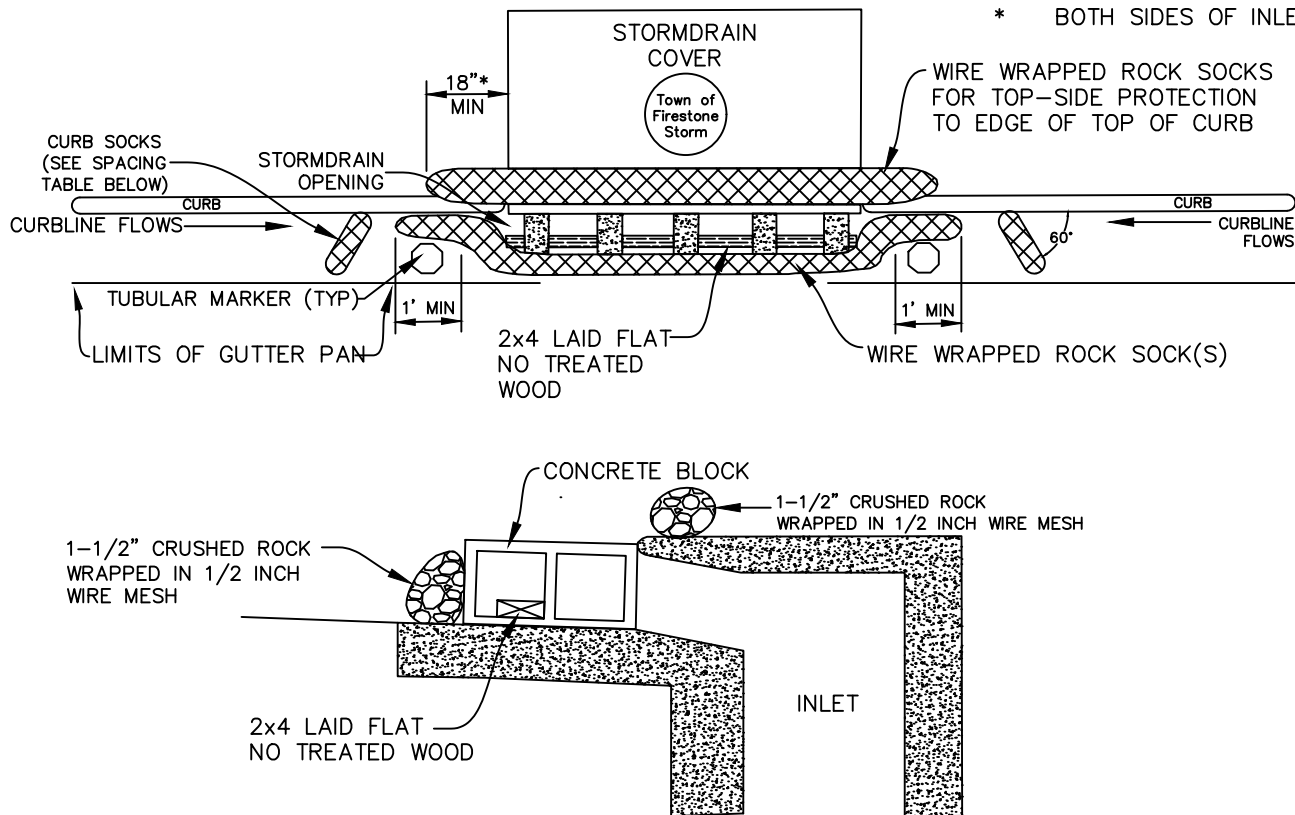
DRAWING:

STM2

NOTES:

1. ROCK SOCK SHALL BE 1 1/2" CRUSHED ROCK FILL (RECYCLED CONCRETE NOT ACCEPTABLE)

* BOTH SIDES OF INLET



NOTES:

1. INTERIM CONFIGURATION OF INLET PROTECTION IN STREETS SHALL BE INSTALLED WITHIN 72-HOURS OF POURING INLET.
2. CRUSHED ROCK SHALL BE FRACTURED FACE (ALL SIDES) AND SHALL BE 1 1/2" CRUSHED ROCK.
3. WIRE MESH SHALL BE FABRICATED OF MINIMUM 16-20 GAUGE WIRE TWISTED INTO A MESH WITH A MAXIMUM OPENING OF 1/2 INCH. ROLL WIDTH SHALL BE 48". 16-20 GAUGE CHICKEN WIRE MAY BE USED IF DOUBLE WRAPPED WITH NO MORE THAN 1/2" OPENING.
4. WIRE MESH SHALL BE SECURED USING "HOG RINGS" OR WIRE TIES AT 6" CENTERS ALONG ALL JOINTS AND AT 2" CENTERS ON ENDS OF ROCK SOCKS.
5. ROCK SOCK SHALL BE CONSTRUCTED IN ONE PIECE OR SHALL BE CONSTRUCTED USING ROCK SOCK JOINT DETAIL.
6. TUBULAR MARKERS SHALL MEET REQUIREMENTS OF MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), AS AMENDED.
7. THE TOP OF THE REINFORCED ROCK SOCK SHALL BE 1/2" - 1" BELOW TOP OF CURB.
8. SEDIMENT ACCUMULATED UPSTREAM OF THE INLET PROTECTION SHALL BE REMOVED WHEN THE SEDIMENT DEPTH UPSTREAM OF ROCK SOCK IS WITHIN 5" OF THE CREST.
9. INLET PROTECTION IS TO REMAIN IN PLACE UNTIL THE UPSTREAM DISTURBED AREA IS STABILIZED AND GRASS COVER IS APPROVED.
10. REFER TO CS AND RS DETAILS FOR MORE INFO.
11. SEE STM10 FOR INLET AND INLET COVER DETAIL.

STREET SLOPE	CURB SOCK SPACING (ft)
0.5%	100
1.0%	100
2.0%	75
3.0%	50
4.0%	50
5.0%	50
6.0%	25
7.0%	25
8.0%	25

INLET PROTECTION



STORM SEWER
CONSTRUCTION DRAWINGS

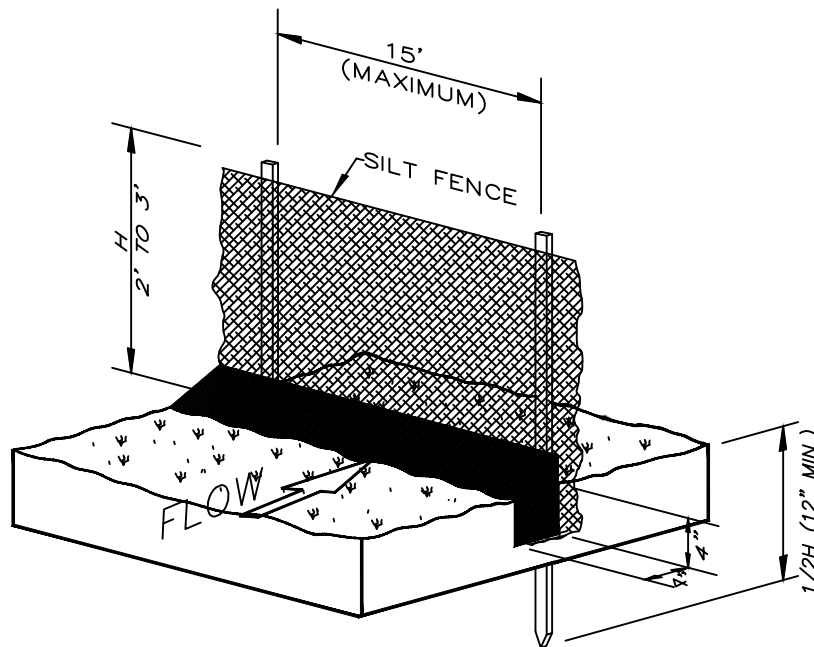
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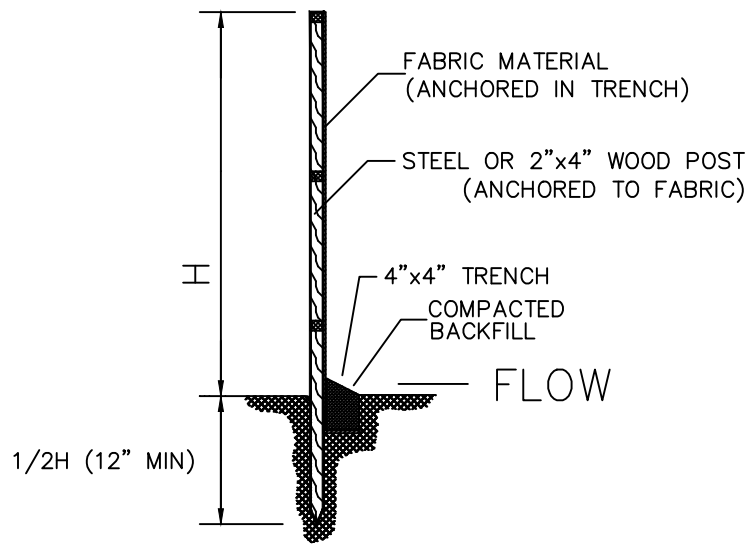
DRAWING:

STM3



SILT FENCE INSTALLATION

-NTS-



SECTION

-NTS-

FOR SINGLE LOT EROSION CONTROL
SEE SHEET STM8

NOTES:

1. INSTALL SILT FENCE PARALLEL TO THE CONTOUR OF THE LAND.
2. EXTEND ENDS UPSLOPE TO ALLOW WATER TO POND BEHIND FENCE.
3. EXCAVATE A TRENCH 4 INCHES WIDE AND 4 INCHES DEEP.
4. INSTALL FENCE WITH POSTS ON THE DOWNSLOPE SIDE.
5. PLACE 8 INCHES OF FABRIC IN THE TRENCH, EXTENDING THE BOTTOM 4 INCHES TOWARD THE UPSLOPE SIDE.
6. JOIN SILT FENCE SECTIONS BY USING A WRAP JOINT.
7. BACKFILL TRENCH WITH SOIL MATERIALS AND COMPACT.
8. INSPECT AT LEAST WEEKLY AND AFTER EACH STORM EVENT, REPAIRING AS NEEDED AND REMOVING SEDIMENT DEPOSITS WHEN THEY REACH ONE-HALF THE FENCE HEIGHT.

SILT FENCE EROSION BARRIER



STORM SEWER
CONSTRUCTION DRAWINGS

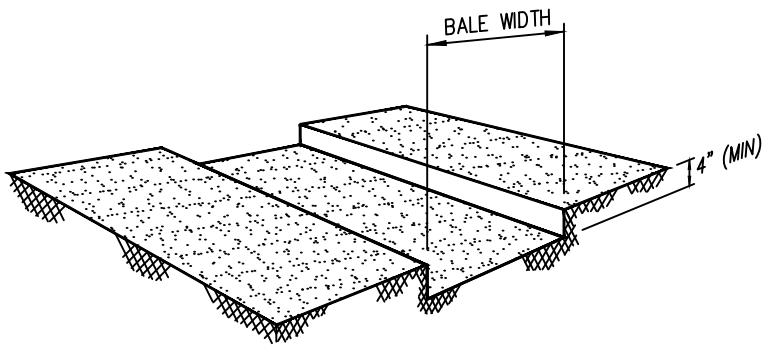
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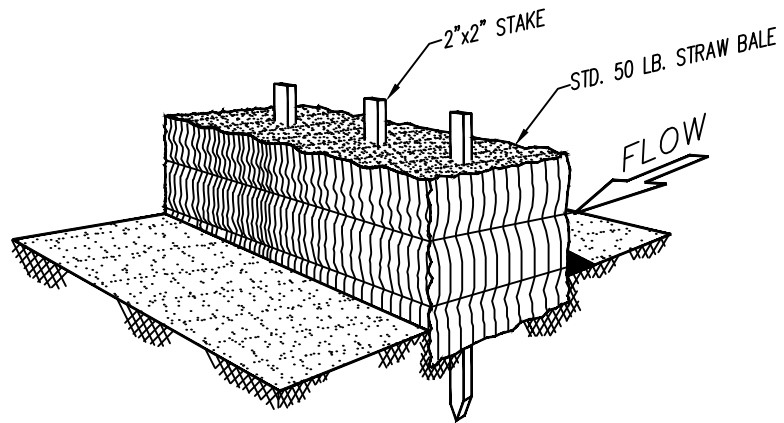
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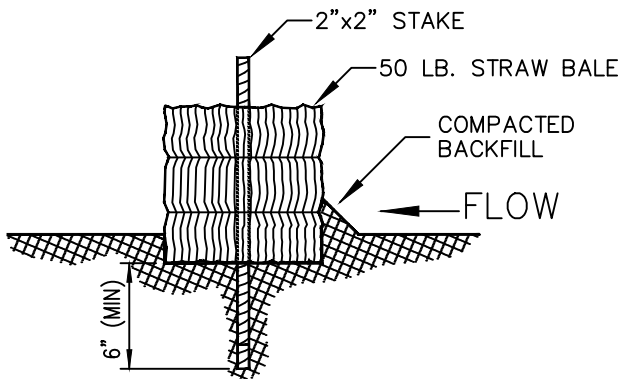
STM4



TRENCH EXCAVATION
-NTS-



STRAW BALE INSTALLATION
-NTS-



SECTION
-NTS-

NOTE: EROSION CONTROL MEASURES SHALL BE MAINTAINED UNTIL LANDSCAPING IS COMPLETED.

STRAW BALE EROSION BARRIER

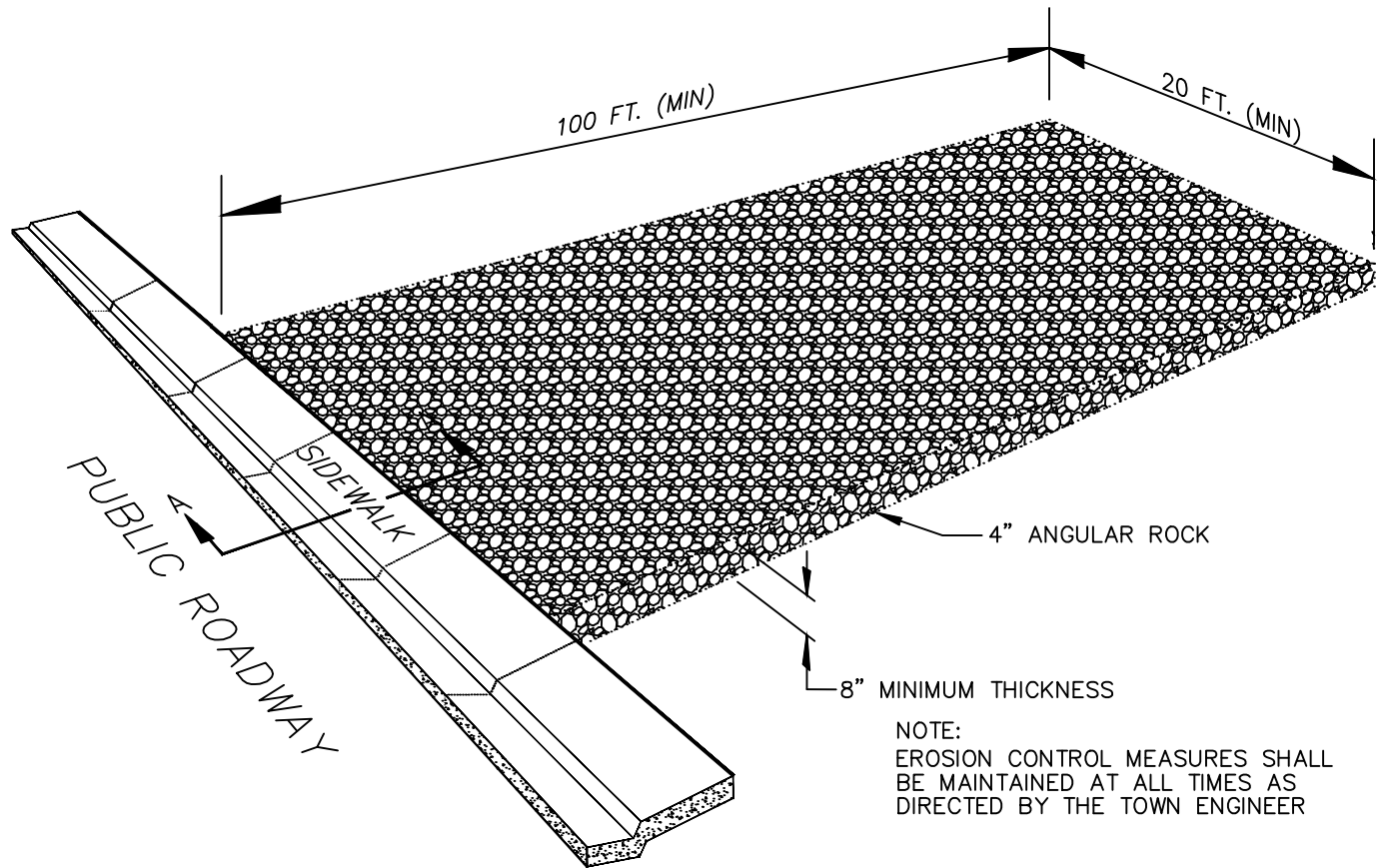


STORM SEWER
CONSTRUCTION DRAWINGS

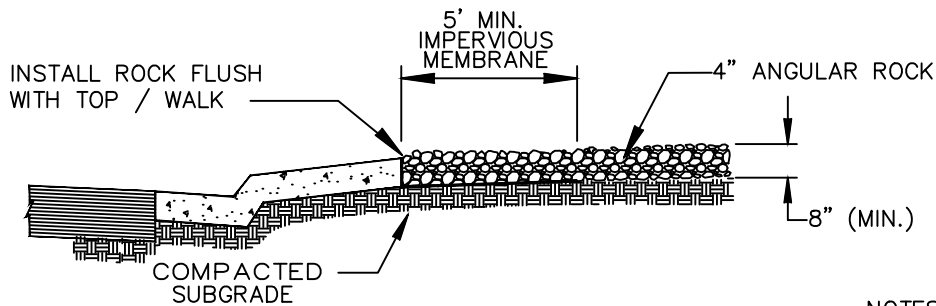
BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

STM5



NOTE:
EROSION CONTROL MEASURES SHALL
BE MAINTAINED AT ALL TIMES AS
DIRECTED BY THE TOWN ENGINEER



SECTION A-A
-NTS-

NOTES:

1. ALL ROCK TO BE REMOVED
UPON COMPLETION OF
CONSTRUCTION
2. PUBLIC ROADWAY TO BE
KEPT CLEAN AND FREE OF
MUD, DIRT AND DEBRIS AT
ALL TIMES

TRACKING CONTROL PAD - CRUSHED ROCK



**STORM SEWER
CONSTRUCTION DRAWINGS**

BY: JME

SCALE: NTS

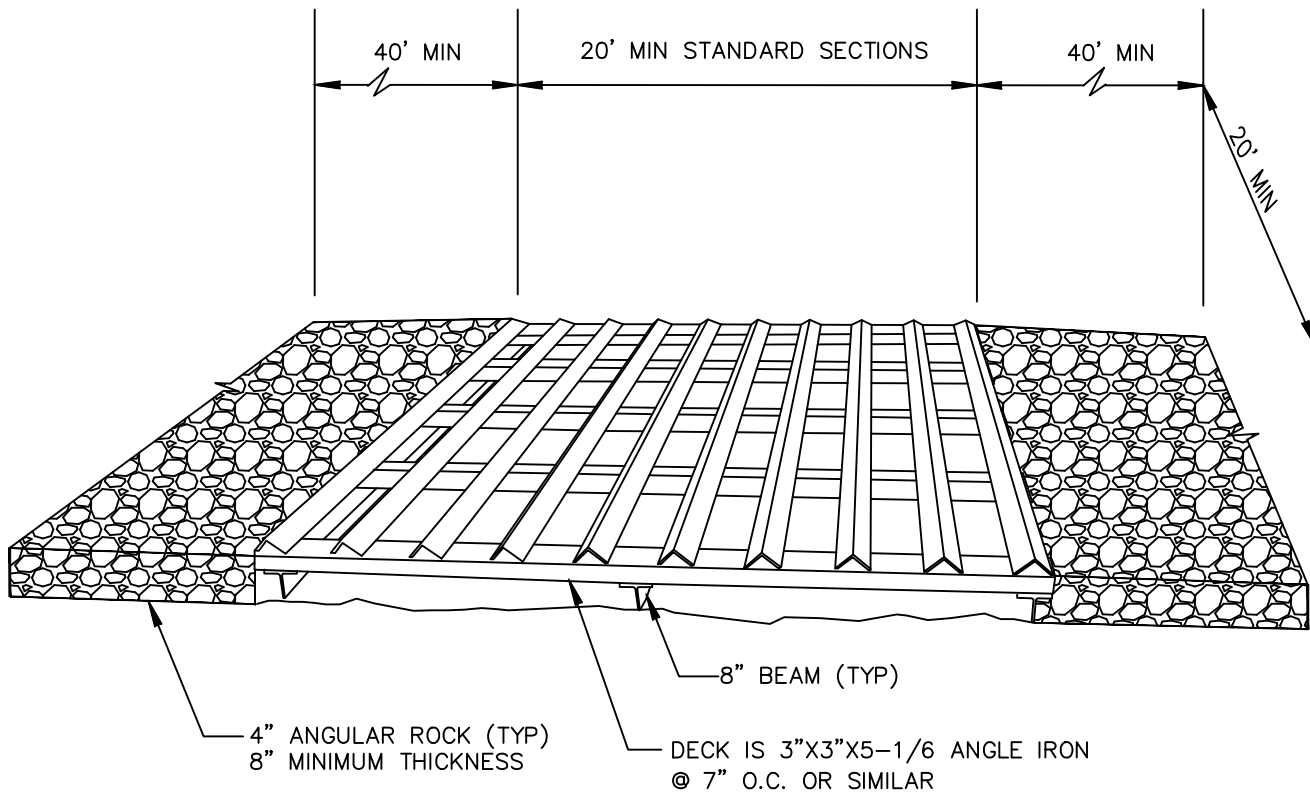
DATE: 1/2020

DRAWING:

STM6A

NOTES:

1. ALL ROCK TO BE REMOVED UPON COMPLETION OF CONSTRUCTION
2. PUBLIC ROADWAY TO BE KEPT CLEAN AND FREE OF MUD, DIRT AND DEBRIS AT ALL TIMES



TRACKING CONTROL PAD - CATTLE GUARD



**STORM SEWER
CONSTRUCTION DRAWINGS**

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

STM6B

CONSTRUCTION SEQUENCE FOR EROSION & SEDIMENT CONTROL PRACTICES FOR SMALL CONSTRUCTION PROJECTS

1. INSTALL PERIMETER EROSION AND SEDIMENT CONTROLS

IDENTIFY THE AREAS WHERE SEDIMENT LADEN RUNOFF COULD LEAVE THE CONSTRUCTION SITE, AND INSTALL PERIMETER CONTROLS TO MINIMIZE THE POTENTIAL FOR OFF-SITE SEDIMENTATION. IT'S IMPORTANT THAT PERIMETER CONTROLS ARE IN PLACE BEFORE ANY LOT EXCAVATION ACTIVITIES BEGIN.

PREFERRED METHODS

- PROTECT DOWN-SLOPE AREAS WITH VEGETATIVE FILTER STRIPS
- PROTECT DOWN-SLOPE AREAS WITH SILT FENCES AND OTHER APPROPRIATE PRACTICES
- INSTALL STABLE CONSTRUCTION TRAFFIC ENTRANCE

2. PREPARE THE SITE FOR CONSTRUCTION

PREPARE THE SITE FOR CONSTRUCTION AND FOR INSTALLATION OF UTILITIES. NOTIFY ALL CONTRACTORS (ESPECIALLY THE EXCAVATION CONTRACTOR) OF AREAS TO BE PROTECTED.

PREFERRED METHOD

- SALVAGE AND STOCKPILE TOPSOIL OR SUBSOIL

3. BUILD STRUCTURE(S) AND CONNECT UTILITIES

CONSTRUCT THE STRUCTURE AND CONNECT THE UTILITIES.

4. MAINTAIN CONTROL PRACTICES

MAINTAIN ALL EROSION AND SEDIMENT CONTROL PRACTICES UNTIL CONSTRUCTION IS COMPLETED AND THE LOT IS STABILIZED.

5. RE-VEGETATE BUILDING SITE

IMMEDIATELY AFTER ALL OUTSIDE CONSTRUCTION ACTIVITIES ARE COMPLETED, STABILIZE THE LOT WITH LANDSCAPING, SEED AND/OR MULCH.

METHODS

- REDISTRIBUTE THE STOCKPILED SUBSOIL AND TOPSOIL
- SEED OR LANDSCAPE BARE AREAS
- MULCH NEWLY SEEDED AREAS

6. REMOVE REMAINING TEMPORARY CONTROL MEASURES

ONCE THE SOD AND/OR VEGETATION IS WELL ESTABLISHED, REMOVE ANY REMAINING TEMPORARY EROSION AND SEDIMENT CONTROL PRACTICES.

EROSION CONTROL SEQUENCE FOR SMALL CONSTRUCTION PROJECTS



STORM SEWER
CONSTRUCTION DRAWINGS

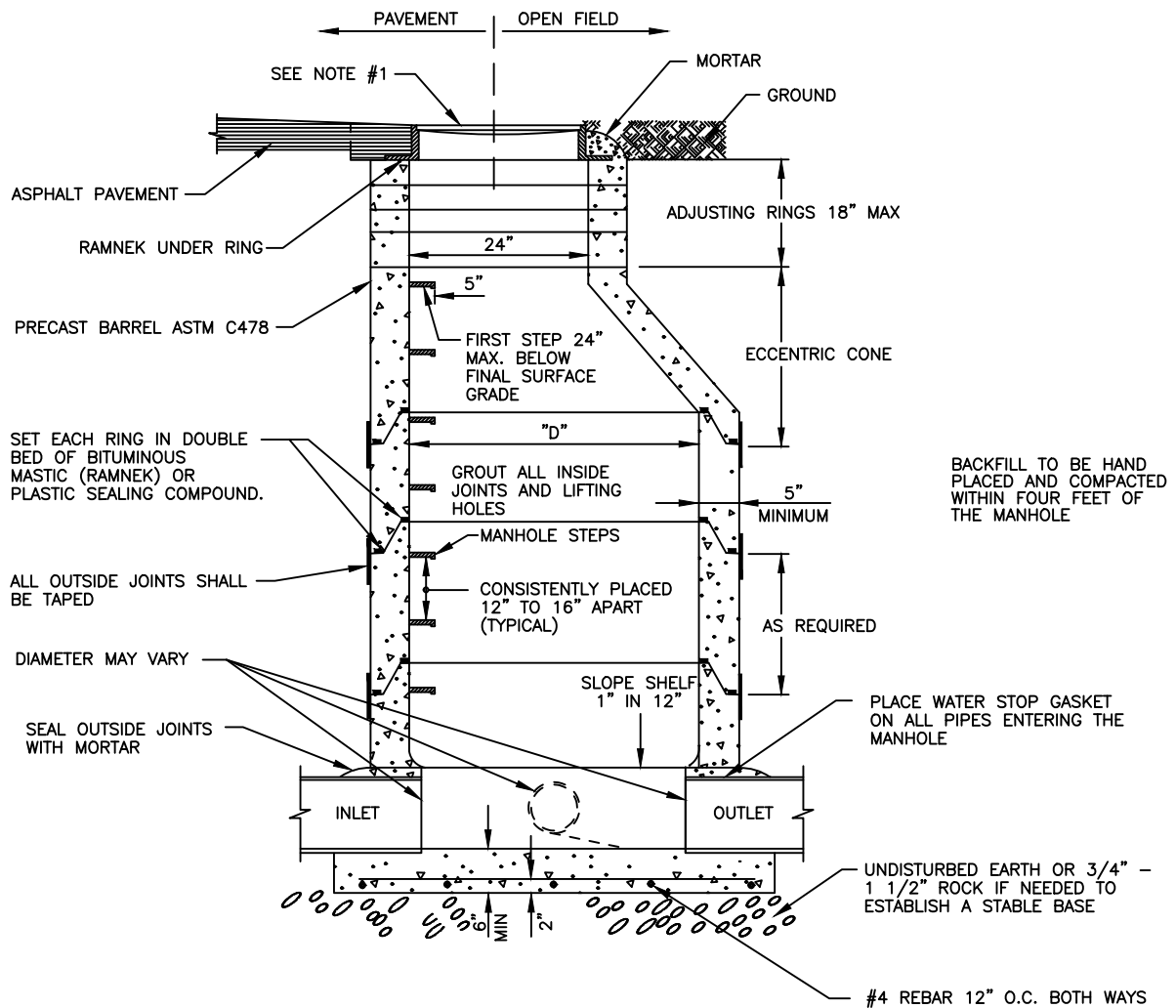
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

STM7



SECTION

NOTES:

1. FINAL GRADE OF MANHOLE COVERS SHALL BE 1/4" LOWER THAN FINAL STREET.
2. NO STEPS ALLOWED IN THE ADJUSTING RING AREA.
3. PRECAST CONCRETE SECTIONS SHALL CONFORM TO ASTM C-478.
4. BLOCK-OUTS, WHEN APPROVED, SHALL EXTEND A MAX. OF 6" PAST MANHOLE O.D. AND BE SATISFACTORILY PLUGGED AND SEALED.
5. MANHOLES NOT IN ASPHALT OR CONCRETE SHALL BE RAISED 6" ABOVE FINAL GRADE AND A CONCRETE COLLAR INSTALLED WITH A GREEN CARSONITE POST

STANDARD MANHOLE



STORM SEWER
CONSTRUCTION DRAWINGS

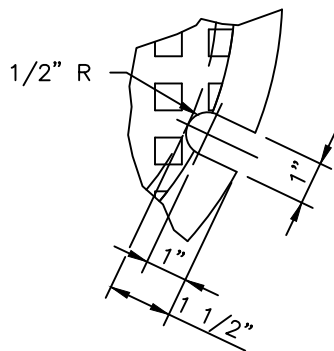
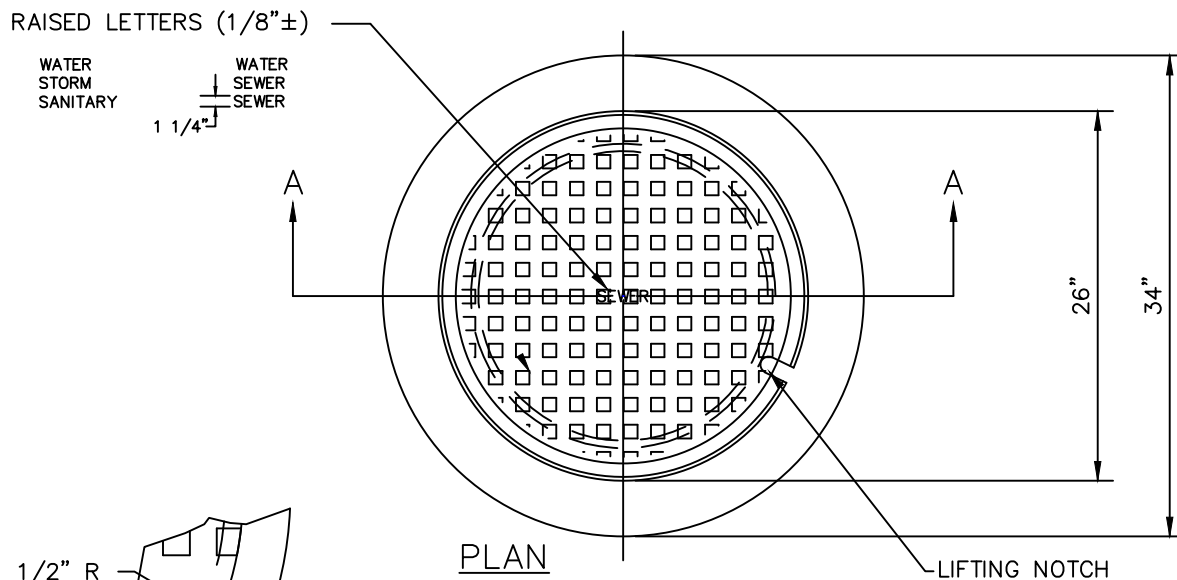
BY: JME

SCALE: NTS

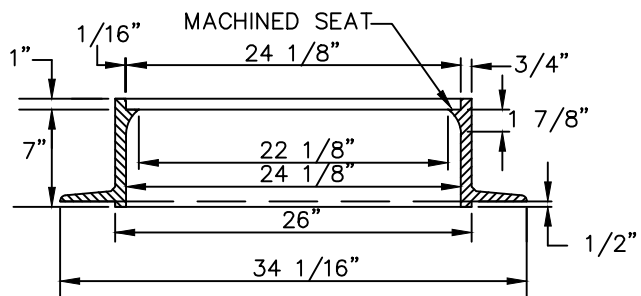
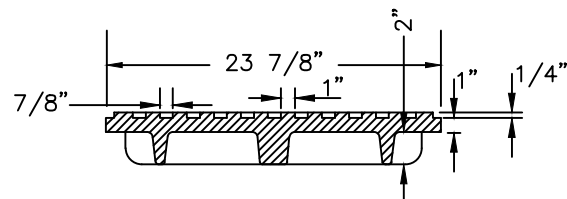
DATE: 1/2020

DRAWING:

STM8A



LIFTING NOTCH



SECTION A-A

1. CASTING SPECIFICATIONS: ASTM A-48 WITH A MINIMUM TENSILE STRENGTH OF 25 KSI (CLASS 25)
2. ALL CASTINGS TO BE DIPPED IN ASPHALT BASE PAINT (OR APPROVED EQUAL)
3. CASTINGS SHALL BE AS SPECIFIED BELOW OR APPROVED EQUAL:

MANUFACTURERS	CAT. #
NEENAH	R-1706
CASTINGS, INC.	MH-400-24 C.I.
HUTCHINSON FDRY. & STL. INC.	MH-400
EAST JORDAN	FRAME-2420Z

5. SEE STM10 FOR MANHOLE RING AND COVER FOR INLETS.

24" MANHOLE RING AND COVER

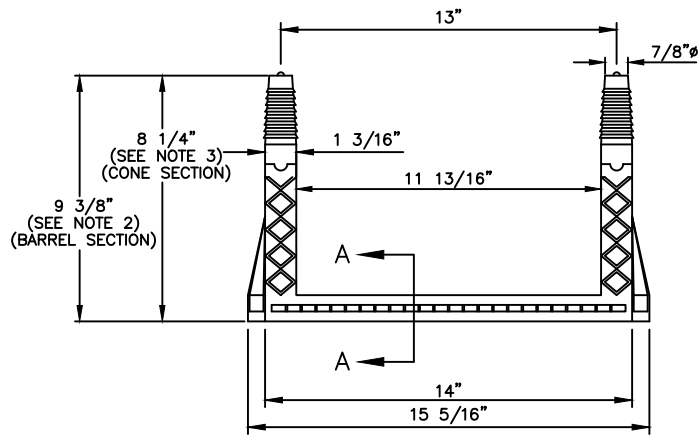


STORM SEWER
CONSTRUCTION DRAWINGS

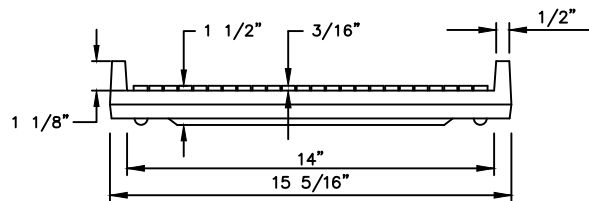
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DATE: 12/2021

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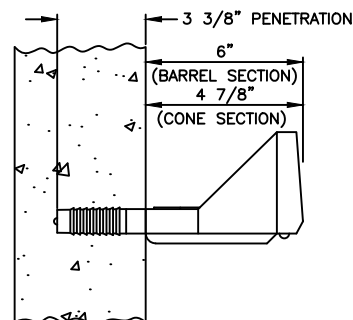
STM8B



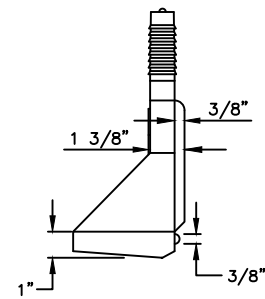
PLAN



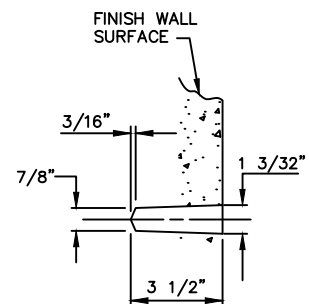
ELEVATION



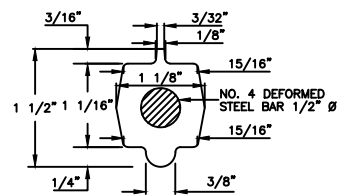
DETAIL



END VIEW



DETAIL
PIN BLOCK OUT



SECTION A-A

POLYPROPYLENE REINFORCED PLASTIC STEP

NOTES:

- ASTM SPECIFICATIONS:
 - ASTM C-478
 - ASTM A-615 GRADE 60 (STEEL REBAR).
 - ASTM 2146-69, TYPE III, GRADE 16906 (POLYPROPYLENE).
- STEPS INSTALLED IN MANHOLE BARREL SECTIONS OR VERTICAL WALLS OF STRUCTURES SHALL HAVE A 9 3/8 INCH LEG AND SHALL PROJECT FROM THE WALL 6 INCHES.
- STEPS INSTALLED IN MANHOLE CONE SECTIONS SHALL HAVE AN 8 1/4 INCH LEG AND SHALL PROJECT FROM THE WALL 4 7/8 INCHES.
- ALL STEPS SHALL HAVE A PENETRATION DEPTH INTO THE WALL OF 3 3/8 INCHES.
- STEPS SHALL BE INSTALLED BY THE "PRESS-FIT" METHOD UTILIZING A SPECIALLY TAPERED PIN TO FORM THE INSERT HOLE AS SHOWN, FOLLOWING MANUFACTURER'S RECOMMENDED PROCEDURE AND SHALL NOT BE GROUTED IN PLACE.
- INSTALLED STEPS SHALL BE CAPABLE OF WITHSTANDING A PULL OUT FORCE OF 2500 LB. PER LEG FOR A MINIMUM PERIOD OF TWO MINUTES.
- PINS MUST BE SMOOTH AND CONTINUOUSLY TAPERED. DIMENSIONS OF THE PIN AND THE INSERTED PORTION OF THE MANHOLE STEP ARE TYPICAL ONLY. W.M.D. INSTALLATIONS REQUIRE A MATCHED COMBINATION OF A TAPERED INSERT PIN AND MANHOLE STEP, AS RECOMMENDED OR REQUIRED BY SPECIFIC MANUFACTURER OF THE STEP TO BE USED.
- THIS STEP CAN ALSO BE USED IN TOE POCKET INSTALLATIONS PROVIDED 5" TOE CLEARANCE IS ALLOWED.

MANHOLE STEPS



STORM SEWER
CONSTRUCTION DRAWINGS

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

STM9

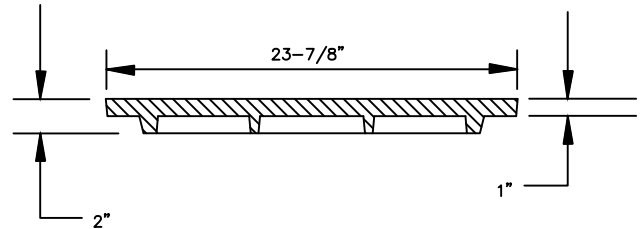
TYPE R INLET COVER



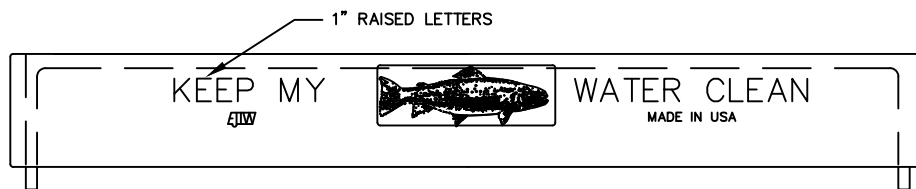
1-5/8" LETTERS

OPEN PICK

NOTE:
MATERIAL TO BE CAST GRAY IRON
ASTM A-48 CLASS 35B, NO PAINT



TYPE 13 INLET

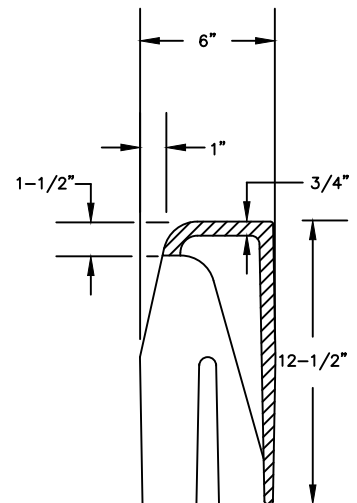


1" RAISED LETTERS

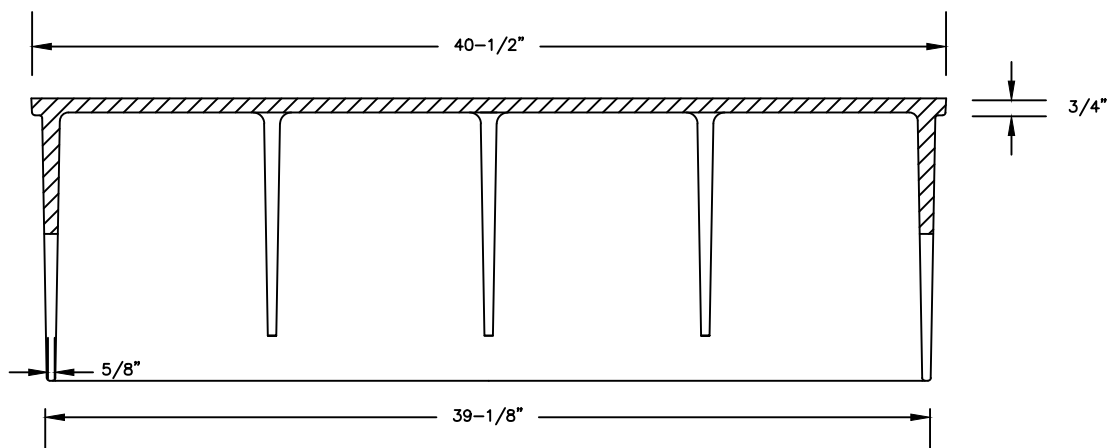
KEEP MY



WATER CLEAN
MADE IN USA



SECTION



SECTION

INLET AND INLET COVER



STORM SEWER
CONSTRUCTION DRAWINGS

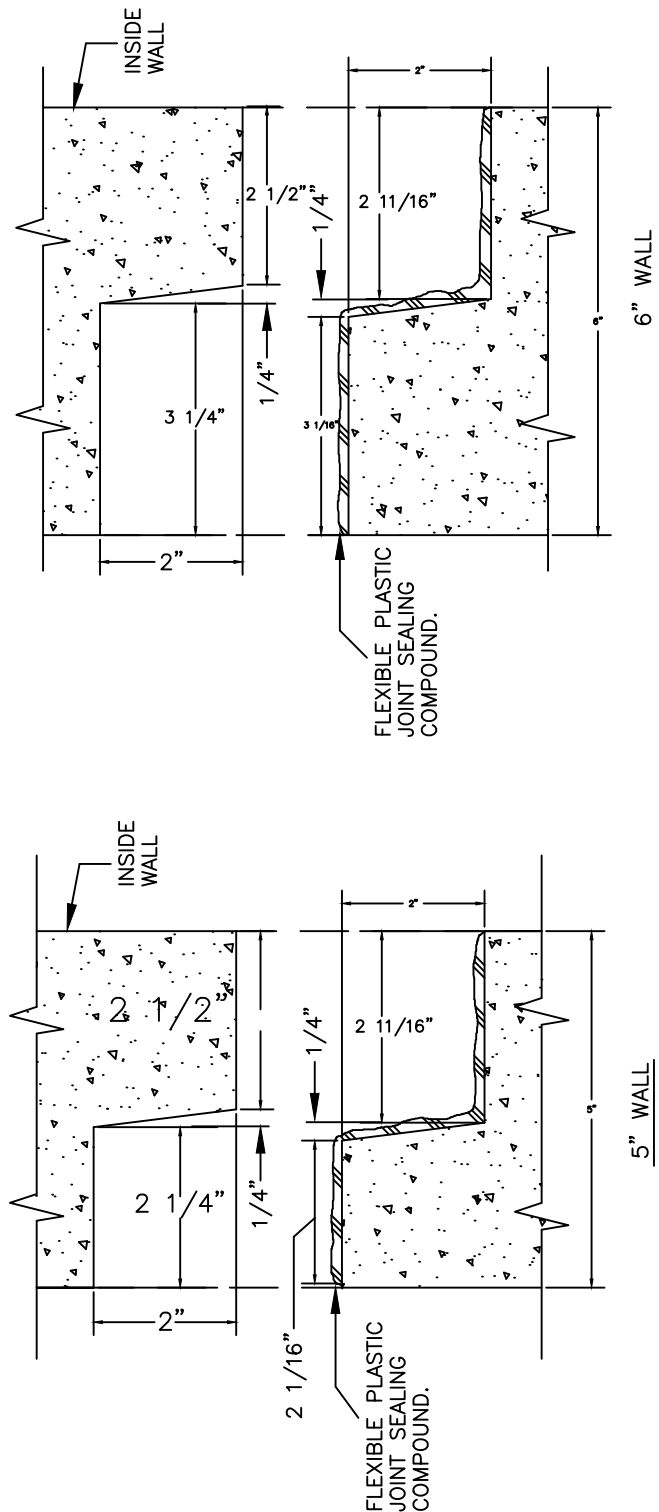
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

STM10



SHIPLAP JOINTS FOR
REINFORCED CONCRETE M.H. SECTIONS
NO SCALE

NOTES:

1. T= WALL THICKNESS OF PIPE FURNISHED.
2. THE CONTRACTOR SHALL SUBMIT ALL TOLERANCES AND DIMENSIONS, REQUIRED BY THE SPECIFIC PIPE JOINT DETAILS SHOWN, TO THE ENGINEER PRIOR TO FABRICATION.
3. ALL DIMENSIONS SHALL BE GIVEN IN INCHES, UNLESS OTHERWISE NOTED, AND ARE FOR BELL AND SPIGOT IN CONCENTRIC POSITION. DEFLECTED PIPE JOINT TOLERANCES & DIMENSIONS SHALL ALSO BE FURNISHED.
4. JOINT CLEARANCE DIMENSION K IS AT CLOSEST POINT WITHIN DISTANCE A.
5. THESE JOINT CONFIGURATIONS ARE IN ACCORDANCE WITH BUREAU OF RECLAMATION'S "TYPE R" JOINT DETAILS.
6. RUBBER "O" RING GASKET SHALL BE IN CONFORMANCE W/ASTM C-443 OR C-361.
7. APPLICABLE CONCRETE PIPE JOINT SPECIFICATIONS:
 - A. ASTM C-76
 - B. ASTM C-361
8. STEEL REINFORCEMENT SHALL BE IN ACCORDANCE WITH THE APPROPRIATE ASTM SPECIFICATION FOR THE PIPE SIZE AND STRENGTH CLASS AS SPECIFIED ON PLAN/PROFILE DRAWINGS.

CONCRETE PIPE JOINTS - SHIPLAP



STORM SEWER
CONSTRUCTION DRAWINGS

BY: JME

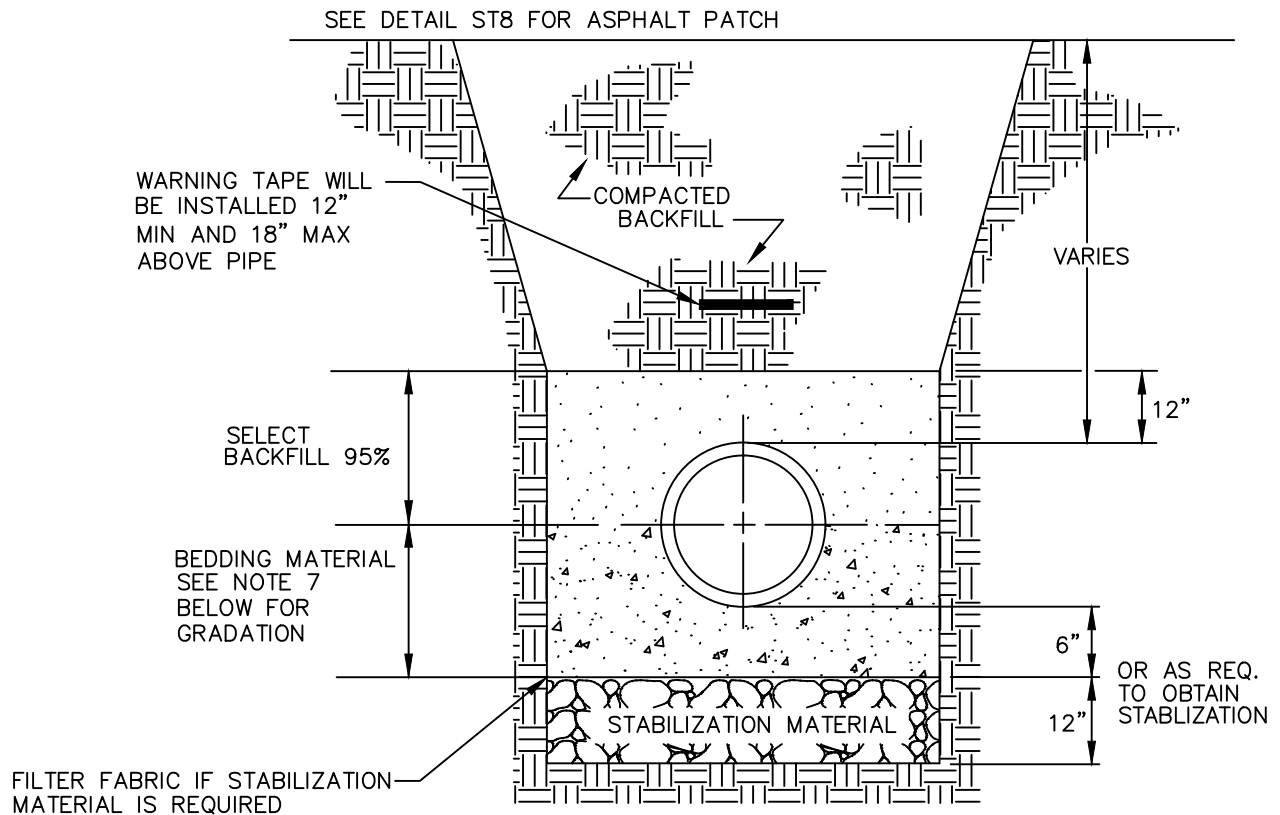
SCALE: NTS

DATE: 1/2020

DRAWING:

STM11A

STM11B



NOTES:

1. FULL TRENCH SECTION IN ROADWAY OR STREET R.O.W. LIMITS WILL REQUIRE 95% S.P.D. TRENCH ZONE ABOVE BEDDING MATERIALS, OUTSIDE OF STREET R.O.W. WILL REQUIRE 90% S.P.D.
2. FILTER FABRIC IS REQUIRED IF STABILIZATION MATERIAL IS USED. THE FABRIC SHALL BE INSTALLED AS SHOWN IN THE DETAIL.
3. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKMEN AND PROTECTION OF OTHER UTILITIES IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL SAFETY REGULATIONS.
4. PIPE SHALL BE BEDDED FROM 6" BELOW THE BOTTOM OF THE PIPE TO THE HORIZONTAL CENTERLINE OF THE PIPE. SEE NOTE 7 FOR BEDDING MATERIAL GRADATION.
5. TRENCH WIDTH SHALL NOT BE MORE THAN 24" NOR LESS THAN 12" WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE.
6. SHOULD THE TRENCH BE EXCAVATED WIDER THAN ALLOWED, A CONCRETE CRADLE SHALL BE PLACED WITH 2500 P.S.I. CONCRETE FROM TRENCH BOTTOM TO PIPE SPRINGLINE.
7. BEDDING MATERIAL SHALL MEET THE GRADATION OF CDOT "NO.67 COARSE AGGREGATE" AS SPECIFIED IN SECTION 703.02 IN THE LATEST EDITION OF THE CDOT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION".

STORM SEWER TRENCH DETAIL



STORM SEWER
CONSTRUCTION DRAWINGS

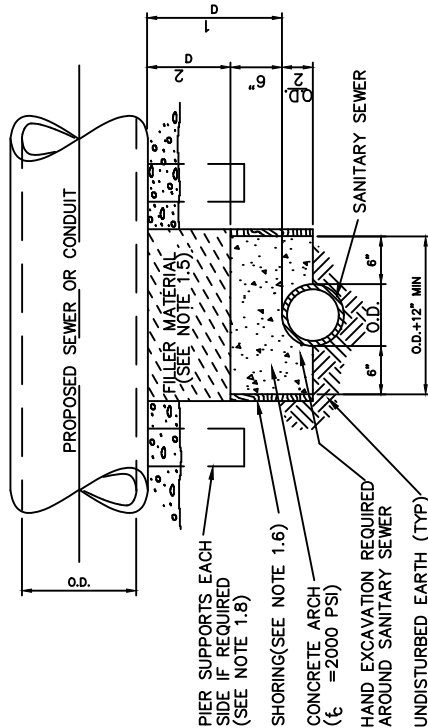
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SCALE: NTS

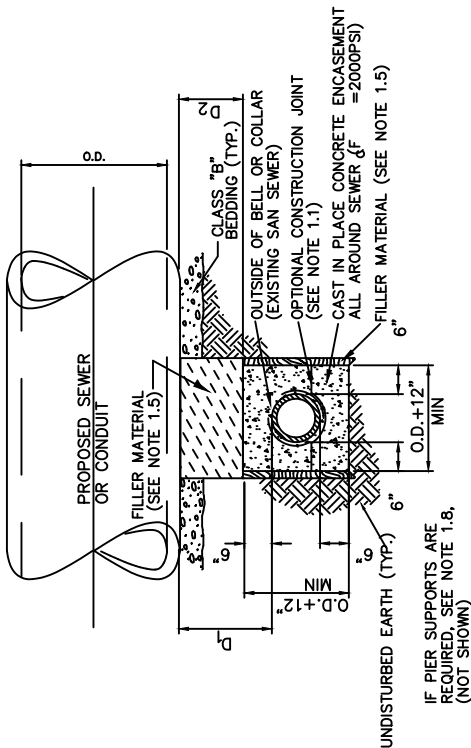
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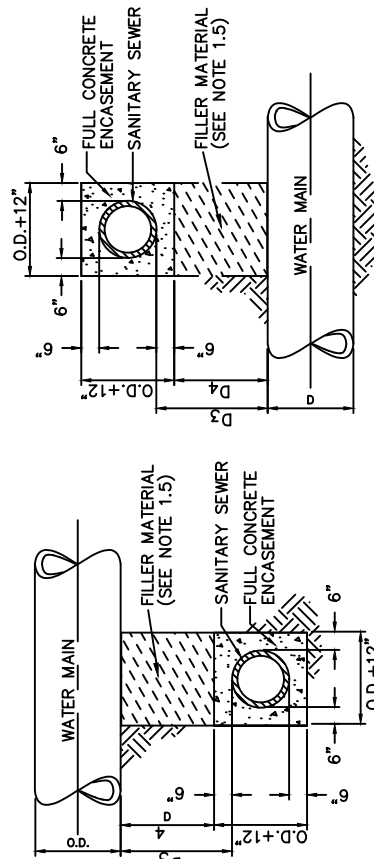
STM12



TYPE I
CONCRETE ENCASEMENT FOR SANITARY SEWERS
(CONCRETE ARCH) NO SCALE (RIGID CONDUITS ONLY)



TYPE III
CONCRETE ENCASEMENT FOR SANITARY SEWERS
(FULL ENCASEMENT) NO SCALE (RIGID CONDUITS ONLY)



TYPE IIA
SANITARY SEWER CROSSING UNDER WATER MAIN
IF D > 3'-2\"/>

TYPE IIB
SANITARY SEWER CROSSING OVER WATER MAIN
FULL ENCASEMENT REQUIRED
REGARDLESS OF DIMENSION D₃

TYPE II
CONCRETE ENCASEMENT FOR SANITARY SEWERS
CROSSING OVER OR UNDER WATER MAIN
NO SCALE (RIGID CONDUITS ONLY)

GENERAL NOTES FOR TYPE I, II & III ENCASEMENT
1.1 CONCRETE TO BE CAST AGAINST UNDISTURBED SOIL OR SHORING. IF OPTIONAL CONSTRUCTION JOINT IS USED, BOTTOM HALF OF ENCASEMENT IS POURED SEPARATELY. A ONE INCH LAYER OF SAND OR MORTAR SHALL BE PLACED BETWEEN BOTTOM OF SANITARY SEWER AND TOP OF CONCRETE.
1.2 LENGTH OF ENCASEMENT FOR :
(A) TYPE I & III ENCASEMENT SHALL EXTEND FULL TRENCH WIDTH EXCAVATED FOR PROPOSED SEWER OR CONDUIT.
(B) TYPE II ENCASEMENT SHALL EXTEND AT LEAST 10 FEET EACH SIDE OF WATER MAIN.
1.3 UNLESS OTHERWISE NOTED ON PLAN/PROFILE DRAWINGS, TYPE I, II & III ENCASEMENTS NEED NOT BE REINFORCED. REINFORCEMENT, IF REQUIRED, TO BE SPECIFIED AND DETAILED SEPARATELY ON PLAN & PROFILE DRAWINGS.
1.4 TYPE I, II OR III ENCASEMENT REQUIRED UNDER FOLLOWING CONDITIONS :
(A) TYPE I OR TYPE III IF D₁ ≤ 18\"/>

1.5 FILLER MATERIAL BETWEEN CONDUITS TO BE :
(A) APPROVED COMPRESSIBLE MATERIAL SUCH AS STYROFOAM, ETC., IF D₂ & D₄ ≤ 6\"/>

1.6 SHORING OR SHEETING, IF USED, TO BE CUT OFF AT TOP OF ENCASEMENT.

1.7 THESE ENCASEMENT DETAILS MAY ALSO BE APPLICABLE FOR CONDUITS OTHER THAN STORM OR SANITARY SEWER INSTALLATIONS.

1.8 IN CERTAIN SITUATIONS WHERE CONDUIT DIAMETER 'D' IS EXTREMELY LARGE, PIER SUPPORTS EACH SIDE OF SANITARY SEWER MAY ALSO BE REQUIRED. IF REQUIRED, SUPPORTS TO BE SPECIFIED AND DETAILED SEPARATELY ON PLAN AND PROFILE DRAWINGS. NO PIPE JOINTS OVER TOP OF WATER MAIN.

1.9 DETAILS SHOWN CONSIDER RIGID CONDUITS ONLY. FLEXIBLE CONDUITS REQUIRE SPECIAL CONSIDERATION.

CONCRETE ENCASEMENT OF RIGID CONDUITS (1 OF 2)

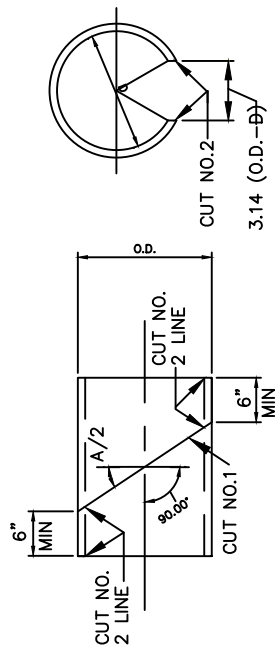
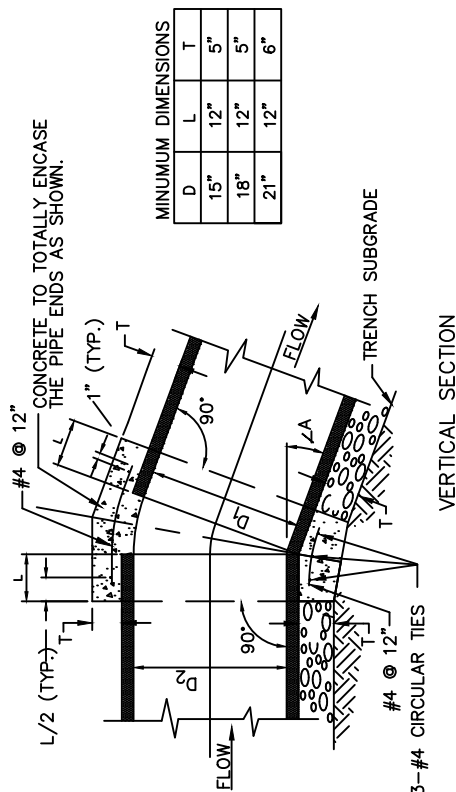


STORM SEWER
CONSTRUCTION DRAWINGS

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:
STM13A

TO BE USED ONLY WHERE NECESSARY AND AS AUTHORIZED BY THE TOWN ENGINEER



CUT NO.1: SAW THE TUBE AT AN ANGLE OF A/2 WITH THE TRANSVERSE PLANE. REVERSE ONE SECTION AND TAPE BOTH SECTIONS TOGETHER FORMING THE DEFLECTION ANGLE A.

CUT NO.2: SAW THE TUBE LONGITUDINALLY REMOVING A STRIP 3.14 (D₀-D) INCHES WIDE ON THE SIDE OPPOSITE THE OPEN JOINT. BEND THE ENDS OF THE TUBE TOGETHER AND INSERT THE TUBE IN THE PIPE.

NOTES: FOR STORM LINE CONNECTORS ONLY, NOT TO BE USED ON MAINLINE SEWERS.

AN INTERIOR FORM OF UNSEALED SONO-TUBE OR EQUAL SHALL BE USED TO PROVIDE A SMOOTH INTERIOR JOINT. (SEE DETAIL A)

DETAIL "A"
SONO-TUBE, OR EQUAL, INTERIOR FORM

GENERAL NOTES

1. A CONCRETE COLLAR IS REQUIRED WHERE THE CHANGE IN GRADE EXCEEDS 0.10 OF A FOOT PER FOOT.
2. GAP LIMITS

PIPE DIAMETER	COLUMN "A" (SEE A BELOW)	COLUMN "B" (SEE B BELOW)
21" OR LESS	1/2"	1"

- A. IF THE "EXTREME OUTER ENDS" OF THE PIPE LEAVE A GAP THAT EXCEEDS VALUES IN COLUMN "A" OR COLUMN "B", A CONCRETE COLLAR IS REQUIRED.
 - B. IF THE GAP EXCEEDS 6 INCHES, A MANHOLE STRUCTURE IS REQUIRED.
 3. CONCRETE COLLAR SHALL NOT BE USED FOR A SIZE CHANGE ON THE MAIN LINE.
 4. FOR PIPE SIZE NOT LISTED USE NEXT SIZE LARGER.
 5. WHERE REINFORCING IS REQUIRED THE DIAMETER OF THE CIRCULAR TIES SHALL BE $D+(2X \text{ WALL THICKNESS})+T$.
 6. REINFORCING SHALL BE USED WHERE THE SPACES BETWEEN THE EXTREME OUTER ENDS IS $2 \frac{1}{2}"$ OR LARGER.
- | PIPE DIAMETER | SPACE BETWEEN EXTREME OUTER ENDS | NO. OF CIRCULAR TIES |
|---------------|----------------------------------|----------------------|
| 21" OR LESS | $2 \frac{1}{2}"$ | 3 |
- WHERE THE SPACE BETWEEN PIPE LONGITUDINAL ENDS EXCEEDS $2 \frac{1}{2}"$, THE NUMBER OF CIRCULAR TIES SHALL BE INCREASED TO MAINTAIN AN APPROXIMATE SPACING OF 6" OC.
7. AN INTERIOR FORM OF UNSEALED SONO-TUBE OR EQUAL SHALL BE USED TO PROVIDE A SMOOTH INTERIOR JOINT. THE PAPER FORM MAY BE LEFT IN PLACE (SEE DETAIL A).
 8. THIS DETAIL APPLIES "ONLY" TO PIPE 21" DIAMETER OR LESS.

PIPE DIAMETER	SPACE BETWEEN EXTREME OUTER ENDS	NO. OF CIRCULAR TIES
21" OR LESS	2 1/2"	3

WHERE THE SPACE BETWEEN PIPE LONGITUDINAL ENDS EXCEEDS 2 1/2", THE NUMBER OF CIRCULAR TIES SHALL BE INCREASED TO MAINTAIN AN APPROXIMATE SPACING OF 6" OC.

7. AN INTERIOR FORM OF UNSEALED SONO-TUBE OR EQUAL SHALL BE USED TO PROVIDE A SMOOTH INTERIOR JOINT. THE PAPER FORM MAY BE LEFT IN PLACE (SEE DETAIL A).
8. THIS DETAIL APPLIES "ONLY" TO PIPE 21" DIAMETER OR LESS.

CONCRETE ENCASEMENT OF RIGID CONDUITS (2 OF 2)



STORM SEWER CONSTRUCTION DRAWINGS

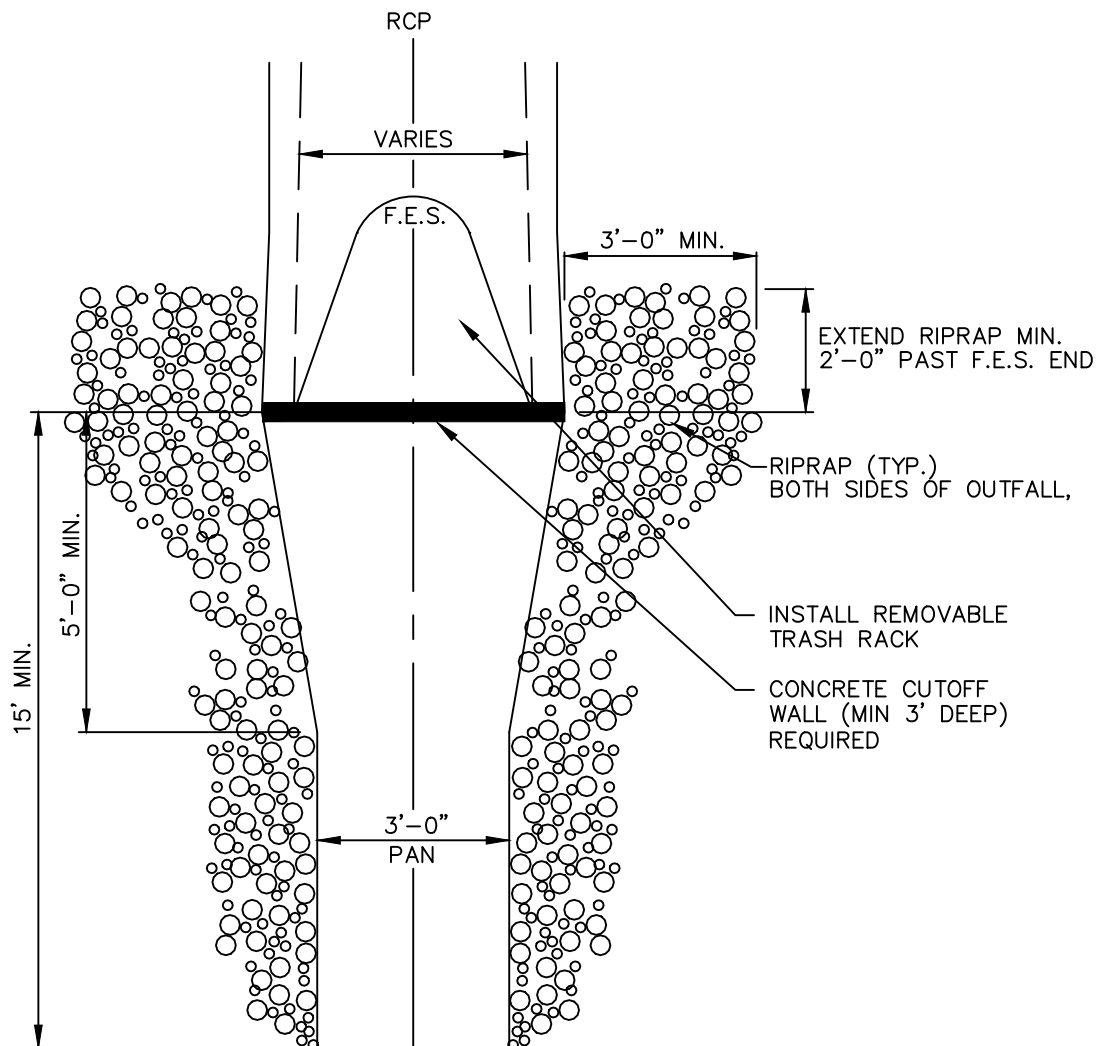
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

STM13B



FLARED END SECTION WITH TRICKLE CHANNEL



STORM SEWER
CONSTRUCTION DRAWINGS

BY: JME

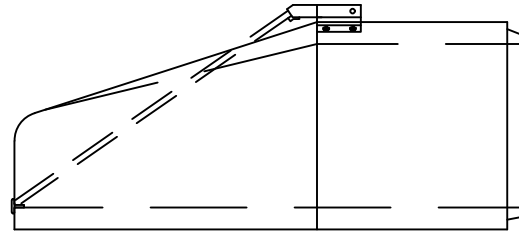
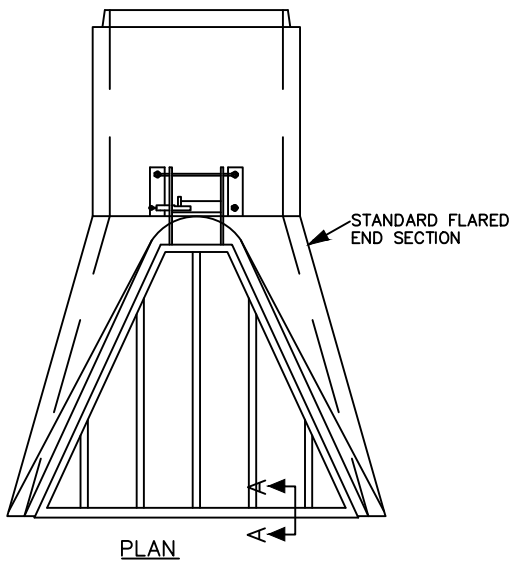
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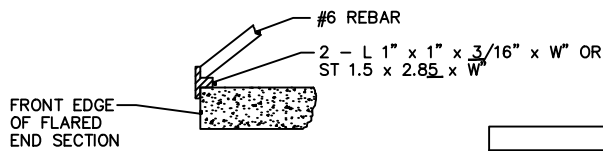
DRAWING:

STM14

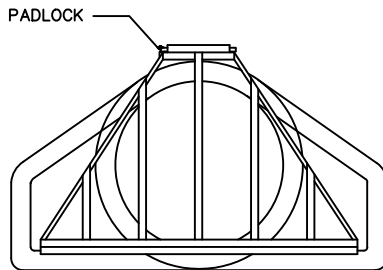
TRASH GUARD INSTALLED



SIDE VIEW



SECTION A-A



ELEVATION

TABLE OF DIMENSIONS												
TRASH GUARD										MOUNTING		
INSIDE DIA	A	B	D	G	L	W	C	H	J	R	S	T
(INCHES)							(EA)	(DEGREE)		(INCHES)		
18	10	6-1/2	8	3	31	28	3	45	45	11-1/2	5	5
24	12	9-1/2	8	3	47-1/2	40	5	35	55	15	6-1/2	5-1/2
30	15	12-1/2	9	3	59-3/4	52	5	35	55	18-1/2	8	6
36	15	15-1/2	8-1/2	4	71-1/4	58	7	35	55	22	9-1/2	6-1/2
42	21	18-1/2	9	4	75	64	7	40	50	25-1/2	11	7
48	24	21-1/2	8	4	82-3/4	70	9	40	50	29	12-3/4	7-1/2

NOTE: AN INDEPENDENT DESIGN AND DETAIL WILL BE REQUIRED FOR PIPE DIAMETERS GREATER THAN 48"

GENERAL NOTES

1. TRASH GUARDS SHALL BE INSTALLED AT LOCATIONS SHOWN IN THE PLANS OR SPECIFIED BY THE ENGINEER
2. PADLOCKS FOR LOCKING BAR WILL BE FURNISHED AND INSTALLED BY THE CONTRACTOR AND KEYS SUBMITTED TO THE PUBLIC WORKS DEPT.
3. THE TRASH GUARDS ARE NOT DESIGNED TO CARRY WHEEL LOADINGS AND SUCH ARE NOT TO BE USED AS SAFETY GRATES
4. IF THE FLARED END DIMENSIONS VARY FROM THOSE SHOWN IN THE STANDARD PLANS, NECESSARY ADJUSTMENTS SHALL BE MADE TO THE TRASH GUARD DIMENSIONS

TRASH GUARD FOR CONDUIT (1 OF 3)



STORM SEWER
CONSTRUCTION DRAWINGS

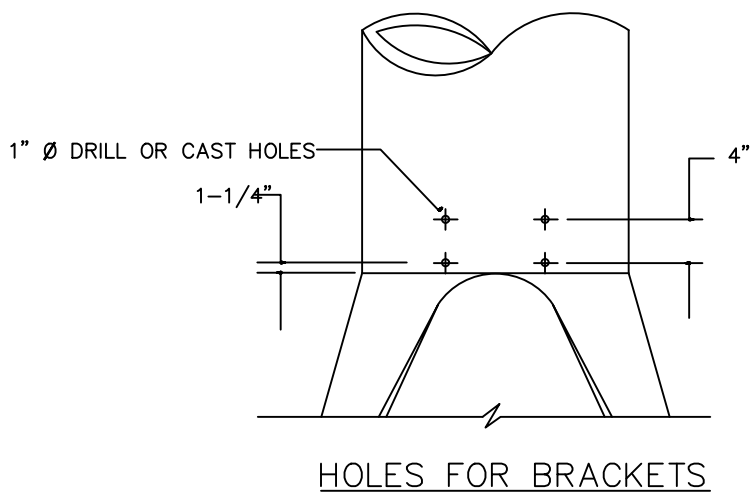
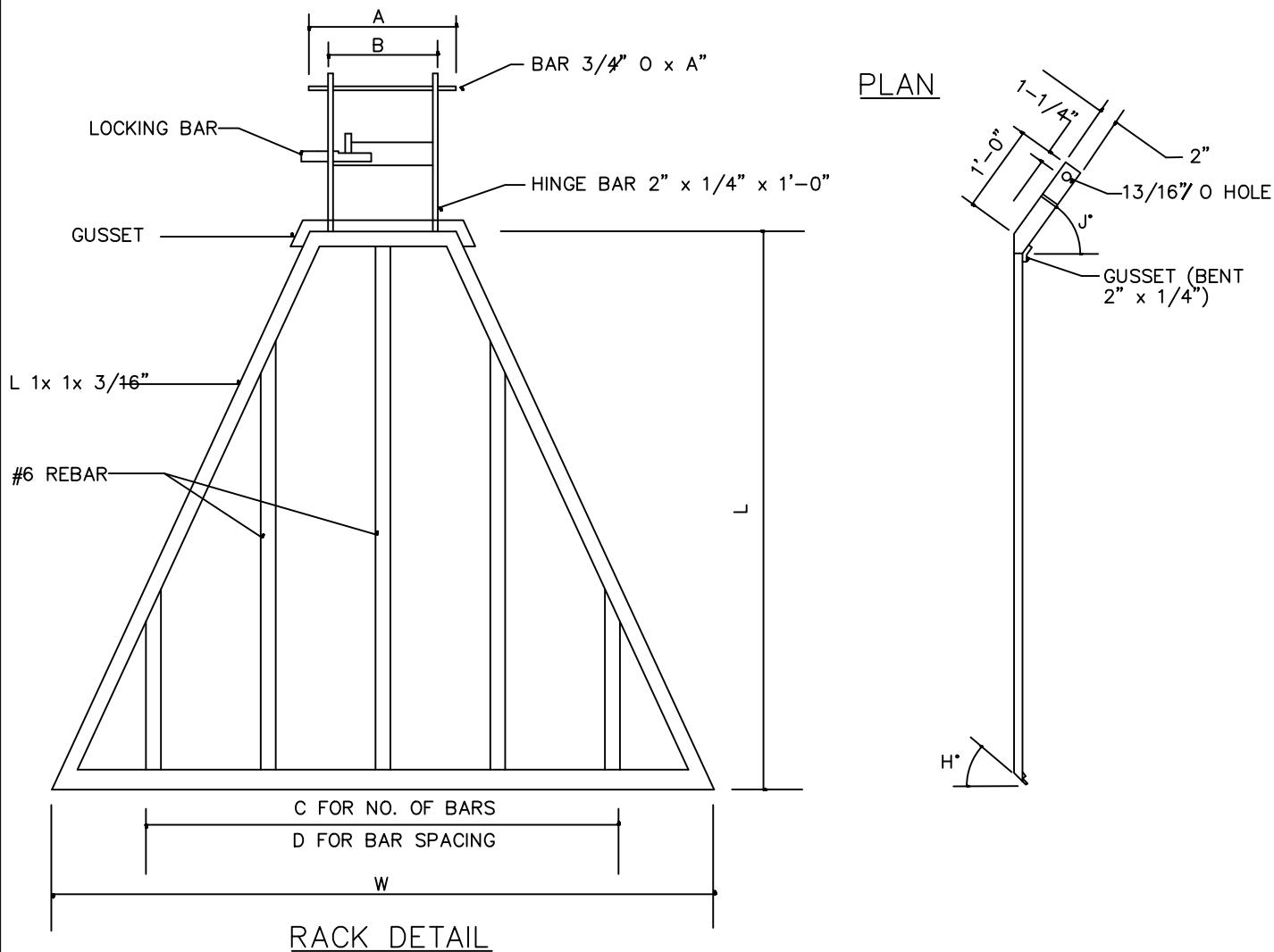
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

STM15A



TRASH GUARD FOR CONDUIT (2 OF 3)



STORM SEWER
CONSTRUCTION DRAWINGS

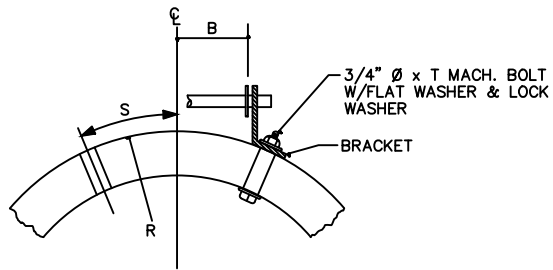
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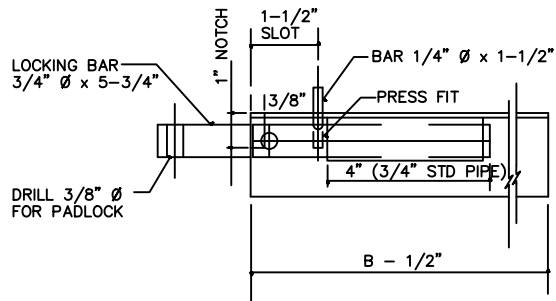
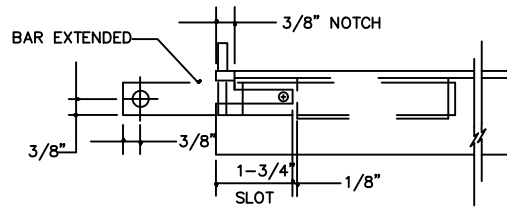
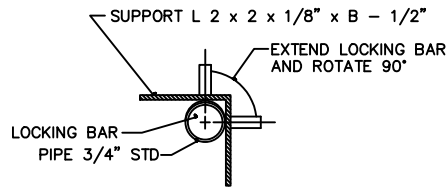
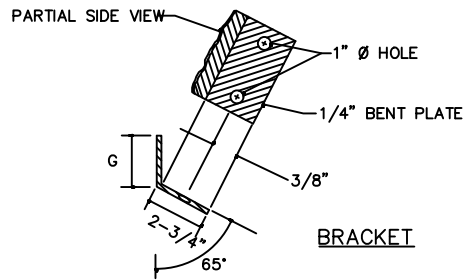
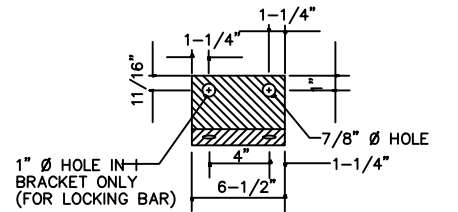
DATE: 1/2020

DRAWING:

STM15B



BRACKET & HINGE
DETAIL



LOCKING BAR &
SUPPORT

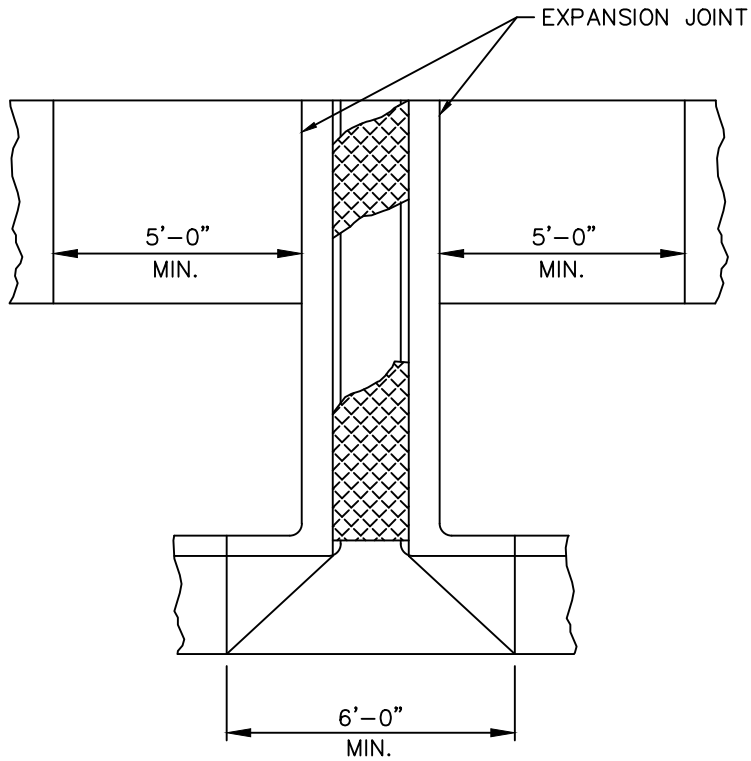
TRASH GUARD FOR CONDUIT (3 OF 3)



STORM SEWER
CONSTRUCTION DRAWINGS

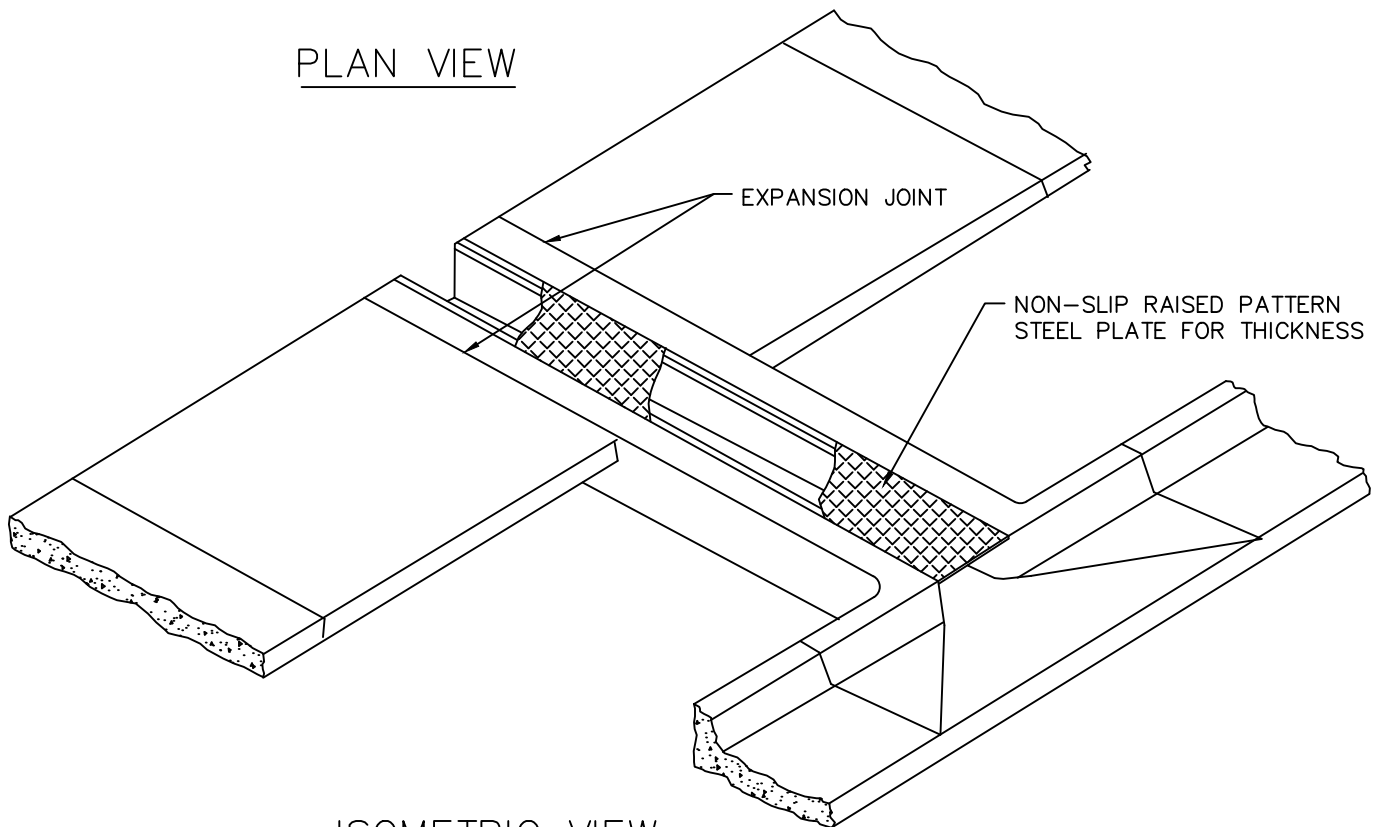
BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:
STM15C



TYPE OF WALK	LENGTH OF PLATE
L ATTACHED	L + 3"
L DETACHED	VARIES

PLAN VIEW



ISOMETRIC VIEW

SIDEWALK CHASE DETAIL (1 OF 2)



**STORM SEWER
CONSTRUCTION DRAWINGS**

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

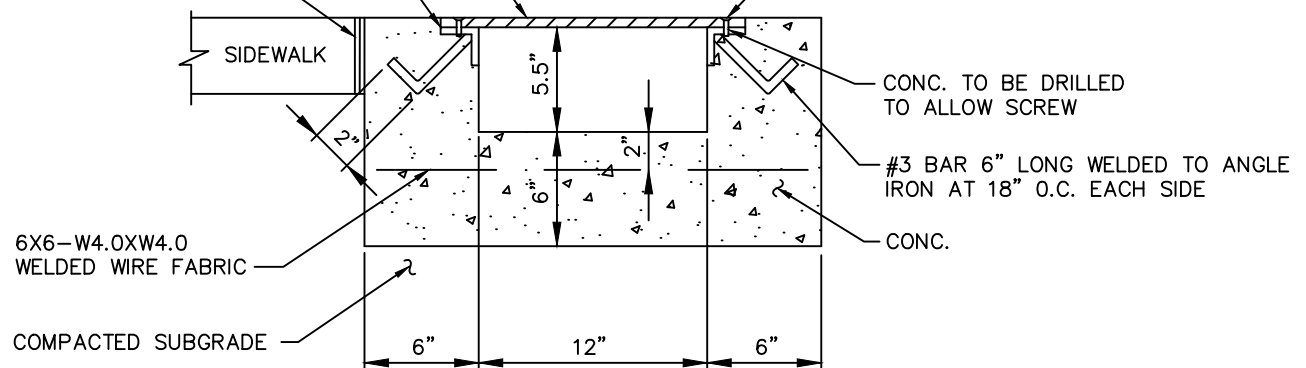
STM16A

1/2" NON-SLIP RAISED
PATTERN STEEL TREAD PLATE

2" X 2" X 1/4" ANGLE
IRON TO BE DRILLED AND
THREADED TO ALLOW SCREW

EXPANSION JOINT

1/2" X 1" FLATHEAD MACH. SCREW
BRASS OR ELECTRO-GALVANIZED
FINISH, 2' O.C.



SIDEWALK CHASE DETAIL

SIDEWALK CHASE DETAIL (2 OF 2)



**STORM SEWER
CONSTRUCTION DRAWINGS**

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

STM16B

<u>DRAWING NO.</u>	<u>TITLE</u>
TS1	ILLUMINATED STREET NAME SIGN
TS2	REGULATORY WARNING SIGN
TS3	SCHOOL FLASHING BEACON
TS4	POWER FEED FOR TRAFFIC SIGNALS
TS5	PULL BOX (PLASTIC/PREFAB)
TS6	PULL BOX (SPECIAL)
TS7	PEDESTRIAN POLE
TS8	POWER SOURCE SCHEMATIC
TS9	SIGNAL HEAD MOUNTING
TS10	CONTROLLER CABINET
TS11	CONDUIT DETAILS
TS12	FLASHING BEACON
TS13A	MASTARM POLES (MAX 55')
TS13B	MASTARM POLES (MAX 55')
TS13C	MASTARM POLES (MAX 55')
TS13D	MASTARM POLES (MAX 55')
TS14A	MASTARM POLES (>55' AND DOUBLES)
TS14B	MASTARM POLES (>55' AND DOUBLES)
TS14C	MASTARM POLES (>55' AND DOUBLES)
TS14D	MASTARM POLES (>55' AND DOUBLES)
TS14E	MASTARM POLES (>55' AND DOUBLES)

INDEX OF TRAFFIC SIGNAL DETAILS



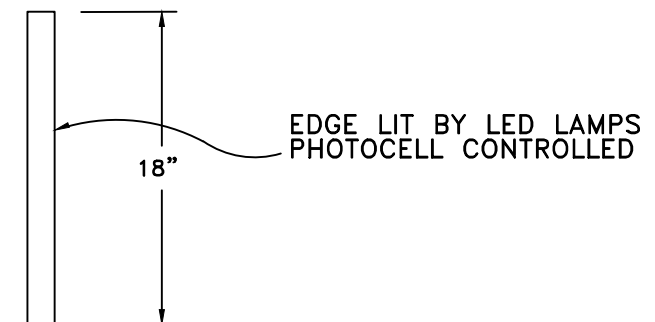
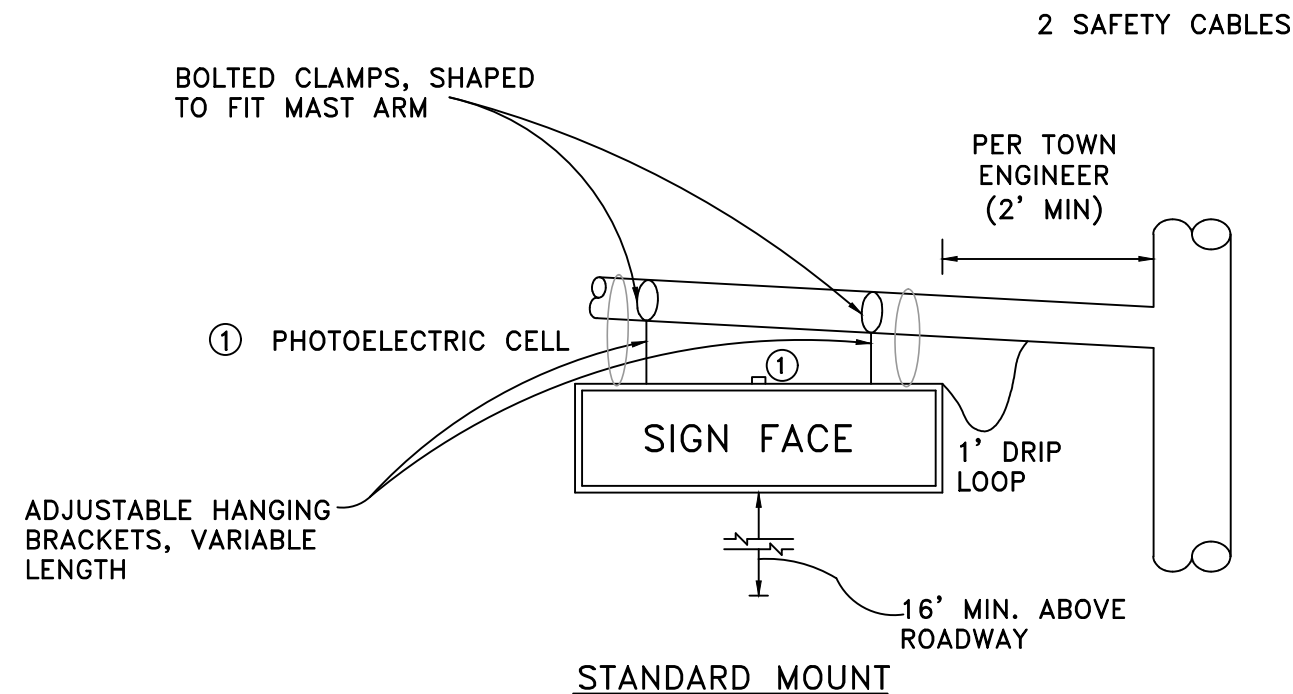
TRAFFIC SIGNAL
CONSTRUCTION
DRAWINGS

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:



SIDE VIEW

NOTES

1. FOR DETAILS ON SIGN REFER TO DETAIL NO. 922-01, TYPICAL STREET SIGNS.
2. FINAL SIGN LAYOUT AND LETTERING DETAILS PER TOWN ENGINEER.
3. SIGN TO BE DOUBLE SIDED WITH WHITE PRINT ON GREEN BACKGROUND FOR STREET NAME AND LOGO.

GENERAL NOTES

1. STREET NAME SIGN TO BE FREE-SWINGING OR LIMITED-SWINGING. SIGN FIXTURE AND PANELS SHALL WITHSTAND 90 MPH WIND LOADING, WITH STRUCTURAL REQUIREMENTS MEETING AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS," LATEST EDITION.
2. HOUSING TO BE CONSTRUCTED OF ALUMINUM.
3. NEOPRENE GASKETS SHALL BE INSTALLED BETWEEN THE SIGN PANEL FRAME AND FIXTURE HOUSING TO PREVENT WATER ENTRANCE. SCREENED WEEP HOLES SHALL BE PROVIDED ON HOUSING BOTTOM FOR DRAINAGE.
4. SAFETY CABLES (2) CONSISTING OF WIRE CABLE AND 2 CABLE CLAMPS FOR EACH SIDE INSTALLED ON EITHER END OF THE ILLUMINATED STREET NAME SIGN.



LIGHTED SIGN TYPICAL LAYOUT

ILLUMINATED STREET NAME SIGN



TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

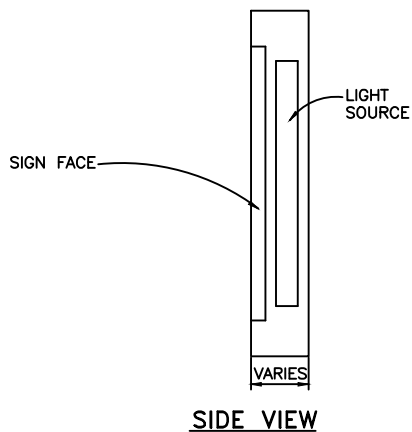
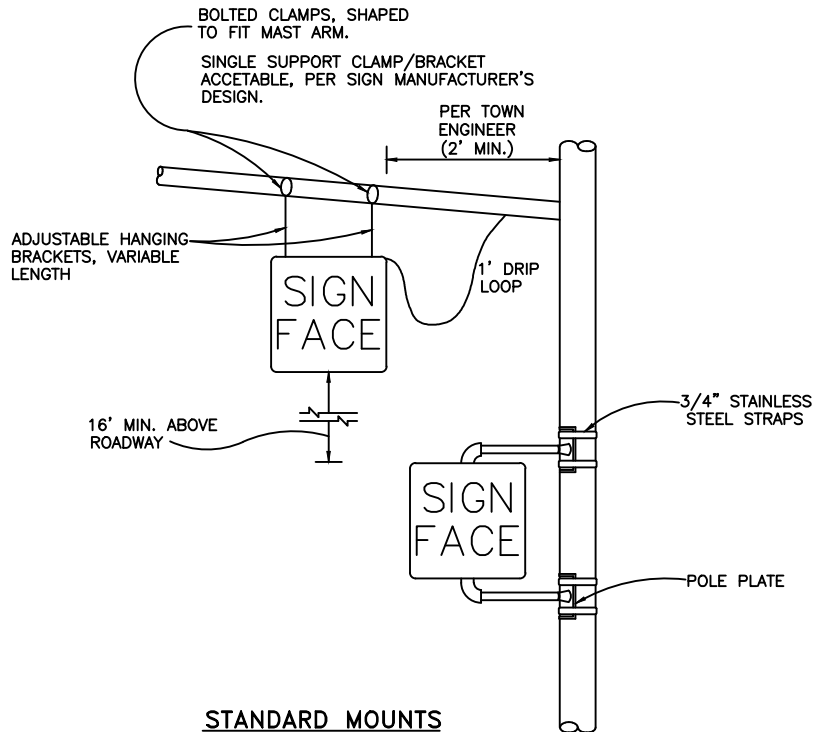
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

TS1

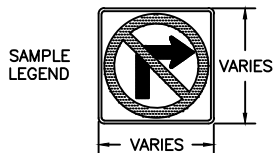


NOTES

1. LIGHT SOURCE SHALL BE LED, SIGN FACE SHALL COMPLETELY BLANK OUT WHEN NOT ENERGIZED.
2. CABINET INTERIOR AND CIRCUIT CONNECTIONS SHALL BE READILY ACCESSIBLE VIA HINGED DOORS OR REMOVABLE PANELS. THE LENS PANEL SHALL BE REMOVABLE WITHOUT THE USE OF TOOLS.

NOTES

1. SIGN MAY BE SINGLE-SIDED OR DOUBLE SIDED PER ENGINEER'S DIRECTION.
2. SIGN COLOR, LEGEND AND SIZE PER PUBLIC WORKS DIRECTOR.



TYPICAL SIGN LAYOUT

GENERAL NOTES

1. SIGN FIXTURE AND PANELS SHALL WITHSTAND 90 MPH WIND LOADING, WITH STRUCTURAL REQUIREMENTS MEETING AASHTO "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS," LATEST EDITION.
2. HOUSING SHALL BE CONSTRUCTED OF ALUMINUM UNLESS OTHERWISE DIRECTED BY ENGINEER.
3. NEOPRENE GASKETS SHALL BE INSTALLED BETWEEN THE SIGN PANEL AND FIXTURE HOUSING TO PREVENT WATER ENTRANCE. SCREENED WEEP HOLES SHALL BE PROVIDED ON HOUSING BOTTOM FOR DRAINAGE.

REGULATORY WARNING SIGN



TRAFFIC SIGNAL
CONSTRUCTION
DRAWINGS

BY: JME

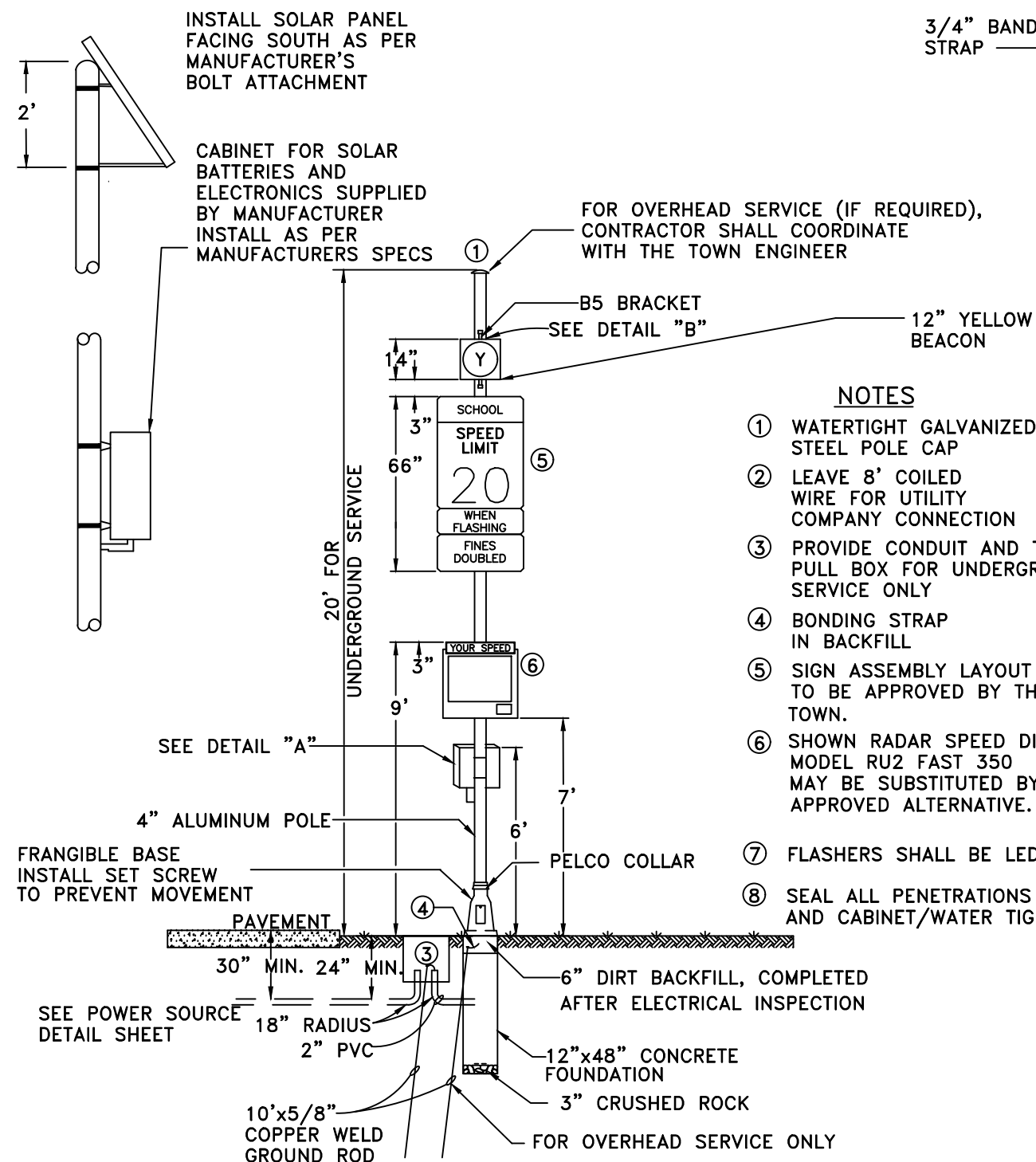
SCALE: NTS

DATE: 1/2020

DRAWING:

TS2

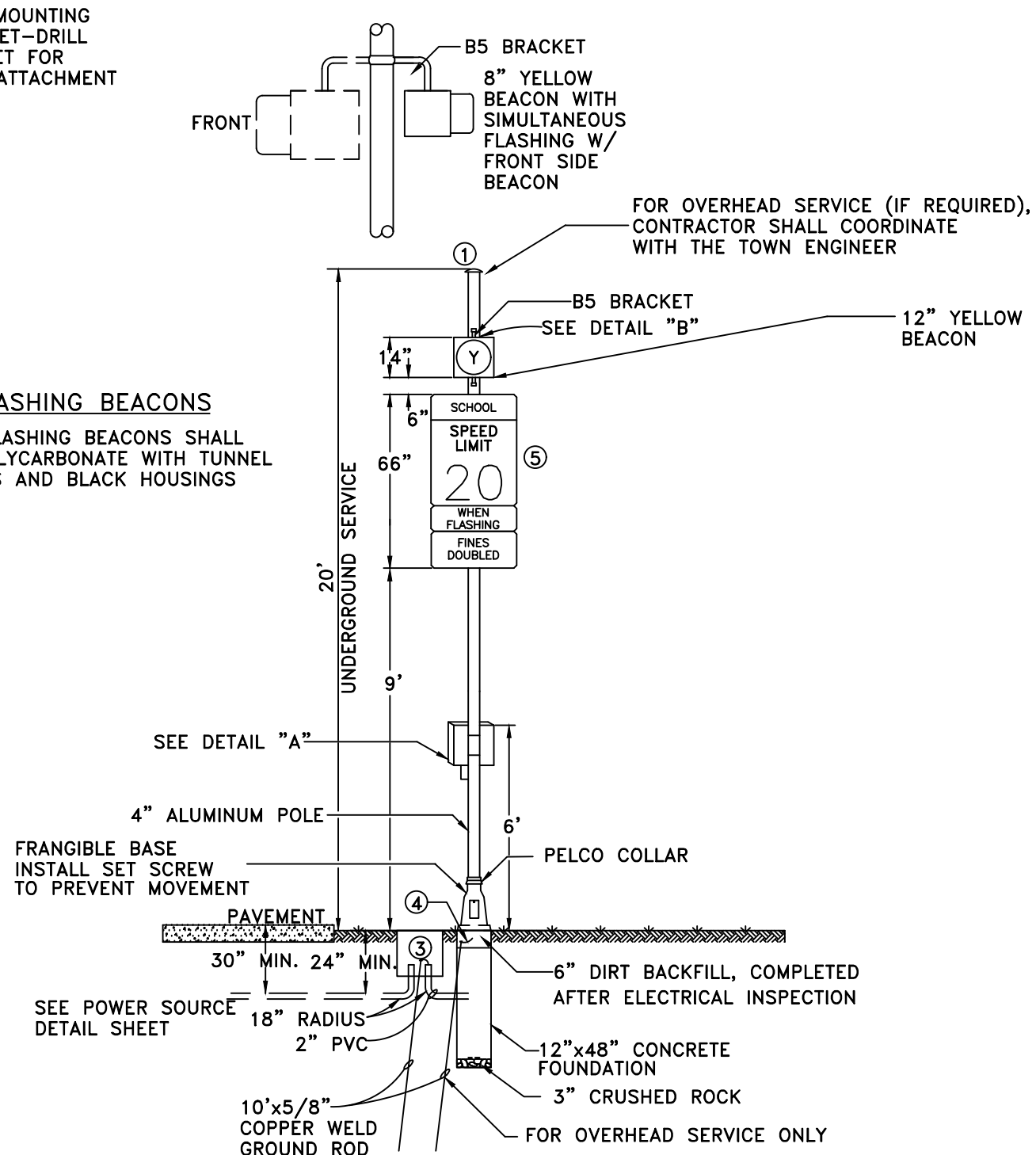
OPTIONAL SOLAR PANEL



- NOTES**
- ① WATERTIGHT GALVANIZED STEEL POLE CAP
 - ② LEAVE 8' COILED WIRE FOR UTILITY COMPANY CONNECTION
 - ③ PROVIDE CONDUIT AND TYPE III PULL BOX FOR UNDERGROUND SERVICE ONLY
 - ④ BONDING STRAP IN BACKFILL
 - ⑤ SIGN ASSEMBLY LAYOUT TO BE APPROVED BY THE TOWN.
 - ⑥ SHOWN RADAR SPEED DISPLAY SIGN IS MODEL RU2 FAST 350 MAY BE SUBSTITUTED BY A TOWN APPROVED ALTERNATIVE.
 - ⑦ FLASHERS SHALL BE LED
 - ⑧ SEAL ALL PENETRATIONS IN POLE AND CABINET/WATER TIGHT

SCHOOL FLASHING BEACON ASSEMBLY
SIDE OF ROAD, TYPE 1

DETAIL "B" OPPOSITE DIRECTION 8" FLASHER



- FLASHING BEACONS**
- ALL FLASHING BEACONS SHALL BE POLYCARBONATE WITH TUNNEL VISORS AND BLACK HOUSINGS

SCHOOL FLASHING BEACON ASSEMBLY
SIDE OF ROAD, TYPE 2

SCHOOL FLASHING BEACON



TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

BY: JME

SCALE: NTS

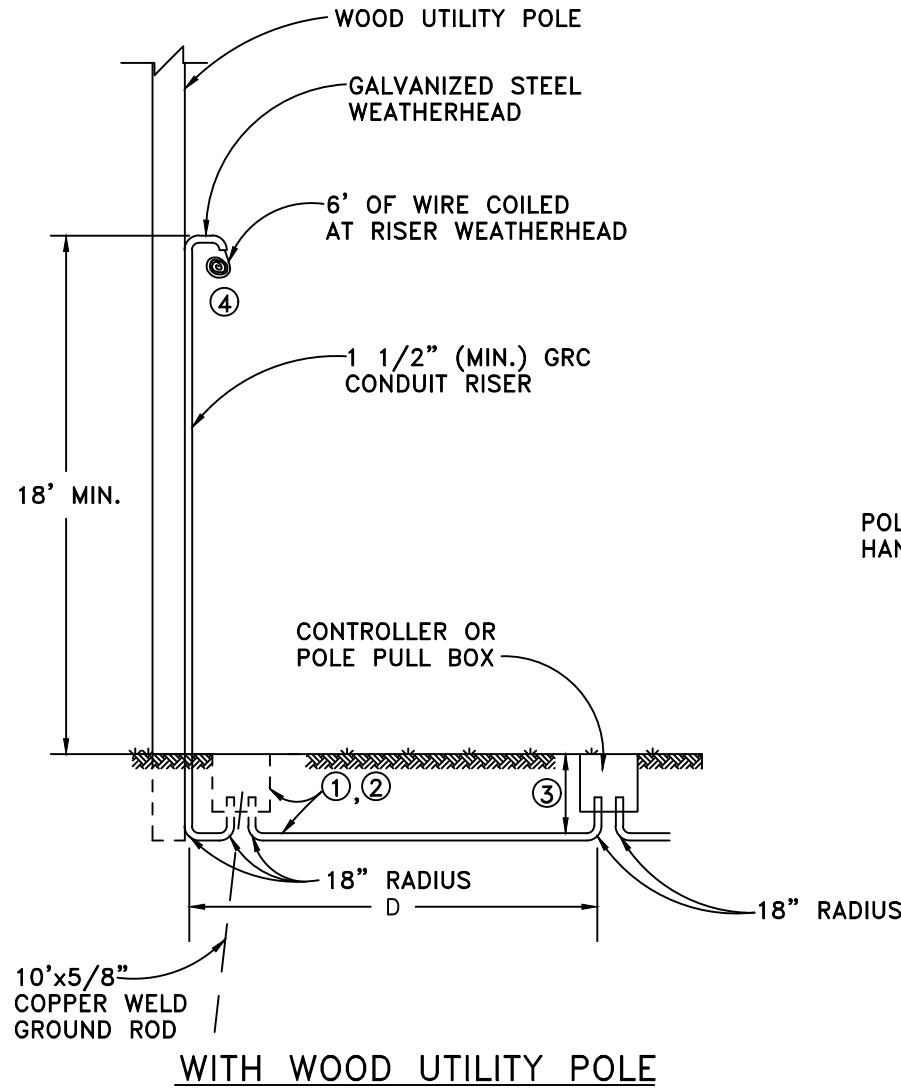
DATE: 1/2020

DRAWING:

TS3

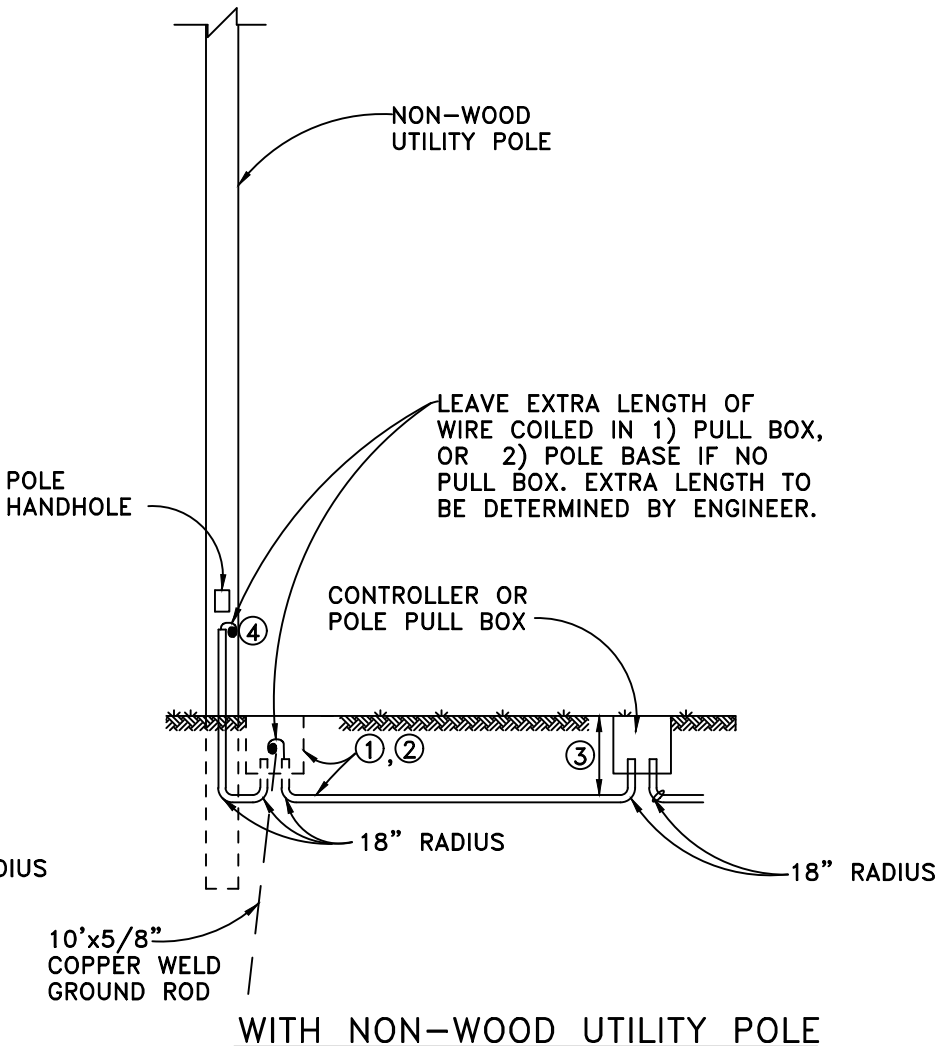
NOTES

- ① PROVIDE TYPE III PULL BOX/GROUND ROD AND 2" PVC CONDUIT ONLY IF D EXCEEDS 10'
- ② PROVIDE 2" GRC CONDUIT WITHOUT PULL BOX/GROUND ROD IF D IS LESS THAN 10'
- ③ MINIMUM CONDUIT DEPTHS:
UNDERGROUND 24"
UNDER PAVEMENT 30"
- ④ WHERE REQUIRED BY UTILITY COMPANY, CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING PERMIT AND INSPECTION FROM THE STATE ELECTRICAL BOARD.

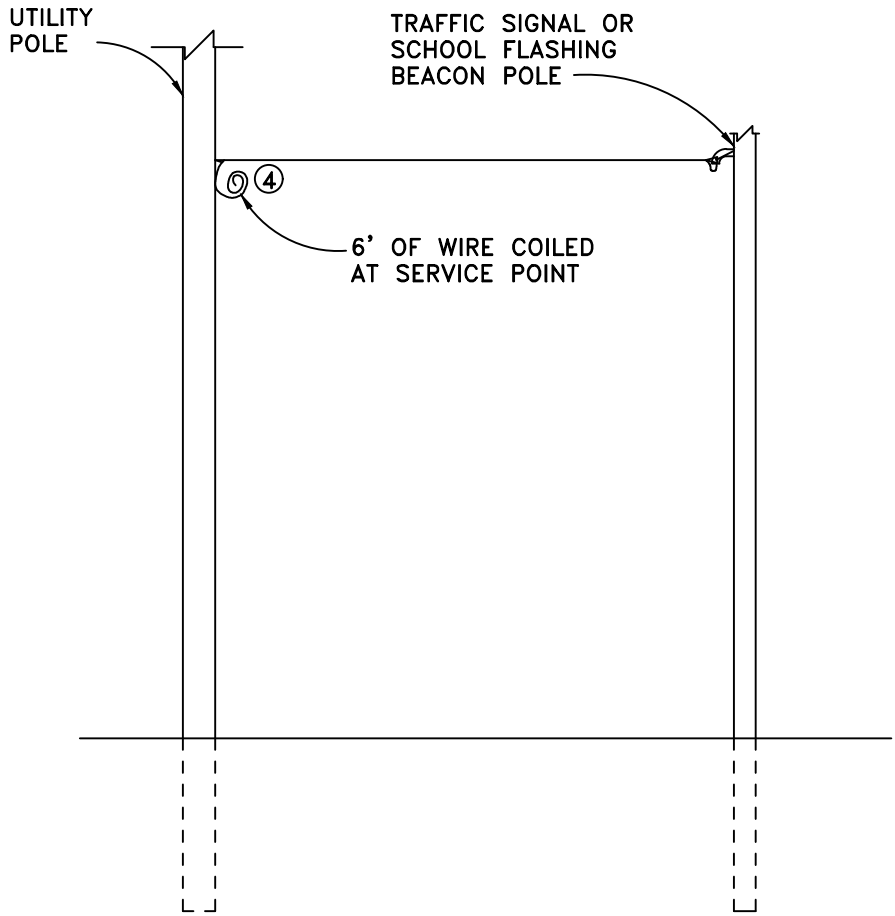


TYPICAL UNDERGROUND POWER FEED

FOR TRAFFIC SIGNALS AND SCHOOL FLASHING BEACON ASSEMBLIES



WITH NON-WOOD UTILITY POLE



TYPICAL OVERHEAD POWER FEED FOR
TRAFFIC SIGNAL AND SCHOOL FLASHING BEACON
ASSEMBLIES

POWER FEED FOR TRAFFIC SIGNALS



TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

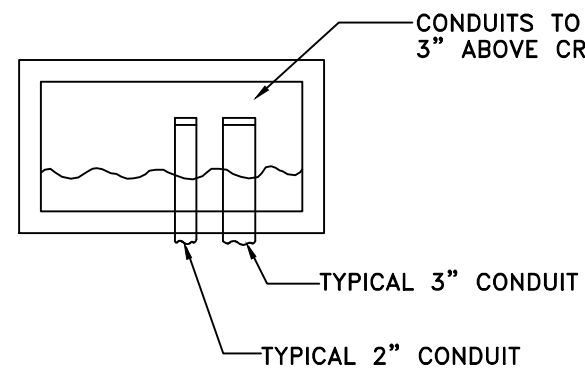
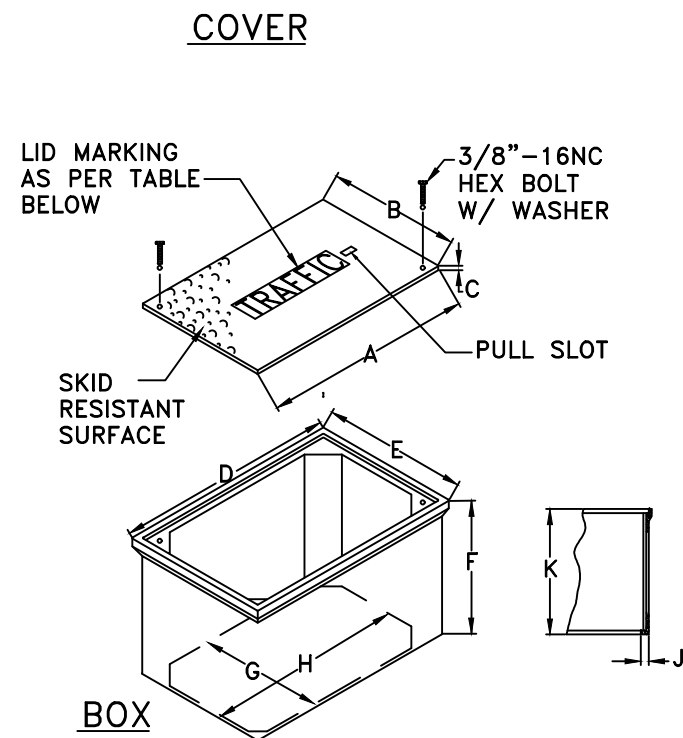
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SCALE: NTS

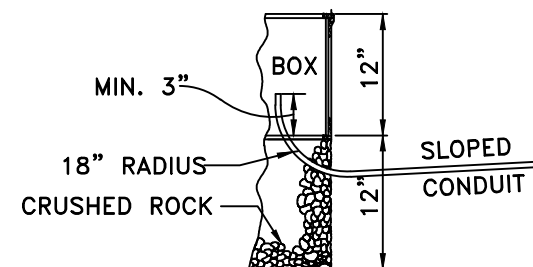
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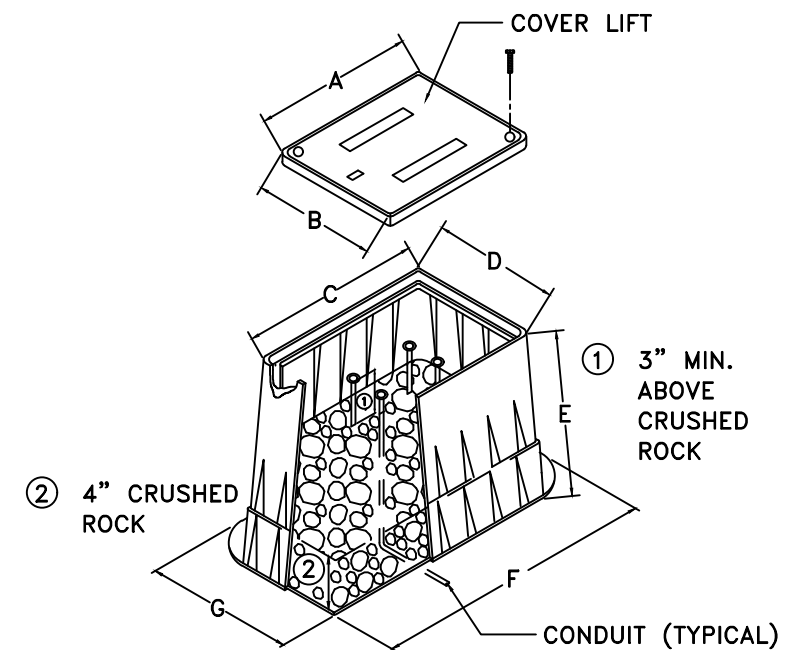
TS4



TYPICAL PULL BOX



TWO BOXES
& EXTENSION



FIBERGLASS REINFORCED POLYMER CONCRETE DESIGNED FOR
SERVICE LOAD (MINIMUM) OF 15,000 LBS. OVER A 10" SQUARE

PULLBOXES

PULL BOX USAGE	SIZE	PULL BOX LID MARKING
CABINET HOME RUN PULLBOX	24"x36"x18"	TRAFFIC
SIGNAL POLE PULL BOX	17"x30"x12"	TRAFFIC
DETECTOR PULL BOX (SIDE OF ROAD)	12"x12"x12"	TRAFFIC
DETECTOR WATER VALVE	WATER VALVE	TRAFFIC
COMMUNICATION VAULT (T/S CABINET)	30"x48"x18"	TRAFFIC COMM
COMMUNICATION VAULT (INTERMEDIATE LOCATIONS)	24"x36"x18"	TRAFFIC COMM
TELEPHONE DEMARCATION	13"x24"x12"	TRAFFIC COMM
ELECTRICAL DEMARCATION	13"x24"x12"	ELECTRIC

PULL BOX (PLASTIC/PREFAB)



TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

BY: JME

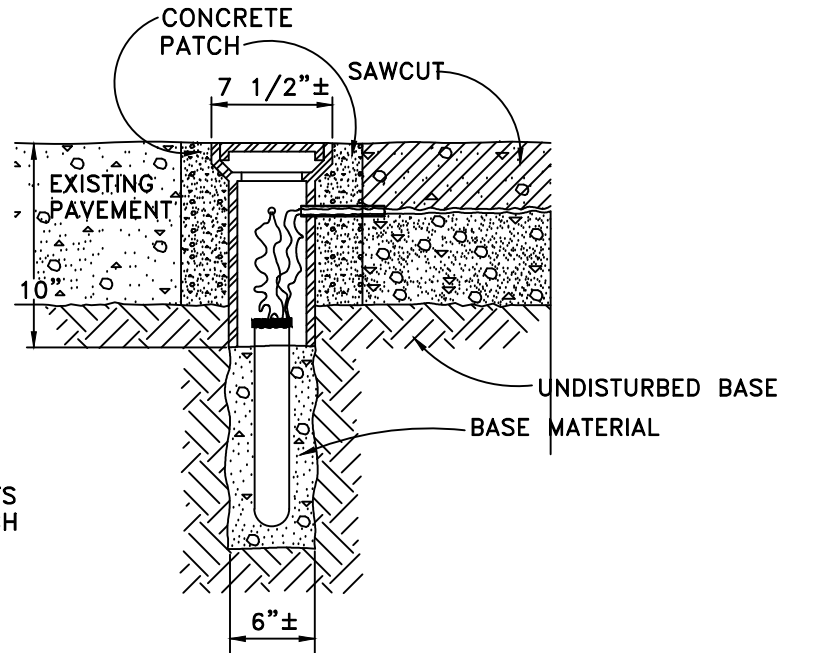
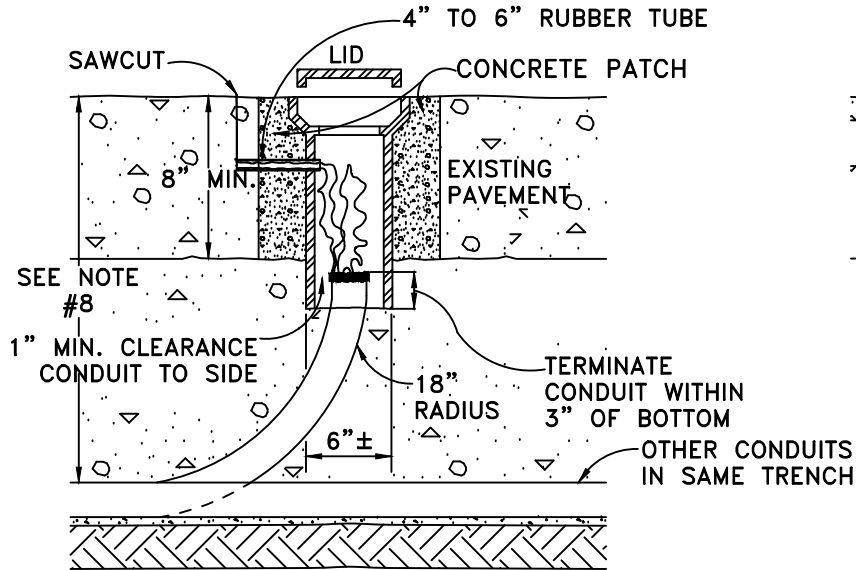
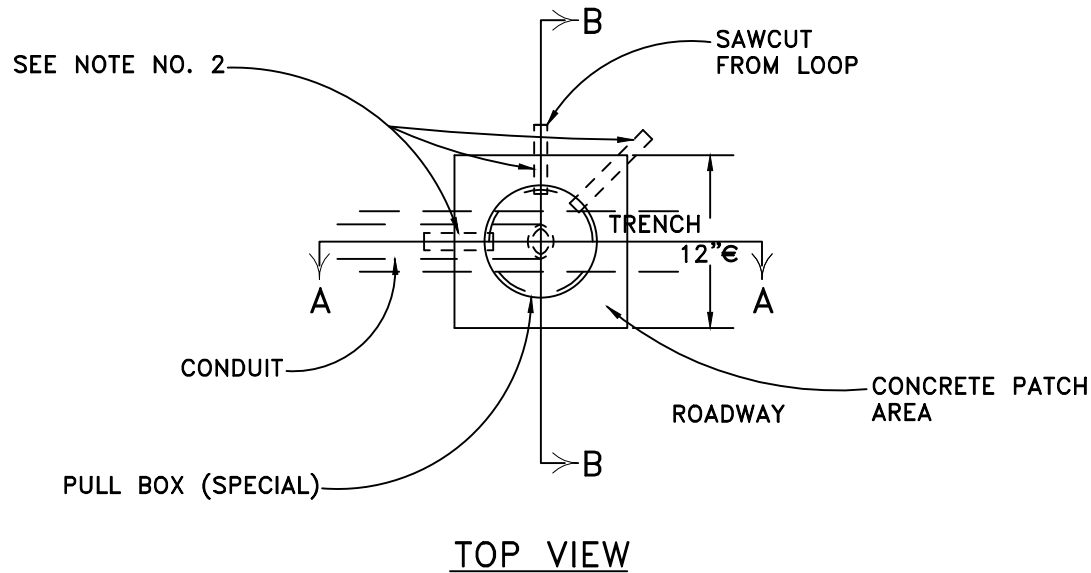
SCALE: NTS

DATE: 1/2020

DRAWING:

TS5

PULL BOX (SPECIAL)



SECTION A-A

SECTION B-B

GENERAL NOTES

1. PULL BOX (SPECIAL) SHALL BE A WATER VALVE STEM TYPE PULL BOX MADE OF ALUMINUM WITH A CAST IRON LID. THE PULL BOX SHALL HAVE THE CAPABILITY OF ACCEPTING RISER RINGS FOR FUTURE OVERLAYS. THE LID SHALL HAVE THE WORD "TRAFFIC" PRINTED ON IT.
2. PULL BOXES SHALL HAVE 3/4" TO 1" DIAMETER HOLES DRILLED OR TORCHED 3" FROM TOP TO ACCEPT A 4" TO 6" RUBBER TUBE (3/4" GARDEN HOSE). THE NUMBER OF HOLES SHALL BE AS PER PLANS OR AS DIRECTED BY THE TOWN ENGINEER.
3. CARE SHALL BE TAKEN DURING BACKFILL COMPACTION TO PREVENT COLLAPSE OF THE TUBES.
4. 2' MINIMUM SLACK OF BOTH FEED AND LOOP WIRES IS TO BE PROVIDED SO THAT ALL TESTING AND SPLICING CAN BE DONE OUTSIDE OF THE PULL BOX.
6. PULL BOX IS TO BE LOCATED IN AN AREA OF THE STREET NOT HEAVILY TRAVELED IF POSSIBLE AND CENTERED A MINIMUM OF 12" FROM THE CONCRETE GUTTER PAN.
7. ALL WORK LISTED ABOVE FOR INSTALLATION OF PULL BOXES SHALL NOT BE PAID FOR SEPARATELY, BUT SHALL BE INCLUDED IN THE PRICE OF THE CONDUIT.
8. CONDUIT UNDER ROADWAY SHALL BE LOCATED AT A DEPTH OF NOT LESS THAN 30 INCHES.

PULLBOX (SPECIAL)



TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

BY: JME

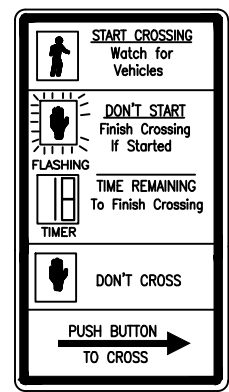
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DATE: 1/2020

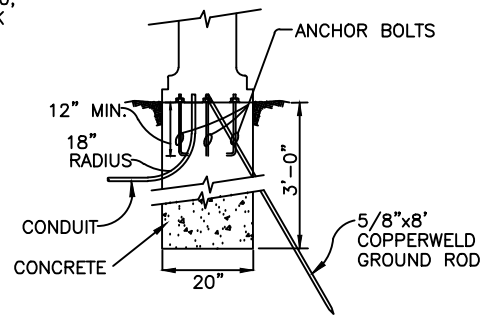
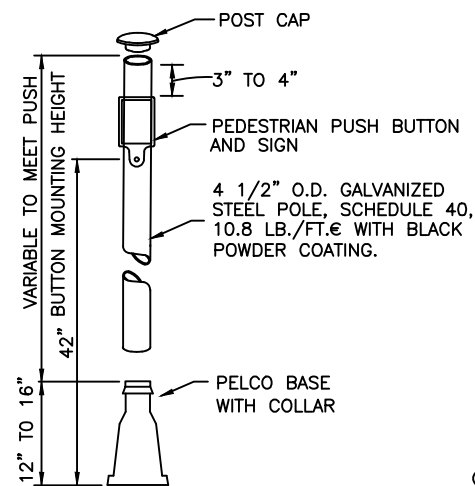
DRAWING:

TS6

TYPICAL PEDESTRIAN PUSH-BUTTON SIGN
SIGN SHALL BE LABEL (STICK-ON) TYPE

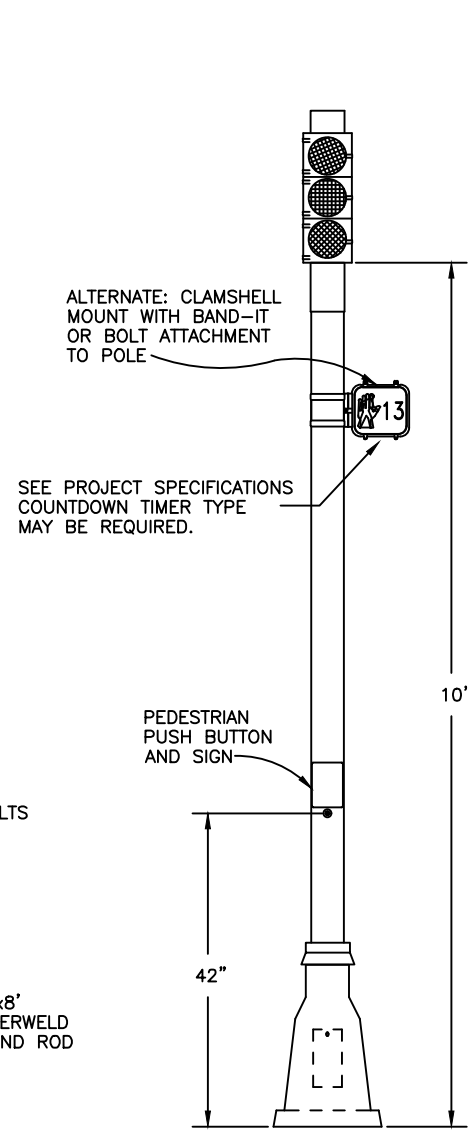


R10-3e
9"x15"
COUNTDOWN



FOUNDATION
DETAIL

PEDESTRIAN PUSH BUTTON POLE

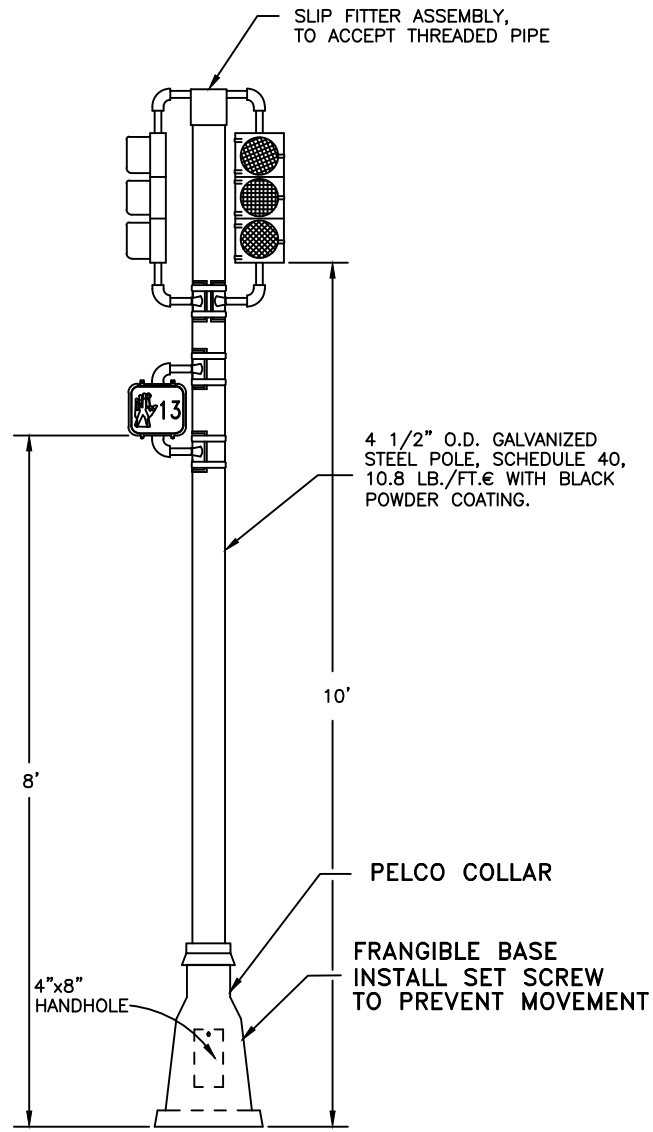


PEDESTAL POLE SHALL BE HOT DIPPED GALVANIZED PER ASTM A123,
EQUIVALENT TO 2 OZ. PER SQUARE FOOT, INSIDE AND OUT

TYPICAL PEDESTAL POLE DETAIL

1/4" SPLIT PIN SHALL BE INSTALLED IN THE UPPER
PORTION OF THE ALUMINUM BASE AND SHALL COMPLETELY
PENETRATE BASE AND POLE TO SECURE POLE TO PREVENT
MOVEMENT OR TWISTING. PELCO COLLAR TO BE INSTALLED.

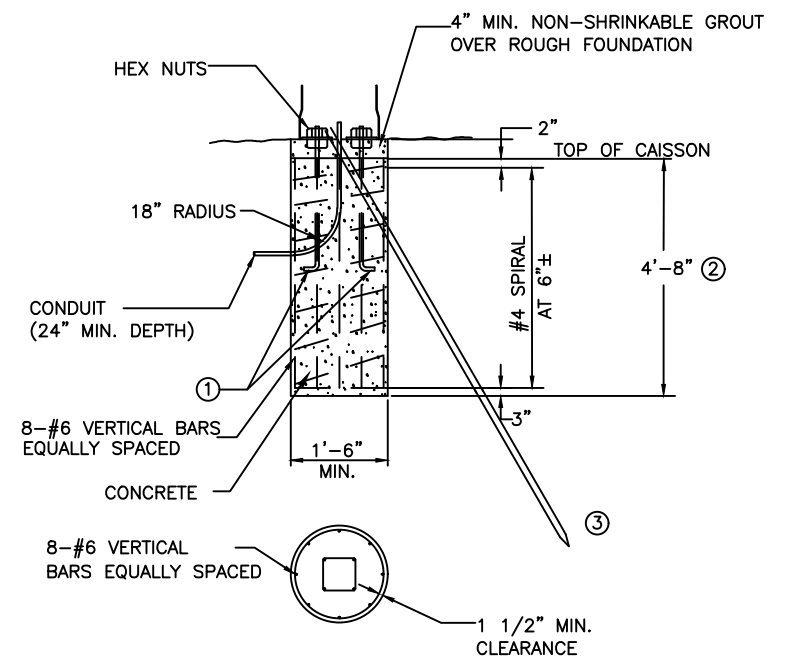
PEDESTRIAN POLE



TYPICAL PEDESTAL POLE FOUNDATION
(CAST IN PLACE)

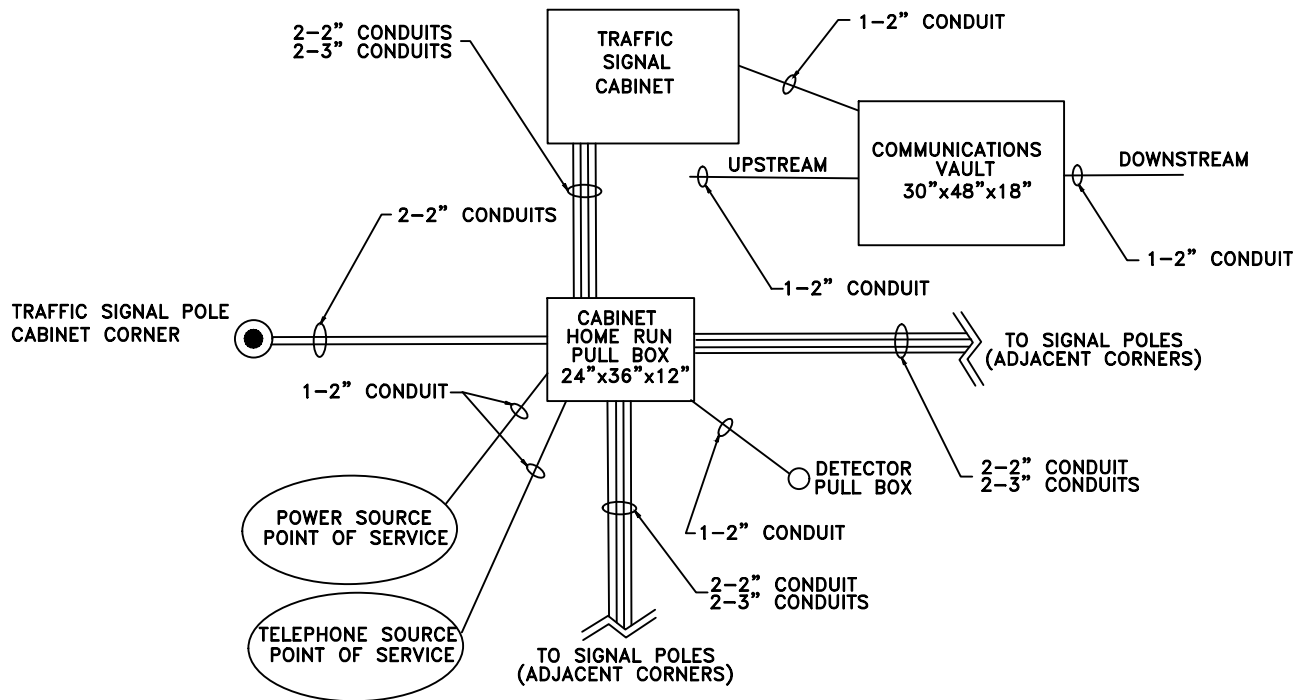
FOOTING NOTES

- 1 ANCHOR BOLTS (FURNISHED WITH POLE)
PER MANUFACTURER'S TEMPLATE.
- 2 CAISSON DESIGNS REQUIRE THAT THE CAISSON
BE FOUNDED IN COMPACT SAND, CLAY OR SANDY
CLAY. IF, BY VISUAL INSPECTION OF THE HOLE,
OTHER MATERIAL IS PRESENT, THE CAISSON
DESIGN SHALL BE MODIFIED AND APPROVED BY
THE CONSTRUCTION MANAGER.
- 3 5/8"x8' COPPERWELD GROUND ROD THROUGH
FOUNDATION, INTO GROUND.
- 4 HAND HOLE SHALL BE PROVIDED.



UNDERGROUND POWER SOURCE SCHEMATIC FOR SIGNALS WITH LUMINAIRES

NOT TO SCALE



RECOMMENDED CONDUIT/CABLE RELATIONSHIPS

"CABINET HOME RUN PULL BOX" TO "TRAFFIC SIGNAL CABINET"

- 1 OF 2 - 2" CONDUITS: POWER FROM POINT-OF-SERVICE
- 2 OF 2 - 2" CONDUITS: LOW VOLTAGE & VIDEO
- 1 OF 2 - 3" CONDUITS: FIELD WIRING (120 VAC)
- 2 OF 2 - 3" CONDUITS: SPARE

"CABINET HOME RUN PULL BOX" TO "SIGNAL POLE PULLBOX"/

"SIGNAL POLE PULL BOX" TO "SIGNAL POLE PULL BOX" ON ADJACENT CORNERS

- 1 OF 2 - 2" CONDUIT: LUMINAIRE POWER
- 2 OF 2 - 2" CONDUITS: LOW VOLTAGE & VIDEO
- 1 OF 2 - 3" CONDUITS: FIELD WIRING (120 VAC)
- 2 OF 2 - 3" CONDUITS: SPARE

"SIGNAL POLE PULL BOX" TO "SIGNAL POLE"

- 1 OF 1 - 2" CONDUIT: LUMINAIRE POWER
- 2 OF 2 - 2" CONDUITS: FIELD WIRING

"CABINET HOME RUN PULL BOX" TO "POINTS OF SERVICE"

- 1 OF 2 - 2" CONDUITS: POWER FROM POINT OF SERVICE
- 2 OF 2 - 2" CONDUITS: TELEPHONE FROM POINT OF SERVICE

"COMMUNICATIONS VAULT" TO "TRAFFIC SIGNAL CABINET":

- 1 OF 1 - 2" CONDUIT: INTERCONNECT

"COMMUNICATIONS VAULT" UPSTREAM/DOWNSTREAM:

- 1 OF 1 - 2" CONDUIT: INTERCONNECT

"SIGNALPOLE PULL BOX" TO "DECTOR PULL BOX"/"DETECTOR WATER VALVE"

- 1 OF 1 - 2" CONDUIT: INDUCTANCE DETECTOR WIRING

NOTE:

THE "TRAFFIC SIGNAL PULL BOX" ON THE CABINET CORNER IS TO BE SIZED AT 24"x36"x12" DUE TO THE NUMBER OF CONDUITS ENTERING IT. TRAFFIC SIGNAL PULL BOXES" ON REMAINING CORNERS ARE TO BE SIZED 17"x30"x12".

POWER SOURCE SCHEMATIC



TRAFFIC SIGNAL
CONSTRUCTION
DRAWINGS

BY: JME

SCALE: NTS

DATE: 1/2020

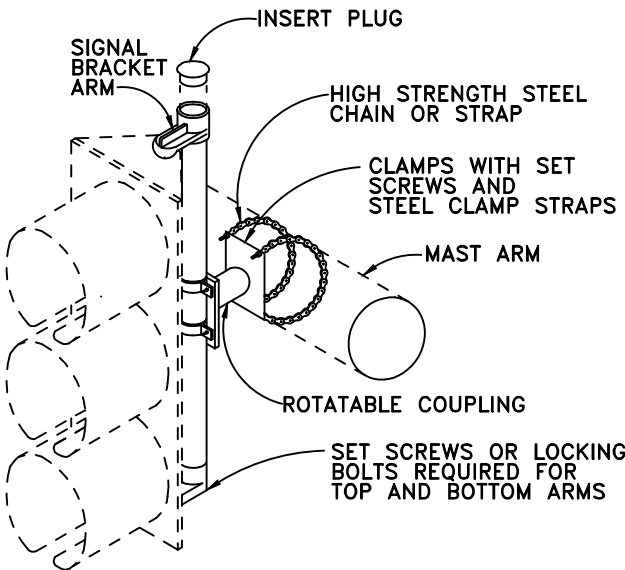
DRAWING:

TS8

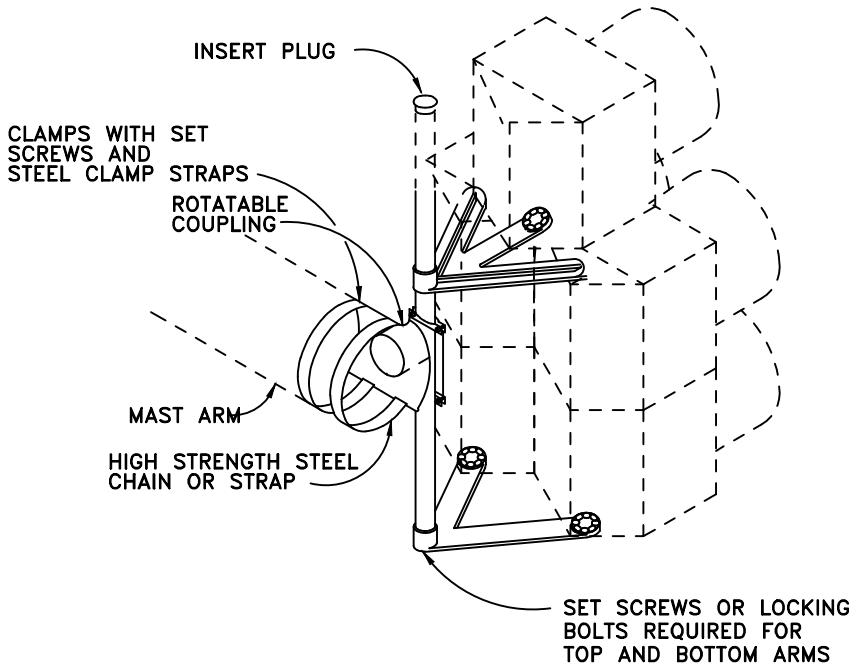
NOTES

ALL VEHICLE SIGNAL HEADS SHALL BE POLYCARBONATE WITH 12" SECTIONS AND TUNNEL VISORS.

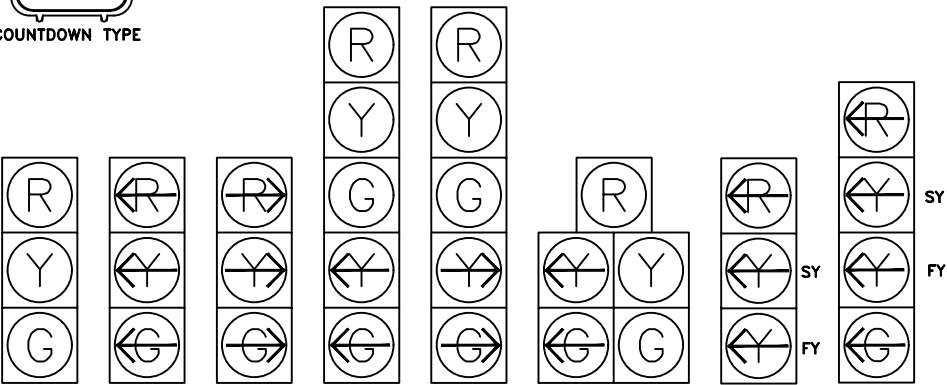
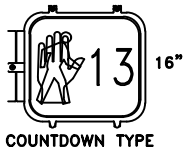
ALL VEHICLE AND PEDESTRIAN SIGNAL HEADS SHALL BE LED TYPE, EXCEPT FOR ONE SIDE OF POLE RED WHICH SHALL BE INCANDESCENT. HEADS SHALL BE BLACK IN COLOR. PEDESTRIAN HEADS SHALL BE COUNTDOWN TYPE.



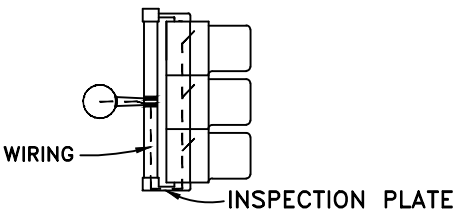
DETAIL OF MAST ARM MOUNTING
FOR IN-LINE SIGNAL HEAD
(3-SECTION OR 4-SECTION)



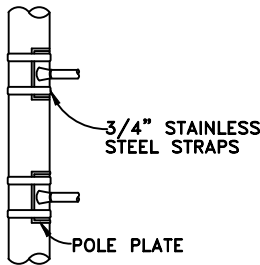
DETAIL OF MAST ARM MOUNTING
FOR DOGHOUSE SIGNAL HEAD
(5-SECTION)



PEDESTRIAN AND VEHICLE SIGNAL HEADS



WIRING DIAGRAM



TYPICAL SIDE OF POLE
SIGNAL MOUNTING

MOUNTING NOTES

1. PIPE COUPLINGS FOR SIGNAL BRACKETS SHALL BE EITHER 1-1/2 OR 2 INCH DEPENDING UPON THE SIGNAL HEAD TO BE INSTALLED. SIGNAL BRACKETS SHALL BE FURNISHED BY THE MANUFACTURER OF THE SIGNAL HEADS.
2. UNLESS OTHERWISE SPECIFIED, ALL TRAFFIC SIGNALS MOUNTED ABOVE THE ROADWAY SHALL HAVE A HEIGHT OF 17' TO 19' ABOVE THE PAVEMENT GRADE AT THE ROADWAY CENTER, ALL SIDE-OF-POLE MOUNTED TRAFFIC SIGNALS SHALL HAVE A HEIGHT OF 10' ABOVE GROUND LINE AND PEDESTRIAN SIGNALS SHALL HAVE A HEIGHT OF 8' ABOVE GROUND LINE AS MEASURED TO THE BOTTOM OF THE SIGNAL HEAD HOUSING OR BRACKET.
3. MAST ARM MOUNTED SIGNAL HEADS SHALL USE ASTRO-BRAC's OR SKY-BRACK. ALL SIGNAL HEADS SHALL BE MOUNTED IN SUCH A MANNER AS TO BE EASILY REMOVED FROM THEIR SUPPORTING STRUCTURE..
4. GASKET SEALING COMPOUND SHALL BE USED IN ADDITION TO ANY LEAD WASHERS REQUIRED FOR CREATING A WATER-TIGHT CONNECTION BETWEEN THE SIGNAL HEAD AND MOUNTING BRACKET.
5. SIGNAL HEADS SHALL BE SECURELY AFFIXED BY USE OF A SERRATED COUPLING OR OTHER ACCESSORIES RECOMMENDED BY THE SIGNAL MANUFACTURER.
6. WIRING FROM INSIDE MAST ARM THROUGH A 1" FIELD DRILLED HOLE IN ARM SHALL BE BROUGHT THROUGH THE MOUNTING SUPPORT TUBE AND LOWER ARM (AS SHOWN). FIELD DRILLED HOLES SHALL HAVE RUBBER GROMMETS INSTALLED.

GENERAL WIRING NOTES

1. TRAFFIC SIGNAL CONDUIT SHALL NOT CARRY WIRING OF OTHER UTILITIES.
2. EXCEPT FOR LOOP DETECTOR LEADS, ALL SPLICES SHALL BE IN HAND HOLES AT POLE BASES AND NOT IN PULL BOXES.
3. PEDESTRIAN AND VEHICLE SIGNAL HEADS SHALL BE INDIVIDUALLY WIRED FROM THE POLE BASE TO THE SIGNAL HEAD.
4. CONTRACTOR SHALL PROVIDE 2 WIRING DIAGRAMS OF THE SIGNAL INSTALLATION TO THE TOWN.
5. UNLESS ALLOWED BY THE TOWN ENGINEER, WIRE SHALL NOT OCCUPY MORE THAN 40% OF THE INSIDE AREA OF CONDUIT.

SIGNAL HEAD MOUNTING



TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

BY: JME

SCALE: NTS

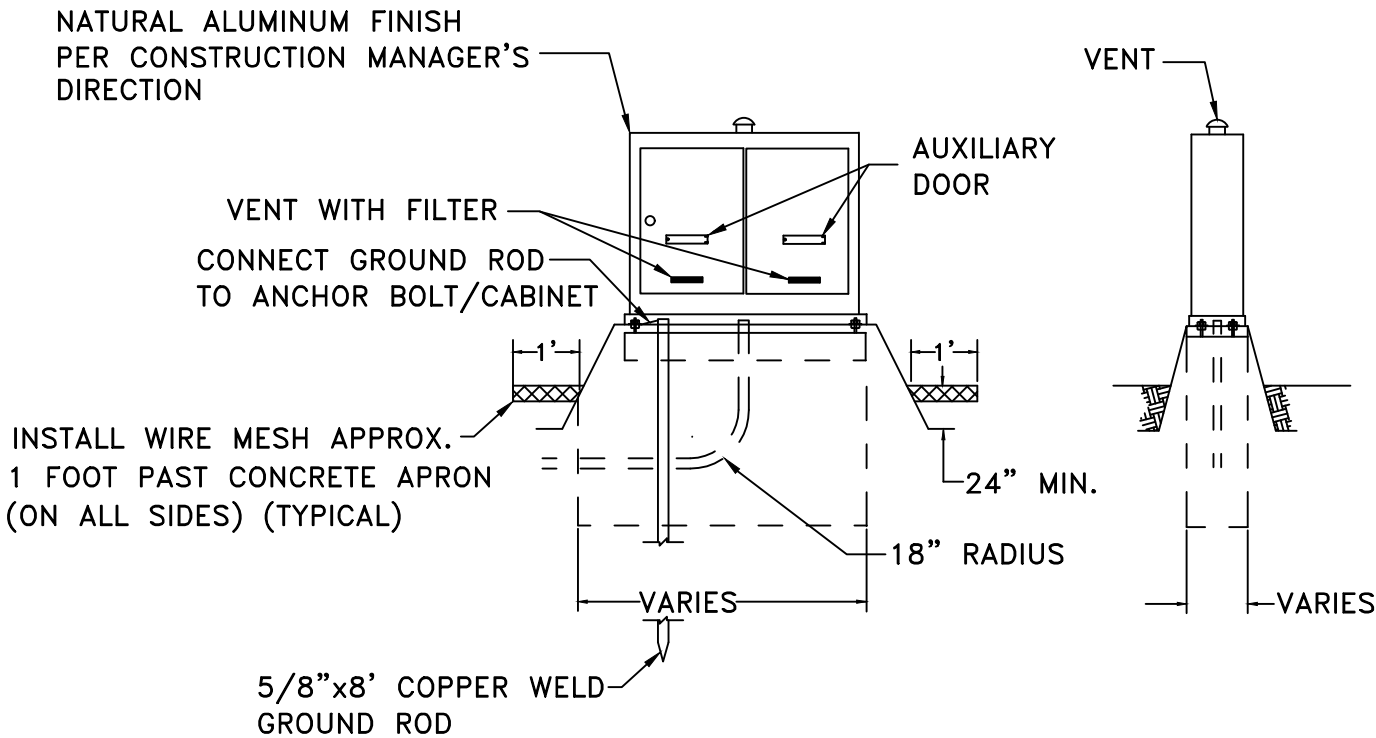
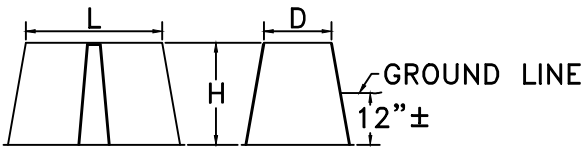
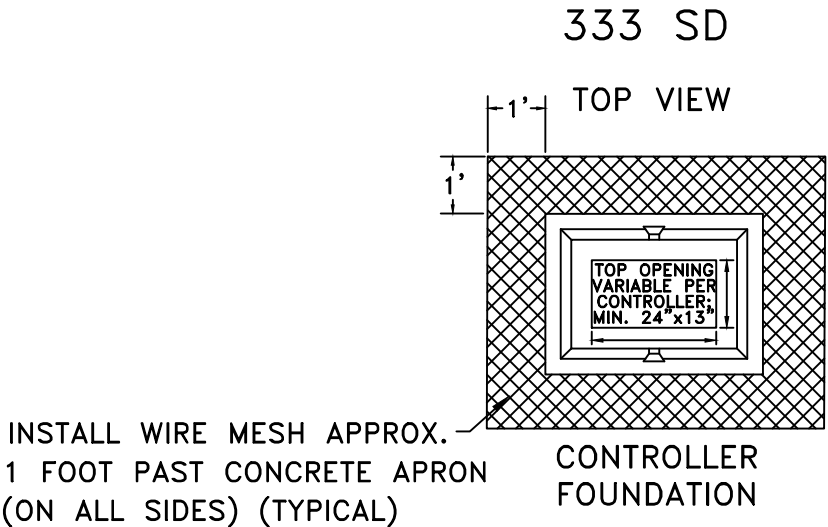
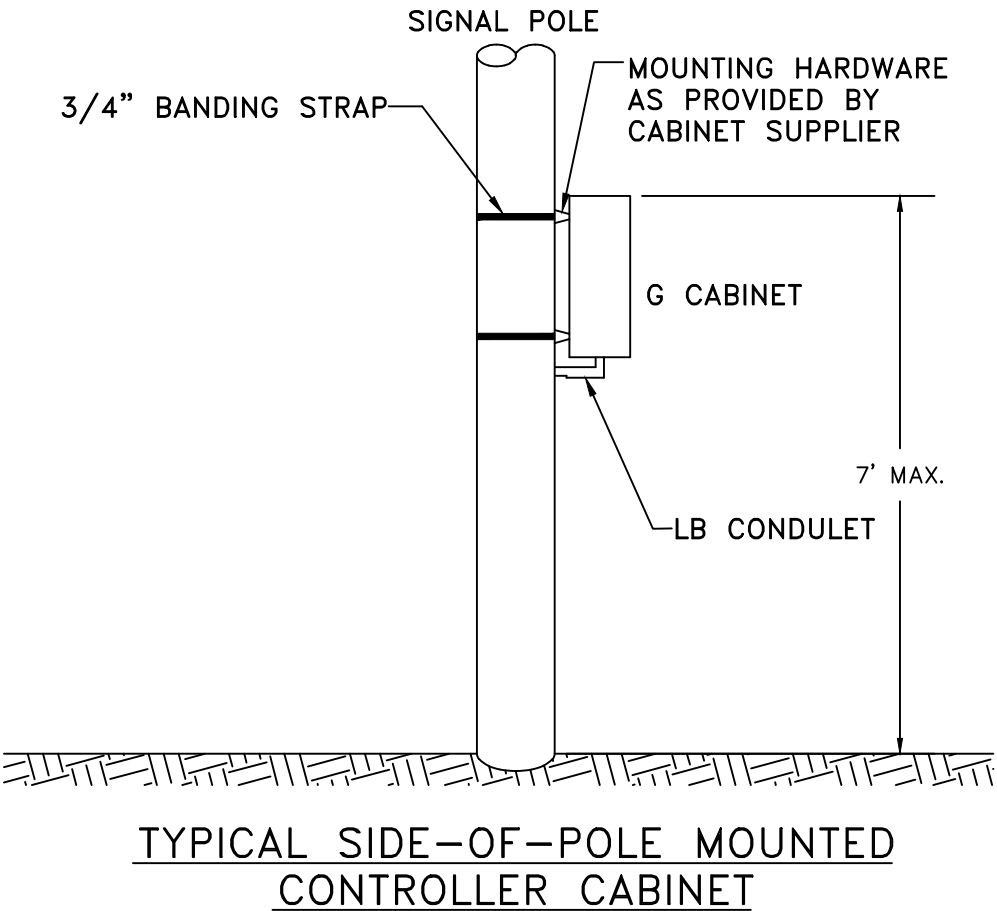
DATE: 1/2020

DRAWING:

TS9

CABINET FOUNDATION

<u>L</u>	<u>D</u>	<u>H</u>
44"	29"	24"



CONTROLLER CABINET



TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

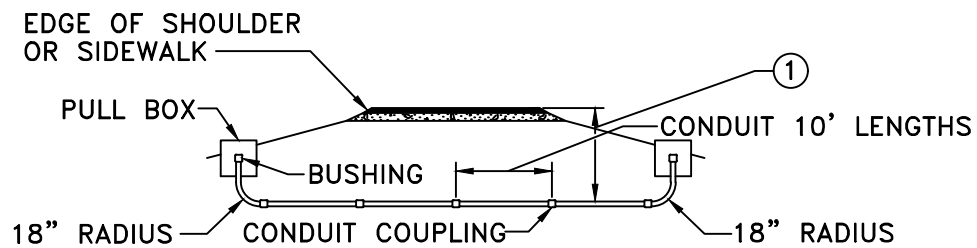
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

TS10



CONDUIT PLACEMENT UNDER PAVEMENT OR SIDEWALK

NOTES

①	MINIMUM CONDUIT DEPTH:	UNDER PAVEMENT 30"	UNDER SIDEWALK 24"
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ALL PVC CONDUIT SHALL BE SCHEDULE 80

CONDUIT DETAILS



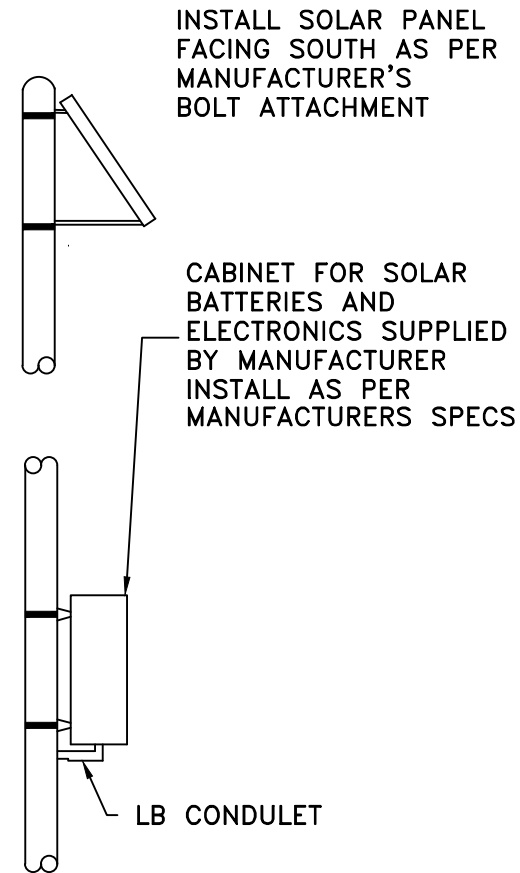
TRAFFIC SIGNAL
CONSTRUCTION
DRAWINGS

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

TS11

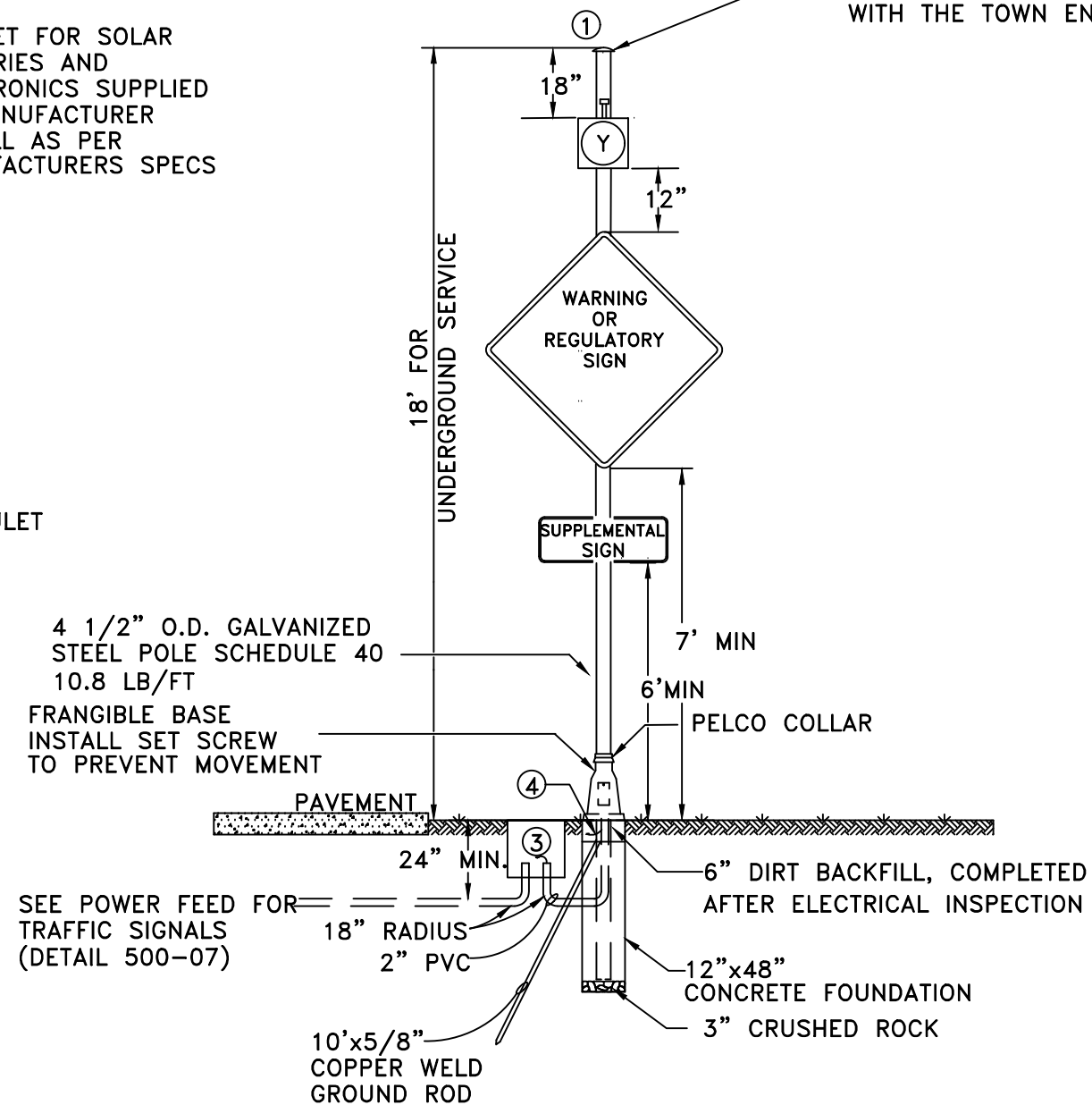
OPTIONAL SOLAR



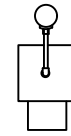
FLASHING BEACONS

ALL FLASHING BEACONS SHALL BE 12" POLYCARBONATE WITH TUNNEL VISORS AND BLACK HOUSINGS

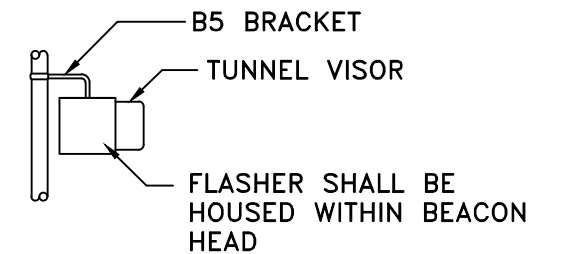
FOR OVERHEAD SERVICE (IF REQUIRED), CONTRACTOR SHALL COORDINATE WITH THE TOWN ENGINEER



BEACON TOP VIEW



BEACON SIDE VIEW



NOTES

- ① WATERTIGHT GALVANIZED STEEL POLE CAP
- ② LEAVE MINIMUM OF 8' COILED WIRE FOR UTILITY COMPANY CONNECTION AT UTILITY DEMARCATION POINT
- ③ PROVIDE CONDUIT AND PULL BOX FOR UNDERGROUND SERVICE ONLY
- ④ BONDING STRAP IN BACKFILL
- ⑤ FLASHERS SHALL BE LED

FLASHING BEACON



TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

TS12

GENERAL NOTES

- REFER TO THE ROADWAY PLANS FOR THE ACTUAL CONFIGURATION AND LOCATION OF TRAFFIC SIGNAL HEADS AND SIGNS MARKED WITH A ■.
- ALL POLES SHALL BE FABRICATED WITH ASTM A572 GRADE 65 STEEL.
- ALL ARMS SHALL BE FABRICATED WITH ASTM A572 GRADE 65 STEEL OR ASTM A595 GRADE A STEEL WITH A MINIMUM YIELD POINT OF 55 KSI.
- ALL POLES AND ARMS SHALL COMPLY WITH THE DIMENSIONAL TOLERANCES SPECIFIED IN ASTM A500, A501, OR A595.
- ALL POLES AND ARMS SHALL BE ROUND OR DODECAGONAL (12 SIDES) TUBES WITH A 0.14 IN/FT TAPER.
- HARDENED WASHERS SHALL CONFORM TO ASTM F436.
- ALL POLES AND ARMS SHALL BE GALVANIZED INSIDE AND OUTSIDE AFTER FABRICATION IN ACCORDANCE WITH ASTM A123, UNLESS PAINTING IS CALLED FOR ON THE PLANS. PAINTING SHALL CONFORM TO SECTION 522, DUPLEX COATING SYSTEM.
- POLE AND MAST ARM SPLICES SHALL BE MECHANICALLY FORCED TOGETHER FOR A SNUG FIT.
- ALL MAST ARMS MORE THAN 35 FT IN LENGTH SHALL BE TWO PIECE CONSTRUCTION TO LIMIT ARM WEIGHTS.
- GALVANIZED ASTM A325 H.S. BOLTS SHALL BE USED FOR ATTACHING MAST ARMS. A LUBRICATED TIGHTENING TORQUE OF 178 FT-LBS FOR 3/4" DIAMETER BOLTS, AND 1300 FT-LBS FOR 1 1/4" INCH DIAMETER BOLTS SHALL BE USED TO TIGHTEN ALL H.S. BOLTS. MAST ARMS SHALL BE TEMPORARILY SUPPORTED TO TAKE LOAD OFF OF FIELD CONNECTIONS WHILE BOLTS ARE TIGHTENED IN ORDER TO FIRMLY SEAT THE FLANGE PLATE. BOLTS SHALL BE SEQUENTIALLY TIGHTENED.
- CAST POLE END CAP TO BE SECURED IN PLACE WITH 3 SET SCREWS.
- ALL SIGNAL HEADS, SIGNS, AND HARDWARE SHALL BE FIELD POSITIONED.
- ACCESSORIES TO BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.
- ALL PLATES SHALL BE FABRICATED WITH AASHTO M270 (ASTM A709) GRADE 36 STEEL AND SHALL COMPLY WITH THE DIMENSIONAL TOLERANCES SPECIFIED IN ASTM A6. ALL HANDHOLES SHALL BE FABRICATED WITH ASTM A572 GRADE 42 STEEL.
- LEVELING CONCRETE SHALL BE 3000 PSI AIR ENTRAINED CONCRETE VIBRATED IN PLACE BELOW THE POLE BASE PLATE.
- CAISSONS SHALL BE PLACED AGAINST UNDISTURBED EARTH. WET OR CAVING HOLES SHALL BE BACKFILLED WITH FLOW-FILL AND REDRILLED AFTER A THREE DAY CURING PERIOD WITHOUT THE USE OF A CASING.
- CAISSONS SHALL BE CONSTRUCTED WITH AIR ENTRAINED CLASS BZ CONCRETE IN ACCORDANCE WITH SECTION 503 OF THE STANDARD SPECIFICATIONS. REINFORCING STEEL SHALL BE GRADE 60.
- CAISSON CONCRETE MUST HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,700 PSI BEFORE INSTALLING THE SIGNAL STRUCTURE; VERIFY CONCRETE STRENGTH WITH MATURITY METER.
- U-BOLTS AND ANCHOR BOLTS SHALL BE FABRICATED WITH AASHTO M314-90 GRADE 55 STEEL.
- ANCHOR BOLTS SHALL BE FABRICATED WITH HEAVY HEX NUTS AND FLAT WASHERS, AND EXTENDED A MINIMUM OF 3/4" ABOVE THE NUT AFTER COMPLETING THE TIGHTENING PROCESS. THREAD UPPER 12 INCHES AND GALVANIZE UPPER 13 INCHES OF THE ANCHOR BOLTS. FIELD WELDING OF ANCHOR BOLTS TO REBAR DURING ERECTION WILL NOT BE ALLOWED. ANCHOR BOLTS SHALL BE SET WITH A STEEL TEMPLATE UNTIL THE CONCRETE HAS CURED AT LEAST TWO DAYS. THEY SHALL BE TIGHTENED USING THE TURN-OF-NUT METHOD BY FIRST TIGHTENING THEM TO SNUG TIGHT, WHICH IS DEFINED AS THE TIGHTNESS THAT EXISTS WHEN THE UPPER AND LOWER NUTS ARE IN FIRM CONTACT WITH THE BASE PLATE, WITH MAST ARMS FREE TO DEFLECT, THE UPPER AND LOWER NUTS SHALL THEN EACH BE ROTATED AN ADDITIONAL 1/12 TURN (30° ± 5°) WITH A SLUGGING, HYDRAULIC OR AIR IMPACT WRENCH.
- WELDING OF STEEL SHALL CONFORM TO THE REQUIREMENTS OF ANSI/AWS D1.1. ALL AREAS TO BE WELDED SHALL BE GRIND TO BRIGHT METAL. ALL WELDING AND REQUIRED TESTING SHALL BE COMPLETE BEFORE ANY MATERIAL IS GALVANIZED. ALL CIRCUMFERENTIAL WELDS SHALL BE NON-DESTRUCTIVELY TESTED USING THE ENHANCED MAGNETIC PARTICLE METHOD IN ACCORDANCE WITH SUBSECTION 509.18 (d) OF THE STANDARD SPECIFICATIONS. THE ACCEPTANCE CRITERIA IS STATED IN TABLE 6.1 OF ANSI/AWS D1.1. ALL LONGITUDINAL WELDS WITHIN 6 INCHES OF FULL PENETRATION CIRCUMFERENTIAL GROOVE WELDS AND FULL PENETRATION GROOVE WELDS SHALL BE INSPECTED AS SPECIFIED ABOVE. MAXIMUM WELD UNDERCUT SHALL BE 0.01 INCHES.
- ALL ELECTRICAL CONNECTIONS TO THE SIGNALS SHALL BE GROUNDED IN ACCORDANCE WITH APPLICABLE ELECTRICAL CODES.
- CERTIFIED MILL TEST REPORTS INCLUDING CHARPY V-NOTCH (CVN) TEST RESULTS, WELD INSPECTION REPORTS AND ENHANCED MAGNETIC PARTICLE TEST REPORTS SHALL BE SUBMITTED TO CDOT STAFF BRIDGE, 4201 E. ARKANSAS AVE., DENVER COLORADO 80222 AS SOON AS THEY BECOME AVAILABLE. CVN TEST RESULTS FOR ASTM A572 GRADES 42, 55 AND 65 STEEL SHALL HAVE A MINIMUM VALUE OF 15 FT-LBS AT 40°F AS PER THE FREQUENCY TEST REQUIREMENTS IN AASHTO T243 (ASTM A673).
- SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW IN ACCORDANCE WITH SUBSECTION 105.02 OF THE STANDARD SPECIFICATIONS.
- TRAFFIC SIGNALS MOUNTED ON MAST ARMS SHALL BE FURNISHED WITH ASTRO TYPE MOUNTING BRACKETS.
- END SECTION DIAMETERS MUST BE INCREASED TO ACCOMMODATE OUT-OF-ROUNDNESS, GALVANIZING THICKNESS AND SEAM WELD PROFILES TO PROVIDE THE MINIMUM REQUIRED ARM SLIP SPLICE LENGTHS AND POLE MEMBER OVERLAPS.
- SECURE ARM FLANGE PLATE, POLE BASE PLATE, AND CONNECTION FACE PLATE DURING WELDING TO PREVENT DISTORTION.
- IF THE VERTICAL DEFLECTIONS DURING A 10 TO 20 MPH WIND EXCEED THE GALLOPING DEFLECTION LIMITS LISTED IN THE TABLE ON SHEET 2 OF 4, THE OWNER SHALL INSTALL AN ALUMINUM SIGN BLANK (18" X 66" OR LARGER) NEAR THE FREE END OF THE TRAFFIC SIGNAL MAST ARM. SAID SIGN BLANK SHALL BE ROTATED ABOUT THE LONGITUDINAL AXIS OF THE ARM WHILE THE WIND BLOWS TO MINIMIZE THE GALLOPING DEFLECTIONS. CONTACT STAFF BRIDGE FOR MORE INFORMATION.
- ONE DRILLED HOLE WITH A MAXIMUM DIAMETER OF 3/4" IS ALLOWED AT LOCATIONS MARKED WITH A ▲ TO ACCOMMODATE ELECTRICAL WIRING.
- SEE S-614-42 AND S-614-43 FOR "CABINET FOUNDATION DETAILS" AND "TRAFFIC LOOP AND MISC. SIGNAL DETAILS" RESPECTIVELY.

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Colorado Department of Transportation

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Traffic & Safety Engineering MKB

ALTERNATE TRAFFIC SIGNAL 25' - 55' SINGLE MAST ARMS

Issued By: Traffic & Safety Engineering Branch July 31, 2019

STANDARD PLAN NO.

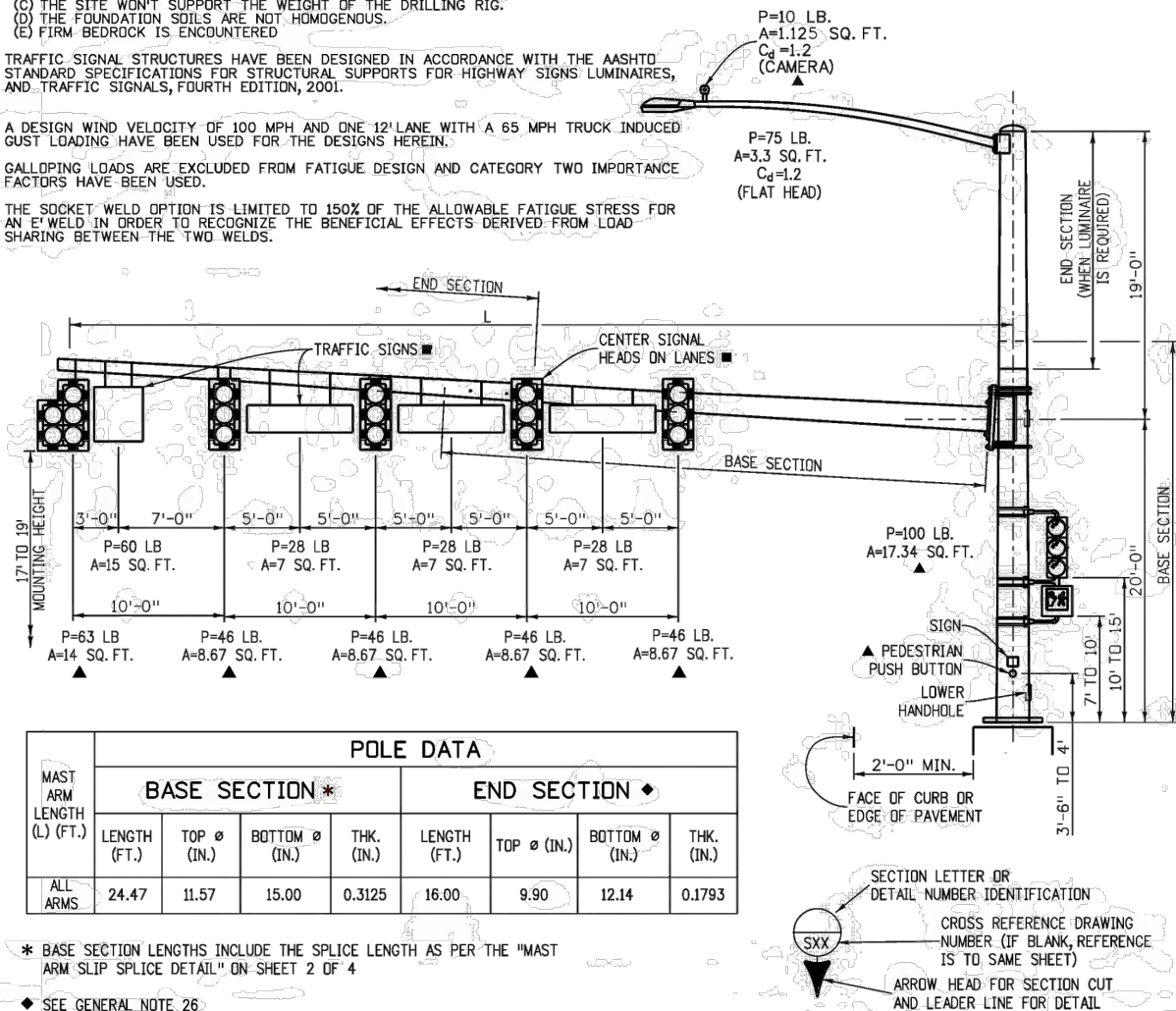
S-614-40A

Standard Sheet No. 1 of 4

Project Sheet Number:

DESIGN DATA

- DRAWING SHOWN HAS 5 SIGNAL HEADS, SHORTER ARM LENGTHS MAY HAVE FEWER HEADS. THIS CONFIGURATION IS INTENDED TO REPRESENT A WORST CASE LOADING SITUATION.
5 SIGNAL HEADS (55') 50' 4 SIGNAL HEADS (45') 40' 3 SIGNAL HEADS (35') 30' 2 SIGNAL HEADS (25')
THE DESIGN LENGTH "L" FOR EACH SERIES IS SHOWN IN PARENTHESIS.
- THE DESIGNS HEREIN ASSUME THAT SIGNALS ARE INSTALLED WITHIN THE ROADWAY EARTHWORK PRISM WITH THE FOLLOWING SOIL PARAMETERS:
SOIL DENSITY $\gamma = 110$ LB./CU.FT.
SOIL COHESION $c = 750$ LB./SQ.FT. FOR MEDIUM STIFF COHESIVE SOIL
SOIL ϕ ANGLE $= 30^\circ$ FOR MEDIUM DENSE COHESIONLESS SOIL
SF $= 1.25$ FOR TORSIONAL RESISTANCE AND 3.0 FOR FLEXURAL RESISTANCE
- CONTACT THE ENGINEER IF ANY OF THE FOLLOWING SOIL CONDITIONS ARE ENCOUNTERED DURING DRILLING:
(A) SIGNALS WILL NOT BE INSTALLED WITHIN THE ROADWAY EARTHWORK PRISM.
(B) THE SOIL HAS A HIGH ORGANIC CONTENT OR CONSISTS OF SATURATED SILT AND CLAY.
(C) THE SITE WON'T SUPPORT THE WEIGHT OF THE DRILLING RIG.
(D) THE FOUNDATION SOILS ARE NOT HOMOGENEOUS.
(E) FIRM BEDROCK IS ENCOUNTERED
- TRAFFIC SIGNAL STRUCTURES HAVE BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS LUMINAIRES, AND TRAFFIC SIGNALS, FOURTH EDITION, 2001.
- A DESIGN WIND VELOCITY OF 100 MPH AND ONE 12' LANE WITH A 65 MPH TRUCK INDUCED GUST LOADING HAVE BEEN USED FOR THE DESIGNS HEREIN.
- GALLOPING LOADS ARE EXCLUDED FROM FATIGUE DESIGN AND CATEGORY TWO IMPORTANCE FACTORS HAVE BEEN USED.
- THE SOCKET WELD OPTION IS LIMITED TO 150% OF THE ALLOWABLE FATIGUE STRESS FOR AN E WELD IN ORDER TO RECOGNIZE THE BENEFICIAL EFFECTS DERIVED FROM LOAD SHARING BETWEEN THE TWO WELDS.



MASTARM POLES (MAX 55')



WATER CONSTRUCTION DRAWINGS

BY: JME

SCALE: NTS

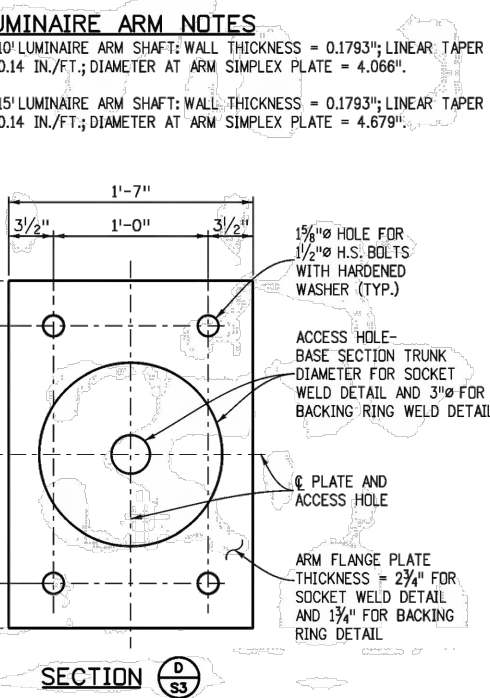
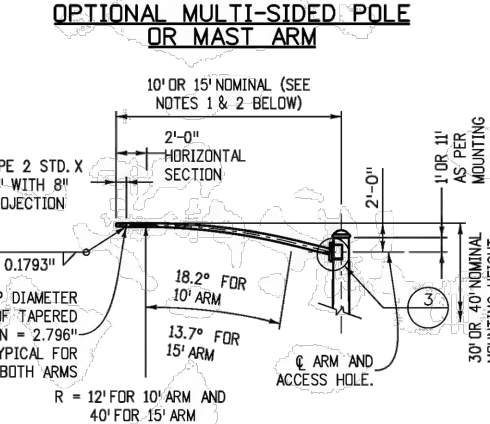
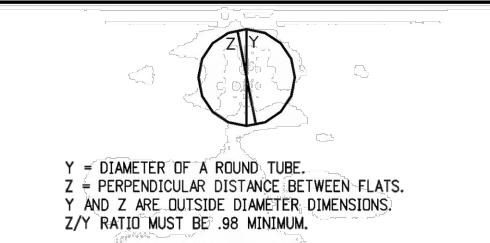
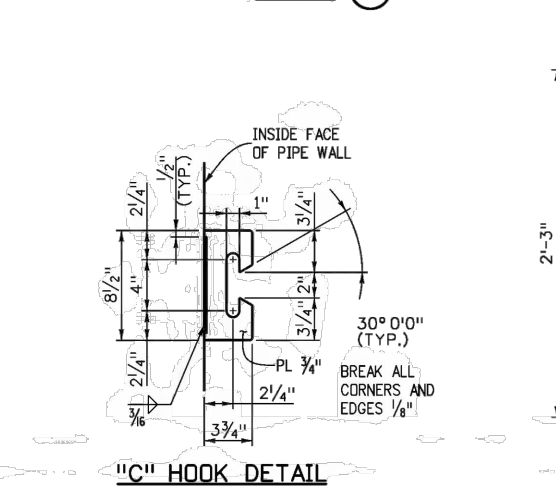
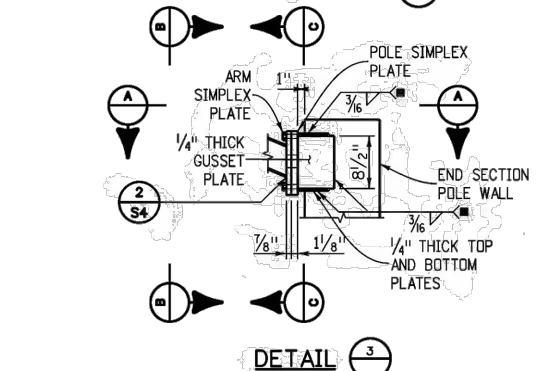
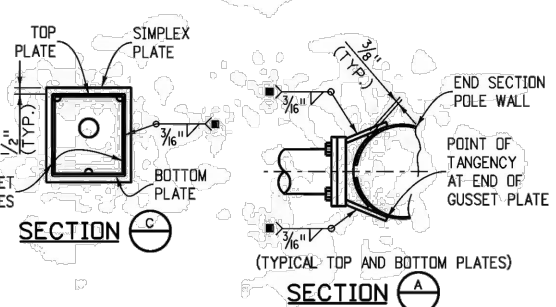
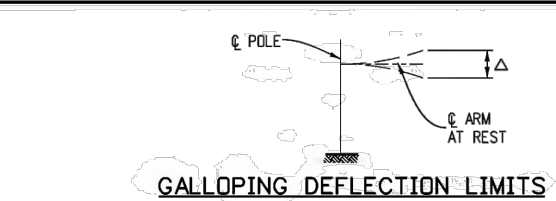
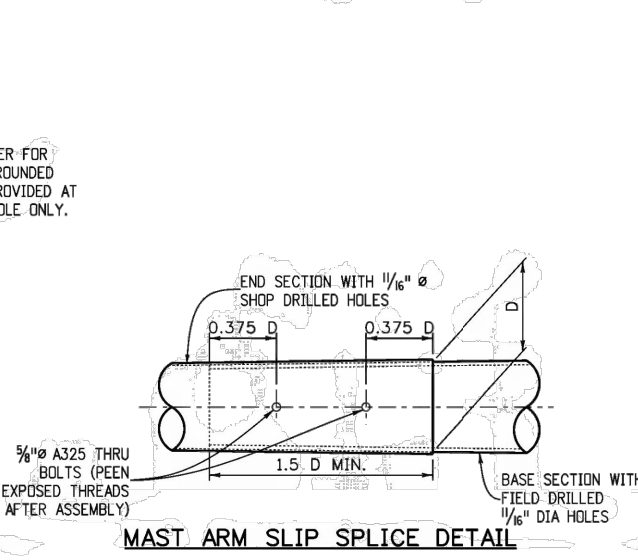
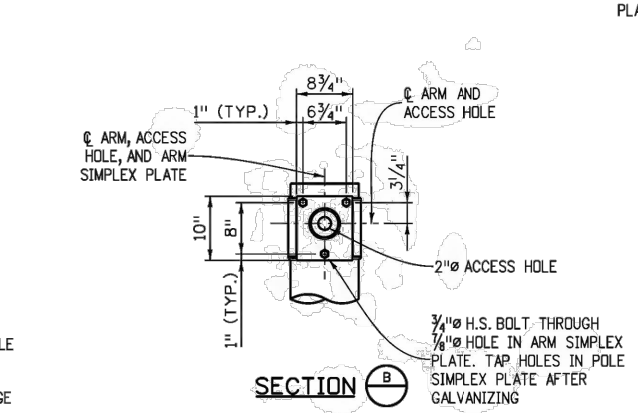
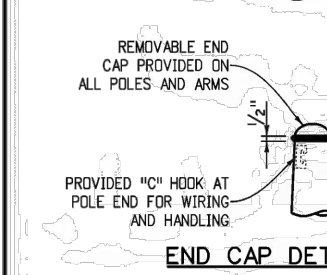
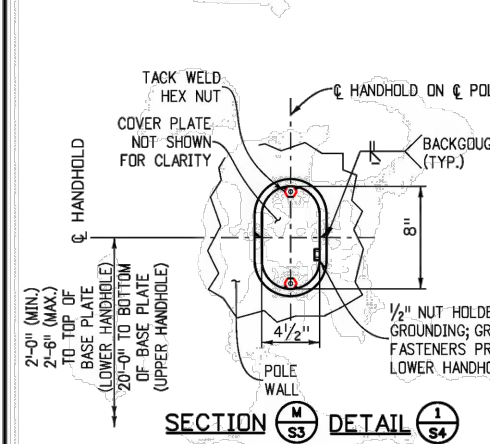
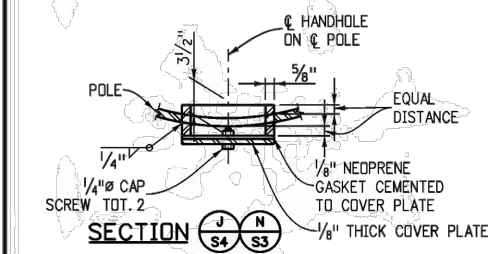
DATE: 1/2020

DRAWING:

TS13A

MAST ARM LENGTH (L) (FT.)	MAST ARM DATA								GALLOPING DEFLECTION LIMITS (Δ) (IN.) ●
	BASE SECTION ★				END SECTION ◆				
	LENGTH (FT.)	TIP Ø (IN.)	TRUNK Ø (IN.)	THK (IN.)	LENGTH (FT.)	TIP Ø (IN.)	TRUNK Ø (IN.)	THK. (IN.)	
25	23.92	6.65	10.00	0.2391	N.A.	N.A.	N.A.	N.A.	+
35	33.92	7.50	12.25	0.2391	N.A.	N.A.	N.A.	N.A.	+
45	25.16	9.73	13.25	0.3125	20.00	7.46	10.26	0.1793	6"
55	25.34	11.20	14.75	0.3125	30.00	7.56	11.76	0.1793	11"

- ★ BASE SECTION LENGTH INCLUDES THE SPLICE LENGTH AS PER THE "MAST ARM SLIP SPLICE DETAIL" BELOW.
- ◆ SEE GENERAL NOTE 26 ON SHEET 1 OF 4.
- SEE GENERAL NOTE 28 ON SHEET 1 OF 4.
- † DEFLECTION TOO SMALL TO MEASURE.
- STOP ALL WELDS 1/2" SHORT OF PLATE EDGES AND BOLT HOLES.



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Date:	Comments

Colorado Department of Transportation
 2829 W. Howard Pl.
 Denver, CO 80204
 Phone: 303-757-9436
 FAX: 303-757-9219
 Traffic & Safety Engineering MKB

ALTERNATE TRAFFIC SIGNAL
 25' - 55' SINGLE MAST ARMS
 Issued By: Traffic & Safety Engineering Branch July 31, 2019

STANDARD PLAN NO.
 S-614-40A
 Standard Sheet No. 2 of 4
 Project Sheet Number:

MASTARM POLES (MAX 55')

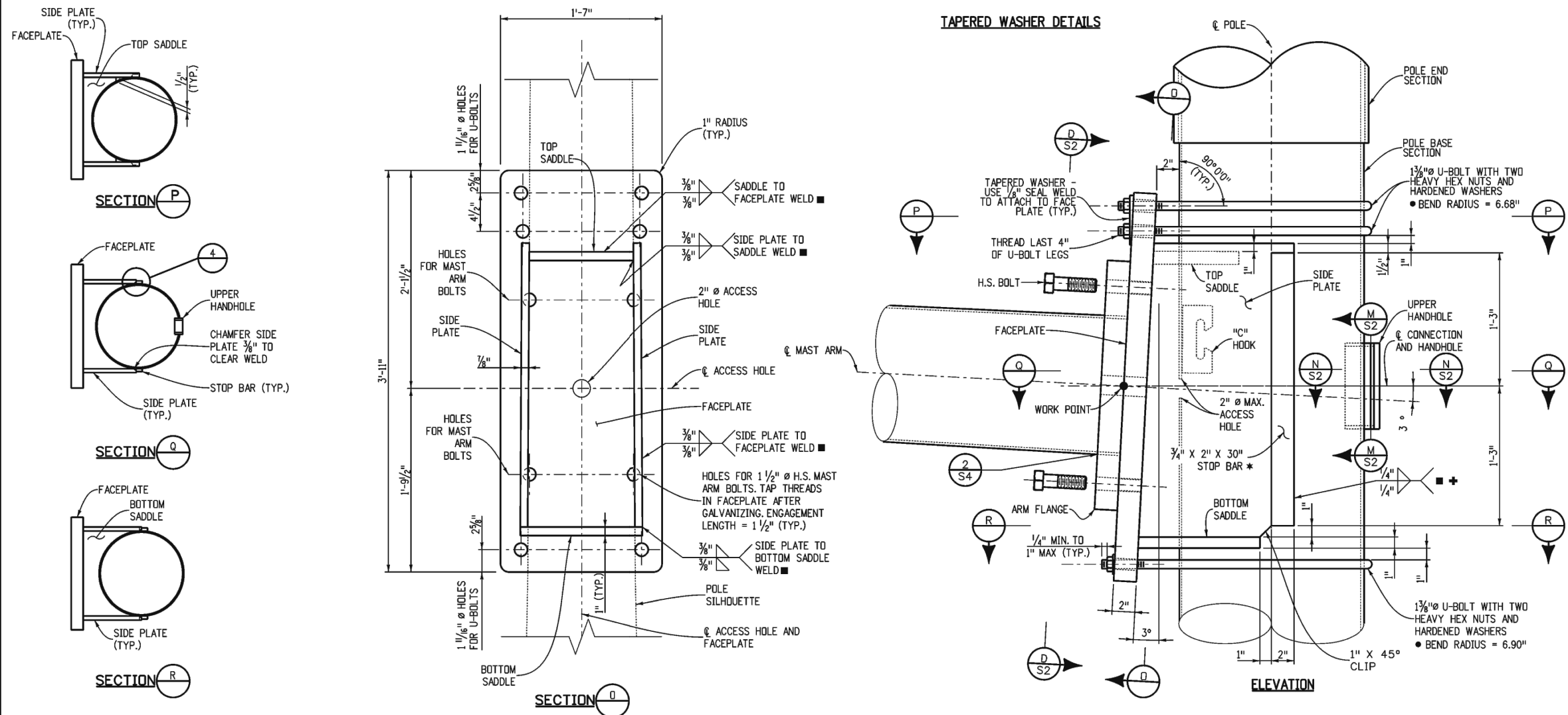


TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

BY: JME
 SCALE: NTS
 DATE: 1/2020

DRAWING:
TS13B

-
- Technical drawing of a plate with two circular holes. The drawing includes front, top, and detail views.
- Front View:** Shows a rectangular plate with two circular holes. The hole diameter is $1\frac{5}{8}"$. The distance between the centers of the holes is $3\frac{1}{4}"$. The total width of the plate is $7\frac{3}{4}"$. The thickness of the plate is $\frac{1}{4}"$. A 3° chamfer is indicated on the top edge.
- Top View:** Shows the plate from above, confirming the hole diameter and spacing.
- Detail View:** A chamfer detail showing the 3° chamfer on the top edge of the plate. The chamfer side is labeled "CHAMFER SIDE PLATE $\frac{3}{8}"$ X 45° TO CLEAR WELD".
- DETAIL 4**

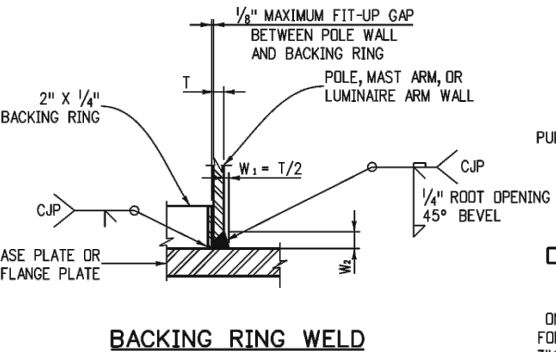
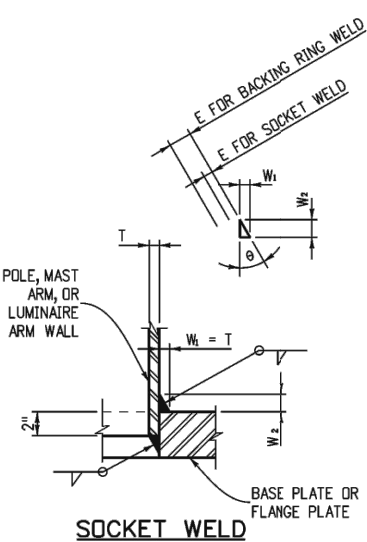


Computer File Information			Sheet Revisions		Colorado Department of Transportation 2829 W. Howard Pl. Denver, CO 80204 Phone: 303-757-9436 FAX: 303-757-9219 Traffic & Safety Engineering MKB	ALTERNATE TRAFFIC SIGNAL 25' - 55' SINGLE MAST ARMS		STANDARD PLAN NO.	
Creation Date: 07/04/12			Date:	Comments		S-614-40A		Standard Sheet No. 3 of 4	
Created By: LAW									
Last Modification Date:									
Last Modified By:									
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English								Issued By: Traffic & Safety Engineering Branch July 31, 2019	

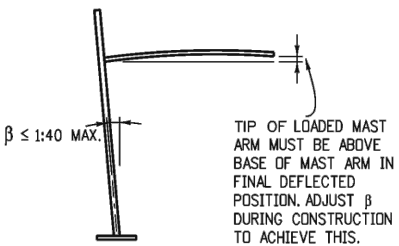
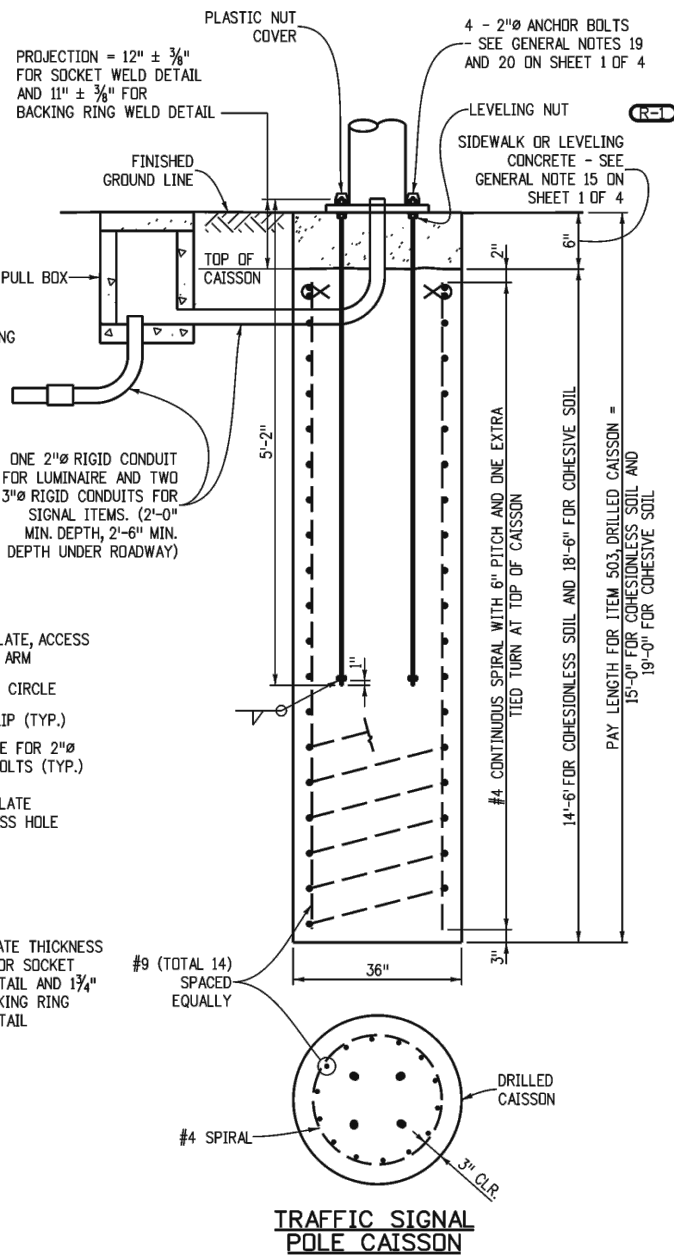
TS13C

SOCKET WELD DATA					
	ARM LENGTH (FT.)	W ₁ (IN.)	W ₂ (IN.)	E (IN.)	θ (DEG.)
MAST ARMS	25	0.2391	0.285	0.183	40
	35	0.2391	0.285	0.183	40
	45	0.3125	0.372	0.239	40
	55	0.3125	0.372	0.239	40
POLE	ALL	0.3125	0.372	0.239	40
LUMINAIRE ARMS	ALL	0.1793	0.214	0.138	40

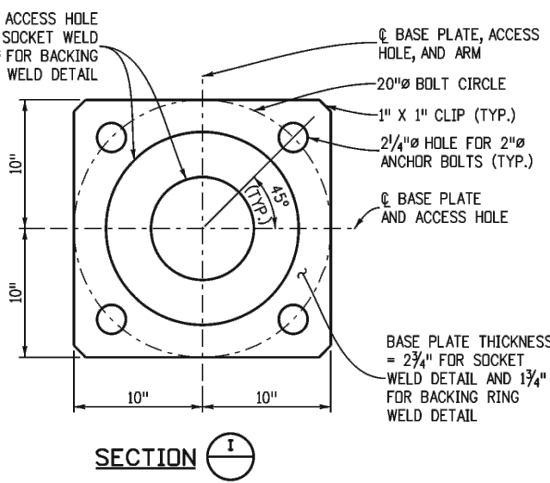
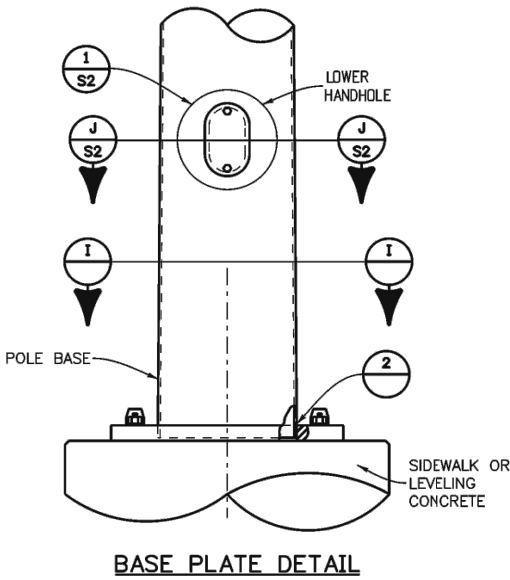
BACKING RING WELD DATA					
	ARM LENGTH (FT.)	W ₁ (IN.)	W ₂ (IN.)	E (IN.)	θ (DEG.)
MAST ARMS	25	0.1196	0.489	0.289	14
	35	0.1196	0.489	0.289	14
	45	0.1566	0.563	0.385	16
	55	0.1566	0.563	0.385	16
POLE	ALL	0.1566	0.563	0.385	16
LUMINAIRE ARMS	ALL	0.0897	0.429	0.212	12



DETAIL 2 2 2
S2 S3



CONSTRUCTION REQUIREMENTS



SECTION I

TRAFFIC SIGNAL POLE CAISSON

Computer File Information		Sheet Revisions		Colorado Department of Transportation 2829 W. Howard Pl. Denver, CO 80204 Phone: 303-757-9436 FAX: 303-757-9219 Traffic & Safety Engineering MKB	ALTERNATE TRAFFIC SIGNAL 25' - 55' SINGLE MAST ARMS		STANDARD PLAN NO. S-614-40A Standard Sheet No. 4 of 4	
Creation Date: 07/04/12		Date:	Comments		Issued By: Traffic & Safety Engineering Branch July 31, 2019		Project Sheet Number:	
Created By: LAW								
Last Modification Date: 09/25/12								
Last Modified By: LAW								
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English								

MASTARM POLES (MAX 55')



TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

BY: JME

SCALE: NTS

DATE: 1/2020

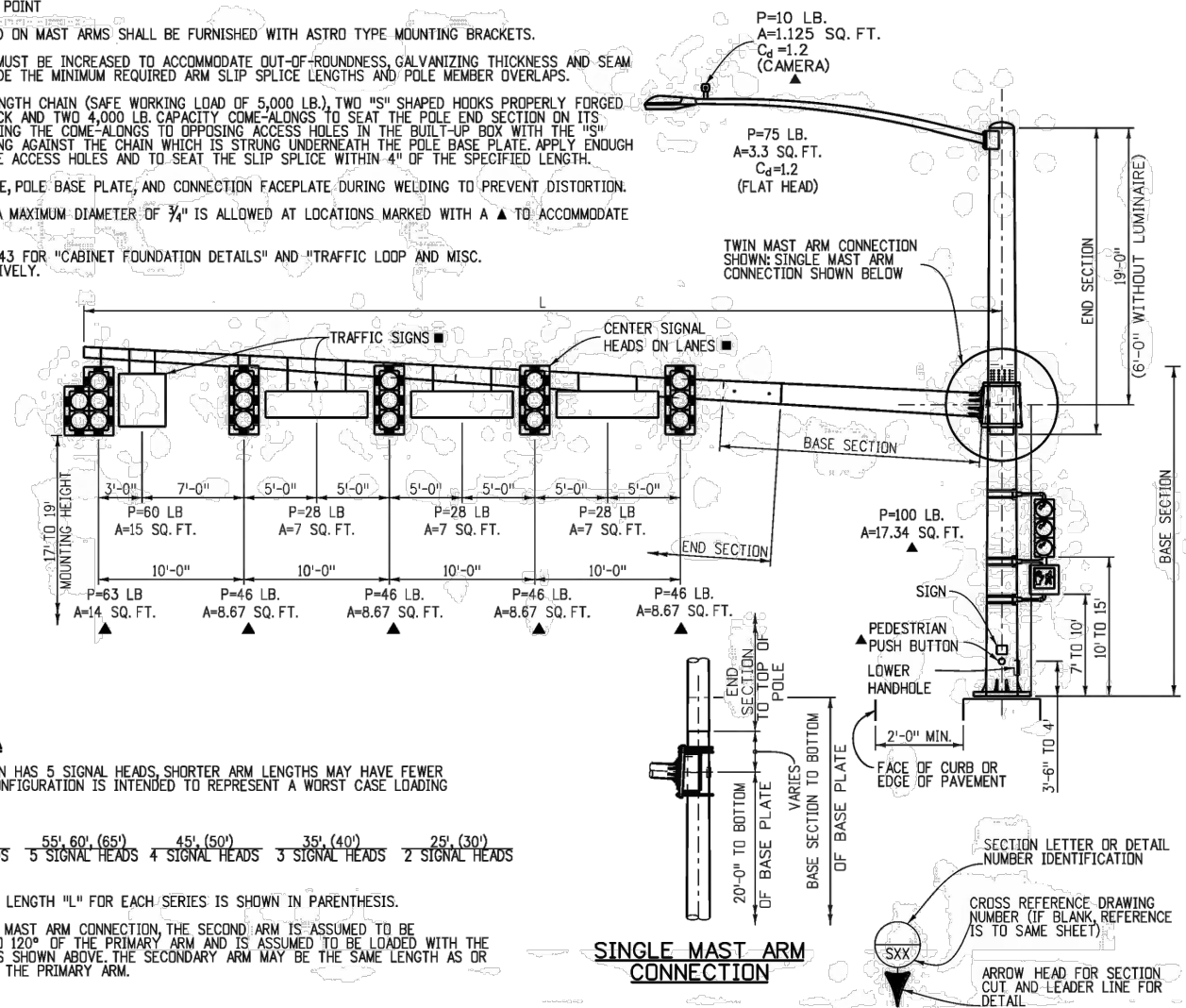
DRAWING:

TS13D

GENERAL NOTES

- REFER TO ROADWAY PLANS FOR THE ACTUAL CONFIGURATION AND LOCATION OF TRAFFIC SIGNAL HEADS AND SIGNS MARKED WITH A ■.
- ALL POLES AND ARMS SHALL BE FABRICATED WITH ASTM A572 GRADE 65 STEEL. LUMINAIRE ARMS MAY BE FABRICATED WITH ASTM A595 GRADE A STEEL WITH A MINIMUM YIELD POINT OF 55 KSI.
- ALL POLES AND ARMS SHALL COMPLY WITH THE DIMENSIONAL TOLERANCES SPECIFIED IN ASTM A500, A501, OR A595.
- ALL POLES AND ARMS SHALL BE ROUND OR DODECAGONAL (12 SIDED) TUBES WITH A 0.14 IN/FT TAPER.
- HARDENED WASHERS SHALL CONFORM TO ASTM F436.
- ALL POLES AND ARMS SHALL BE GALVANIZED INSIDE AND OUTSIDE AFTER FABRICATION IN ACCORDANCE WITH ASTM A123, UNLESS PAINTING IS CALLED FOR ON THE PLANS. PAINTING SHALL CONFORM TO SECTION 522, DUPLEX COATING SYSTEM.
- POLE AND MAST ARM SPLICES SHALL BE MECHANICALLY FORCED TOGETHER FOR A SNUG FIT.
- BLIND BOLTS SHALL BE A307 GRADE A STEEL AND ARE NOT REQUIRED FOR MULTISIDED POLES. MECHANICAL ALTERNATIVES TO BLIND BOLTS UTILIZING FRICTION KEYS, INTERLOCKING TEETH OR A COMBINATION THEREOF TO PREVENT THE BUILT-UP BOX FROM TWISTING ON THE POLE MAY BE USED AS APPROVED BY CDDT STAFF BRIDGE.
- ALL MAST ARMS MORE THAN 40 FT IN LENGTH SHALL BE TWO PIECE CONSTRUCTION TO LIMIT ARM WEIGHTS.
- GALVANIZED ASTM A325 H.S. BOLTS SHALL BE USED FOR ATTACHING LUMINAIRE AND MAST ARMS. A LUBRICATED TIGHTENING TORQUE OF 178 FT-LBS FOR 3/4" DIAMETER BOLTS, 395 FT-LBS FOR 1" DIAMETER BOLTS AND 1300 FT-LBS FOR 1 1/2" DIAMETER BOLTS SHALL BE USED TO TIGHTEN ALL H.S. BOLTS. MAST ARMS SHALL BE TEMPORARILY SUPPORTED TO TAKE LOAD OFF OF FIELD CONNECTIONS WHILE BOLTS ARE TIGHTENED IN ORDER TO FIRMLY SEAT THE FLANGE PLATE. BOLTS SHALL BE SEQUENTIALLY TIGHTENED, ASSUMING 12 BOLTS AND A CLOCK FACE, THE TIGHTENING SEQUENCE WOULD BE 12, 6, 1, 7, ETC. THIS PROCESS SHALL BE CONTINUED UNTIL NO LOOSE BOLTS ARE FOUND AFTER ALL BOLTS HAVE BEEN INITIALLY TIGHTENED.
- CAST POLE END CAP TO BE SECURED IN PLACE WITH 3 SET SCREWS.
- ALL SIGNAL HEADS, SIGNS, AND HARDWARE SHALL BE FIELD POSITIONED.
- ACCESSORIES TO BE HOT DIP GALVANIZED IN ACCORDANCE WITH ASTM A153.
- ALL PLATES AND STIFFENERS SHALL BE FABRICATED WITH AASHTO M270 (ASTM A709) GRADE 36 STEEL AND SHALL COMPLY WITH THE DIMENSIONAL TOLERANCES SPECIFIED IN ASTM A6. ALL HANDHOLES SHALL BE FABRICATED WITH ASTM A572 GRADE 42 STEEL.
- LEVELING CONCRETE SHALL BE 3000 PSI AIR ENTRAINED CONCRETE VIBRATED IN PLACE BELOW THE POLE BASE PLATE.
- THE DESIGNS HEREIN ASSUME THAT SIGNALS ARE INSTALLED WITHIN THE ROADWAY EARTHWORK PRISM WITH THE FOLLOWING SOIL PARAMETERS:
SOIL DENSITY = 110 LB./CU.FT.
SOIL COHESION = 750 LB./SQ.FT. FOR MEDIUM STIFF COHESIVE SOIL
SOIL Ø ANGLE = 30° FOR MEDIUM DENSE COHESIONLESS SOIL
SF = 1.5 FOR TORSIONAL RESISTANCE AND 3.0 FOR FLEXURAL RESISTANCE.
- CONTACT THE ENGINEER IF ANY OF THE FOLLOWING SOIL CONDITIONS ARE ENCOUNTERED DURING DRILLING:
(A) SIGNALS WILL NOT BE INSTALLED WITHIN THE ROADWAY EARTHWORK PRISM.
(B) THE SOIL HAS A HIGH ORGANIC CONTENT OR CONSISTS OF SATURATED SILT AND CLAY.
(C) THE SITE WON'T SUPPORT THE WEIGHT OF THE DRILLING RIG.
(D) THE FOUNDATION SOILS ARE NOT HOMOGENEOUS.
(E) FIRM BEDROCK IS ENCOUNTERED.
- CAISSONS SHALL BE PLACED AGAINST UNDISTURBED EARTH. WET OR CAVING HOLES SHALL BE BACKFILLED WITH FLOW-FILL AND REDRILLED AFTER A THREE DAY CURING PERIOD WITHOUT THE USE OF A CASING.
- CAISSONS SHALL BE CONSTRUCTED WITH AIR ENTRAINED CLASS BZ CONCRETE IN ACCORDANCE WITH SECTION 503 OF THE STANDARD SPECIFICATIONS. REINFORCING STEEL SHALL BE GRADE 60.
- CAISSON CONCRETE MUST HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2,700 PSI BEFORE INSTALLING THE SIGNAL STRUCTURE; VERIFY CONCRETE STRENGTH WITH MATURITY METER.
- U-BOLTS AND ANCHOR BOLTS SHALL BE FABRICATED WITH AASHTO M314-90 GRADE 55 STEEL.
- ANCHOR BOLTS SHALL BE FABRICATED WITH HEAVY HEX NUTS AND FLAT WASHERS, AND EXTENDED A MINIMUM OF 3/4" ABOVE THE NUT AFTER COMPLETING THE TIGHTENING PROCESS. THREAD UPPER 12 INCHES AND GALVANIZE UPPER 13 INCHES OF THE ANCHOR BOLTS. FIELD WELDING OF ANCHOR BOLTS TO REBAR DURING ERECTION WILL NOT BE ALLOWED. ANCHOR BOLTS SHALL BE SET WITH A STEEL TEMPLATE UNTIL THE CONCRETE HAS CURED AT LEAST TWO DAYS. THE ANCHOR BOLTS SHALL BE TIGHTENED USING THE TURN-OF-NUT METHOD. THE BOLTS SHALL FIRST BE TIGHTENED TO SNUG TIGHT, WHICH IS DEFINED AS THE TIGHTNESS THAT EXISTS WHEN THE UPPER AND LOWER NUTS ARE IN FIRM CONTACT WITH THE BASE PLATE. WITH MAST ARMS FREE TO DEFLECT, THE UPPER AND LOWER NUTS SHALL THEN EACH BE ROTATED AN ADDITIONAL 1/2 TURN (30° ± 5°) WITH A SLUGGING, HYDRAULIC OR AIR IMPACT WRENCH.
- WELDING OF STEEL SHALL CONFORM TO THE REQUIREMENTS OF ANSI/AWS D1.1. ALL AREAS TO BE WELDED SHALL BE GROUND TO BRIGHT METAL. ALL WELDING AND REQUIRED TESTING SHALL BE COMPLETE BEFORE ANY MATERIAL IS GALVANIZED. ALL CIRCUMFERENTIAL AND STIFFENER WELDS SHALL BE NON-DESTRUCTIVELY TESTED USING THE ENHANCED MAGNETIC PARTICLE METHOD IN ACCORDANCE WITH SUBSECTION 509.18 (d) OF THE STANDARD SPECIFICATIONS. THE ACCEPTANCE CRITERIA IS STATED IN TABLE 6.1 OF ANSI/AWS D1.1. ALL LONGITUDINAL WELDS WITHIN 6 INCHES OF FULL PENETRATION CIRCUMFERENTIAL GROOVE WELDS AND FULL PENETRATION GROOVE WELDS SHALL BE INSPECTED AS SPECIFIED ABOVE. MAXIMUM WELD UNDERCUT SHALL BE 0.01 INCHES.

- ALL ELECTRICAL CONNECTIONS TO THE SIGNALS SHALL BE GROUNDED IN ACCORDANCE WITH APPLICABLE ELECTRICAL CODES.
- TRAFFIC SIGNAL STRUCTURES HAVE BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS, FOURTH EDITION, 2001.
- A DESIGN WIND VELOCITY OF 100 MPH AND ONE 12' LANE WITH A 65 MPH TRUCK INDUCED GUST LOADING HAVE BEEN USED FOR THE DESIGNS HEREIN.
- CERTIFIED MILL TEST REPORTS INCLUDING CHARPY V-NOTCH TEST RESULTS, WELD INSPECTION REPORTS AND ENHANCED MAGNETIC PARTICLE TEST REPORTS SHALL BE SUBMITTED TO CDDT STAFF BRIDGE, 4201 E. ARKANSAS AVE. DENVER, COLORADO 80222 AS SOON AS THEY BECOME AVAILABLE. CVN TEST RESULTS FOR ASTM A572 GRADES 42 AND 65 STEEL SHALL HAVE A MINIMUM VALUE OF 15 FT-LBS AT 40°F AS PER THE H FREQUENCY TEST REQUIREMENTS IN AASHTO T243 (ASTM A673).
- SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW IN ACCORDANCE WITH SUBSECTION 105.02 OF THE STANDARD SPECIFICATIONS.
- DEFINITIONS: U.O.N. = UNLESS OTHERWISE NOTED
W.P. = WORK POINT
- TRAFFIC SIGNALS MOUNTED ON MAST ARMS SHALL BE FURNISHED WITH ASTRO TYPE MOUNTING BRACKETS.
- END SECTION DIAMETERS MUST BE INCREASED TO ACCOMMODATE OUT-OF-ROUNDNESS, GALVANIZING THICKNESS AND SEAM WELD PROFILES TO PROVIDE THE MINIMUM REQUIRED ARM SLIP SPLICE LENGTHS AND POLE MEMBER OVERLAPS.
- USE 35' OF 3/4" HIGH STRENGTH CHAIN (SAFE WORKING LOAD OF 5,000 LB.), TWO "S" SHAPED HOOKS PROPERLY FORGED FROM 1" SQUARE BAR STOCK AND TWO 4,000 LB. CAPACITY COME-ALONGS TO SEAT THE POLE END SECTION ON ITS BASE SECTION BY ATTACHING THE COME-ALONGS TO OPPOSING ACCESS HOLES IN THE BUILT-UP BOX WITH THE "S" SHAPED HOOKS AND PULLING AGAINST THE CHAIN WHICH IS STRUNG UNDERNEATH THE POLE BASE PLATE. APPLY ENOUGH FORCE TO ALIGN THE WIRE ACCESS HOLES AND TO SEAT THE SLIP SPLICE WITHIN 4" OF THE SPECIFIED LENGTH.
- SECURE ARM FLANGE PLATE, POLE BASE PLATE, AND CONNECTION FACEPLATE DURING WELDING TO PREVENT DISTORTION.
- ONE DRILLED HOLE WITH A MAXIMUM DIAMETER OF 3/4" IS ALLOWED AT LOCATIONS MARKED WITH A ▲ TO ACCOMMODATE ELECTRICAL WIRING.
- SEE S-614-42 AND S-614-43 FOR "CABINET FOUNDATION DETAILS" AND "TRAFFIC LOOP AND MISC. SIGNAL DETAILS" RESPECTIVELY.



DESIGN DATA

- DRAWING SHOWN HAS 5 SIGNAL HEADS, SHORTER ARM LENGTHS MAY HAVE FEWER HEADS. THIS CONFIGURATION IS INTENDED TO REPRESENT A WORST CASE LOADING CONDITION.
70' (75') 55' 60' (65') 45' (50') 35' (40') 25' (30')
5 SIGNAL HEADS 5 SIGNAL HEADS 4 SIGNAL HEADS 3 SIGNAL HEADS 2 SIGNAL HEADS
THE DESIGN LENGTH "L" FOR EACH SERIES IS SHOWN IN PARENTHESIS.
- FOR THE TWIN MAST ARM CONNECTION, THE SECOND ARM IS ASSUMED TO BE WITHIN 60° TO 120° OF THE PRIMARY ARM AND IS ASSUMED TO BE LOADED WITH THE SAME LOADS AS SHOWN ABOVE. THE SECONDARY ARM MAY BE THE SAME LENGTH AS OR SHORTER THAN THE PRIMARY ARM.

Computer File Information

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CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English

Sheet Revisions

Date:	Comments:

Colorado Department of Transportation



2829 W. Howard Pl.
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Traffic & Safety Engineering

MKB

TYPICAL TRAFFIC SIGNAL 30' - 75' DOUBLE MAST ARMS 65' - 75' SINGLE MAST ARMS

Issued By: Traffic & Safety Engineering Branch July 31, 2019

STANDARD PLAN NO.

S-614-40
Standard Sheet No. 1 of 5

Project Sheet Number:



TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

BY: JME

SCALE: NTS

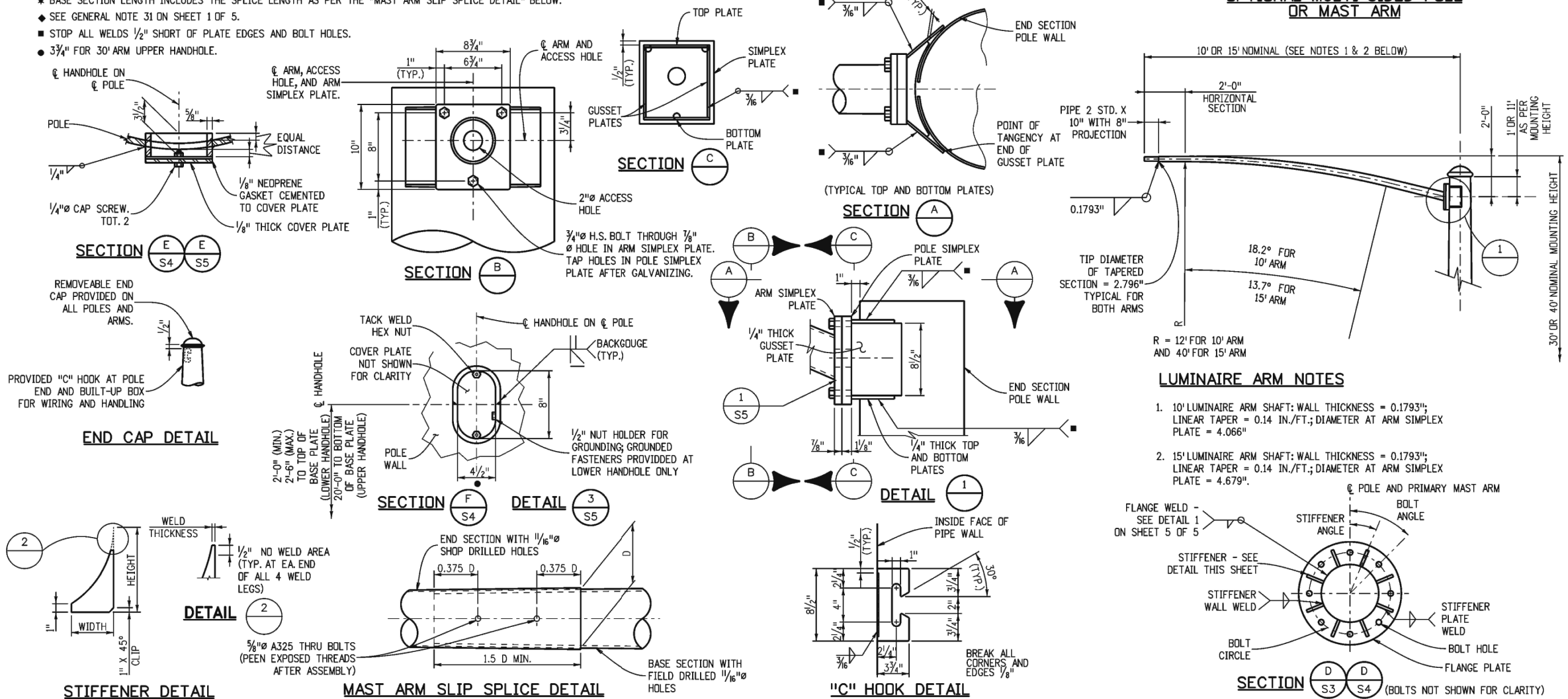
DATE: 1/2020

DRAWING:

TS14A

MAST ARM LENGTH (L) (FT.)	MAST ARM DATA								MAST ARM CONNECTION DATA															
	BASE SECTION *				END SECTION ♦				STIFFENER							FLANGE			BOLT					
	LENGTH (FT.)	TIP Ø (IN.)	TRUNK Ø (IN.)	THK. (IN.)	LENGTH (FT.)	TIP Ø (IN.)	TRUNK Ø (IN.)	THK. (IN.)	NO. OF	THK. (IN.)	WIDTH (IN.)	HEIGHT (IN.)	RADIUS (IN.)	ANGLE	WALL WELD (IN.)	PLATE WELD (IN.)	DIA. (IN.)	THK. (IN.)	SOCKET WELD (IN.)	NO. OF	DIA. (IN.)	CIRCLE DIA. (IN.)	HOLE DIA. (IN.)	ANGLE
30	29.25	6.50	10.59	0.1793	N.A.	N.A.	N.A.	N.A.	6	0.50	3.5	7	6.89	30.0°	0.179	0.375	20	1.00	0.179	6	1.0	16	1.125	60.0°
40	39.11	6.50	11.98	0.2391	N.A.	N.A.	N.A.	N.A.	8	0.50	4.0	8	8.12	22.5°	0.239	0.375	23	1.25	0.239	8	1.5	17	1.625	45.0°
50	25.15	9.47	12.99	0.3125	25	6.50	10.00	0.1793	8	0.75	4.0	8	8.12	22.5°	0.250	0.625	24	1.50	0.250	8	1.5	18	1.625	45.0°
65	25.35	12.52	16.07	0.3125	40	7.50	13.10	0.1793	8	0.75	5.0	10	10.60	22.5°	0.250	0.625	29	1.75	0.250	8	1.5	23	1.625	45.0°
75	35.23	12.52	17.45	0.3125	40	7.50	13.10	0.1793	10	0.75	5.5	11	11.84	18.0°	0.250	0.625	31	1.75	0.250	10	1.5	25	1.625	36.0°

- * BASE SECTION LENGTH INCLUDES THE SPLICE LENGTH AS PER THE "MAST ARM SLIP SPLICE DETAIL" BELOW.
- ♦ SEE GENERAL NOTE 31 ON SHEET 1 OF 5.
- STOP ALL WELDS 1/2" SHORT OF PLATE EDGES AND BOLT HOLES.
- 3/4" FOR 30' ARM UPPER HANDHOLE.



Computer File Information			Sheet Revisions		Colorado Department of Transportation 2829 W. Howard Pl. Denver, CO 80204 Phone: 303-757-9436 FAX: 303-757-9219 Traffic & Safety Engineering MKB	TYPICAL TRAFFIC SIGNAL 30' - 75' DOUBLE MAST ARMS 65' - 75' SINGLE MAST ARMS Issued By: Traffic & Safety Engineering Branch July 31, 2019	STANDARD PLAN NO. S-614-40 Standard Sheet No. 2 of 5 Project Sheet Number:
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MASTARM POLES (>55' AND DOUBLES)



TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

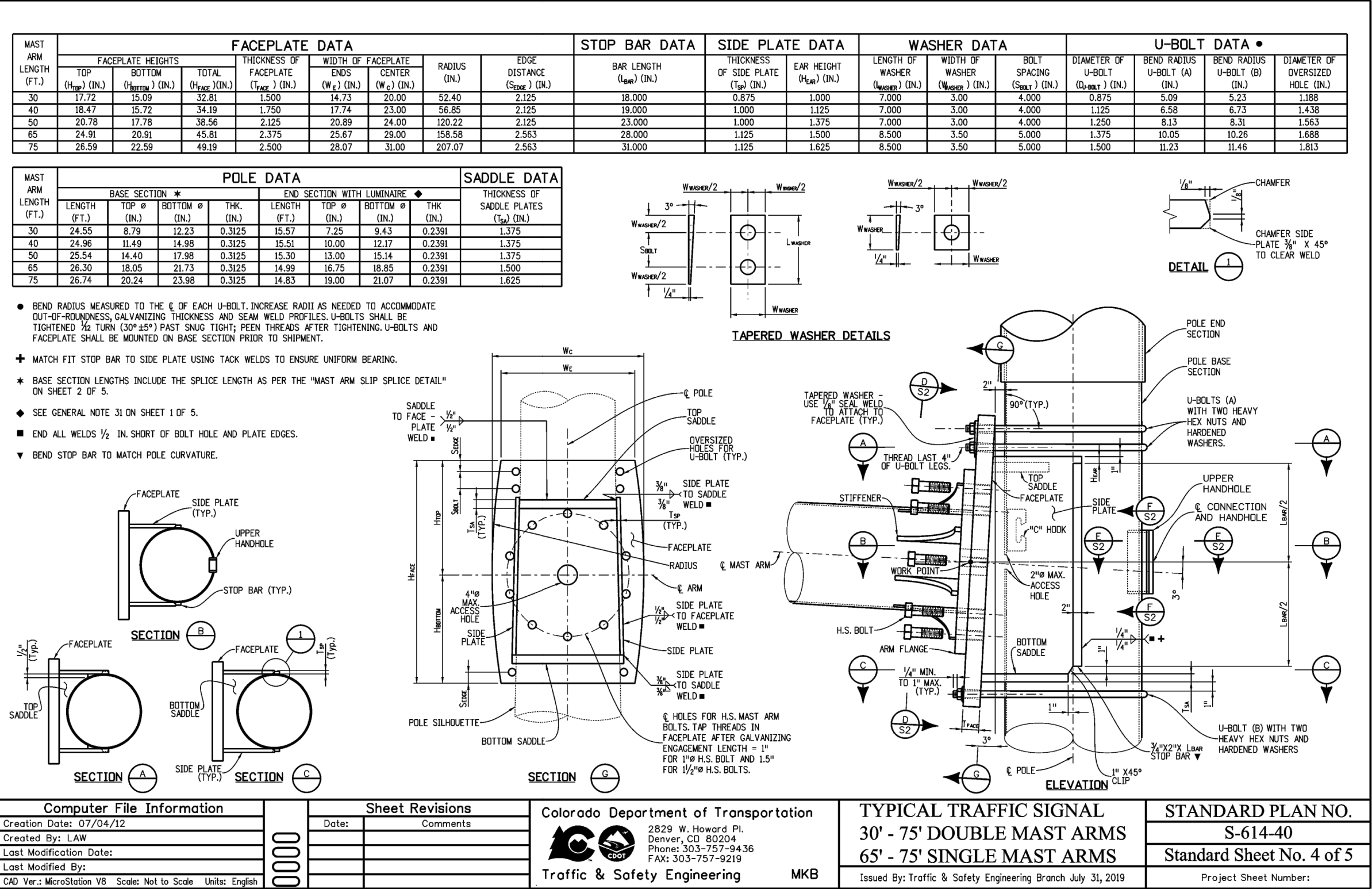
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

TS14B



- BEND RADIUS MEASURED TO THE C OF EACH U-BOLT. INCREASE RADII AS NEEDED TO ACCOMMODATE OUT-OF-ROUNDNESS, GALVANIZING THICKNESS AND SEAM WELD PROFILES. U-BOLTS SHALL BE TIGHTENED 1/2 TURN (30°±5°) PAST SNUG TIGHT; PEEN THREADS AFTER TIGHTENING. U-BOLTS AND FACEPLATE SHALL BE MOUNTED ON BASE SECTION PRIOR TO SHIPMENT.
- + MATCH FIT STOP BAR TO SIDE PLATE USING TACK WELDS TO ENSURE UNIFORM BEARING.
- * BASE SECTION LENGTHS INCLUDE THE SPLICE LENGTH AS PER THE "MAST ARM SLIP SPLICE DETAIL" ON SHEET 2 OF 5.
- ♦ SEE GENERAL NOTE 31 ON SHEET 1 OF 5.
- END ALL WELDS 1/2 IN. SHORT OF BOLT HOLE AND PLATE EDGES.
- ▼ BEND STOP BAR TO MATCH POLE CURVATURE.

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Date:	Comments

Colorado Department of Transportation



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Traffic & Safety Engineering

MKB

TYPICAL TRAFFIC SIGNAL

30' - 75' DOUBLE MAST ARMS

65' - 75' SINGLE MAST ARMS

Issued By: Traffic & Safety Engineering Branch July 31, 2019

STANDARD PLAN NO.
S-614-40
Standard Sheet No. 4 of 5
Project Sheet Number:

MASTARM POLES (>55' AND DOUBLES)

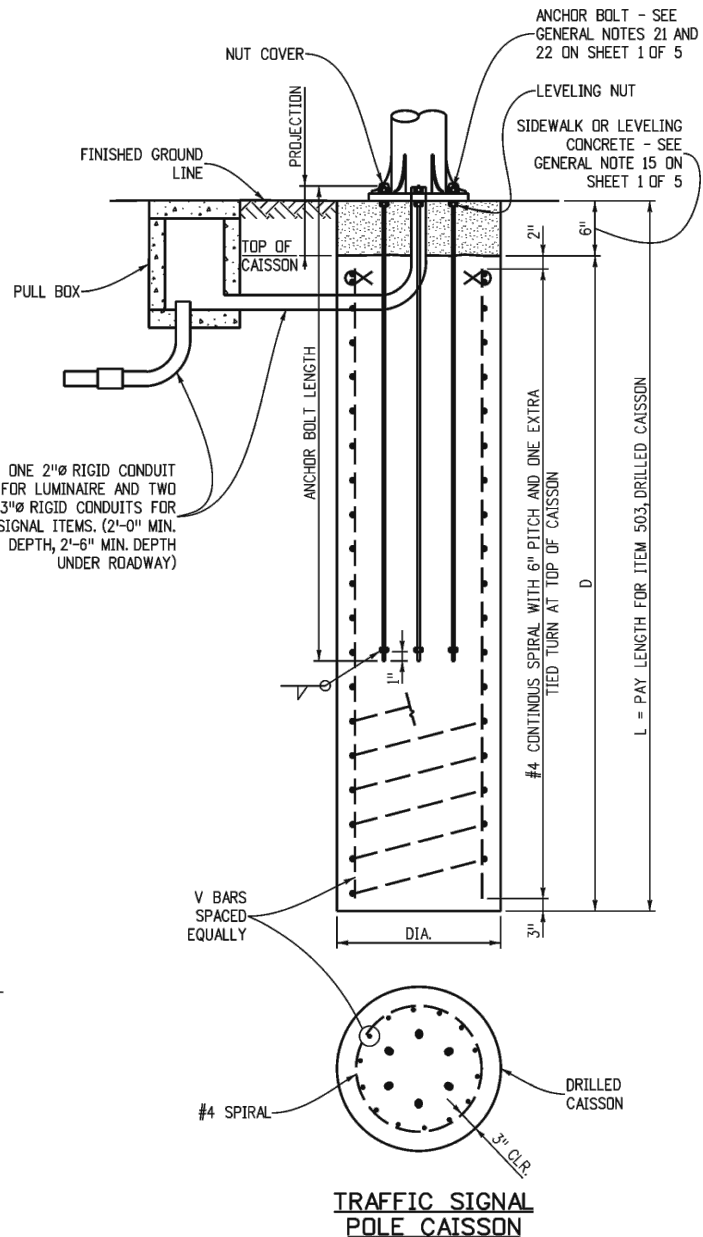
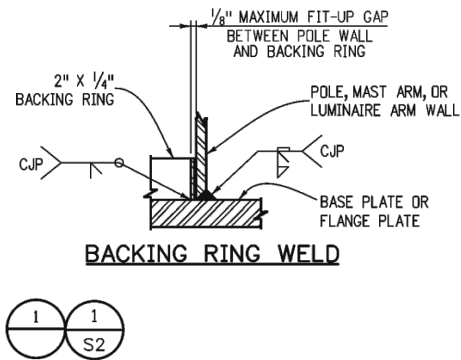
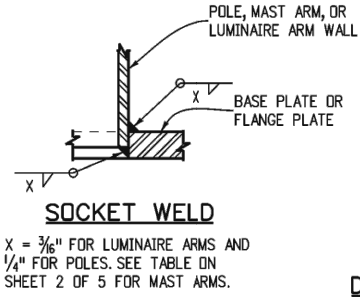
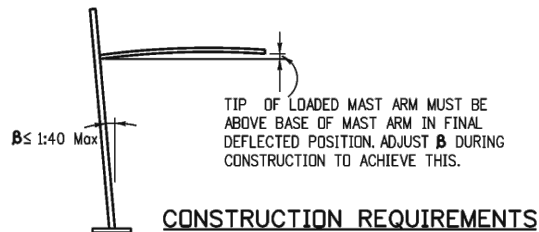
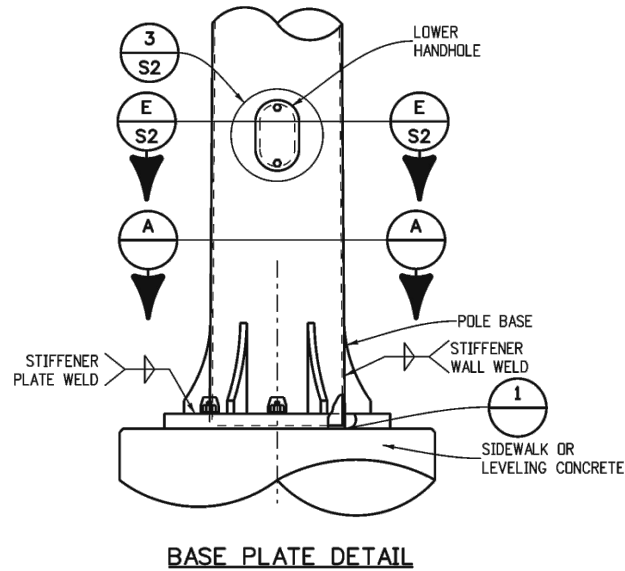
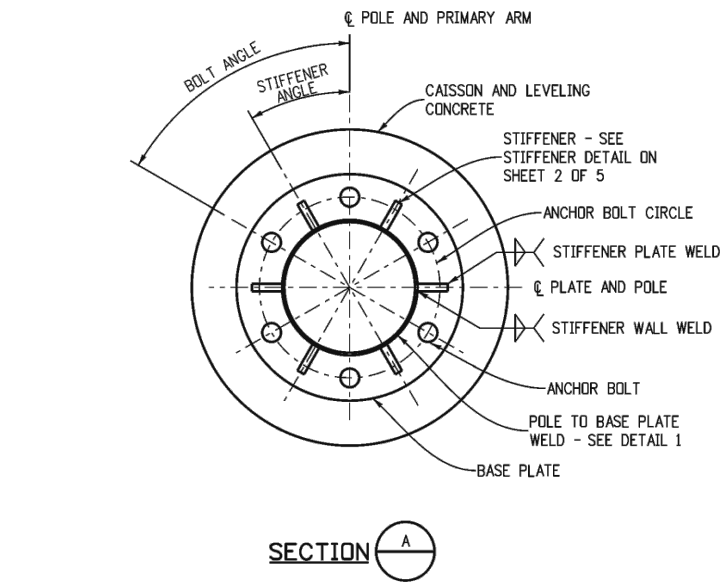


TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:
TS14D

MAST ARM LENGTH (FT.)	POLE BASE CONNECTION DATA															CAISSON DATA (FOR SINGLE AND DOUBLE ARM INSTALLATIONS)						
	STIFFENER							BASE PLATE		ANCHOR BOLT												
	NO. OF	THK. (IN.)	WIDTH (IN.)	HEIGHT (IN.)	RADIUS (IN.)	ANGLE	WALL WELD (IN.)	PLATE WELD (IN.)	DIA. (IN.)	THK. (IN.)	NO. OF	DIA. (IN.)	LENGTH (IN.)	CIRCLE DIA. (IN.)	HOLE DIA. (IN.)	ANGLE	PROJECTION (IN.)	DIA. (IN.)	DEPTH (D) (FT.)	PAY LENGTH (L) (FT.)	V BARS	
																					SIZE	TOTAL
30	6	0.75	5.0	10	10.600	30.0°	0.25	0.625	24	2.25	6	2.0	63	17.75	2.25	60.0°	11.25	36	12.5	13	#9	11
40	6	0.75	5.5	11	11.841	30.0°	0.25	0.625	27	2.50	6	2.0	63	21.00	2.25	60.0°	11.50	36	14.5	15	#9	11
50	6	0.75	6.5	13	14.327	30.0°	0.25	0.625	32	2.75	6	2.0	63	25.00	2.25	60.0°	11.75	42	16.5	17	#9	14
65	6	0.75	8.0	16	18.063	30.0°	0.25	0.625	39	3.00	6	2.5	63	30.25	2.75	60.0°	12.50	48	20.5	21	#9	18
75	6	0.75	8.5	17	19.309	30.0°	0.25	0.625	42	3.25	6	2.5	63	33.00	2.75	60.0°	12.75	54	20.5	21	#9	23



Computer File Information			Sheet Revisions		Colorado Department of Transportation	TYPICAL TRAFFIC SIGNAL 30' - 75' DOUBLE MAST ARMS 65' - 75' SINGLE MAST ARMS	STANDARD PLAN NO. S-614-40 Standard Sheet No. 5 of 5
Creation Date: 07/04/12			Date:	Comments			
Created By: LAW	00				 2829 W. Howard Pl. Denver, CO 80204 Phone: 303-757-9436 FAX: 303-757-9219 Traffic & Safety Engineering	MKB	Issued By: Traffic & Safety Engineering Branch July 31, 2019
Last Modification Date:	00						
Last Modified By:	00						
CAD Ver.: MicroStation V8 Scale: Not to Scale Units: English							Project Sheet Number:

MASTARM POLES (>55' AND DOUBLES)



TRAFFIC SIGNAL CONSTRUCTION DRAWINGS

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

TS14E

<u>DRAWING NO.</u>	<u>TITLE</u>
W1	VALVE OPERATION
W2	WATER TRENCH DETAIL
W3	STANDARD VALVE AND BOX
W4	24" MANHOLE RING AND COVER
W5	WATERLINE LOWERING
W6	FIRE HYDRANTS, MAINS AND VALVES
W7A	STUB-OUT CONFIGURATIONS (1 OF 2)
W7B	STUB-OUT CONFIGURATIONS (2 OF 2)
W8	WATER SERVICE DETAIL
W9	5/8" – 1" WATER METER DETAIL
W10	1 1/2" – 2" WATER METER DETAIL
W11A	PRV IN RECTANGULAR VAULT (1 OF 2)
W11B	PRV IN RECTANGULAR VAULT (2 OF 2)
W12	POLYETHYLENE WRAP
W13	INSULATORS
W14	TEMPORARY BLOWOFF FOR 12" AND SMALLER PIPE
W15	UTILITY ENCASEMENT DETAIL
W16	CONCRETE THRUST BLOCK DETAIL
W17	METER PIT AND CURB STOP PROTECTION
W18	DITCH OR PIPE CROSSING DETAIL
W19	CASING PIPE DETAIL
W20	RESTRAINED PIPE LENGTHS
W21	GALVANIZED STEEL VENT PIPE
W22	AIR AND VACUUM VALVE DETAIL
W23	MECHANICAL JOINT RESTRAINT DETAIL
W24	COMBINATION FLANGED HARNESS LUG DETAIL
W25	JOINT RESTRAINT DETAIL
W26	FIRE HYDRANT GUARDS
W27	TAPPING TEE AND VALVE
W28	DOMESTIC WATER TAPPING DETAIL
W29	CROSSING STORM AND SANITARY SEWERS
W30	MARKER POST
W31	TYPICAL CUTOFF WALL FOR DITCH CROSSING
W32	2" AND LARGER DOMESTIC AND FIRELINE CONNECTIONS
W33A	TRACER WIRE (1 OF 2)
W33B	TRACER WIRE (2 OF 2)
W34	CONCRETE METER SUPPORTS
W35	PLASTIC STEP
W36	WATER AND SEWER SERVICE LOCATIONS
W37	CLAY OR CONCRETE CUT-OFF WALL
W38	WATER METER NOTES

INDEX OF WATER DETAILS



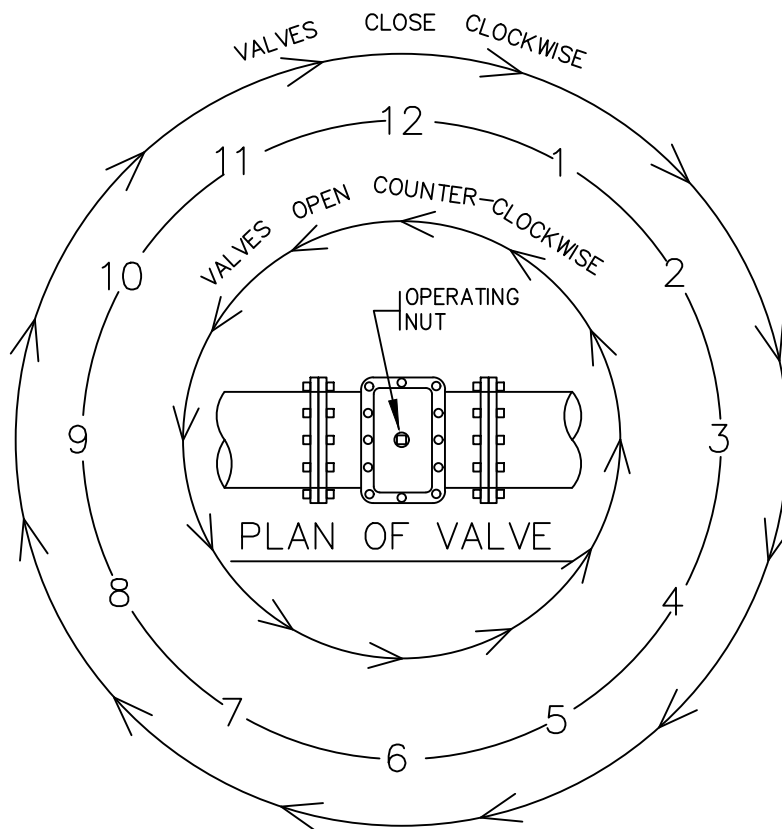
WATER CONSTRUCTION DRAWINGS

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:



NOTES:

1. NORMALLY VALVES WITH A BLACK OPERATING NUT INDICATE A STANDARD FIRESTONE VALVE (OPEN LEFT).

VALVE OPERATION

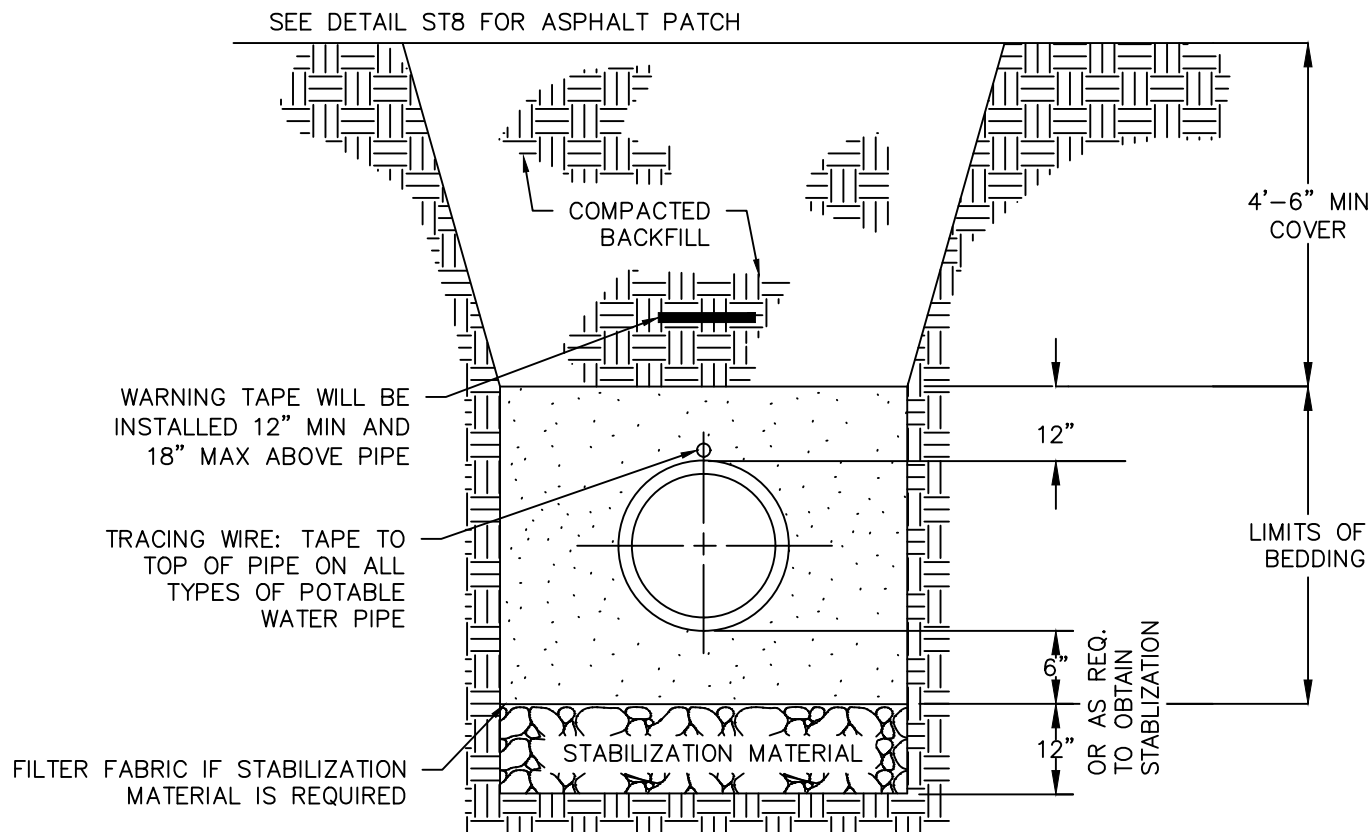


**WATER CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

W1



NOTES:

1. COMPACTION SHALL BE AS FOLLOWS: PIPE ZONE BEDDING 6" UNDER AND 12" OVER PIPE WILL REQUIRE 90% S.P.D. TRENCH ZONE ABOVE BEDDING MATERIALS, FULL TRENCH SECTION IN ROADWAY OR STREET R.O.W. LIMITS WILL REQUIRE 95% S.P.D. TRENCH ZONE ABOVE BEDDING MATERIALS, OUTSIDE OF STREET R.O.W. WILL REQUIRE 90% S.P.D.
2. 12 AWG. SINGLE STRAND INSULATED COPPER WIRE SHALL BE INSTALLED AS TRACING WIRE ABOVE ALL POTABLE WATER PIPES. THE WIRE SHALL BE CONNECTED AND COME TO THE SURFACE BEHIND THE FIRE HYDRANTS IN A TESTBOX.
3. FILTER FABRIC IS REQUIRED IF STABILIZATION MATERIAL IS USED. THE FABRIC SHALL BE INSTALLED AS SHOWN IN THE DETAIL.
4. TRENCH TO BE BRACED OR SHEETED AS NECESSARY FOR THE SAFETY OF THE WORKMEN AND PROTECTION OF OTHER UTILITIES IN ACCORDANCE WITH APPLICABLE LOCAL, STATE AND FEDERAL SAFETY REGULATIONS.
5. PIPE SHALL BE BEDDED FROM 6" BELOW THE BOTTOM OF THE PIPE TO 12" ABOVE THE TOP OF THE PIPE.
6. TRENCH WIDTH SHALL NOT BE MORE THAN 24" NOR LESS THAN 12" WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE.

WATER TRENCH DETAIL



WATER CONSTRUCTION
DRAWINGS

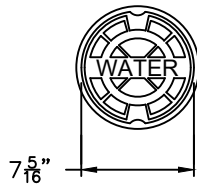
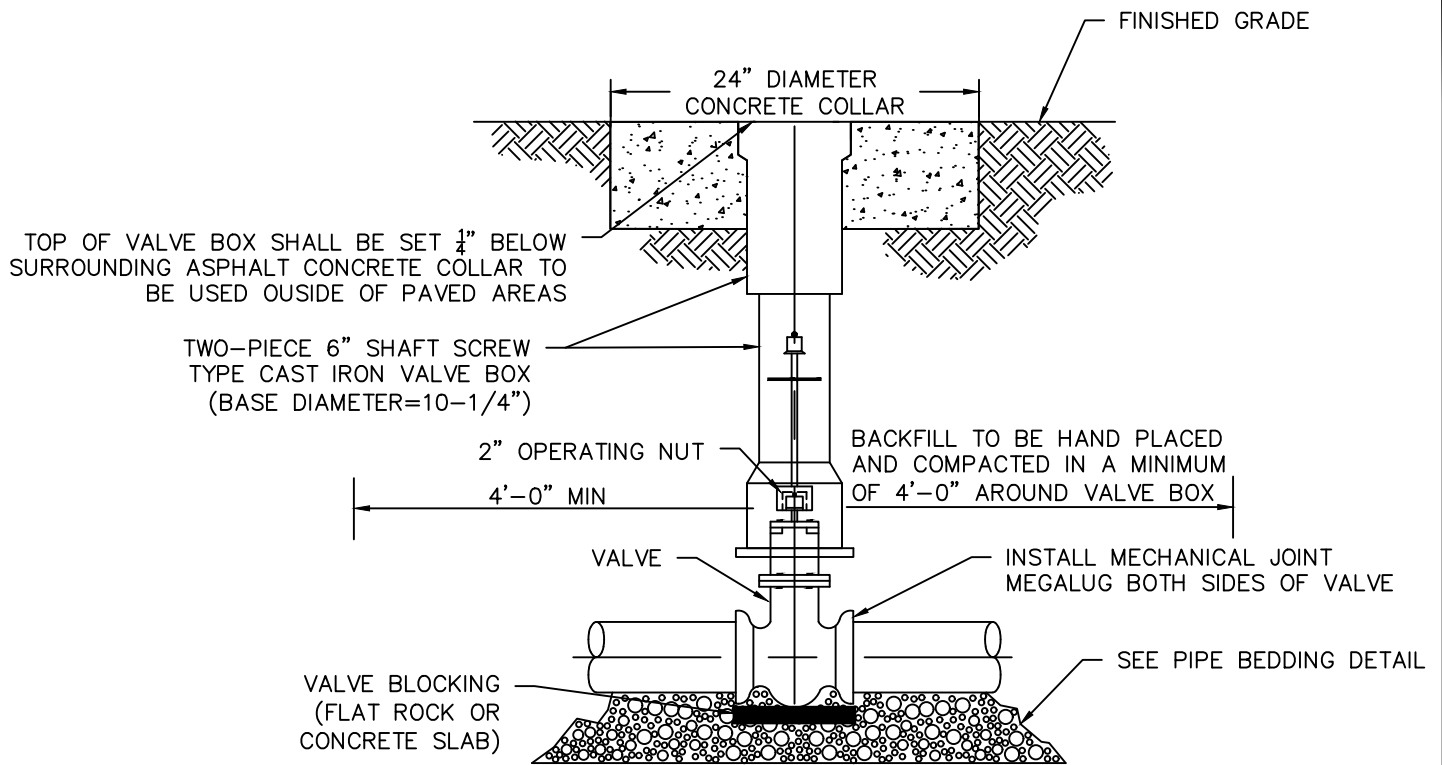
BY: JME

SCALE: NTS

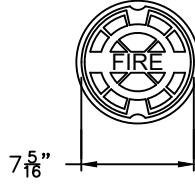
DATE: 1/2020

DRAWING:

W2



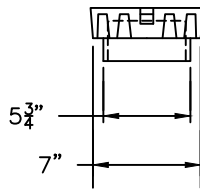
POTABLE VALVE BOX COVER PLAN



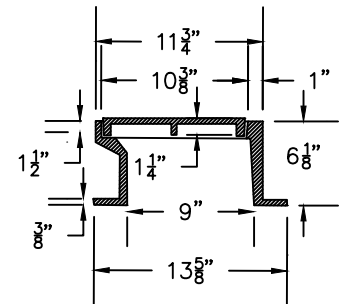
FIRE VALVE BOX COVER PLAN



NON-POTABLE VALVE BOX COVER PLAN



POTABLE & FIRE VALVE BOX COVER ELEVATION



NON-POTABLE VALVE BOX COVER ELEVATION

NOTES:

1. POTABLE & FIRE VALVE BOX LID RESTS INSIDE THE UPPER VALVE BOX SECTION.
2. NON-POTABLE VALVE BOX LID SLIDES OVER THE TOP OF THE UPPER VALVE BOX SECTION.
3. NON-POTABLE, WATER OR FIRE CAST IN TOP OF APPROPRIATE VALVE BOX COVER.
4. VALVE BOX SHALL NOT BE SUPPORTED BY WATER LINE.
5. VALVE BOX TO BE PLUMB AND CENTERED OVER NUT.
6. UTILIZING A VALVE BOX ALIGNMENT DEVICE IS OPTIONAL.
7. IF 2" OPERATING NUT IS MORE THAN 6' BELOW FINISHED GRADE, A VAULT NUT EXTENDER SHALL BE INSTALLED TO PUT THE VALVE NUT AT AN ELEVATION OF 4' BELOW FINISHED GRADE.

STANDARD VALVE AND BOX



**WATER CONSTRUCTION
DRAWINGS**

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

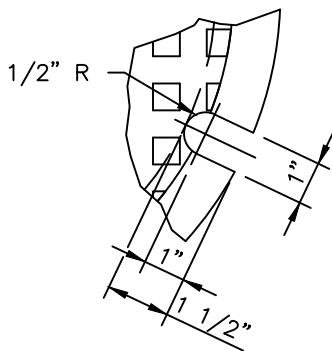
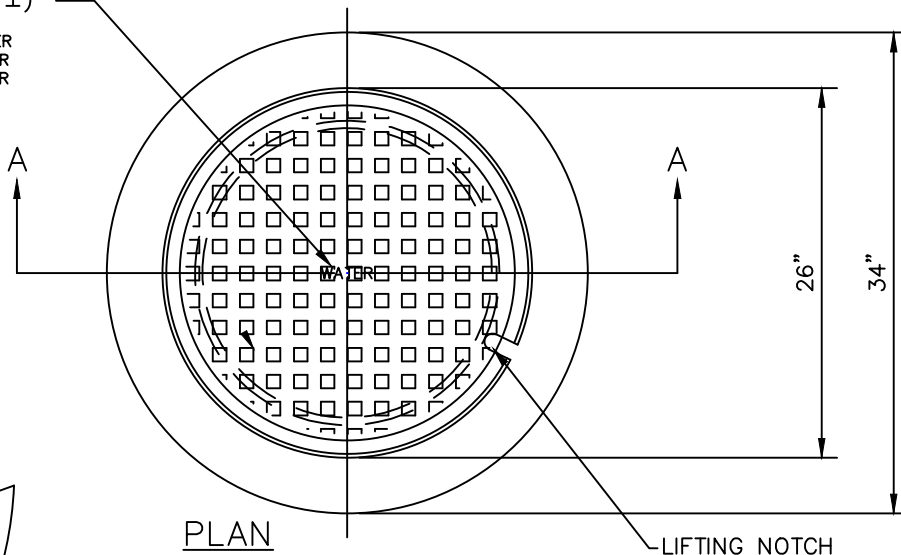
W3

RAISED LETTERS ($1/8"$ ±)

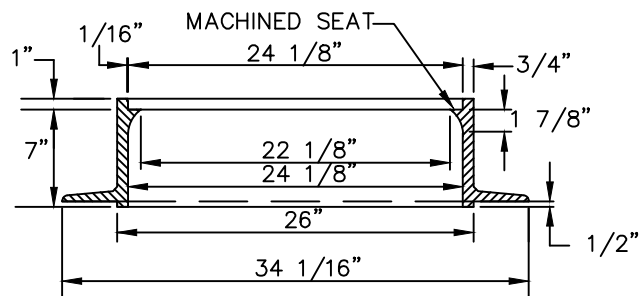
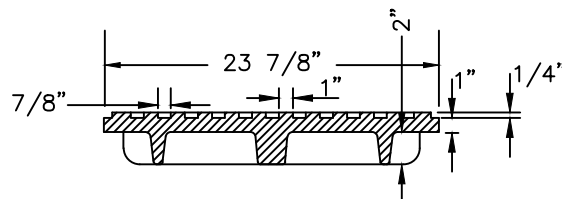
WATER
STORM
SANITARY

WATER
SEWER
SEWER

$1\ 1/4"$



LIFTING NOTCH



SECTION A-A

1. CASTING SPECIFICATIONS: ASTM A-48 WITH A MINIMUM TENSILE STRENGTH OF 25 KSI (CLASS 25)
2. ALL CASTINGS TO BE DIPPED IN ASPHALT BASE PAINT (OR APPROVED EQUAL)
3. CASTINGS SHALL BE AS SPECIFIED BELOW OR APPROVED EQUAL:

MANUFACTURERS	CAT. #
NEENAH	R-1706
CASTINGS, INC.	MH-400-24 C.I.
HUTCHINSON FDRY. & STL. INC.	MH-400
EAST JORDAN	FRAME-2420Z

4. ALL NEW MANHOLES MUST INCLUDE A PLASTIC OR VINYL TAG ATTACHED TO THE TOP STEP STATING THE FOLLOWING "CAUTION CONFINED SPACE; ENTRY PERMIT REQUIRED.

24" MANHOLE RING AND COVER

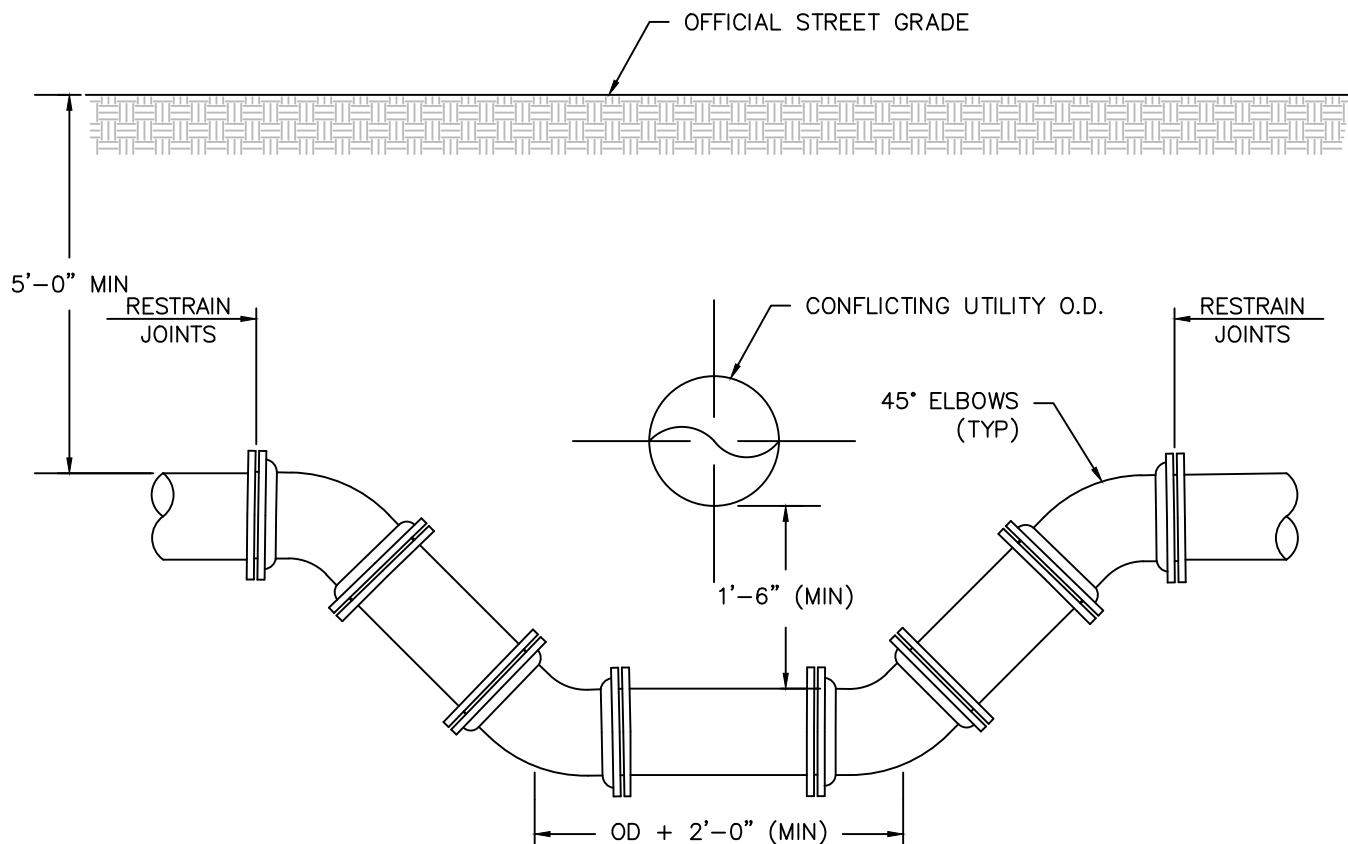


WATER CONSTRUCTION
DRAWINGS

BY: PCB
SCALE: NTS
DATE: 12/2021

DRAWING:

W4



NOTES:

1. LOWERING OF THIS TYPE WILL BE RESTRAINED BY MEANS OF THRUST BLOCKING AND MEGALUGS OR RODDING.
2. FOR SIZING INFORMATION OF THRUST BLOCKS REFER TO THRUST BLOCK DETAILS.
3. WHEN RESTRAINING PIPE BY MEANS OF RODDING JOINTS, $\frac{3}{4}$ " TIE RODS, NUTS AND WASHERS WILL BE USED AND ARE TO BE MADE OF "COR-TEN" STEEL AS PER A.S.T.M. A242.
4. FOR FURTHER INFORMATION ON RODDING OF JOINTS REFER TO TABLE 1.
5. ALL METALLIC PIPE, FITTINGS AND APPURTENANCES WILL BE WRAPPED IN POLYETHYLENE.
6. REQUIREMENTS FOR LARGER THAN 12" DIAMETER PIPE WILL BE DETERMINED ON A CASE BY CASE BASIS.
7. LENGTH OF EXTENSION OF PIPE AND RESTRAINED JOINTS SHALL BE IN ACCORDANCE WITH THE ENGINEERING STANDARDS.
8. CATHODIC PROTECTION SHALL BE AS REQUIRED IN ACCORDANCE WITH THE ENGINEERING STANDARDS.
9. A BORED CROSSING MAY BE REQUIRED BY THE ENGINEER.

Pipe Size	Test Pressure (psi)	Min. Number of Tie Rods
10" and Under	150	2
	200	2
12"	150	2
	200	4

TABLE 1

WATERLINE LOWERING

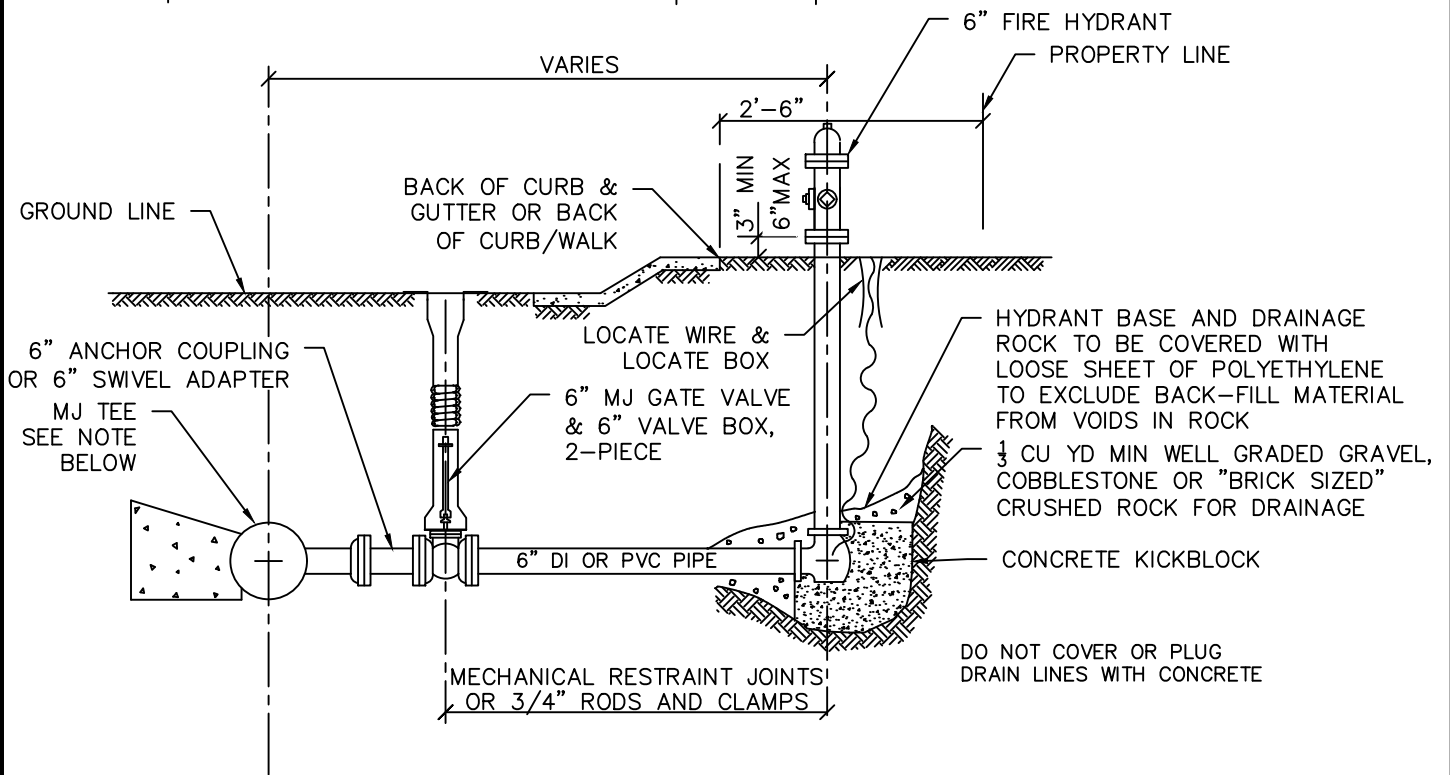
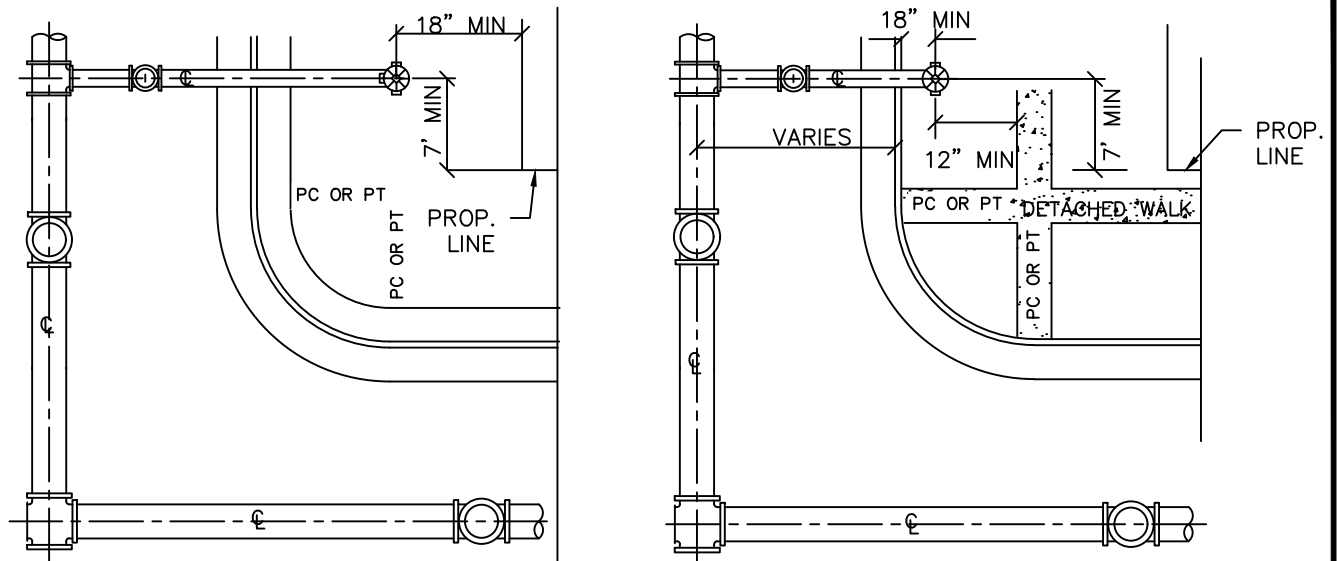


**WATER CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

W5



NOTES:

1. ALTERNATE TO THE ABOVE: FASTEN MJ VALVE DIRECTLY TO A MJ ANCHOR TEE (ALSO CALLED SWIVEL TEE)
2. NO HORIZONTAL OR VERTICAL BENDS ARE ALLOWED IN FIRE HYDRANT BRANCH OR SPRINKLER LINES
3. MAXIMUM OF ONE FIRE HYDRANT EXTENSION
4. CONTRACTOR TO TAKE CARE NOT TO BLOCK WEEP HOLES
5. ALL DUCTILE IRON PIPE TO BE POLYETHYLENE WRAPPED

FIRE HYDRANTS, MAINS AND VALVES

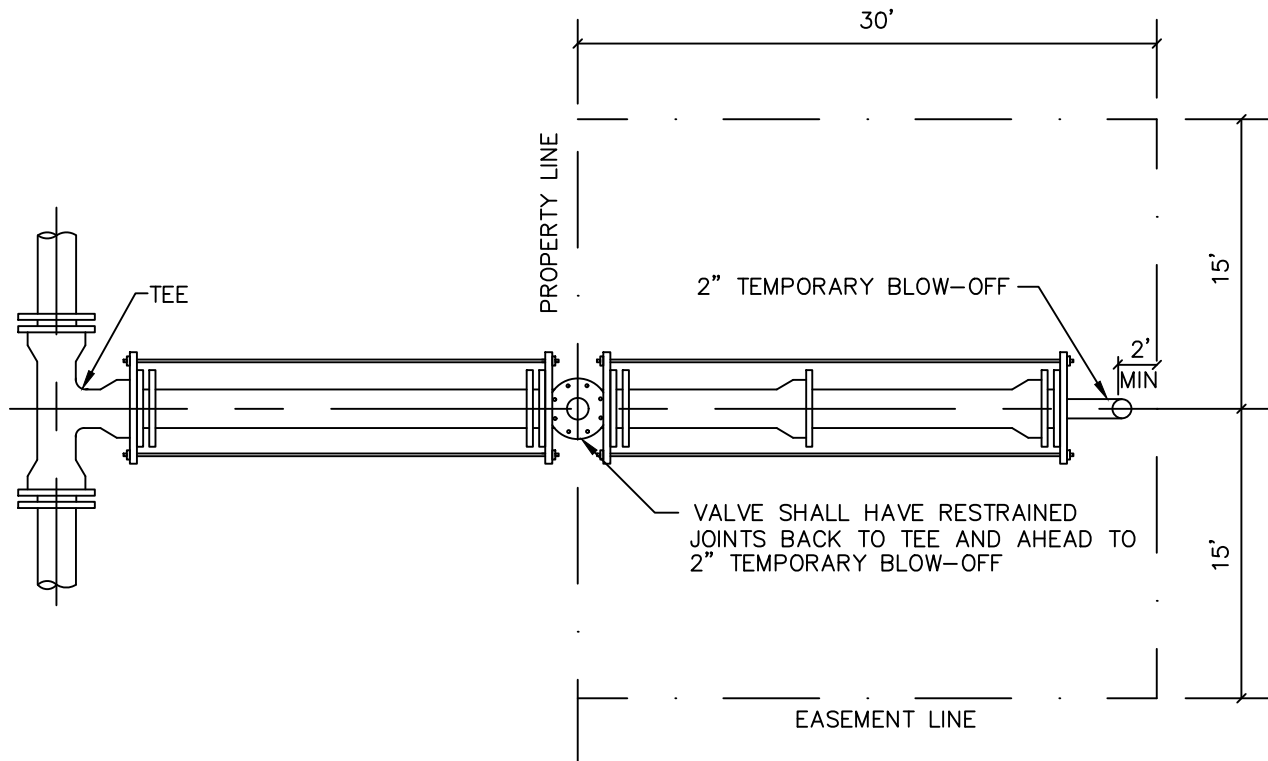
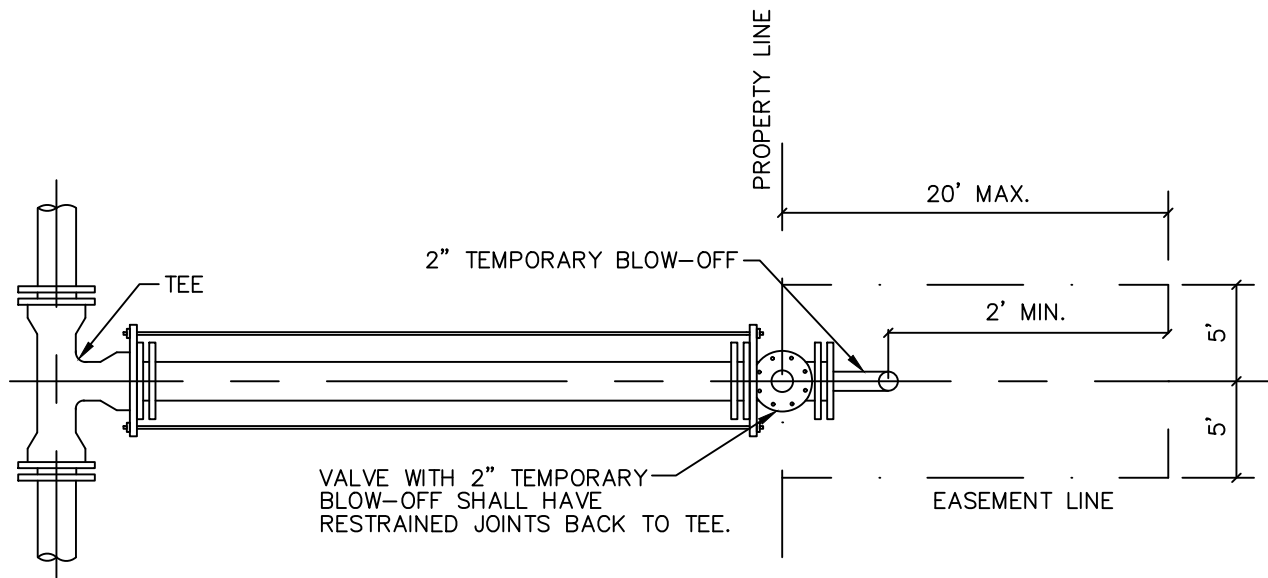


**WATER CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

W6



STUB-OUT CONFIGURATIONS (1 OF 2)



WATER CONSTRUCTION
DRAWINGS

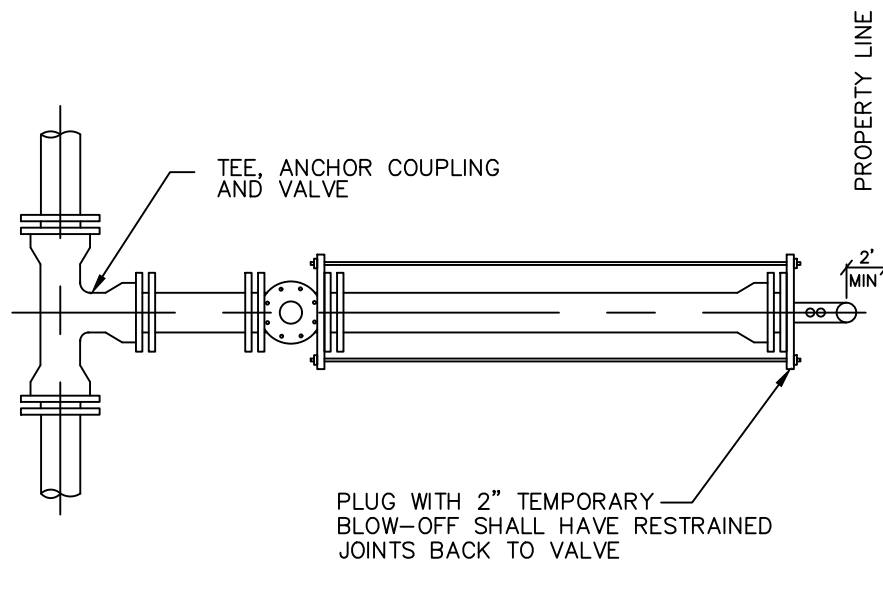
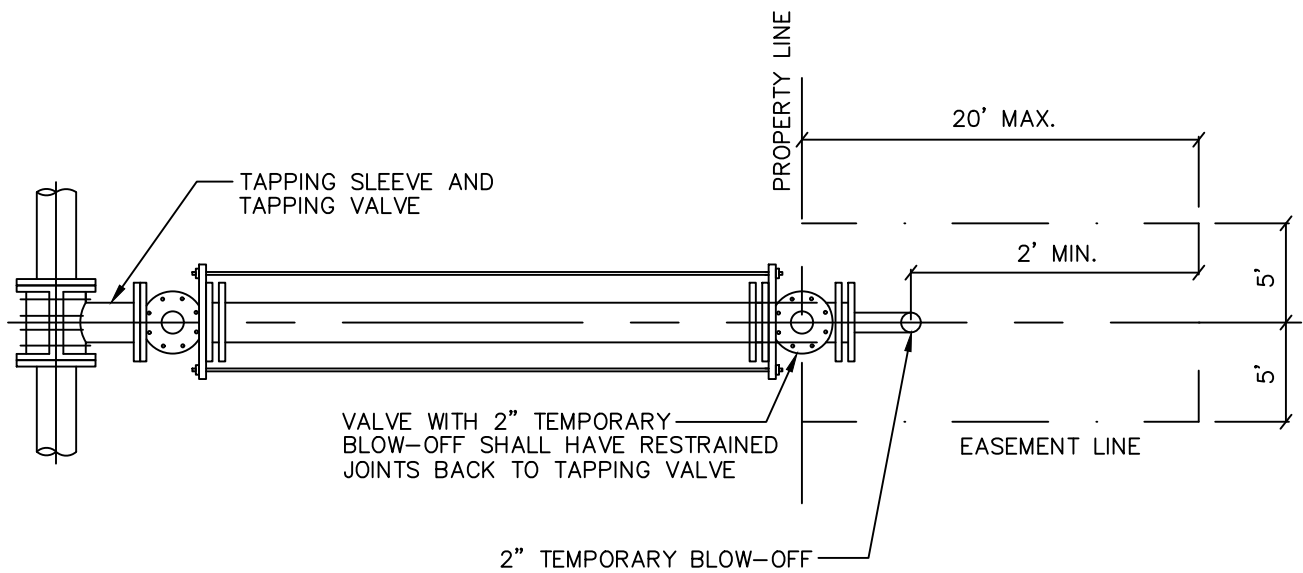
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

W7A



STUB-OUT CONFIGURATIONS (2 OF 2)

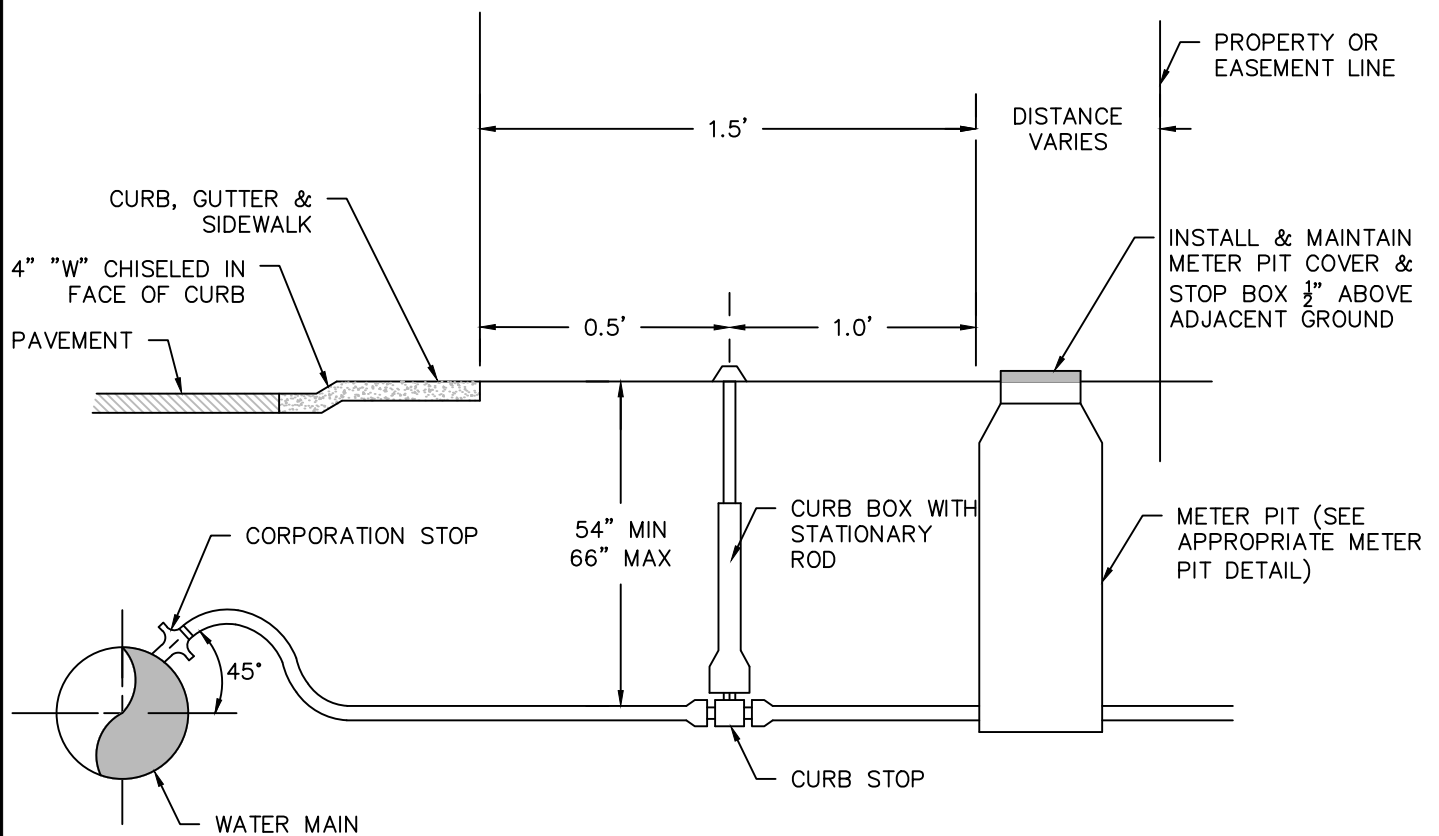


WATER CONSTRUCTION
DRAWINGS

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

W7B



NOTES:

1. FOR 5/8-INCH THROUGH 1-INCH SERVICES, USE SADDLE TAP.
2. FOR 1 1/2-INCH AND 2-INCH SERVICES, INSTALL WITH SADDLE TAP AND CORPORATION STOP AT TIME OF CONSTRUCTION .
3. LOCATION OF CURB BOX AND METER PIT SHALL BE ACCORDING TO APPROVED UTILITY DRAWINGS.
4. TOWN'S RESPONSIBILITY FOR MAINTENANCE SHALL BE THE WATER MAIN, CORPORATION STOP, CURB STOP, SERVICE PIPING UP TO AND INCLUDING THE METER PIT. OWNER'S RESPONSIBILITY SHALL BE FROM THE METER PIT TO THE BUILDING.
5. NO COUPLINGS SHALL BE ALLOWED BETWEEN CURB STOP AND METER SETTER.
6. SERVICE SHALL BE TYPE K COPPER FROM CORPORATION STOP TO 5- FEET PAST METER PIT (MINIMUM).

WATER SERVICE DETAIL



**WATER CONSTRUCTION
DRAWINGS**

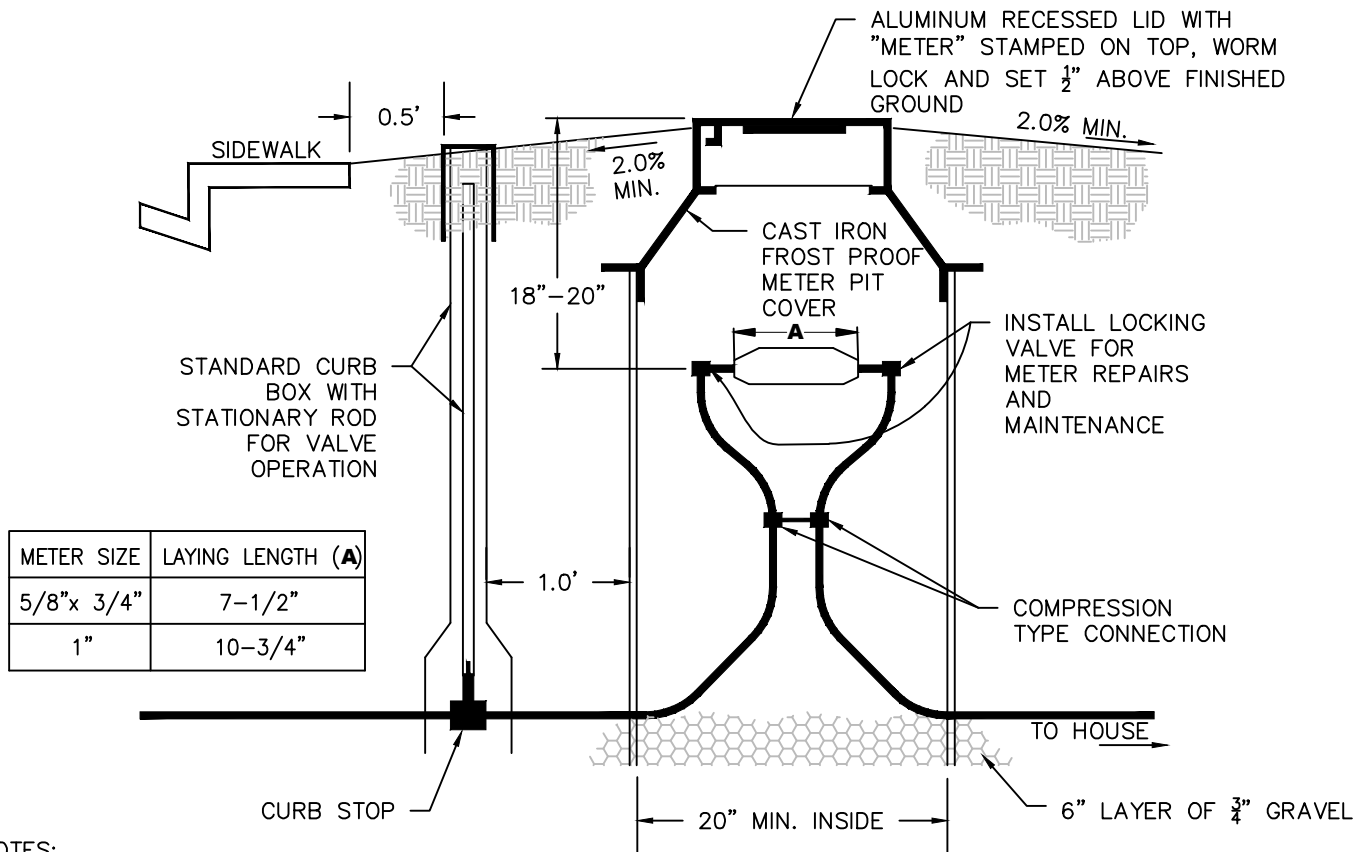
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

W8



NOTES:

1. METER PIT AND CURB STOP ARE NOT TO BE INSTALLED IN ANY STREET, ALLEY, DRIVEWAY, SIDEWALK, OR PARKING AREA. METER PIT MUST BE INSTALLED IN LANDSCAPED AREA.
2. NO SHRUBS, BOULDERS, RETAINING WALLS, CONCRETE, PAVERS OR OTHER LANDSCAPING FEATURES SHALL BE INSTALLED WITHIN 5' OF THE METER PIT. NO TREES SHALL BE INSTALLED WITHIN 10' OF THE METER PIT. IF LANDSCAPING CHANGES THE GRADE AROUND THE METER PIT THE OWNER SHALL BE REQUIRED TO ADJUST THE METER PIT COVER TO BE 1/2" ABOVE THE FINISHED GRADE AND ENSURE POSITIVE DRAINAGE AWAY FROM THE METER PIT IN ALL DIRECTIONS.
3. THE TOWN SHALL PROVIDE THE METER, SETTER AND PIT. NOTIFY THE PUBLIC WORKS DEPARTMENT ONE WEEK IN ADVANCE OF INSTALLATION SO THAT THE UNITS CAN BE ORDERED IF THERE ARE NONE IN STOCK. THE TOWN SHALL INSTALL THE METER.
4. RESIDENTIAL METER PITS SHOULD BE INSTALLED DURING CONSTRUCTION OF THE HOME TO ENSURE PROPER LOCATION AND PREVENT DAMAGE DURING THE TIME THE INFRASTRUCTURE IS BEING COMPLETED AND THE HOME IS BUILT.
5. BACKFILL TO BE HAND PLACED AND COMPACTED WITHIN A FOOT OF THE PIT.
6. EXTENSIONS AND OFF GRADE EXTENSIONS SHALL BE INSERTED BETWEEN THE DOME AND TOP RING TO PUT LID TO GRADE.
7. NO CONNECTIONS OR CHANGES IN PIPE DIAMETER SHALL BE MADE IN THE METER PIT OR IN THE DISTANCE OF FIVE FEET BEYOND THE METER PIT WALL ON THE OUTLET SIDE.
8. LAWN SPRINKLER CONNECTIONS SHALL BE A MINIMUM OF FIVE FEET FROM THE METER PIT WALL ON THE OUTLET SIDE.
9. ANY VARIATION OR DEVIATION FROM THIS STANDARD REQUIRES APPROVAL PRIOR TO INSTALLATION FROM THE TOWN ENGINEER.

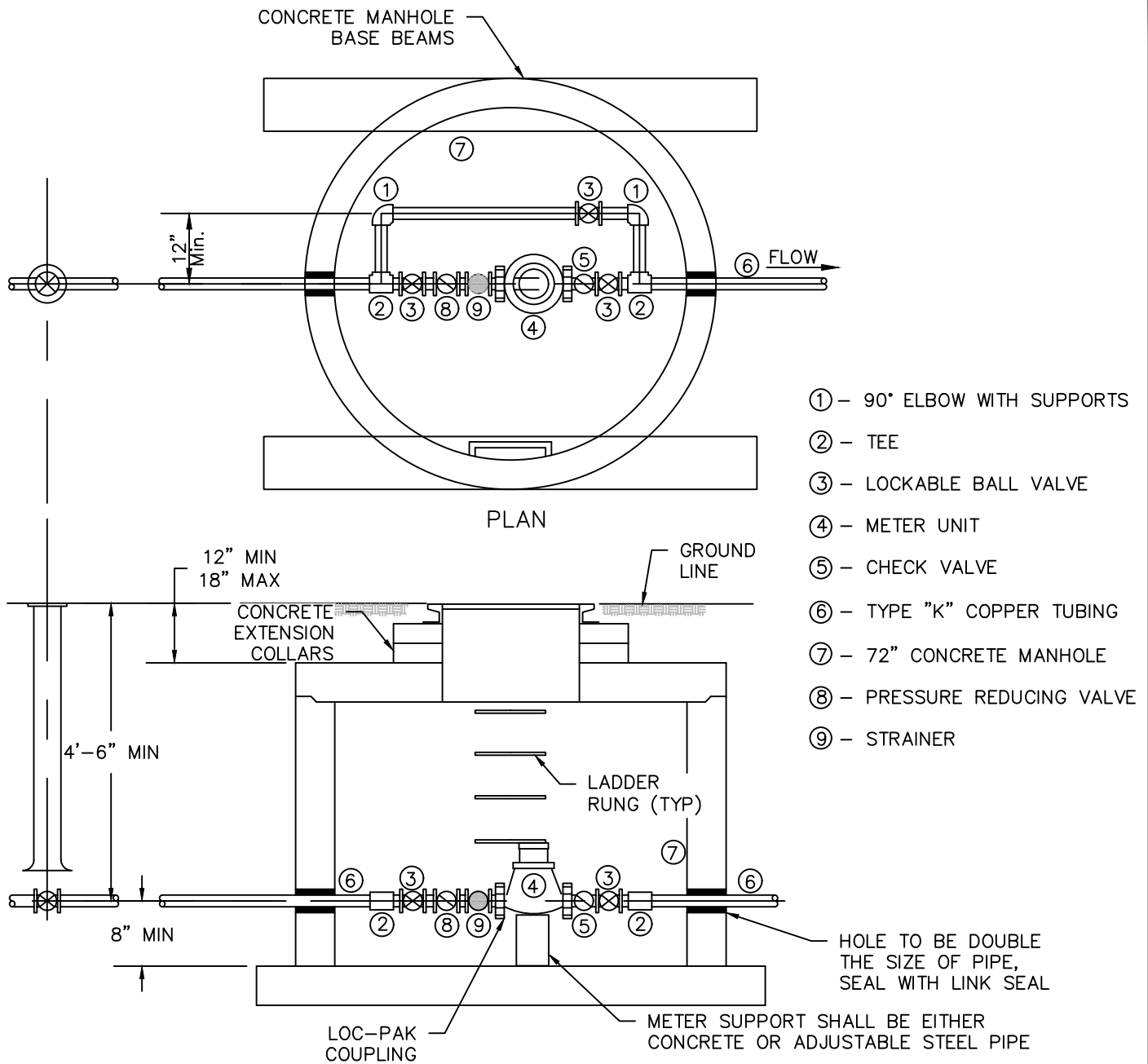
5/8IN - 1IN WATER METER DETAIL



**WATER CONSTRUCTION
DRAWINGS**

BY: PCB
SCALE: NTS
DATE: 12/2021

DRAWING:
W9



NOTES:

ELEVATION

1. MANHOLE BASE BEAMS REQUIRED FOR DRIVEWAYS, OR PARKING AREA WHEN APPROVED.
2. A 72" DIAMETER MANHOLE PIT WILL ACCOMMODATE 1-1/2" & 2" METERS W/ CUSTOM SETTER.
3. JOINTS INSIDE METER VAULT SHALL BE EITHER THREADED OR SOLDERED W/ 95-5 TIGANTIMONY SOLDER.
4. NO CONCRETE TO BE LAID IN FLOOR OF METER MANHOLE.
5. METER SHALL BE FLANGED W/ BRASS COMPANION FLANGES.
6. NO CONNECTIONS OR CHANGES IN PIPE DIAMETER SHALL BE MADE IN THE METER PIT OR IN THE DISTANCE OF FIVE FEET BEYOND THE METER PIT ON THE OUTLET SIDE.
7. LADDER RUNGS SHALL BE ON THE OPPOSITE SIDE OF BYPASS.
8. BYPASS SHALL NOT BE INSTALLED FOR USE WITH AN IRRIGATION SYSTEM.
9. CONCRETE OR ADJUSTABLE STEEL PIPE SUPPORTS SHALL BE PROVIDED UNDER THE 90 DEGREE BENDS ON THE BYPASS.

1 1/2 IN - 2 IN WATER METER DETAIL



**WATER CONSTRUCTION
DRAWINGS**

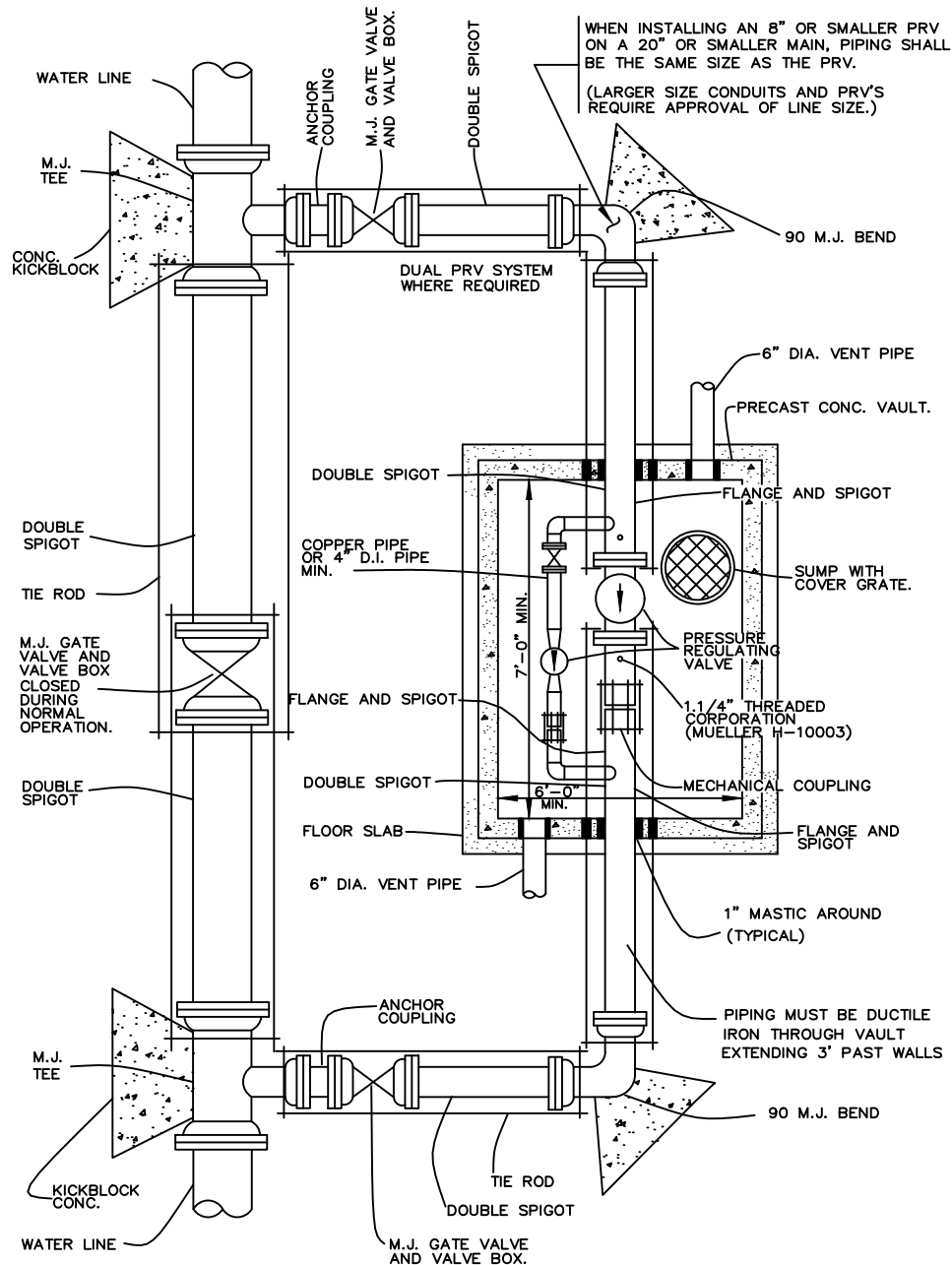
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

W10



NOTES:

1. A RECTANGULAR VAULT IS REQUIRED. SIZE TO BE DESIGNED TO ACCOMMODATE REQUIRED EQUIPMENT WITH ADEQUATE WORKING SPACE. SHOP DRAWING APPROVAL REQUIRED PRIOR TO CONSTRUCTION.
2. ACCESS STAIRS WITH DOOR OUTSIDE OF PAVEMENT MAY BE REQUIRED ON STREETS WITH HEAVY TRAFFIC.
3. FOR ELEVATION VIEW SEE CROSS SECTION DRAWING ON SHEET 2 OF 2.
4. THREADED FITTINGS ON LOW FLOW.
5. COUPLING ON LOW FLOW.
6. SADDLE FOR TAP FOR LOW FLOW.
7. ALL PIPING 4" IN DIAMETER OR GREATER IS D.I.P.
8. NO PVC PIPING ALLOWED.

PRV IN RECTANGULAR VAULT (1 OF 2)



**WATER CONSTRUCTION
DRAWINGS**

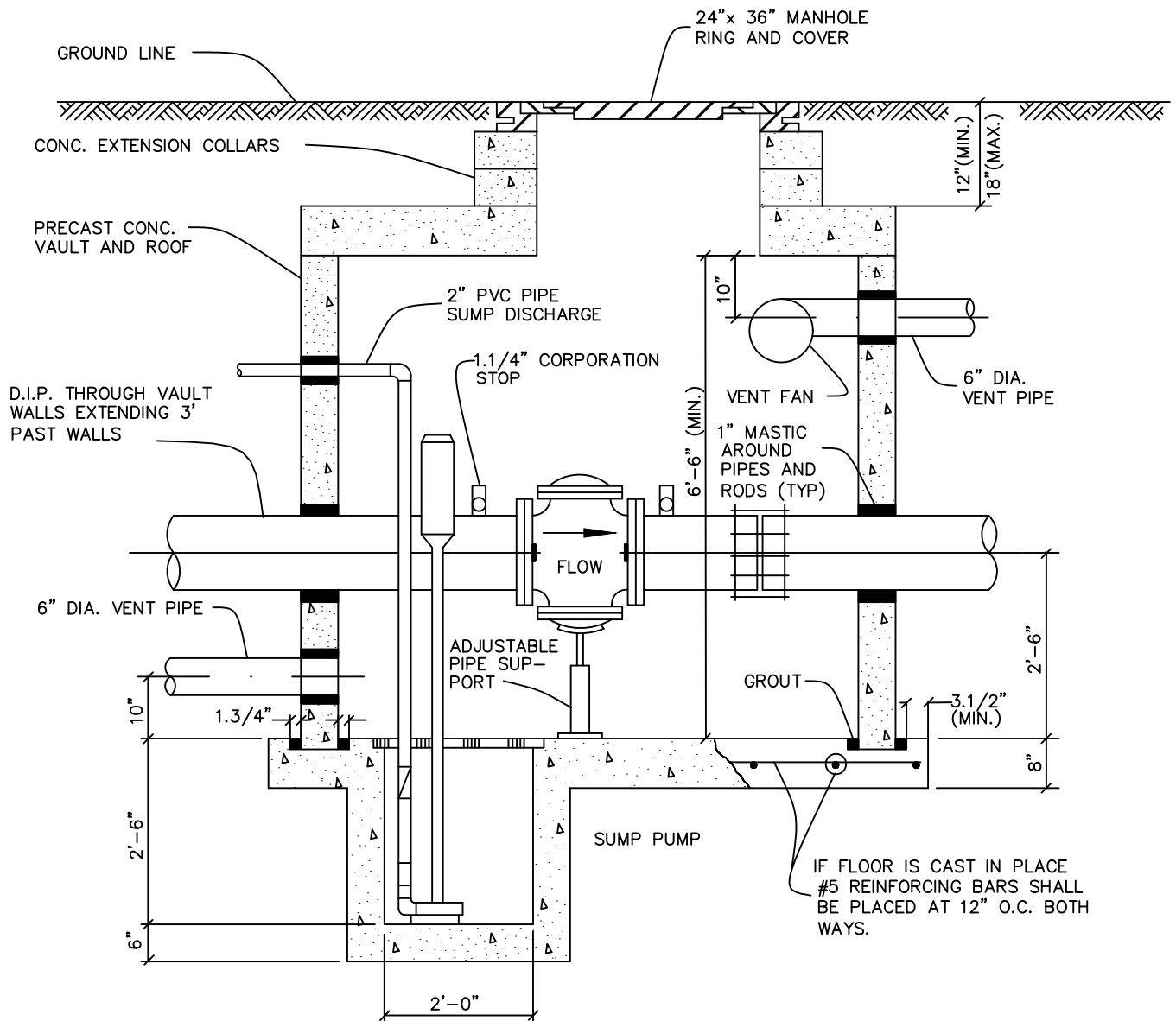
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

W11A



NOTES:

1. A PERMIT IS REQUIRED FOR SUMP PUMP TO DISCHARGE TO STORM SEWER.
2. SUMP PUMP AND VENT FAN REQUIRED IN VAULTS.
3. THIS MANHOLE IS SUITABLE FOR CHECK VALVE INSTALLATIONS.
4. FOR PLAN VIEW AND ADDITIONAL NOTES SEE SHEET 1 OF 2.

PRV IN RECTANGULAR VAULT (2 OF 2)

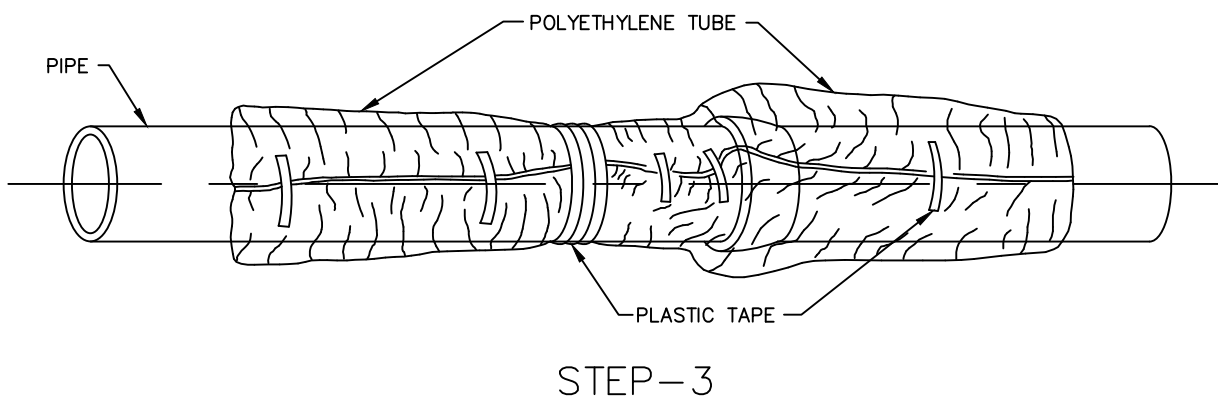
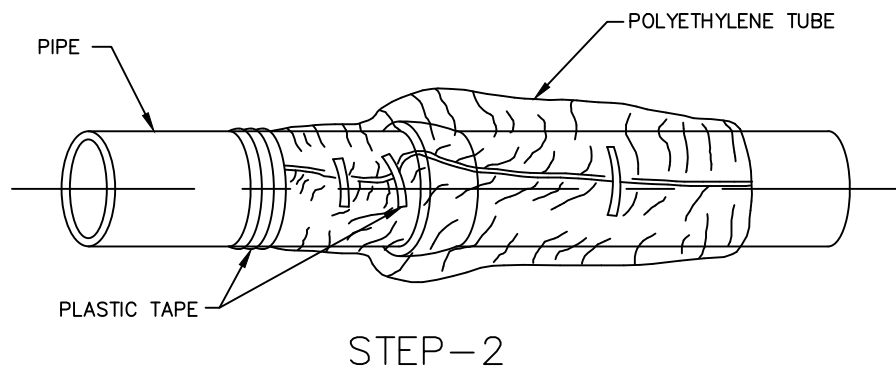
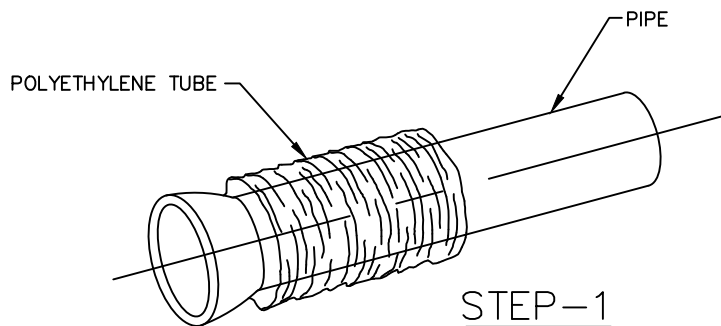


**WATER CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

W11B



FIELD INSTALLATION-POLYETHYLENE WRAP

- STEP-1 PLACE TUBE OF POLYETHYLENE MATERIAL AROUND PIPE PRIOR TO LOWERING PIPE INTO TRENCH.
- STEP-2 PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH THREE CIRCUMFERENTIAL TURNS OF TWO-INCH WIDE PLASTIC TAPE TO HOLD PLASTIC TUBE AROUND SPIGOT END.
- STEP-3 ADJACENT TUBE OVERLAPS FIRST TUBE AND IS SECURED WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE WILL BE LOOSE. EXCESS MATERIAL AND SHOULD BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED INTO AN OVERLAP ON TOP OF THE PIPE AND HELD IN PLACE BY MEANS OF PIECES OF THE PLASTIC TAPE AT APPROXIMATELY THREE TO FIVE FOOT INTERVALS.

NOTE: ALL RODDING TO BE ENCASED IN POLYETHYLENE SEPARATED FROM THE PIPE

POLYETHYLENE WRAP

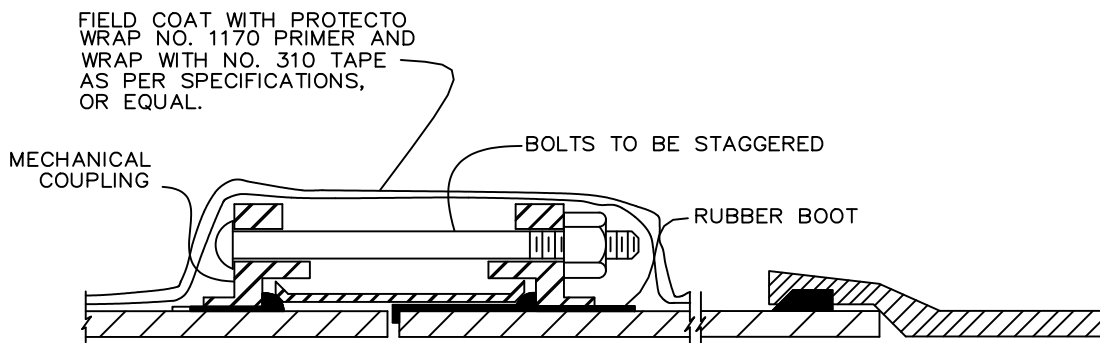
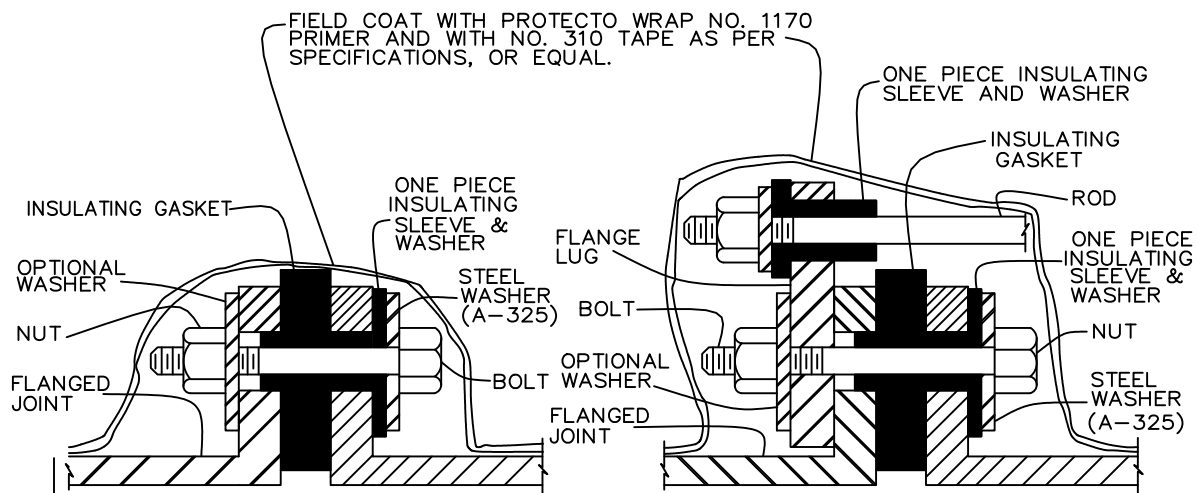


WATER CONSTRUCTION
DRAWINGS

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

W12



INSULATORS



WATER CONSTRUCTION
DRAWINGS

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

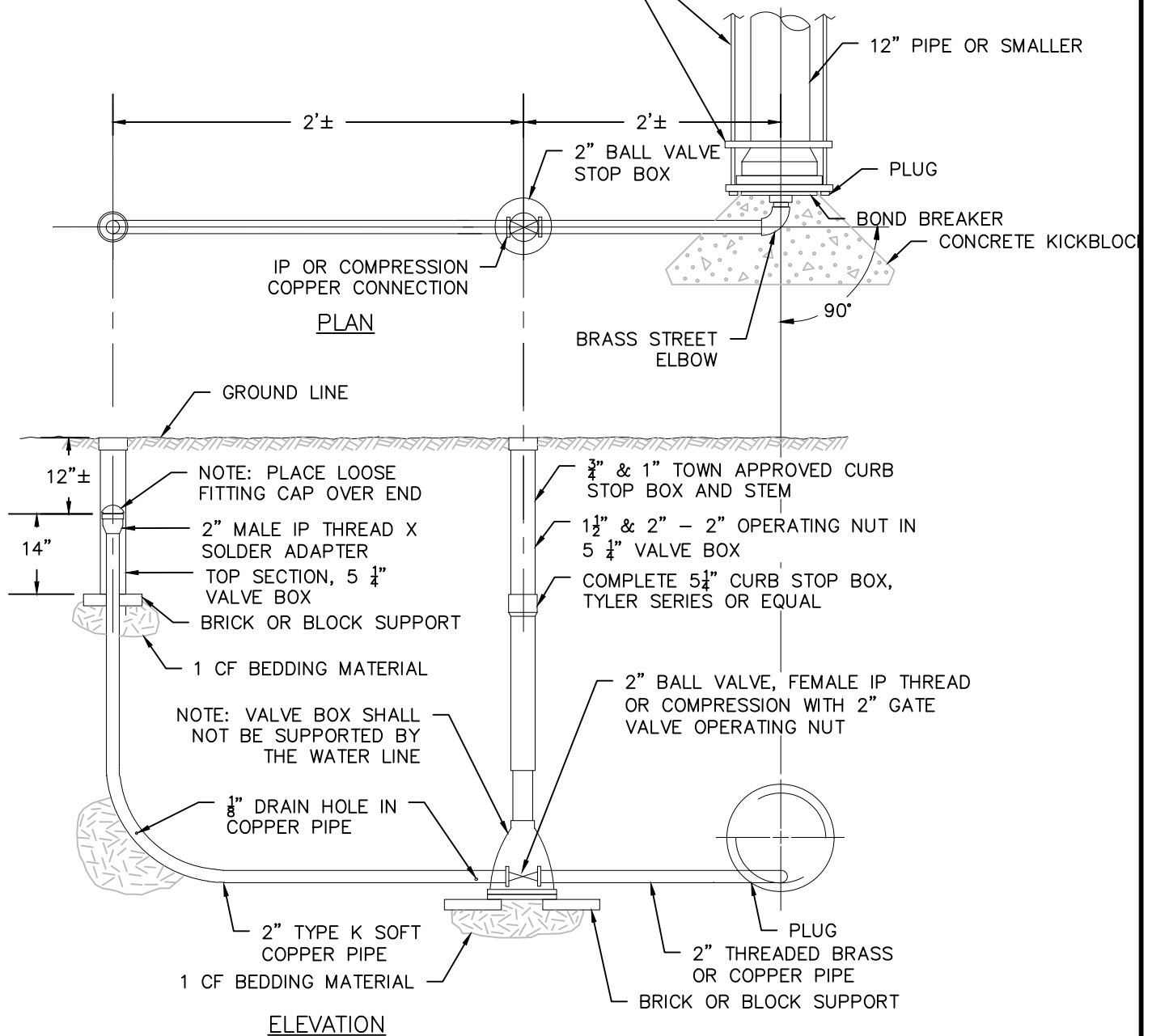
W13

NOTE

PLUG SHALL BE MECHANICALLY RESTRAINED:

A—FOR SLEEVE TYPE MACHINED COUPLING PIPE,
TIE BACK TO NEXT COUPLING

B—FOR BELL AND SPIGOT PIPE, TIE TO BELL



NOTE: FOR 12" AND SMALLER PIPE

TEMPORARY BLOWOFF FOR 12" AND SMALLER PIPE



**WATER CONSTRUCTION
DRAWINGS**

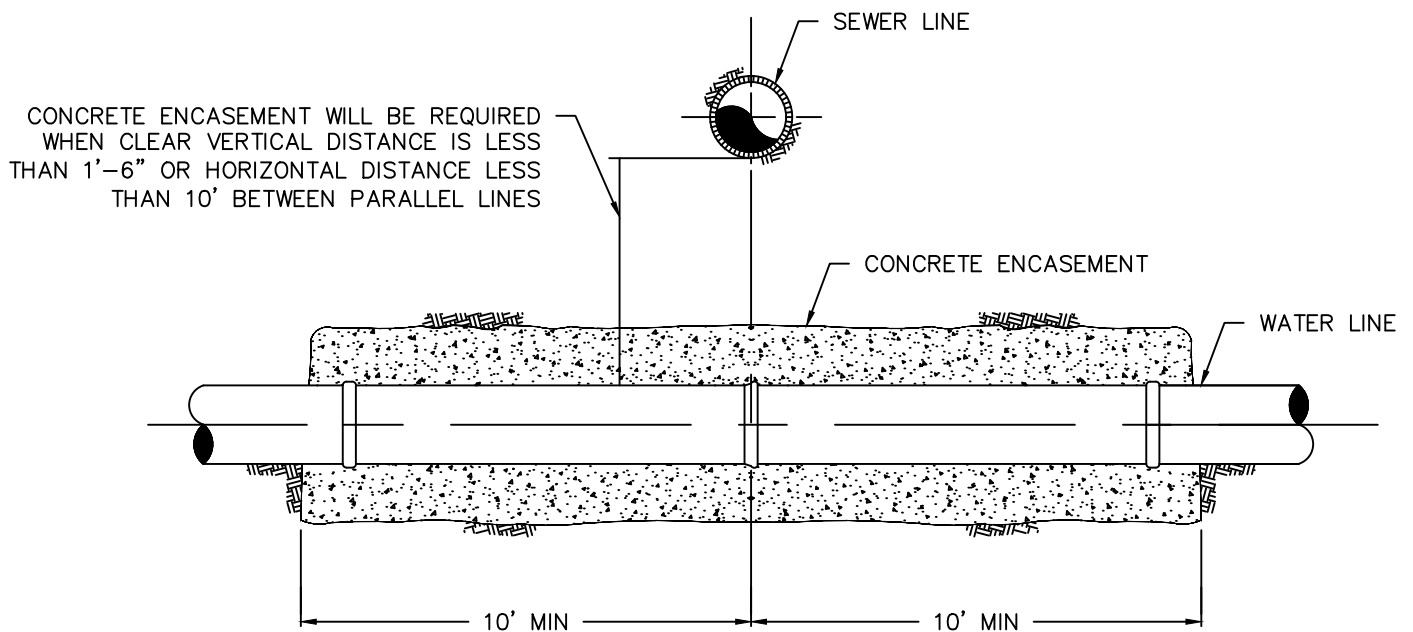
BY: JME

SCALE: NTS

DATE: 1/2020

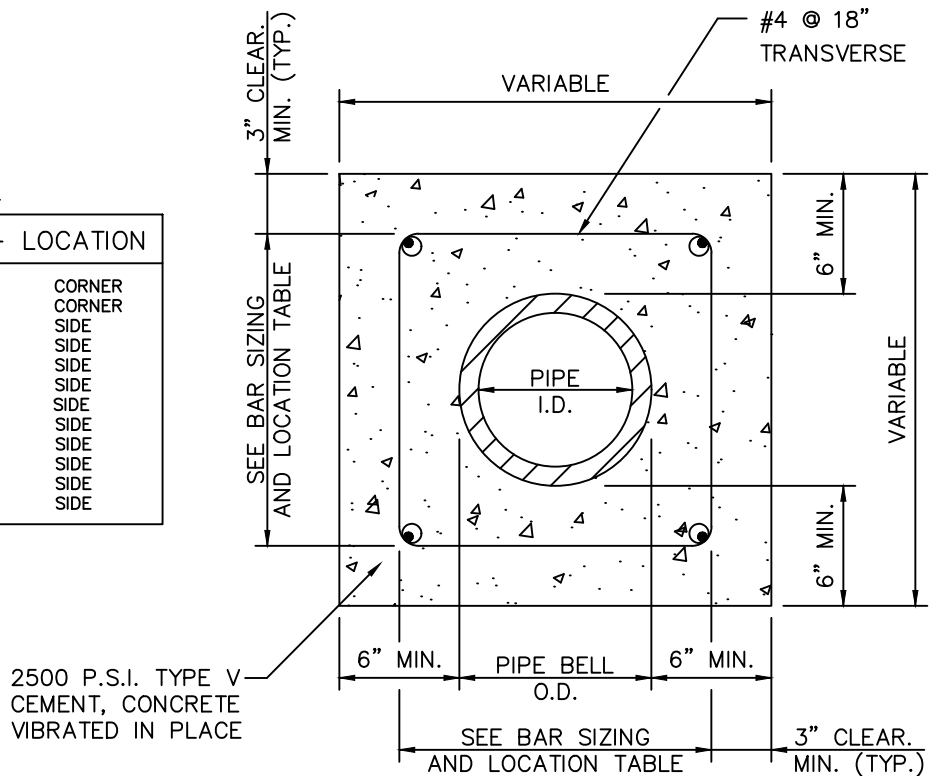
DRAWING:

W14



REINFORCEMENT STEEL

PIPE I.D.	LONGITUDINAL BARS — LOCATION		
6 IN.	4—NO. 4 BARS	1 EACH	CORNER
8 IN.	4—NO. 4 BARS	1 EACH	CORNER
10 IN.	8—NO. 4 BARS	3 EACH	SIDE
12 IN.	8—NO. 4 BARS	3 EACH	SIDE
15 IN.	8—NO. 4 BARS	3 EACH	SIDE
18 IN.	8—NO. 4 BARS	3 EACH	SIDE
21 IN.	12—NO. 4 BARS	4 EACH	SIDE
24 IN.	12—NO. 4 BARS	4 EACH	SIDE
27 IN.	12—NO. 4 BARS	4 EACH	SIDE
30 IN.	12—NO. 4 BARS	4 EACH	SIDE
33 IN.	12—NO. 4 BARS	4 EACH	SIDE
36 IN.	16—NO. 4 BARS	5 EACH	SIDE



NOTES:

1. CONCRETE ENCASEMENT REQUIRED IN ALL CASES WHERE SEWER LINE IS ABOVE WATER LINE.
2. THE TOWN SHALL REVIEW THIS DETAIL FOR USE ON A CASE BY CASE BASIS. SPECIAL ENCASEMENTS MAY BE REQUIRED AT CREEK CROSSINGS AND CONDUIT CROSSINGS

UTILITY ENCASEMENT DETAIL

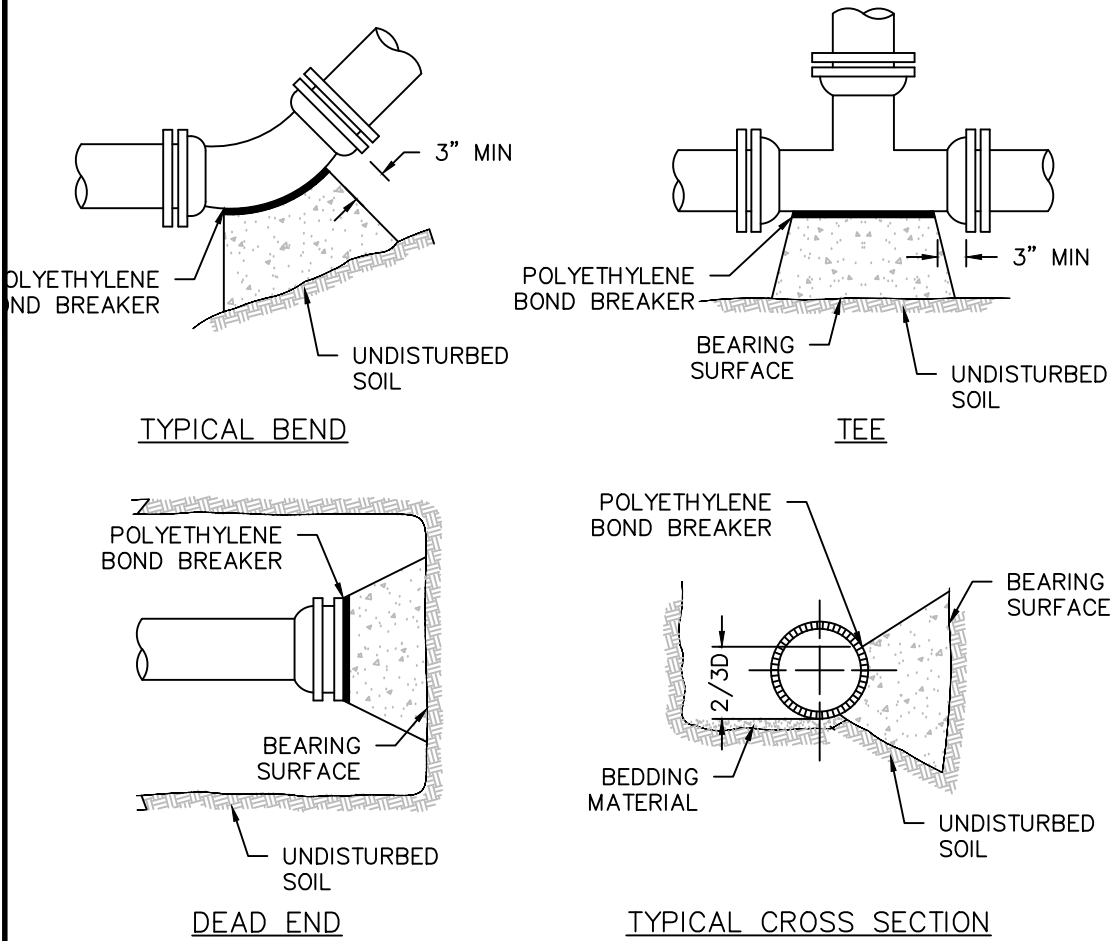


WATER CONSTRUCTION
DRAWINGS

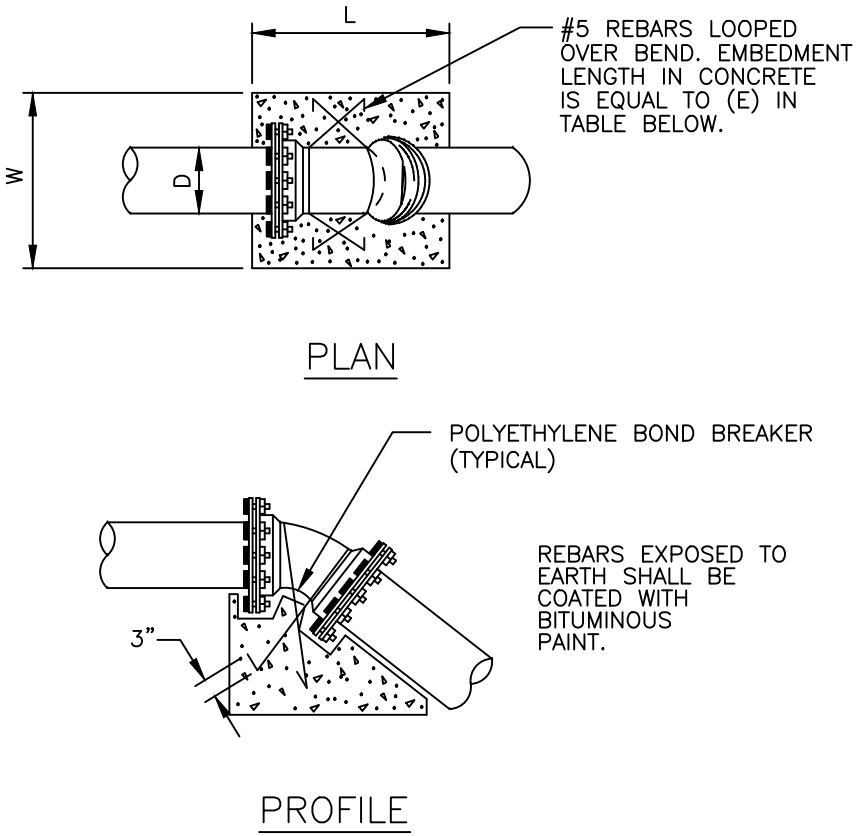
BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

W15



BEARING AREA (SQUARE FEET) FOR CONCRETE THRUST BLOCKS								
SIZE	BENDS				TEES	DEAD ENDS	CROSS W/ 1 BRANCH PLUGGED	CROSS W/ 2 BRANCHES PLUGGED
	90°	45°	22-1/2°	11-1/4°				
3	1.5	0.8	0.4	0.2	1.1	1.1	1.1	1.1
4	2.7	1.4	0.7	0.4	1.9	1.9	1.9	1.9
6	6.0	3.2	1.7	0.8	4.2	4.2	4.2	4.2
8	10.7	5.8	2.9	1.5	7.5	7.5	7.5	7.5
10	16.7	9.0	4.6	2.3	11.8	11.8	11.8	11.8
12	24.0	13.0	6.6	3.3	17.0	17.0	17.0	17.0
14	32.7	17.7	9.0	4.5	23.1	23.1	23.1	23.1
15	37.5	20.3	10.3	5.2	26.5	26.5	26.5	26.5
16	42.7	23.1	11.8	5.9	30.2	30.2	30.2	30.2
18	54.0	29.2	14.9	7.5	38.2	38.2	38.2	38.2
20	66.6	36.1	18.4	9.2	47.1	47.1	47.1	47.1
21	73.5	39.8	20.3	10.2	52.0	52.0	52.0	52.0
22	80.6	43.6	22.2	11.2	57.0	57.0	57.0	57.0
24	96.0	51.9	26.5	13.3	67.9	67.9	67.9	67.9
30	149.9	81.2	41.4	20.8	106.0	106.0	106.0	106.0
36	215.9	116.9	59.6	29.9	152.7	152.7	152.7	152.7

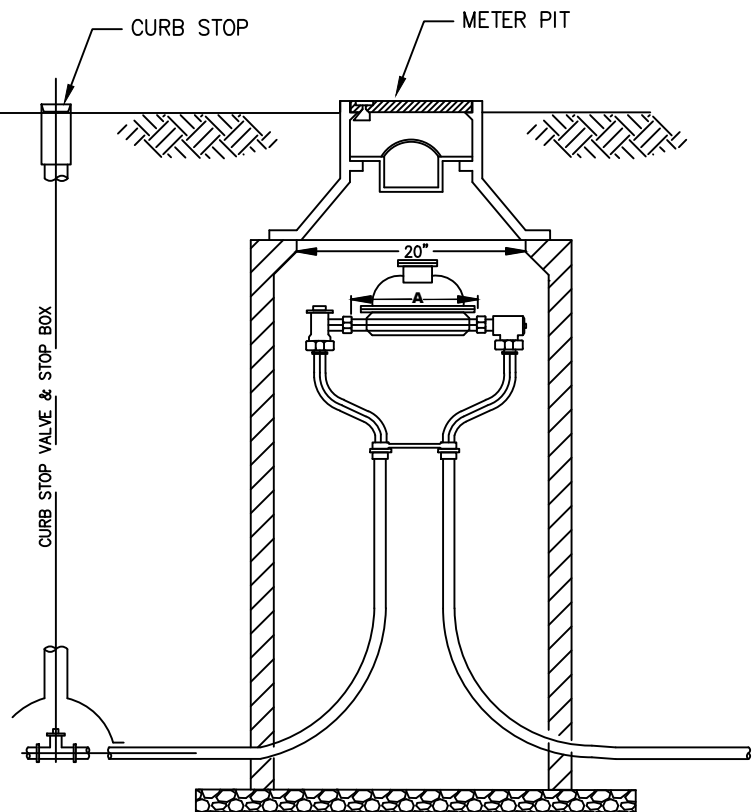
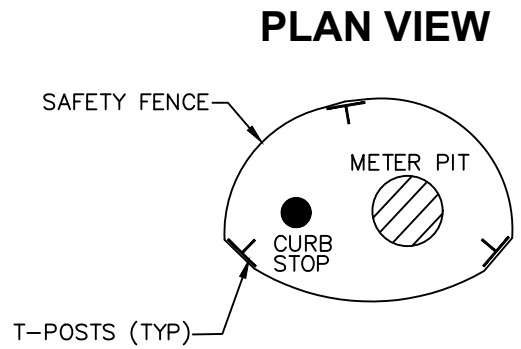
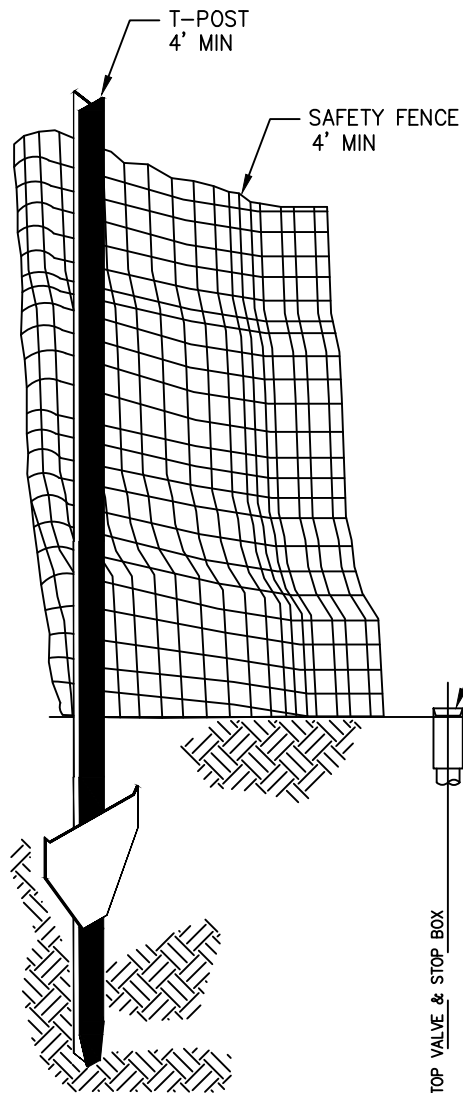


SIZE OF PIPE (D)	11 1/4 DEG.					22 1/2 DEG.					45 DEG.				
	L"	W"	H"	E"	VOL	L"	W"	H"	E"	VOL	L"	W"	H"	E"	VOL
4"	12	24	24	12	4	12	34	34	12	8	22	37	32	22	15
6"	18	32	27	18	9	15	52	40	15	18	28	64	32	28	33
8"	21	40	33	21	16	22	61	40	22	31	35	64	45	35	58
10"	24	50	36	24	25	30	59	48	30	49	42	72	52	42	90
12"	31	56	36	31	36	36	70	48	36	70	45	80	62	45	129

- NOTES:
- REFER TO CONCRETE THRUST BLOCK TABLE FOR MINIMUM BEARING SURFACE AREAS.
 - ALL FITTINGS TO BE WRAPPED WITH POLYETHYLENE.
 - PIPE INSTALLED UNDER CONDITIONS DIFFERENT FROM THOSE NORMALLY ENCOUNTERED SHALL REQUIRE THRUST BLOCKS DESIGNED FOR THOSE PARTICULAR CONDITIONS.
 - THRUST BLOCKS ON PIPE LARGER THAN 12" SHALL BE DESIGNED FOR CONDITIONS EXISTING AT THE INSTALLATION SITE.
 - REFER TO SECTION 03300 FOR CONCRETE REQUIREMENTS.
 - CALCULATION MADE FOR THIS TABLE ASSUME:
100 P.S.I. INTERNAL STATIC PRESSURE
1,000 P.S.F. SOIL BEARING CAPACITY
1.5 FACTOR OF SAFETY
 - FOR STATIC PRESSURES GREATER THAN 100 P.S.I. AND/OR SOIL BEARING CAPACITY LESS THAN 1,000 P.S.F., THE DESIGN ENGINEER SHALL PROVIDE SPECIFIC CALCULATIONS FOR REVIEW AND APPROVAL.
 - ALL CONCRETE SHALL BE 4000 P.S.I. MINIMUM.

- VERTICAL THRUST BLOCK NOTES:
- THRUST BLOCKING SHALL BE CAST AGAINST UNDISTURBED EARTH. FORMS SHALL BE USED AS REQUIRED TO OBTAIN ADEQUATE BEARING AND TO CONFINE THE CONCRETE. THRUST BLOCKING SHALL BEAR ON THE FITTING OR END CAP ONLY AND SHOULD NOT BE ALLOWED TO SPILL OVER THE JOINT OR AGAINST THE PIPE.
 - VOLUME IS IN CUBIC FEET.
 - ALL CONCRETE TO BE 4000 P.S.I. MIN.
 - BLOCKS TO BE CENTERED HORIZONTALLY ON THE BEND.
 - DESIGN BASED ON A TEST PRESSURE OF 150 P.S.I. AND SAFETY FACTOR (S_f) OF 1.5
 - $V_g = \frac{S_f \text{ PA SIN } \theta}{W_m}$
 - $W_m = 140 \text{ # / FT}^3$
 - THE DESIGN ENGINEER IS RESPONSIBLE FOR VERIFYING THE ACTUAL SITE CONDITIONS WITH RESPECT TO THE ASSUMPTIONS LISTED ABOVE.

CONCRETE THRUST BLOCK DETAIL



NOTE:

ALL METER PITS AND CURB STOPS SHALL BE PROTECTED AT THE TIME OF INSTALLATION WITH A MINIMUM OF 3-T POSTS AND ORANGE SAFETY FENCE. THE T-POSTS AND SAFETY FENCE SHALL REMAIN IN PLACE AND IN GOOD CONDITION UNTIL THE LANDSCAPING IS INSTALLED.

METER PIT AND CURB STOP PROTECTION



WATER CONSTRUCTION
DRAWINGS

BY: JME
SCALE: NTS
DATE: 1/2020

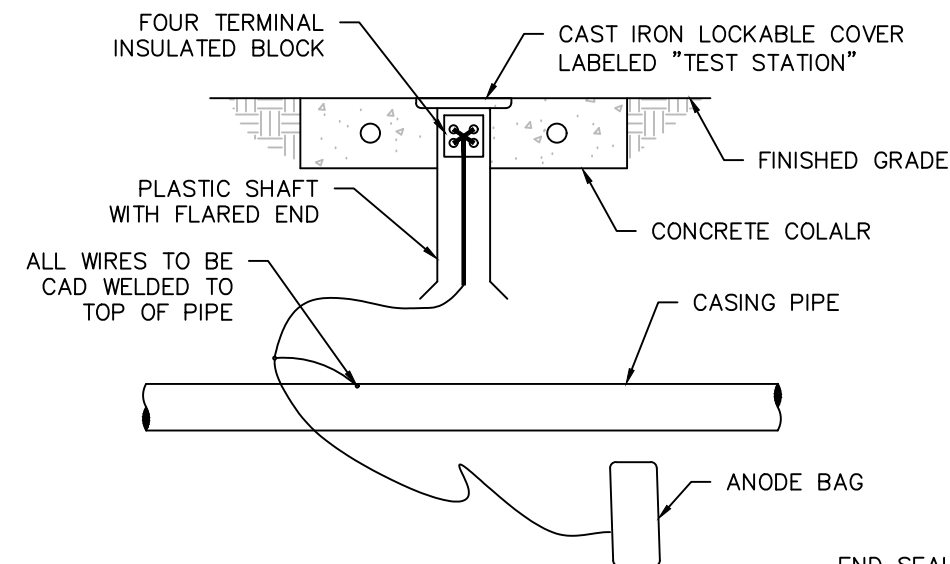
DRAWING:

W17



DITCH OR PIPE CROSSING DETAIL



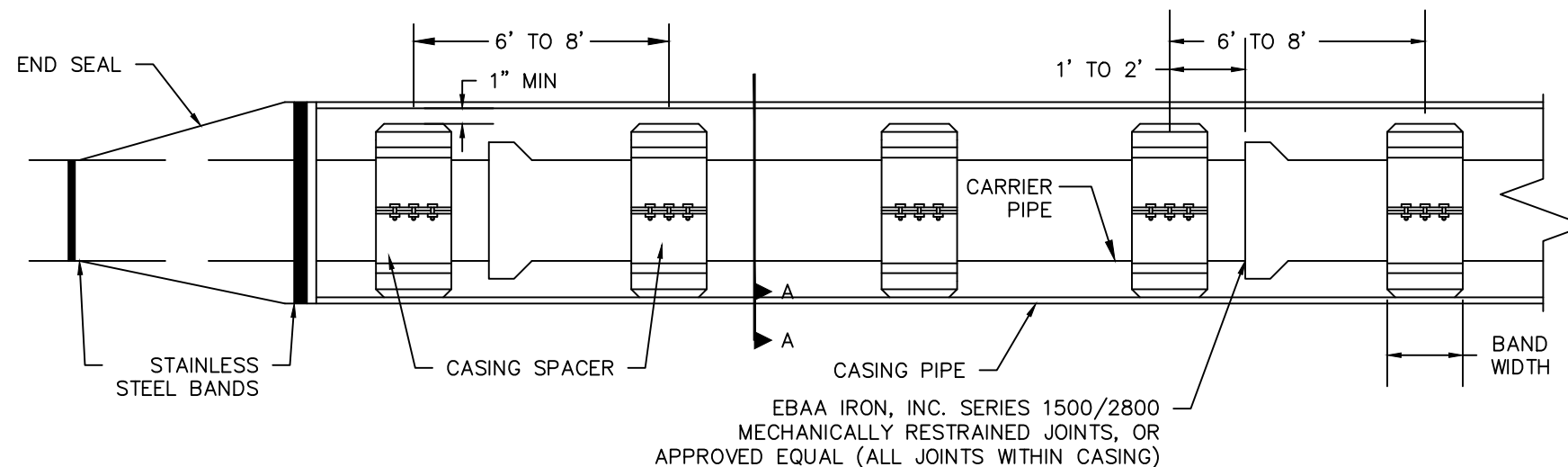


CATHODIC TEST STATION DETAIL

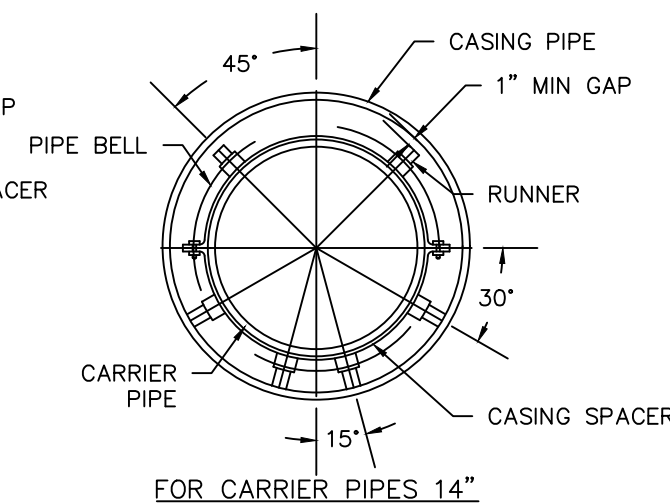
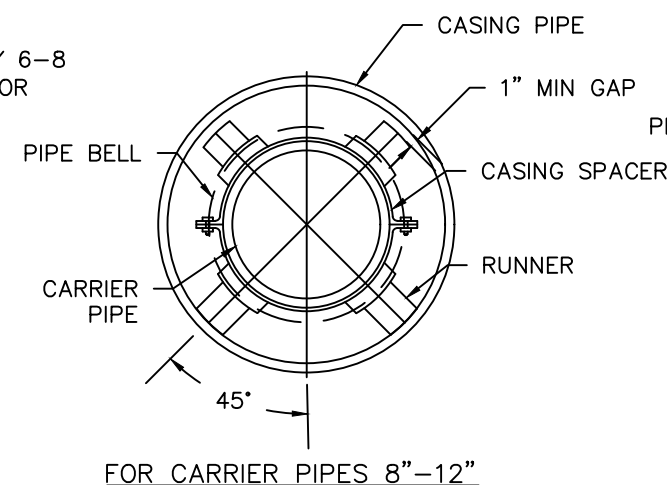
CATHODIC PROTECTION NOTES:

1. INSTALL THE ANODES VERTICALLY OR HORIZONTALLY IN SOIL WITH TOP OF ANODES BELOW THE SPRINGLINE OF THE PIPE. ANODES MUST BE PLACED IN NATIVE SOIL, NOT SELECT BACKFILL SUCH AS SAND, BEDDING, OR CRUSHED ROCK.
2. INSTALL A 17 LB HIGH POTENTIAL MAGNESIUM ANODE BAG ON EACH END OF STEEL CASING PIPES WITH A CATHODIC TEST STATION.
3. STATION TEST WIRES TO BE THHN/THWH.
4. INSTALL A MINIMUM OF 2 FT SLACK AT EACH END OF WIRES.
5. BE CAUTIOUS DURING BACKFILLING. DO NOT DAMAGE OR STRESS WIRES OR CONNECTIONS.

CARRIER PIPE DIAMETER (in)	MINIMUM CASING PIPE INSIDE DIAMETER (in)	BORINGS AND ENCASEMENTS	CASING SPACERS (Y or N)
		STEEL CASING PIPE MIN WALL THICKNESS (in)	
8"	21"	0.375	Y
10"	23"	0.375	Y
12"	26"	0.500	Y
14"	30"	0.500	Y



ELEVATION VIEW



SECTION A-A

CASING PIPE DETAIL

NOTES:

1. CASING PIPE, CASING SPACERS, AND END SEALS TO BE INSTALLED PER WATER CONSTRUCTION SPECIFICATIONS.
2. RECOMMENDED CASING SPACER POSITIONING – PLACE ONE CASING SPACER 1–2 FT ON EITHER SIDE OF THE BELL JOINT AND ONE EVERY 6–8 FT APART THERE AFTER FOR A TOTAL OF 3 CASING SPACERS PER PIPE LENGTH UNLESS OTHERWISE SPECIFIED BY THE MANUFACTURER OR TOWN.
3. FOR 12" DIAMETER AND SMALLER CARRIER PIPES USE 8" CASING SPACER BANDWIDTH.
4. FOR CARRIER PIPES LARGER THAN 12' DIAMETER USE 12" CASING SPACER BANDWIDTH.
5. CASING SPACERS TO BE IN THE "CENTER RESTRAINED" POSITION.
6. ALL BORINGS & ENCASEMENTS WILL REQUIRE END SEALS AS SHOWN.
7. TRACER WIRE SHALL BE EXTENDED THROUGH THE CASING PIPE.



WATER CONSTRUCTION DRAWINGS

BY: JME

SCALE: NTS

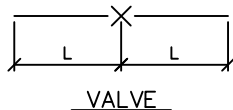
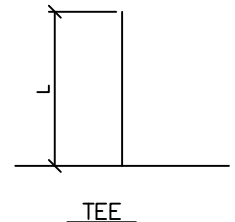
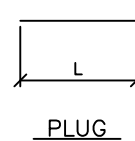
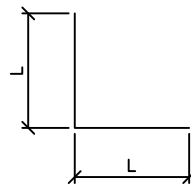
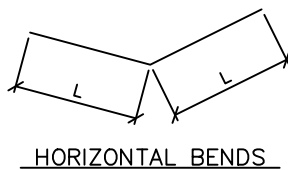
DATE: 1/2020

DRAWING:

W19

ROD DIAMETER, GRADE & LENGTH OF RESTRAINED PIPE

PIPE SIZE	4"			6"			8"			12"			16"			20"			24"		
FITTING	D	L	G	D	L	G	D	L	G	D	L	G	D	L	G	D	L	G	D	L	G
90° BEND, TEE, PLUG	3/4"	30'	MS	3/4"	45'	MS	3/4"	60'	MS	3/4"	86'	MS	1"	108'	HS	1 1/4"	132'	HS	-	155'	-
VALVE	-	-	-	-	-	-	-	-	-	-	-	-	1"	108'	HS	1 1/4"	132'	HS	-	155'	-
45° BEND	3/4"	9'	MS	3/4"	13'	MS	3/4"	18'	MS	3/4"	25'	MS	1"	32'	MS	3/4"	39'	HS	-	45'	-
22 1/2° BEND	3/4"	1'	MS	3/4"	4'	MS	3/4"	5'	MS	3/4"	7'	MS	3/4"	8'	MS	3/4"	10'	MS	-	12'	-
11 1/4° BEND	-	-	-	-	-	-	3/4"	1'	MS	3/4"	2'	MS	3/4"	2'	MS	3/4"	3'	MS	-	3'	-



NOTES:

1. LENGTH OF RESTRAINED PIPE MEASURED EACH WAY FROM VALVES AND BENDS.
2. CLAMPS AND RODS NOT ALLOWED FOR 24" & LARGER PIPES.
3. D=DIAMETER, L=LENGTH, G=GRADE, MS=MILD STEEL, HS=HIGH STRENGTH.
4. MIN 4.5' GROUND COVER REQD.
5. BASED ON 150 PSI INTERNAL PRESSURE.
6. MS = MILD STEEL ROD ASTM A 36.
7. HS = HIGH STRENGTH ROD ASTM A 193 GRADE B7.
8. NUTS SHALL BE ASTM A 307 GRADE A OR B HEXAGON HEAVY SERIES. HS NUTS SHALL CONFORM TO MS-22.
9. LENGTH REFERS TO THE AMOUNT OF PIPE WHICH MUST BE RESTRAINED TOGETHER.
10. LENGTH OF RESTRAINED PIPE CHART IS ALSO FOR THE LENGTH OF JOINT RESTRAINT FOR MEGALUGS.
11. TEES & CROSSES MUST BE RESTRAINED IN ALL APPLICABLE DIRECTIONS.
12. 12" AND SMALLER IN LINE VALVES AND TEES SHALL HAVE A MECHANICAL JOINT RESTRAINT DEVICE ON EACH SIDE OF THE FITTING OR VALVE.
13. A SECOND VALVE WILL BE REQD TO BE CLOSED WHEN EXCAVATING NEXT TO A EXIST VALVE.
14. WHEN REDUCERS ARE USED ON VALVE INSTALLATIONS THE LENGTH OF RESTRAINT SHALL BE BASED ON THE SIZE OF THE PIPE NOT THE SIZE OF THE VALVE.
15. ALL REDUCERS/INCREASERS SHALL HAVE MECHANICAL RESTRAINT DEVICES ON EACH SIDE OF FITTING.
16. PIPE JOINT RESTRAINT MAY BE ACCOMPLISHED USING HARNESS RODS, MECHANICAL JOINT RESTRAINT OR RESTRAINED JOINT PIPE AND FITTINGS.
17. AN ANALYSIS OF THE NECESSARY RESTRAINT LENGTH FOR PIPE LARGER THAN 24" SHALL BE SUBMITTED TO THE TOWN ENGINEER FOR REVIEW AND APPROVAL ON A CASE BY CASE BASIS.

RESTRAINED PIPE LENGTHS

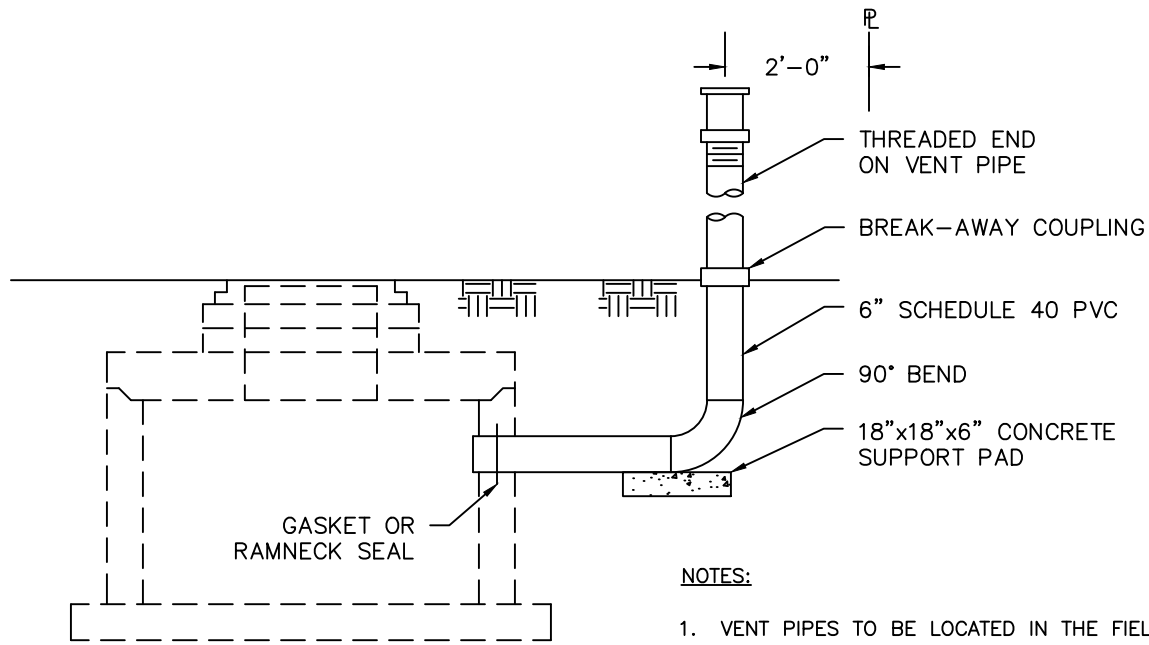


**WATER CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

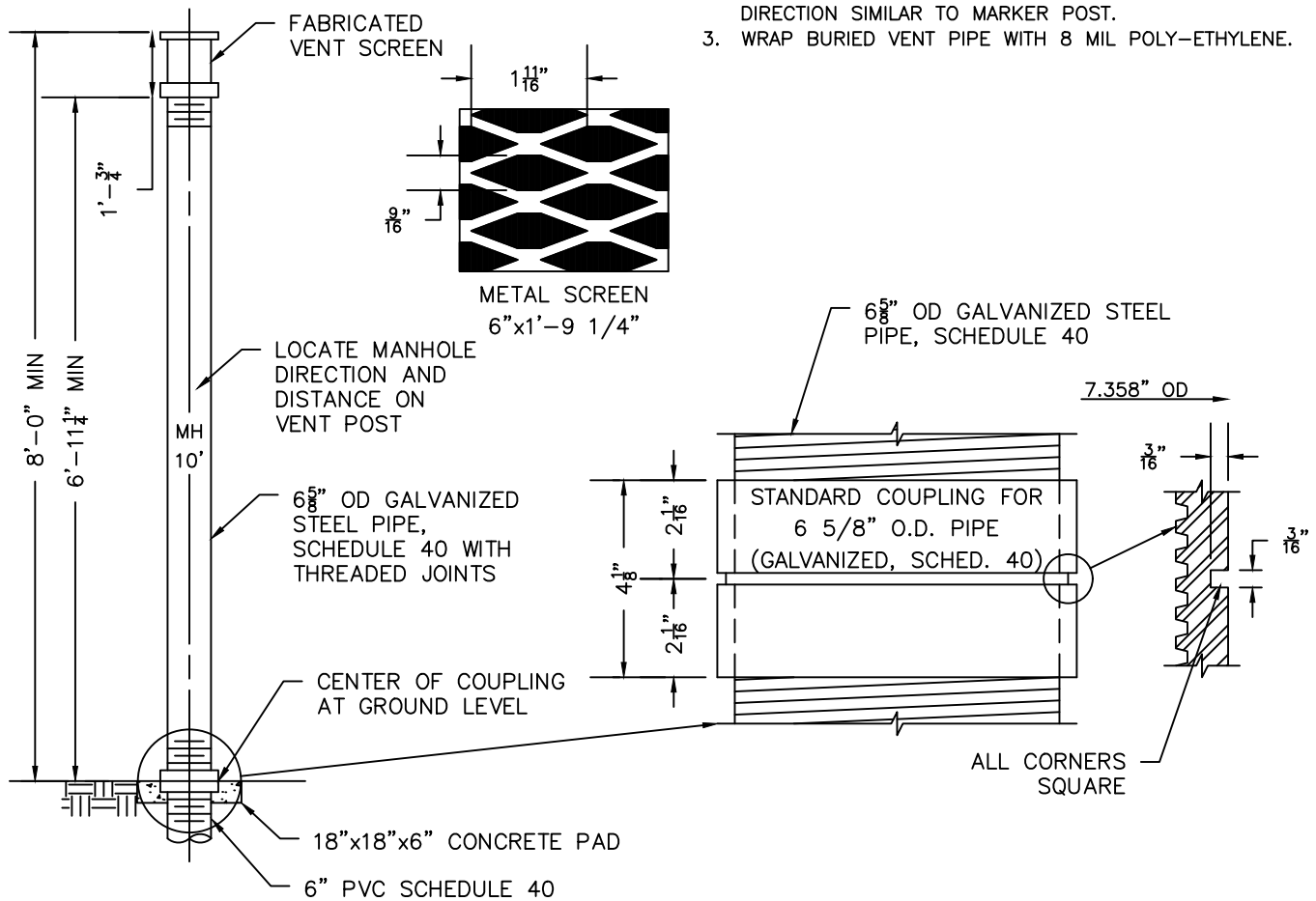
W20



VENT PIPE INSTALLATION

NOTES:

1. VENT PIPES TO BE LOCATED IN THE FIELD AT THE NEAREST INTERSECTION OF THE STREET PROPERTY LINE AND SIDE LOT LINE.
2. PAINT PIPE AND LOCATE M.H. WITH DISTANCE AND DIRECTION SIMILAR TO MARKER POST.
3. WRAP BURIED VENT PIPE WITH 8 MIL POLY-ETHYLENE.



GALVANIZED STEEL VENT PIPE

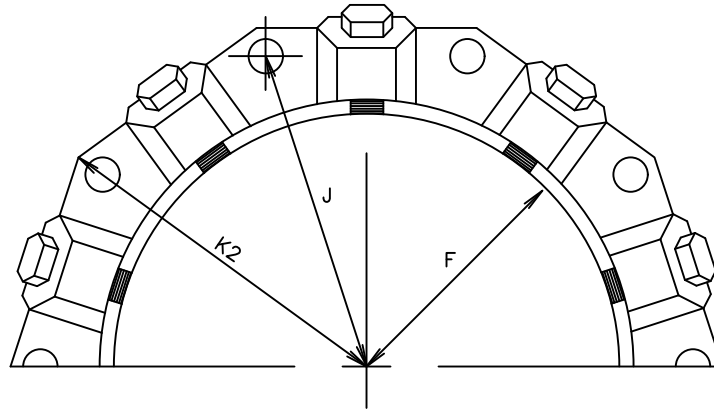


WATER CONSTRUCTION
DRAWINGS

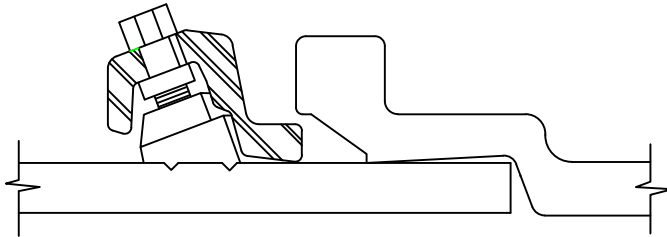
BY: JME
SCALE: NTS
DATE: 1/2020

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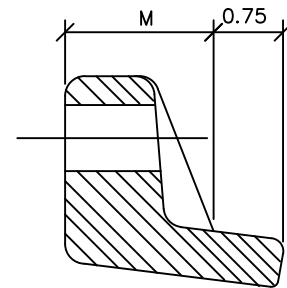
W21



MECHANICAL JOINT RESTRAINT



WEDGE DETAIL



BOLT HOLE DETAIL

DIMENSIONS

	NOMINAL PIPE SIZE	NO. OF BOLTS	NO. OF WEDGES	K2 INCHES	J INCHES	F INCHES	M INCHES	
P V C	4"	2	2					P V C
	6"	6	3	11.12	9.50	7.00	0.88	
	8"	6	4	13.37	11.75	9.15	1.00	
	10"	8	6	15.62	14.00	11.20	1.00	
	12"	8	8	17.88	16.25	13.30	1.25	
D I	4"	4	2					D I
	6"	6	3	11.12	9.50	7.00	0.88	
	8"	6	4	13.37	11.75	9.15	1.00	
	10"	8	6	15.62	14.00	11.20	1.00	
	12"	8	8	17.88	16.25	13.30	1.25	

NOTES:

1. DIMENSIONS FOR 16" AND 20" D.I. PIPE NOT SHOWN.
2. OTHER MECHANICAL JOINT RESTRAINT DEVICES MUST BE APPROVED BEFORE INSTALLATION.

MECHANICAL JOINT RESTRAINT DETAIL

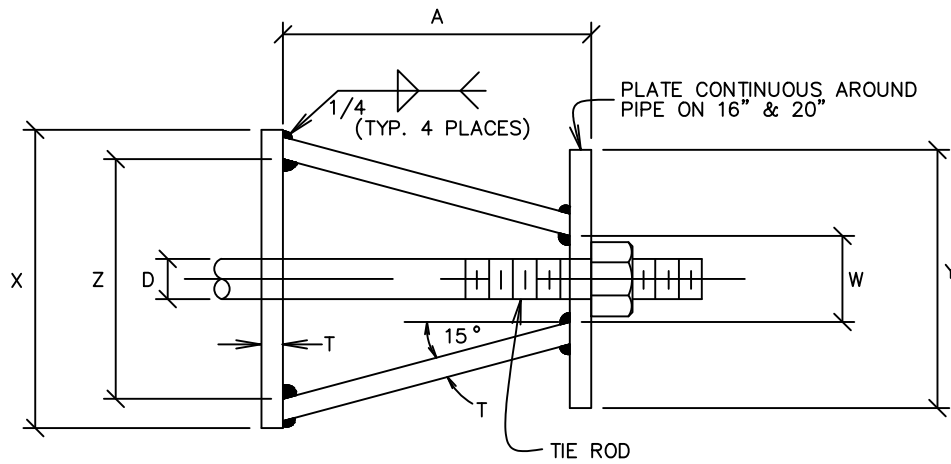


WATER CONSTRUCTION
DRAWINGS

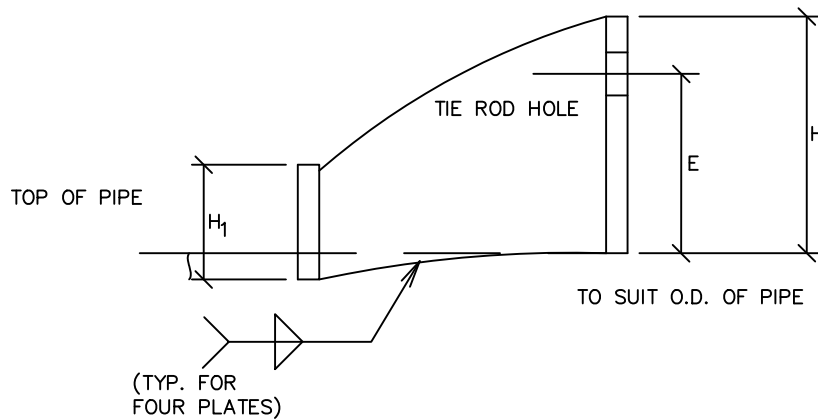
BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

W23



TOP VIEW



SIDE VIEW

	CARRIER PIPE NOMINAL DIA.	STUD DIA. D	A	W	Z	T	H	E	H ₁	Y	X
W/O FLANGED LUGS	4" TO 12"	3/4"	5"	1-1/2"	3-3/4"	3/8"	4-1/8"	3-1/8"	2"	4-1/2"	5"
	16"	1"	5-3/4"	1-3/4"	4-1/2"	1/2"	4-1/2"	3-1/4"	2"	RING	6"
	20"	1-1/4"	7-1/2"	2"	5-3/4"	5/8"	5"	3-3/4"	2-1/2"	RING	7-1/2"

NOTES:

1. USE TWO HIGH-STRENGTH STEEL TIE-RODS AT END OF CASING.
2. TIE-ROD HOLE DIAMETER $\frac{1}{8}$ " LARGER THAN STUD DIAMETER.
3. BOTTOM EDGE OF ALL PLATES SHAPED TO FIT O.D. OF PIPE.
4. HARNESS LUGS AS PER AWWA MANUAL M-11.

COMBINATION FLANGED HARNESS LUG DETAIL



WATER CONSTRUCTION
DRAWINGS

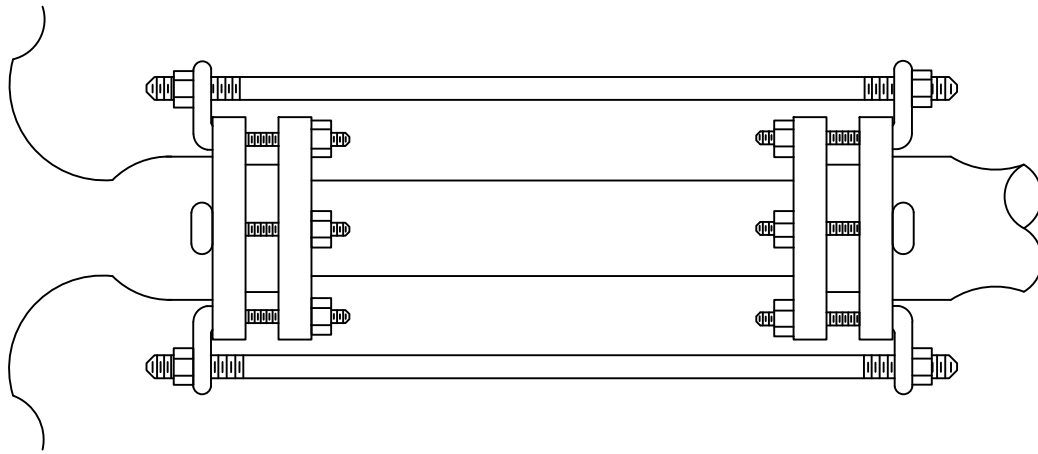
BY: JME

SCALE: NTS

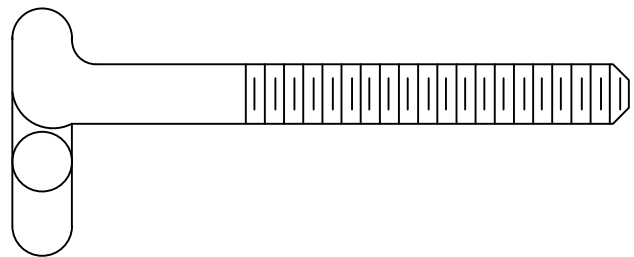
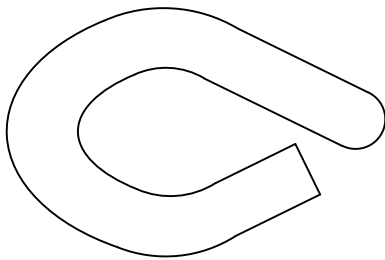
DATE: 1/2020

DRAWING:

W24



PLAN



DETAIL

DIMENSIONS

ALLOWABLE PIPE DIAMETER INCHES	BOLT SIZE	NO . OF BOLTS REQUIRED
4	3/4"	2
6	3/4"	2
8	3/4"	2
10	3/4"	4
12	3/4"	6

NOTES:

1. THE BOLT SHALL BE MANUFACTURED OF "COR-TEN" OR APPROVED EQUAL.
2. THE BOLT MAY BE HEAT TREATED.

JOINT RESTRAINT DETAIL



**WATER CONSTRUCTION
DRAWINGS**

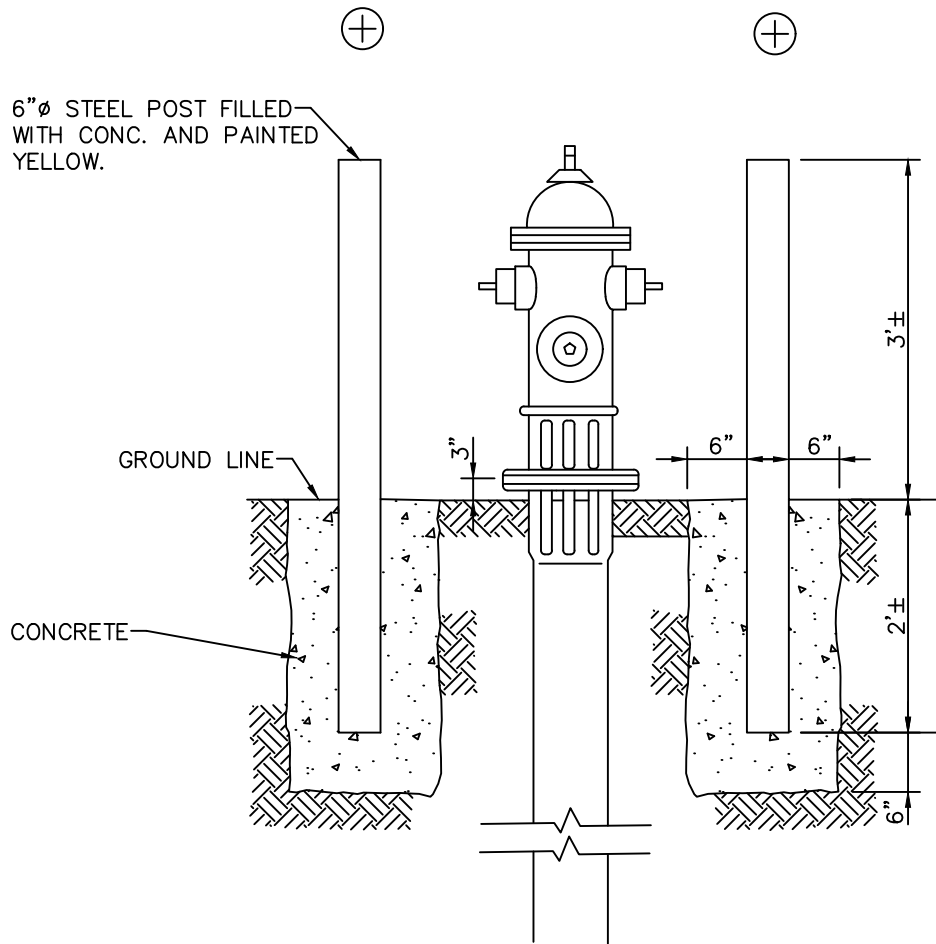
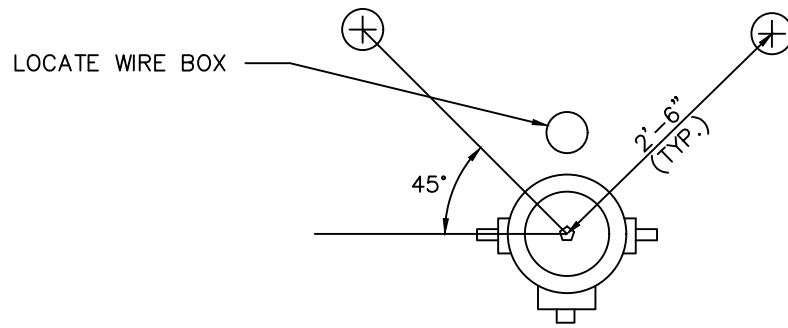
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

W25



NOTES:

1. TO BE USED IN COMMERCIAL OR INDUSTRIAL AREAS WHERE HYDRANTS ARE UNPROTECTED FROM TRAFFIC FLOW.
2. STEAMER CONNECTION ON FIRE HYDRANT SHOULD FACE THE STREET.

FIRE HYDRANT GUARDS

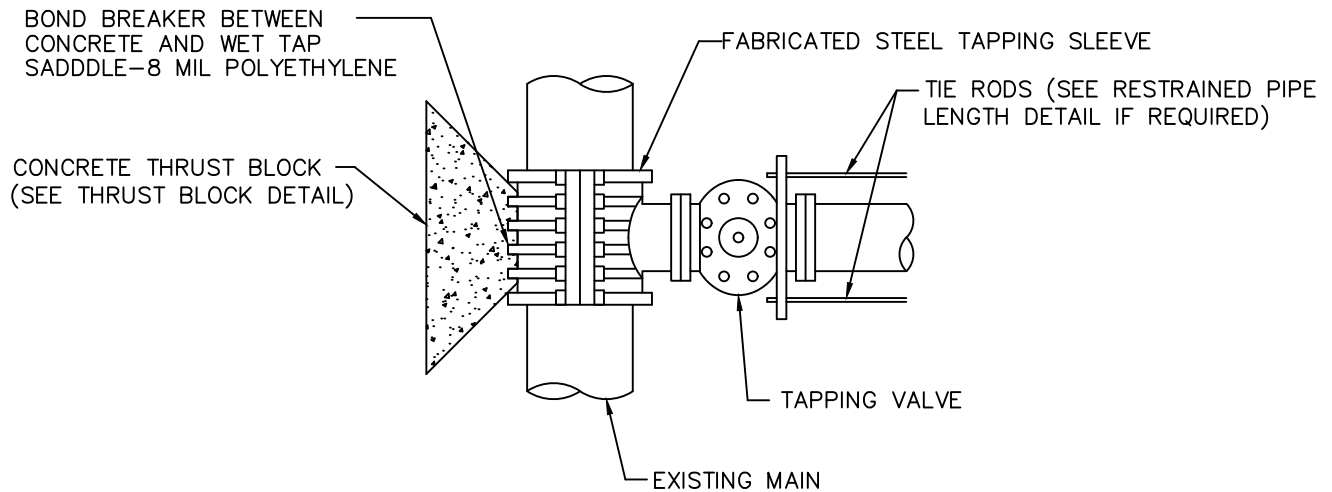


**WATER CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

W26



NOTES:

1. FABRICATED STEEL TAPPING SLEEVE SHALL BE:

ROMAC FTS419 OR APPROVED EQUAL TO BE USED FOR PVC UP TO 75% OF EXISTING MAIN

ROMAC FTS420 OR APPROVED EQUAL TO BE USED FOR DIP UP TO 75% OF EXISTING MAIN

ROMAC FTS425 OR APPROVED EQUAL TO BE USED ON ALL AC PIPE AND ANYTIME A BRANCH LINE IS GREATER THAN 75% OF EXISTING MAIN

TAPPING TEE AND VALVE



WATER CONSTRUCTION
DRAWINGS

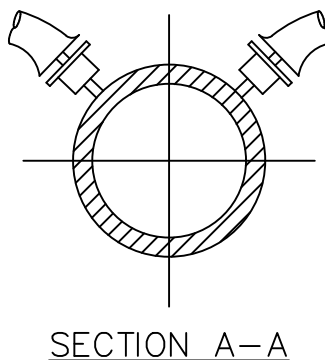
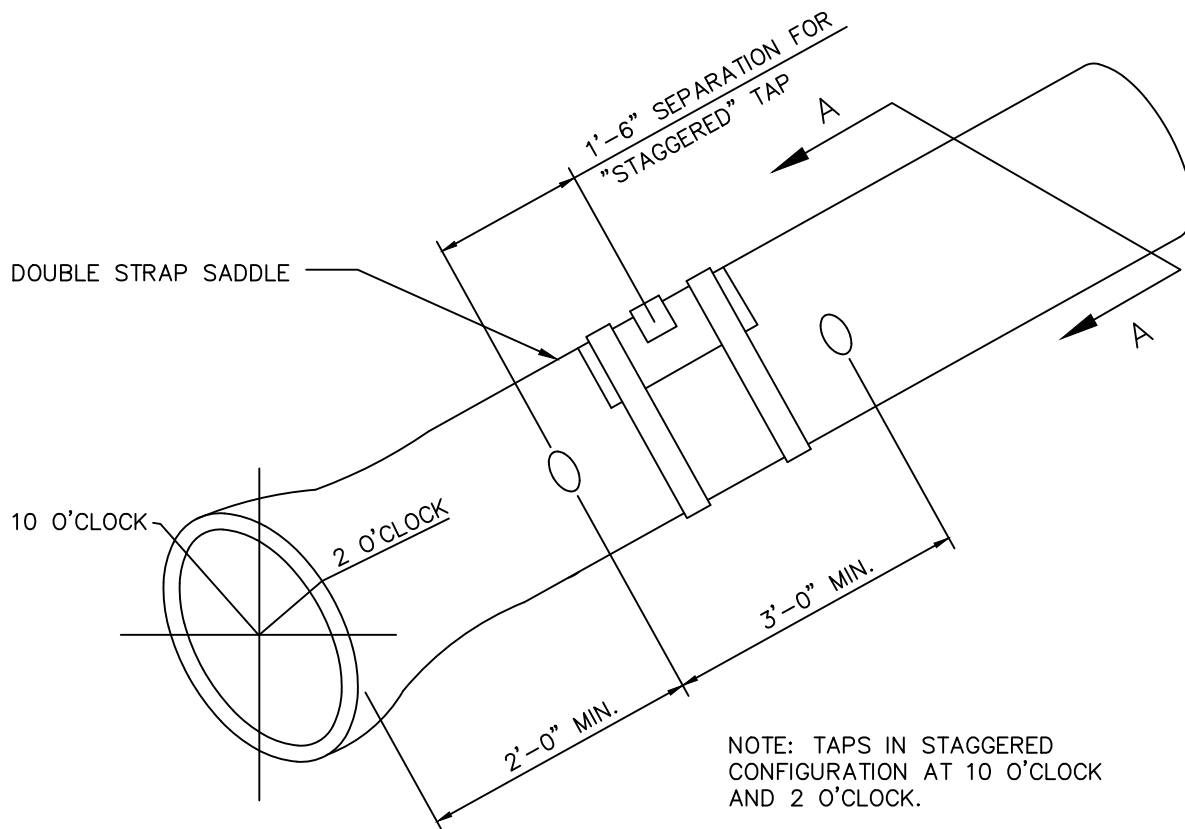
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

W27



NOTE:

SERVICE TAP – WATER SERVICE TAP SHALL BE MADE AT EITHER THE 2 O'CLOCK OR THE 10 O'CLOCK POSITION ON THE CIRCUMFERENCE OF A WATER MAIN. THE MINIMUM DISTANCE BETWEEN A TAP MADE AT THE 2 O'CLOCK POSITION AND THE ONE MADE AT THE 10 O'CLOCK POSITION SHALL BE 18" MEASURED ALONG THE PIPE. THE MINIMUM DISTANCE BETWEEN SUCCESSIVE TAPS MADE EITHER AT THE 2 O'CLOCK OR THE 10 O'CLOCK POSITION SHALL BE 3'. THE MINIMUM DISTANCE FROM EITHER THE BELL OR SPIGOT END OF A PIPE TO TAP SHALL BE 2'. A MAXIMUM OF 4 WATER SERVICE TAPS SHALL BE ALLOWED PER LENGTH OF PIPE. DOUBLE STRAP SADDLE (ROMAC 202B OR APPROVED EQUAL) SHALL BE USED FOR ALL SERVICE TAPS.

DOMESTIC WATER TAPPING DETAIL

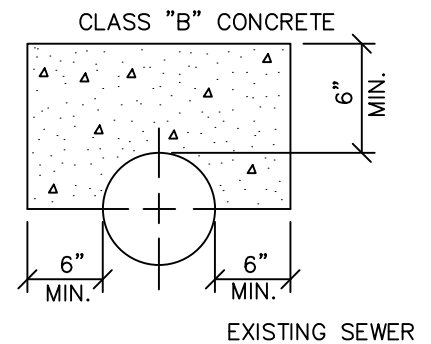
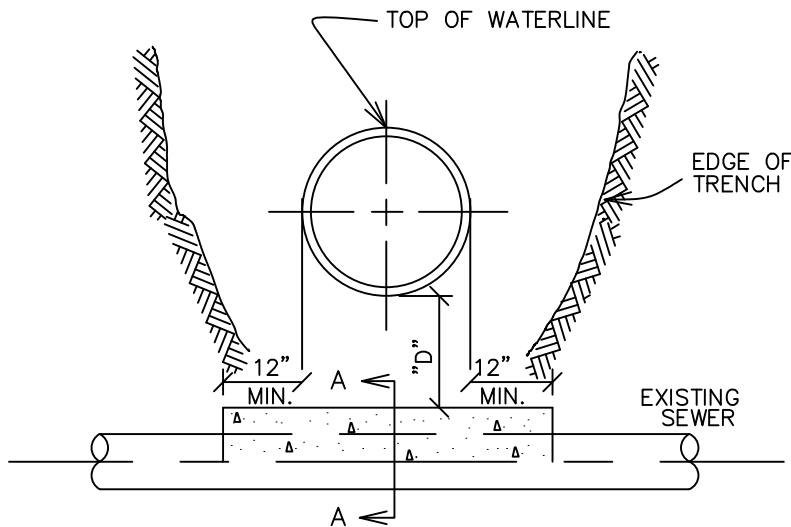
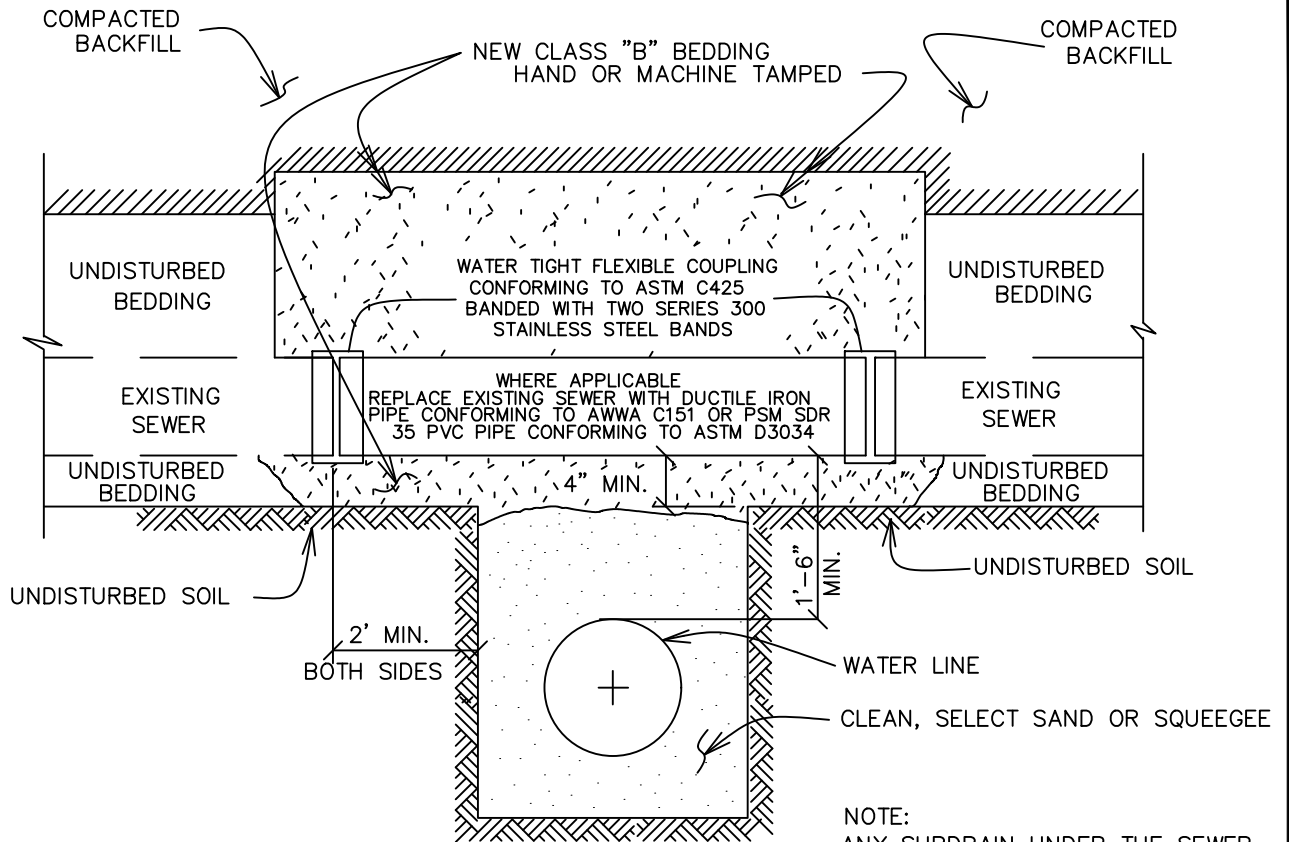


**WATER CONSTRUCTION
DRAWINGS**

BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

W28



SEWER CROSSING UNDER
WITH "D" LESS THAN 2'

SECTION A-A

NOTE:

ALL EXISTING SEWER DAMAGED DURING INSTALLATION
MUST BE REPLACED WITH PVC PIPE

CROSSING STORM AND SANITARY SEWERS



**WATER CONSTRUCTION
DRAWINGS**

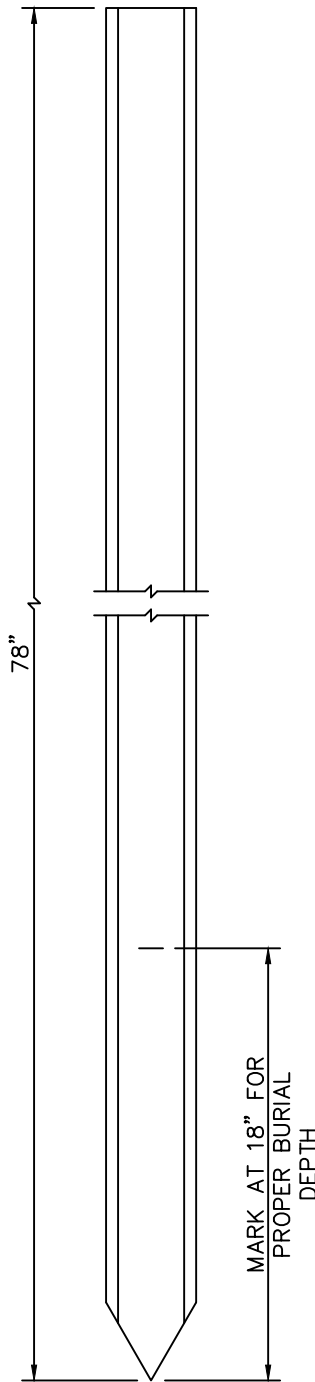
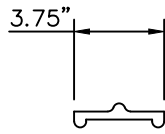
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

W29



FIBERGLASS MARKER POST

4" DIA. STEEL POST PAINTED
BLUE, FILLED WITH
CONCRETE

12" SIZE (12 INCHES)

G.V. OBJECT (GATE VALVE)

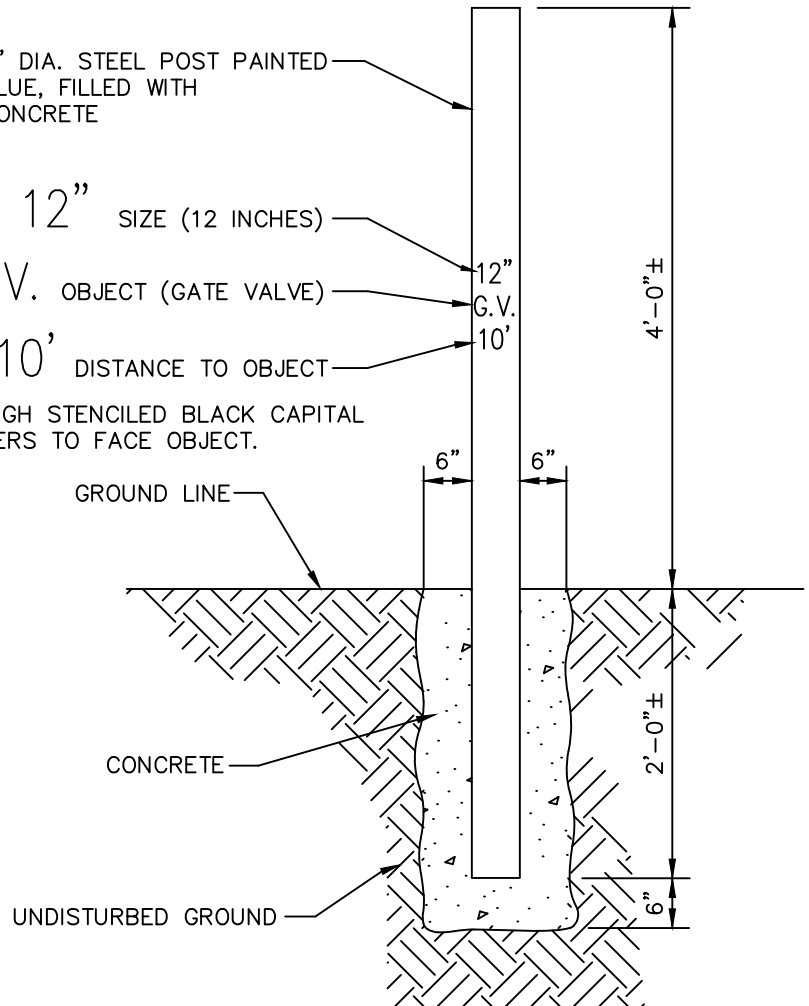
10' DISTANCE TO OBJECT

2" HIGH STENCILED BLACK CAPITAL
LETTERS TO FACE OBJECT.

GROUND LINE

CONCRETE

UNDISTURBED GROUND



STEEL MARKER POST

NOTES:

1. FIBERGLASS MARKER POST SHALL BE CARSONITE
CUM-375 OR EQUAL WITH ANCHORS AND APPROPRIATE
DECALS FOR WATER.
2. COLOR FOR WATER - BLUE
3. COLOR FOR NON-POTABLE - PURPLE

MARKER POST



**WATER CONSTRUCTION
DRAWINGS**

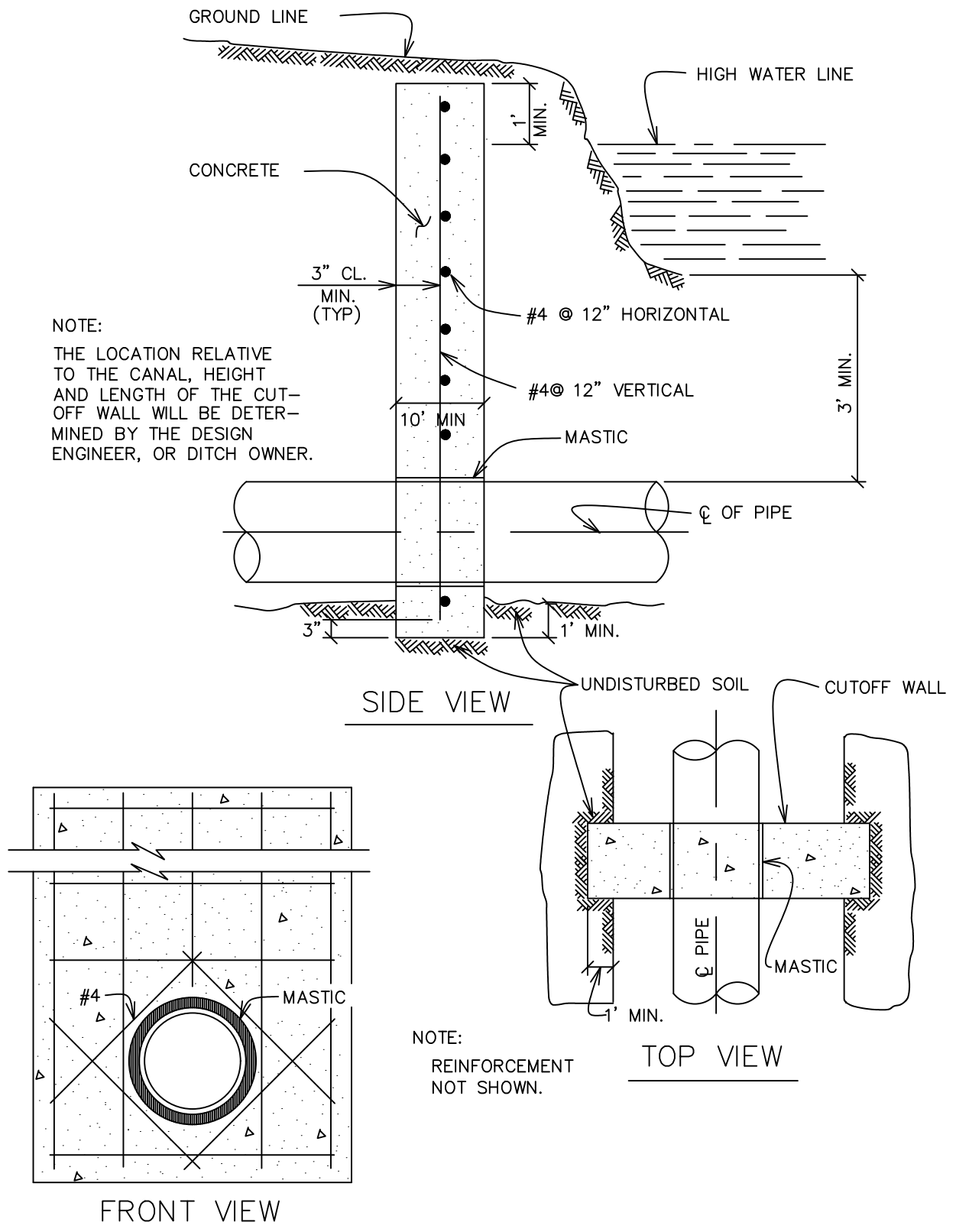
BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

W30



TYPICAL CUTOFF WALL FOR DITCH CROSSING



**WATER CONSTRUCTION
DRAWINGS**

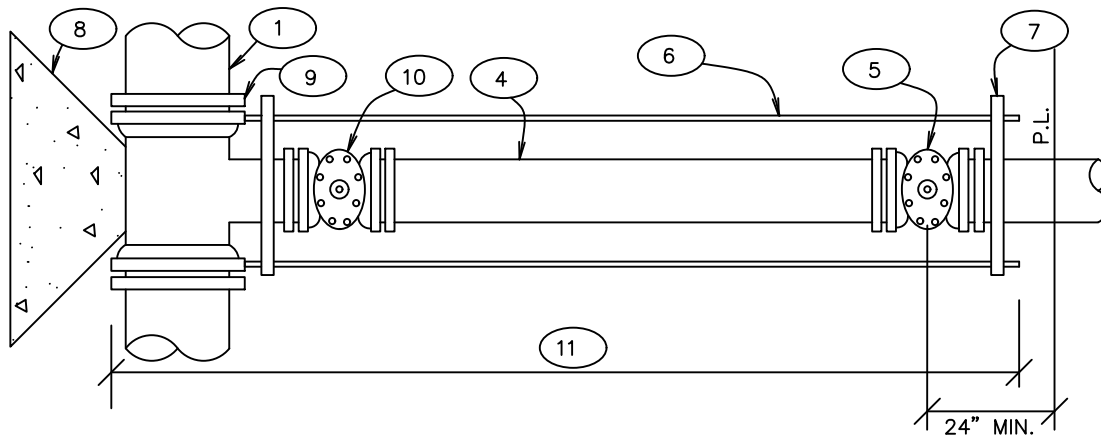
BY: JME

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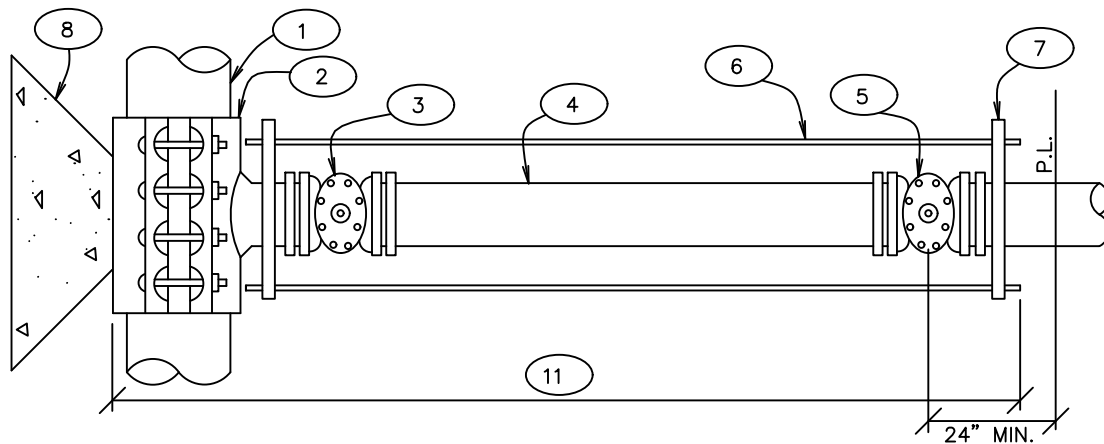
DATE: 1/2020

DRAWING:

W31



FIRELINE OR DOMESTIC CONNECTION WITH MAIN EXTENSION



FIRELINE OR DOMESTIC CONNECTION

- | | |
|--|--|
| (1) EXISTING MAIN | (8) CONCRETE KICKBLOCK |
| (2) TAPPING SLEEVE | (9) M.J. ANCHORING TEE (SWIVEL TEE WHERE APPLICABLE) |
| (3) TAPPING VALVE | (10) M.J. VALVE |
| (4) DOUBLE SPIGOT PIPE | (11) POLYETHYLENE WRAPPED |
| (5) PROPERTY LINE VALVE | |
| (6) TIE RODS (MEGALUGS MAY BE USED IN PLACE OF RODDING.) | |
| (7) PIPE CLAMP | |

2" AND LARGER DOMESTIC AND FIRELINE CONNECTIONS

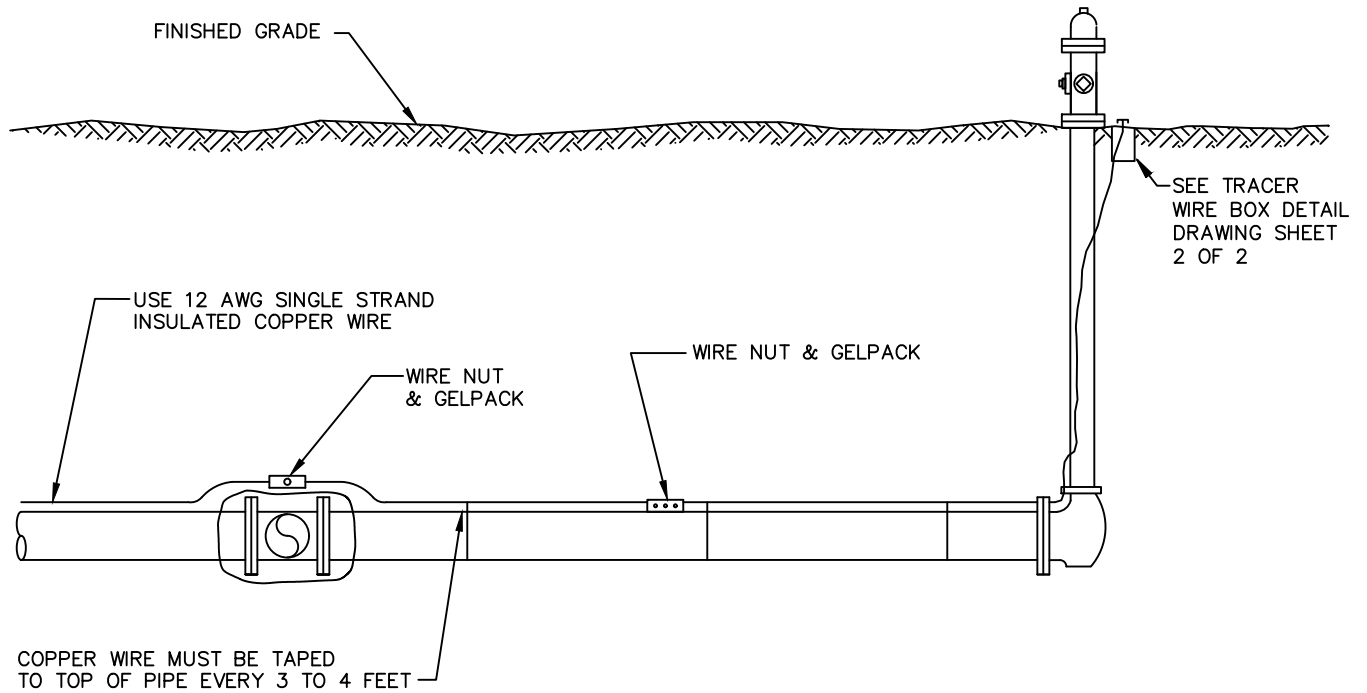


WATER CONSTRUCTION
DRAWINGS

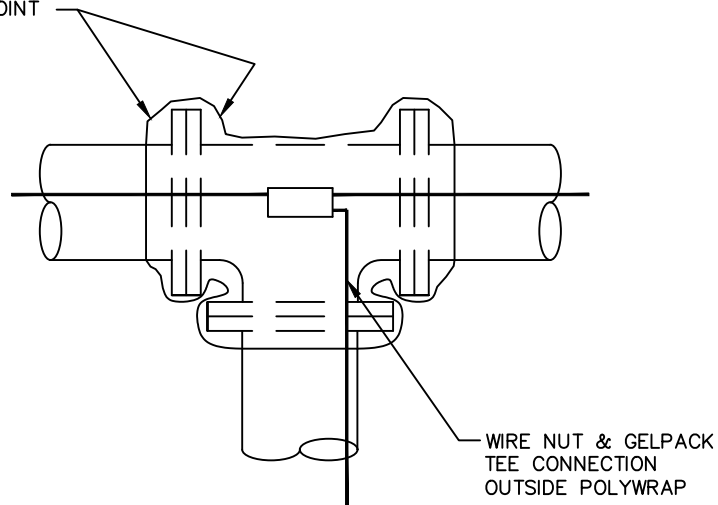
BY: JME
SCALE: NTS
DATE: 1/2020

DRAWING:

W32



WIRE TO BE TAPED ON EACH SIDE OF EVERY JOINT



TRACER WIRE (1 OF 2)



WATER CONSTRUCTION
DRAWINGS

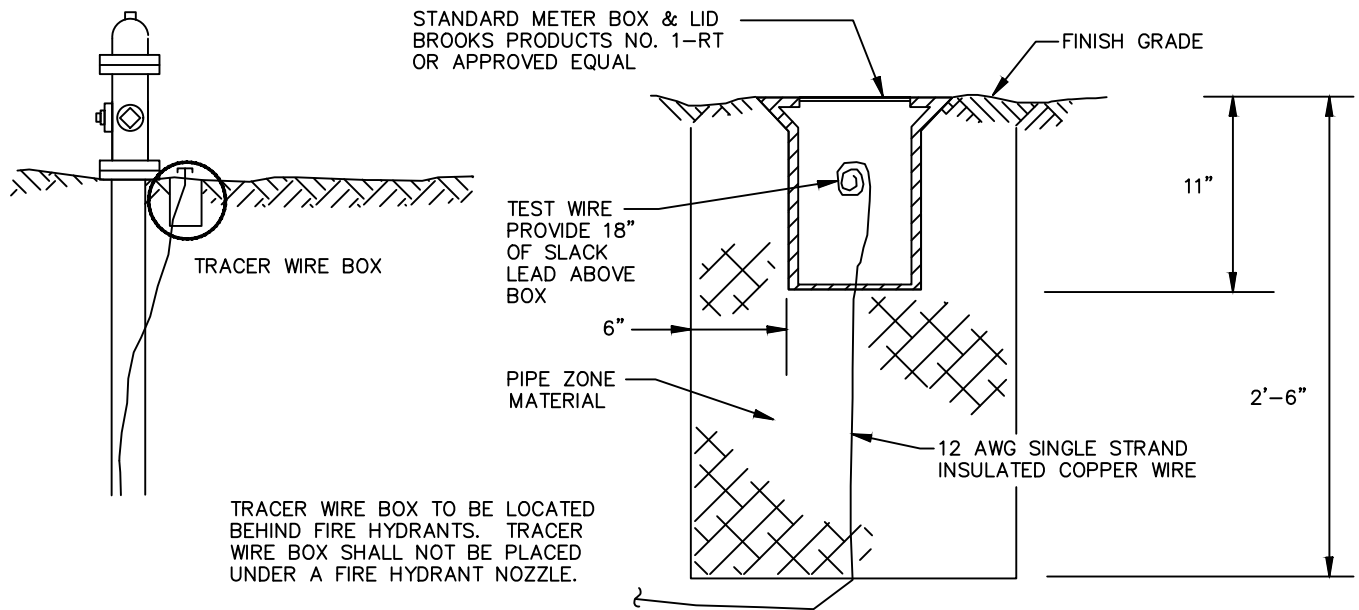
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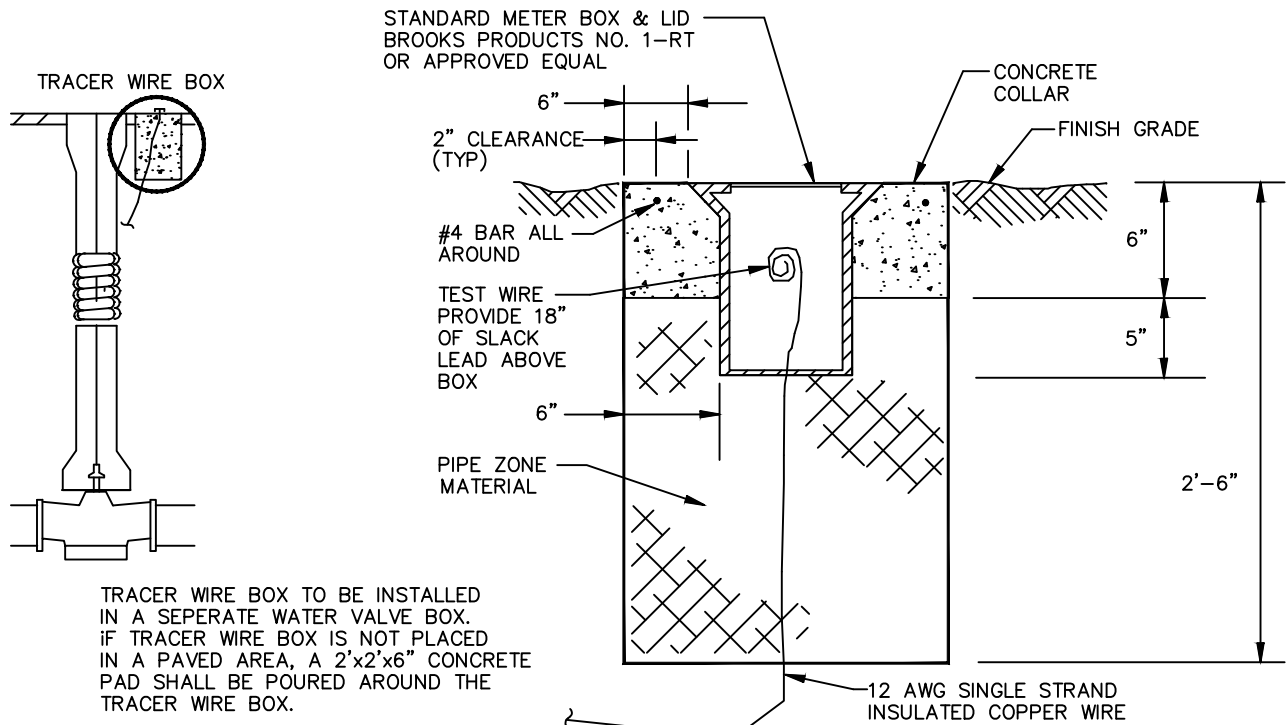
DATE: 1/2020

DRAWING:

W33A



TRACER WIRE BOX AT FIRE HYDRANT



TRACER WIRE BOX FOR AREA WITH NO FIRE HYDRANT

TRACER WIRE (2 OF 2)



WATER CONSTRUCTION
DRAWINGS

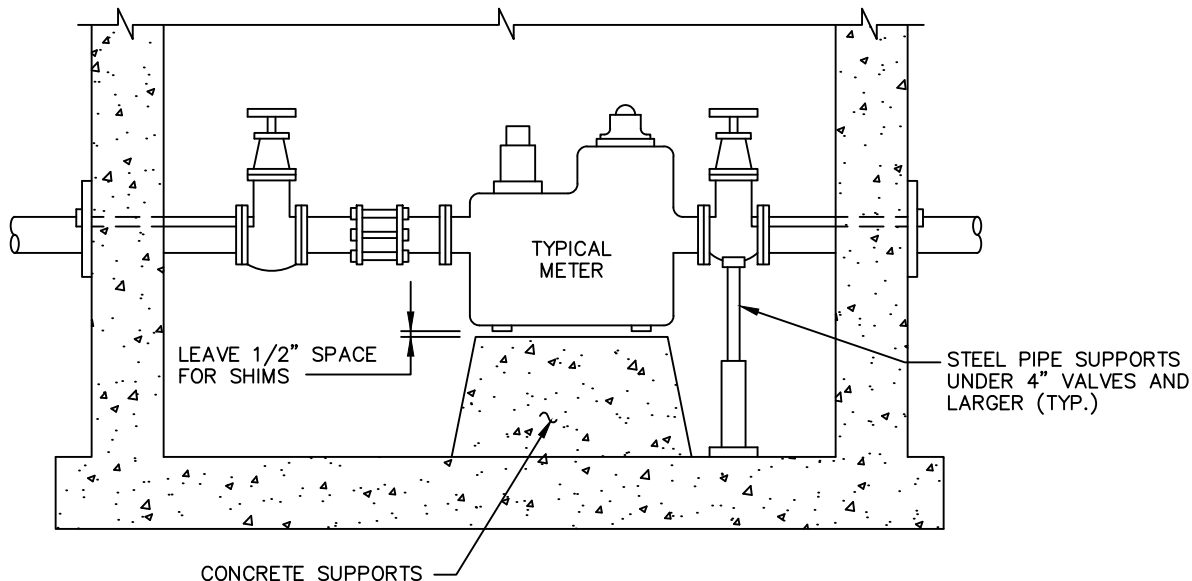
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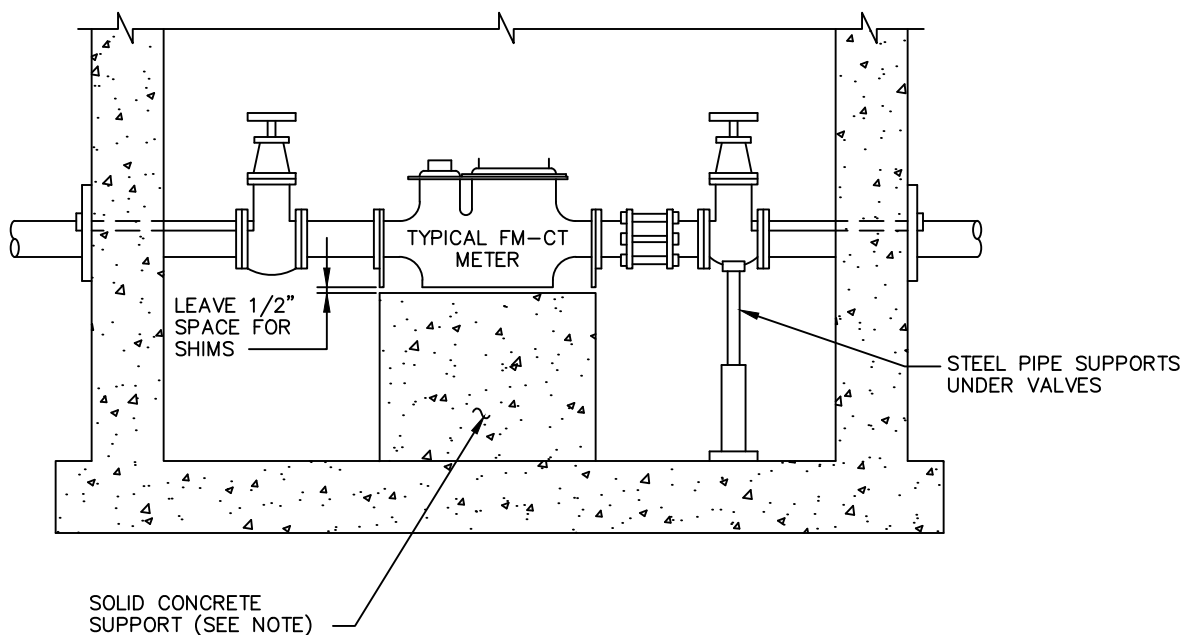
DATE: 1/2020

DRAWING:

W33B



TYPICAL CONCRETE METER SUPPORTS
FOR 2", 3", 4", 6", 8", & 10" METERS



TYPICAL CONCRETE METER SUPPORTS
FOR F.M.-C.T. METERS

NOTE:
 SOLID CONCRETE BASE EXTENDS UNDER
 THE FM-CT METER BY PASS FOR 6",
 8", AND 10".

SIZE OF CONCRETE SUPPORT
 6" FM-CT W=3'-9" L=3'-0"
 8" FM-CT W=4'-5" L=3'-8"
 10" FM-CT W=5'-8" L=4'-8"

CONCRETE METER SUPPORTS

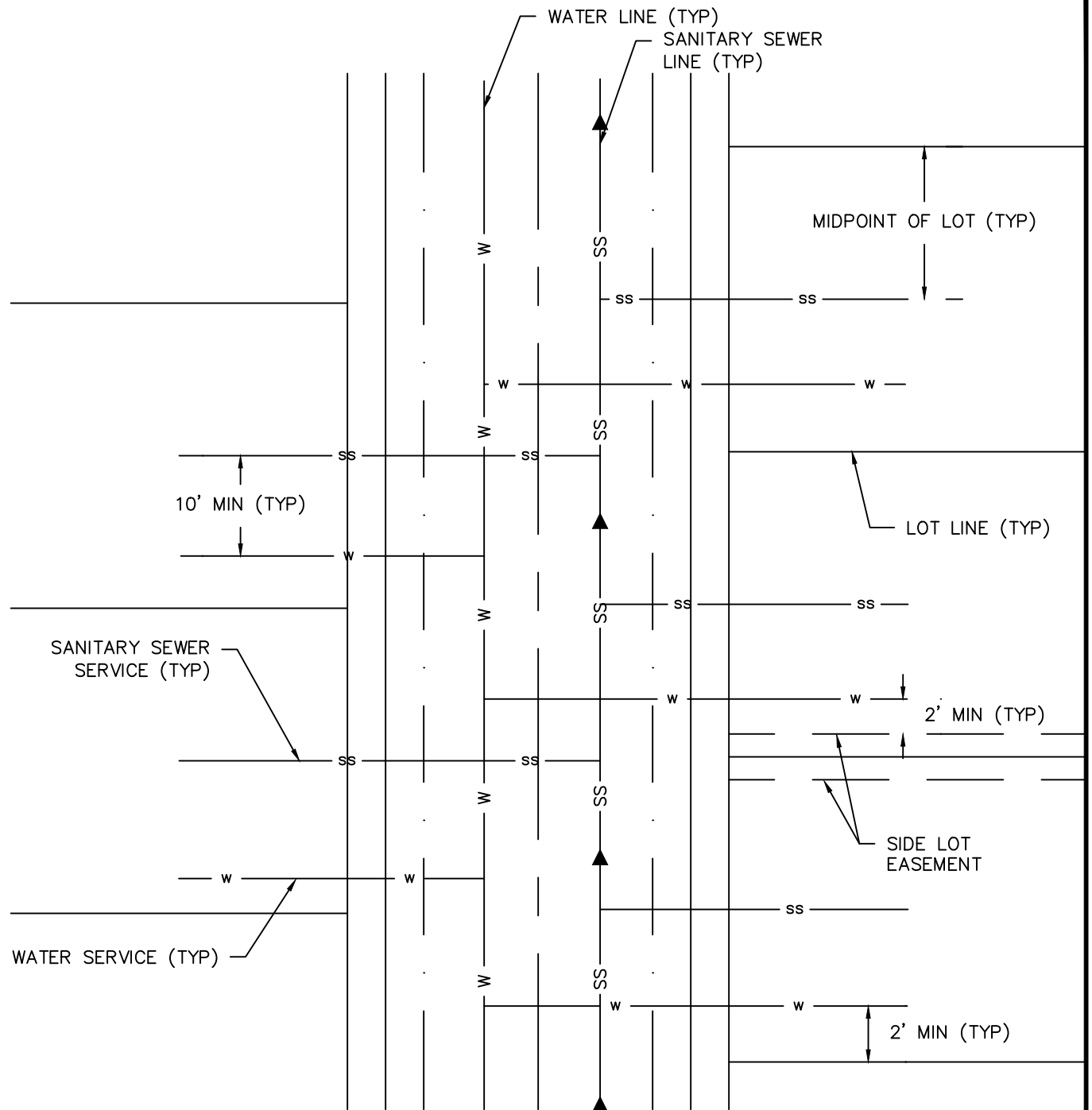


WATER CONSTRUCTION
 DRAWINGS

BY: JME
 SCALE: NTS
 DATE: 1/2020

DRAWING:

W34



NOTES:

1. SANITARY SEWER SERVICES SHALL BE INSTALLED IN THE CENTER OF THE LOT PER THE ST. VRAIN SANITATION DISTRICT STANDARDS.
2. WATER SERVICES SHALL BE INSTALLED A MINIMUM OF 10 FEET FROM THE SEWER SERVICE.
3. WATER SERVICES SHALL NOT BE LOCATED UNDER DRIVEWAYS.
4. STAMP AN "S" AND A "W" IN THE FACE OF CURB (4" HEIGHT) AT THE LOCATION OF THE WATER AND SANITARY SEWER SERVICE LOCATIONS, "S" FOR SEWER AND "W" FOR WATER.

WATER AND SEWER SERVICE LOCATIONS



**WATER CONSTRUCTION
DRAWINGS**

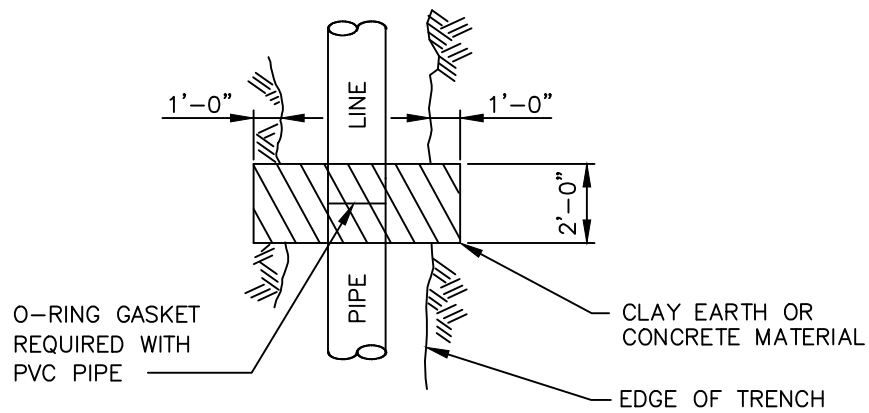
BY: JME

SCALE: NTS

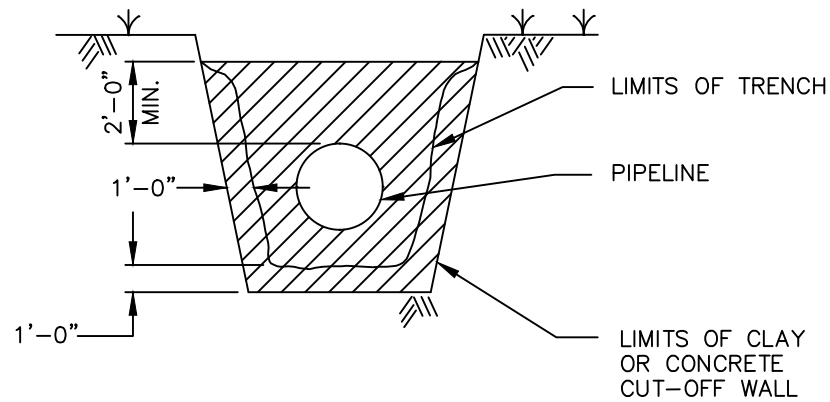
DATE: 1/2020

DRAWING:

W36



PLAN



SECTION

NOTES:

1. CLAY OR CONCRETE WALL EXTENDS A MINIMUM OF 12" INTO UNDISTURBED SOIL ON EACH SIDE AND ON BOTTOM OF TRENCH.
2. CLAY MATERIAL TO BE CLASSIFIED AS CL, CH OR OH.
3. APPROVED FLOW-FILL MATERIAL MAY BE USED INSTEAD OF CLAY MATERIAL.

CLAY OR CONCRETE CUT-OFF WALL



**WATER CONSTRUCTION
DRAWINGS**

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

W37

GENERAL METER NOTES

1. LOCATION OF THE METER TO BE ESTABLISHED BY THE DEVELOPMENT ENGINEER.
2. ALL SETTINGS MUST BE INSPECTED BY THE RESIDENT PROJECT REPRESENTATIVE.
3. IF THE STREET OR GROUND IS NOT TO OFFICIAL GRADE AT THE TIME OF INSTALLATION OF THE METER, THE OWNER MUST RAISE OR LOWER THE METER VAULT WHEN THE FINAL GRADE IS ESTABLISHED.
4. LEADED JOINTS AND GALVANIZED PIPING SHALL NOT BE ALLOWED INSIDE THE METER VAULTS.
5. A BYPASS IS TO BE INSTALLED ON 1-1/2" AND LARGER METERS UNLESS OTHERWISE SPECIFIED.
6. THE SERVICE LINE THROUGH AND ON BOTH SIDES OF THE METER PIT MUST BE OF THE SAME MATERIAL.
7. NO CONNECTIONS SHALL BE MADE IN THE METER PIT. SPRINKLER CONNECTIONS MUST BE MADE MORE THAN FIVE (5) FEET FROM THE METER PIT ON THE DOWNSTREAM SIDE.
8. GATE VALVES:
 - A. ALL GATE VALVES UNDER 3" FOR USE W/COPPER PIPE SHALL BE ALL BRONZE, W/ NON-RISING STEMS AND SOLID WEDGE DISC, MANUFACTURED IN ACCORDANCE WITH A.S.T.M. SPEC. B62 AND FEDERAL SPEC. W.W.-V-54 CLASS A, 125PSI W.S.P., 200PSI W.O.G. OR CURB STOPS IN ACCORDANCE WITH AWWA C800 AND MS-23 OF THE MATERIAL SPECIFICATIONS.
 - B. ALL GATE VALVES 3" AND LARGER SHALL CONFORM WITH THE TOWN OF FIRESTONE'S STANDARD SPECIFICATIONS.
9. ALL DRESSER (OR APPROVED EQUAL) COUPLINGS SHALL HAVE THE PIPE STOP REMOVED.

WATER METER NOTES



WATER CONSTRUCTION
DRAWINGS

BY: JME

SCALE: NTS

DATE: 1/2020

DRAWING:

W38

GENERAL NOTES – CONSTRUCTION

1. ALL CONSTRUCTION SHALL CONFORM TO THE LATEST "DESIGN STANDARDS AND CONSTRUCTION SPECIFICATIONS FOR PUBLIC IMPROVEMENTS" BY THE TOWN OF FIRESTONE. COPIES OF THE STANDARDS AND SPECIFICATIONS MAY BE OBTAINED FROM THE TOWN WEB SITE. CONTRACTOR SHALL HAVE A SET ON SITE AT ALL TIMES.
2. THE OWNER SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH THE TOWN OF FIRESTONE ENGINEERING STAFF PRIOR TO THE START OF CONSTRUCTION. THOSE IN ATTENDANCE SHALL INCLUDE THE OWNER, HIS ENGINEER, THE TOWN ENGINEERING STAFF, REPRESENTATIVES OF THE CONTRACTORS AND OTHER AFFECTED AGENCIES. PLANS SIGNED AND ACCEPTED BY THE TOWN WILL BE DISTRIBUTED AT THE PRE-CONSTRUCTION MEETING. CONTRACTOR SHALL HAVE (1) COPY OF THE SIGNED PLANS ON SITE AT ALL TIMES.
3. THE TOWN OF FIRESTONE, THROUGH ACCEPTANCE OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR THE COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT. THE OWNER AND DESIGN ENGINEER UNDERSTAND THAT THE RESPONSIBILITY FOR THE ENGINEERING ADEQUACY OF THE FACILITIES DEPICTED IN THIS DOCUMENT LIES SOLELY WITH THE REGISTERED PROFESSIONAL ENGINEER WHOSE STAMP AND SIGNATURE ARE AFFIXED TO THIS DOCUMENT. REPORT ALL DISCREPANCIES TO THE DESIGN ENGINEER IMMEDIATELY.
4. PRIOR TO BEGINNING THE WORK, THE CONTRACTOR SHALL OBTAIN ANY/ALL WRITTEN AGREEMENTS FOR INGRESS AND EGRESS TO THE WORK SITE FROM ADJACENT PRIVATE PROPERTY OWNERS. A COPY OF ALL AGREEMENTS SHALL BE PROVIDED TO THE TOWN. ACCESS TO ANY ADJACENT PRIVATE PROPERTY SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
5. ALL MATERIALS AND WORKMANSHIP SHALL BE SUBJECT TO INSPECTION BY THE TOWN ENGINEERING STAFF. THE TOWN RESERVES THE RIGHT TO ACCEPT OR REJECT ANY SUCH MATERIALS AND WORKMANSHIP THAT DOES NOT CONFORM TO TOWN STANDARDS AND SPECIFICATIONS. INSPECTIONS AND ONSITE VISITS ARE NOT TO BE CONSTRUED AS A GUARANTEE BY THE TOWN ENGINEERING STAFF OF THE CONTRACTORS' CONTRACTUAL COMMITMENT. REQUESTS FOR INSPECTION BY THE TOWN SHALL BE MADE BY THE CONTRACTOR A MINIMUM OF TWENTY-FOUR (24) HOURS IN ADVANCE.

6. CONSTRUCTION WATER IS AVAILABLE TO THE CONTRACTOR AS ESTABLISHED IN THE TOWN STANDARDS AND SPECIFICATIONS. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTACT THE TOWN REGARDING CURRENT REGULATIONS, FEES AND REQUIRED AGREEMENTS RELATED TO THE PROVISION OF CONSTRUCTION WATER.
7. THE CONTRACTOR SHALL COORDINATE HIS ACTIVITIES WITH THE AFFECTED UTILITY COMPANIES AND SHALL NOTIFY THE UTILITY NOTIFICATION CENTER, PHONE NUMBER 811, THREE (3) BUSINESS DAYS PRIOR TO THE START OF CONSTRUCTION.
8. UTILITIES IN THE AREA OF CONSTRUCTION ARE APPROXIMATE ONLY. THEY HAVE BEEN LOCATED FROM FIELD INVESTIGATION AND THE BEST AVAILABLE UTILITY RECORDS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION, PROTECTION AND REPAIR OF ALL UTILITIES ENCOUNTERED DURING CONSTRUCTION WHETHER SHOWN ON THESE PLANS OR NOT. THE CONTRACTOR SHALL CONTACT ALL RESPECTIVE UTILITIES AND HAVE ALL UTILITIES FIELD-LOCATED PRIOR TO CONSTRUCTION. IF ANY UNKNOWN SUBSURFACE STRUCTURES ARE ENCOUNTERED DURING CONSTRUCTION, IT SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE TOWN ENGINEERING STAFF AND DESIGN ENGINEER PRIOR TO PROCEEDING.
9. THE CONTRACTOR SHALL NOTIFY TOWN ENGINEERING STAFF OF ANY PROBLEM IMPACTING WATER AND WASTE WATER FACILITIES THAT WOULD POTENTIALLY REQUIRE A VARIANCE FROM THE APPROVED PLANS AND SPECIFICATIONS. ANY VARIANCE FROM THE APPROVED DOCUMENTS SHALL BE AT THE SOLE DISCRETION OF THE TOWN ENGINEERING STAFF.
10. CONTRACTOR SHALL OBTAIN, AT HIS OWN EXPENSE, ALL APPLICABLE SPECIFICATIONS AND PERMITS NECESSARY TO PERFORM THE PROPOSED WORK.
11. AS-BUILT DRAWINGS AS REQUIRED IN THE SPECIFICATIONS, ARE TO BE SUBMITTED BY THE OWNER/DEVELOPER PRIOR TO INITIAL ACCEPTANCE OF THE CONSTRUCTION.
12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING AND REPLACING ANY EXISTING SIGNS, STRUCTURES, FENCES, ETC., ENCOUNTERED ON THE JOB AND RESTORING THEM TO THEIR ORIGINAL CONDITION.

13. THE CONTRACTOR IS RESPONSIBLE FOR:
 - A. NOTIFYING THE TOWN UTILITY CUSTOMERS OF POTENTIAL SERVICE OUTAGES, AND COORDINATE WITH THE TOWN FOR DETERMINATION OF MINIMUM TIME REQUIREMENT.
 - B. NOTIFYING THE TOWN ENGINEERING STAFF IF WORK IS SUSPENDED FOR ANY PERIOD OF TIME AFTER INITIAL START-UP. THE CONTRACTOR SHALL NOTIFY THE TOWN FORTY-EIGHT (48) HOURS PRIOR TO RESTART.
 - C. IN THE EVENT OF AN AFTER HOURS EMERGENCY, CALL 720-652-4222.
 - D. NOTIFYING THE FREDERICK FIRESTONE FIRE PROTECTION DISTRICT OF ALL STREET CLOSURES AND EXISTING FIRE HYDRANTS TAKEN OUT OF SERVICE A MINIMUM OF FORTY-EIGHT (48) HOURS PRIOR TO THE START OF CONSTRUCTION.
14. PRIOR TO INSTALLATION OF UTILITY MAINS, ROAD CONSTRUCTION MUST HAVE COMPLETED THE OVER LOT GRADING STAGE.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING ANY GROUNDWATER ENCOUNTERED DURING THE CONSTRUCTION OF ANY PORTION OF THIS PROJECT. A CONSTRUCTION DEWATERING PERMIT MUST BE OBTAINED FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE). GROUNDWATER SHALL BE PUMPED, PIPED, REMOVED AND DISPOSED OF IN A MANNER WHICH DOES NOT CAUSE FLOODING OF EXISTING STREETS OR EROSION OF ABUTTING PROPERTIES IN ORDER TO CONSTRUCT THE IMPROVEMENTS SHOWN ON THESE PLANS. THE USE OF ANY SANITARY SEWER TO DISPOSE OF TRENCH WATER WILL NOT BE PERMITTED. NO CONCRETE SHALL BE PLACED WHERE GROUNDWATER IS VISIBLE OR UNTIL THE GROUNDWATER TABLE HAS BEEN LOWERED BELOW THE PROPOSED IMPROVEMENTS. ANY UNSTABLE AREAS, AS A RESULT OF GROUNDWATER, ENCOUNTERED DURING THE CONSTRUCTION OF THE PROPOSED IMPROVEMENTS SHALL BE STABILIZED AS AGREED UPON BY THE CONTRACTOR, THE TOWN, AND THE DESIGN ENGINEER AT THE TIME OF THE OCCURRENCE
16. IT SHALL BE THE RESPONSIBILITY OF THE DESIGN ENGINEER TO RESOLVE CONSTRUCTION PROBLEMS WITH THE TOWN DUE TO CHANGED CONDITIONS ENCOUNTERED BY THE CONTRACTOR DURING THE PROGRESS OF ANY PORTION OF THE PROPOSED WORK. IF, IN THE OPINION OF THE TOWN, PROPOSED ALTERATIONS TO THE SIGNED CONSTRUCTION PLANS INVOLVES SIGNIFICANT CHANGES TO THE CHARACTER OF THE WORK, OR TO THE FUTURE CONTIGUOUS PUBLIC OR PRIVATE IMPROVEMENTS, THE DESIGN ENGINEER SHALL BE RESPONSIBLE FOR SUBMITTING REVISED PLANS TO THE TOWN FOR REVIEW AND ACCEPTANCE, PRIOR TO ANY FURTHER CONSTRUCTION RELATED TO THAT PORTION OF THE WORK.



17. DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, THE CONTRACTOR SHALL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS AT AND ADJACENT TO THE JOB INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THE CONTRACTOR SHALL PROVIDE ALL LIGHTS, SIGNS, BARRICADES, FLAGMEN, OR OTHER DEVICES NECESSARY TO PROVIDE FOR PUBLIC SAFETY. THIS REQUIREMENT SHALL APPLY CONTINUOUSLY AND IS NOT LIMITED TO NORMAL WORKING HOURS. THE TOWN OR THE DESIGN ENGINEER EXERCISE NO CONTROLS OVER THE SAFETY OR ADEQUACY OF ANY EQUIPMENT, BUILDING COMPONENTS, SCAFFOLDING, FORMS OR OTHER WORK AIDS USED IN OR ABOUT THE PROJECT, OR IN THE SUPERINTENDING OF THE SAME. THE CONTRACTOR SHALL DEFEND, INDEMNIFY AND HOLD HARMLESS FROM ANY AND ALL LIABILITY, REAL AND ALLEGED, IN CONNECTION WITH THE PERFORMANCE OF WORK ON THIS PROJECT, EXCEPTING FOR LIABILITY ARISING FROM THE SOLE NEGLIGENCE OF THE OWNER, THE DESIGN ENGINEER OR THE TOWN. THE TOWN ENGINEERING STAFF, OR ANY CONTRACTED ENGINEER, ARE NOT RESPONSIBLE FOR SAFETY IN, ON OR ABOUT THE PROJECT SITE, NOR FOR COMPLIANCE BY THE APPROPRIATE PARTY OF ANY REGULATIONS RELATING THERETO.
18. WORK IN PUBLIC STREETS, ONCE BEGUN, SHALL BE PROSECUTED TO COMPLETION WITHOUT DELAY SO AS TO PROVIDE MINIMUM INCONVENIENCE TO ADJACENT PROPERTY OWNERS AND TO THE TRAVELING PUBLIC.
19. REGULAR WORK HOURS ARE SEVEN (7) A.M. UNTIL SEVEN (7) P.M. OR DUSK (WHICHEVER OCCURS FIRST) OF THE SAME DAY, MONDAY THROUGH FRIDAY. THE CONTRACTOR WILL NOT PERMIT OVERTIME WORK OUTSIDE OF REGULAR WORKING HOURS OR THE PERFORMANCE OF WORK ON SATURDAY, SUNDAY OR ANY LEGAL HOLIDAY WITHOUT RECEIVING WRITTEN CONSENT FROM THE TOWN ENGINEER. REQUESTS FOR WEEKEND WORK APPROVAL MUST BE SUBMITTED, IN WRITING TO THE TOWN NO LATER THAN WEDNESDAYS AT 3:30PM FOR SUBSEQUENT WEEKEND AND REQUESTS FOR HOLIDAY WORK APPROVAL MUST BE SUBMITTED, IN WRITING TO THE TOWN NO LATER THAN 7:00AM-2 BUSINESS DAYS PRIOR TO THE HOLIDAY. ALL EXPENSES INCURRED BY THE TOWN SHALL BE REIMBURSED AT A RATE TO BE DETERMINED BY DIRECTOR OF FINANCE.
20. THE CONTRACTOR SHALL TAKE ALL NECESSARY AND PROPER PRECAUTIONS TO PROTECT ADJACENT PROPERTIES FROM ANY AND ALL DAMAGE THAT MAY OCCUR FROM STORM WATER RUNOFF AND/OR DEPOSITION OF DEBRIS RESULTING FROM ANY AND ALL WORK. THE OWNER/CONTRACTOR IS RESPONSIBLE FOR OBTAINING A STORMWATER DISCHARGE PERMIT FOR CONSTRUCTION ACTIVITIES FOR ANY PROJECT DISTURBING OVER ONE ACRE FROM BOTH THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND THE TOWN.

21. EACH TYPE OF CONSTRUCTION SHALL BE COMPLETED BY A CONTRACTOR THAT HAS DEMONSTRATED ACCEPTABLE QUALIFICATIONS TO THE TOWN AND IS A LICENSED CONTRACTOR IN THE TOWN.
22. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL DURING CONSTRUCTION. ALL TRAFFIC CONTROLS SHALL CONFORM TO THE TOWN STANDARDS AND SPECIFICATIONS AND THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, (MUTCD) LATEST EDITIONS. A PLAN SHALL BE SUBMITTED TO THE TOWN FOR REVIEW AND ACCEPTANCE PRIOR TO CONSTRUCTION.
23. ALL BACKFILL SHALL CONFORM TO THE TRENCH DETAIL LOCATED IN THE TOWN STANDARDS & SPECIFICATIONS.
24. THE CONTRACTOR SHALL IMMEDIATELY REMOVE ANY CONSTRUCTION DEBRIS OR MUD TRACKED ONTO EXISTING ROADWAYS.
25. THE CONTRACTOR SHALL REPAIR ANY EXCAVATION OR PAVEMENT FAILURES CAUSED BY HIS CONSTRUCTION.
26. THE CONTRACTOR SHALL RENEW OR REPLACE ANY EXISTING TRAFFIC STRIPING AND/OR PAVEMENT MARKINGS, WHICH HAVE BEEN EITHER REMOVED OR THE EFFECTIVENESS OF WHICH HAS BEEN REDUCED DURING HIS OPERATION. RENEWAL OF PAVEMENT STRIPING AND MARKING SHALL BE DONE IN CONFORMANCE WITH THE TOWN STANDARD SPECIFICATIONS.
27. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO TAKE EVERY MEASURE NECESSARY TO COMPLY WITH ANY STATE, COUNTY OR TOWN DUST CONTROL ORDINANCE.
28. CONSTRUCTION VEHICLES SHALL USE TRUCK ROUTES DESIGNATED BY THE TOWN. OVERSIZE AND/OR OVERWEIGHT VEHICLES REQUIRE AN OVERWIEGHT VEHICLE PERMIT FROM THE TOWN PRIOR TO TRAVELLING ON TOWN STREETS.
29. THE OWNER/DEVELOPER WILL BE HELD RESPONSIBLE FOR THE PROPER FUNCTIONING OF THE IMPROVEMENTS FOR A MINIMUM OF TWO (2) YEARS FROM THE DATE OF INITIAL ACCEPTANCE OF THE IMPROVEMENTS BY THE TOWN. ANY FAILURE DURING THIS PERIOD OF GUARANTEE SHALL BE REMEDIED BY THE OWNER/CONTRACTOR TO THE SATISFACTION OF THE TOWN AT NO EXPENSE TO THE TOWN.
30. THE SOILS ENGINEER SHALL PERFORM SUFFICIENT INSPECTIONS DURING GRADING AND CONSTRUCTION SO THAT AN OPINION CAN BE RENDERED



AND VERIFIED IN WRITING AS TO COMPLIANCE WITH THE PLANS AND CODES WITHIN THE SOILS ENGINEER'S PURVIEW.

GENERAL NOTES – GRADING

1. ALL CONSTRUCTION ACTIVITIES THAT DISTURBS ONE OR MORE ACRES OF LAND, AS WELL AS ACTIVITIES THAT DISTURB LESS THAN ONE ACRE OF LAND, BUT IS PART OF A LARGER COMMON PLAN OF DEVELOPMENT, MUST COMPLY WITH BOTH LOCAL AND STATE REGULATIONS REGARDING STORMWATER DRAINAGE ON CONSTRUCTION SITES. OWNERS OR CONTRACTORS MUST OBTAIN A COLORADO STORMWATER DISCHARGE PERMIT FOR CONSTRUCTION ACTIVITIES FROM THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT (CDPHE) AND A STORMWATER QUALITY PERMIT FROM THE TOWN OF FIRESTONE. OWNERS AND OPERATORS SHALL:
 - A. MAINTAIN A COPY OF THE STORM WATER MANAGEMENT PLAN (SWMP) ONSITE AT ALL TIMES, THOUGH A DIGITAL COPY WILL SUFFICE. THE SWMP MUST BE MAINTAINED AND MADE AVAILABLE TO TOWN INSPECTORS UPON REQUEST.
 - B. INSTALL AND MAINTAIN EROSION, SEDIMENT, AND MATERIALS MANAGEMENT CONTROL BMPS AS SPECIFIED IN THE SWMP.
 - C. INSPECT ALL BEST MANAGEMENT PRACTICES (BMPS) AT LEAST EVERY SEVEN (7) DAYS OR EVERY FOURTEEN (14) DAYS AND WITHIN TWENTY FOUR (24) HOURS AFTER ANY PRECIPITATION OR SNOWMELT EVENT THAT CAUSES SURFACE RUNOFF.
 - D. MAINTAIN INSPECTION AND MAINTENANCE RECORDS OF BMPS ONSITE WITH THE SWMP. COPIES OF THESE REPORTS SHALL BE PROVIDED TO THE TOWN ENGINEERING STAFF.
 - E. BASED ON INSPECTIONS PERFORMED BY THE PERMIT HOLDER OR BY TOWN PERSONNEL, MODIFICATIONS TO THE SWMP WILL BE NECESSARY IF AT ANY TIME THE SPECIFIED BMPS DO NOT MEET THE OBJECTIVES OF THE PERMIT. ALL MODIFICATIONS SHALL BE COMPLETED AS SOON AS PRACTICABLE AFTER THE REFERENCED INSPECTION, AND SHALL BE RECORDED ON THE OWNER'S COPY OF THE SWMP.
 - F. THE OPERATOR SHALL AMEND THE SWMP WHENEVER THERE IS A MINOR CHANGE TO ADDRESS A SPECIFIED CONTROL MEASURE THAT DOES NOT MEET THE REQUIREMENTS OF THE STORMWATER QUALITY PERMIT. SIGNIFICANT CHANGES IN DESIGN, CONSTRUCTION, OPERATION, OR MAINTENANCE, WHICH HAS A SIGNIFICANT EFFECT ON THE POTENTIAL FOR DISCHARGE OF POLLUTANTS TO THE RECEIVING WATERS, OR IF THE SWMP PROVES TO BE INEFFECTIVE IN ACHIEVING THE GENERAL

OBJECTIVES OF CONTROLLING POLLUTANTS IN STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES, A REVISED SWMP SHALL BE SUBMITTED TO THE TOWN ENGINEER.

- G. INSTALLATION AND MAINTENANCE OF BMPS SHALL BE SUPERVISED BY PERSONNEL CERTIFIED IN EROSION AND SEDIMENT CONTROL.
2. ALL SITE GRADING (EXCAVATION, EMBANKMENT, AND COMPACTION) SHALL CONFORM TO THE RECOMMENDATIONS OF THE LATEST SOILS INVESTIGATION FOR THIS PROPERTY AND SHALL FURTHER BE IN CONFORMANCE WITH THE TOWN OF FIRESTONE "DESIGN STANDARDS AND CONSTRUCTION SPECIFICATIONS OF PUBLIC IMPROVEMENTS", LATEST EDITION.
 3. ALL GRADING AND FILLING OPERATIONS SHALL BE OBSERVED, INSPECTED AND TESTED BY A LICENSED SOILS ENGINEER. ALL TEST RESULTS SHALL BE SUBMITTED TO THE TOWN ENGINEERING STAFF.
 4. NATURAL VEGETATION SHALL BE RETAINED AND PROTECTED WHEREVER POSSIBLE. EXPOSURE OF SOIL TO EROSION BY REMOVAL OR DISTURBANCE OF VEGETATION SHALL BE LIMITED TO THE AREA REQUIRED FOR IMMEDIATE CONSTRUCTION OPERATION AND FOR THE SHORTEST PRACTICAL PERIOD OF TIME. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO AVOID ANY DAMAGE TO EXISTING FOLIAGE THAT LIES IN THE PROJECT AREA UNLESS DESIGNATED FOR REMOVAL AND SHALL BE LIABLE FOR SUCH DAMAGE AT HIS/HER EXPENSE.
 5. TOPSOIL SHALL BE STOCKPILED TO THE EXTENT PRACTICABLE ON THE SITE FOR USE ON AREAS TO BE RE-VEGETATED. ANY AND ALL STOCKPILES SHALL BE LOCATED AND PROTECTED FROM EROSION ELEMENTS.
 6. TEMPORARY VEGETATION SHALL BE INSTALLED ON ALL DISTURBED AREAS WHERE PERMANENT SURFACE IMPROVEMENTS ARE NOT SCHEDULED FOR IMMEDIATE INSTALLATION. SEEDING WILL BE DONE ACROSS THE SLOPE FOLLOWING THE CONTOURS. VEGETATION SHALL CONFORM TO THE TOWN STANDARDS AND SPECIFICATIONS. PROJECT SCHEDULING SHOULD TAKE ADVANTAGE OF SPRING OR FALL PLANTING SEASONS FOR NATURAL GERMINATION. SEEDED AREAS SHALL BE IRRIGATED IN ACCORDANCE WITH THE TOWN STANDARDS AND SPECIFICATIONS.
 7. AT ALL TIMES, A WATER TRUCK SHALL BE ON-SITE AND THE PROPERTY SHALL BE MAINTAINED AND/OR WATERED TO PREVENT

- WIND-CAUSED EROSION. EARTHWORK OPERATIONS SHALL BE DISCONTINUED WHEN FUGITIVE DUST SIGNIFICANTLY IMPACTS ADJACENT PROPERTY. IF EARTHWORK IS COMPLETE OR DISCONTINUED AND DUST FROM THE SITE CONTINUES TO CREATE PROBLEMS, THE OWNER/DEVELOPER SHALL IMMEDIATELY INSTITUTE MITIGATIVE MEASURES AND SHALL CORRECT DAMAGE TO ADJACENT PROPERTY.
8. FILL SLOPES SHALL BE COMPACTED BY MEANS OF SHEEPSFOOT COMPACTOR OR OTHER SUITABLE EQUIPMENT. COMPACTING SHALL CONTINUE UNTIL SLOPES ARE STABLE AND THERE IS NOT AN APPRECIABLE AMOUNT OF LOOSE SOIL ON THE SLOPES.
 9. TEMPORARY CUT/FILL SLOPES SHALL ABIDE BY THE SOILS REPORT. PERMANENT SLOPES SHALL BE AS SHOWN ON PLANS.
 10. DEPTH OF MOISTURE-DENSITY CONTROL SHALL BE FULL DEPTH ON ALL EMBANKMENT AND SIX (6) INCHES ON THE BASE OF CUTS AND FILLS.
 11. OUTLET SIDES OF ALL STORM PIPES SHALL BE GRADED TO DRAIN AND SHALL HAVE SUFFICIENT EROSION PROTECTION.
 12. THE PERMITTEE OR HIS AGENT SHALL NOTIFY THE SITE GEOTECHNICAL ENGINEER WHEN THE GRADING OPERATION IS READY FOR EACH OF THE FOLLOWING INSPECTIONS:
 - A. INITIAL INSPECTION WHEN THE PERMITTEE IS READY TO BEGIN WORK, BUT NOT LESS THAN TWO (2) DAYS BEFORE ANY GRADING OR GRUBBING IS STARTED.
 - B. AFTER THE NATURAL GROUND OR BEDROCK IS EXPOSED AND PREPARED TO RECEIVE FILL, BUT BEFORE FILL IS PLACED.
 - C. EXCAVATION INSPECTION AFTER THE EXCAVATION IS STARTED BUT BEFORE THE VERTICAL DEPTH OF THE EXCAVATION EXCEEDS TEN (10) FEET.
 - D. FILL INSPECTION AFTER THE FILL PLACEMENT IS STARTED, BUT BEFORE THE FILL EXCEEDS TEN (10) FEET.
 13. TEMPORARY CUT/FILL SLOPES SHALL NOT BE STEEPER THAN 2:1 (2H:1V). PERMANENT SLOPES SHALL NOT BE STEEPER THAN 4:1 (4H:1V) IN AREAS TO BE SEEDED OR SODDED.

GENERAL NOTES – ROADWAY

1. ALL STATIONING IS BASED ON CENTERLINE OF ROADWAYS UNLESS OTHERWISE NOTED.
2. THE CONTRACTOR SHALL PREPARE THE SUBGRADE BY SCARIFYING THE UPPER ONE (1) FOOT OF THE SUBGRADE IN CUT AREAS OR AREAS WITH LITTLE OR NO FILL, UNLESS SPECIFIED IN THE SOILS REPORT. THE WORK SHALL CONFORM TO THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS.
3. PAVEMENT SHALL NOT BE CONSTRUCTED UNTIL ALL UNDERGROUND UTILITIES HAVE BEEN INSTALLED, TESTED AND ACCEPTED BY THE TOWN OF FIRESTONE ENGINEERING STAFF.
4. IT SHALL BE THE RESPONSIBILITY OF THE OWNER/CONTRACTOR TO SUPERVISE AND CERTIFY THAT PROPER COMPACTION HAS BEEN OBTAINED BY SUBCONTRACTORS AND AGENCIES CONCERNING UTILITY LINE BACKFILL INCLUDING, BUT NOT LIMITED TO, SEWER, WATER, ELECTRICAL, GAS AND LANDSCAPE IRRIGATION LINES AND ACCEPTED BY THE TOWN ENGINEERING STAFF AND THE SOILS ENGINEER.
5. STREET PAVING SHALL NOT START UNTIL:
 - a. A SOILS REPORT AND PAVEMENT DESIGN IS ACCEPTED BY THE TOWN ENGINEERING STAFF.
 - b. ALL STREETS ARE COMPACTED IN ACCORDANCE WITH THE SOILS REPORT AND THE TOWN SPECIFICATIONS.
 - c. ALL COMPACTION TEST REPORTS HAVE BEEN SUBMITTED TO THE TOWN ENGINEERING STAFF PRIOR TO PROOF ROLLS.
 - d. PROOF ROLLS ARE PERFORMED USING A LOADED SINGLE AXLE 2000 GALLON WATER TRUCK AND MONITORED BY THE TOWN ENGINEERING STAFF.
6. THE OWNER/CONTRACTOR SHALL BE RESPONSIBLE FOR ADJUSTING ALL UTILITY MANHOLE COVERS AND ACCESS LIDS TO GRADE.
7. ALL CONCRETE SHALL BE A MINIMUM OF CLASS B, IN CONFORMANCE WITH CDOT STANDARDS.
8. ALL CONCRETE EDGES MUST BE ROUNDED TO A FOURTH (1/4) INCH RADIUS, EXCEPT WHERE SHOWN OTHERWISE ON DRAWINGS.

9. ONE HALF (1/2) INCH EXPANSION JOINTS SHALL BE INSTALLED AT ALL CURB RETURNS, CURB CUTS AND EXISTING STRUCTURES. CONTROL JOINTS SHALL BE INSTALLED PER THE TOWN STANDARDS AND SPECIFICATIONS.
10. BEFORE PLACING OF ASPHALT THE SUBGRADE SHALL RECEIVE A GROUND STERILANT APPLIED AT A RATE IN ACCORDANCE TO MANUFACTURERS RECOMMENDATIONS.
11. THE GRADATION OF THE MINERAL AGGREGATE WILL BE GRADING SX (1/2" NOMINAL) FOR ALL TOP LIFTS AND OVERLAYS.
12. TACK COAT SHALL BE USED PRIOR TO OVERLAY, (CSS-1H), 50:50 DILUTION, 0.10 GAL/SY. ALL EDGES ABUTTING NEW PAVEMENT SHALL BE TACKED.
13. WHEN IT IS REQUIRED TO MATCH EXISTING PAVEMENT, EXISTING PAVEMENT SHALL BE SAW CUT IN A MANNER TO AFFECT A SMOOTH, VERTICAL STRAIGHT CUT EDGE. T PATCH MILLING MUST BE DONE PER STANDARD DETAILS.
14. ALL SAWCUT EDGES OF EXISTING PAVEMENT SHALL BE CLEAN AND COATED WITH TACK COAT PRIOR TO PLACING NEW PAVEMENT ADJACENT TO THE EXISTING PAVEMENT.
15. ALL ASPHALT SHALL BE ONE FOURTH (1/4) INCH ABOVE CONCRETE EDGES, MANHOLE COVERS AND ACCESS LIDS.
16. SIGNAGE AND STRIPING SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, THE COLORADO DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, THE COLORADO DEPARTMENT OF TRANSPORTATION M&S STANDARDS, AND THE TOWN STANDARDS.
17. THE PURCHASE AND INSTALLATION OF STREET NAME SIGNS SHALL BE THE RESPONSIBILITY OF THE OWNER/CONTRACTOR. THE OWNER/CONTRACTOR SHALL SECURE THE APPROVAL OF THE TOWN ENGINEERING STAFF FOR TYPE AND LOCATION OF THE STREET NAME SIGNS PRIOR TO INSTALLATION.
18. ALL NEW ROADWAY SECTIONS SHALL HAVE SUBGRADE PREPARATION AND INITIAL ASPHALT PAVEMENT PLACED WITH A 1% CROWN. FINAL OVERLAY IS TO BE PLACED WITH A 2% CROWN. SEE DETAIL ST7 IN THE "STANDARD DETAILS-STREET" FOR MORE INFORMATION.



19. DETERMINATION OF CROWN FOR CUL DE SAC PAVING SHALL BE EVALUATED ON A CASE BY CASE BASIS.

GENERAL NOTES – SANITARY SEWER

1. TOWN OF FIRESTONE SEWER SERVICE IS UNDER THE JURISDICTION OF THE ST. VRAIN SANITATION DISTRICT (SVSD). ALL SANITARY SEWER SHALL BE CONSTRUCTED IN ACCORDANCE WITH SVSD STANDARDS AND CRITERIA IN ADDITION TO THE TOWN STANDARDS AND SPECIFICATIONS.
2. MINIMUM VERTICAL SEPARATIONS BETWEEN ALL UTILITY PIPES SHALL BE EIGHTEEN (18) INCHES. IF VERTICAL SEPARATIONS ARE LESS THAN EIGHTEEN (18) INCHES, THE UTILITY PIPES SHALL BE REINFORCED AND PROTECTED AS REQUIRED BY CURRENT TOWN STANDARD SPECIFICATIONS.
3. WATER AND SANITARY SEWER LINES SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF TEN (10) FEET. WHEN A TEN (10) FOOT SEPARATION IS NOT PROVIDED OR WHEN SEWER LINES CROSS WATER LINES WITH LESS THAN ONE AND ONE-HALF (1½) FEET OF VERTICAL SEPARATION, SEWER LINE JOINTS SHALL BE CONCRETE ENCASED. FOR PERPENDICULAR CROSSINGS, ENCASED JOINTS SHALL EXTEND TEN (10) FEET, PERPENDICULAR TO THE WATER LINE IN BOTH DIRECTIONS.
4. ALL SANITARY SEWER SERVICES AND WATER SERVICES ARE TO BE TEN (10) FEET APART.
5. SERVICE LATERALS SHALL EXTEND FIVE (5) FEET BEYOND RIGHTS OF WAY OR UTILITY EASEMENTS, WHICHEVER IS GREATER. THE ENDS SHALL BE MARKED BY A GREEN PAINTED WOOD POST UNTIL CURB AND GUTTER IS IN PLACE. WHEN CURB AND GUTTER IS IN PLACE THE LATERALS SHALL BE MARKED ON THE CONCRETE CURB FACE WITH AN "S" or "X".
6. BEDDING MATERIAL SHALL CONFORM TO SVSD AND TOWN STANDARDS AND SPECIFICATIONS.
7. WARNING TAPE SHALL BE INSTALLED 12" MINIMUM AND 18" MAXIMUM ABOVE SEWER PIPE.
8. PRECAST CONCRETE MANHOLE SECTIONS SHALL BE IN ACCORDANCE WITH ASTM C-478. CAST IRON RING AND COVER SHALL CONFORM TO ASTM A-48.
9. MANHOLES SHALL BE A MINIMUM FOUR (4) FOOT DIAMETER AND CONSTRUCTED PER THE STANDARDS AND SPECIFICATIONS.

10. MANHOLE RIMS SHALL BE SET AT AN ELEVATION RELATIVE TO THE PAVEMENT, IN ACCORDANCE WITH THE TOWN STANDARDS. WHETHER THE MANHOLE IS AT PAVED OR UNPAVED GRADE, A MINIMUM OF ONE (1) AND A MAXIMUM OF FOUR (4) CONCRETE RINGS SHALL BE USED TO ADJUST THE RIM ELEVATION TO FINAL GRADE. THE MAXIMUM ACCEPTABLE VERTICAL ADJUSTMENT UTILIZING CONCRETE RINGS IS EIGHTEEN (18) INCHES.

GENERAL NOTES – STORM SEWER

1. EXCEPT WHERE NOTED, ALL STORM SEWER PIPE SHALL BE REINFORCED CONCRETE, CLASS III AND SHALL CONFORM TO REQUIREMENTS OF ASTM C76. ALL RCP SHALL HAVE RUBBER GASKETED JOINTS AND SHALL CONFORM TO REQUIREMENTS OF ASTM C443, AND SHALL PROVIDE WATERTIGHT PERFORMANCE CHARACTERISTICS.
2. TONGUE AND GROOVE JOINTS SHALL NOT BE ALLOWED.
3. THE MINIMUM COVERAGE FOR ALL STORM DRAINAGE PIPES SHALL BE 1.5 FEET FOR CLASS III PIPE AND 1 FOOT FOR CLASS IV PIPE.
4. BEDDING MATERIAL SHALL CONFORM TO TOWN OF FIRESTONE STANDARDS AND SPECIFICATIONS.
5. ALL MANHOLES SHALL BE CONCRETE AND CONFORM TO CDOT STANDARD M-604-20.
6. THE MINIMUM MANHOLE DIAMETER SHALL BE AS SPECIFIED BELOW:

<u>PIPE DIAMETER</u>	<u>MANHOLE SIZE</u>
15" TO 18"	4' DIAMETER
21" TO 42"	5' DIAMETER
48" TO 54"	6' DIAMETER
60" AND LARGER	BOX BASE MANHOLE

7. ALL STREET INLETS SHALL BE CURB OPENING TYPE R CONFORMING TO CDOT STANDARD M-604-12, EXCEPT WHERE OTHERWISE NOTED.
8. ALL INLET ACCESS COVERS SHALL HAVE THE WORDS "NO DUMPING – DRAINS TO RIVERS" AND "STORM SEWER" CAST INTO THE COVER PER TOWN STANDARD DETAIL.
9. ALL END SECTIONS SHALL CONFORM TO CDOT STANDARD M-603-10.
10. WHERE RIPRAP OR GROUTED BOULDERS ARE CALLED FOR ON THE PLANS FOR EROSION CONTROL, IT SHALL CONFORM TO THE URBAN STORM DRAINAGE CRITERIA MANUAL SPECIFICATIONS (LATEST REVISION).

GENERAL NOTES – WATER

1. AT ALL POINTS OF CONNECTION OF NEW WATER MAINS TO EXISTING MAINS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR EXCAVATING AND VERIFYING LOCATION OF THE EXISTING LINES PRIOR TO ANY CONSTRUCTION.
2. EXCEPT IN CASE OF AN EMERGENCY, VALVES ON THE TOWN OF FIRESTONE WATER SYSTEM SHALL BE OPERATED BY OR UNDER THE DIRECTION OF THE APPROPRIATE TOWN PERSONNEL. THE CONTRACTOR SHALL GIVE THE TOWN ENGINEERING STAFF 48 HOURS NOTICE TO ARRANGE FOR OPERATING VALVES. BOTH THE CONTRACTOR AND THE APPROPRIATE TOWN PERSONNEL SHALL BE PRESENT WHEN THE VALVES ARE OPERATED.
3. WATER AND SANITARY SEWER LINES SHALL HAVE A MINIMUM HORIZONTAL SEPARATION OF TEN (10) FEET. WHEN A TEN (10) FOOT SEPARATION IS NOT PROVIDED OR WHEN SEWER LINES CROSS WATER LINES WITH LESS THAN ONE AND ONE-HALF (1½) FEET OF VERTICAL SEPARATION, SEWER LINE JOINTS SHALL BE CONCRETE ENCASED. FOR PERPENDICULAR CROSSINGS, ENCASED JOINTS SHALL EXTEND TEN (10) FEET, PERPENDICULAR TO THE WATER LINE IN BOTH DIRECTIONS.
4. ALL WATER LINES SHALL HAVE A MINIMUM OF FOUR AND ONE-HALF (4½) FEET OF COVER AND BE LOCATED A MINIMUM OF TEN (10) FEET FROM THE SANITARY SEWER AND THREE (3) FEET FROM THE EDGE OF CONCRETE CURB AND GUTTER PAN.
5. CHANGES IN DIRECTION OF WATERLINE PIPE SHALL REQUIRE BENDS IN ALL INSTANCES. AXIAL DEFLECTION AT THE JOINTS SHALL NOT BE ALLOWED.
6. WHEN IT IS NECESSARY TO DEPRESS WATER LINES AT UTILITY CROSSINGS, A MINIMUM CLEARANCE OF ONE AND ONE-HALF (1-1/2) FEET SHALL BE MAINTAINED BETWEEN OUTSIDES OF PIPE.
7. DISTANCES FOR WATER LINES ARE THE HORIZONTAL DISTANCE BETWEEN THE CENTERS OF THE FITTINGS. THEREFORE, DISTANCES SHOWN ON THE PLANS ARE APPROXIMATE AND COULD VARY DUE TO VERTICAL ALIGNMENT AND FITTING DIMENSIONS.
8. ALL WATER LINE VALVES SHALL BE SET ADJACENT TO THE TEE, EXCEPT FOR POINTS THAT FALL IN THE FLOW LINE OF A CONCRETE CROSS PAN. IN WHICH CASE, THE VALVE SHALL BE LOCATED SO THAT SURFACE DRAINAGE DOES NOT INFILTRATE THE VALVE BOX. VALVE BOXES SHALL BE SET AT AN ELEVATION IN ACCORDANCE WITH TOWN PAVING REQUIREMENTS.

9. ALL WATER MAINS SHALL BE POLYVINYL CHLORIDE (PVC) PRESSURE PIPE UNLESS SPECIFIED OTHERWISE. NOMINAL PVC PIPE SIZES 8-INCH THROUGH 12-INCH SHALL CONFORM TO ALL REQUIREMENTS OF AWWA STANDARD C-900, PRESSURE CLASS 150 (DR18). NOMINAL PVC PIPE SIZES 16-INCH THROUGH 24-INCH SHALL CONFORM TO ALL REQUIREMENTS OF AWWA STANDARD C-905, PRESSURE CLASS 165 (DR25). ALL PVC PIPES SHALL HAVE OUTSIDE DIAMETERS EQUIVALENT TO CAST IRON PIPE.
10. FIRE HYDRANT ASSEMBLY INCLUDES THE FIRE HYDRANT, SIX (6) INCH VALVE, AND SIX (6) INCH PIPE. INSTALLATION SHALL BE IN ACCORDANCE WITH THE TOWN STANDARDS AND SPECIFICATIONS.
11. ALL FITTINGS SHALL BE MADE FROM DUCTILE IRON, FURNISHED WITH MECHANICAL JOINT ENDS OR INTEGRAL RESTRAINED JOINTS, AND SHALL HAVE A PRESSURE RATING OF 350 PSI.
12. POLYETHYLENE WRAPPING SHALL BE INSTALLED AROUND ALL DUCTILE IRON PIPES, FITTINGS, VALVES, FIRE HYDRANT BARRELS AND ROD AND CLAMPS. THE POLYETHYLENE SHALL HAVE A MINIMUM THICKNESS OF EIGHT (8) MILS, IN ACCORDANCE WITH AWWA STANDARD C-105.
13. ALL WATER LINE PIPE SHALL BE PROVIDED WITH A MINIMUM GAGE SIZE OF 12 SINGLE STRAND INSULATED COPPER WIRE. SPLICES IN TRACER WIRE SHALL BE CAPPED IN WATER PROOF GEL CAP TYPE CONNECTORS SUITED FOR DIRECT BURY APPLICATION (3M TYPE DBY-6 LOW VOLTAGE OR EQUAL). WIRE SHALL BE ATTACHED TO TOP OF WATER LINE WITH 2-INCH WIDE PVC TAPE @ 5-FT INTERVALS ALONG PIPE. TRACER WIRE SHALL EXTEND TO THE SURFACE AND BE COILED IN A LOCATE BOX AT THE BACKSIDE OF EITHER EACH FIRE HYDRANT OR VALVE. UNDER THE SUPERVISION OF TOWN ENGINEERING STAFF, TEST SHALL BE MADE BY THE CONTRACTOR @ THE COMPLETION OF CONSTRUCTION TO INSURE THAT THE TRACER WIRES CARRY A CONTINUOUS CURRENT BETWEEN ALL ACCESS POINTS.
14. WARNING TAPE SHALL BE INSTALLED 12" MINIMUM AND 18" MAXIMUM ABOVE WATER PIPE.
15. BEDDING MATERIAL SHALL CONFORM TO TOWN STANDARDS AND SPECIFICATIONS.
16. VALVES SHALL OPEN COUNTER CLOCKWISE. VALVES 12-INCH AND SMALLER SHALL BE RESILIENT SEAT GATE VALVES. LARGER VALVES SHALL BE BUTTERFLY VALVES.
17. VALVE BOXES SHALL BE RAISED TO ONE-FOURTH (1/4) INCH BELOW GRADE AFTER COMPLETION OF SURFACE PAVING OR FINAL GRADING.

- VALVE BOXES IN NON-PAVED AREAS SHALL HAVE A CONCRETE COLLAR AROUND THE VALVE LID IN ACCORDANCE WITH THE DETAIL.
18. ALL SERVICE LINE TAPS SHALL HAVE DOUBLE STRAP BRASS TAPPING SADDLES. (ROMAC 202B OR APPROVED EQUAL).
 19. ALL RESIDENTIAL WATER TAPS SHALL BE FIVE-EIGHTHS (5/8) INCH OR AS REQUIRED BY THE CURRENT BUILDING CODE.
 20. ALL WATER SERVICE LATERALS SHALL EXTEND FIVE (5) FEET BEYOND RIGHT OF WAY OR UTILITY EASEMENTS, WHICHEVER IS GREATER. THE ENDS SHALL BE MARKED BY A BLUE PAINTED WOOD POST UNTIL CURB AND GUTTER IS IN PLACE. WHEN CURB AND GUTTER IS IN PLACE THE LATERALS SHALL BE MARKED ON THE CONCRETE CURB FACE WITH A "V" or "W".
 21. CONCRETE THRUST BLOCKS AND/OR "MEGA-LUG" MECHANICAL RESTRAINTS ARE REQUIRED AT ALL MECHANICAL FITTINGS. THRUST BLOCKS MAY NOT BE REQUIRED IF PIPE RESTRAINT IS PROVIDED IN ACCORDANCE WITH RESTRAINED PIPE DETAIL.
 22. NO WORK SHALL BE BACKFILLED (INCLUDING BEDDING MATERIAL ABOVE THE SPRING LINE OF THE PIPE) UNTIL THE CONSTRUCTION HAS BEEN INSPECTED AND APPROVED FOR BACKFILLING BY TOWN ENGINEERING STAFF.
 23. ONLY ONE CONNECTION TO THE EXISTING WATER DISTRIBUTION SYSTEM SHALL BE MADE UNTIL ALL HYDROSTATIC TESTING, CHLORINATION AND FLUSHING HAS BEEN COMPLETED.
 24. DISINFECTION AND HYDROSTATIC TESTING SHALL BE DONE IN THE PRESENCE OF A TOWN ENGINEERING STAFF. CONTACT THE TOWN ENGINEERING DIVISION FORTY-EIGHT (48) HOURS PRIOR TO DISINFECTING AND/OR TESTING.
 25. DISINFECTION AND FLUSHING SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE COLORADO DEPARTMENT OF HEALTH AND THE PROCEDURE SET FORTH IN AWWA C651, "STANDARD FOR DISINFECTING WATER MAINS". THE CHLORINATION OF THE WATER LINE SHALL BE PERFORMED PRIOR TO THE HYDROSTATIC TESTING. ALL VALVES, FIRE HYDRANTS AND OTHER APPURTANCES SHALL BE OPERATED WHILE PIPELINE IS FILLED WITH THE CHLORINATING AGENT TO INSURE THAT HIGH CHLORINE CONTACT IS MADE WITH ALL INTERNAL SURFACES.
 26. TWO TWENTY-FOUR (24) HOUR BACTERIOLOGICAL TESTS, FROM MULTIPLE POINTS TO BE DETERMINED BY THE TOWN ENGINEER, FOR TOTAL COLI-FORM BACTERIA SHALL BE PERFORMED BY THE TOWN A

- MINIMUM OF 24 HOURS APART. IF EITHER OF THESE TESTS FAIL, THE LINE SHALL BE RE-CHLORINATED, RE-FLUSHED AND THEN RETESTED. THE DEVELOPER AND/OR CONTRACTOR SHALL BE RESPONSIBLE FOR REIMBURSING THE TOWN FOR ALL COSTS ASSOCIATED WITH THE WATER QUALITY TESTING.
27. ALL WATER LINES SHALL BE HYDROSTATIC TESTED. PRESSURE AND LEAKAGE TESTS SHALL BE CONDUCTED ACCORDING TO THE APPLICABLE SECTIONS OF AWWA C600/605 TO A MINIMUM PRESSURE OF ONE HUNDRED AND FIFTY (150) POUNDS PER SQUARE (PSI) INCH AT THE LOW POINT OF THE SECTION BEING TESTED FOR THE DURATION OF TWO (2) HOURS. THE MAXIMUM LENGTH OF LINE TO BE TESTED SHALL BE ONE THOUSAND (1,000) FEET. ALL JOINTS IN CONNECTIONS ARE TO BE WATERTIGHT WITHIN TOLERANCES ALLOWED BY THE SPECIFICATIONS IN AWWA C600/605. ANY LEAKAGE THAT IS DISCOVERED BY OBSERVATION OR TESTS SHALL BE LOCATED AND MADE WATERTIGHT BY THE CONTRACTOR. PRESSURE AND LEAKAGE TESTS SHALL NOT BE CONDUCTED UNTIL THE LINE HAS PASSED ALL REQUIRED DISINFECTION TESTS.
28. INITIAL ACCEPTANCE OF THE NEW WATER LINES ARE CONTINGENT UPON RECEIVING COPIES OF:
- A. WATER TRENCH COMPACTION TEST RESULTS
 - B. HYDRO STATIC TESTING OF 100% OF THE SYSTEM
 - C. HEALTH DEPARTMENT TESTS. (CHLORINE AND/OR CLEAR WATER AS REQUIRED)
29. ALL METER PITS AND CURB STOPS SHALL BE PROTECTED AT THE TIME OF INSTALLATION WITH A MINIMUM OF THREE (3) T-POSTS AND ORANGE SAFETY FENCE. THE T-POST AND SAFETY FENCE SHALL REMAIN IN PLACE AND IN GOOD CONDITION UNTIL THE LANDSCAPING IS INSTALLED.
30. ALL WATER VAULTS SHALL BE WATER TIGHT. CONTRACTOR SHALL SEAL VAULTS TO ENSURE SURFACE WATER DOES NOT INFILTRATE INTO THE VAULTS. VAULT LIDS SHALL BE PLACED TO ENSURE THAT SURFACE WATER DOES NOT FLOW INTO THE VAULTS.

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 5.i

Consent Agenda

Meeting Date: December 8, 2021

Initiated By: Jessica Clanton

Dept: Finance

AGENDA TITLE

Resolution 21-206: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, ADOPTING A FIRESTONE POLICE DEPARTMENT RECORDS FEE SCHEDULE

SUMMARY

The updated Police Records Fee schedule is for records requests received from the public. The basis for the updated fees is based on staff time and cost of materials.

- Police Report increased from \$0.25 per page to \$5.00/Report. Free to Victims indexed as such in the report. The survey was based on staff time, computer equipment costs, and required redactions.
- Evidence Audio/Video Records increased to \$20 per CD instead of \$15. Based on staff time and increase in cost of materials.
- Research/Administrative Fee will increase from 1 hour free, \$33.50 hourly after, to \$30 hourly with a ½ hour minimum required. This increase will cover staff time.
- New fees were created because of the new demand of public requests for Body Worn Camera Video. The fees will be as follows: \$40 hourly, 1 hour minimum, in addition to the cost of the drive/CD. A \$20 rush fee for requests that require a quicker turn around-time. Since March, the town has received 16 requests from the public for BWC totaling 26 hours total of review-time. The \$40 hourly covers staff time for all involved in processing those requests and redactions as required.

HISTORY AND PREVIOUS BOARD ACTION

RECOMMENDATION

Staff recommends approval of Resolution 21-206

ALTERNATIVES

ATTACHMENTS

1. 21-206 PD Records Fees - R111921

FINANCIAL CONSIDERATIONS

RESOLUTION NO. 21-206

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, ADOPTING A FIRESTONE POLICE DEPARTMENT RECORDS FEE SCHEDULE

WHEREAS, C.R.S. § 24-72-306 authorizes Firestone to assess reasonable fees for the actual costs it incurs in searching for, retrieving, and redacting criminal justice records for public inspection; and

WHEREAS, C.R.S. § 24-72-306 also authorizes Firestone to charge a fee not to exceed twenty-five cents per standard page for a copy of a criminal justice record or a fee not to exceed the actual cost of providing a copy, printout or photograph of a criminal justice record in a format other than a standard page; and

WHEREAS, C.R.S. § 24-72-306 requires that any such fees be established by the Board of Trustees; and

WHEREAS, C.R.S. § 24-72-705 authorizes the imposition of a fee for the filing of a petition to seal criminal conviction records in the Firestone Municipal Court; and

WHEREAS, the Town's Finance Department, Records Division of the Police Department, and Municipal Court Administrator have examined the administrative costs of making criminal justice records available for public inspection and the processing of petitions filed in municipal court to seal certain of its conviction records; and

WHEREAS the Town's Finance Department, Records Division of the Police Department, and Municipal Court Administrator have determined that the proposed fees are reasonably related to the Town's costs and, thus, necessary to defray the actual costs incurred by the Town in the processing of requests to the Records Division of the Firestone Police Department for public inspection of criminal justice records and the processing of petitions to seal criminal conviction records; and

WHEREAS, C.R.S. § 16-22-108 authorizes the Town's Police Department to establish a registration fee to be paid by persons registering and re-registering annually or quarterly with the Police Department pursuant to the Colorado Sex Offender Registration Act; and

WHEREAS, the Town's Police Department have examined the administrative costs of implementing and administering the Colorado Sex Offender Registration Act, and has determined that the proposed fees are reasonably related to the Police Department's costs and, thus, necessary to defray the actual costs incurred by the Police Department in implementing and administering the Colorado Sex Offender Registration Act.

WHEREAS, the Finance Department and Police Department recommends that the Board of Trustees adopt the fees set forth in this resolution.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

The Board of Trustees of the Town of Firestone hereby adopts the Firestone Police Department Records Fee Schedule in substantially the same form as the copy attached hereto and made a part of this resolution.

INTRODUCED, READ AND ADOPTED this __ day of _____, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

Jessica Koenig, CMC, Town Clerk

APPROVED AS TO FORM:

William P. Hayashi, Town Attorney



Schedule of Fees

All criminal justice records are released in accordance with the Colorado Criminal Justice Records Act C.R.S. 24-72-301 et seq.

All minimum initial fees are to be paid as a deposit before requested service is started. Fees include the research and preparation of the requested record(s) for release.

ITEM	FEE
Vin Checks	\$15.00 for non-residents (<i>free for residents</i>)
Photo Copies/Reports	\$5.00 per report (<i>no fee for crime victims</i>)
Certified Copies	\$1.25 per Certified Page
Evidence Photos	\$15.00 per CD
Evidence Audio/Video Recordings	\$15.00 per CD
Research/Administrative fee	\$30 hourly
Clearance Letters	\$10 per document
Sex Offender Registration	\$75 New \$25 Annual/Quarterly
Insufficient Check	\$35
Sealing of Municipal Records	\$65 pursuant to <i>C.R.S. 24-72-708</i>
BWC Research and Redaction Processing	\$40 Hourly (<i>1 hour minimum, in addition to cost of drive/CD</i>)
Rush Request Fee	\$20 in addition to other fees (<i>due to additional staff time</i>)

For dispatch audio/video recordings or call for service reports, please contact [Weld County Communications](#) at 720-652-4222.

AGENDA INFORMATION MEMORANDUM

FIRESTONE TOWN BOARD OF TRUSTEES



AIM#: 5.k

Consent Agenda

Meeting Date: December 8, 2021

Initiated By: Raelynn Ferrera

Dept: Administration

AGENDA TITLE

Resolution 21-212: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING THE COLORADO OPIOIDS SETTLEMENT MEMORANDUM OF UNDERSTANDING AND ASSOCIATED SETTLEMENT DOCUMENTS

SUMMARY

Colorado Opioids Settlement Memorandum of Understanding ("Colorado MOU"). The Colorado MOU was signed by Colorado Attorney General Phil Weiser on August 26, 2021. In order to receive the full settlement payments for all of Colorado, strong participation by local governments signing on to the Colorado MOU is necessary.

HISTORY AND PREVIOUS BOARD ACTION

RECOMMENDATION

ALTERNATIVES

ATTACHMENTS

1. Opioids Settlement Res 21-212
2. 1 Colorado Opioid MOU
3. 2 Colorado Opioid MOU Summary
4. 3 Colorado Opioid MOU FAQ
5. 4 Johnson & Johnson - Janssen Opioid Settlement Participation Form
6. 5 Distributor Opioid Settlement Participation Form
7. 6 Local Government Opioid Escrow Agreement
8. Letter to Local Government Managers and Attorneys

FINANCIAL CONSIDERATIONS

RESOLUTION NO. 21-212

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING THE COLORADO OPIOIDS SETTLEMENT MEMORANDUM OF UNDERSTANDING AND ASSOCIATED SETTLEMENT DOCUMENTS

WHEREAS, approximately 2,500 cities, counties, and tribal authorities, are parties to the National Prescription Opiate Litigation, Multi District Litigation (MDL 2804 N.D. Ohio), which is before the United States District Court for the Northern District of Ohio, Eastern Division; and

WHEREAS, the defendants in the litigation consist of a multitude of opioid manufacturers and distributors, including Johnson and Johnson, Amerisource Bergen, Cardinal Health, McKesson, Mallinckrodt, Endo International, Allergan, CVS, Walmart and Albertson's; and

WHEREAS, the defendants are accused of heightening the opioid crisis by aggressively marketing opioid treatments while minimizing the risks of addiction and overdose, and failing to monitor the distribution of opioids to guard against abuse by distributors; and

WHEREAS, some of the defendants, such as Purdue Pharma and Mallinckrodt have sought relief through bankruptcy; and

WHEREAS, a nationwide settlement has been reached with the "Big 3" Opioid Distributors (McKesson, Cardinal Health and AmerisourceBergen) and Johnson & Johnson to resolve the claims that these entities contributed to the opioid epidemic; and

WHEREAS, the Big 3 shall pay a maximum of twenty-one billion dollars over eighteen years and Johnson and Johnson will pay a maximum of five billion dollars over no more than nine years; and

WHEREAS, it is anticipated that the State of Colorado's share of the settlement will exceed three hundred million, which funds could be available as soon as July 2022; and

WHEREAS, as more funds become available such as from the Purdue Pharma and Mallinckrodt bankruptcies, they will be deposited into the National Opioid Settlement Administrative Fund; and

WHEREAS, to establish a framework for the distribution and sharing of settlement funds local governments within the State worked with the State Attorney General's Office to develop the Colorado Opioids Settlement Memorandum of Understanding ("MOU") which was signed by Attorney General Phil Weiser on August 26, 2021; and

WHEREAS, the MOU provides that all local governments even those not parties to the litigation are, upon their approval of the MOU eligible to receive the same amount of funds as the litigating parties, and those that do not approve the MOU will have their share allocated to the Regional Share for the region in which the local government is located; and

WHEREAS, as the settlement agreements contain incentive payments based upon the participation rate of local governments to ensure the maximum payout for Colorado it is essential that all local governments even those not parties to the litigation approve the MOU; and

WHEREAS, settlement funds are to be used for “Approved Purposes” which include for example, the treatment of opioid use disorder and its effects, intervention, assistance to those in the criminal justice system as a result of opioid use, care and treatment for women and assistance for medical providers as to the adverse effect of use of opioids during pregnancy, care and recovery programs and services for those dealing with opioid addiction, training for health care providers to ensure safe and responsible use of opioids, education and public service programs to prevent opioid abuse and increased availability of naloxone and other drugs that treat overdoses of opioids, education of first responders, and funding for opioid research for measures and treatments to reduce the harm of opioid use; and

WHEREAS, Opioid Settlement Funds provided to Colorado shall be divided and distributed as follows:

- 10% directly to the State for Approved Purposes (“State Share”);
- 20% directly to Participating Local Governments for Approved Purposes (“LG Share”);
- 60% directly to Regions for Approved Purposes (“Regional Share”) which is comprised of single and multi-county regions throughout the State;
- 10% to specific abatement infrastructure improvements for Approved Purposes (Statewide Infrastructure Share’) which includes capital projects and operational assistance to improve the infrastructure needed to abate the opioid crisis; and

WHEREAS, local governments shall receive funds directly from the LG Share, which shall be distributed to the applicable County Area (“Region”), which allocations are based on the number of persons suffering opioid use disorder in the Region, the number of opioid deaths in the Region and the amount of opioids distributed in the Region; and

WHEREAS, for the Town of Firestone its LG Share will come from its Region which is Weld County and Firestone is anticipated to receive 1.46% of the funds distributed to Weld County; and

WHEREAS, participating local governments shall also be members of their Regional Council, which shall be governed by a Regional Council whose voting members shall be employees or elected officials of a participating local government; and

WHEREAS, each Regional Council may draft its own intra-regional agreements, by laws and other operating documents to determine how it will operate subject to the terms and conditions of the MOU; and

WHEREAS, all funds distributed to the parties within the State shall be governed by a General Abatement Fund Council, which will consist of thirteen members appointed by the State

and the Local Governments, with the State's seven appointees and the Local Government's six appointees to be individuals who are not officials of the entities but volunteers such as licensed professionals with significant experience in substance abuse, opioids impact upon criminal justice, public health, and prevention, education and recovery programs; and

WHEREAS, the State has sole discretion within the guidelines of the Approved Purposes of the funds it receives under the State Share and the Statewide Infrastructure Share and must on an annual basis provide documentation regarding all its expenditures including administrative costs to the General Abatement Fund Council; and

WHEREAS, the MOU includes a provision as to attorney fees by which law firms must first apply to any national common benefit fee fund and if fees are still owed they shall be paid out of a "Back-Stop Fund" which limits fees to 8.7% of the LG Share and 4.35% of the Regional Share; and

WHEREAS, distribution of the attorney fees will be overseen by a Committee of litigating and non-litigating local governments, and no attorney fee funds will be provided from the Sate Share or Statewide Infrastructure Share; and

WHEREAS, in addition to approval of the MOU the Town must execute the following settlement agreements;

Subdivision Settlement Participation Form which releases subdivisions legal claims against Johnson and Johnson parent corporation of Janssen;
Subdivision Settlement Participation Form that releases subdivisions legal claims against AmerisourceBergen, Cardinal Health and McKesson; and
The Colorado Subdivision Escrow Agreement that ensures subdivision's legal claims are released only when ninety-five percent participation by local governments has been reached, which secures significant incentive payments under the settlement agreements.

WHEREAS, the Board of Trustees finds that the Colorado Opioids Settlement Memorandum of Understanding will be of benefit to the community's health, safety and welfare by addressing the issues which the opioid crisis has inflicted not only upon those within the community but throughout the entire State.

THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, THAT:

The Colorado Opioids Settlement Memorandum of Understanding and the Johnson & Johnson Subdivision Settlement Participation Form, AmerisourceBergen, Cardinal Health and McKesson Subdivision Settlement Participation Form and the Colorado Subdivision Escrow Agreement are all approved in substantially the same form as the copy attached hereto and made a part of this resolution, and the Mayor is authorized to execute the MOU, Settlement Participation Forms and Colorado Subdivision Escrow Agreement on behalf of the Town with the Town Clerk being directed to forthwith provide this executed Resolution and the executed

MOU, Settlement Participation Forms and Colorado Subdivision Escrow Agreement to the Colorado Municipal League, 1144 N. Sherman Street Denver CO 80203.

Done and resolved the _____ day of _____, 2021.

Bobbi Sindelar, Mayor

ATTEST:

APPROVED AS TO FORM:

Jessica Koenig, CMC, Town Clerk

William P. Hayashi, Town Attorney

**COLORADO OPIOIDS SETTLEMENT MEMORANDUM OF UNDERSTANDING
("MOU")**

Thursday, August 26, 2021

August 25, 2021 Attorney General version

A. Definitions

As used in this MOU:

1. "Approved Purpose(s)" shall mean forward-looking strategies, programming, and services to abate the opioid epidemic as identified by the terms of any Settlement. If a Settlement is silent on Approved Purpose(s), then Approved Purpose(s) shall mean those forward-looking strategies to abate the opioid epidemic identified in **Exhibit A** or any supplemental forward-looking abatement strategies added to **Exhibit A** by the Abatement Council. Consistent with the terms of any Settlement, "Approved Purposes" shall also include the reasonable administrative costs associated with overseeing and administering Opioid Funds from each of the four (4) Shares described in Section (B)(2). Reimbursement by the State or Local Governments for past expenses are not Approved Purpose(s). "Approved Purposes" shall include attorneys' fees and expenses incurred in the course of the opioid litigation that are paid through the process discussed below.
2. "County Area" shall mean a county in the State of Colorado plus the Local Governments, or portion of any Local Government, within that county.
3. "Effective Date" shall mean the date on which a court of competent jurisdiction, including any bankruptcy court, enters the first Settlement by order or consent decree. The Parties anticipate that more than one Settlement will be administered according to the terms of this MOU, but that the first entered Settlement will trigger the formation of the Abatement Council in Section (C) and the Regional Councils in Section (F)(5).¹
4. "General Abatement Fund Council," or "Abatement Council," shall have the meaning described in Section (C), below.

¹ For the avoidance of doubt, the McKinsey Settlement and any other Settlement that precedes the finalization of drafting this MOU are not considered a trigger for purposes of the calculation of "Effective Date."

5. “Local Government(s)” shall mean all counties in the State of Colorado and the municipalities, towns, and county and city municipal corporations that are listed in **Exhibit B**.
6. “National Opioid Settlement Administrative Fund” shall mean any fund identified by a Settlement for the national distribution of Opioid Funds.
7. “Opioid Funds” shall mean damage awards obtained through a Settlement.
8. “Opioid Settling Defendant” shall mean any person or entity, or its affiliates, that engages in or has engaged in the manufacture, marketing, promotion, distribution, or dispensing of licit opioids.
9. “Participating Local Government(s)” shall mean all Local Governments that sign this MOU, and if required under terms of a particular Settlement, who have executed a release of claims with the Opioid Settlement Defendant(s). For the avoidance of doubt, a Local Government must sign this MOU to become a “Participating Local Government.” Local Governments may designate the appropriate individual from their entity to sign the MOU.
10. “Party” or “Parties” shall mean the State and/or Participating Local Government(s).
11. “Qualified Settlement Fund Account,” or “QSF Account,” shall mean an account set up as a qualified settlement fund, 468b fund, as authorized by Treasury Regulations 1.468B-1(c) (26 CFR §1.468B-1).
12. “Regional Council” shall have the meaning described in Section (F)(5), below.
13. “Settlement” shall mean the negotiated resolution of legal or equitable claims against an Opioid Settling Defendant when that resolution has been jointly entered into by the State and the Participating Local Governments, or by any individual Party or collection of Parties that opt to subject their Settlement to this MOU. Unless otherwise directed by an order from a United States Bankruptcy Court, “Settlement” shall also include distributions from any liquidation under Chapter 7 of the United States Bankruptcy Code or confirmed plan under Chapter 11 of the United States Bankruptcy Code that treats the claims of the State and Local Governments against an Opioid Settling Defendant.
14. “The State” shall mean the State of Colorado acting through its Attorney General and the Colorado Department of Law.

B. Allocation of Settlement Proceeds

1. All Opioid Funds shall be held in accordance with the terms of any Settlement. If a Settlement allows Opioid Funds to be held in a National Opioid Settlement Administrative Fund, then Opioid Funds shall be held in such National Opioid Settlement Administrative Fund. If a Settlement does not allow for Opioid Funds

to be held in a National Opioid Settlement Administrative Fund, Opioid Funds shall be held in a Colorado-specific QSF Account or, under the following limited circumstances, in the State's Custodial Account: 1) if at the time of a Settlement, a Colorado-specific QSF Account is not yet established, although in such case, the Opioid Funds shall be transferred to the Colorado-specific QSF Account once it is established or 2) where the Abatement Fund Council determines Opioids Funds cannot be legally held in a Colorado-specific QSF Account. Regardless of whether Opioid Funds are held in a National Administrative Fund, a Colorado-specific QSF Account, or in the State's Custodial Account, the Abatement Council shall appoint one of its members to serve as the point of contact in accordance Section (C)(4)(b)(i), below.

2. All Opioid Funds, at the time of a Settlement or at the time designated in the Settlement documents, shall be divided and distributed as follows:²
 - a. **10%** directly to the State ("State Share") for Approved Purposes in accordance with Section (D), below;
 - b. **20%** directly to Participating Local Governments ("LG Share") for Approved Purposes in accordance with Section (E), below;
 - c. **60%** directly to Regions ("Regional Share") for Approved Purposes in accordance with Section (F), below; and
 - d. **10%** to specific abatement infrastructure projects ("Statewide Infrastructure Share") for Approved Purposes in accordance with Section (G), below.
3. Distribution of the Shares in Section B(2)(a) – (d) shall be direct, meaning that funds held in accordance with Section B(1) shall be disbursed directly to the State, Participating Local Governments, Regions, and the Statewide Infrastructure Share according to the terms of this MOU.
4. All Opioid Funds, regardless of allocation, shall be used for Approved Purposes.
5. Participating Local Governments may elect to share, pool, or collaborate with their respective allocation of the LG or Regional Shares in any manner they choose, so long as such sharing, pooling, or collaboration is used for Approved Purposes and complies with the terms of this MOU and any Settlement.

C. General Abatement Fund Council

1. A General Abatement Fund Council (the "Abatement Council"), consisting of representatives appointed by the State and Participating Local Governments, shall

² This MOU treats multi-county health departments as county health departments for purposes of allocation and distribution of abatement proceeds and therefore multi-county health departments shall not receive any Opioid Funds directly. Third-Party Payors ("TPPs") are not Parties to this MOU.

be created to ensure the distribution of Opioid Funds complies with the terms of any Settlement and to provide oversight of the Opioid Funds in accordance with the terms of this MOU.

2. **Membership:** The Abatement Council shall consist of the following thirteen (13) members, who shall serve in their official capacity only.

a. **State Members:** Seven (7) members shall be appointed by the State, as authorized volunteers of the State, as follows:

- (i) A Chair to serve as a non-voting member, except in the event of a tie;
- (ii) Two (2) members who are licensed professionals with significant experience in substance use disorders;
- (iii) Three (3) members who are professionals with significant experience in prevention, education, recovery, treatment, criminal justice, rural public health issues, or government administration related to substance use disorders; and
- (iv) One (1) member or family member affected directly by the opioid crisis.

b. **Local Government Members:** Six (6) members shall be appointed by the Participating Local Governments. Local Government Members shall be a County Commissioner, Mayor, City or Town Council Member, or a professional with significant experience in prevention, education, recovery, treatment, criminal justice, rural public health issues, or governmental administration related to substance use disorders. A Participating Local Government may determine which Local Government Members are eligible (or ineligible) to serve on the General Abatement Fund Council. County Commissioners, City or Town Council Members, and/or Mayors from the Regions identified in **Exhibit C** shall collaborate to appoint Local Government Members as follows:

- (i) Two (2) Members from Regions 1, 5, 13, 14, 15, 17, 18;
- (ii) Two (2) Members from Regions 2, 6, 7, 8, 9, 10, 11, 12, 16; and
- (iii) Two (2) Members from Regions 3, 4, 19.

c. **Terms:** The Abatement Council shall be established within ninety (90) days of the Effective Date. In order to do so, within sixty (60) days of the Effective Date, the State shall appoint the State Members in accordance with Section (C)(2)(a), and after conferral with the Local Governments, CCI and CML shall jointly appoint six (6) Local Government Members for an initial term not to exceed one year. Thereafter, Members shall be

appointed in accordance with this Section and Sections (C)(2)(a) and (b) and may serve no more than two (2) consecutive two-year terms, for a total of four (4) consecutive years. Except that, beginning in the second year only, two (2) State Members and two (2) Local Government members shall be appointed for a three-year term and may serve one consecutive two-year term thereafter. The Chair shall have no term but may be replaced at the State's discretion.

- (i) If a State or Local Government Member resigns or is otherwise removed from the Abatement Council prior to the expiration of their term, a replacement Member shall be appointed within sixty (60) days in accordance with Sections (C)(2)(a) and (b).
- (ii) If a Local Government Member vacancy exists for more than sixty (60) days, the State shall appoint a replacement Local Government Member to serve until the vacancy is filled in accordance with Section (C)(2)(b).

- 3. **Duties:** The Abatement Council is primarily responsible for ensuring that the distribution of Opioid Funds complies with the terms of this MOU. The Abatement Council is also responsible for oversight of Opioid Funds from the Regional Share in accordance with Section (F), below, and for developing processes and procedures for the distribution and oversight of Opioid Funds from the Statewide Infrastructure Share in accordance with Section (G) below.
- 4. **Governance:** The Abatement Council shall draft its own bylaws or other governing documents, which must include appropriate conflict of interest and dispute resolution provisions, in accordance with the terms of this MOU and the following principles:
 - a. **Authority:** The Abatement Council does not have rulemaking authority. The terms of this MOU and any Settlement, as entered by any court of competent jurisdiction, including any bankruptcy court, control the authority of the Abatement Council and the Abatement Council shall not stray outside the bounds of the authority and power vested by this MOU and any Settlement.
 - b. **Administration:** The Abatement Council shall be responsible for an accounting of all Opioid Funds. The Abatement Council shall be responsible for releasing Opioid Funds in accordance with Section (B)(1) for the Regional and Statewide Infrastructure Shares in Sections (B)(2)(c) and (d) and shall develop policies and procedures for the release and oversight of such funds in accordance with Sections (F) and (G). Should the Abatement Council require assistance with providing an accounting of Opioid Funds, it may seek assistance from the State.

- (i) The Abatement Council shall appoint one of its members to serve as a point of contact for the purpose of communicating with the entity holding Opioid Funds in accordance with Section (B)(1) and in that role shall only act as directed by the Abatement Council.
- c. **Transparency:** The Abatement Council shall operate with all reasonable transparency and operate in a manner consistent with all Colorado laws relating to open records and meetings regardless of whether the Abatement Council is otherwise obligated to comply with them.
 - (i) The Abatement Council shall develop a centralized public dashboard or other repository for the publication of expenditure data from any Party or Regional Council that receives Opioid Funds in accordance with Sections (D)-(G).
 - (ii) The Abatement Council may also require outcome related data from any Party or Regional Council that receives Opioid Funds in accordance with Sections (D)-(G) and may publish such outcome related data in the centralized public dashboard or other repository described above. In determining which outcome related data may be required, the Abatement Council shall work with all Parties and Regional Councils to identify appropriate data sets and develop reasonable procedures for collecting such data sets so that the administrative burden does not outweigh the benefit of producing such outcome related data.
 - (iii) For purposes of funding the centralized public dashboard or other repository described above, the Abatement Council shall make good faith efforts to seek funding from outside sources first, otherwise the State shall provide such funding.
- d. **Collaboration:** The Abatement Council shall facilitate collaboration between the State, Participating Local Governments, Regional Councils, and other stakeholders for the purposes of sharing data, outcomes, strategies, and other relevant information related to abating the opioid crisis in Colorado.
- e. **Decision Making:** The Abatement Council shall seek to make all decisions by consensus. In the event consensus cannot be achieved, unless otherwise required in this MOU, the Abatement Council shall make decisions by a majority vote of its Members. The Chair shall only vote in the event of a tie.
- f. **Due Process:** The Abatement Council shall develop the due process procedures required by Section (G)(3)(d) for Parties to dispute or challenge remedial actions taken by the Abatement Council for Opioid Funds from the Statewide Infrastructure Share. The Abatement Council

shall also abide by the due process principles required by Section (F)(12)-(13) for Regions to dispute or challenge remedial actions taken by the Abatement Council for Opioid Funds from the Regional Share.

- g. **Legal Status:** The Abatement Council shall not constitute a separate legal entity.
- h. **Legal Representation:** To the extent permitted by law, the State shall provide legal counsel to State Members for all legal issues arising from those State Members' work on the Abatement Council. At all times, Local Government Members of the Abatement Council are entitled to receive legal representation from their respective governmental entities. In the event of a conflict, the Abatement Council and its members may retain the services of other legal counsel.
- i. **Compensation:** No member of the Abatement Council shall be compensated for their work related to the Abatement Council.

D. State Share

- 1. In accordance with Sections (B)(1) and (B)(2)(a), and the terms of any Settlement, the State Share shall be paid directly to the State in accordance with the terms of this Section (D).
- 2. The State maintains full discretion over distribution of the State Share anywhere within the State of Colorado, however, the State Share shall be used for Approved Purposes only. The State will work to reduce administrative costs as much as practicable.
- 3. On an annual basis, as determined by the Abatement Council, the State shall provide all expenditure data, including administrative costs, from the State Share to the Abatement Council for purposes of maintaining transparency in accordance with Section (C)(4)(c)(i). The Abatement Council may require the State to provide additional outcome-related data in accordance with Section (C)(4)(c)(ii) and the State shall comply with such requirements.
- 4. If the State disputes the amount of Opioid Funds it receives from the State Share, the State shall alert the Abatement Council within sixty (60) days of discovering the information underlying the dispute. Failure to alert the Abatement Council within this time frame shall not constitute a waiver of the State's right to seek recoupment of any deficiency in its State Share.

E. LG Share

- 1. In accordance with Sections (B)(1) and (B)(2)(b), and the terms of any Settlement, the LG Share shall be paid directly to Participating Local Governments in accordance with the terms of this Section (E).

2. Allocations to Participating Local Governments from the LG Share shall first be determined using the percentages shown in **Exhibit D**.
3. The LG Share for each County Area shall then be allocated among the county and the other Participating Local Governments within it. **Exhibit E** reflects the default allocation that will apply unless the Participating Local Governments within a County Area enter into a written agreement providing for a different allocation. The Participating Local Governments may elect to modify the allocation for a County Area in **Exhibit E**, but such modification to the allocation in **Exhibit E** shall not change a County Area's total allocation under Section (E)(2).
4. A Local Government that chooses not to become a Participating Local Government will not receive a direct allocation from the LG Share. The portion of the LG Share that would have been allocated to a Local Government that is not a Participating Local Government will instead be re-allocated to the Regional Share for the Region where the Local Government is located, in accordance with Section (F), below.
5. In the event a Participating Local Government dissolves or ceases to exist during the term of any Settlement, the allocation for that Participating Local Government from the LG Share shall be re-allocated as directed by any Settlement, and if not specified, be re-allocated to the Regional Share for the Region in which the Participating Local Government was located, in accordance with Section (F). If a Participating Local Government merges with another Participating Local Government, the allocation for that Participating Local Government from the LG Share shall be re-allocated as directed by any Settlement, and if not specified, shall be re-allocated to the successor Participating Local Government's allocation of the LG Share. If a Participating Local Government merges with a Local Government that is not a Participating Local Government, the allocation for that Participating Local Government from the LG Share shall be re-allocated as directed by any Settlement, and if not specified, be re-allocated to the Region in which the merging Participating Local Government was located, in accordance with Section (F), below.
6. A Participating Local Government may forego its allocation of the LG Share and direct its allocation to the Regional Share for the Region where the Participating Local Government is located, in accordance with Section (F) below, by affirmatively notifying the Abatement Council on an annual basis of its decision to forego its allocation of the LG Share. A Participating Local Government's election to forego its allocation of the LG Share shall carry over to the following year unless the Participating Local Government notifies the Abatement Council otherwise. If a Participating Local Government elects to forego its allocation of the LG Share, the Participating Local Government shall be excused from the reporting requirements required by Section (E)(8).
7. Participating Local Governments maintain full discretion over the distribution of their allocation of the LG Share anywhere within the State of Colorado, however,

all Participating Local Governments shall use their allocation from the LG Share for Approved Purposes only. Reasonable administrative costs for a Participating Local Government to administer its allocation of the LG Share shall not exceed actual costs or 10% of the Participating Local Government's allocation of the LG Share, whichever is less.

8. On an annual basis, as determined by the Abatement Council, all Participating Local Governments shall provide all expenditure data, including administrative costs, from their allocation of the LG Share to the Abatement Council for purposes of maintaining transparency in accordance with Section (C)(4)(c)(i). The Abatement Council may require Participating Local Governments to provide additional outcome related data in accordance with Section (C)(4)(c)(ii) and all Participating Local Governments shall comply with such requirements.
9. If any Participating Local Government disputes the amount of Opioid Funds it receives from its allocation of the LG Share, the Participating Local Government shall alert the Abatement Council within sixty (60) days of discovering the information underlying the dispute. Failure to alert the Abatement Council within this time frame shall not constitute a waiver of the Participating Local Government's right to seek recoupment of any deficiency in its LG Share.

F. Regional Share

1. In accordance with Sections (B)(1) and (B)(2)(c), and the terms of any Settlement, the Regional Share shall be paid to the Regions in accordance with the terms of this Section (F).
2. Participating Local Governments shall organize themselves into the Regions depicted in **Exhibit C**. Municipalities located in multiple Regions may join all or some of the Regions in which they are located according to **Exhibit C**.
3. Allocations to Regions will be distributed according to **Exhibit F**. For multi-county Regions, each Region's share listed in **Exhibit F** is calculated by summing the individual percentage shares listed in **Exhibit D** for the counties within that Region. The percentages in **Exhibit F** are based on the assumption that every Local Government in each Region becomes a Participating Local Government.
4. In the event a city, town, or other municipality that is a Participating Local Government merges, dissolves, or ceases to exist during the term of any Settlement, the allocation of the Regional Share owed to the Region in which that Participating Local Government existed shall be re-allocated as directed by any Settlement, and if not specified, shall not be modified from **Exhibit F**. If a county that is a Participating Local Government merges with another county within its Region, the allocation of the Regional Share owed to the Region in which that county existed shall be re-allocated as directed by any Settlement, and if not specified, shall not be modified from **Exhibit F**. If a county that is a Participating Local Government merges with a county in a different Region during the term of

any Settlement, the allocation of the Regional Share owed to the Region in which that county existed shall be re-allocated as directed by any Settlement, and if not specified, shall be re-allocated to the Region in which that Participating Local Government merged in accordance with **Exhibit F**.

5. Each Region must create its own Regional Council while giving consideration to the regional governance models illustrated in **Exhibit G**. The Regional Council must be formed by the Participating Local Governments within the Region and each Regional Council shall designate a fiscal agent for the Region. Regional fiscal agents shall be county or municipal governments only. All funds from the Regional Share shall be distributed to the Regional Council's identified fiscal agent for the benefit of the entire Region.
 - a. Subject to this Section F(5), each Region may draft its own intra-regional agreements, bylaws, or other governing documents to determine how the Regional Council will operate. However, each voting member of a Regional Council shall be an employee or elected official of a Participating Local Government within the applicable Region. In the case of Denver, the voting members of its Regional Council shall be appointed by the Mayor. In the case of Broomfield, the voting members of its Regional Council shall be appointed by the Broomfield City and County Manager.
 - b. The Region shall not receive any Opioid Funds from the Regional Share until the Region certifies to the Abatement Council that its Regional Council has been formed and a fiscal agent has been designated. Such certification shall be in a simple form adopted by the Region and may be made via email, so long as it includes the names and affiliations of the Regional Council's members and the designated fiscal agent.
 - c. If a Region does not form and certify its Regional Council and designate its fiscal agent within one-hundred and eighty (180) days of the Effective Date, the Abatement Council shall appoint members to the Region's Regional Council. Regional Council members appointed by the Abatement Council shall serve until the Region certifies the formation of its Regional Council to the Abatement Council.
 - d. A Region shall submit a renewed certification required by Section (F)(5)(b), above, when its membership changes.
 - e. If a membership vacancy exists on a Regional Council for more than ninety (90) days and the Regional Council is unable to fill the vacancy by its regular procedures during that time, the Abatement Council shall appoint a replacement member to serve until the Region fills the vacancy.

6. A Local Government that chooses not to become a Participating Local Government shall not receive any Opioid Funds from the Regional Share or participate in the Regional Councils described in Section (F)(5) above.
7. Each Regional Council shall make requests to the Abatement Council for Opioid Funds from their allocation of the Regional Share. Each Regional Council's request for Opioid Funds from the Regional Share shall be accompanied by a 2-year plan identifying the Approved Purposes for which the requested funds will be used by the Region anywhere within the State of Colorado. A Regional Council's 2-year plan may be amended so long as such amendments comply with the terms of this MOU and any Settlement. Any Regional Council may seek assistance from the Abatement Council for purposes of developing its 2-year plan.
8. Reasonable administrative costs for a Regional Council to administer its Region's allocation of the Regional Share shall not exceed actual costs or 10% of the Region's allocation of the Regional Share, whichever is less.
9. The Abatement Council shall release funds requested by a Regional Council in accordance with Section (B)(1) if the Regional Council's 2-year plan complies with the Approved Purposes, the terms of this MOU, and the terms of any Settlement. The Abatement Council shall not deny any funding request from a Regional Council on the basis that the Abatement Council does not approve or agree with the Approved Purposes for which a Regional Council requests Opioid Funds from the Regional Share. Nor may the Abatement Council hold up, delay, or make unreasonable requests for additional or supporting information of the Regional Council prior to releasing the requested Opioid Funds. The purpose of this MOU is to facilitate Opioid Funds to their intended recipients quickly and efficiently with minimal administrative procedure.
10. On an annual basis, as determined by the Abatement Council, each Regional Council's fiscal agent shall provide to the Abatement Council the Regional Council's expenditure data, including administrative costs, from their allocation of the Regional Share and certify to the Abatement Council that the Regional Council's expenditures were for Approved Purposes and complied with its 2-year plan. The Regional Council shall subject itself to an accounting at the Abatement Council's discretion.
 - a. The Abatement Council shall review a Regional Council's expenditure data and certification to ensure compliance with the Regional Council's 2-year plan, the Approved Purposes, and the terms of this MOU and any Settlement.
 - b. The Abatement Council shall publish the Regional Council's expenditure data, including administrative costs, from the Regional Share in accordance with Section (C)(4)(c)(i). The Abatement Council may require Regional Councils to provide additional outcome related data in

accordance with Section (C)(4)(c)(ii) and all Regional Councils shall comply with such requirements.

11. If any Regional Council disputes the amount of Opioid Funds it receives from its allocation of the Regional Share, the Regional Council shall alert the Abatement Council within sixty (60) days of discovering the information underlying the dispute. Failure to alert the Abatement Council within this time frame shall not constitute a waiver of the Regional Council's right to seek recoupment of any deficiency in its Regional Share.
12. If the Abatement Council has reason to believe a Region's expenditure of its allocation of the Regional Share did not comply with the Region's 2-year Plan, the Approved Purposes, the terms of this MOU or any Settlement, as described in this Section (F), or that the Region otherwise misused its allocation of the Regional Share, the Abatement Council may take remedial action against the alleged offending Region. Such remedial action is left to the discretion of the Abatement Council and may include but not be limited to, withholding future Opioids Funds owed to the offending Region or requiring the offending Region to reimburse improperly expended Opioid Funds to the Regional Share.
13. Within one hundred and twenty (120) days of the Abatement Council being formed, in accordance with Section (C)(2)(c) above, the Abatement Council shall develop and publish due process procedures for allowing a Region to challenge or dispute any remedial action taken by the Abatement Council, including timelines during which the Region may engage in such a challenge or dispute. Such due process procedures shall reflect, at a minimum, the following principles:
 - a. Upon learning of any conduct that may warrant remedial action against a Region, the Abatement Council shall first provide notice to the Region of the conduct at issue, provide the Region an opportunity to respond, and, if appropriate, cure the alleged offending conduct. If after providing the Region such notice and opportunities to respond and cure, the Abatement Council continues to believe remedial action is warranted, the Abatement Council may take such remedial action.
 - b. If the Abatement Council decides to take remedial action against an alleged offending Region, such action may only occur by a two-thirds supermajority vote of the Abatement Council. Thus, an Abatement Council made up of twelve (12) voting members requires a vote of eight (8) Members prior to taking remedial action against an alleged offending Region.
 - c. Prior to taking any remedial action against an alleged offending Region, the Abatement Council shall first provide notice to the alleged offending Region of the remedial action to be taken and the facts underlying such remedial action. The Abatement Council shall then provide the alleged

offending Region an opportunity to challenge or dispute the remedial action in accordance with, at a minimum, the principles below:

- i. The alleged offending Region may request revisions or modifications to the proposed remedial action;
 - ii. The alleged offending Region may submit a written response to and/or request a hearing before the Abatement Council, or a third-party hearing officer,³ regarding the alleged offending conduct and proposed remedial action; and
 - iii. After such written responses are submitted and reviewed and/or a hearing is conducted, the alleged offending Region may submit an appeal to the Abatement Council of the decision to take remedial action.
- d. Remedial actions taken by the Abatement Council, in accordance with the due process principles detailed above, shall be considered final non-appealable orders and offending Regions may not seek judicial relief from remedial action taken by the Abatement Council, except as provided in Section (H), below.
- e. Subject to Section (H)(2), below, if any Party(ies) believes the Abatement Council violated the terms of this MOU, such Party(ies) may seek to enforce the terms of this MOU.

14. If the Abatement Council has reason to believe a Region's conduct, or the conduct of any Participating Local Government or individual in that Region, amounts to a violation of any criminal law, the Abatement Council shall refer such matters to the appropriate authorities and may consider such conduct in its determination of any remedial action to be taken.

15. If the Abatement Council has reason to believe that an individual involved in the receipt or administration of Opioid Funds from the Regional Share has violated any applicable ethics rules or codes, the Abatement Council shall not attempt to adjudicate such a violation. In such instances, the Abatement Council shall lodge a complaint with the appropriate forum for handling such ethical matters, such as a local home rule municipality's ethics board.

16. Costs associated with the Abatement Council's distribution and oversight of the Regional Share, as described above in this Section (F), including costs associated with any remedial action by the Abatement Council, shall be paid from the Statewide

³ Only an alleged offending Region may request the appointment of a third-party hearing officer to review any written responses and conduct any requested hearings. If an alleged offending Region makes such a request, the Abatement Council has sole discretion to appoint the third-party hearing officer and the alleged offending Region shall bear the cost of such review and/or hearing by the third-party hearing officer.

Infrastructure Share. The Abatement Council shall make all good faith efforts to limit such costs to the greatest extent possible.

G. Statewide Infrastructure Share

1. In accordance with Sections B(1) and (B)(2)(d), and the terms of any Settlement, the Statewide Infrastructure Share shall be paid to any Party or Regional Council in accordance with this Section (G).
2. The purpose of the Statewide Infrastructure Share is to promote capital improvements and provide operational assistance for developing or improving the infrastructure necessary to abate the opioid crisis anywhere within the State of Colorado. The Statewide Infrastructure Share is intended to supplement Opioid Funds received by any Party or Region.
3. Prior to distributing any Opioid Funds from the Statewide Infrastructure Share, the Abatement Council shall establish and publish policies and procedures for the distribution and oversight of the Statewide Infrastructure Share, including processes for Parties or Regions to apply for Opioid Funds from the Statewide Infrastructure Share. The Abatement Council's policies and procedures shall, at a minimum, reflect the following principles:
 - a. Opioid Funds from the Statewide Infrastructure Share shall be used for Approved Purposes only;
 - b. Opioid Funds from the Statewide Infrastructure Share shall be paid directly to the appropriate state agencies (including but not limited to the Colorado Department of Law), Regional fiscal agents, or Participating Local Governments only;
 - c. Distribution and oversight of the Statewide Infrastructure Share shall comply with the terms of this MOU and any Settlement;
 - d. Appropriate processes for remedial action will be taken against Parties or Regions that misuse Opioid Funds from the Statewide Infrastructure Share. Such processes shall include procedures for alleged offending Parties or Regions to challenge or dispute such remedial action; and
 - e. Limitations on administrative costs to be expended by recipients for administering Opioid Funds received from the Statewide Infrastructure Fund, not to exceed actual costs expended by the recipient or 10% of the amount received, whichever is less.
4. The distribution and oversight policies and procedures developed by the Abatement Council, in accordance with Section (G)(3), shall be non-appealable orders and no Party or Region may seek judicial relief related to the distribution and oversight of the Statewide Infrastructure Share.

5. On an annual basis, as determined by the Abatement Council, any Party or Regional Council that receives funds from the Statewide Infrastructure Share shall provide all expenditure data, including administrative costs, related to any Opioid Funds it received from the Statewide Infrastructure Share and subject itself to an accounting as required by the Abatement Council. The Abatement Council shall publish all expenditure data from the Statewide Infrastructure Share in accordance with Section (C)(4)(c)(i). The Abatement Council may require the Parties or Regional Councils that receive funds from the Statewide Infrastructure Share to provide additional outcome related data in accordance with Section (C)(4)(c)(ii) and the Parties or Regional Councils shall comply with such requirements.
6. Costs associated with the Abatement Council's distribution and oversight of the Statewide Infrastructure Share, as described in this Section (G), shall be paid for from the Statewide Infrastructure Share. The Abatement Council shall make all good faith efforts to limit such costs to the greatest extent possible.

H. General Terms

1. All Parties and Regional Councils shall maintain all records related to the receipt and expenditure of Opioid Funds for no less than five (5) years and shall make such records available for review by the Abatement Council, any other Party or Regional Council, or the public. Records requested by the public shall be produced in accordance with Colorado's open records laws. Records requested by the Abatement Council or another Party or a Regional Council shall be produced within twenty-one (21) days of the date the record request was received. This requirement does not supplant any Party or Regional Council's obligations under Colorado's open records laws.
2. If any Party(ies) believes the Abatement Council has violated the terms of this MOU, the alleging Party(ies) may seek to enforce the terms of this MOU, provided the alleging Party(ies) first provides notice to the Abatement Council of the alleged violation and a reasonable opportunity to cure the alleged violation. In such an enforcement action, the alleging Party(ies) may only seek to enforce the terms of the MOU against the State and the Participating Local Governments from which the Local Government Members of the Abatement Council were appointed and may only seek declaratory and/or injunctive relief. In defense of such an enforcement action, the State's Members of the Abatement Council shall be represented by the State and the Local Government Members shall be represented by the Participating Local Governments from which the Local Government Members were appointed. In the event of a conflict, the Abatement Council and its Members may seek outside representation to defend itself against such an enforcement action.
3. If any Party(ies) believes another Party(ies), not including the Abatement Council, violated the terms of this MOU, the alleging Party(ies) may seek to enforce the terms of this MOU in the court in which any applicable Settlement(s) was entered, provided the alleging Party(ies) first provide the alleged offending Party(ies)

notice of the alleged violation(s) and a reasonable opportunity to cure the alleged violation(s). In such an enforcement action, any alleging Party or alleged offending Party(ies) may be represented by their respective public entity in accordance with Colorado law.

4. Nothing in this MOU shall be interpreted to waive the right of any Party to seek judicial relief for conduct occurring outside the scope of this MOU that violates any Colorado law. In such an action, the alleged offending Party(ies), including the Abatement Council, may be represented by their respective public entities in accordance with Colorado law. In the event of a conflict, any Party, including the Abatement Council and its Members, may seek outside representation to defend itself against such an action.
5. If any Party(ies) believes another Party(ies), Region(s), or individual(s) involved in the receipt, distribution, or administration of Opioids Funds has violated any applicable ethics codes or rules, a complaint shall be lodged with the appropriate forum for handling such matters, such as a local home rule municipality's ethics board.
6. If any Party(ies) believes another Party(ies), Region(s), or individual(s) involved in the receipt, distribution, or administration of Opioid Funds violated any Colorado criminal law, such conduct shall be reported to the appropriate criminal authorities.
7. Venue for any legal action related to this MOU shall be in a court of competent jurisdiction where any applicable Settlement(s) is entered.
8. Because recovery under the terms of different Settlement(s) may vary depending on the number of Parties required to effectuate a Settlement, the Parties may conditionally agree to sign on to the MOU through a letter of intent, resolution or similar written statement, declaration or pronouncement declaring their intent to sign on to the MOU if the threshold for Party participation in a specific Settlement is achieved.⁴
9. This MOU may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. The Parties approve the use of electronic signatures for execution of this MOU. All use of electronic signatures shall be governed by the Uniform Electronic Transactions Act, C.R.S. §§ 24-71.3-101, *et seq.* The Parties agree not to deny the legal effect or enforceability of the MOU solely because it is in electronic form or

⁴ For instance, the July 21, 2021 "Distributor Settlement Agreement" includes a "Subdivision Settlement Agreement Form" that, once filled out and executed, is meant to indicate that Local Government's (or Subdivision's) election to participate in that Distributor Settlement and also, to require that Local Government to take steps to formally release any claim it may have against the Settling Distributors. With regard to the Distributor Settlement Agreement or any other Settlements that include a form similar to the Subdivision Settlement Agreement Form, the Parties may still conditionally agree to sign on to the MOU if, for instance, the threshold for Party participation in a specific Settlement is achieved.

because an electronic record was used in its formation. The Parties agree not to object to the admissibility of the MOU in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

10. Each party represents that all procedures necessary to authorize such Party's execution of this MOU have been performed and that the person signing for such Party has been authorized to execute the MOU.

I. Payment of Counsel and Litigation Expenses Through a Back-Stop Fund

1. Some Settlements, including the McKesson Corporation, Cardinal Health, Inc., and AmerisourceBergen Corporation ("Distributor") and Johnson & Johnson/Janssen ("J&J") settlements, may provide for the payment of all or a portion of the fees and litigation expenses owed by Participating Local Governments to counsel specifically retained to file suit in the opioid litigation. If any Settlement is insufficient to cover the fee obligations of the Participating Local Governments (as discussed and modified by Judge Polster's Order of August 6 regarding fees for the Distributor and J&J settlements), the deficiencies will be covered as set forth in further detail below.
2. The Parties also recognize that, as in the Distributor and J&J settlements, certain Opioid Settling Defendants may offer premiums benefiting the entire state of Colorado when Participating Local Governments agree to the Settlement(s), thereby settling their claims in their on-going lawsuits. For example, below is the chart illustrating how Incentive Payment B (a 25% premium to the entire state) works in the Distributor Settlement at Section IV.F.2.b (p. 20):

Percentage of Litigating Subdivision Population that is Incentive B Eligible Subdivision Population ⁵	Incentive Payment B Eligibility Percentage
Up to 85%	0%
85%+	30%
86+	40%
91+	50%
95+	60%
99%+	95%
100%	100%

3. If the court in *In Re: National Prescription Opiate Litigation*, MDL No. 2804 (N.D. Ohio), or if a Settlement establishes a common benefit fund or similar device to compensate attorneys for services rendered and expenses incurred that have benefited plaintiffs generally in the litigation (the "Common Benefit Fund"),

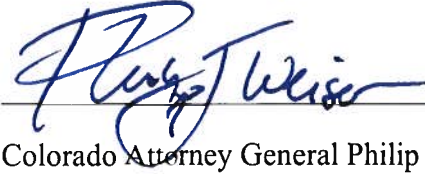
and/or requires certain governmental plaintiffs to pay a share of their recoveries from defendants into the Common Benefit Fund (“Court-Ordered Common Benefit Fund Assessment”), then the Participating Local Governments shall be required to first seek to have their attorneys’ fees and expenses paid through the Common Benefit Fund.

4. For the Distributor and J&J settlements only, counsel for Participating Local Governments shall have their expenses otherwise recoverable from Colorado Participating Local Governments compensated only through the Common Benefit Fund(s) established in those settlement(s). For the avoidance of doubt, counsel for Participating Local Governments may recover their attorneys’ fees through the Distributor and J&J settlements and through the other applicable provisions of this Section (I).
5. In addition, as a means of covering any deficiencies in paying counsel for Participating Local Governments, a supplemental Colorado Attorney Fee Back-Stop Fund shall be established. The Colorado Attorney Fee Back-Stop Fund is to be used to compensate counsel for Participating Local Governments that filed an initial complaint in the opioid litigation by September 1, 2020 (“Litigating Participating Local Governments”).
6. Payments out of the Colorado Attorney Fee Back-Stop Fund shall be determined by a committee (the “Opioid Fee and Expense Committee”). The Opioid Fee and Expense Committee shall consist of the following five (5) members:
 - a. One (1) member appointed by CCI from a litigating county or from a litigating county and city municipal corporation;
 - b. One (1) member appointed by CML from a litigating city;
 - c. One (1) member appointed jointly by CCI and CML from a non-litigating county or city;
 - d. One (1) member appointed by the Attorney General’s Office; and
 - e. One (1) neutral member jointly appointed by all of the other members listed above.
7. The Colorado Attorney Fee Back-Stop Fund shall be funded as follows from any Settlement, excluding settlements involving McKinsey and payments resulting from the Purdue or Mallinckrodt bankruptcy. For purposes only of calculating the funding of the Colorado Attorney Fee Back-Stop Fund, the Parties deem 58% of the total LG Share and Regional Share to be attributable to the Litigating Local Governments. The Colorado Attorney Fee Back-Stop Fund shall be funded by 8.7% of the total LG Share and 4.35% of the total Regional Share at the time such funds are actually received. No funds deposited into the Colorado Attorney Fee Back-Stop Fund will be taken from the Statewide Infrastructure Share or State Share.

8. Counsel for Litigating Participating Local Governments may apply to the Colorado Attorney Fee Back-Stop Fund only after applying to the Common Benefit Fund.
9. Counsel for Litigating Participating Local Governments may apply to the Colorado Attorney Fee Back-Stop Fund for only a shortfall – that is, the difference between what their fee agreements would entitle them to (as limited by this Section (I)) minus what they have already collected from the Common Benefit Fund (including both the “common benefit” and “contingency fee” calculations, if any). If they receive fees/costs for common benefit work in the national fee fund, these fees/costs will be allocated proportionately across all their local government opioid clients based on the allocation model used in the Negotiation Class website to allocate the appropriate portion to Colorado clients.
10. Counsel for Litigating Participating Local Governments are limited to being paid, at most, and assuming adequate funds are available in any Common Benefit Fund and Colorado Attorney Fee Back-Stop Fund, fees in an amount equal to 15% of the LG Share and 7.5% of the Regional Share attributable to their Colorado clients.
11. Any funds remaining in the Colorado Attorney Fee Back-Stop Fund in excess of the amounts needed to cover the fees and litigation expenses owed by Litigating Participating Local Governments to their respective counsel shall revert to the Participating Local Governments according to the allocations described in Sections (E) and (F). Every two years, the Opioid Fee and Expense Committee shall assess the amount remaining in the Colorado Attorney Fee Back-Stop Fund to determine if it is overfunded.
12. Despite the fact that a litigating entity bonus benefits the entire state, no portion of the State Share shall be used to fund the Colorado Attorney Fee Back-Stop Fund or in any other way to fund any Participating Local Government’s attorneys’ fees and expenses. Because the state did not hire outside counsel, any funds for attorneys fees that the state receives from the J&J and Distributor settlement will be deposited into the State Share.
13. To participate in the Colorado Attorney Fee Back-Stop Fund, counsel must follow the requirements of C.R.S. § 13-17-304.

This **Colorado Opioids Settlement Memorandum of Understanding** is signed

this 26 day of August, 2021 by:


Colorado Attorney General Philip J. Weiser

This **Colorado Opioids Settlement Memorandum of Understanding** is signed

this ____ day of _____, ____ by:

Name & Title_____

On behalf of _____

Exhibit A

POTENTIAL OPIOID ABATEMENT APPROVED PURPOSES

I. TREATMENT

A. TREATMENT OF OPIOID USE DISORDER AND ITS EFFECTS

1. Expand availability of treatment, including Medication-Assisted Treatment (MAT), for Opioid Use Disorder (OUD) and any co-occurring substance use or mental health issues.
2. Supportive housing, all forms of FDA-approved MAT, counseling, peer-support, recovery case management and residential treatment with access to medications for those who need it.
3. Treatment of mental health trauma issues that resulted from the traumatic experiences of the opioid user (e.g., violence, sexual assault, human trafficking) and for family members (e.g., surviving family members after an overdose or overdose fatality).
4. Expand telehealth to increase access to OUD treatment, including MAT, as well as counseling, psychiatric support, and other treatment and recovery support services.
5. Fellowships for addiction medicine specialists for direct patient care, instructors, and clinical research for treatments.
6. Scholarships for certified addiction counselors.
7. Clinicians to obtain training and a waiver under the federal Drug Addiction Treatment Act to prescribe MAT for OUD.
8. Training for health care providers, students, and other supporting professionals, such as peer recovery coaches/recovery outreach specialists, including but not limited to training relating to MAT and harm reduction.
9. Dissemination of accredited web-based training curricula, such as the American Academy of Addiction Psychiatry's Provider Clinical Support Service-Opioids web-based training curriculum and motivational interviewing.
10. Development and dissemination of new accredited curricula, such as the American Academy of Addiction Psychiatry's Provider Clinical Support Service Medication-Assisted Treatment.
11. Development of a multistate/nationally accessible database whereby health care providers can list currently available in-patient and out-patient OUD treatment services that are accessible on a real-time basis.

12. Support and reimburse services that include the full American Society of Addiction Medicine (ASAM) continuum of care for OUD.
13. Improve oversight of Opioid Treatment Programs (OTPs) to assure evidence-informed practices such as adequate methadone dosing.

B. INTERVENTION

1. Ensure that health care providers are screening for OUD and other risk factors and know how to appropriately counsel and treat (or refer, if necessary) a patient for OUD treatment.
2. Fund Screening, Brief Intervention and Referral to Treatment (SBIRT) programs to reduce the transition from use to disorder.
3. Training and long-term implementation of SBIRT in key systems (health, schools, colleges, criminal justice, and probation), with a focus on the late adolescence and young adulthood when transition from misuse to opioid disorder is most common.
4. Purchase automated versions of SBIRT and support ongoing costs of the technology.
5. Training for emergency room personnel treating opioid overdose patients on post-discharge planning, including community referrals for MAT, recovery case management and/or support services.
6. Support work of Emergency Medical Systems, including peer support specialists, to connect individuals to treatment or other appropriate services following an opioid overdose or other opioid-related adverse event.
7. Create school-based contacts whom parents can engage to seek immediate treatment services for their child.
8. Develop best practices on addressing OUD in the workplace.
9. Support assistance programs for health care providers with OUD.
10. Engage non-profits and faith community as a system to support outreach for treatment.

C. CRIMINAL-JUSTICE-INVOLVED PERSONS

1. Address the needs of persons involved in the criminal justice system who have OUD and any co-occurring substance use disorders or mental health (SUD/MH) issues.

2. Support pre-arrest diversion and deflection strategies for persons with OUD and any co-occurring SUD/MH issues, including established strategies such as:
 - a. Self-referral strategies such as Angel Programs or the Police Assisted Addiction Recovery Initiative (PAARI);
 - b. Active outreach strategies such as the Drug Abuse Response Team (DART) model;
 - c. “Naloxone Plus” strategies, which work to ensure that individuals who have received Naloxone to reverse the effects of an overdose are then linked to treatment programs;
 - d. Officer prevention strategies, such as the Law Enforcement Assisted Diversion (LEAD) model; or
 - e. Officer intervention strategies such as the Leon County, Florida Adult Civil Citation Network.
3. Support pre-trial services that connect individuals with OUD and any co-occurring SUD/MH issues to evidence-informed treatment, including MAT, and related services.
4. Support treatment and recovery courts for persons with OUD and any co-occurring SUD/MH issues, but only if they provide referrals to evidence-informed treatment, including MAT.
5. Provide evidence-informed treatment, including MAT, recovery support, harm reduction, or other appropriate services to individuals with OUD and any co-occurring SUD/MH issues who are incarcerated, on probation, or on parole.
6. Provide evidence-informed treatment, including MAT, recovery support, harm reduction, or other appropriate re-entry services to individuals with OUD and any co-occurring SUD/MH issues who are leaving jail or prison or who have recently left jail or prison.
7. Support critical time interventions (CTI), particularly for individuals living with dual-diagnosis OUD/serious mental illness, and services for individuals who face immediate risks and service needs and risks upon release from correctional settings.

D. WOMEN WHO ARE OR MAY BECOME PREGNANT

1. Evidence-informed treatment, including MAT, recovery, and prevention services for pregnant women or women who could become pregnant and have OUD.
2. Training for obstetricians and other healthcare personnel that work with pregnant women and their families regarding OUD treatment.

3. Other measures to address Neonatal Abstinence Syndrome, including prevention, care for addiction and education programs.
4. Child and family supports for parenting women with OUD.
5. Enhanced family supports and child care services for parents receiving treatment for OUD.

E. PEOPLE IN TREATMENT AND RECOVERY

1. The full continuum of care of recovery services for OUD and any co-occurring substance use or mental health issues, including supportive housing, residential treatment, medical detox services, peer support services and counseling, community navigators, case management, and connections to community-based services.
2. Identifying successful recovery programs such as physician, pilot, and college recovery programs, and providing support and technical assistance to increase the number and capacity of high-quality programs to help those in recovery.
3. Training and development of procedures for government staff to appropriately interact and provide social and other services to current and recovering opioid users, including reducing stigma.
4. Community-wide stigma reduction regarding treatment and support for persons with OUD, including reducing the stigma on effective treatment.
5. Engaging non-profits and faith community as a system to support family members in their efforts to help the opioid user in the family.

II. PREVENTION

F. PRESCRIBING PRACTICES

1. Training for health care providers regarding safe and responsible opioid prescribing, dosing, and tapering patients off opioids.
2. Academic counter-detailing.
3. Continuing Medical Education (CME) on prescribing of opioids.
4. Support for non-opioid pain treatment alternatives, including training providers to offer or refer to multi-modal, evidence-informed treatment of pain.
5. Fund development of a multistate/national prescription drug monitoring program (PDMP) that permits information sharing while providing appropriate safeguards on sharing of private information, including but not limited to:

- a. Integration of PDMP data with electronic health records, overdose episodes, and decision support tools for health care providers relating to OUD.
 - b. Ensuring PDMPs incorporate available overdose/naloxone deployment data, including the United States Department of Transportation's Emergency Medical Technician overdose database.
6. Educating dispensers on appropriate opioid dispensing.

G. MISUSE OF OPIOIDS

1. Corrective advertising/affirmative public education campaigns.
2. Public education relating to drug disposal.
3. Drug take-back disposal or destruction programs.
4. Fund community anti-drug coalitions that engage in drug-abuse prevention efforts.
5. School-based programs that have demonstrated effectiveness in preventing drug misuse and seem likely to be effective in preventing the uptake and use of opioids.
6. Support community coalitions in implementing evidence-informed prevention, such as reduced social access and physical access, stigma reduction – including staffing, educational campaigns, or training of coalitions in evidence-informed implementation.
7. School and community education programs and campaigns for students, families, school employees, school athletic programs, parent-teacher and student associations, and others.
8. Engaging non-profits and faith community as a system to support prevention.

H. OVERDOSE DEATHS AND OTHER HARMS

1. Increasing availability and distribution of naloxone and other drugs that treat overdoses to first responders, overdose patients, opioid users, families and friends of opioid users, schools, community navigators and outreach workers, drug offenders upon release from jail/prison, and other members of the general public.
2. Training and education regarding naloxone and other drugs that treat overdoses for first responders, overdose patients, patients taking opioids, families, schools, and other members of the general public.

3. Developing data tracking software and applications for overdoses/naloxone revivals.
4. Public education relating to emergency responses to overdoses.
5. Free naloxone for anyone in the community.
6. Public education relating to immunity and Good Samaritan laws.
7. Educating first responders regarding the existence and operation of immunity and Good Samaritan laws.
8. Syringe service programs, including supplies, staffing, space, peer support services, and the full range of harm reduction and treatment services provided by these programs.
9. Expand access to testing and treatment for infectious diseases such as HIV and Hepatitis C resulting from intravenous opioid use.

III. ADDITIONAL AREAS

I. SERVICES FOR CHILDREN

1. Support for children's services: Fund additional positions and services, including supportive housing and other residential services, relating to children being removed from the home and/or placed in foster care due to custodial opioid use.

J. FIRST RESPONDERS

1. Law enforcement expenditures relating to the opioid epidemic.
2. Educating first responders regarding appropriate practices and precautions when dealing with fentanyl or other drugs.
3. Increase electronic prescribing to prevent diversion and forgery.

K. COMMUNITY LEADERSHIP

1. Regional planning to identify goals for opioid reduction and support efforts or to identify areas and populations with the greatest needs for treatment intervention services.
2. Government dashboard to track key opioid-related indicators and supports as identified through collaborative community processes.

L. STAFFING AND TRAINING

1. Funding for programs and services regarding staff training and networking to improve staff capability to abate the opioid crisis.
2. Support infrastructure and staffing for collaborative cross-systems coordination to prevent opioid misuse, prevent overdoses, and treat those with OUD (e.g., health care, primary care, pharmacies, PDMPs, etc.).

M. RESEARCH

1. Funding opioid abatement research.
2. Research improved service delivery for modalities such as SBIRT that demonstrate promising but mixed results in populations vulnerable to OUD.
3. Support research for novel harm reduction and prevention efforts such as the provision of fentanyl test strips.
4. Support for innovative supply-side enforcement efforts such as improved detection of mail-based delivery of synthetic opioids.
5. Expanded research for swift/certain/fair models to reduce and deter opioid misuse within criminal justice populations that build upon promising approaches used to address other substances (e.g. Hawaii HOPE and Dakota 24/7).
6. Research expanded modalities such as prescription methadone that can expand access to MAT.

N. OTHER

1. Administrative costs for any of the approved purposes on this list.

Exhibit B

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Adams County	Adams	County	
Arvada	Adams	City	2 counties
Aurora	Adams	City	3 counties
Bennett	Adams	City	2 counties
Brighton	Adams	City	2 counties
Commerce City	Adams	City	
Federal Heights	Adams	City	
Lochbuie	Adams	City	2 counties
Northglenn	Adams	City	2 counties
Thornton	Adams	City	2 counties
Westminster	Adams	City	2 counties
Alamosa County	Alamosa	County	
Alamosa	Alamosa	City	
Hooper	Alamosa	City	
Arapahoe County	Arapahoe	County	
Aurora	Arapahoe	City	3 counties
Bennett	Arapahoe	City	2 counties
Bow Mar	Arapahoe	City	2 counties
Centennial	Arapahoe	City	
Cherry Hills Village	Arapahoe	City	
Columbine Valley	Arapahoe	City	
Deer Trail	Arapahoe	City	
Englewood	Arapahoe	City	
Foxfield	Arapahoe	City	
Glendale	Arapahoe	City	
Greenwood Village	Arapahoe	City	
Littleton	Arapahoe	City	3 counties
Sheridan	Arapahoe	City	
Archuleta County	Archuleta	County	
Pagosa Springs	Archuleta	City	
Baca County	Baca	County	
Campo	Baca	City	
Pritchett	Baca	City	
Springfield	Baca	City	
Two Buttes	Baca	City	
Vilas	Baca	City	
Walsh	Baca	City	
Bent County	Bent	County	
Las Animas	Bent	City	
Boulder County	Boulder	County	
Boulder	Boulder	City	
Erie	Boulder	City	2 counties
Jamestown	Boulder	City	
Lafayette	Boulder	City	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Longmont	Boulder	City	2 counties
Louisville	Boulder	City	
Lyons	Boulder	City	
Nederland	Boulder	City	
Superior	Boulder	City	2 counties
Ward	Boulder	City	
Broomfield	Broomfield	City/County	
Chaffee County	Chaffee	County	
Buena Vista	Chaffee	City	
Poncha Springs	Chaffee	City	
Salida	Chaffee	City	
Cheyenne County	Cheyenne	County	
Cheyenne Wells	Cheyenne	City	
Kit Carson	Cheyenne	City	
Clear Creek County	Clear Creek	County	
Central City	Clear Creek	City	2 counties
Empire	Clear Creek	City	
Georgetown	Clear Creek	City	
Idaho Springs	Clear Creek	City	
Silver Plume	Clear Creek	City	
Conejos County	Conejos	County	
Antonito	Conejos	City	
La Jara	Conejos	City	
Manassa	Conejos	City	
Romeo	Conejos	City	
Sanford	Conejos	City	
Costilla County	Costilla	County	
Blanca	Costilla	City	
San Luis	Costilla	City	
Crowley County	Crowley	County	
Crowley	Crowley	City	
Olney Springs	Crowley	City	
Ordway	Crowley	City	
Sugar City	Crowley	City	
Custer County	Custer	County	
Silver Cliff	Custer	City	
Westcliffe	Custer	City	
Delta County	Delta	County	
Cedaredge	Delta	City	
Crawford	Delta	City	
Delta	Delta	City	
Hotchkiss	Delta	City	
Orchard City	Delta	City	
Paonia	Delta	City	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Denver	Denver	City/County	
Dolores County	Dolores	County	
Dove Creek	Dolores	City	
Rico	Dolores	City	
Douglas County	Douglas	County	
Aurora	Douglas	City	3 counties
Castle Pines	Douglas	City	
Castle Rock	Douglas	City	
Larkspur	Douglas	City	
Littleton	Douglas	City	3 counties
Lone Tree	Douglas	City	
Parker	Douglas	City	
Eagle County	Eagle	County	
Avon	Eagle	City	
Basalt	Eagle	City	2 counties
Eagle	Eagle	City	
Gypsum	Eagle	City	
Minturn	Eagle	City	
Red Cliff	Eagle	City	
Vail	Eagle	City	
El Paso County	El Paso	County	
Calhan	El Paso	City	
Colorado Springs	El Paso	City	
Fountain	El Paso	City	
Green Mountain Falls	El Paso	City	2 counties
Manitou Springs	El Paso	City	
Monument	El Paso	City	
Palmer Lake	El Paso	City	
Ramah	El Paso	City	
Elbert County	Elbert	County	
Elizabeth	Elbert	City	
Kiowa	Elbert	City	
Simla	Elbert	City	
Fremont County	Fremont	County	
Brookside	Fremont	City	
Cañon City	Fremont	City	
Coal Creek	Fremont	City	
Florence	Fremont	City	
Rockvale	Fremont	City	
Williamsburg	Fremont	City	
Garfield County	Garfield	County	
Carbondale	Garfield	City	
Glenwood Springs	Garfield	City	
New Castle	Garfield	City	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Parachute	Garfield	City	
Rifle	Garfield	City	
Silt	Garfield	City	
Gilpin County	Gilpin	County	
Black Hawk	Gilpin	City	
Central City	Gilpin	City	2 counties
Grand County	Grand	County	
Fraser	Grand	City	
Granby	Grand	City	
Grand Lake	Grand	City	
Hot Sulphur Springs	Grand	City	
Kremmling	Grand	City	
Winter Park	Grand	City	
Gunnison County	Gunnison	County	
Crested Butte	Gunnison	City	
Gunnison	Gunnison	City	
Marble	Gunnison	City	
Mount Crested Butte	Gunnison	City	
Pitkin	Gunnison	City	
Hinsdale County	Hinsdale	County	
Lake City	Hinsdale	City	
Huerfano County	Huerfano	County	
La Veta	Huerfano	City	
Walsenburg	Huerfano	City	
Jackson County	Jackson	County	
Walden	Jackson	City	
Jefferson County	Jefferson	County	
Arvada	Jefferson	City	2 counties
Bow Mar	Jefferson	City	2 counties
Edgewater	Jefferson	City	
Golden	Jefferson	City	
Lakeside	Jefferson	City	
Lakewood	Jefferson	City	
Littleton	Jefferson	City	3 counties
Morrison	Jefferson	City	
Mountain View	Jefferson	City	
Superior	Jefferson	City	2 counties
Westminster	Jefferson	City	2 counties
Wheat Ridge	Jefferson	City	
Kiowa County	Kiowa	County	
Eads	Kiowa	City	
Haswell	Kiowa	City	
Sheridan Lake	Kiowa	City	
Kit Carson County	Kit Carson	County	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Bethune	Kit Carson	City	
Burlington	Kit Carson	City	
Flagler	Kit Carson	City	
Seibert	Kit Carson	City	
Stratton	Kit Carson	City	
Vona	Kit Carson	City	
La Plata County	La Plata	County	
Bayfield	La Plata	City	
Durango	La Plata	City	
Ignacio	La Plata	City	
Lake County	Lake	County	
Leadville	Lake	City	
Larimer County	Larimer	County	
Berthoud	Larimer	City	2 counties
Estes Park	Larimer	City	
Fort Collins	Larimer	City	
Johnstown	Larimer	City	2 counties
Loveland	Larimer	City	
Timnath	Larimer	City	2 counties
Wellington	Larimer	City	
Windsor	Larimer	City	2 counties
Las Animas County	Las Animas	County	
Aguilar	Las Animas	City	
Branson	Las Animas	City	
Cokedale	Las Animas	City	
Kim	Las Animas	City	
Starkville	Las Animas	City	
Trinidad	Las Animas	City	
Lincoln County	Lincoln	County	
Arriba	Lincoln	City	
Genoa	Lincoln	City	
Hugo	Lincoln	City	
Limon	Lincoln	City	
Logan County	Logan	County	
Crook	Logan	City	
Fleming	Logan	City	
Iliff	Logan	City	
Merino	Logan	City	
Peetz	Logan	City	
Sterling	Logan	City	
Mesa County	Mesa	County	
Collbran	Mesa	City	
De Beque	Mesa	City	
Fruita	Mesa	City	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Grand Junction	Mesa	City	
Palisade	Mesa	City	
Mineral County	Mineral	County	
City of Creede	Mineral	City	
Moffat County	Moffat	County	
Craig	Moffat	City	
Dinosaur	Moffat	City	
Montezuma County	Montezuma	County	
Cortez	Montezuma	City	
Dolores	Montezuma	City	
Mancos	Montezuma	City	
Montrose County	Montrose	County	
Montrose	Montrose	City	
Naturita	Montrose	City	
Nucla	Montrose	City	
Olathe	Montrose	City	
Morgan County	Morgan	County	
Brush	Morgan	City	
Fort Morgan	Morgan	City	
Hillrose	Morgan	City	
Log Lane Village	Morgan	City	
Wiggins	Morgan	City	
Otero County	Otero	County	
Cheraw	Otero	City	
Fowler	Otero	City	
La Junta	Otero	City	
Manzanola	Otero	City	
Rocky Ford	Otero	City	
Swink	Otero	City	
Ouray County	Ouray	County	
Ouray	Ouray	City	
Ridgway	Ouray	City	
Park County	Park	County	
Alma	Park	City	
Fairplay	Park	City	
Phillips County	Phillips	County	
Haxtun	Phillips	City	
Holyoke	Phillips	City	
Paoli	Phillips	City	
Pitkin County	Pitkin	County	
Aspen	Pitkin	City	
Basalt	Pitkin	City	2 counties
Snowmass Village	Pitkin	City	
Prowers County	Prowers	County	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Granada	Prowers	City	
Hartman	Prowers	City	
Holly	Prowers	City	
Lamar	Prowers	City	
Wiley	Prowers	City	
Pueblo County	Pueblo	County	
Boone	Pueblo	City	
Pueblo	Pueblo	City	
Rye	Pueblo	City	
Rio Blanco County	Rio Blanco	County	
Meeker	Rio Blanco	City	
Rangely	Rio Blanco	City	
Rio Grande County	Rio Grande	County	
Center	Rio Grande	City	2 counties
Del Norte	Rio Grande	City	
Monte Vista	Rio Grande	City	
South Fork	Rio Grande	City	
Routt County	Routt	County	
Hayden	Routt	City	
Oak Creek	Routt	City	
Steamboat Springs	Routt	City	
Yampa	Routt	City	
Saguache County	Saguache	County	
Bonanza	Saguache	City	
Center	Saguache	City	2 counties
Crestone	Saguache	City	
Moffat	Saguache	City	
Saguache	Saguache	City	
San Juan County	San Juan	County	
Silverton	San Juan	City	
San Miguel County	San Miguel	County	
Mountain Village	San Miguel	City	
Norwood	San Miguel	City	
Ophir	San Miguel	City	
Sawpit	San Miguel	City	
Telluride	San Miguel	City	
Sedgwick County	Sedgwick	County	
Julesburg	Sedgwick	City	
Ovid	Sedgwick	City	
Sedgwick	Sedgwick	City	
Summit County	Summit	County	
Blue River	Summit	City	
Breckenridge	Summit	City	
Dillon	Summit	City	

Colorado Local Governments*

Government Name	County	Gov't Type	Multi-County
Frisco	Summit	City	
Montezuma	Summit	City	
Silverthorne	Summit	City	
Teller County	Teller	County	
Cripple Creek	Teller	City	
Green Mountain Falls	Teller	City	2 counties
Victor	Teller	City	
Woodland Park	Teller	City	
Washington County	Washington	County	
Akron	Washington	City	
Otis	Washington	City	
Weld County	Weld	County	
Ault	Weld	City	
Berthoud	Weld	City	2 counties
Brighton	Weld	City	2 counties
Dacono	Weld	City	
Eaton	Weld	City	
Erie	Weld	City	2 counties
Evans	Weld	City	
Firestone	Weld	City	
Fort Lupton	Weld	City	
Frederick	Weld	City	
Garden City	Weld	City	
Gilcrest	Weld	City	
Greeley	Weld	City	
Grover	Weld	City	
Hudson	Weld	City	
Johnstown	Weld	City	2 counties
Keenesburg	Weld	City	
Kersey	Weld	City	
La Salle	Weld	City	
Lochbuie	Weld	City	2 counties
Longmont	Weld	City	2 counties
Mead	Weld	City	
Milliken	Weld	City	
Northglenn	Weld	City	2 counties
Nunn	Weld	City	
Pierce	Weld	City	
Platteville	Weld	City	
Raymer (New Raymer)	Weld	City	
Severance	Weld	City	
Thornton	Weld	City	2 counties
Timnath	Weld	City	2 counties
Windsor	Weld	City	2 counties

Colorado Local Governments*

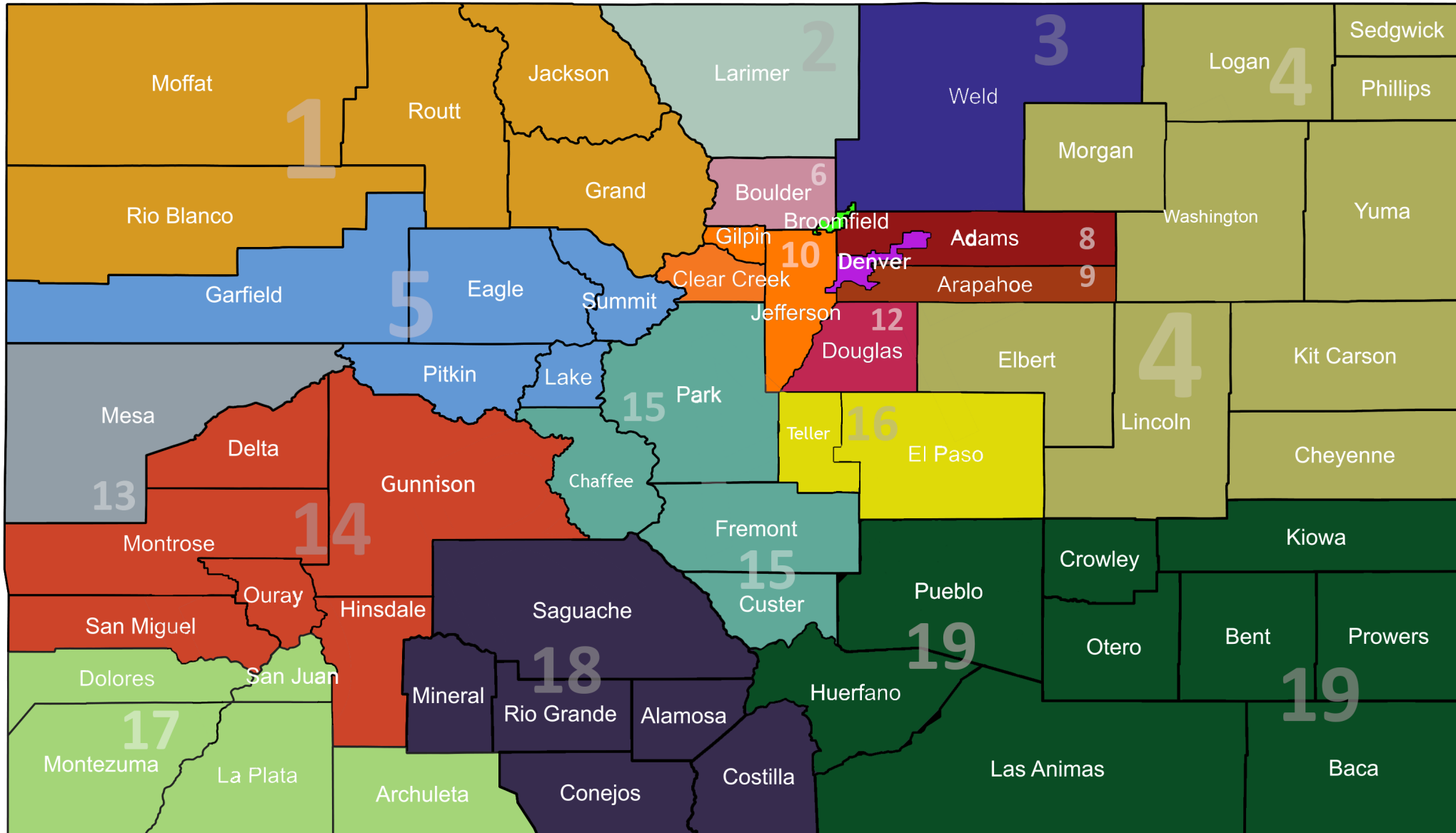
Government Name	County	Gov't Type	Multi-County
Yuma County	Yuma	County	
Eckley	Yuma	City	
Wray	Yuma	City	
Yuma	Yuma	City	

*This list includes all 64 Colorado counties and all 271 municipalities listed in the 2019 Census. Cities located in multiple counties are listed under each corresponding county subheading. City and County of Denver and City and County of Broomfield are counted in both the city and county totals. The City of Carbonate is not included in this list, as there was no population in the 2019 Census data.

This list will be reconciled as necessary to be consistent with the terms of Settlement(s) with Opioid Settling Defendant(s)

Exhibit C

Regions for the distribution of opioid settlement funds



Region 1	Region 5	Region 9	Region 13	Region 17
Region 2	Region 6	Region 10	Region 14	Region 18
Region 3	Region 7 (Broomfield)	Region 11 (Denver)	Region 15	Region 19
Region 4	Region 8	Region 12	Region 16	

Exhibit D

Exhibit D - Allocations to Colorado County Areas

County	Percentage of LG Share
Adams	9.4247%
Alamosa	0.5081%
Arapahoe	10.8071%
Archuleta	0.1370%
Baca	0.0592%
Bent	0.1133%
Boulder	5.7936%
Broomfield	1.0014%
Chaffee	0.3604%
Cheyenne	0.0159%
Clear Creek	0.1380%
Conejos	0.2108%
Costilla	0.0552%
Crowley	0.0934%
Custer	0.0412%
Delta	0.5440%
Denver	15.0042%
Dolores	0.0352%
Douglas	3.6696%
Eagle	0.6187%
El Paso	11.9897%
Elbert	0.2804%
Fremont	0.9937%
Garfield	0.8376%
Gilpin	0.0561%
Grand	0.2037%
Gunnison	0.1913%
Hinsdale	0.0112%
Huerfano	0.2505%
Jackson	0.0310%
Jefferson	10.5173%
Kiowa	0.0142%
Kit Carson	0.0940%
La Plata	0.8127%
Lake	0.0990%
Larimer	6.5211%
Las Animas	0.6304%
Lincoln	0.0819%
Logan	0.3815%
Mesa	2.8911%
Mineral	0.0039%
Moffat	0.2326%
Montezuma	0.4429%

Montrose	0.5695%
Morgan	0.4677%
Otero	0.4486%
Ouray	0.0535%
Park	0.1674%
Phillips	0.0714%
Pitkin	0.1747%
Prowers	0.1727%
Pueblo	5.6757%
Rio Blanco	0.1013%
Rio Grande	0.2526%
Routt	0.3837%
Saguache	0.0666%
San Juan	0.0097%
San Miguel	0.1005%
Sedgwick	0.0618%
Summit	0.3761%
Teller	0.6219%
Washington	0.0357%
Weld	3.8908%
Yuma	0.0992%
TOTAL	100.0000%

Exhibit E

Exhibit E - Intracounty Allocations^{1,2}

The below chart depicts the default percentage that each Local Government will receive from the LG Share amount attributed to its County Area, as described in Section (E)(3) of the MOU. The chart assumes full participation by all Local Governments

Government Name	Intracounty Share
Adams County	68.3372%
Arvada (2 Counties)	0.2632%
Aurora (3 Counties)	4.6336%
Bennett (2 Counties)	0.1670%
Brighton (2 Counties)	1.4527%
Commerce City	4.7314%
Federal Heights	1.1457%
Lochbuie (2 Counties)	0.0001%
Northglenn (2 Counties)	2.0913%
Thornton (2 Counties)	10.6435%
Westminster (2 Counties)	6.5342%

Alamosa County	85.3075%
Alamosa	14.6818%
Hooper	0.0108%

Arapahoe County	42.7003%
Aurora (3 Counties)	35.5997%
Bennett (2 Counties)	0.0324%
Bow Mar (2 Counties)	0.0159%
Centennial	0.4411%
Cherry Hills Village	0.6685%
Columbine Valley	0.1601%
Deer Trail	0.0003%
Englewood	5.5850%
Foxfield	0.0372%
Glendale	1.2289%
Greenwood Village	2.8305%
Littleton (3 Counties)	8.5654%
Sheridan	2.1347%

Archuleta County	90.0864%
Pagosa Springs	9.9136%

Baca County	85.9800%
Campo	2.4443%
Pritchett	1.5680%
Springfield	7.0100%

Government Name	Intracounty Share
Two Buttes	0.4766%
Vilas	0.9070%
Walsh	1.6141%

Bent County	80.9608%
Las Animas	19.0392%

Boulder County	47.6311%
Boulder	31.7629%
Erie (2 Counties)	0.3634%
Jamestown	0.0086%
Lafayette	3.3203%
Longmont (2 Counties)	14.6833%
Louisville	1.4455%
Lyons	0.5916%
Nederland	0.1646%
Superior (2 Counties)	0.0258%
Ward	0.0030%

Broomfield County/City	100.0000%
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Chaffee County	74.8440%
Buena Vista	5.8841%
Poncha Springs	4.2369%
Salida	15.0350%

Cheyenne County	66.8002%
Cheyenne Wells	0.8586%
Kit Carson	32.3412%

Clear Creek County	92.2164%
Central City (2 Counties)	0.0000%
Empire	0.3364%
Georgetown	1.9063%
Idaho Springs	4.7625%
Silver Plume	0.7784%

Conejos County	77.1204%
Antonito	4.6338%
La Jara	2.4313%
Manassa	1.0062%
Romeo	2.4270%
Sanford	12.3812%

Government Name	Intracounty Share
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Costilla County	97.3454%
Blanca	1.2036%
San Luis	1.4509%

Crowley County	80.7081%
Crowley	4.3597%
Olney Springs	8.3683%
Ordway	0.1853%
Sugar City	6.3786%

Custer County	96.6858%
Silver Cliff	0.7954%
Westcliffe	2.5188%

Delta County	76.3512%
Cedaredge	3.6221%
Crawford	0.4938%
Delta	16.2658%
Hotchkiss	1.0963%
Orchard City	0.1473%
Paonia	2.0236%

Denver County/City	100.0000%
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Dolores County	76.3307%
Dove Creek	17.3127%
Rico	6.3566%

Douglas County	71.8404%
Aurora (3 Counties)	0.2099%
Castle Pines	0.2007%
Castle Rock	13.5204%
Larkspur	0.0856%
Littleton (3 Counties)	0.0156%
Lone Tree	5.2786%
Parker	8.8487%

Eagle County	60.8236%
Avon	7.6631%
Basalt (2 Counties)	2.2311%
Eagle	3.1376%
Gypsum	1.7469%
Minturn	0.7771%

Government Name	Intracounty Share
Red Cliff	0.0957%
Vail	23.5250%

El Paso County	18.4181%
Calhan	0.0228%
Colorado Springs	80.1161%
Fountain	0.9892%
Green Mountain Falls (2 Counties)	0.0149%
Manitou Springs	0.2411%
Monument	0.1492%
Palmer Lake	0.0455%
Ramah	0.0033%

Elbert County	86.5840%
Elizabeth	10.2633%
Kiowa	1.5455%
Simla	1.6072%

Fremont County	60.7882%
Brookside	0.0348%
Cañon City	30.9017%
Coal Creek	0.0476%
Florence	8.0681%
Rockvale	0.0687%
Williamsburg	0.0907%

Garfield County	76.3371%
Carbondale	2.4698%
Glenwood Springs	11.8141%
New Castle	1.4295%
Parachute	1.0653%
Rifle	5.2733%
Silt	1.6110%

Gilpin County	46.8613%
Black Hawk	46.3909%
Central City (2 Counties)	6.7478%

Grand County	80.1046%
Fraser	2.4903%
Granby	5.4008%
Grand Lake	0.3174%
Hot Sulphur Springs	0.1431%
Kremmling	2.9284%

Government Name	Intracounty Share
Winter Park	8.6154%

Gunnison County	88.9185%
Crested Butte	2.3562%
Gunnison	5.9501%
Marble	0.1714%
Mount Crested Butte	2.5657%
Pitkin	0.0381%

Hinsdale County	76.0940%
Lake City	23.9060%

Huerfano County	68.2709%
La Veta	11.0719%
Walsenburg	20.6572%

Jackson County	61.5339%
Walden	38.4661%

Jefferson County	58.2140%
Arvada (2 Counties)	11.9733%
Bow Mar (2 Counties)	0.0087%
Edgewater	0.6604%
Golden	3.4815%
Lakeside	0.0030%
Lakewood	15.9399%
Littleton (3 Counties)	0.6176%
Morrison	0.2205%
Mountain View	0.1344%
Superior (2 Counties)	0.0000%
Westminster (2 Counties)	5.4779%
Wheat Ridge	3.2689%

Kiowa County	93.2138%
Eads	5.3777%
Haswell	0.6402%
Sheridan Lake	0.7682%

Kit Carson County	86.3178%
Bethune	0.1841%
Burlington	12.0640%
Flagler	0.4264%
Seibert	0.0291%
Stratton	0.9012%

Government Name	Intracounty Share
Vona	0.0775%

La Plata County	66.8874%
Bayfield	1.6292%
Durango	29.2985%
Ignacio	2.1849%

Lake County	73.4523%
Leadville	26.5477%

Larimer County	56.0589%
Berthoud (2 Counties)	0.4139%
Estes Park	0.3502%
Fort Collins	18.5702%
Johnstown (2 Counties)	0.0711%
Loveland	23.4493%
Timnath (2 Counties)	0.2964%
Wellington	0.3653%
Windsor (2 Counties)	0.4248%

Las Animas County	77.8076%
Aguilar	0.0751%
Branson	0.0101%
Cokedale	0.0188%
Kim	0.0101%
Starkville	0.0087%
Trinidad	22.0696%

Lincoln County	91.3222%
Arriba	0.3444%
Genoa	0.2222%
Hugo	1.4778%
Limon	6.6333%

Logan County	72.7982%
Crook	0.0931%
Fleming	0.3413%
Iliff	0.0095%
Merino	0.4702%
Peetz	0.2029%
Sterling	26.0848%

Mesa County	60.8549%
Collbran	0.0920%

Government Name	Intracounty Share
De Beque	0.0123%
Fruita	1.6696%
Grand Junction	37.1505%
Palisade	0.2208%

Mineral County	87.6744%
City of Creede	12.3256%

Moffat County	91.7981%
Craig	8.1862%
Dinosaur	0.0157%

Montezuma County	79.6682%
Cortez	18.6459%
Dolores	0.6106%
Mancos	1.0753%

Montrose County	92.8648%
Montrose	6.5980%
Naturita	0.1551%
Nucla	0.0703%
Olathe	0.3118%

Morgan County	61.6991%
Brush	8.5522%
Fort Morgan	27.8214%
Hillrose	0.1986%
Log Lane Village	0.6424%
Wiggins	1.0863%

Otero County	60.8168%
Cheraw	0.1888%
Fowler	1.0413%
La Junta	25.9225%
Manzanola	0.6983%
Rocky Ford	8.8215%
Swink	2.5109%

Ouray County	76.0810%
Ouray	17.6541%
Ridgway	6.2649%

Park County	96.3983%
Alma	0.7780%

Government Name	Intracounty Share
Fairplay	2.8237%

Phillips County	52.3463%
Haxtun	13.9505%
Holyoke	33.1803%
Paoli	0.5228%

Pitkin County	47.1379%
Aspen	42.0707%
Basalt (2 Counties)	1.1156%
Snowmass Village	9.6757%

Prowers County	70.4524%
Granada	0.9965%
Hartman	0.3164%
Holly	4.9826%
Lamar	21.5860%
Wiley	1.6661%

Pueblo County	54.6622%
Boone	0.0019%
Pueblo	45.3350%
Rye	0.0008%

Rio Blanco County	78.2831%
Meeker	9.1326%
Rangely	12.5843%

Rio Grande County	68.0724%
Center (2 Counties)	0.7713%
Del Norte	6.7762%
Monte Vista	20.4513%
South Fork	3.9288%

Routt County	58.5353%
Hayden	1.0679%
Oak Creek	0.6360%
Steamboat Springs	39.4499%
Yampa	0.3109%

Saguache County	92.8796%
Bonanza	0.1367%
Center (2 Counties)	6.3687%
Crestone	0.0137%

Government Name	Intracounty Share
Moffat	0.3553%
Saguache	0.2460%

San Juan County	87.0423%
Silverton	12.9577%

San Miguel County	48.7493%
Mountain Village	25.7930%
Norwood	0.4078%
Ophir	0.0816%
Sawpit	0.0272%
Telluride	24.9411%

Sedgwick County	98.7331%
Julesburg	0.3830%
Ovid	0.0295%
Sedgwick	0.8544%

Summit County	57.0567%
Blue River	0.5011%
Breckenridge	26.1112%
Dillon	4.1421%
Frisco	6.5096%
Montezuma	0.0169%
Silverthorne	5.6623%

Teller County	66.1557%
Cripple Creek	17.2992%
Green Mountain Falls (2 Counties)	0.0322%
Victor	3.1685%
Woodland Park	13.3445%

Washington County	99.1320%
Akron	0.7659%
Otis	0.1021%

Weld County	51.9387%
Ault	0.3202%
Berthoud (2 Counties)	0.0061%
Brighton (2 Counties)	0.0927%
Dacono	0.6104%
Eaton	0.4573%
Erie (2 Counties)	0.8591%
Evans	4.5121%

Government Name	Intracounty Share
Firestone	1.4648%
Fort Lupton	0.8502%
Frederick	1.2228%
Garden City	0.1514%
Gilcrest	0.1580%
Greeley	30.6922%
Grover	0.0852%
Hudson	0.0066%
Johnstown (2 Counties)	1.5416%
Keenesburg	0.0215%
Kersey	0.1378%
La Salle	0.4128%
Lochbuie (2 Counties)	0.4004%
Longmont (2 Counties)	0.0154%
Mead	0.0941%
Milliken	1.5373%
Northglenn (2 Counties)	0.0030%
Nunn	0.2558%
Pierce	0.0948%
Platteville	0.3712%
Raymer (New Raymer)	0.0597%
Severance	0.0403%
Thornton (2 Counties)	0.0000%
Timnath (2 Counties)	0.0000%
Windsor (2 Counties)	1.5865%

Yuma County	75.5598%
Eckley	2.5422%
Wray	10.2148%
Yuma	11.6832%

¹ These allocations are based on the allocation model used in the Negotiation Class website. The allocation model is the product of prolonged and intensive research, analysis, and discussion by and among members of the court-appointed Plaintiffs' Executive Committee and Settlement Committee and their retained public health and health economics experts, as well as a series of meetings with scores of cities, counties and subdivisions. Additional information about the allocation model is available on the Negotiation Class website.

The allocations in the Negotiation Class website use two different methodologies:

County-Level Allocation

The allocation model uses three factors, based on reliable, detailed, and objective data collected and reported by the federal government, to determine the share of a settlement fund that each county will receive. The three factors are: (1) the amount of opioids shipped to the county, (2) the number of opioid deaths in that county, and (3) the number of people who suffer opioid use disorder in that county.

County/Municipal-Level Allocation

The county/municipal-level allocation is a default allocation to be used if another agreement is not reached between the county and its constituent cities. The formula uses U.S. Census Bureau data on local government spending. This data covers cities and counties for 98% of the U.S. population. If a jurisdiction lacked this data, it was extrapolated based on available data.

² The municipalities of Bow Mar, Johnstown, and Timnath were not reflected as being in multiple counties in the Negotiation Class website. The estimated allocations to those cities are based on the same methodology used in the website, in consultation with the expert. For cities in multiple counties, please see each county in which that city lies.

Exhibit F

Regional Allocations		
Region Number	Region Description	Total State Share
1	Northwest	0.9522%
2	Larimer	6.5211%
3	Weld	3.8908%
4	Logan	1.5896%
5	North Central	2.1061%
6	Boulder	5.7936%
7	Broomfield	1.0014%
8	Adams	9.4247%
9	Arapahoe	10.8071%
10	Jefferson	10.7114%
11	Denver	15.0042%
12	Douglas	3.6696%
13	Mesa	2.8911%
14	Southwest	1.4700%
15	Central	1.5627%
16	El Paso/Teller	12.6116%
17	Southwest Corner	1.4375%
18	South Central	1.0973%
19	Southeast	7.4580%
Total		100.0000%

Exhibit G

Regional Governance Models

A. Membership Structure

Single-County Regions

1. Voting Members (Recommended List: Participating Local Governments to Decide)
 - 1 or 2 representatives appointed by the county (can be commissioners)
 - 1 representative appointed from the public health department
 - 1 representative from the county human services department
 - 1 representative appointed from law enforcement within region (sheriff, police, local city or town district attorney, etc.)
 - 1 representative appointed from a municipal or county court system within region
 - 1-3 representatives (total) appointed by the cities within the county (or other city or cities agreed upon) (can be councilmembers and mayors)
 - Such other representatives as participating counties/cities agree on (not to include providers who may be recipients of funds)
2. Non-Voting Members (Optional but strongly encouraged)
 - Representatives from behavioral health providers
 - Representatives from health care providers
 - Recovery/treatment experts
 - Other county or city representatives
 - A representative from the Attorney General's Office
 - Community representative(s), preferably those with lived experience with the opioid crisis
 - Harm reduction experts

Multi-County Regions

1. Voting Members (Recommended List: Participating Local Governments to Decide)
 - 1 representative appointed by each county (can be commissioners)
 - 1 representative appointed by a rotating city within each county (or other city agreed upon) (can be councilmembers and mayors)
 - 1 representative from each public health department within the region
 - 1 representative from a county human services department
 - At least 1 representative appointed from law enforcement within region (sheriff, police, local city or town district attorney, etc.)
 - 1 representative from a municipal or county court system within region
 - Such other representatives as participating counties/cities agree on (not to include providers who may be recipients of funds)
2. Non-Voting Members (Optional)
 - Representatives from behavioral health providers

- Representatives from health care providers
- Recovery/treatment experts
- Other county or city representatives
- A representative from the Attorney General’s Office
- Community representative(s), preferably those with lived experience with the opioid crisis.
- Harm reduction experts

Single-County Single-City Regions (Denver & Broomfield)

1. Voting Members (Recommended List: Participating Local Government to Decide)¹

- 1 representative appointed by the city and county
- 1 representative appointed from the public health department
- 1 representative from the county human services department
- 1 representative appointed from law enforcement within region (sheriff, police, district attorney, etc.)
- 1 representative appointed from a municipal or county court system within region
- Such other representatives as participating counties/cities agree on (not to include providers who may be recipients of funds)

2. Non-Voting Members (Optional)

- Representatives from behavioral health providers
- Representatives from health care providers
- Recovery/treatment experts
- Other county or city representatives
- A representative from the Attorney General’s Office
- Community representative(s), preferably those with lived experience with the opioid crisis.
- Harm reduction experts

B. Member Terms

- Regions may establish terms of appointment for members. Appointment terms may be staggered.

C. Procedures

- Regions will be governed by an intergovernmental agreement (“IGA”) or memorandum of understanding (“MOU”).
- Regions may adopt the Model Colorado Regional Opioid Intergovernmental Agreement, attached here as Exhibit G-1, in its entirety or alter or amend it as they deem appropriate.

¹ In Denver, the Mayor shall make voting member appointments to the Regional Council. In Broomfield, the City and County Manager shall make voting member appointments to the Regional Council.

- Regions may establish their own procedures through adoption of bylaws (model bylaws to be made available).
- Meetings of regional board/committee shall be open to the public and comply with the Colorado Open Meetings Law (including requirement to keep minutes).

D. Financial Responsibility/Controls

- A local government entity shall nominate and designate a fiscal agent for the Region.
- A Regional fiscal agent must be appointed by the Regional Council on an annual basis. A Regional fiscal agent may serve as long as the Regional Council determines is appropriate, including the length of any Settlement that contemplates the distribution of Opioid Funds within Colorado. However, the Regional fiscal agent also can change over time.
- Regional fiscal agents must be a board of county commissioners or a city or town council or executive department, such as a department of finance.
- Yearly reporting by fiscal agent (using standard form) to the Abatement Council.
- All documents subject to CORA.

E. Conflicts of Interest

- Voting members shall abide by the conflict-of-interest rules applicable to local government officials under state law.

F. Ethics Laws

- Voting members shall abide by applicable state or local ethics laws, as appropriate.

G. Authority

- The Regional Council for each region shall have authority to decide how funds allocated to the region shall be distributed in accordance with the Colorado MOU and shall direct the fiscal agent accordingly.
- Any necessary contracts will be entered into by the fiscal agent, subject to approval by the Regional Council.

H. Legal Status

- The region shall not be considered a separate legal entity, unless the Participating Local Governments decide, through an IGA, to create a separate governmental entity.

Exhibit G-1

MODEL COLORADO REGIONAL OPIOID
INTERGOVERNMENTAL AGREEMENT²

THIS MODEL COLORADO REGIONAL OPIOID INTERGOVERNMENTAL AGREEMENT (the “Regional Agreement”) is made between _____, a Participating Local Government, as defined in the Colorado MOU, in the _____ Region (“_____”) and _____, a Participating Local Government in the _____ Region, (“_____”), individually herein a “Regional PLG” and collectively the “Regional PLGs.””

RECITALS

WHEREAS, the State of Colorado and Participating Local Governments executed the Colorado Opioids Summary Memorandum of Understanding on _____ 2021 (the “Colorado MOU”), establishing the manner in which Opioid Funds shall be divided and distributed within the State of Colorado;

WHEREAS, the Regional Agreement assumes and incorporates the definitions and provisions contained in the Colorado MOU, and the Regional Agreement shall be construed in conformity with the Colorado MOU³;

WHEREAS, all Opioid Funds, regardless of allocation, shall be used for Approved Purposes;

WHEREAS, Participating Local Governments shall organize themselves into Regions, as further depicted in **Exhibit E** to the Colorado MOU;

² This Model Regional Agreement is meant to serve as an example for the various Regions and to facilitate the flow of Opioid Funds to their intended purposes. Regions are free to adopt this Regional Agreement in its entirety or alter or amend it as they deem appropriate.

³ When drafting agreements like this Regional Agreement, Regional PLGs should be conscious of the definitions used therein so as not to confuse such definitions with those used in the Colorado MOU. The Definitions in the Colorado MOU shall supersede any definitions used by Regional PLGs in a Regional Agreement.

WHEREAS, Regions may consist of Single-County Regions, Multi-County Regions, or Single County-Single City Regions (Denver and Broomfield).

WHEREAS, there shall be a 60% direct allocation of Opioid Funds to Regions through a Regional Share;

WHEREAS, each Region shall be eligible to receive a Regional Share according to **Exhibit C** to the Colorado MOU;

WHEREAS, the Colorado MOU establishes the procedures by which each Region shall be entitled to Opioid Funds from the Abatement Council and administer its Regional Share allocation;

WHEREAS, the procedures established by the Colorado MOU include a requirement that each Region shall create its own Regional Council;

WHEREAS, all aspects of the creation, administration, and operation of the Regional Council shall proceed in accordance with the provisions of the Colorado MOU;

WHEREAS, each such Regional Council shall designate a fiscal agent from a county or municipal government within that Region;

WHEREAS, each such Regional Council shall submit a two-year plan to the Abatement Council that identifies the Approved Purposes for which the requested funds will be used, and the Regional Council's fiscal agent shall provide data and a certification to the Abatement Council regarding compliance with its two-year plan on an annual basis;

WHEREAS, the Regional Agreement pertains to the procedures for the Regional PLGs to establish a Regional Council, designate a fiscal agent, and request and administer Opioid Funds in a manner consistent with the Colorado MOU;

NOW, THEREFORE, in consideration of the mutual covenants and agreements hereinafter set forth and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Regional PLGs incorporate the recitals set forth above and agree as follows:

1. **DEFINITIONS**. The defined terms used in this Regional Agreement shall have the same meanings as in the Colorado MOU⁴. Capitalized terms used herein and not otherwise defined within the Regional Agreement or in the Colorado MOU shall have the meanings ascribed to them in the body of the Regional Agreement.
2. **OBLIGATIONS OF THE REGIONAL PLGS**. The Regional PLGs shall perform their respective obligations as set forth in the Regional Agreement, the Colorado MOU and the accompanying exhibits to the Colorado MOU and incorporated herein by reference.

3. **REGIONAL COUNCIL**.

3.1. Purpose: In accordance with the Colorado MOU, a Regional Council, consisting of representatives appointed by the Regional PLGs, shall be created to oversee the procedures by which a Region may request Opioid Funds from the Abatement Council and the procedures by which the allocation of its Region's Share of Opioid Funds are administered.

3.2. Membership: The Regional Council of a Multi-County or Single County Region shall consist of the following:

a. **Multi-County Region:**

- (i) **Voting Members.** Voting Members shall be appointed by the Regional PLGs. The Regional PLGs shall collaborate to appoint Regional Council members and to the extent practicable, Voting Members shall be selected from different counties and cities. No single county or city should dominate the make-up of the Regional Council. Voting Members shall be selected as follows:
 - (1) 1 representative appointed by each county (can be commissioners).
 - (2) 1 representative appointed from a rotating city within each county (or other city agreed upon) (can be councilmembers and mayors). A rotating city member shall be selected by majority vote of the cities within each county who do not have a Voting Member currently sitting on the Regional

⁴ See FN 2, *supra*.

Council.

- (3) 1 representative from each public health department within the region.
- (4) 1 representative from a county human services department.
- (5) At least 1 representative appointed from law enforcement within the region (sheriff, police, local city or town district attorney, etc.).
- (6) 1 representative from a municipal or county court system within the region.

b. Single-County Region:

- (i) **Voting Members.** Voting Members shall be appointed by the Regional PLGs. The Regional PLGs shall collaborate to appoint Regional Council members and to the extent practicable, Voting Members shall be selected from different cities within the region. No single city should dominate the make-up of the Regional Council. Voting Members shall be selected as follows:
 - (1) 1 or 2 representatives appointed by the county (can be commissioners)
 - (2) 1 representative appointed from the public health department
 - (3) 1 representative from the county human services department
 - (4) 1 representative appointed from law enforcement within region (sheriff, police, local city or town district attorney, etc.)
 - (5) 1 representative appointed from a municipal or county court system within region
 - (6) 1-3 representatives (total) appointed by rotating cities within the county (or other city or cities agreed upon) (can be councilmembers and mayors). Rotating city members shall be selected by majority vote of the cities who do not have a Voting Member currently sitting on the Regional Council.
 - (7) Such other representatives as participating counties/cities agree on (not to include providers who may be recipients of

funds)

- c. **Non-Voting Members.** For both Multi-County and Single County Regions, Non-Voting Members are optional but are strongly encouraged. Non-voting members shall serve in an advisory capacity. Any Non-Voting Members shall be appointed by the Regional PLGs and may be comprised of all or some of the following, not to include potential recipients of funds:
 - (i) Representatives from behavioral health providers.
 - (ii) Representatives from health care providers.
 - (iii) Recovery/treatment experts.
 - (iv) Other county or city representatives.
 - (v) A representative from the Attorney General's Office.
 - (vi) Community representative(s), preferably those with lived experience with the opioid crisis.
 - (vii) Harm reduction experts.
- d. **Acting Chair:** The Voting Members for both Multi-County and Single-County Regions shall appoint one member to serve as Acting Chair of the Regional Council. The Acting Chair's primary responsibilities shall be to schedule periodic meetings and votes of the Regional Council as needed and to serve as the point of contact for disputes within the Region. The Acting Chair must be either a Member from a county within a Region, such as a county commissioner or their designee, or a Member from a city or town within a Region, such as a mayor or city or town council member or their designee.
- e. **Non-Participation:** A Local Government that chooses not to become a Participating Local Government in the Colorado MOU shall not receive any Opioid Funds from the Regional Share or participate in the Regional Council.
- f. **Terms:** The Regional Council shall be established within ninety (90) days of the first Settlement being entered by a court of competent jurisdiction, including any bankruptcy court. In order to do so, within sixty (60) days of the first Settlement being entered, CCI and CML shall jointly recommend six (6) Voting Members, and so long as such recommendations comply with the terms of Section 3.2 (a) or (b), the Regional Council shall consist of CCI/CML's recommended Members for

an initial term not to exceed one year.⁵ Thereafter, Voting Members shall be appointed in accordance with Section 3.2 (a) or (b) and shall serve two-year terms. Following the expiration of that two-year term, the Regional PLGs, working in concert, shall reappoint that Voting Member, or appoint a new Voting Member according to Section 3.2 (a) or (b).

- (i) If a Voting Member resigns or is otherwise removed from the Regional Council prior to the expiration of their term, a replacement Voting Member shall be appointed within sixty (60) days in accordance with Section 3.2 (a) or (b) to serve the remainder of the term. If the Regional PLGs are unable to fill a Voting Member vacancy within sixty (60) days, the existing Voting Members of the Regional Council at the time of the vacancy shall work collectively to appoint a replacement Voting Member in accordance with Section 3.2 (a) or (b). At the end of his or her term, the individual serving as that replacement Voting Member may be reappointed by the Regional PLGs to serve a full term consistent with this Section.
- (ii) The purpose of the two-year term is to allow Regional PLGs an increased opportunity to serve on the Regional Council. However, Regional Council members who have already served on the Regional Council may be appointed more than once and may serve consecutive terms if appointed to do so by the Regional Council.

3.3. Duties: The Regional Council is primarily responsible for engaging with the Abatement Council on behalf of its Region and following the procedures outlined in the Colorado MOU for requesting Opioid Funds from the Regional Share, which shall include developing 2-year plans, amending those plans as appropriate, and providing the Abatement Council with data through its fiscal agent regarding Opioid Fund expenditures. Upon request from the Abatement Council, the Regional Council may also be subject to an accounting from the Abatement Council.

3.4. Governance: A Regional Council may establish its own procedures through adoption of bylaws if needed. Any governing documents must be consistent with the other provisions in this section and the Colorado MOU.

3.5. Authority: The terms of the Colorado MOU control the authority of a Regional Council and a Regional Council shall not stray outside the bounds of the authority and power vested by the Colorado MOU. Should a Regional Council require legal assistance in determining its authority,

⁵ Local Governments within Multi-County or Single County Regions may decide to select initial Voting Members of the Regional Council between themselves and without CCI and CML involvement. However, the Regional Council must be established within ninety (90) days of the first Settlement being entered by a court of competent jurisdiction, including any bankruptcy court.

it may seek guidance from the legal counsel of the county or municipal government of the Regional Council's fiscal agent at the time the issue arises.

3.6. Collaboration: The Regional Council shall facilitate collaboration between the State, Participating Local Governments within its Region, the Abatement Council, and other stakeholders within its Region for the purposes of sharing data, outcomes, strategies, and other relevant information related to abating the opioid crisis in Colorado.

3.7. Transparency: The Regional Council shall operate with all reasonable transparency and abide by all Colorado laws relating to open records and meetings. To the extent the Abatement Council requests outcome-related data from the Regional Council, the Regional Council shall provide such data in an effort to determine best methods for abating the opioid crisis in Colorado.

3.8. Conflicts of Interest: Voting Members shall abide by the conflict-of-interest rules applicable to local government officials under state law.

3.9. Ethics Laws: Voting Members shall abide by their local ethics laws or, if no such ethics laws exist, by applicable state ethics laws.

3.10. Decision Making: The Regional Council shall seek to make all decisions by consensus. In the event consensus cannot be achieved, the Regional Council shall make decisions by a majority vote of its Members.

4. REGIONAL FISCAL AGENT

4.1. Purpose: According to the Colorado MOU, the Regional Council must designate a fiscal agent for the Region prior to the Region receiving any Opioid funds from the Regional Share. All funds from the Regional Share shall be distributed to the Regional Council's fiscal agent for the benefit of the entire Region.

4.2. Designation: The Regional Council shall nominate and designate a fiscal agent for the Region by majority vote. Regional fiscal agents must be a board of county commissioners or a city or town council or executive department, such as a department of finance.

4.3. Term: A Regional fiscal agent must be appointed by the Regional Council on an annual basis. A Regional fiscal agent may serve as long as the Regional Council determines is appropriate, including the length of any Settlement that contemplates the distribution of Opioid Funds within Colorado.

4.4. Duties: The Regional fiscal agent shall receive, deposit, and make available Opioid Funds distributed from the Abatement Council and provide expenditure reporting data to the

Abatement Council on an annual basis. In addition, the Regional fiscal agent shall perform certain recordkeeping duties outlined below.

- a. **Opioid Funds:** The Regional fiscal agent shall receive all Opioid Funds as distributed by the Abatement Council. Upon direction by the Regional Council, the Regional fiscal agent shall make any such Opioid Funds available to the Regional Council.
- b. **Reporting:** On an annual basis, as determined by the Abatement Council, the Regional fiscal agent shall provide to the Abatement Council the Regional Council's expenditure data from their allocation of the Regional Share and certify to the Abatement Council that the Regional Council's expenditures were for Approved Purposes and complied with its 2-year plan.
- c. **Recordkeeping:** The Regional fiscal agent shall maintain necessary records with regard the Regional Council's meetings, decisions, plans, and expenditure data.

4.5. Authority: The fiscal agent serves at the direction of the Regional Council and in service to the entire Region. The terms of the Colorado MOU control the authority of a Regional Council, and by extension, the Regional fiscal agent. A Regional fiscal agent shall not stray outside the bounds of the authority and power vested by the Colorado MOU.

5. REGIONAL TWO-YEAR PLAN

5.1. Purpose: According to the Colorado MOU, as part of a Regional Council's request to the Abatement Council for Opioid Funds from its Regional Share, the Regional Council must submit a 2-year plan identifying the Approved Purposes for which the requested funds will be used.

5.2 Development of 2-Year Plan: In developing a 2-year plan, the Regional Council shall solicit recommendations and information from all Regional PLGs and other stakeholders within its Region for the purposes of sharing data, outcomes, strategies, and other relevant information related to abating the opioid crisis in Colorado. At its discretion, a Regional Council may seek assistance from the Abatement Council for purposes of developing a 2-year plan.

5.3 Amendment: At any point, a Regional Council's 2-year plan may be amended so long as such amendments comply with the terms of the Colorado MOU and any Settlement.

6. DISPUTES WITHIN REGION. In the event that any Regional PLG disagrees with a decision of the Regional Council, or there is a dispute regarding the appointment of Voting or Non-Voting Members to the Regional Council, that Regional PLG shall inform the Acting Chair of its dispute at the earliest

possible opportunity. In Response, the Regional Council shall gather any information necessary to resolve the dispute. Within fourteen (14) days of the Regional PLG informing the Acting Chair of its dispute, the Regional Council shall issue a decision with respect to the dispute. In reaching its decision, the Regional Council may hold a vote of Voting Members, with the Acting Chair serving as the tie-breaker, or the Regional Council may devise its own dispute resolution process. However, in any disputes regarding the appointment of a Voting Member, that Voting Member will be recused from voting on the dispute. The decision of the Regional Council is a final decision.

7. **DISPUTES WITH ABATEMENT COUNCIL.** If the Regional Council disputes the amount of Opioid Funds it receives from its allocation of the Regional Share, the Regional Council shall alert the Abatement Council within sixty (60) days of discovering the information underlying the dispute. However, the failure to alert the Abatement Council within this time frame shall not constitute a waiver of the Regional Council's right to seek recoupment of any deficiency in its Regional Share.
8. **RECORDKEEPING.** The acting Regional fiscal agent shall be responsible for maintaining records consistent with the Regional Agreement.
9. **AUTHORIZED REPRESENTATIVES.** Each Regional PLGs' representative designated below shall be the point of contact to coordinate the obligations as provided herein. The Regional PLGs designate their authorized representatives under this Regional Agreement as follows:
 - 9.1. _____ designates the _____ of the _____ or their designee(s).
 - 9.2. _____ designates the _____ of the _____ or their designee(s).
10. **OBLIGATIONS OF THE REGIONAL PLGS.** The Regional PLGs shall perform their respective obligations as set forth in the Regional Agreement, the Colorado MOU and the accompanying exhibits to the Colorado MOU and incorporated herein by reference.
11. **TERM.** The Regional Agreement will commence on _____, and shall expire on the date the last action is taken by the Region, consistent with the terms of the Colorado MOU and any Settlement. (the "Term").
12. **INFORMATIONAL OBLIGATIONS.** Each Regional PLG hereto will meet its obligations as set forth in § 29-1-205, C.R.S., as amended, to include information about this Regional Agreement in a filing with the Colorado Division of Local Government; however, failure to do so shall in no way affect the validity of this Regional Agreement or any remedies available to the Regional PLGs hereunder.
13. **CONFIDENTIALITY.** The Regional PLGs, for themselves, their agents, employees and representatives, agree that they will not divulge any confidential or proprietary information they receive from another Regional PLG or otherwise have access to, except as may be required by law. Nothing in this Regional

Agreement shall in any way limit the ability of the Regional PLGs to comply with any laws or legal process concerning disclosures by public entities. The Regional PLGs understand that all materials exchanged under this Regional Agreement, including confidential information or proprietary information, may be subject to the Colorado Open Records Act., § 24-72-201, *et seq.*, C.R.S., (the “Act”). In the event of a request to a Regional PLG for disclosure of confidential materials, the Regional PLG shall advise the Regional PLGs of such request in order to give the Regional PLGs the opportunity to object to the disclosure of any of its materials which it marked as, or otherwise asserts is, proprietary or confidential. If a Regional PLG objects to disclosure of any of its material, the Regional PLG shall identify the legal basis under the Act for any right to withhold. In the event of any action or the filing of a lawsuit to compel disclosure, the Regional PLG agrees to intervene in such action or lawsuit to protect and assert its claims of privilege against disclosure of such material or waive the same. If the matter is not resolved, the Regional PLGs may tender all material to the court for judicial determination of the issue of disclosure.

14. GOVERNING LAW; VENUE. This Regional Agreement shall be governed by the laws of the State of Colorado. Venue for any legal action relating solely to this Regional Agreement will be in the applicable District Court of the State of Colorado for the county of the Region’s fiscal agent. Venue for any legal action relating to the Colorado MOU shall be in a court of competent jurisdiction where a Settlement or consent decree was entered, as those terms are described or defined in the Colorado MOU. If a legal action relates to both a Regional Agreement and the Colorado MOU, venue shall also be in a court of competent jurisdiction where a Settlement or consent decree was entered.

15. TERMINATION. The Regional PLGs enter into this Regional Agreement to serve the public interest. If this Regional Agreement ceases to further the public interest, a Regional PLG, in its discretion, may terminate their participation in the Regional Agreement, in whole or in part, upon written notice to the other Regional PLGs. Each Regional PLG also has the right to terminate the Regional Agreement with cause upon written notice effective immediately, and without cause upon thirty (30) days prior written notice to the other Regional PLGs. A Regional PLG’s decision to terminate this Regional Agreement, with or without cause, shall have no impact on the other Regional PLGs present or future administration of its Opioid Funds and the other procedures outlined in this Regional Agreement. Rather, a Regional PLG’s decision to terminate this Regional Agreement shall have the same effect as non-participation, as outlined in Section 3.2 (e).

16. NOTICES. “Key Notices” under this Regional Agreement are notices regarding default, disputes, or termination of the Regional Agreement. Key Notices shall be given in writing and shall be deemed

received if given by confirmed electronic transmission that creates a record that may be retained, retrieved and reviewed by a recipient thereof, and that may be directly reproduced in paper form by such a recipient through an automated process, but specifically excluding facsimile transmissions and texts when transmitted, if transmitted on a business day and during normal business hours of the recipient, and otherwise on the next business day following transmission; certified mail, return receipt requested, postage prepaid, three business days after being deposited in the United States mail; or overnight carrier service or personal delivery, when received. For Key Notices, the Regional PLGs will follow up any electronic transmission with a hard copy of the communication by the means described above. All other communications or notices between the Regional PLGs that are not Key Notices may be done via electronic transmission. The Regional PLGs agree that any notice or communication transmitted by electronic transmission shall be treated in all manner and respects as an original written document; any such notice or communication shall be considered to have the same binding and legal effect as an original document. All Key Notices shall include a reference to the Regional Agreement, and Key Notices shall be given to the Regional PLGs at the following addresses:

17. GENERAL TERMS AND CONDITIONS

- 17.1. Independent Entities.** The Regional PLGs enter into this Regional Agreement as separate, independent governmental entities and shall maintain such status throughout.
- 17.2. Assignment.** This Regional Agreement shall not be assigned by any Regional PLG without the prior written consent of all Regional PLGs. Any assignment or subcontracting without such consent will be ineffective and void and will be cause for termination of this Regional Agreement.
- 17.3. Integration and Amendment.** This Regional Agreement represents the entire agreement between the Regional PLGs and terminates any oral or collateral agreement or understandings. This Regional Agreement may be amended only by a writing signed by the Regional PLGs. If any provision of this Regional Agreement is held invalid or unenforceable, no other provision shall be affected by such holding, and the remaining provision of this Regional Agreement shall continue in full force and effect.

- 17.4. No Construction Against Drafting Party.** The Regional PLGs and their respective counsel have had the opportunity to review the Regional Agreement, and the Regional Agreement will not be construed against any Regional PLG merely because any provisions of the Regional Agreement were prepared by a particular Regional PLG.
- 17.5. Captions and References.** The captions and headings in this Regional Agreement are for convenience of reference only and shall not be used to interpret, define, or limit its provisions. All references in this Regional Agreement to sections (whether spelled out or using the § symbol), subsections, exhibits or other attachments, are references to sections, subsections, exhibits or other attachments contained herein or incorporated as a part hereof, unless otherwise noted.
- 17.6. Statutes, Regulations, and Other Authority.** Any reference in this Regional Agreement to a statute, regulation, policy or other authority shall be interpreted to refer to such authority then current, as may have been changed or amended since the execution of this Regional Agreement.
- 17.7. Conflict of Interest.** No Regional PLG shall knowingly perform any act that would conflict in any manner with said Regional PLG's obligations hereunder. Each Regional PLG certifies that it is not engaged in any current project or business transaction, directly or indirectly, nor has it any interest, direct or indirect, with any person or business that might result in a conflict of interest in the performance of its obligations hereunder. No elected or employed member of any Regional PLG shall be paid or receive, directly or indirectly, any share or part of this Regional Agreement or any benefit that may arise therefrom.
- 17.8. Inurement.** The rights and obligations of the Regional PLGs to the Regional Agreement inure to the benefit of and shall be binding upon the Regional PLGs and their respective successors and assigns, provided assignments are consented to in accordance with the terms of the Regional Agreement.
- 17.9. Survival.** Notwithstanding anything to the contrary, the Regional PLGs understand and agree that all terms and conditions of this Regional Agreement and any exhibits that require continued performance or compliance beyond the termination or expiration of this Regional Agreement shall survive such termination or expiration and shall be enforceable against a Regional PLG if such Regional PLG fails to perform or comply with such term or condition.
- 17.10. Waiver of Rights and Remedies.** This Regional Agreement or any of its provisions may not be waived except in writing by a Regional PLG's authorized representative. The failure of a

Regional PLG to enforce any right arising under this Regional Agreement on one or more occasions will not operate as a waiver of that or any other right on that or any other occasion.

17.11. No Third-Party Beneficiaries. Enforcement of the terms of the Regional Agreement and all rights of action relating to enforcement are strictly reserved to the Regional PLGs. Nothing contained in the Regional Agreement gives or allows any claim or right of action to any third person or entity. Any person or entity other than the Regional PLGs receiving services or benefits pursuant to the Regional Agreement is an incidental beneficiary only.

17.12. Records Retention. The Regional PLGs shall maintain all records, including working papers, notes, and financial records in accordance with their applicable record retention schedules and policies. Copies of such records shall be furnished to the Parties request.

17.13. Execution by Counterparts; Electronic Signatures and Records. This Regional Agreement may be executed in two or more counterparts, each of which shall be deemed an original, but all of which shall constitute one and the same instrument. The Regional PLGs approve the use of electronic signatures for execution of this Regional Agreement. All use of electronic signatures shall be governed by the Uniform Electronic Transactions Act, C.R.S. §§ 24-71.3-101, *et seq.* The Regional PLGs agree not to deny the legal effect or enforceability of the Regional Agreement solely because it is in electronic form or because an electronic record was used in its formation. The Regional PLGs agree not to object to the admissibility of the Regional Agreement in the form of an electronic record, or a paper copy of an electronic document, or a paper copy of a document bearing an electronic signature, on the ground that it is an electronic record or electronic signature or that it is not in its original form or is not an original.

17.14. Authority to Execute. Each Regional PLG represents that all procedures necessary to authorize such Regional PLG's execution of this Regional Agreement have been performed and that the person signing for such Regional PLG has been authorized to execute the Regional Agreement.

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Colorado Opioids Settlement Memorandum of Understanding

Summary

Below is a brief overview of the key provisions outlined in the Colorado Opioids Settlement Memorandum of Understanding (“Colorado MOU”). The Colorado MOU was signed by Colorado Attorney General Phil Weiser on August 26, 2021. In order to receive the full settlement payments for all of Colorado, strong participation by local governments signing on to the Colorado MOU is necessary.

Local governments and the State prepared the Colorado MOU, which prioritizes regionalism, collaboration, and abatement in the sharing and distribution of opioid settlement funds. The points below summarize the framework laid out in the Colorado MOU for distributing and sharing opioids settlement proceeds throughout Colorado. Please see the full Colorado MOU and exhibits for additional details.

While Colorado’s local governments are currently being asked to participate in recent settlements with the “Big 3” Distributors (AmerisourceBergen, Cardinal Health, and McKesson) and Johnson & Johnson, the Colorado MOU is intended to apply to all current and future opioid settlements.

A. Allocation of Settlement Funds

The Colorado MOU provides the framework for fairly dividing and sharing settlement proceeds among the state and local governments in Colorado. Under the Colorado MOU, settlement proceeds will be distributed as follows:

- 1. 10% directly to the State (“State Share”)**
- 2. 20% directly to Participating Local Governments (“LG Share”)**
- 3. 60% directly to Regions (“Regional Share”)**
- 4. 10% to specific abatement infrastructure projects (“Statewide Infrastructure Share”)**

Under the Colorado MOU, all settlement funds must be used only for “Approved Purposes,” a long and broad list that focuses on abatement strategies. These strategies emphasize prevention, treatment, and harm reduction. Some examples of these strategies include training health care providers on opioid use disorder (“OUD”) treatment and responsible prescribing, expanding telehealth and mobile services for treatment, and increasing naloxone and rescue breathing supplies. The list of Approved Purposes is broad enough to be flexible for local communities, while ensuring that settlement funds are used to combat the opioid epidemic. The list of Approved Purposes is attached as Exhibit A to the MOU, unless the term is otherwise defined in a settlement.

B. General Abatement Fund Council

A General Abatement Fund Council (the “Abatement Council”), consisting of representatives appointed by the State and Participating Local Governments, will ensure that the distribution of opioid funds complies with the terms of any settlement and the terms of the Colorado MOU. The Abatement Council will consist of 13 members, seven appointed by the State and six appointed by the Participating Local Governments.

C. Local Government Share (20%)

Twenty percent of settlement funds will be paid directly to Participating Local Governments. Exhibit D to the Colorado MOU lists the percentage to each County Area (that is, the county government plus the municipalities within that county), and Exhibit E further breaks down those allocations to an intracounty level using a default allocation.

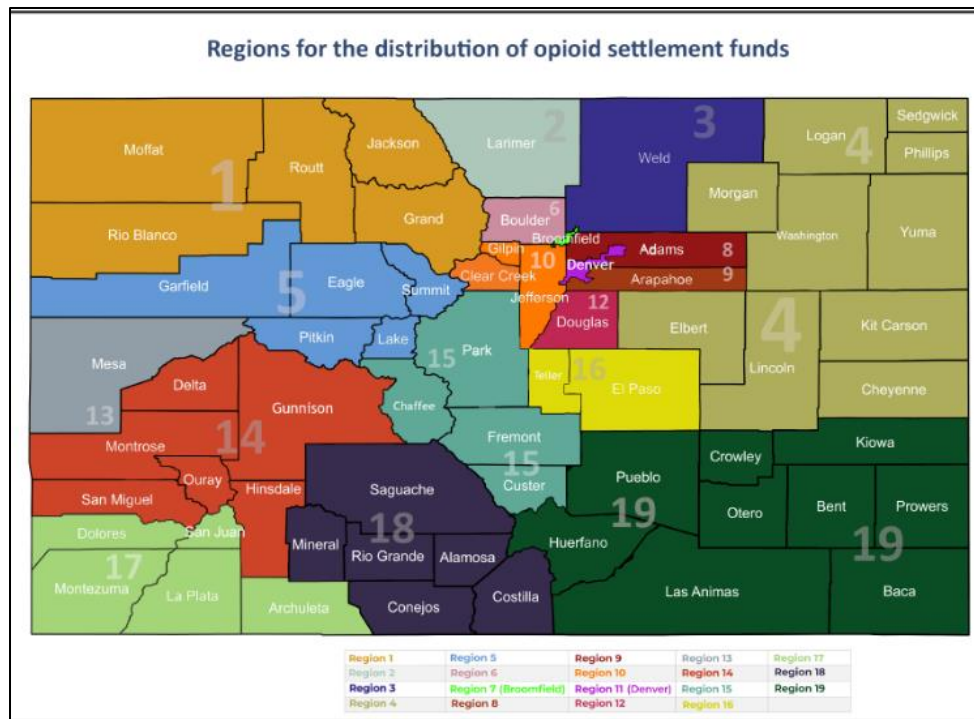
The allocations to each County Area in Exhibit D are based on three factors that address critical causes and effects of the opioid crisis: (1) the number of persons suffering opioid use disorder in the county; (2) the number of opioid overdose deaths that occurred in the county; and (3) the amount of opioids distributed within the county.

The intracounty allocations in Exhibit E are a default allocation that will apply unless the local governments in a County Area enter into a written agreement providing for a different allocation. These allocations are based on a model, developed by health economist experts, which uses data from the State and Local Government Census on past spending relevant to opioid abatement.

Participating Local Governments will provide data on expenditures from the LG Share to the Abatement Council on an annual basis. If a local government wishes, it may forego its LG Share and direct it to the Regional Share. A local government that chooses not to participate or sign onto the Colorado MOU will not receive funds from the LG Share and the portion of the LG Share that it would have received will instead be re-allocated to the Regional Share for the region where that local government is located.

D. Regional Share (60%)

Sixty percent of settlement funds will be allocated to single- or multi-county regions made up of local governments. These regions were drawn by local governments to make use of existing local infrastructure and relationships. The regional map is shown below, as well as in Exhibit C to the Colorado MOU:



Allocations to regions will be calculated according to the percentages in Exhibit F. Each region will create its own “Regional Council” to determine what Approved Purposes to fund with that region’s allocation from the Regional Share. Regional governance models are attached to the Colorado MOU as Exhibit G. Each region may draft its own intra-regional agreements, bylaws, or other governing documents to determine how the Regional Council will operate, subject to the terms of the Colorado MOU. Each Regional Council will provide expenditure data to the Abatement Council on an annual basis.

A local government that chooses not to participate or sign onto the Colorado MOU shall not receive any opioid funds from the Regional Share and shall not participate in the Regional Councils.

E. State Share (10%)

Ten percent of settlement funds will be allocated directly to the State for statewide priorities in combating the opioid epidemic. The State maintains full discretion over distribution of the State Share anywhere within the State of Colorado. On an annual basis, the State shall provide all data on expenditures from the State Share, including administrative costs, to the Abatement Council.

F. Statewide Infrastructure Share (10%)

Ten percent of the settlement funds will be allocated to a Statewide Infrastructure Share to promote capital improvements and provide operational assistance for the development or improvement of infrastructure necessary to abate the opioid crisis anywhere in Colorado.

The Abatement Council shall establish and publish policies and procedures for the distribution and oversight of the Statewide Infrastructure Share, including processes for local governments or regions to apply for opioid funds from the Statewide Infrastructure Share.

G. Attorneys' Fees and Expenses Paid Through a Back-Stop Fund

To a large extent, the national opioid settlements occurred because of the pressure that litigating entities and their counsel exerted on defendants through their lawsuits. The attorneys' fee provision equitably allocates the cost of attorneys' fees, while also allowing non-litigating entities to share in the 25% premium for releases by the litigating entities in the "Big 3" Distributor and Johnson & Johnson settlements. The work that was done by the litigating entities and their law firms in the litigation has substantially contributed to achieving the settlements that are currently being offered and those that are anticipated in the future.

The Attorney General and local governments have agreed to a "Back-Stop Fund" for attorneys' fees and costs. Before a law firm can apply to the Back-Stop Fund, it must first apply to any national common benefit fee fund. The Back-Stop Fund will only be used to pay the difference between what law firms are owed and the amount they have received from a national common benefit fee fund.

Attorneys' fees are limited to 8.7% of the total LG Share and 4.35% of the total Regional Share. No funds will be taken from the Statewide Infrastructure Share or State Share.

A committee will be formed to oversee payments from the Back-Stop Fund. The committee will include litigating and non-litigating entities. Importantly, any excess money in the Back-Stop fund, after attorneys' fees and costs are paid, will go back to the local governments.

H. Participation in the Colorado MOU and Expected Timeline

The MOU was designed to ensure that as many local governments as possible would agree to its terms. Strong participation from local governments is needed to receive the full settlement payments for all of Colorado. On August 26, 2021, Colorado Attorney General Phil Weiser signed the MOU. It is projected that settlement funds from the "Big 3" Distributor/Johnson & Johnson settlements could be made available as soon as July 2022 and will be distributed within Colorado according to the MOU.

Along with the MOU, each local government will need to sign a Subdivision Settlement Participation Form for each of the settlements (the "Big 3" Distributor settlement and the Johnson & Johnson settlement) releasing their legal claims and stating they are participating in the settlements. In addition, a Colorado Subdivision Escrow Agreement should be signed to ensure legal claims are released only when 95% participation by certain local governments has been reached. That 95% participation threshold is important because it triggers certain amounts of incentive payments under the settlements and signals to the settling pharmaceutical companies that the settlements have wide acceptance.

A copy of the MOU with signature pages for each local government, the Subdivision Settlement Participation Forms, and the Colorado Subdivision Escrow Agreement will be

provided by the Attorney General's Office. The documents should be executed by the individual or body with authority to do so on behalf of their respective county or municipality and submitted by mail or email to either CCI or CML at the following addresses:

<u>For Counties:</u> Colorado Counties, Inc. 800 Grant, Ste 500 Denver, CO 80203 Email: Kiley Burress at KBurress@ccionline.org Katie First at KFirst@ccionline.org	<u>For Municipalities:</u> Colorado Municipal League 1144 N. Sherman St. Denver, CO 80203 Email: opioidsettlement@cml.org
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If you have any questions, please reach out to Heidi Williams of the Colorado AG's office at Heidi.Williams@coag.gov.

Colorado Opioids Settlement MOU: Frequently Asked Questions

1. What does this “settle” and why does Colorado need an MOU?

Nationwide settlements have been reached with the “Big 3” opioid distributors (McKesson, Cardinal Health, and AmerisourceBergen) and opioid manufacturer Johnson & Johnson to resolve claims by state and local governments that these companies contributed to the opioid epidemic. The claims being settled include those raised by local governments in the national multi-district litigation (“MDL”), *In Re: National Prescription Opiate Litigation*, MDL 2804 (N.D. Ohio). More information about these settlements can be found at <https://nationalopioidsettlement.com/>.

The Colorado MOU establishes the framework for distributing and sharing these settlement proceeds throughout Colorado. Local governments and the State prepared the Colorado MOU, which prioritizes regionalism, collaboration, and abatement. It is expected that the Colorado MOU will also be used for settlements with other opioid defendants in the future, including any settlement from Purdue Pharma’s bankruptcy proceeding. Colorado Attorney General Phil Weiser signed the MOU on August 26, 2021. The Colorado MOU is included in this packet from the Attorney General’s Office and can also be found at www.coag.gov/opioids.

2. Who put together the Colorado MOU?

Local government officials from across Colorado were involved in the negotiation of the Colorado MOU with the Attorney General’s Office. County commissioners, mayors, county and city attorneys, and other stakeholders came together with the assistance of Colorado Counties, Inc. (“CCI”) and the Colorado Municipal League (“CML”) to establish the framework and negotiate the details of the Colorado MOU.

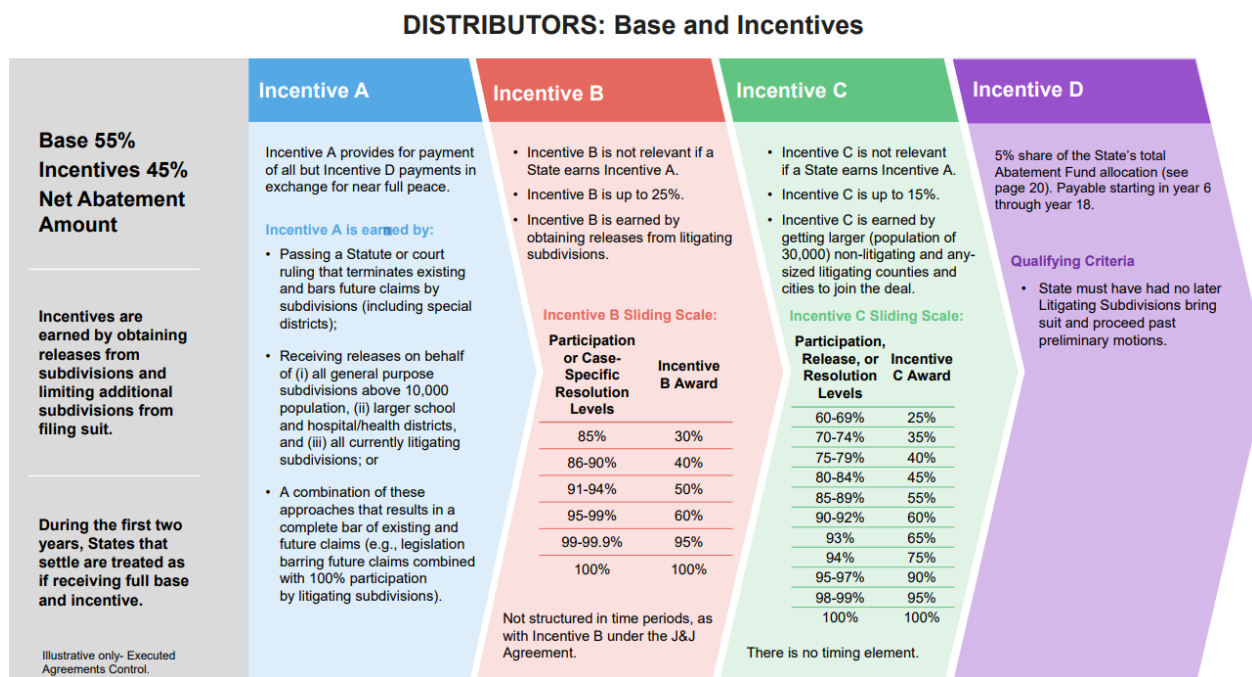
3. How much money will Colorado receive and over what period of time?

Funds from the Big 3 and Johnson & Johnson settlements will be distributed over a period of years. The Big 3 distributors will pay a maximum of \$21 billion over 18 years, while Johnson & Johnson will pay a maximum of \$5 billion over no more than nine years. In total, up to approximately \$22.8 billion in settlement proceeds will be payable to state and local subdivisions nationwide. Each state receives a percentage of that recovery, and Colorado’s maximum share from these settlements will likely be more than \$300 million.

However, as discussed more below, Colorado will receive its maximum share of settlement payments only if enough local governments sign on to the deal. Also, the settling defendants have the option to “walk away” from the deals if there is not enough participation, so it is important that a “critical mass” of local governments signs on soon. Otherwise, the entire deal could fall through.

4. How can we maximize Colorado's recovery?

The MOU was designed to ensure that as many local governments as possible would agree to its terms. The Big 3 Distributor and Johnson & Johnson settlements include incentive payments based on how many governments participate. Strong participation from local governments is needed to receive the full settlement payments for all of Colorado. Local governments should sign the Colorado Subdivision Escrow Agreement to ensure their legal claims are released only when 95% participation by local governments has been reached, which secures significant incentive payments under these settlement agreements. For more information on the incentive payments, please see the graphics below:



JOHNSON & JOHNSON: Base and Incentives

	Incentive A	Incentive B	Incentive C	Incentive D																																												
Base 45% Incentives 55% Global Settlement Abatement Amount Incentives are earned by obtaining releases from subdivisions and limiting additional subdivisions from filing suit.	Incentive A provides for payment of all but Incentive D payments in exchange for near full peace. Earning Incentive A also causes substantial payments, the first three years of payments, accelerated and paid within 90 days. Incentive A is earned by: - Passing a Statute or court ruling that terminates existing and bars future claims by subdivisions (including special districts); - Receiving releases on behalf of (i) all general purpose subdivisions above 10,000 population, (ii) larger school and hospital/health districts, and (iii) all currently litigating subdivisions; or - A combination of these approaches that results in a complete bar of existing and future claims (e.g., legislation barring future claims combined with 100% participation by litigating subdivisions).	- Incentive B is not relevant if a State earns Incentive A. - Incentive B is up to 30%. - Incentive B is earned from obtaining releases from litigating subdivisions. Incentive B Sliding Scale: <table><thead><tr><th>Participation or Case-Specific Resolution Levels</th><th>Incentive B Award</th></tr></thead><tbody><tr><td>75%</td><td>50%</td></tr><tr><td>76%</td><td>52%</td></tr><tr><td>77%</td><td>54%</td></tr><tr><td>78%</td><td>56%</td></tr><tr><td>79%</td><td>58%</td></tr><tr><td>80%</td><td>60%</td></tr><tr><td>85%</td><td>70%</td></tr><tr><td>90%</td><td>80%</td></tr><tr><td>95%</td><td>90%</td></tr><tr><td>100%</td><td>100%</td></tr></tbody></table> Timing element Incentive B is structured in time periods and states will receive a percentage of sliding scale payments depending on when they reach 75% of litigating subdivisions signed on: (a) 0-210 days = 100% of sliding scale; (b) 211-365 = 75% of sliding scale; and (c) 366-2 years from effective date = 50% of sliding scale.	Participation or Case-Specific Resolution Levels	Incentive B Award	75%	50%	76%	52%	77%	54%	78%	56%	79%	58%	80%	60%	85%	70%	90%	80%	95%	90%	100%	100%	- Incentive C is not relevant if a State earns Incentive A. - Incentive C is up to 20%. It breaks Incentive C in two parts. - Incentive C is earned by getting larger (population of 30,000) litigating and non-litigating counties and cities to join the deal. 5% is awarded for obtaining a State's ten largest general purpose subdivisions (cities and counties). Incentive C Sliding Scale: <table><thead><tr><th>Participation, Release, or Resolution Levels</th><th>Incentive C(1) Award</th></tr></thead><tbody><tr><td>60%</td><td>40%</td></tr><tr><td>70%</td><td>45%</td></tr><tr><td>80%</td><td>50%</td></tr><tr><td>85%</td><td>55%</td></tr><tr><td>90%</td><td>60%</td></tr><tr><td>91%</td><td>65%</td></tr><tr><td>92%</td><td>70%</td></tr><tr><td>93%</td><td>80%</td></tr><tr><td>94%</td><td>90%</td></tr><tr><td>95%</td><td>100%</td></tr></tbody></table> There is no timing element.	Participation, Release, or Resolution Levels	Incentive C(1) Award	60%	40%	70%	45%	80%	50%	85%	55%	90%	60%	91%	65%	92%	70%	93%	80%	94%	90%	95%	100%	5% share of the State's total Abatement Fund allocation (see page 20). Payable starting in year 6 through year 18. Qualifying Criteria State must have had no later Litigating Subdivisions bring suit and proceed past preliminary motions in the 5 years following the Effective Date.
Participation or Case-Specific Resolution Levels	Incentive B Award																																															
75%	50%																																															
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94%	90%																																															
95%	100%																																															

5. Is participation limited to litigating entities?

No, participation is not limited to governments that filed suit in the opioid litigation. Money from these settlements will be used for opioid crisis abatement in communities across Colorado, regardless of whether they have chosen to sue. All Colorado local governments are eligible to participate in the settlements and join the MOU, and the MOU does **not** allocate more funds to cities and counties that chose to file suit—all cities and counties in Colorado are allocated funds based on the same objective factors.

6. How will settlement proceeds be divided within the state under the Colorado MOU?

Under the Colorado MOU, settlement proceeds will be distributed as follows:

- 10% directly to the State (“State Share”)
- 20% directly to Participating Local Governments (“LG Share”)
- 60% directly to Regions (“Regional Share”)
- 10% to specific abatement infrastructure projects (“Statewide Infrastructure Share”)

7. How will the money be spent?

Under the Colorado MOU, all settlement funds must be used only for “Approved Purposes,” a long and broad list that focuses on abatement strategies. These strategies emphasize prevention, treatment, and harm reduction. Some examples of these strategies include training health care providers on opioid use disorder (“OUD”) treatment and responsible prescribing, expanding telehealth and mobile services for treatment, and increasing naloxone and rescue breathing

supplies. The list of Approved Purposes is broad enough to be flexible for local communities, while ensuring that settlement funds are used to combat the opioid epidemic. The list of Approved Purposes is attached as Exhibit A to the MOU, unless the term is otherwise defined in a settlement.

To ensure that settlement funds are in fact used only for Approved Purposes, a General Abatement Fund Council (the “Abatement Council”) will be formed. This committee will consist of thirteen representatives appointed by the State and Participating Local Governments to ensure opioid funds are spent in compliance with the terms of the settlements and the Colorado MOU.

8. How will direct payments to local governments be allocated?

Under the Colorado MOU, 20% of the settlement funds will be paid directly to local governments. A list of the percentage of settlement funds that will be allocated to each County Area (that is, the county government plus the municipalities within that county) is Exhibit D to the Colorado MOU. Those allocations are further broken down to an intracounty level in Exhibit E, which is a default allocation.

The allocations to each County Area are based on three factors that address the relative severity of the opioid crisis: (a) the number of persons suffering from Opioid Use Disorder in the county; (b) the number of opioid overdose deaths in the county; and (c) the amount of opioids distributed within the county (measured in Morphine Milligram Equivalent units).

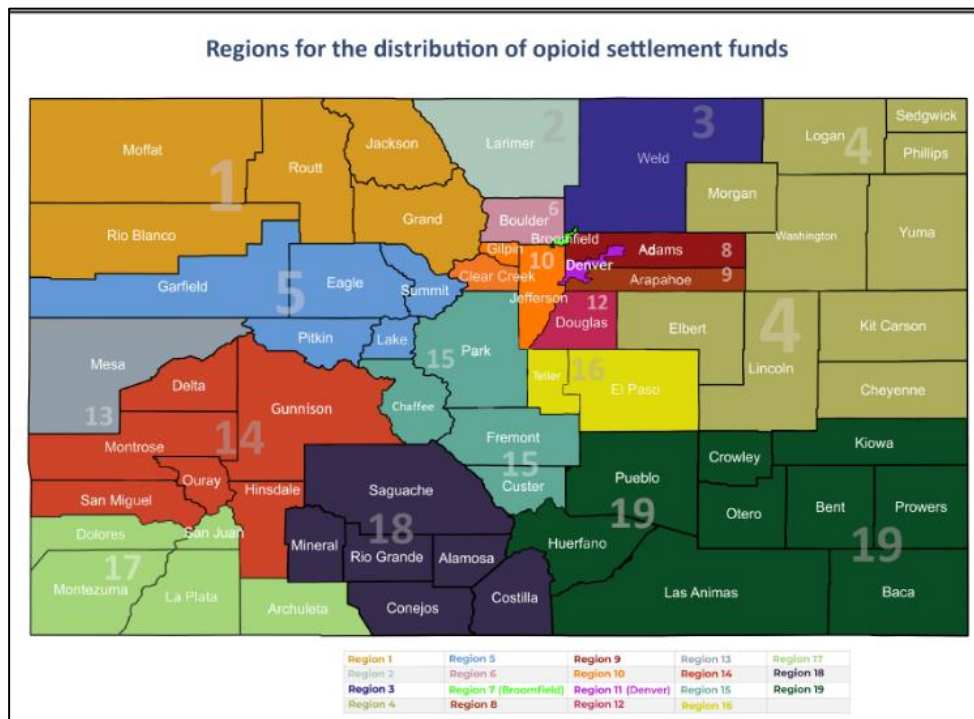
The intracounty allocations in Exhibit E are based on a default allocation model that will apply unless the local governments in a County Area enter into an agreement that provides for a different allocation model. These allocations are based on a model developed by health economist experts, which use data from the State and Local Governments Census on past spending relevant to opioid abatement.

To ensure transparency and that settlement funds are used for Approved Purposes, local governments that receive settlement funds directly will be required to provide expenditure data to the Abatement Council on an annual basis. Local governments that wish to join the MOU but do not wish to receive any direct payments have the option to redirect their payments to the Regional allocation described below.

A local government that chooses not to participate or sign onto the Colorado MOU will not receive funds from the LG Share and the portion of the LG share that it would have received will instead be re-allocated to the Regional Share described below.

9. How will payments to Regions be allocated?

Under the Colorado MOU, 60% of the settlement funds will be allocated to single- or multi-county regions made up of local governments. Local governments in Colorado worked collaboratively to develop the Regional Map, which emphasizes existing local infrastructure and relationships. The regional map is below, as well as included in the Colorado MOU as Exhibit C:



For more information on the percentages of settlement funds that will be allocated to each Region, please see Exhibit F of the Colorado MOU.

10. How will the Regions be governed?

Each Region will create its own “Regional Council” consisting of members from the constituent local governments to determine what Approved Purposes to fund with the Region’s allocation. The Regional Council will have the power to make spending decisions in the Region. The Regions will designate a fiscal agent prior to receiving any settlement funds. Regional governance models are attached to the Colorado MOU as Exhibit G. Each Region may draft its own intra-regional agreements, bylaws, or other governing documents to determine how the Regional Council will operate. Each Regional Council will provide expenditure data to the Abatement Council on an annual basis.

11. How will the Statewide Infrastructure Share work?

Many stakeholders have expressed a need for capital improvements across Colorado, and particularly in underserved areas, to abate the opioid crisis. The Colorado MOU directly addresses this by allocating 10% of settlement funds going to these projects. This money will be distributed by a statewide committee based on need. The Abatement Council will establish and publish policies and procedures for the distribution and oversight of the Statewide Infrastructure Share, including processes for local governments or regions to apply for opioid funds from the Statewide Infrastructure Share.

12. How will attorneys' fees and expenses be paid?

The Attorney General and local governments have agreed to a "Back-Stop Fund" for attorneys' fees and costs. The attorneys' fee provision in the Colorado MOU equitably allocates the cost of attorneys' fees across all local governments, while also allowing non-litigating entities to share in the 25% premium for releases signed by the litigating entities in the "Big 3" Distributor and Johnson & Johnson settlements.

Before a law firm can apply to the Back-Stop Fund, it must first apply to any national common benefit fee fund. The Back-Stop Fund will only be used to pay the difference between what law firms are owed and the amount they have received from a national common benefit fee fund. Attorneys' fees are limited to 8.7% of the total LG Share and 4.35% of the total Regional Share. No funds will be taken from the Statewide Infrastructure Share or State Share.

A committee will be formed to oversee payments from the Back-Stop Fund. The committee will include litigating and non-litigating entities. Importantly, any excess money in the Back-Stop fund, after attorneys' fees and costs are paid, will go back to the local governments.

13. Why is this a great result for local governments?

The Colorado MOU will ensure effective and efficient use of funds without dilution or diversion of opioid settlement money to unrelated purposes or unnecessary overhead expenses. In the Colorado MOU the local governments control 80% of the settlement funds.

- Bottom-Up Approach – The need is at the local level, so the resources should be, too.
- Local Voices – The communities bearing the brunt of this burden must have a meaningful seat at the table to make decisions about where resources go.
- Flexibility – The Colorado MOU provides an opportunity for local governments to decide how to entrust their own regional funds without unnecessary red tape.

14. How do I sign the MOU?

Local governments should sign four documents.

a. First is the MOU.

b. Next, each local government will need to sign a Subdivision Settlement Participation Form for each of the **two settlements** (the "Big 3" Distributor settlement and the Johnson & Johnson settlement) releasing their legal claims and stating they are participating in the settlements.

c. In addition, a Colorado Subdivision Escrow Agreement should be signed to ensure legal claims are released only when 95% participation by certain local governments has been reached, which secures a significant portion of the incentive payments described in FAQ 4, above. Under the terms of the Colorado Subdivision Escrow Agreement, CCI (for counties) or

CML (for municipalities) will hold the MOUs and the Subdivision Settlement Participation Forms for each of the settlements in escrow until 95% participation by local governments has been reached as to specified incentive payments under the respective settlement agreements.

Copies of the Subdivision Settlement Participation Forms, the MOU with signature pages for each local government, and the Colorado Subdivision Escrow Agreement will be provided by the Attorney General's Office. The documents should be executed by the individual or body with authority to do so on behalf of their respective county or municipality and submitted by mail or email to either CCI or CML at the following addresses:

<u>For Counties:</u> Colorado Counties, Inc. 800 Grant, Ste 500 Denver, CO 80203 Email: Kyley Burress KBurress@ccionline.org Katie First KFirst@ccionline.org	<u>For Municipalities:</u> Colorado Municipal League 1144 N. Sherman St. Denver, CO 80203 Email: opioidsettlement@cml.org
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If you have any questions, please reach out to Heidi Williams of the Colorado AG's office at Heidi.Williams@coag.gov.

EXHIBIT K

Settlement Participation Form

Governmental Entity:	State:
Authorized Official:	
Address 1:	
Address 2:	
City, State, Zip:	
Phone:	
Email:	

The governmental entity identified above (“Governmental Entity”), in order to obtain and in consideration for the benefits provided to the Governmental Entity pursuant to the Settlement Agreement dated July 21, 2021 (“Janssen Settlement”), and acting through the undersigned authorized official, hereby elects to participate in the Janssen Settlement, release all Released Claims against all Released Entities, and agrees as follows.

1. The Governmental Entity is aware of and has reviewed the Janssen Settlement, understands that all terms in this Election and Release have the meanings defined therein, and agrees that by this Election, the Governmental Entity elects to participate in the Janssen Settlement and become a Participating Subdivision as provided therein.
2. The Governmental Entity shall, within 14 days of the Reference Date and prior to the filing of the Consent Judgment, dismiss with prejudice any Released Claims that it has filed.
3. The Governmental Entity agrees to the terms of the Janssen Settlement pertaining to Subdivisions as defined therein.
4. By agreeing to the terms of the Janssen Settlement and becoming a Releasor, the Governmental Entity is entitled to the benefits provided therein, including, if applicable, monetary payments beginning after the Effective Date.
5. The Governmental Entity agrees to use any monies it receives through the Janssen Settlement solely for the purposes provided therein.
6. The Governmental Entity submits to the jurisdiction of the court in the Governmental Entity’s state where the Consent Judgment is filed for purposes limited to that court’s role as provided in, and for resolving disputes to the extent provided in, the Janssen Settlement.
7. The Governmental Entity has the right to enforce the Janssen Settlement as provided therein.

8. The Governmental Entity, as a Participating Subdivision, hereby becomes a Releasor for all purposes in the Janssen Settlement, including but not limited to all provisions of Section IV (Release), and along with all departments, agencies, divisions, boards, commissions, districts, instrumentalities of any kind and attorneys, and any person in their official capacity elected or appointed to serve any of the foregoing and any agency, person, or other entity claiming by or through any of the foregoing, and any other entity identified in the definition of Releasor, provides for a release to the fullest extent of its authority. As a Releasor, the Governmental Entity hereby absolutely, unconditionally, and irrevocably covenants not to bring, file, or claim, or to cause, assist or permit to be brought, filed, or claimed, or to otherwise seek to establish liability for any Released Claims against any Released Entity in any forum whatsoever. The releases provided for in the Janssen Settlement are intended by the Parties to be broad and shall be interpreted so as to give the Released Entities the broadest possible bar against any liability relating in any way to Released Claims and extend to the full extent of the power of the Governmental Entity to release claims. The Janssen Settlement shall be a complete bar to any Released Claim.
9. In connection with the releases provided for in the Janssen Settlement, each Governmental Entity expressly waives, releases, and forever discharges any and all provisions, rights, and benefits conferred by any law of any state or territory of the United States or other jurisdiction, or principle of common law, which is similar, comparable, or equivalent to § 1542 of the California Civil Code, which reads:

General Release; extent. A general release does not extend to claims that the creditor or releasing party does not know or suspect to exist in his or her favor at the time of executing the release that, if known by him or her, would have materially affected his or her settlement with the debtor or released party.

A Releasor may hereafter discover facts other than or different from those which it knows, believes, or assumes to be true with respect to the Released Claims, but each Governmental Entity hereby expressly waives and fully, finally, and forever settles, releases and discharges, upon the Effective Date, any and all Released Claims that may exist as of such date but which Releasors do not know or suspect to exist, whether through ignorance, oversight, error, negligence or through no fault whatsoever, and which, if known, would materially affect the Governmental Entities' decision to participate in the Janssen Settlement.

10. Nothing herein is intended to modify in any way the terms of the Janssen Settlement, to which Governmental Entity hereby agrees. To the extent this Election and Release is interpreted differently from the Janssen Settlement in any respect, the Janssen Settlement controls.

I have all necessary power and authorization to execute this Election and Release on behalf of the Governmental Entity.

Signature: _____

Name: _____

Title: _____

Date: _____

EXHIBIT K

Subdivision Settlement Participation Form

Governmental Entity:	State:
Authorized Official:	
Address 1:	
Address 2:	
City, State, Zip:	
Phone:	
Email:	

The governmental entity identified above ("*Governmental Entity*"), in order to obtain and in consideration for the benefits provided to the Governmental Entity pursuant to the Settlement Agreement dated July 21, 2021 ("*Distributor Settlement*"), and acting through the undersigned authorized official, hereby elects to participate in the Distributor Settlement, release all Released Claims against all Released Entities, and agrees as follows.

1. The Governmental Entity is aware of and has reviewed the Distributor Settlement, understands that all terms in this Participation Form have the meanings defined therein, and agrees that by signing this Participation Form, the Governmental Entity elects to participate in the Distributor Settlement and become a Participating Subdivision as provided therein.
2. The Governmental Entity shall, within 14 days of the Reference Date and prior to the filing of the Consent Judgment, secure the dismissal with prejudice of any Released Claims that it has filed.
3. The Governmental Entity agrees to the terms of the Distributor Settlement pertaining to Subdivisions as defined therein.
4. By agreeing to the terms of the Distributor Settlement and becoming a Releasor, the Governmental Entity is entitled to the benefits provided therein, including, if applicable, monetary payments beginning after the Effective Date.
5. The Governmental Entity agrees to use any monies it receives through the Distributor Settlement solely for the purposes provided therein.
6. The Governmental Entity submits to the jurisdiction of the court in the Governmental Entity's state where the Consent Judgment is filed for purposes limited to that court's role as provided in, and for resolving disputes to the extent provided in, the Distributor Settlement. The Governmental Entity likewise agrees to arbitrate before the National Arbitration Panel as provided in, and for resolving disputes to the extent otherwise provided in, the Distributor Settlement.

7. The Governmental Entity has the right to enforce the Distributor Settlement as provided therein.
8. The Governmental Entity, as a Participating Subdivision, hereby becomes a Releasor for all purposes in the Distributor Settlement, including, but not limited to, all provisions of Part XI, and along with all departments, agencies, divisions, boards, commissions, districts, instrumentalities of any kind and attorneys, and any person in their official capacity elected or appointed to serve any of the foregoing and any agency, person, or other entity claiming by or through any of the foregoing, and any other entity identified in the definition of Releasor, provides for a release to the fullest extent of its authority. As a Releasor, the Governmental Entity hereby absolutely, unconditionally, and irrevocably covenants not to bring, file, or claim, or to cause, assist or permit to be brought, filed, or claimed, or to otherwise seek to establish liability for any Released Claims against any Released Entity in any forum whatsoever. The releases provided for in the Distributor Settlement are intended by the Parties to be broad and shall be interpreted so as to give the Released Entities the broadest possible bar against any liability relating in any way to Released Claims and extend to the full extent of the power of the Governmental Entity to release claims. The Distributor Settlement shall be a complete bar to any Released Claim.
9. The Governmental Entity hereby takes on all rights and obligations of a Participating Subdivision as set forth in the Distributor Settlement.
10. In connection with the releases provided for in the Distributor Settlement, each Governmental Entity expressly waives, releases, and forever discharges any and all provisions, rights, and benefits conferred by any law of any state or territory of the United States or other jurisdiction, or principle of common law, which is similar, comparable, or equivalent to § 1542 of the California Civil Code, which reads:

General Release; extent. A general release does not extend to claims that the creditor or releasing party does not know or suspect to exist in his or her favor at the time of executing the release, and that if known by him or her would have materially affected his or her settlement with the debtor or released party.

A Releasor may hereafter discover facts other than or different from those which it knows, believes, or assumes to be true with respect to the Released Claims, but each Governmental Entity hereby expressly waives and fully, finally, and forever settles, releases and discharges, upon the Effective Date, any and all Released Claims that may exist as of such date but which Releasors do not know or suspect to exist, whether through ignorance, oversight, error, negligence or through no fault whatsoever, and which, if known, would materially affect the Governmental Entities' decision to participate in the Distributor Settlement.

11. Nothing herein is intended to modify in any way the terms of the Distributor Settlement, to which Governmental Entity hereby agrees. To the extent this Participation Form is interpreted differently from the Distributor Settlement in any respect, the Distributor Settlement controls.

I have all necessary power and authorization to execute this Participation Form on behalf of the Governmental Entity.

Signature: _____

Name: _____

Title: _____

Date: _____

Colorado Subdivision Escrow Agreement

Governmental Entity:	State: CO
Authorized Official:	
Address 1:	
Address 2:	
City, State, Zip:	
Phone:	
Email:	

The governmental entity identified above (“*Governmental Entity*”) hereby provides Colorado Counties, Inc. (for counties) or the Colorado Municipal League (for municipalities) (“*Escrow Agent*”) the enclosed copies of the Governmental Entity’s endorsed Subdivision Settlement Participation Forms and the Colorado Opioids Settlement Memorandum of Understanding (“Colorado MOU”), to be held in escrow. The Subdivision Settlement Participation Forms apply respectively to (1) the National Settlement Agreement with McKesson Corporation, Cardinal Health, Inc., and AmerisourceBergen Corporation, dated July 21, 2021 (“*Distributor Settlement*”); and (2) the National Settlement Agreement with Janssen Pharmaceuticals, Inc., and its parent company Johnson & Johnson, dated July 21, 2021 (“*J&J Settlement*”). Pursuant to this Agreement, the Subdivision Settlement Participation Forms and the Colorado MOU will be released only if there is 95% participation by local governments in Colorado as further explained below.

Purpose of this Agreement

By endorsing a Subdivision Settlement Participation Form in the Distributor Settlement and the J&J Settlement, a governmental entity agrees to participate in those settlements and release any legal claims it has or may have against those settling pharmaceutical companies. This Colorado Subdivision Escrow Agreement is meant to ensure that the legal claims of governmental entities in Colorado will be released only when 95% participation by certain governmental entities has been reached. That 95% participation threshold is important because it signals to the settling pharmaceutical companies that the settlement has wide acceptance which will then secure significant incentive payments under these settlement agreements.

Escrow

The Escrow Agent shall promptly report the receipt of any Governmental Entity’s endorsed Subdivision Settlement Participation Forms and Colorado MOUs to the Colorado Attorney General’s Office and to the law firm of Keller Rohrback L.L.P. These documents shall be released by the Escrow Agent to the Colorado Attorney General’s Office if and when the Escrow Agent is notified by the Attorney General’s Office and Keller Rohrback that that the threshold 95% participation levels have been reached for both the Distributor Settlement and the J&J Settlement, as further described below. If by December 29, 2021, the Escrow Agent has not received notification that the threshold 95% levels have been reached for both the Distributor Settlement and the J&J Settlements, then the documents being escrowed shall be returned to the Governmental Entities and all copies shall be destroyed.

Distributor Settlement

The Attorney General's Office and Keller Rohrback shall jointly submit a written notification to the Escrow Agent when it has been determined that the percentages of populations eligible for Incentives B and C, as described in Sections IV.F.2 and IV.F.3 of the Distributor Settlement, are each 95% or more. For purposes of this Escrow Agreement, the percentages of populations eligible for Incentives B and C under the Distributor Settlement will include governmental entities that sign a Subdivision Settlement Participation Form subject to an escrow agreement and governmental entities that sign a Subdivision Settlement Participation Form that is not subject to an escrow agreement.

J&J Settlement

The Attorney General's Office and Keller Rohrback shall jointly submit a written notification to the Escrow Agent when it has been determined that the Participation or Case-Specific Resolution Levels for Incentives B and C, as described in Sections V.E.5 and V.E.6 of the J&J Settlement, are each 95% or more. For purposes of this Escrow Agreement, the percentages or populations eligible for Incentives B and C under the J&J Settlement will include governmental entities that sign a Subdivision Settlement Participation Form subject to an escrow agreement and governmental entities that sign a Subdivision Settlement Participation Form that is not subject to an escrow agreement.

Colorado Subdivision Name _____

Authorized Signature

Date

PHIL WEISER
Attorney General

NATALIE HANLON LEH
Chief Deputy Attorney General

ERIC R. OLSON
Solicitor General

ERIC T. MEYER
Chief Operating Officer



RALPH L. CARR
COLORADO JUDICIAL CENTER
1300 Broadway, 10th Floor
Denver, Colorado 80203
Phone (720) 508-6000

STATE OF COLORADO
DEPARTMENT OF LAW

October 1, 2021

Dear Commissioner, Mayor, Administrator, Manager and/or Attorney:

We are pleased to inform you that the Colorado Department of Law has come to an agreement with Colorado's local governments for distributing opioid settlement and recovery funds to local counties and municipalities. The attached Memorandum of Understanding ("MOU") is the product of a lengthy and complex negotiation between the Attorney General's Office, Colorado Counties, Inc. ("CCI"), Colorado Municipal League ("CML"), and many negotiating local governments detailing that distribution process.

As you may know, the State, as well as several Colorado local governments, have pursued litigation against various pharmaceutical companies for their role in causing the opioid epidemic in Colorado. That litigation recently resulted in settlements with Purdue Pharma, McKinsey & Co., Johnson & Johnson, AmerisourceBergen, Cardinal Health, and McKesson, resulting in up to approximately \$400 million in settlement funds for both the State and Colorado local governments to abate the opioid crisis.

To maximize the settlement funds within Colorado, it is important that all Colorado counties and municipalities participate in these settlements and the distribution process by signing the following four documents:

1. The MOU that lays out the allocation of Opioid recoveries in the State of Colorado;
2. The Subdivision Settlement Participation Form that releases subdivisions' legal claims against Johnson & Johnson;
3. The Subdivision Settlement Participation Form that releases subdivisions' legal claims against AmerisourceBergen, Cardinal Health, and McKesson; and
4. The Colorado Subdivision Escrow Agreement that ensures subdivisions' legal claims are released only when 95% participation by certain local governments has been reached. That 95% participation threshold is important because it triggers certain amounts of incentive payments under the settlements and signals to the settling pharmaceutical companies that the settlements have wide acceptance.

We are asking you to present the enclosed MOU, Subdivision Settlement Participation Forms, and Colorado Subdivision Escrow Agreement to the body or individual with authority to approve and execute the documents on behalf of your county or municipality. We request that you return the signed documents as detailed below by **November 5, 2021**. If you are unable to return the signed documents by this date, please contact Heidi Williams, Department of Law Director of Opioid Response, at

Heidi.Williams@coag.gov. By promptly returning the signed documents, we will be able to put Colorado and our local governments in a position to maximize our share of the settlements and begin putting the settlement funds to use abating the crisis in our communities.

Please email or mail the signed documents to either CCI or CML at the following addresses:

<u>For Counties:</u> Colorado Counties, Inc. 800 Grant, Ste 500 Denver, CO 80203 Email: Kyley Burress KBurress@ccionline.org Katie First KFirst@ccionline.org	<u>For Municipalities:</u> Colorado Municipal League 1144 N. Sherman St. Denver, CO 80203 Email: opioidsettlement@cml.org
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For more information about the opioid response funds, please check out our website at www.coag.gov/opioids. If you have any questions about the Colorado MOU, the settlements, or this letter, please contact Heidi Williams, Department of Law Director of Opioid Response, at Heidi.Williams@coag.gov.

Thank you for your partnership and commitment to Colorado.

Phil Weiser
Attorney General

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 6.a

Presentation

Meeting Date: December 8, 2021

Initiated By:

Dept: Town Clerk

AGENDA TITLE

Frederick-Firestone Fire Protection District 2021 Third Quarter Service Report

SUMMARY

HISTORY AND PREVIOUS BOARD ACTION

RECOMMENDATION

ALTERNATIVES

ATTACHMENTS

1. FFFPD 2021 Third Quarter Service Report - Firestone

FINANCIAL CONSIDERATIONS



THIRD QUARTER SERVICE REPORT
July 1 – September 30, 2021

Prepared for: **The Town of Firestone**

**FREDERICK-FIRESTONE
FIRE PROTECTION
DISTRICT**
*Leading Together,
By Serving Together*



**OFFICE OF THE
FIRE CHIEF**
Office: 303.833.2742
Fax: 303.833.3736
E-Mail: jyoung@fffd.us

October 14, 2021

Town of Firestone
151 Grant Ave
Firestone, CO 80520

Mayor Sindelar, Honorable Trustees, and Town Manager Krieger

In compliance with the District's Inter-Governmental Agreement (IGA) with the Town of Firestone, enclosed is the written quarterly service report of our performance during the 3rd Quarter of 2021. The report contains three (3) categories, response times, training hours, and community risk reduction activities for the Fire District.

The response time report contains two (2) sections; total average response time and explanations for response times over seven (7) minutes. The average response time required by the IGA is 5.5 minutes 80% of the time. The District responded to a total of 730 fire, rescue and medical emergency incidents between July 1 and September 30, 2021, with an average emergency response time of 4 minutes and 40 seconds. The summary of responses over seven (7) minutes can be found on the *Incident Response Time Overages* report. Please note, it is District policy not to respond emergent to routine incidents such as blood draws, agency assist calls, or other non-emergency and non-life-threatening situations. For a specific explanation of all overages, please see the report included.

The training report is divided into two (2) sections as well, fire and rescue training hours and emergency medical training hours. All training conducted by the District is taught according to State of Colorado Division of Fire Prevention & Control standards which in turn encompass International Fire Services Accreditation Council (IFSAC) and National Fire Protection Association (NFPA) standards. All medical training is approved by the District's Medical Director to meet or exceed Denver Metropolitan Medical Care Protocols and Procedures. For the 3rd Quarter of 2021, District employees participated in 5,646 hours of fire, rescue, and emergency medical service training.

The Community Risk Reduction Division completed 179 fire safety inspections during the 3rd Quarter of 2021. Additionally, eleven (11) Certificates of Occupancies were issued for businesses in the District. Also, there were four (4) fire investigations completed during the third quarter of 2021.

➤ **District Updates/Intergovernmental and News for the Third Quarter of 2021**

- The District hosted the Weld County Fire Chiefs Association (WCFCFA) meeting on July 21. Presentations were provided the Weld County Assessor and the Regional Insurance Service Officer (ISO) representative. Other topics of discussion was law-enforcement response to fire and medical emergencies, Weld County Communications and the new CAD systems being installed in 2022, outside training courses for the County, and WCFCFA recognition policy and procedures was revised and approved by voting members.
- The District hosted the monthly Carbon Valley Chamber of Commerce luncheon. The guest speaker was from the Frederick Police Department and they shared Active Shooter Awareness Training with the group.
- Chief Young met with the Town of Frederick's Town Manager on August 19th. The meet and greet between the Towns Trustees and the Fire District Board were discussed and following up processes needed for better communication.
- The District hosted the annual member appreciation picnic at Hart Park on August 21st. The picnic was well attended and allowed members to get together for fellowship and meeting each other's families.
- Chief Young, Finance Director and Assistant Chief of Planning met with our DOLA District Manager over the upcoming Energy Impact Assistance Fund (EIAF) Grant. After hearing what funds will be available and what they plan to fund in 2021-2022, the District will wait until Summer of 2022 to make a decision on applying for the EIAF Grant Process. At this time, it is not timely or a value add to participate in this grant process cycle of 2021.
- The District hosted a 9-11 Remembrance and Pinning Ceremony for Recruit Class 2020-02 on September 11th at 8:00 A.M. at Fire Station #1. The event was well attended, and we appreciate the food and beverages provided for everyone from Daylight Donuts and Shorty D's Coffee.
- The District received its official pre-liminary numbers from the Weld County Assessor on August 25th. The District Assessed Valuation increased slightly from the July 2021 numbers provided by the County. Previous year's net total assessed valuation was \$662,504,115 and the current year's assessed valuation is 663,841,384 providing only a \$18,000 increase in the 2022 Budget.
- The District was informed by the Federal Emergency Management Agency's (FEMA) Grant Programs Directorate that we were not chosen to receive the 2020 SAFER Act grant for the hiring of three (3) firefighter personnel. We will continue to pursue and apply for grants that will assist the District with its overall mission. This is the third denial for this grant.
- Staff has been working with Beyond Your Base Consulting Group for the November and December Public Engagement piece. Beyond Your Base will be working with us heavily in the month of October to finish final touches before engaging the community mid-November into early December.

- Chief Young, Finance Director Cummins, and HR Specialist Docheff attended the Special District's Association Conference in Keystone, September 14 – 16. The conference was well attended with over 750 in person and over 300 virtually. We all received over 34 hours of training and education during the conference from everything to Board relations to Leadership within your organization.
- Staff continue to attend multiple Weld County meetings through the third quarter of 2021. Meetings include the Communication Board Meetings, E-911 Authority, County Workgroups, and the Weld County Utility Board Commission as requested or required.
- Chief Young presented a District Update to some of our public influencers on September 30th. The presentation went well, there were some excellent questions and remarks. We will continue to keep the open dialogue with our citizens and plan for future meetings in late November and early December.
- Chief Young met with the Town of Frederick's Town Manager on September 9th. We worked on finalizing timelines around impact fees, Station 5 property issues and concerns, emergency services agreement, Carbon Valley EMA, town mechanic agreement, and future planning needs for both the District and the Town of Frederick moving into 2022 and beyond.
- Chief Young met with the Town of Firestone's Town Manager on September 21st. Discussion and timelines were discussed on the Impact Fee Intergovernmental Agreement and Emergency Services Intergovernmental Agreement for 2022. Chief Young has also been requested to set on the interview panel on November 8th and 9th for the new Police Chief process for Firestone.
- Chief Young and Asst. Chief Iacino continue working with Allred and Associates Architectural Firm on the Station 5 and now Station 6 building design. Allred and Associates continue working with the Town of Frederick and the District's legal team on final governmental approvals on the property and building design.
- Chief Young and Asst. Chief Iacino continue working with Ireland Stapleton the District's legal team for the Sisters Charity of Leavenworth land donation agreement. The District is still planning on closing on the property mid-December 2021.

Please review the enclosed materials and supporting data at your convenience. If you have any questions or should you need any additional information, please feel free to contact me. As always, if we can do anything to improve our service to the Town, please do not hesitate to contact me directly.

Respectfully,



Jeremy A. Young MS, EFO, CFO
Fire Chief

**FREDERICK-FIRESTONE
FIRE PROTECTION
DISTRICT**



**ASSISTANT CHIEF
OF OPERATIONS**

Office: 303.833.2742

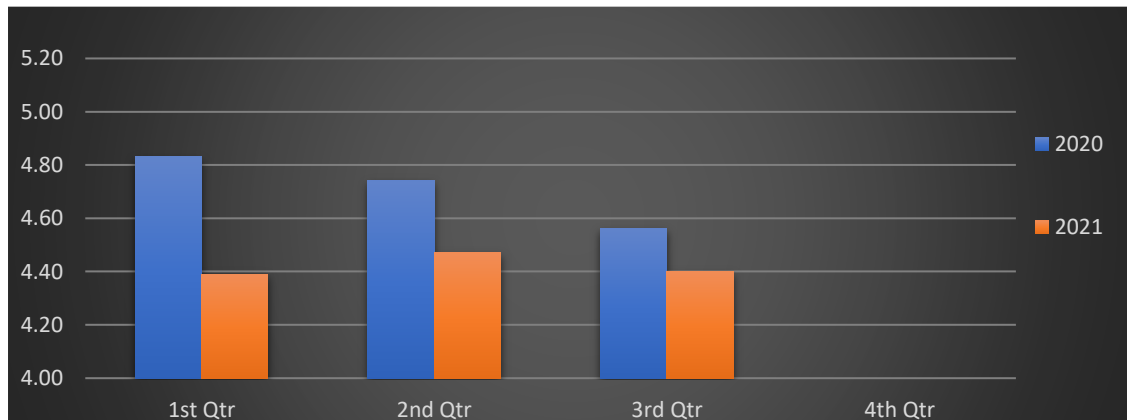
Fax: 303.833.3736

E-Mail: dprunk@fffd.us

**RESPONSE SUMMARY
July 1 – September 30, 2021**

	<u>2020</u>	<u>2021</u>
Total incidents July – September:	562	730
Total number of non-emergency response calls:	297	316
Total number of emergency response calls:	265	414
<u>Total number of patient transports by ambulance:</u>	<u>233</u>	<u>312</u>
Average response time for emergency response calls:	4.56 min	4.40min

**Average Emergency Response Times
(Minutes & Seconds)**



**FREDERICK-FIRESTONE
FIRE PROTECTION
DISTRICT**



**ASSISTANT CHIEF
OF OPERATIONS**

Office: 303.833.2742

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**RESPONSE TIME OVERAGES
July 1 – September 30, 2021**

INCIDENT	DATE	ALARM TIME	RESPONSE MINUTES	EXPLANATION
Station 1				
2021-01338	07/04/2021	22:04	8	Multiple calls for service
2021-01484	07/23/2021	02:47	7	Dispatch alert/address issues
2021-01551	07/31/2021	00:50	9	Road conditions, weather/construction
2021-01679	08/17/2021	14:42	8	Primary unit in training/meeting
2021-01742	08/27/2021	10:51	9	Distance only no outside factors
2021-01893	09/13/2021	01:49	7	Distance only no outside factors
2021-01898	09/13/2021	13:16	12	Distance only no outside factors
Station 2				
2021-01552	07/31/2021	01:48	9	Response and access to I-25
2021-01692	08/18/2021	23:11	7	Dispatch alert/address issues
2021-01810	09/03/2021	00:49	9	Mechanical issue
2021-01815	09/03/2021	18:47	11	Dispatch alert/address issues
2021-01819	09/04/2021	02:47	9	Distance only no outside factors
2021-02028	09/30/2021	17:02	8	Multiple calls for service
Station 3				
2021-01353	07/07/2021	12:00	7	Multiple calls for service
2021-01430	07/16/2021	22:22	15	Dispatch alert/address issues
2021-01449	07/20/2021	10:03	8	Primary unit in training/meeting
2021-01536	07/29/2021	20:36	9	Multiple calls for service
2021-01549	07/30/2021	22:57	8	Road conditions, weather/construction
2021-01585	08/04/2021	05:37	10	Distance only no outside factors
2021-01663	08/14/2021	18:50	12	Dispatch alert/address issues
2021-01709	08/21/2021	14:12	7	Distance only no outside factors
2021-01743	08/27/2021	11:23	9	Multiple calls for service
Station 4				
2021-01481	07/22/2021	18:16	8	Distance only no outside factors
2021-01531	07/29/2021	03:37	9	Distance only no outside factors
2021-01926	09/17/2021	16:14	7	Primary unit in training/meeting

**FREDERICK-FIRESTONE
FIRE PROTECTION
DISTRICT**



**OPERATIONS SECTION
TRAINING DIVISION**

Office: 303.833.2742

Fax: 303.833.3736

E-Mail: bjoseph@fffd.us

**TRAINING SUMMARY
July 1 – September 30, 2021**

Total Fire Training Hours July - September: 4,977 hours

Total EMS Training Hours July - September: 669 hours

Overview of Training Events:

- Training Division working on multiple goals for the strategic plan.
- All members complete monthly Continuing Medical Education with the District's Medical Director.
- All members completed multiple forcible entry training scenarios.
- All members completed open water boat operations training.
- One (1) EMT Field Instruction was completed.
- One (1) Paramedic Field Instruction was completed.
- Two (2) members completed a two-week Driver/Operator-Pumper Academy.
- Training Division worked on 2022 budget process with Fire Chief.
- Forcible entry prop re-sheeted with new steel for additional training.
- One (1) member accepted into the Master Firefighter Program.
- Multiple members registered for upcoming Fire/EMS conferences.
- Current Officers, Acting Officers, and Officer Development Program (ODP) attended report writing class and legal ethical training from outside instructors.
- Three (3) members attended the Fire Department Instructors Conference.
- Two (2) members attended Denver Chop Shop (Vehicle Extrication).
- Three (3) members continue to work on Recruit Task Books.
- Three (3) members completed Six-month Recruit Test.
- All members attended Scott X3 Pro SCBA in-service training with MES.
- All members completed trainings on SCBA/Trench Rescue/Neuro/Seizures and Central Nervous medical emergencies.
- Awareness level trench rescue training taught to Ft. Lupton Fire by Lt. Timm and St. 4 members.
- Training Division worked on 21-02 hiring process.
- ODP members completed Section 3 of task book and ICS 300 / ICS 400 classes.
- Three (3) members attended an initial Car Seat Technician course and obtained certification.
- One (1) EMT member accepted into St. Anthony's Paramedic Program. Will attend July 2022.
- Two members completed IV certification class and obtained certification.
-

- All members completed trainings on Hose management/VADs/Fluid Resuscitation and Extrication.
- Self-Contained Breathing Apparatus (SCBA) fit testing was completed for all members.
- ODP members completed classes on Public Speaking, Public Information Officer (PIO), Community Risk Reduction and Business Inspections/Preplans.
- ODP members worked on completing Blue Card Incident Command initial on-line training 40-hour course.
- One (1) member obtained State Driver Operator Pumper (DOP) certification.
- Multiple members assisted with new-hire assessment center process.



**FREDERICK-FIRESTONE
FIRE PROTECTION
DISTRICT**



**ASSISTANT CHIEF OF
PLANNING**

Office: 303.833.2742

Fax: 303.833.3736

E-Mail: siacino@fffd.us

**PLANNING SECTION SUMMARY
July 1 – September 30, 2021**

Fire Safety Inspections completed from July 2021 through September 2021

- 179 Fire and Life Safety Inspections

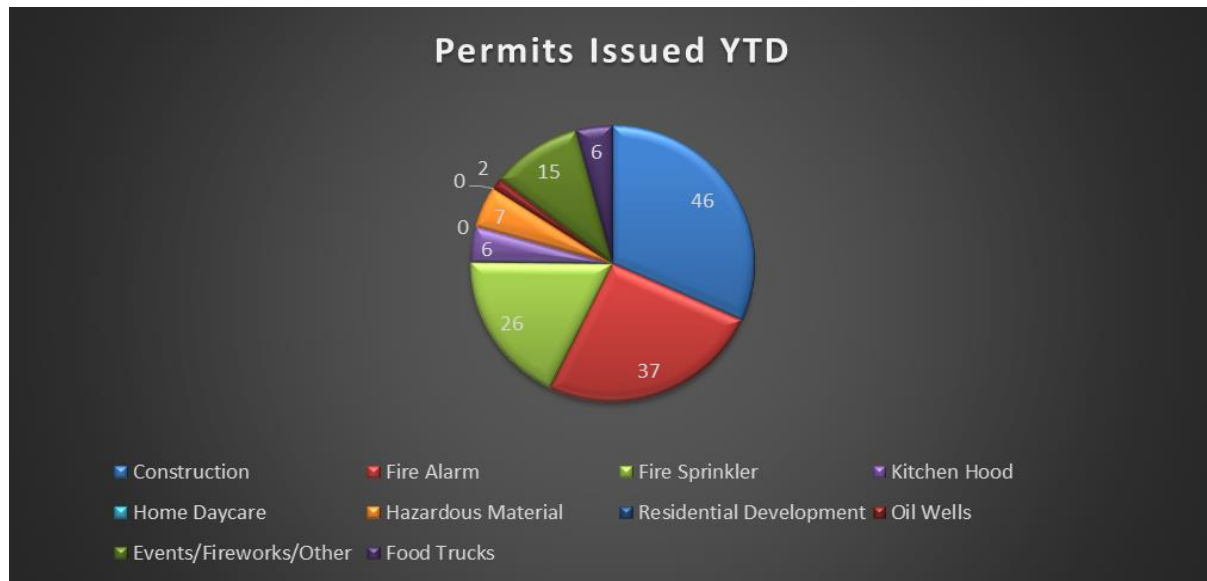
New Construction Activity (year to date)



Certificate of Occupancy Inspections and completed from July 2021 through September 2021

- American Furniture Truck Shop
- Caliber Collision
- Firestone Town Hall
- Centennial Elementary TI
- Sit Means Sit TI
- Sterling Coffee TI
- 4030 Bruin Unit D TI
- 4030 Bruin Unit K TI
- Dollar General
- Starbucks – E I25 Frontage Rd Firestone TI
- Dark Horse Fitness TI

108 Fire and Life Safety Permits Issued (year to date)



Fire Investigations from July 2021 through September 2021

- One (1) Commercial Structure Fire
- Three (3) Residential Structure Fires (one fatality)

Youth Firesetter Program from July 2021 through September 2021

- There were two (2) new YFS Cases during the 3rd quarter

Community Outreach Programs / Pub Ed from July 2021 through September 2021

- Completed CPR/AED/Basic First Aid Skills for staff and students at Frederick High School, Anytime Fitness, Trident Security, and Firestone Charter Academy.
- Audit of District's website to ensure we are following all accessibility laws and procedures required by law.
- Hosted two (2) Carbon Valley Chamber of Commerce Luncheons
- District hosted a 9/11 Remembrance Ceremony and badge pinning for recruit class 2020 – 02 on September 11th at Station 1 in Frederick.
- District attended the 4th at Firestone, Chainsaws and Chuckwagons, and Miners Day.
- Attended National Information Officers Association (NIOA) training conference



2021-2026 Organizational Strategic Plan 3rd Quarterly Update

- **Goal 1: Objectives 1A/2A 2021 – Executive Staff:**

External Relationship Committee mainly comprised of the Executive Staff are continually working with neighboring Fire Districts, Partnering Agencies, Towns, and Civic Groups on enhancing relationships and agreements. The committee is working with the identified District's core services and current agreements and aid assistance locally, regionally and statewide. Work continues on identifying future needs, trends and stakeholders to assist with those needs. Along with Weld County Fire Chief's Association, Weld County Haz-Mat and Technical Rescue relationships and teams are being researched and discussed. The District's neighboring Fire Districts have been talking about future services, fire stations, conforming boundaries, closest unit dispatching, and future inclusions and exclusions. We have also been working with Weld County Communications on enhancing the auto aid and mutual aid process with the new computer aided dispatch being implemented. This new change will allow Fire Districts to change service needs by approval of Fire Chief's rather than fully executed changes within the County Mutual Aid Agreements or Automatic Aid Agreements. We have extensively been working with the Towns on Emergency Services IGA's and Developer Impact Fee IGA's. Goal 1 is an intensive goal with many layers of policy, politics, and legal requirements involved. The committee understands this Goal will take numerous years to complete as we enhance relationships and services for our community on an ongoing basis.

- **Goal 2: Objectives 2A 2021 – Community Risk Reduction Division:**

The Strategic Goal #2 committee, which focuses on community engagement, met with line staff representatives, external partners and community stakeholders to receive information pertaining to the District's public education and community programs this last quarter. External feedback showed that better communication about what programs are offered through the District is needed. All programs were broken into three (3) categories, which included school programs, business programs, and community programs, to help narrow down feedback. Overall, established programs such as the Community CPR and AED programs and Fire Prevention Week were rated as the most important and needed programs by all groups. Suggested programs needed included potential summer-based fire academies for the public and more senior programming. With this feedback in mind a community survey was put together and delivered through District social media outlets, the District website, and through the District's e-newsletter. With a total of 50 responses and good feedback on what type of programs community members would like to see, in what forum they are delivered (in-person, virtual, or hybrid), and how best to market opportunities, the internal committee will be meeting on Thursday, October 28, 2021, to discuss the community feedback and look at what programs should be revised and/or developed moving forward. (Objective 2B). A program proposal, based on the collected data, will also be prepared by the community engagement manager and presented to the committee at the meeting. This proposal will be the first step toward the creation of the Comprehensive Marketing and Outreach Plan (CMOP).

- **Goal 3: Objectives 3A 2021 – Training Division:**

The committee will be meeting again in late October of 2021. This year we have completed a review of each position to determine which need defined career paths. Reviewed current job description to ensure they are contemporary and adequate. We have also surveyed all member for their input regarding their career development and researched other comparable fire departments career development processes. The committee is currently working on establishing career oath criteria for each job position within the District and defining milestones for each position to be consistent with industry standards and the District's mission and values. More data and information to compile at the next meeting to identify next steps within the process and plan.

- **Goal 4: Objectives 4A/4B 2021 – Finance Section:**

Since the last update (6-28-2021) the Team has focused on three (3) items: Relative to ***Historical Maintenance***, the team is working on utilizing data aggregated prior to June of 2021 and in between that date and the present. Data going back to 2010 was originally gathered but after analysis, it was determined that data from 2014 through 2020 would be utilized. This data relates specifically to maintenance costs of the capital assets. These maintenance costs are then to be regressed on several parameters relating to capital assets. Namely, total cost of the assets, depreciated value of the assets, and potentially, also the accumulated depreciation itself. Potentially, also the marginal depreciation (i.e., each year's depreciation). The objective being to learn and quantify how maintenance costs vary with increasing total costs of assets, increasing accumulated depreciation as well as marginal depreciation. A minor setback in that significant amounts of data were obtained from the Districts old and, to a small degree, new software as well as the Districts historical depreciation records. However, when this data was compared and reconciled to the Audits, the District's historical data pre 2018 was found to be lacking. Unfortunately Audit data is highly aggregated, but the team is working towards deriving a meaningful methodology in this regard.

Relative to ***Service Life Expectations***, certain of the Team's members submitted estimates based upon their background and experience relative to specific asset service lives. The objective here is to come to a more realistic quantification of the lives of assets. It is generally believed that there is at least a modicum of error historically in this regard. In a nutshell, it appears that we have a noteworthy amount of depreciable capital assets that have been "depreciated out" for some time now but are still in service. This would indicate that the District has assigned expected lives that are too short in the past. The issue here is that this causes an aberrant estimate of the amount of annual depreciation (i.e., too high) in the early years of an asset's life, and then too low in the later years. Assets still in service are depreciated out contribute nothing to the current year's depreciation. This then affects the statistical inferences to be derived in the objectives mentioned above in "Historical Maintenance".

Certain of the Team Members also have remitted their estimates, again based upon their background and experience, of the ***condition*** of the assets on the depreciation schedule. The objectives here are to potentially improve the future

planning and modeling for asset acquisition. There are also implications for both of the other two (2) items discussed above.

- **Goal 5: Objectives 5A 2021 – Safety and Wellness Committee (SWC):**
The SWC completed the categorization of proficiencies and deficiencies as identified through the planning process. Among the five (5) categories 12 proficiencies were identified and 17 deficiencies were identified for the District. The SWC utilized the Drexel RAPID survey results from 17 other like sized departments. This data was utilized to analyze the categories of proficiencies and deficiencies that were identified by the committee previously. The data extrapolated from this comparison will be utilized in the coming objectives to formulate a needs-based approach and assessment guiding the committee through the next steps of the planning process.
- **Goal 6: Objectives 6A/6B 2021 – Operations Section / L/M Committee:**
During the third quarter of 2021, the Goal #6 Committee evaluated data from the May 2021 survey and compared to the current policies and procedures of FFFD to create a basic gap analysis and needs statement. Currently, the District is enforcing a hybrid of two (2) or three (3) person staffing of structural fire and rescue apparatus. During recent emergency events which have occurred in 2021, Command Staff has identified a noticeable difference in capabilities of these two par levels pertaining to efficiencies and safe working practices on emergency scenes. The Goal #6 Committee identified the need for FFFD to further enhance services for not only the customers but to increase safety of crews by increasing minimum staffing of all structural fire apparatus to three (3) person units and medical and non-structural firefighting apparatus to two (2) person staffing as soon as fiscally possible. The Committee has set a goal for the District to reach a minimum staffing policy of 17 persons per shift, per day by mid-2023, while still having a strong understanding this type of goal is largely driven by finances and auxiliary funding methods in an already difficult economic situation. Due to these constraints, the Committee is running at an idle pace with the anticipation of an economic up-tic in the near future. The committee is researching avenues of grants, reviewing the District's current reserve and cadet programs as well.
- **Goal 7: Objectives 7D 2021 – Planning Section:**
Objectives 7B and 7C are complete with the development of the five (5) year strategic plan. EMC Garner has worked with The Blue Cell and community stakeholders to conduct the community hazards and risk assessment for objective 7D. The final draft of the risk assessment should be completed by the end of October 2021. Once complete we can start working on the Standards of Cover document and master reference files. Assistant Chief Iacino and Specialist Campos are currently working on objective 7E which is the self-assessment. There are 10 objectives with multiple criteria in each. We have the outline and are identifying our subject matter experts (SME) for each of the criteria so we can start gathering the data for the self-assessment. A draft of Category 1 which is governance and administration is currently being reviewed by the Fire Chief.



Mission Statement

To enhance your quality of life, by always earning trust, reducing loss of life, preventing harm, and protecting property with compassion and integrity.

Vision Statement

The Frederick-Firestone Fire District and its members will be a model of excellence in emergency services, risk reduction, and life safety programs. We will strategically engage the needs of our community; while remaining committed to continuous organizational development through trust, involvement, innovation, creativity, and accountability, while consistently remaining rooted in service.

Enhanced Core Values

Service: Our members believe in standing ready with duty, honor, and loyalty to help others during any time of need. This core value inspires our culture and is the cornerstone of our mission and vision.

Family: Our members believe in developing relationships of emotional support with love and respect to serve one another, teach one another, and share life's joys and sorrows with one another for personal growth.

Professionalism: Our members believe in ownership, accountability, and mastery of their knowledge, skills, and abilities within our profession of emergency services, even as expectations and demands continue in the ever-changing world around us.

Compassion: Our members believe in empathy and kindness, which empowers us to do our best at relieving the suffering of physical, mental, and emotional misfortunes of others.

Integrity: Our members believe in maintaining strong moral and ethical principles of honesty, fairness, and respect in all aspects of life.

Organizational Motto

"Leading Together, By Serving Together"

AGENDA INFORMATION MEMORANDUM

FIRESTONE TOWN BOARD OF TRUSTEES



AIM#: 7.a

Land Development

Meeting Date: December 8, 2021

Initiated By:

Dept: Planning & Development

AGENDA TITLE

PUBLIC HEARING: Ordinance 1003: AN ORDINANCE OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO AMENDING SECTIONS 16.2.3, 16.2.5, 16.3.3, 16.4.2, 16.5.4, 16.6.2, 16.6.3, 16.6.4, 16.6.5, 16.6.7, 16.6.12, 16.11.3, AND TABLES 3-1, 4-1 AND 6.12-6 OF CHAPTER 16.04 (FIRESTONE DEVELOPMENT CODE) OF TITLE 16 OF THE FIRESTONE MUNICIPAL CODE

SUMMARY

During the work sessions leading up to and the hearings during which the new Firestone Development Code (FDC) was considered in 2020, Town Staff discussed the intent to present updates of the FDC to the Planning & Zoning Commission and the Board of Trustees on an annual basis to be effective at the beginning of each calendar year. The purpose of an annual update is to correct typographical, formatting, and organization items as well as modifications for clarity, efficiency, and legality that are identified during the year but are not urgent or time sensitive. Proposed changes are included in the Board of Trustees Ordinance attached as well as the attachment of excerpted redlines.

HISTORY AND PREVIOUS BOARD ACTION

The Planning & Zoning Commission considered the Firestone Development Code (FDC) during a public hearing at its May 7, 2020 and May 21, 2020 regular meetings. The Commission approved Resolution PC-20-06 recommending approval of the Firestone Development Code on May 21, 2020.

The Town of Firestone Board of Trustees subsequently introduced the adopting ordinance on May 27, 2020 and held a public hearing to consider the Firestone Development Code on June 24, 2020. The Board adopted the FDC on June 24, 2020 and the code became effective on July 30, 2020.

The Planning & Zoning Commission and the Board of Trustees considered the 2021 FDC Annual Update during hearings on October 15, 2020 and October 28, 2020 respectively, with an effective date of January 1, 2021.

RECOMMENDATION

Staff recommends that the Board of Trustees approve Ordinance 1003 approving amendments to the Firestone Development Code.

The Planning Commission recommended approval of the amendments on December 2, 2021 by adopting Resolution PC-21-09 which is attached.

ALTERNATIVES

ATTACHMENTS

1. Ordinance 1003 - 2022 FDC Amendments
2. 2022 FDC Annual Update - Excerpted Redlines
3. Planning and Zoning Commission Resolution No. PC-21-09

FINANCIAL CONSIDERATIONS

ORDINANCE NO. ____

**AN ORDINANCE OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE,
COLORADO AMENDING SECTIONS 16.2.3, 16.2.5, 16.3.3, 16.4.2, 16.5.4, 16.6.2, 16.6.3,
16.6.4, 16.6.5, 16.6.7, 16.6.12, 16.11.3, AND TABLES 3-1, 4-1 AND 6.12-6 OF CHAPTER
16.04 (FIRESTONE DEVELOPMENT CODE) OF TITLE 16 OF THE FIRESTONE
MUNICIPAL CODE**

WHEREAS, Chapter 16.04 of the Firestone Municipal Code was enacted to adopt the Firestone Development Code (“FDC”), which establishes comprehensive regulations pertaining to the use and development of land within the Town of Firestone; and

WHEREAS, the Board of Trustees desires to amend various sections of the Firestone Development Code as part of the Town’s overall annual FDC update process that will guide the growth and development of the Town and improve the administration of the FDC; and

WHEREAS, the Board of Trustees believes these amendments will improve the understanding and administration of the Firestone Development Code with regard to those regulations and their underlying goals.

NOW THEREFORE, BE IT ORDAINED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:¹

Section 1. Section 16.2.3.B.1, “Old Town Commercial (OTC), of the Firestone Development Code is hereby amended to read as follows:

1. Purpose

To provide for and encourage development and redevelopment that preserves and enhances the unique character and vitality of Old Town Firestone. Small-scale offices, retail, and residential uses are permitted. New development is encouraged to place residential above the ground floor. Design standards focus on creating a human-scaled, pedestrian-oriented and walkable downtown that invites commercial development and complementary residential opportunities. Continuous retail frontages, largely uninterrupted by driveways and parking, are encouraged. The zone district classifications of C-1, C-2, C-M, and NC from former Town zoning code and development regulations along First Street in Old Town Firestone are intended to be included in the OTC district. Developing and redeveloping non-residential properties adjacent to Grant Avenue between Colorado Boulevard and Second Street are intended to be included in the OTC district

Section 2. Section 16.2.5.G, “Use Overlay Districts (UO), of the Firestone Development Code is hereby amended by the addition of a new subsection 5, to read as follows:

5. Manufactured Home Park Use Overlay District (UO-2)

¹ Additions to the current text of the Code are indicated by underlining, and deletions are indicated by ~~striketrough~~.

- a. There is hereby created a Use Overlay District designated as the Manufactured Home Park Use Overlay District, and the provisions of this UO-2 district shall apply only to those areas within the R-A Low-Density Residential Zone District that are designated with the UO-2 Zone District on the Official Zone Map and located east of Weld County Road 17.
- b. **Allowance for Manufactured Home Park Uses**
Notwithstanding the limitations applicable in the underlying zone district, manufactured home park uses, as defined by this FDC, shall be permitted in this overlay zone district.
- c. **General Provisions**
 - i. All manufactured homes and manufactured home parks shall conform to the R-A zone district and single-family residential standards of this FDC, unless otherwise modified by this section.
 - ii. All manufactured home parks shall conform to the Town of Firestone Design Standards & Construction Specifications for Public Improvements (Standards and Specifications).
 - iii. All manufactured homes shall be located only in a Manufactured Home Park, as defined by this FDC.
 - iv. Existing manufactured homes, whether located within or outside of a Manufactured Home Park, shall be deemed conforming as of the effective date of this FDC. Existing manufactured homes shall only be upgraded or replaced with newer and higher quality contemporary manufactured homes.
 - v. *Permitted Principal Uses*
The following uses shall be permitted within a manufactured home park:
 - 1. Any single-family dwelling unit regardless of its method of assembly, including Type 1 and Type 2 manufactured homes, module homes assembled after 1976, factory built homes or on-site built homes, provided such dwelling unit has been constructed no more than 10 years prior to the effective date of this FDC.
 - 2. Community center.
 - 3. Group care facilities.
 - vi. *Permitted Accessory Uses:*

1. Uses that are customarily incidental to any of the permitted principal uses and are located on the same lot or on an adjacent lot.
2. Recreational facilities.

d. Development Standards

- i. All manufactured homes are required to meet the provisions of C.R.S. § 24-32-3301 *et seq.*, as amended, and the Colorado Division of Housing administrative rules set forth in 8 C.C.R. 1302-14, as amended, which provide for comprehensive regulation of the installation of manufactured homes to ensure the safety, affordability and performance of such dwelling units.
 - ii. All interior streets shall meet all adopted Town Standards and Specifications.
 - iii. Interior streets, parking areas and walkways shall be adequately lighted to provide safe movement of vehicles and pedestrians at night.
 - iv. Landscaping that complies with the provisions set forth in this FDC shall be submitted as part of the required Final Development Plan for the park. All setback areas, with the exception of driveways and sidewalks, and other open space shall be landscaped to soften the exterior appearance of the mobile home park.
 - v. All manufactured homes shall be skirted between the floor and the ground surface with durable, all-weather construction as manufactured specifically for covering the undercarriage area of the mobile home.
 - vi. All manufactured homes constructed on existing lots located in the floodplain shall be installed on a permanent foundation.
- e. No replacement manufactured home shall be moved onto any lot, unless such manufactured home is certified pursuant to the "National Mobile home Construction and Safety Standards Act of 1974", 42 U.S.C. §5401 *et seq.*, as amended, or is certified by the Colorado Division of Housing pursuant to C.R.S. § 24-32-3301, *et seq.* and any administrative rules promulgated thereunder. A manufactured home presently located within a manufactured home park that is relocated within the same manufactured home park is exempted from the requirements of this section.

Section 3. Table 3-1 (Table of Permitted Uses), Use Standards for Vehicles and Equipment Use Category, of Section 16.3.1 of the Firestone Development Code, is amended to read as follows:

Vehicles and Equipment	Car Wash							S	S						3.2.C.7.b
	Outdoor Recreational Vehicle Storage								S						Minimum 1000' from Interstate, and Arterial, and Section Line Roadways
	Fueling Station						S	P	P				S		3.2.C.7
	Towing Facility								S						Minimum 1000' from Interstate, and Arterial, and Section Line Roadways
	Truck Stop								S						Minimum 1000' from Interstate, and Arterial, and Section Line Roadways
	Vehicle Sales and Rental								S						Minimum 1000' from Interstate, and Arterial, and Section Line Roadways
	Vehicle Service and Repair, Heavy								P						3.2.C.7.b
	Vehicle Service and Repair, Light						P	P	P						3.2.C.7.b

Section 4. Table 3-1 (Table of Permitted Uses), Use Standards for Warehouse and Freight Movement Use Category, of Section 16.3.1 of the Firestone Development Code, is amended to read as follows:

Warehouse and Freight Movement	Mini-warehouse/Self Storage								S						Minimum 1000' from Interstate, and Arterial, and Section Line Roadways
	Warehouse/Wholesale Distribution Center								S						Minimum 1000' from Interstate, and Arterial, and Section Line Roadways

Section 5. Table 3-1 (Table of Permitted Uses), Family Child Care Home Accessory Use Category, of Section 16.3.1 of the Firestone Development is amended to read as follows:

ACCESSORY USE	RESIDENTIAL					COMMERCIAL				OTHER				Use-Specific Standards
	RR	R-A	R-B	R-C	OTR	NC	RC	LI	OTC	DR	AG	OS	PLI	
Family Child Care Home (Small)	P	P	P	P	P						P			3.3.G.2

Section 6. Table 3-1 (Table of Permitted Uses) of Section 16.3.1 of the Firestone Development Code is amended by the addition of a new row, entitled “Family Child Care Home (Large)”, to be inserted alphabetically and to read as follows:

ACCESSORY USE	RESIDENTIAL					COMMERCIAL				OTHER				Use-Specific Standards
	RR	R-A	R-B	R-C	OTR	NC	RC	LI	OTC	DR	AG	OS	PLI	
Family Child Care Home (Large)	S	S	S	S	S						S			

Section 7. Section 16.3.3.G.2, “Family Child Care Home,” of the Firestone Development Code is hereby deleted in its entirety and re-enacted to read as follows:

2. Family Child Care Home

Family Child Care Homes shall comply with the Colorado licensing statutes codified at C.R.S. §26-6-101 *et seq.*, as amended, and the Department of Human Service Regulations codified at 12 CCR 2509-8 *et seq.*, as amended. Family Child Care Homes (Small) may serve no more than six (6) full time and two (2) part time children or students within a Single-Family Detached residence. Family Child Care Homes (Large) shall conform to the following standards:

- a. Family Child Care Homes (Large) shall serve no more than twelve (12) children;
- b. Family Child Care Homes (Large) shall not be located adjacent to or directly across the street from other Family Child Care Homes (Large); and
- c. Family Child Care Homes (Large) shall only be located on streets that accommodate on-street parking.

Section 8. Table 4-1 is amended to appear as follows:

TABLE 4-1: DIMENSIONAL AND DENSITY STANDARDS – RESIDENTIAL AND COMMERCIAL DISTRICTS (Additional standards may apply. See Use-Specific Standards in Section 3.2)								
		Minimum Lot Standards		Minimum Setbacks (ft.) [Ⓢ]				Max Height (ft)
District	Max/Min Density (DU/Acre)	Width (ft)	Net Area [Ⓢ] (sq ft)	Front	Street (all uses)	Interior Lot Line	Rear	
RR	1/na	100 (Flag lots: 50)	43,560	Principal: 30 Accessory: 40	30	10	Principal: 30 Accessory: 10	40
R-A	5/na	SFD: 45 Corner 55 SFD-Alley: 35 Corner 45 SFA: 25 Corner 35 MF: none	SFD: 4,500 SFD-Alley: 3,500 SFA: 2,000 SFA-Alley: 1,500 MF: 1,500 per DU	Principal SF: 14 10 for alley loaded 20 to front load garage Principal MF: 20 Accessory: 30	SF: 10 MF: 20	Principal SF: 5 [Ⓢ] Principal MF: 10 [Ⓢ] Accessory: 5 [Ⓢ]	Principal SFD: 20 2 for SFD-Alley loaded: 2 Principal SFA: 15 SFA-Alley: 2 Principal MF: 20 Accessory SF: 5 Accessory MF: 10	Prin-SF: 35 Prin-MF: 45 Acc: 25
R-B	10/5							
R-C	20/10							

Section 9. Section 16.4.2.A.1.b.iv, “General Setback Requirements,” of the Firestone Development Code is hereby amended to read as follows:

ii. *Incidental Architectural Features*

Cornices, eaves, canopies, ~~window wells~~, chimneys, bay windows, ornamental features, and other similar architectural features may encroach not more than two (2) feet into any required setback. Window well openings may encroach not more than three (3) feet into any required setback.

Section 10. Section 16.4.2.A.1.b, “General Setback Requirements,” of the Firestone Development Code is hereby amended by the addition of a new subsection viii, to read as follows:

viii. *Driveways*

Residential driveways may encroach into any required interior side setback provided these encroachments are at least three (3) feet from the side lot line and do not impact drainage conveyance or utilities.

Section 11. Section 16.5.4.E.8, “Lots,” of the Firestone Development Code is hereby amended to read as follows:

Wedge-shaped lots shall not be less than ~~forty~~ thirty-five (40 35) feet in width at the front property line. Such lots shall conform to the minimum lot width for the district at the front setback line.

Section 12. Section 16.5.4.G.7, “Street Arrangement and Connections,” of the Firestone Development Code is hereby deleted in its entirety and re-enacted to read as follows:

7. Street Arrangement and Connections

- a. Local streets shall be arranged so that their use by through traffic will be discouraged. Traffic calming techniques such as use of grid patterning, diverters and curvilinear alignments are encouraged to reduce speeds and cut-through traffic. All traffic calming measures shall be approved by the Town Engineer.

- b. Where a subdivision borders the following, a minimum landscaped buffer area shall be provided as follows: thirty (30) feet adjacent to arterial streets and section line roadways, fifty (50) feet adjacent to railroad right-of-way, and one-hundred (100) feet adjacent to Interstate right-of-way. This buffer is in addition to any required right-of-way, and exclusive of any lot size requirements. No driveway access shall be permitted from the lot directly to any highway, freeway, arterial, section line roadways, or railroad right-of-way.
- c. Dead-end streets (excluding cul-de-sac or stub streets) shall not be permitted unless approved by the Board of Trustees
- d. Visibility into residential subdivision from arterial, section line, and collector roadways shall be emphasized and coordinated with street configurations including cul-de-sacs and parallel road loops, open space, and trail corridors. The backing of lots to arterials, section line, and collector roadways shall be limited. Continuous runs of lots which back to such roadways shall not exceed five-hundred (500) feet in length.
- e. Openings in the perimeter fence frontage shall serve to visually link intersecting streets, view corridors into and out of the development, pedestrian entryways, and parks or open space.

Section 13. Section 16.6.2.D.2.a, “Standards for Community Gateway Corridors,” of the Firestone Development Code is hereby deleted in its entirety and re-enacted to read as follows:

a. ***Arterials and Section Line Roadways***

- i. A minimum thirty (30) foot landscaped buffer shall be maintained on either side of the arterial or section line roadway and located in a tract. This buffer should utilize a variety of live plant material and berming to provide year-round visual interest. A minimum ten (10) foot wide sidewalk shall be incorporated as an integral component of the landscape buffer and landscape area within the right-of-way.
- ii. Single-family detached residential lots shall be set back a minimum of one-hundred fifty (150) feet from the right-of-way along Firestone Boulevard west of Colorado Boulevard.
- iii. All fencing facing the arterial or section line roadway shall be a maximum of four (4) feet in height and should have an open character, such as split rail or picket. Opaque fencing is prohibited.
- iv. Parking shall be screened to the greatest extent reasonably practicable from the arterial or section line roadway using a combination of berming, walls, fencing and landscaping with a minimum cumulative height of three (3) feet. Such berming or screening walls and fencing may be located within the landscaped buffer prescribed in this Section. Parking, internal drives or streets may not extend into the landscape buffer excepting access drives from the right-of-way running perpendicular to the arterial or section line roadway.

- v. Garages and carports may not be used as a screen or barrier between the arterial or section line roadway and a development site.

Section 14. Section 16.6.3.B.5.a.i.(C), “Pocket Parks,” of the Firestone Development Code is hereby amended to read as follows:

Bordered on at least one (1) side by public streets (excluding major collector, section line, and arterial streets) to provide easy public access, visual surveillance, and on-street parking;

Section 15. Section 16.6.3.B.5.a.ii.(C), “Neighborhood Parks,” of the Firestone Development Code is hereby amended to read as follows:

Bordered on at least two (2) sides by public streets (excluding arterial or section line streets) to provide easy public access, visual surveillance and parking;

Section 16. Section 16.6.3.c..f.viii, “Areas Not Eligible,” of the Firestone Development Code is hereby amended to read as follows:

The first 150’ of oil ~~Oil~~ and gas well and facility setbacks or the setback as identified in a Surface Use Agreement (SUA), whichever is greater; and

Section 17. Section 16.6.4.G.6, “Rooftop Mechanical Equipment,” of the Firestone Development Code is hereby amended to read as follows:

Rooftop mechanical equipment, including HVAC equipment, venting, and utility equipment that serves the structure, shall be screened. Screening shall be accomplished through the use of parapet walls or a sight-obscuring enclosure around the equipment constructed of one (1) of the primary materials used on the primary facades of the structure, and that is an integral part of the building’s architectural design. The parapet or screen shall completely surround the rooftop mechanical equipment to an elevation equal to or greater than the highest portion of the rooftop mechanical equipment being screened. In the event such parapet wall does not fully screen all rooftop equipment, then the rooftop equipment shall be enclosed by a screen constructed of one (1) of the primary materials used on the primary facade of the building so as to achieve complete screening.

Section 18. Section 16.6.4.H of the Firestone Development Code is hereby amended by the addition of a new subsection 8. to read as follows:

8. *Fences within Residential Districts*

a. Fencing Required

- i. For new residential development, wing fencing, street side fencing, and fencing against open space, parks and landscape tracts shall be required and in a manner pursuant to this FDC as applicable.

Section 19. Section 16.6.5.D.2.d, “Access,” of the Firestone Development Code is hereby amended to read as follows:

d. Access

- i.** All driveways shall be paved in concrete or asphalt.
- ii.** All non-residential development shall be designed to allow for cross-access to adjacent properties to encourage shared parking and shared access points on public or private streets. When cross-access is deemed impractical by the Director on the basis of topography, the presence of natural features, vehicular safety, or convenience factors, this requirement may be waived provided that appropriate bicycle and pedestrian connections are provided between adjacent developments or land uses. Cross access easements shall be referenced as a note on the plat.
- iii.** Whenever feasible, there shall be no direct driveway access (ingress or egress) from any single-family residential lots to any non-residential collector street, arterial street, section line roadway or highway. Whenever feasible, all single-family residential lots driveway access shall be limited to residential collector and local residential streets.

Section 20. Section 16.6.7.D.1.b.iii, “Diversification Standards,” of the Firestone Development Code is hereby deleted in its entirety and re-enacted to read as follows:

iii. Housing types that apply to Table 6.7-1 include:

- (A) Single-family Detached;
- (B) Duplex;
- (C) Single-family Attached – Townhouse;
- (D) Multi-Family – six (6) units or less;
- (E) Multi-Family – Apartments (seven (7) units or more); and
- (F) Live-Work units.

Section 21. Section 16.6.7.E.3.b, “Width/Façade Ratio,” of the Firestone Development Code is hereby deleted in its entirety and re-enacted to read as follows:

The width of a front-loaded garage shall not exceed fifty-five (55) percent of the width of the front elevation for two-car garages or sixty-five (65) percent of the width of the front elevation for three-car garages.

Section 22. Section 16.6.12.C.2.i., “Exemptions,” of the Firestone Development Code is hereby amended to read as follows:

Town decorations, banners, signs or other elements located on Town property, right-of-way, utility poles, or streetlights and elements approved through the Town’s Special Events process.

Section 23. The row entitled “Maximum Number” of Table 6.12-6 of Section 16.6.12.J.2 of the Firestone Development Code is hereby amended to read as follows:

Standards	Non-Residential Zoning Districts	Multi-Family	Single-Family Zoning Districts
		Zoning Districts	
Maximum Number	1 per street frontage** <u>(1 additional for every 500' of frontage)**</u>	1 per street frontage	1 per street frontage

Section 24. Table 6.12-6 of Section 16.6.12.J.2 of the Firestone Development Code is hereby amended by the addition of a new note to read as follows:

****** For non-residential zoning district temporary freestanding signs located within one-thousand two-hundred (1,200) feet of the Interstate 25 right-of-way, the maximum sign height may be increased to twelve (12) feet, the maximum sign area may be increased to sixty-four (64) square feet, and the maximum number of signs may be doubled.

Section 25. Section 16.11.3, “Terms Defined,” of the Firestone Development Code is hereby amended by modifying the following definitions, to read as follows:

Gazebo.

An accessory structure no larger than two-hundred ~~one hundred fifty (150)~~ 200 square feet which may be covered by a roof and enclosed with screening intended to be used for outdoor living activities.

Setback, Front

A setback that extends across the full frontage of a lot or tract on a public or private street. The front setback is defined by the front property line.

- a.** In the case of rounded property corners at street intersections, the front setback is measured as if the corner is not rounded and the front and street side property lines are extrapolated to intersect.
- ~~**b.** In the case of corner or through lots, a front setback extends across all frontages.~~
- e b.** For cul-de-sac lots and lots abutting a curved street, the front setback follows the curve of the front property line.
 - i.** The minimum lot width requirement shall be met at the front setback line.
 - ii.** In no event shall the front lot line be less than thirty-five (35) feet in width.
- ~~**d c.**~~ In the case of flag lots, a front setback extends across the entire flag portion of the lot and includes the flagpole portion of the lot.

- e d.** In the case of a corner lot, through lot, or three (3) sided lot, there will be no rear setbacks, but only front and side setbacks.

Shed

An accessory building of not more than ~~one hundred fifty~~ two hundred (150 200) square feet in floor area and not more than ~~fourteen~~ twelve (14 12) feet in ~~maximum~~ height.

Section 26. If any article, section, paragraph, sentence, clause, or phrase of this ordinance is held to be unconstitutional or invalid for any reason, such decision shall not affect the validity or constitutionality of the remaining portions of this ordinance. The Board of Trustees hereby declare it would have passed this ordinance and each part or parts hereof irrespective of the fact that any one part or parts be declared unconstitutional or invalid.

Section 27. Violations of this ordinance shall be punishable in accordance with Section 1.16.010 of the Municipal Code of the Town of Firestone, Colorado.

Section 28. All other ordinances or portions thereof inconsistent or conflicting with this ordinance or any portion hereof are hereby repealed to the extent of such inconsistency or conflict.

INTRODUCED, READ, ADOPTED, APPROVED, AND ORDERED PUBLISHED IN FULL this __th day of _____, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

APPROVED AS TO FORM:

Jessica Koenig, Town Clerk

William P. Hayashi, Town Attorney



**FIRESTONE
DEVELOPMENT
CODE**

JANUARY 20221

CHAPTER 1: GENERAL PROVISIONS

16.1.1 TITLE AND EFFECTIVE DATE

The Firestone Development Code may be referred to throughout this document as “this FDC.”

16.1.2 AUTHORITY

This FDC is enacted pursuant to the powers granted and limitations imposed on municipalities by the laws of the State of Colorado, including without limitation C.R.S. §29-20-101 *et seq.* (Local Government and Land Use Enabling Act). This FDC has been adopted by reference into the Firestone Municipal Code (Ordinance No. 976) and as amended (Ordinances No. 982 and _____).

16.1.3 PURPOSE OF THIS TITLE

A. General Purpose

This FDC has as its general purpose the promotion of the health, safety, and general welfare of the Town of Firestone (“Town”).

B. Specific Purposes

The provisions of this FDC are specifically intended to:

1. Foster quality, compatible, and efficient relationships among land uses;
2. Promote a healthy and convenient distribution of population by regulating and limiting the density of development;
3. Ensure greater public safety and accessibility through quality physical design and location of land use activities;
4. Encourage the efficient use of the available land supply;
5. Promote a balanced supply of residential, commercial, industrial, institutional, and transportation land uses that are substantially compatible with adjacent land uses and that have good access to transportation networks;
6. Preserve the character and quality of the Town’s residential neighborhoods;
7. Promote a balanced, diverse supply of quality housing located in safe and livable neighborhoods;
8. Enhance the appearance, visual scale, orientation, quality, and mix of land uses of new developments;
9. Ensure that developments are substantially compatible with the Town’s Comprehensive Master Plan;
10. Promote the vitality and development of the Town’s major employment centers, town centers, and its other commercial and mixed-use districts;
11. Manage traffic congestion in the streets;
12. Ensure the provision of adequate open space for light, air, and recreation;
13. Preserve the value of buildings and land;
14. Manage the preservation of existing trees and vegetation, wetlands, floodplains, wildlife and habitat, stream corridors, scenic views, and other areas of scenic and environmental significance from adverse impacts of land development;

zoning code and development regulations located outside of the Old Town Firestone area is intended to be included in the R-A district.

D. Medium-Density Residential (R-B)

1. Purpose

To provide areas for residential uses of an urban character, at a gross density not to exceed ten (10) dwelling units per acre. A minimum gross density of five (5) dwelling units per acre is required. The zone district classification of R-2 from former Town zoning code and development regulations is intended to be included in the R-B district.

E. High-Density Residential (R-C)

1. Purpose

To provide areas for residential uses of an urban character, at a gross density not to exceed twenty (20) dwelling units per acre. A minimum gross density of ten (10) dwelling units per acre is required. The zone district classification of R-3 from former Town zoning code and development regulations is intended to be included in the R-C district.

F. Old Town Residential (OTR)

1. Purpose

To ensure the preservation of the unique character and quality of life in the historic residential area of the Town by encouraging compatible redevelopment and infill development. The zone district classification of R-1 from former Town zoning code and development regulations located within Old Town Firestone is intended to be included in the OTR district.

2. District-Specific Standards

a. *Single-Family Detached*

Single-family residential development of up to five (5) dwelling units per acre.

b. *Multi-Family Development*

Multi-family residential development of up to ten (10) dwelling units per acre.

16.2.3 COMMERCIAL AND INDUSTRIAL DISTRICTS

A. General Purposes of Commercial and Industrial Districts

The commercial and industrial zoning districts contained in this Section generally are intended to:

1. Provide appropriately located areas substantially consistent with the Town's Comprehensive Master Plan for industrial, retail, service, and office uses;
2. Expand the Town's economic base and provide employment opportunities primarily for Firestone residents and the region;
3. Minimize any potentially negative impact of commercial and industrial development on adjacent residential districts;
4. Ensure that the appearance and effects of commercial and industrial buildings and uses are of an appropriate high quality and are substantially consistent with the character of the area in which they are located; and
5. Provide sites for residential, public, and semi-public uses needed to complement commercial and industrial development.

B. Old Town Commercial (OTC)

1. Purpose

To provide for and encourage development and redevelopment that preserves and enhances the unique character and vitality of Old Town Firestone. Small-scale offices, retail, and

residential uses are permitted. New development is encouraged to place residential above the ground floor. Design standards focus on creating a human-scaled, pedestrian-oriented and walkable downtown that invites commercial development and complementary residential opportunities. Continuous retail frontages, largely uninterrupted by driveways and parking, are encouraged. The zone district classifications of C-1, C-2, C-M, and NC from former Town zoning code and development regulations along First Street in Old Town Firestone are intended to be included in the OTC district. Developing and redeveloping non-residential properties adjacent to Grant Avenue between Colorado Boulevard and Second Street are intended to be included in the OTC district.

C. Neighborhood Center (NC)

1. Purpose

To provide areas for a full range of community-oriented retail and service commercial uses. The zone district classification of C-1 from former Town zoning code and development regulations outside of Old Town Firestone is intended to be included in the NC district.

D. Regional Commercial (RC)

1. Purpose

To provide areas for a variety of regionally oriented large retail and service commercial uses, and highway-oriented commercial uses such as shopping centers, big-box retail, gas stations, restaurants, hotels and similar and associated land uses. The zone district classifications of C-2 and M-2 from former Town zoning code and development regulations are intended to be included in the RC district.

E. Light Industrial (LI)

1. Purpose

To provide areas for light industrial uses including warehousing and limited outdoor sales and storage. Heavy industrial uses may only be approved as a Special Review Use. The zone district classifications of EC, C-M, and M-1 from former Town zoning code and development regulations are intended to be included in the LI district.

16.2.4 OTHER DISTRICTS

A. Agricultural

1. Purpose

To provide areas to be used for agricultural purposes. The zoning classification is intended to recognize and preserve lands suitable for long-term production of agricultural commodities, lands suitable for grazing, animal husbandry, and agro-tourism.

B. Open Space (OS)

1. Purpose

To provide areas to be used for open space purposes. The zoning classification is intended to recognize and preserve lands suitable for habitat, view protection, passive and active recreation, and conservation uses.

C. Developing Resource (DR)

1. Purpose

To provide for the annexation of those areas that are presently used for agriculture or other nonurban uses that are adjacent to Town limits. These areas are designated in the comprehensive plan as potentially suitable for urban development, but not in the immediate future because of lack of utilities, other services, or other needs. No uses other than those existing at the time of annexation are permitted until the property is rezoned to another zoning classification pursuant to this FDC.

	• Open Space • Library • Community and Recreation Center • Day-care facility • Religious assembly • Private or Public School
Adult Bookstore Adult Photo Studio Adult Theater Adult Amusement or Entertainment Eating place with adult amusement or entertainment	Not more than two (2) of the uses listed in this table row shall be established, operated or maintained within seven-hundred fifty (750) feet of each other

5. Manufactured Home Park Use Overlay District (UO-2)

a. There is hereby created a Use Overlay District designated as the Manufactured Home Park Use Overlay District, and the provisions of this UO-2 district shall apply only to those areas within this FDC's R-A Low-Density Residential Zone District that is designated with the UO-2 Zone District on the Official Zone Map and located east of Weld County Road 17.

b. Allowance for Manufactured Home Park Uses

Notwithstanding the limitations applicable in the underlying zone district, manufactured home park uses, as defined by this FDC, shall be permitted in this overlay zone district.

c. General Provisions

i. All manufactured homes and manufactured home parks shall conform to the R-A zone district and single-family residential standards of this FDC unless otherwise modified by this section.

ii. All manufactured home parks shall conform to the Town of Firestone Design Standards & Construction Specifications for Public Improvements (Standards and Specifications).

iii. All manufactured homes shall be located only in a Manufactured Home Park.

iv. Existing manufactured homes whether they be located within or outside of a manufactured home park shall be deemed conforming as of the effective date of this FDC. Existing manufactured homes shall only be upgraded or replaced with newer and higher quality contemporary manufactured homes.

v. Permitted Principal Uses

The following uses shall be permitted within a manufactured home park:

1. Any single-family dwelling unit regardless of its method of assembly including Type 1 and Type 2 manufactured homes, module homes

assembled after 1976, factory built homes or on-site built homes, provided said dwelling units have been constructed no more than 10 years prior to the effective date of this FDC.

2. Community center.

3. Group care facilities.

vi. Permitted Accessory Uses:

1. Uses that are customarily incidental to any of the permitted principal uses and are located on the same lot or on an adjacent lot.

2. Recreational facilities.

d. Development Standards

i. All manufactured homes are required to meet the provisions of C.R.S. § 24-32-3301 et seq., as amended, and the Colorado Division of Housing administrative rules set forth in 8 C.C.R. 1302-14, as amended, which provide for comprehensive regulation of the installation of manufactured homes to ensure the safety, affordability and performance of such dwelling units.

ii. All interior streets shall meet all adopted Town Standards and Specifications.

iii. Interior streets, parking areas and walkways shall be adequately lighted to provide safe movement of vehicles and pedestrians at night.

iv. Landscaping that complies with the provisions set forth in this FDC shall be submitted as part of the required Final Development Plan for the park. All setback areas, with the exception of driveways and sidewalks, and other open space shall be landscaped to soften the exterior appearance of the mobile home park.

v. All manufactured homes shall be skirted between the floor and the ground surface with durable, all-weather construction as manufactured specifically for covering the undercarriage area of the mobile home.

vi. All manufactured homes constructed on existing lots located in the floodplain shall be installed on a permanent foundation.

e. No replacement manufactured home shall be moved onto any lot unless such manufactured home is certified pursuant to the "National Mobile Home Construction and Safety Standards Act of 1974", 42 U.S.C. §5401 et seq., as amended or is certified by the Colorado Division of Housing pursuant to C.R.S. §24-32-701, et seq. A manufactured home presently located within a manufactured home park that is relocated within the same manufactured home park is exempted from the requirements of this Chapter.

TABLE 3-1: TABLE OF PERMITTED USES																
P = Permitted Use by Right S = Special Review Use <u>Blank Cell = Prohibited</u>																
USE CATEGORY	USE TYPE	RESIDENTIAL					COMMERCIAL				OTHER				Use Standards	
		RR	R-A	R-B	R-C	OTR	NC	RC	LI	OTC	DR	AG	OS	PLI		
RESIDENTIAL USES																
Household Living	Dwelling, Live/Work								S	P					3.2.A.1	
	Dwelling, Multi-Family				P	S										
	Dwelling, Single-Family Attached		P	P	P	S										
	Dwelling, Single-Family Detached	P	P	P	P	P						P			3.2.A.2	
	Model Home	P	P	P	P	P									3.2.A.3	
	<u>Manufactured Home Park</u>		<u>P</u>												<u>2.5.G.5</u>	
Group Living	Group Home, Residential	P	P	P	P	P						P			3.2.A.4	
	Group Home, Large		S	S	S							S				
	Group Home, Small	S	S	S	S	S				S						
	Retirement Home, Nursing Home, Hospice Care Residential Facility or Assisted Living Facility		S	S	P	S									3.2.A.5	
PUBLIC / INSTITUTIONAL USES																
Aviation	Helistop						S	S	S					S		
Cemetery	Cemetery	S										S	S	S		
Child Care	Child Care Center, Large	S	S	S	S	S	P	P	S	S				S	3.2.B.1	
	Child Care Center Small	P	P	P	P	P	P	P	S	S				P	3.2.B.1	
	Community Center	S	S	S	S	S	P	P	P	P			P	P		

TABLE 3-1: TABLE OF PERMITTED USES															
P = Permitted Use by Right S = Special Review Use Blank Cell = Prohibited															
USE CATEGORY	USE TYPE	RESIDENTIAL					COMMERCIAL				OTHER				Use Standards
		RR	R-A	R-B	R-C	OTR	NC	RC	LI	OTC	DR	AG	OS	PLI	
	Pharmacy with drive-through service						P	P	P						3.2.C.5
	Repair Shop						P	P	P	P					
Vehicles and Equipment	Car Wash							S	S						3.2.C.7.b
	Outdoor Recreational Vehicle Storage								S						Minimum 1000' from Interstate, and Arterial , and <u>Section Line</u> Roadways
	Fueling Station						S	P	P				S		3.2.C.7
	Towing Facility								S						Minimum 1000' from Interstate, and Arterial , and <u>Section Line</u> Roadways
	Truck Stop								S						Minimum 1000' from Interstate, and Arterial , and <u>Section Line</u> Roadways
	Vehicle Sales and Rental								S						Minimum 1000' from Interstate, and Arterial , and <u>Section Line</u> Roadways
	Vehicle Service and Repair, Heavy								P						3.2.C.7.b
	Vehicle Service and Repair, Light						P	P	P						3.2.C.7.b

TABLE 3-1: TABLE OF PERMITTED USES															
P = Permitted Use by Right S = Special Review Use Blank Cell = Prohibited															
USE CATEGORY	USE TYPE	RESIDENTIAL					COMMERCIAL				OTHER				Use Standards
		RR	R-A	R-B	R-C	OTR	NC	RC	LI	OTC	DR	AG	OS	PLI	
Warehouse and Freight Movement	Mini-warehouse/Self Storage								S						Minimum 1000' from Interstate, and Arterial , and Section Line Roadways
	Warehouse/Wholesale Distribution Center								S						Minimum 1000' from Interstate, and Arterial , and Section Line Roadways
Waste-Related Uses	Auto Wrecking and Salvage Yard/Junkyard														
	Hazardous Materials Handling and Transfer Facility														
	Recycling Collection Point													P	3.2.D.2
	Recycling Center														
	Sanitary Landfill														

Chapter 11 (Definitions), identifies typical accessory uses associated with many principal uses as part of that principal use's definition.

2. All accessory uses shall be subject to the general standards set forth in this Subsection, as well as any use-specific standards set forth in Section 3.2 above.

C. Explanation of Table Abbreviations

1. Permitted Uses

"P" in a cell indicates that the use is permitted by right, without special conditions other than those imposed upon other uses by right in the district. A use by right requires no further approval from the Board of Trustees; however, it shall be subject to Final Development Plan review if the associated principal use requires Final Development Plan review. Permitted uses are subject to all other applicable regulations of this FDC, including the use-specific standards set forth in this Chapter and the requirements of Chapter 6.

2. Special Review Uses

"S" in a cell indicates that, in the respective zoning district, the use is permitted only if reviewed and approved as a Special Review Use in accordance with the procedures of Section 7.11. Special Review Uses are subject to all other applicable regulations of this FDC, including the use-specific standards set forth in this Chapter and the requirements of Chapter 6.

3. Prohibited Uses

A blank cell indicates that the use is prohibited in the respective zoning district.

4. Use-Specific Standards

Regardless of whether a use is permitted by right or permitted as a Special Review Use, there may be additional standards that are applicable to the use. The existence of these use-specific standards is noted through a cross-reference in the last column of the table. Cross-references refer to Section 3.2. These standards apply in all districts unless otherwise specified.

D. Classification of New and Unlisted Uses

When application is made for an accessory use category or use type that is not specifically listed in Table 3-2, the procedure described in Subsection 3.1.D, shall be followed.

E. Table of Permitted Accessory Uses

TABLE 3-2: TABLE OF ACCESSORY USES

P=Permitted Use By Right S=Special Review Use Blank=Not Permitted

ACCESSORY USE	RESIDENTIAL					COMMERCIAL				OTHER				Use-Specific Standards
	RR	R-A	R-B	R-C	OTR	NC	RC	LI	OTC	DR	AG	OS	PLI	
Accessory dwelling unit	S	P	P	P	P									3.3.G.1
Backyard Chicken Hens	P	P	P	P	P						P			3.3.G.5
Family eChild eCare hHome (Small)	P	P	P	P	P						P			3.3.G.2

<u>Family Child Care Home (Large)</u>	<u>S</u>	<u>S</u>	<u>S</u>	<u>S</u>	<u>S</u>						<u>S</u>			<u>3.3.G.2</u>
Garage, Private Detached	P	P	P	P	P	P	P	P	P		P	P	P	3.3.G.11
Greenhouse, Private	P	P	P	P	P						P			3.3.G.3
Heliport						S	S	S						
Home occupations	P	P	P	P	P						P			3.3.G.4
Keeping of Household Pets	P	P	P	P	P						P			3.3.G.6
Keeping of Large Animals	S										P	P		3.3.G.7
Outdoor display and sales						P	P	P	P					3.3.G.8
Outdoor storage						P	P	P	P			P	P	3.3.G.9
Private Structure, Large	P	P	P	P	P	P	P	P	P		P	P	P	3.3.G.11
Private Structure, Small	P	P	P	P	P	P	P	P	P		P	P	P	3.3.G.12
Quarters for caretaker/guard as part of a permanent structure								S			S			
Refuse/Recycling/Donation Collection Receptacle						P	P							
Swimming Pool/Hot Tub	P	P	P	P	P	P	P	P	P		P	P	P	3.3.G.10
Truck/Fleet Fueling & Carwash								S						

Table 3-2 below lists the accessory uses permitted within all zoning districts.

F. General Standards

All accessory uses and structures shall comply with the general standards in this Section. No accessory use shall be located on any lot as the principal use.

1. Compliance

- a. All accessory uses and structures shall be subject to the standards set forth in this Section, and also the use-specific standards of Section 3.2 above and the dimensional standards of Chapter 4. In the case of any conflict between the accessory use/structure standards of this Section and any other requirement of this FDC, the more restrictive standards shall control.
- b. Accessory uses shall comply with all standards of this FDC applicable to the principal use with which they are associated. Parking requirements shall be met for both the principal use and any accessory use.

2. Same Lot Required

The accessory use or structure shall be conducted and/or located on the same lot as the principal use.

3. Same Ownership Required

The property where the principal use and the accessory use are occurring shall be under the same ownership.

4. Same Utility Meter Required

The principal use and the accessory use shall utilize the same utility meter.

5. Temporary Accessory Uses and Structures

Temporary accessory uses and structures shall be governed by the temporary use permit procedures and standards set forth in Sections 7.14 and 3.4.

the accessory dwelling unit will be located. Mobile homes, recreational vehicles, and travel trailers shall not be used as accessory dwelling units.

iii. *Size of Accessory Dwelling Unit*

No accessory dwelling unit shall exceed thirty-three (33) percent of the size of the habitable floor area of the principal dwelling unit, or nine-hundred (900) square feet, whichever is less. In addition, accessory dwelling units shall be no less than five-hundred (500) square feet. An accessory dwelling unit shall contain private sanitary facilities with hot and cold running water and cooking and food storage facilities.

iv. *Limit on Number*

There shall be no more than one (1) accessory dwelling unit on a lot in addition to the principal single-family detached dwelling. An accessory dwelling unit shall not serve as the principal dwelling on the site.

v. *Parking Requirements*

(A) On-site parking is not required if an accessory dwelling unit is built on a site with an existing single-family detached house that has on-street parking on the abutting street frontage.

(B) One (1) additional parking space is required when:

(1) The street abutting the site does not have on-street parking;
or

(2) The accessory dwelling unit is built at the same time as the single-family detached house.

vi. *Design Standards*

(A) All accessory dwelling units shall be designed to maintain the appearance, architectural style and character of the principle dwelling unit. Exterior siding, roofing, and trim shall match the appearance of the materials on the principal dwelling unit. Roof style shall match the predominant style of the principal dwelling unit. Exterior window trim, window proportions (width to height), patterns, and orientation (horizontal to vertical) shall match those of the principal dwelling unit.

e. *Permit Required*

New accessory dwelling units shall be required to receive an Accessory Dwelling Unit Permit through the Town. Review of the permit application shall be reviewed by the Director for compliance with the standards included in this section and Town code.

2. **Family Child Care Home**

Family ~~C~~ehild ~~e~~Care ~~h~~Homes shall comply with the Colorado licensing statutes codified at C.R.S. §26-6-102 *et seq.*, as amended, and the Department of Human Service Regulations codified at 12 CCR 2509-8 *et seq.*, as amended. Family ~~e~~Child ~~C~~care ~~h~~Homes (Small) may serve no more than six (6) full time and two (2) part time children or students within a Single-Family Detached residence. Family Child Care Homes (Large) shall conform to the following standards:

a. Family Child Care Homes (Large) shall serve no more than twelve (12) children;

b. Family Child Care Homes (Large) shall not be located adjacent to or directly across the street from other Family Child Care Homes (Large); and

a-c. Family Child Care Homes (Large) shall only be located on streets that accommodate on-street parking.

3. Greenhouse

A greenhouse shall be permitted as an accessory use to a residential dwelling unit only if there are no sales from the premises.

4. Home Occupations

Home occupations shall be a permitted accessory use governed by the following regulations:

- a. A home occupation shall not be conducted until a home occupation has been reviewed and approved and a license has been issued by the Director. Said license shall cite the conditions of the approval, if any.
- b. Home occupations must be clearly secondary to the use of the building as a residence and shall not occupy more than twenty-five (25) percent of the total floor area.
- c. The home occupation shall use the same water, electric and gas meters as the residence.
- d. Home occupations shall be operated entirely from an enclosed structure with no exterior storage of business related vehicles, materials or equipment. The home occupation owner's individual business/personal passenger vehicle is exempt from this requirement.
- e. There shall be no visible evidence of the operation, and it shall not change the residential character thereof.
- f. Only persons residing in the residence can operate the home occupation at the residence. A maximum of two (2) non-occupant employees, independent contractors or others associated with the business may be at the residence at the same time for work, work assignments, supplies, etc.
- g. The operation shall not generate objectionable traffic in the area, and off-street parking must be provided to accommodate all needs created by the home occupation.
- h. The operation shall not be objectionable due to odor, dust, smoke, noise, vibration or other similar impacts.
- i. The following uses, because of their tendency to go beyond the limits permitted for home occupations and thereby impair the use and value of the residential area shall not be permitted as home occupations: auto repair or motorized implement repair; dance, music or other types of instruction (if more than four (4) students are being instructed at one (1) time); dental offices; medical offices; the painting of vehicles, trailers or boats; private schools with organized classes; motor vehicle towing operation; barber shops having more than one (1) chair, beauty shops having more than one (1) chair; welding shops; nursing homes; bed and breakfast and other such transient lodging; and retail sales where products are stocked and sold to purchasers at the home occupation residence like a retail store.

5. Keeping of Backyard Chicken Hens

The keeping of backyard chicken hens shall be a permitted accessory use to single-family detached dwelling units on lots greater than 4,500 square feet in lot area that meet the following regulations:

- a. No more than six (6) backyard chicken hens are permitted per dwelling unit.
- b. Roosters are prohibited.

2. Temporary Sales Trailer or Temporary Sales Office

A temporary sales trailer or temporary sales office shall be reviewed and if appropriate approved by the Director. Plans shall be submitted illustrating that the application meets all of the following requirements:

- a. The use shall be located on a lot.
- b. The owner shall provide a paved road to Town of Firestone Design Standards & Construction Specifications for Public Improvements (Standards and Specifications) as accepted on the construction plans, and shall provide secondary access if required by Fire District; to their standards.
- c. The use shall meet zoning category setback and height requirements.
- d. A water and sewer tap is required on the lot where the trailer/office is located to provide adequate public facilities within the sales trailer.
- e. ADA access is required.
- f. A minimum of four (4) temporary off-street parking stalls shall be provided on-site or on an adjacent vacant lot.
- g. Off-street parking shall have all-weather surfacing.
- h. Off-street parking shall maintain five (5) foot setbacks to all property lines excluding the access way to the parking area.
- i. Access to a sales trailer and associated parking shall come from a local or collector street.
- j. The trailer and associated site elements shall be removed within thirty (30) days of the last Certificate of Occupancy being issued within the filing within the development in which the trailer is located or as otherwise authorized by the Director.
- k. Within 30 days of the trailer being removed from the site, the owner shall either have a building permit(s) issued for the site to construct a residence, a building permit to construct a non-residential building subject to an approved Final Development Plan, or the site shall be restored with appropriate ground cover in accordance with Town erosion control standards.

3. Mobile Food Vendor

Mobile Food Vendors, permitted under this FDC, shall meet the following criteria:

- a. Mobile food vendor sales shall only be conducted on properties with the appropriate zoning allowing food sales.
- b. Mobile food vendor sales shall be an accessory use to an existing commercial business and shall not be conducted from any vacant property.
- c. The mobile food vendor shall meet principle structure setbacks for the zone district in which it is located.
- d. The mobile food vendor shall not be located in public right-of-way or on Town Property unless permitted by Town special event permit.
- e. The mobile food vendor and other associated items such as signs, trash receptacles, chairs, tables, etc., shall not be parked or located in such a way to block, obstruct or interfere with fire lanes, travel lanes, or pedestrian ways on or adjacent to the property on which sales are conducted.
- f. A mobile food vendor may not use amplified sound.

A. Dimensional and Density Standards

TABLE 4-1: DIMENSIONAL AND DENSITY STANDARDS – RESIDENTIAL AND COMMERCIAL DISTRICTS (Additional standards may apply. See Use-Specific Standards in Section 3.2)								
		Minimum Lot Standards		Minimum Setbacks (ft.) ^②				Max Height (ft)
District	Max/Min Density (DU/Acre)	Width (ft)	Net Area ^③ (sq ft)	Front	Street (all uses)	Interior Lot Line	Rear	
RR	1/na	100 (Flag lots: 50)	43,560	Principal: 30 Accessory: 40	30	10	Principal: 30 Accessory: 10	40
R-A	5/na	SFD: 45 Comer: 55 SFD-Alley: 35 Comer: 45 SFA: 25 Comer: 35 MF: none	SFD: 4,500 SFD-Alley: 3,500 SFA: 2,000 SFA-Alley: 1,500 MF: 1,500 per DU	Principal SF: 14 10 for alley loaded 20 to front load garage Principal MF: 20 Accessory: 30	SF: 10 MF: 20	Principal SF: 5 ^① Principal MF: 10 ^① Accessory: 5 ^①	Principal SFD: 20 2 for SFD-Alley loaded: 2 Principal SFA: 15 SFA-Alley: 2 Principal MF: 20 Accessory SF: 5 Accessory MF: 10	Prin-SF: 35 Prin-MF: 45 Acc: 25
R-B	10/5							
R-C	20/10							

① Zero lot line setbacks shall be permitted for attached buildings provided that the building meets the zone district interior lot line setback on the side of the building not attached.

② Multiple principal buildings on a single lot shall be separated a distance equal to the distance that would be required if they were separated by a lot line.

③ Net area is the size of the lot; not to include tracts and streets and their right-of-ways.

16.4.2 MEASUREMENTS AND EXCEPTIONS

A. Setbacks

1. General Setback Requirements

a. **Required Setbacks**

Setbacks shall be unoccupied and unobstructed by any structure or portion of a structure from thirty (30) inches above grade upward; provided, however, that fences, walls, trellises, poles, posts, ornaments, furniture and other customary yard accessories may be permitted in any setback subject to height limitations and requirements limiting obstruction of visibility.

- i. A building, structure, or lot shall not be developed, used, or occupied unless it meets the minimum setback requirements set forth in Table 4-1 for the zoning district in which it is located, except as otherwise established in this FDC or unless a variance has been granted.
- ii. A setback or other open space required by this FDC shall not be included as part of a setback or other open space required by this FDC for another building or structure or lot.

b. **Encroachments into Required Setbacks, General**

The following structures may encroach into required front, side or rear setbacks as specified in this Subsection and as permitted by building code:

i. **Paved Patios or Terraces**

Paved patios or terraces may encroach into any required setback, provided that no structures placed on them shall violate other requirements of this FDC.

ii. **Unroofed Landings, Decks and Stairs**

Unroofed landings, decks and stairs may encroach into side and rear required setbacks, provided that the floor shall not extend higher than thirty (30) inches above the finished grade level and the projection is at least five (5) feet from the lot line.

iii. **Covered Decks and Exterior Balconies**

Covered Decks and exterior balconies may encroach into a required rear setback provided these encroachments are at least ten (10) feet from the rear lot line.

iv. **Incidental Architectural Features**

Cornices, eaves, canopies, ~~window wells~~, chimneys, bay windows, ornamental features, and other similar architectural features may encroach not more than two (2) feet into any required setback. Window well openings may encroach not more than three (3) feet into any required setback.

v. **Covered Porches and Roofs Over Other Exterior Approaches**

Roofs over porches, stairways, landings, terraces, or other exterior approaches to pedestrian doorways may project up to four (4) feet into a front setback. The projection shall be at least ten (10) feet from the front property line.

vi. **Handicap Ramps**

The Director may allow the installation of handicap access ramps in required front, side, and rear setbacks. The design and placement of the ramps shall be reviewed to ensure that:

- (A) The ramp has minimal visual impact on abutting properties;
- (B) The width of the ramp does not exceed forty-eight (48) inches except as required by law.

vii. Fences and Walls

Fences and walls may project into any required setback and shall be in accordance with other requirements of this FDC.

viii. Driveways

Residential driveways may encroach into any required interior side setback provided these encroachments are at least three (3) feet from the side lot line and do not impact drainage conveyance or utilities.

c. Encroachments Into Easement and Right-of-ways Prohibited

Encroachments shall not extend into any easement(s) or public right-of-way except as legally authorized by the easement holder.

d. Contextual Front Setbacks

In addition to permitted projections described in Subsection 4.2.A.1.b above, the following exceptions to the front setback requirement for dwellings abutting local streets (not collector or arterial streets) are authorized for a lot in any district.

- i. If there are dwelling units on both abutting lots with front setbacks of less than the required depth for the district, the front setback for the lot need not exceed the average front yard of the abutting dwelling units.
- ii. If there is a dwelling unit on one (1) abutting lot with a front setback of less than the required depth for the district, the front setback for the lot need not exceed a depth one-half (1/2) way between the depth of the abutting lot and the required setback depth.
- iii. Regardless of contextual front setback, any garage portion of the dwelling facing the front or street side shall have a setback of twenty (20) feet.

e. Corner Sight Distance (a.k.a. Sight or Vision Clearance Triangle)

Where a driveway or private street intersects a public right-of-way or where property abuts the intersection of two (2) public right-of-ways, unobstructed sight distance as described in the Town Standards and Specifications shall be maintained at all times within the sight triangle area on the property adjacent to the intersection in order to ensure that safe and adequate sight distance is provided for the public use of the right-of-way.

B. Height Exceptions for Appurtenances

Except as specifically provided elsewhere in this FDC, the height limitations contained in this FDC do not apply to spires, belfries, cupolas, chimneys, heating and ventilation equipment, elevator housings, stairwell towers or similar appurtenances; provided, however, the following:

1. The appurtenance does not interfere with FAA Regulations;
2. The appurtenance does not extend more than twenty-five (25) feet above the maximum permitted building height;
3. The appurtenance is not constructed for the purpose of providing additional occupiable floor area in the building; and
4. The appurtenance complies with the screening requirements for mechanical equipment and appurtenances in Subsection 6.4.G.

drainage easements, open space, view corridors, pedestrian/bicycle paths, and other relevant design considerations.

E. Lots

1. Lot size, width, depth, shape, and orientation and minimum building setback lines shall be appropriate for the location of the subdivision and for the type of development and use contemplated, and shall facilitate the placement of buildings with sufficient access, outdoor space, privacy, and view. All lots shall conform to the applicable zoning regulations affecting the property.
2. Depth and width of properties reserved or laid out for commercial and industrial purposes shall be adequate to provide for off-street parking, landscaping or planting area, and loading areas required by the type of use and development contemplated.
3. No single lot shall be divided by a municipal boundary line.
4. No single lot shall be divided by a zone district boundary line.
5. A lot shall not be divided by a street, alley, or other lot.
6. Each residential lot shall be provided with lot frontage on a street. Residential lots may be permitted to front on common greens, parks, auto-courts, and other common areas subject to the provisions of this FDC. Non-residential lots shall be provided with lot frontage on a street or private drive.
7. Corner lots for residential use shall have extra width to accommodate the required building setback line on both street frontages.
8. Wedge-shaped lots shall not be less than ~~forty-three~~ forty-three (4035) feet in width at the front property line. Such lots shall conform to the minimum lot width for the district at the front setback line.
9. Side lot lines shall be at substantially right angles and radial to curved streets. Where lot lines are not at right angles to the street lines, it shall be indicated on Preliminary and Final Plats.
10. Triple frontage lots and flag lots are prohibited in residential zone districts.
11. Lot widths and minimum square footage shall conform to the requirements of Chapter 4 of this FDC.
12. Double frontage residential through lots are prohibited. To prevent such double frontage lots, a landscape tract of not less than thirty (30) feet shall be required between the rear of a lot and street right-of-way. Alley loaded lots shall not be considered double frontage lots for the purpose of this section.

F. Blocks

The requirements and standards set forth in Section 6.5, shall apply to all subdivisions.

G. Streets

All streets shall comply with the requirements and standards set forth in Section 6.5, in addition to the following:

1. Compliance with Town Standards Required

All new streets within a subdivision shall be constructed in accordance with the Town of Firestone Transportation Master Plan and the Standards and Specifications.

2. General Street Design Considerations

All new streets should be designed in relation to existing or planned streets, to public convenience and safety, and in relation to the proposed use of land to be served. To the maximum extent reasonably practicable, streets shall be arranged to follow the natural contours of the site. Streets shall be extended to connect with existing streets, except where such extension is prevented by topography or other physical conditions or where the connection of streets with existing or probable future streets is deemed unnecessary by the Town for the advantageous development of adjacent properties.

3. Private Streets

Private streets may be permitted provided they meet all Standards and Specifications required for public streets and right-of-ways and demonstrate that private streets and right-of-ways can be perpetually maintained.

4. Street Intersections

- a. Arterial streets shall not be intersected by local streets.
- b. No more than two (2) streets shall intersect at one (1) point unless approved by the Town Engineer.
- c. Streets shall intersect at ninety (90) degrees, except where this may be impractical. Angles of less than ninety (90) degrees may be designed, subject to the approval of the Town Engineer.
- d. Two local streets meeting a third street from opposite sides shall meet at the same point, or their centerlines shall be offset at least one-hundred fifty (150) feet.

5. Street Right-of-Way Widths

Street right-of-way widths within the proposed subdivision, or boundary streets impacted by the proposed subdivision, shall follow the Town's Transportation Master Plan and Standards and Specifications.

6. Cul-de-sacs

All cul-de-sacs shall be designed in accordance with the Standards and Specifications of the Town and the Fire District. A cul-de-sac on a local street shall not be longer than five-hundred (500) feet and at the closed end shall provide a turnaround in a configuration approved by the Town Engineer and Fire District. The cul-de-sac length shall be measured from the centerline of the intersecting street to the centerline of the cul-de-sac turnaround.

7. Street Arrangement and Connections

- a. Local streets shall be arranged so that their use by through traffic will be discouraged. Traffic calming techniques such as use of grid patterning, diverters and curvilinear alignments are encouraged to reduce speeds and cut-through traffic. All traffic calming measures shall be approved by the Town Engineer.
- b. Where a subdivision borders the following, a minimum landscaped buffer area shall be provided as follows: thirty (30) feet adjacent to arterial streets and section line roadways, fifty (50) feet adjacent to railroad right-of-way, and one-hundred (100) feet adjacent to Interstate right-of-way. This buffer is in addition to any required right-of-way, and exclusive of any lot size requirements. No driveway access shall be permitted from the lot directly to any highway, freeway, arterial, section line roadways, or railroad right-of-way.
- c. Dead-end streets (excluding cul-de-sac or stub streets) shall not be permitted unless approved by the Board of Trustees.
- d. Visibility into residential subdivision from arterial, section line, and collector roadways shall be emphasized and coordinated with street configurations including cul-de-sacs

and parallel road loops, open space, and trail corridors. The backing of lots to arterials, section line, and collector roadways shall be limited. Continuous runs of lots which back to such roadways shall not exceed five-hundred (500) feet in length.

- e. Openings in the perimeter fence frontage shall serve to visually link intersecting streets, view corridors into and out of the development, pedestrian entryways, and parks or open space.

H. Alleys

Alleys are permitted subject to meeting all the standards in this Section and other pertinent sections of this FDC. All new alleys shall be constructed in accordance with Town of Firestone Standards and Specifications.

1. Alleys in developments approved after the effective date of this FDC shall be privately owned and maintained within a tract. An easement in such alleys shall be granted to the Town and/or other service providers for installation and maintenance of utilities, refuse collection, and similar facilities and services.
2. In residential districts, alleys should be parallel, or approximately parallel, to the frontage of the street. Alleys in residential districts shall provide a minimum of thirty (30) feet of right-of-way. A minimum of twelve (12) feet of pavement is required unless otherwise required by the Town or Fire District.
3. Dead-end alleys shall not exceed one-hundred fifty (150) feet in length.
4. If an alley is provided, garage driveway connections shall be from an alley. In areas where no alley is provided, garage driveway connection shall be from the street.
5. Alleys may not exceed a maximum length of six-hundred (600) feet without having a secondary outlet to a residential street.

I. Sidewalks, Curbs and Gutters

In all subdivisions, streets shall be constructed according to Standards and Specifications. Handicap accessible ramps from the sidewalk to street grade shall be provided, in conformance with the Americans with Disabilities Act criteria.

J. Utility Easements

In addition to the following, the requirements and standards set forth in Subsection 6.4.G, shall apply to all subdivisions provisions for utility easements.

1. Utility easements shall follow rear and side lot lines whenever practical, and the centerline of any easement should coincide with a joint property line.
2. Easements shall be determined so as to provide efficient installation of utilities and should integrate well with the Town's street design criteria.
3. Public utility installations shall be so located as to permit multiple utility installations within the easements, to avoid cross connections, to minimize trenching and adequately separate incompatible systems. No utilities shall be placed within one (1) foot of the property line of any property.
4. The location and width of all utility easements shall be subject to the approval of the Town and the utility providers.
5. Utility lines shall be placed underground. The applicant shall make the necessary arrangements including any construction or installation charges with each of the serving utilities for the installation of such facilities.

5. Standards for Tree Protection and Replacement

a. Tree Retention Generally

To the maximum extent reasonably practicable, healthy trees in locations that reasonably avoid conflict with the development shall be retained.

b. Tree Protection Before and During Construction

As part of the required landscape plan, protection measures including but not limited to flagging, protective fencing, boring, trenching separation, and general methods shall be identified for trees designated for protection taking place prior to construction and during construction. Protection measures shall prohibit the storage of materials, vehicular traffic, grade changes, and any other activities that would impact the health of the protected tree. The protection measures shall be maintained until construction activities around the protected trees are complete.

D. Community Gateways

1. Applicability

This Section shall apply to all new development in the Town.

2. Standards for Community Gateway Corridors

Along the following gateway corridors, the following additional standards shall apply to protect distinct entryways into the community:

a. Arterials and Section Line Roadways

- i. A minimum thirty (30) foot landscaped buffer shall be maintained on either side of the arterial or section line roadway and located in a tract. This buffer should utilize a variety of live plant material and berming to provide year-round visual interest. A minimum ten (10) foot wide sidewalk shall be incorporated as an integral component of the landscape buffer and landscape area within the right-of-way.
- ii. Single-family detached residential lots shall be set back a minimum of one-hundred fifty (150) feet from the right-of-way along Firestone Boulevard west of Colorado Boulevard.
- iii. All fencing facing the arterial or section line roadway shall be a maximum of four (4) feet in height and should have an open character, such as split rail or picket. Opaque fencing is prohibited.
- iv. Parking shall be screened to the greatest extent reasonably practicable from the arterial or section line roadway using a combination of berming, walls, fencing and landscaping with a minimum cumulative height of three (3) feet. Such berming or screening walls and fencing may be located within the landscaped buffer prescribed in this Section. Parking, internal drives or streets may not extend into the landscape buffer excepting access drives from the right-of-way running perpendicular to the arterial or section line roadway.
- v. Garages and carports may not be used as a screen or barrier between the arterial or section line roadway and a development site.

16.6.3 PARKS, OPEN SPACE, AND TRAILS

A. Purpose

This Section is intended to regulate the planning, development, construction, preservation, and maintenance of parks, open space, and trails throughout the Town. Parks, open space, and trail

5. Characteristics of Park Land to be Dedicated and Constructed

a. *Standard Criteria for Pocket, Neighborhood, and Community Parks*

To the maximum extent reasonably practicable, park land to be dedicated shall be generally consistent with the standard characteristics of parks identified in the Town's Comprehensive Master Plan and the Town's Park, Open Space and Trails (POST) Master Plan.

i. *Pocket Parks*

Pocket parks provide opportunities for passive outdoor recreation at a sub-neighborhood scale. Pocket parks shall be located within one-quarter (1/4) mile of the residences they are intended to serve and may include lawn areas, picnic shelters and tables, play equipment, artwork or other amenities that are appropriate for the demographics and types of activities that the neighborhood may desire. Pocket parks shall be:

- (A) One-quarter (1/4) acre to two (2) acres in size;
- (B) Centrally located within sub-neighborhoods served;
- (C) Bordered on at least one (1) side by public streets (excluding major collector, section line, and arterial streets) to provide easy public access, visual surveillance, and on-street parking;
- (D) Accessible from the surrounding neighborhoods using sidewalks and/or trails;
- (E) Pocket Parks shall be owned and maintained by an HOA or metropolitan district;
- (F) Pocket Parks shall be platted with a dedicated public access easement;
- (G) Each pocket park within a subdivision shall be unique and thematically different from other Pocket Parks within the subdivision; and
- (H) Pocket Parks shall be constructed to POST Master Plan requirements and the Town's Standards and Specifications.

ii. *Neighborhood Parks*

Neighborhood Parks shall provide places for recreation and gathering places within approximately one-half (1/2) mile from most residences being served. Neighborhood Parks may include multi-use lawn areas, picnic areas, playground equipment, small court games, community gardens and playing fields and facilities as appropriate. Neighborhood Parks shall be:

- (A) Of a size determined by Subsection 10.6.3.B.3 above, but not less than a minimum size of seven (7) acres;
- (B) Centrally located within or adjacent to the neighborhood(s) served;
- (C) Bordered on at least two (2) sides by public streets (excluding arterial or section line streets) to provide easy public access, visual surveillance and parking;
- (D) Accessible from surrounding neighborhoods by sidewalks and/or trails;
- (E) As reasonably practicable, parks shall be integrated into the Town's overall open space, parks, and trail system;

e. *Environmental Considerations*

All open space and trails should be located, designed, and maintained to minimize environmental impacts.

f. *Areas Not Eligible*

Lands within the following areas shall not be counted towards required open space dedication:

- i. Private yards;
- ii. Public or private streets or right-of-ways not intended for open space-related purposes;
- iii. Open parking areas and driveways not intended for open space and trail purposes;
- iv. Pocket, neighborhood, and community parks;
- v. Land covered by structures not intended for open space purposes;
- vi. Streetscape, landscape buffers, or medians;
- vii. Easements and/or related utilities or uses that inhibit the ability to develop, program, or maintain the open space for its intended purposes;
- viii. The first 150' of Oil and gas well and facility setbacks or the setback as identified in a Surface Use Agreement (SUA), whichever is greater; and
- ix. Storm water channels, detention and water quality ponds, and sump basins unless such drainage areas are regional in nature, designed to be natural in form, and integrated into the adjacent open space consistent with Subsection 6.3.C.4.b above.

5. Procedure and Method for Dedication of Open Space

- a. The dedication of open space shall be reviewed and approved as part of the preliminary plat and accepted as part of the final plat. The developer shall designate on the Preliminary Plat and Final Plat the area or areas of land to be dedicated pursuant to this Section.
- b. The conveyance of dedicated land to the Town shall be by means of a final plat dedication, and the land dedicated to the Town shall be free and clear of all liens and encumbrances, including real property taxes prorated to the time of conveyance.

6. Payments of Cash Fee In-Lieu of Open Space Land Dedication

a. *Applicability*

- i. If there is insufficient acceptable land available within the subdivision to satisfy the open space land dedication requirements based upon the standards in this Section, the expansion of adjacent open space area would be more appropriate to satisfy the need created by the proposed development than land within the proposed development, or in cases in which the cash value of open space land dedication is deemed, by the Board of Trustees, to be more appropriate in satisfying the open space demands generated by the proposed development, the owner, subdivider or developer shall pay a cash fee in lieu of open space dedication requirements.
- ii. This cash-in-lieu of dedication fee will be calculated at the time of payment based upon the fair market value of the land which was otherwise to be dedicated. A per square foot land value will be determined by the Town by means of an appraisal, if available, or by comparing the cash value of

area or required landscaping area which abuts an adjacent residential use. Refuse/recycling collection receptacles shall not be located in a manner that obstructs or interferes with any designated vehicular or pedestrian circulation routes onsite.

b. Screening Enclosure

All outdoor refuse/recycling collection receptacles, other than those used by a single-family dwelling units, shall be screened from view on all sides by a durable sight-obscuring enclosure consisting of a wall and gate six (6) feet in height that matches or is complimentary to the building materials of the principal building that it serves.

c. Maintenance of Refuse/Recycling Collection Receptacles and Screening Enclosures

The enclosure shall be maintained in working order, and remain closed except during deposits and pick-ups. Lids are required on all outdoor refuse/recycling collection receptacles in screening enclosures without roof structures. Lids shall remain closed between pick-ups, and shall be maintained in working order. Screening enclosures and gates shall be kept in good repair.

4. Service and Off-Street Loading Areas

Service and off-street loading areas shall be designed and located to reduce the visual and acoustic impacts of these functions on adjacent properties and public streets. Non-enclosed service and off-street loading areas adjacent to residential properties and public streets shall be screened with opaque materials that are an integral part of the building architecture, including, durable, sight-obscuring walls and/or fences to a height consistent with the object, structure, and use to be screened. Screening materials shall be the same as, or of equal quality to, the materials used for the primary building. Landscaping shall also be incorporated to aid in screening the non-enclosed service and off-street loading areas and softening the appearance of the screening wall or fence.

5. Drive Through Service and Stacking Drives

Drive through service areas and stacking drives shall be designed and located to reduce the potential visual and acoustic impacts of these functions on adjacent residential property, public streets, and primary internal drive circulation routes in a multi-building complex.

- a. Drive through service ordering and pick-up window areas shall not be orientated toward residential property, arterial streets, and collector streets.
- b. The minimum landscape setback to drive through service areas and stacking drives from streets, and primary internal drive circulation routes in a multi-building complex shall be ten (10) feet.

6. Rooftop Mechanical Equipment

Rooftop mechanical equipment, including HVAC equipment, venting, and utility equipment that serves the structure, shall be screened. Screening shall be accomplished through the use of parapet walls or a sight-obscuring enclosure around the equipment constructed of one (1) of the primary materials used on the primary facades of the structure, and that is an integral part of the building's architectural design. The parapet or screen shall completely surround the rooftop mechanical equipment to an elevation equal to or greater than the highest portion of the rooftop mechanical equipment being screened. In the event such parapet wall does not fully screen all rooftop equipment, then the rooftop equipment shall be enclosed by a screen constructed of one (1) of the primary materials used on the primary facade of the building so as to achieve complete screening.

7. Wall-Mounted Mechanical Equipment and Meters

Wall-mounted mechanical equipment should not be placed on the front facade of a building or on a facade that faces a right-of-way to the maximum extent reasonably practicable. Wall-

property line; except, that if the side or rear property line is adjacent to a driveway, alley or street, the site distance triangle requirements shall apply.

- c. Fences adjacent to sidewalks must be placed at least four (4) feet from the edge of the sidewalk. Gates adjacent to sidewalks shall open inward to the property.

5. Height Restrictions

- a. A fence located in a front yard or street side yard area shall have a maximum height of forty-two (42) inches within the front yard or street side yard setback or forward of the front face of the principal structure, whichever is greater. Such fence shall be not more than fifty (50) percent opaque. A wall located in a front yard area shall have a maximum height of three (3) feet.
- b. Fences abutting open space, parks, and trails shall be limited to four (4) feet in height and shall be not more than fifty (50) percent opaque. The finished side of the fence shall face the open space, park, or trail area.
- c. No fence in any district shall exceed six (6) feet in height; except:
 - i. Fences may be up to eight (8) feet in height in certain districts pursuant to Subsection 6.4.G.9. Outdoor Storage.
 - ii. Fences around a court (e.g., tennis, squash racquet, squash tennis or badminton) or around a publicly owned recreation area may exceed six (6) feet in height if constructed of limited solid material.

6. Construction Standards for Fences

- a. ***Compliance with Building Code***
Fences must be constructed to meet the adopted building code of the Town. Fences and walls shall be constructed of durable, easily maintained materials such as, but not limited to, stone or simulated stone, brick, vinyl, or wood sections. All wood fence materials shall be treated wood or wood with natural resistance to decay, or equivalent.
- b. All fences must be of durable material and kept in good repair. Fence posts and all vertical members of a fence shall be plumb.
- c. The finished side of the fence or wall shall face the adjacent street, trail, open space, park, or common area.
- d. Open fencing styles may include wire mesh attached to the interior of the fence.

7. Restrictions Regarding Certain Materials

- a. Fences in the LI zoning district may include up to four (4) strands of barbless wire, with the lowest strand at least six (6) feet above ground level. The barbless wire may be placed vertically or at a forty-five (45) degree angle; provided, that it does not extend across the property line.
- b. Electric fences and barbed wire stock fences are permitted only in the AG zoning district. Barbed wire or electric fences shall not be placed adjacent to a residential zone, open space, park, trail, or street.
- c. Fences constructed primarily of sheet metal, chicken wire, wafer board, particleboard, plywood, or any other substandard, not durable or unsafe material are prohibited.

8. Fences within Residential Districts

a. Fencing Required

- i. For new residential development, wing fencing, street side fencing, and fencing against open space, parks and landscape tracts shall be required and in a manner pursuant to this FDC as applicable.

8.9. Fences and Walls in Districts Adjacent to Residential Districts

- a. Chain link, wire mesh, or other similar products shall be prohibited.
- b. In the B, NC, RC, LI, and PUD zoning districts, a solid material fence, wall, or a combination of landscaped earthen berms, fences and walls shall be constructed between land uses when adjacent to a residential zone or district. Such buffer shall consider the proximity, context, and nature of uses in the non-residential district for proper mitigation.

9.10. Perimeter Fencing and Walls

a. *Uninterrupted Fencing and Walls Prohibited*

The use of uninterrupted fencing and walls to separate developments from perimeter streets, adjacent developments and the surrounding community is prohibited.

b. *Perimeter Fencing*

Where perimeter fencing or walls are provided around a subdivision or development, such fences shall be subject to the following standards:

- i. Perimeter fencing shall include columns at termini, changes of direction, and runs greater than two-hundred (200) feet. Individual columns shall be a minimum of two (2) feet by two (2) feet, with a minimum of one (1) foot projecting in front of the fence towards the street. Columns shall include a cap detail for visual interest.
- ii. A variety of landscaping shall be provided in the right-of-way buffer in combination with any of the fencing options to incorporate seasonal color, plant variety, and berming to break up the visual mass of walls and fences. Landscaped berms may be used in lieu of fencing or walls or in combination with fencing or walls. Such berms shall incorporate the curvilinear characteristics of natural landforms.
- iii. Fences or walls shall not exceed six (6) feet in height.

16.6.5 TRANSPORTATION AND ACCESS

A. Purpose

The purpose of this Section is to support the creation of a highly connected transportation system within the Town in order to provide choices for drivers, bicyclists, and pedestrians; increase effectiveness of municipal service delivery; promote walking and bicycling; connect neighborhoods to each other and to local destinations such as employment, schools, parks, and shopping centers; reduce vehicle miles of travel and travel times; improve air quality; reduce emergency response times; mitigate the traffic impacts of new development, and free up arterial capacity to better serve regional long-distance travel needs.

B. Applicability

The standards of this Section 6.5 shall apply to all new development and expansion of existing buildings except for development on a single-family detached lot in an approved subdivision.

Street and block patterns should include a clear hierarchy of well-connected streets that distribute traffic over multiple streets and avoids traffic congestion on principal routes. Within each residential development, the access and circulation system should accommodate the safe, efficient, and convenient movement of vehicles, bicycles, and pedestrians through the development, and provide ample opportunities for linking adjacent neighborhoods, properties, parks, schools, shopping, and land uses.

b. Vehicular Access to Public Streets

Any development shall be required to provide adequate vehicular access to public streets for circulation, and public safety unless deemed impractical by the Director due to topography, natural features, or the configuration of adjacent developments.

c. Connections to Vacant Land

Where new development is adjacent to land likely to be developed or redeveloped in the future, all streets, bicycle paths, and access ways in the development's proposed street system shall continue through to the boundary lines of the area to provide for the orderly subdivision of such adjacent land or the transportation and access needs of the community. In addition, all redevelopment and street improvement projects shall take advantage of opportunities for retrofitting existing streets to provide increased vehicular and pedestrian connectivity to maximum extent practicable.

d. Access

i. All driveways shall be paved in concrete or asphalt.

i.ii. All non-residential development shall be designed to allow for cross-access to adjacent properties to encourage shared parking and shared access points on public or private streets. When cross-access is deemed impractical by the Director on the basis of topography, the presence of natural features, vehicular safety, or convenience factors, this requirement may be waived provided that appropriate bicycle and pedestrian connections are provided between adjacent developments or land uses. Cross access easements shall be referenced as a note on the plat.

ii.iii. Whenever feasible, there shall be no direct driveway access (ingress or egress) from any single-family residential lots to any non-residential collector street, arterial street, section line roadway or highway. Whenever feasible, all single-family residential lots driveway access shall be limited to residential collector and local residential streets.

e. Cul-de-Sacs and Dead-End Streets

The use of dead end streets or cul-de-sacs should be minimized unless their use is required by site constraints including but not limited to topography, the preservation of natural features, open space, and trail corridors. Should they be incorporated, a view corridor, at the cul-de-sac head or dead-end street, a minimum of thirty-five (35) feet in width shall be provided to maintain open views and pedestrian access. View corridors shall be created in a separate tract from buildable lots. View corridors shall contain a pedestrian walkway or trail connection whenever possible unless deemed unfeasible by the Town.

f. Neighborhood Circulation

Street connections shall connect neighborhoods to each other and to local destinations such as schools, parks, greenbelt trail systems, and shopping centers, while minimizing neighborhood cut-through vehicle traffic movements that are non-local in nature.

- a. Fleet parking shall be in addition to the minimum parking calculated from Table 6.6-1. One fleet parking space shall be provided for each fleet vehicle. Parking of fleet vehicles outside of a building shall be classified as outdoor storage and shall be required to be screened in accordance with Subsection 6.4.G.9.
- b. Development with zoning or development approvals that would permit a future change of use that will require additional parking to meet the standards of this Section shall provide an undeveloped area on the site that can accommodate any future parking needs.
- c. **Off-Street Parking Location**
 - i. Off-street parking for residential uses shall be located within approximately two-hundred fifty (250) feet of the primary building entrance of the primary building.
 - ii. Off-street parking for non-residential uses shall be located within six-hundred (600) feet of the primary building entrance of the primary building.
 - iii. Off-street parking shall be located on the same lot or parcel of land as the structure they are intended to serve unless off-site parking is approved through the process in Subsection 6.6.E.2.
 - iv. Off-street parking spaces for non-residential uses shall not be located in front of garage doors.
 - v. Off-street parking spaces for non-residential uses may only be located adjacent to building doors when a pedestrian walkway is provided between the building and all parking spaces on that side of building.
 - vi. The following shall count toward the minimum parking requirement:
 - (A) Surface parking;
 - (B) Accessible parking;
 - (C) Vanpool and carpool parking;
 - (D) Electrical vehicle charging station parking; and
 - (E) Structured parking, underground parking and parking within, above or beneath the building(s) it serves.

TABLE 6.6-1: OFF-STREET PARKING SCHEDULE A

"du" = dwelling unit "sf" = gross square feet

USE CATEGORY	USE TYPE	OFF-STREET SPACES REQUIRED
Household Living Residential	Dwelling, Duplex	2 per du
	Dwelling, Live/Work	See Subsection 6.6.D.3
	Dwelling, Mobile <u>Manufactured</u> Home	2 per du
	Dwelling, Multi-Family	1.5 spaces per efficiency, studio or 1-bedroom du; 2 spaces per du with 2 or more bedrooms, plus 1 guest space per 3 du's
	Dwelling, Single-Family Attached	2 spaces per du, + 1 guest space per 3 du's

TABLE 6.6-1: OFF-STREET PARKING SCHEDULE A		
"du" = dwelling unit "sf" = gross square feet		
USE CATEGORY	USE TYPE	OFF-STREET SPACES REQUIRED
	Dwelling, Single-Family Detached	2 spaces per du
	<u>Manufactured Home Park</u>	<u>2 spaces per du, + 1 guest space per 4 du's</u>
	Model Home	See Subsection 6.6.D.3
Group Living	Group Home	See Subsection 6.6.D.3
	Retirement Home, Nursing Home, or Assisted Living Facility	See Subsection 6.6.D.3
Aviation	Helistop	See Subsection 6.6.D.3
Cemetery	Cemetery	See Subsection 6.6.D.3
Child Care	Child Care Center	1 per 6 children of licensed capacity
Community Facilities	Community Center (Public)	See Subsection 6.6.D.3
	HOA/Metro District Facility	See Subsection 6.6.D.3
	Recreation Center (Indoor/Outdoor)	See Subsection 6.6.D.3
	Public Safety Station	See Subsection 6.6.D.3
	Transit Center	See Subsection 6.6.D.3
Cultural Facilities	Library	1 per 400 sf
	Museum	1 per 400 sf
Educational Use	College or University	See Subsection 6.6.D.3
	Instructional Studio	1 per 300 sf
	School (public or private)	See Subsection 6.6.D.3
Human Health Services	Dental or Medical Office, Clinic, Lab	1 per 300 sf
	Emergency Room	1 per 200 sf
	Hospital	See Subsection 6.6.D.3
	Substance Abuse Treatment Facility, Outpatient	1 per 200 sf
	Urgent Care Center	1 per 200 sf
Park and Open Space	Athletic Fields and Courts	See Subsection 6.6.D.3
	Parks/Open Space	See Subsection 6.6.D.3 for Trailheads, Neighborhood and Community Parks; No parking required for Pocket Parks

- i. To promote a more diverse community through the provision of a variety of housing types.
- ii. To encourage developments that are not dominated by a single type of home or dwelling unit, within a narrow range of price points and densities.
- iii. To encourage “neighborhood-oriented” multi-family developments that incorporate a variety of housing types, such as a combination of duplex, townhomes, condominiums, apartments, live-work units, and single-family dwelling units in a range of sizes.

b. Diversification Standards

- i. Diversification Standards shall not apply to:
 - (A) All zone districts that do not allow residential uses.
 - (B) Certain zone districts that allow residential: RR and AG.
- ii. Residential development parcels, including parcels part of a phased development, shall provide a minimum mix of housing, based on the size of the development as required in Table 6.7-1 below:

TABLE 6.7-1: HOUSING DIVERSITY	
Development Parcel Size	Required Mix of Housing Type
0-40 Acres	1 housing type
41-80 Acres	2 housing types
81-160 Acres	3 housing types
161-320 Acres	4 housing types
321-640 Acres	5 housing types
641+ Acres	6 housing types

- iii. Housing types that apply to Table 6.7-1 include:

(A) Single-Family Detached;

(A)(B) Duplex;

(B)(C) Single-Family Attached - Townhouse;

(C)(D) Multi-Family – six (6) units or less;

(D)(E) Multi-Family – Apartments (seven (7) units or more); and,

(E)(F) Live-Work units.

- iv. For purposes of Housing Type, front loaded garage products versus alley or rear-loaded garage products shall be considered a unique and separate Housing Type.
- v. For unlisted, unique or miscellaneous products such as age restricted products, patio homes or detached townhomes that are distinct from the housing types above may be considered for designation as unique housing types through the Preliminary Plat, Overlay Rezoning or PUD Rezoning processes.

feature exists near the corner, the masonry wrap shall extend at least six (6) feet from the corner.

2. Orientation of Dwellings to the Street

Each residence shall have at least one (1) primary pedestrian doorway for access to the dwelling unit generally visible from the front lot line of the property and within twelve (12) feet of the most forward plane of the ground level living space within the house. On corner lots, the pedestrian doorway may face any adjacent street. For dwelling units that do not have street frontage but front onto a park or landscaped common area, the primary pedestrian doorway shall be oriented toward such common area and include a pedestrian walk that connects to adjacent streets.

3. Garages

The regulations for garages shall be applied to non-living space or storage areas within garages when used for the storage of automobiles or other items.

a. Diversity of Garage Location

- i. Except for garages oriented to alleys, all single-family homes shall provide garages that meet one of the requirements below:

(A) Recessed garage where the primary garage door generally faces the front lot line and the garage is recessed a minimum of two (2) feet behind the most forward plane of the main floor living space or a front porch;

(B) Projecting garages where the primary garage door generally faces the front lot line and the garage projects no more than fifteen (15) feet from the front door;

(C) Side-loaded garages;

(D) Garages recessed a minimum of two (2) feet beneath a second floor living space.

b. Width/Facade Ratio

~~For one-story dwelling units, the~~ width of a front loaded garage shall not exceed fifty-five (55) percent of the width of the front elevation for two-car garages or sixty-five (65) percent of the width of the front elevation for three-car garages.

c. Three Car or More Garage Orientation

The additional bay of any three (3) car or more garage shall:

- i. Have a different orientation from the first two (2);
- ii. Shall be off-set by at least two (2) feet from the first two (2) garages when having the same orientation; or
- iii. Shall be tandem to the first two (2).

4. Minimum Front Porch

Each home shall include a covered front porch. The front porch shall be a minimum size of fifty (50) square feet in floor area excluding the area required to access the front door and shall have a minimum depth of five (5) feet. For unique products or specific architectural style that may not accommodate a front porch, Alternative Equivalent Compliance and justification shall be provided.

5. Townhomes

- a. No more than six (6) townhome dwelling units may be attached in any single row or building cluster.

protected from visual discord and clutter that may result from the unrestricted proliferation and placement of signs;

4. Regulation of sign design, construction, installation, repair and maintenance is necessary to protect the public from potential hazards;
5. Regulation of signs is necessary to preserve and enhance the aesthetic quality of life in the community; and
6. Reasonable regulations are necessary to conserve the character and economic value of property and neighborhoods.

B. Alternative Equivalent Compliance

The alternative equivalent compliance procedure in Section 6.1 may be used to propose alternative means of complying with the intent of this Section.

C. Applicability and Exemptions

1. Generally

This article shall apply to, govern and control the display, construction, installation, erection, alteration, use, location, maintenance, and removal of all signs within the Town that are not specifically exempt from such application, provided, that whenever both a provision of this article and any other law, statute or ordinance of any kind restrict the same subject matter, the most restrictive standard shall govern. Non-commercial speech is permitted to be substituted on any sign where commercial speech is allowed.

2. Exemptions

This Section does not apply to the following:

- a. The United States flag, state flags, pennant flag strings and any flag, crest or insignia of any official governmental agency or of any civic, charitable or religious organization.
- b. Any item of merchandise or models of products or services that may be visible in a store window but does not inhibit proper visibility into the space for safety and security.
- c. Scoreboards, time and temperature, or stock exchange information devices not related to any product or service.
- d. Required signs.
- e. Memorial signs.
- f. Governmental signs.
- g. Murals which do not advertise or identify a business or depict a business name, symbol, trademark or logo.
- h. Address signs which contain only the street address and number.
- i. Town decorations, banners, signs or other elements located on Town property, right-of-way, utility poles, or streetlights and elements approved through the Town's Special Events process.
- j. Freestanding works of art and building architectural features that are integral to the design of a building.

* For Development Identification signs located within one-thousand two-hundred (1,200) feet of the Interstate 25 right-of-way, the maximum sign height may be increased to fifty (50) feet and the maximum sign area may be increased to three-hundred (300) square feet.

J. Temporary Sign Standards

1. **Temporary Wall Signs.** Table 6.12-5 below details the standards for temporary signs attached to buildings.

TABLE 6.12-5: STANDARDS FOR TEMPORARY SIGNS ATTACHED TO BUILDINGS			
Standards	Non-Residential Zoning Districts	Multi-Family Zoning Districts	Single-Family Zoning Districts
Maximum Number per Building Elevation	1 per street frontage or tenant space	1 per complex	1
Maximum Sign Area	40 sf	8 sf	6 sf
Allowed Lighting	External	none	none
Maximum Duration per Sign	60 days	60 days	60 days
Maximum Posting	180 days per year	90 days per year	90 days per year

2. **Temporary Freestanding Signs.** Table 6.12-6 below details the standards for temporary freestanding signs.

TABLE 6.12-6 STANDARDS FOR TEMPORARY FREESTANDING SIGNS			
Standards	Non-Residential Zoning Districts	Multi-Family Zoning Districts	Single-Family Zoning Districts
Maximum Number	1 per street frontage** (1 additional for every 500' of frontage)**	1 per street frontage	1 per street frontage
Maximum Sign Area per Sign	32 sf**	32 sf	8 sf
Maximum Sign Height	8 ft**	8 ft	8 ft
Allowed Lighting	External	none	none
Setbacks and Spacing	10 ft from all property lines	2 ft from property lines	2 ft from property lines
Maximum Duration per Sign	60 days*	60 days*	60 days*
Maximum Posting	180 days per year*	90 days per year*	90 days per year*

* Exclusive of the duration of a new construction project with an active building permit; exclusive of a parcel that is vacant, undeveloped, or listed for sale or rent.

** For non-residential zoning district temporary freestanding signs located within one-thousand two-hundred (1,200) feet of the Interstate 25 right-of-way, the maximum sign height may be increased to twelve (12) feet, the maximum sign area may be increased to sixty-four (64) square feet, and the maximum number of signs may be doubled.

- i. There are unusual physical circumstances or conditions, including, without limitation: irregularity, narrowness or shallowness of the lot; or exceptional topographical or other physical conditions peculiar to the affected property; or unusual physical circumstances or conditions arising from an existing, nonconforming or compliant structure on the affected property; and
- ii. The circumstances or conditions do not exist throughout the neighborhood or zone district in which the property is located, or the circumstances or conditions relate to drainage conditions and challenges found consistently throughout the neighborhood or zone district in which the property is located; and
- iii. The development or use of the property cannot yield a reasonable return in service, use or income as compared to adjacent conforming property in the same district; however loss of a financial advantage, hardship that is solely financial, or the fact that a more profitable use of the property might be had if a variance were granted are not grounds for a variance; and
- iv. The unusual physical circumstances or conditions have not been created by the applicant.

c. *Compatibility with Existing Neighborhood*

- i. The property could be reasonably developed in conformity with the provisions of this FDC, but the proposed variance will result in a building form that is reasonable, customary and consistent with or more compatible, in terms of building height, siting, and design elements, with the existing neighborhood in which the subject property is located.

d. *Review Criteria*

Applicable to All Variance Requests. The Board of Adjustment may grant a variance only if the Board of Adjustment finds that:

- i. The hardship is not shared by many surrounding properties; and
- ii. The Variance, if granted, will not alter the essential character of the neighborhood or district in which the property is located, nor substantially or permanently impair the appropriate use or development of adjacent property; and
- iii. The Variance, if granted, is the minimum Variance that will afford relief and is the least modification possible of the provisions of this FDC which are in question; and
- iv. The Variance, if granted, would not grant a change to either (a) a condition attached to an approved rezoning or special use, or (b) an approved PUD District plan that would constitute an "amendment" under Subsection 2.4.E.72-5.D.7 or (c) a condition attached to an approved Final Development Plan; or (d) a condition attached to an approved Final Plat.

4. Step 12 (Lapse)

Applicable, as follows: Any Variance granted shall become null and void:

- a. If the Variance is not exercised (e.g. building permit obtained, substantial construction commenced) within one-hundred eighty (180) days of the date it is granted;
- b. If the approval or conditions of approval of the Variance is violated;

Garage, Tandem

A parking space within a group of two (2) or more parking spaces arranged one (1) behind the other.

Gas Station

See Service Station.

Gazebo

An accessory structure no larger than ~~two-hundred~~~~one-hundred-fifty~~ (200~~150~~) square feet which may be covered by a roof and enclosed with screening intended to be used for outdoor living activities.

General Outdoor Recreation, Commercial

Intensely developed recreational uses such as amusement parks, miniature golf courses, batting cages, skateboard or skate parks or courses, bicycle motocross courses, water parks or slides, drive-in or outdoor movie theaters, courses for paramilitary games, and archery facilities.

General Retail

A commercial enterprise that provides goods, products, or materials directly to the consumer. This includes uses such as art galleries, appliance stores, bakeries, bookstores, clothing stores, food stores, grocers, caterers, pharmacies, florists, furniture stores, hardware stores, liquor stores, pet stores, toy stores, and variety stores. This use type shall not include restaurants, personal service establishments, convenience stores, or amusement establishments.

Geologic Hazards

Unstable or potentially unstable slopes, faulting, landslides, rock falls, flood, wildfire or similar naturally occurring dangerous features or soil conditions or natural features unfavorable to development.

Golf Course

A tract of land laid out with a course having nine (9) or more holes for playing the game of golf, including any accessory clubhouse, driving range, office, restaurant, concession stand, picnic tables, pro shop, maintenance building, restroom facility, or similar accessory use or structure. This term shall not include miniature golf courses as a principal or accessory use, nor shall it include driving ranges that are not accessory to a golf course.

Golf Driving Range or Putting Course

A sports facility equipped with tee areas, distance markers, and related features for practicing golf and which may include a pro shop, snack bar, but excludes miniature golf courses.

Governmental Office

A building occupied by a governmental agency that provides direct services to the public such as employment, public assistance, motor vehicle licensing and registration, and similar activities.

Grade

The lowest point of elevation of the finished surface of the ground, paving or sidewalk within the area between the building and the property line or, when the property line is more than five (5) feet from the building, between the building and a line five (5) feet from the building.

Greenhouse

A building or structure used for the growing of plants.

Group Home, Large

A group home (including halfway houses) for nine (9) or more persons.

Group Home, Residential

Funeral Parlor or Mortuary; General Retail; Personal Service Establishment; Repair Shop; or Shopping Center.

Right-Of-Way

That portion of land dedicated to public use of a street, path, street trees, and/or utility purposes.

Roof

The cover of any building, including the eaves and similar projections.

Roofline

The point on any building where an exterior wall or any parapet wall encloses usable floor space, including floor area for housing mechanical equipment.

Sanitary Landfill

A discrete area of land or an excavation for which the final disposal of solid waste employs a method to obtain the most dense volume practicable of the waste and covering with earth or other suitable material. A sanitary landfill may receive household waste, community waste, municipal solid waste, commercial waste, and industrial waste.

School - Private

An school under the sponsorship of a private or religious agency, having a curriculum generally equivalent to public elementary or secondary schools, not including vocational schools.

School - Public

A school under the sponsorship of a Colorado accredited school district. School- Public includes charter schools but does not include **School - Vocational**.

School - Vocational

An establishment, other than public or parochial schools, private primary or secondary schools, or colleges and universities, offering training or instruction in a trade, art, or occupation, including but not limited to, beauty schools, dance schools, and trade schools.

Service Station

Any premises where gasoline and other petroleum products are sold or light maintenance activities such as engine tune-ups, emissions testing, lubrication, minor repairs, and carburetor cleaning are conducted. Accessory activities may include automatic car wash and convenience items sales. Service stations shall not include premises where heavy motor vehicle maintenance activities such as engine overhauls, motor vehicle painting, and body fender work are conducted. Fuel dispensing may be performed by an employee of the establishment (full-service) or by the customer (self-service).

Setback

A required area on the same lot or tract with a principal use that provides for light, air, building separation, and access for emergency personnel and equipment. A setback shall be unoccupied and unobstructed by any portion of a structure from the ground upward, except as otherwise provided in this FDC. The depth of a setback is measured at right angles to the relevant property line.

Setback, Front

A setback that extends across the full frontage of a lot or tract on a public or private street. The front setback is defined by the front property line.

- a. In the case of rounded property corners at street intersections, the front setback is measured as if the corner is not rounded and the front and street side property lines are extrapolated to intersect.
- b. ~~In the case of corner or through lots, a front setback extends across all frontages.~~

- c. For cul-de-sac lots and lots abutting a curved street, the front setback follows the curve of the front property line.
 - i. The minimum lot width requirement shall be met at the front setback line.
 - ii. In no event shall the front lot line be less than thirty-five (35) feet in width.
- d. In the case of flag lots, a front setback extends across the entire flag portion of the lot and includes the flagpole portion of the lot.
- e. In the case of a corner lot, through lot, or three (3) sided lot, there will be no rear setbacks, but only front and side setbacks.

Setback, Rear

A setback that extends across the full rear of a lot or tract. The rear setback is defined by the rear property line.

Setback, Side

Any setback that is not a front or rear setback. Generally, side setbacks extend from the inner boundary of the front setback (or from the front property line of the lot or tract where no front setback is required) to the inner boundary of the rear setback (or to the rear property line of the lot or tract where no rear setback is required.) For corner and through lots, setbacks remaining after front setbacks have been established shall be considered side yards.

Sexually Oriented Business

Amusement entertainment that is distinguished or characterized by an emphasis on material depicting, describing or relating to specified sexual activities or specified anatomical areas. Uses shall include, but shall not be limited to, the following: **Adult Bookstore, Adult Photo Studio, and Adult Theater.**

Shared Parking

A public or private parking area used jointly by two (2) or more users or uses to fulfill their individual parking requirements.

Shed

An accessory building of not more than ~~one hundred fifty~~two hundred (~~150~~200) square feet in floor area and not more than ~~fourteen~~twelve (~~14~~12) feet in ~~maximum~~ height.

Shooting Range, Indoor

A soundproof, enclosed building or part thereof, wherein firearms are shot at targets under strict rules of conduct and safety.

Shooting Range, Outdoor

An outdoor facility wherein firearms are shot at targets under strict rules of conduct and safety.

Shopping Center

A retail shopping area in excess of thirty (30) acres (divided by no interior public streets) containing at least one (1) major retail store of over one-hundred thousand (100,000) square feet of gross leasable area and additional retail area.

Sidewalk

An improved pedestrian surface that is typically located adjacent to a street.

Sight Distance Triangle

The area required to be clear of obstructions at the intersections of streets, highways, railroads, alleys and driveways. See the Town of Firestone Standards and Specifications for Design and Construction of Public Improvements.

Sign

FIRESTONE PLANNING & ZONING COMMISSION

RESOLUTION NO. PC-21-09

**A RESOLUTION OF THE FIRESTONE PLANNING & ZONING COMMISSION
RECOMMENDING THAT THE BOARD OF TRUSTEES APPROVE AN ORDINANCE
AMENDING TITLE 16 OF THE FIRESTONE MUNICIPAL CODE**

WHEREAS, a Unified Development Code ("UDC") has been identified as a critical tool in the implementation of the Town's updated master plans; and

WHEREAS, the UDC, entitled the Firestone Development Code ("FDC") establishes land use regulations and promotes orderly development within the Town of Firestone; and

WHEREAS, the FDC is a compilation of development regulations included in zoning, subdivision, and other land use and development related ordinances and regulations; and

WHEREAS, the Town of Firestone Board of Trustees approved Ordinance 976 adopting the FDC on June 24, 2020 with an effective date of July 30, 2020; and

WHEREAS, the Town of Firestone Board of Trustees approved Ordinance 982 adopting amendments to the FDC on October 28, 2020 with an effective date of January 1, 2021; and

WHEREAS, the Town of Firestone identifies a benefit to annual updates to the FDC to provide increment amendments for clarity, efficiency, grammar, format and implementation; and

WHEREAS, the Firestone Planning & Zoning Commission has reviewed the draft amendments of the FDC, and considered the merits of these amendments in a public hearing on December 2, 2021; and

WHEREAS, the Firestone Planning and Zoning Commission wishes to make a recommendation to the Board of Trustees regarding the amendments.

NOW, THEREFORE, BE IT RESOLVED BY THE FIRESTONE PLANNING & ZONING COMMISSION:

1. That the Firestone Planning & Zoning Commission recommends approval of an ordinance amending Title 16 of the Firestone Municipal Code as detailed in Exhibit A with technical changes.

INTRODUCED, READ AND ADOPTED AT A REGULAR MEETING OF THE
FIRESTONE PLANNING AND ZONING COMMISSION THE 2nd DAY OF December, 2021.

ATTEST:

Acting Secretary 



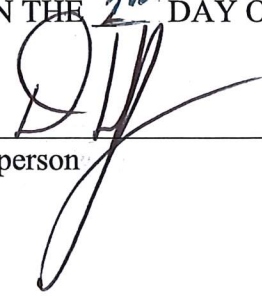

Chairperson

EXHIBIT A

ORDINANCE NO. ____

**AN ORDINANCE OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE,
COLORADO AMENDING SECTIONS 16.2.3, 16.2.5, 16.3.3, 16.4.2, 16.5.4, 16.6.2, 16.6.3,
16.6.4, 16.6.5, 16.6.7, 16.6.12, 16.11.3, AND TABLES 3-1, 4-1 AND 6.12-6 OF CHAPTER
16.04 (FIRESTONE DEVELOPMENT CODE) OF TITLE 16 OF THE FIRESTONE
MUNICIPAL CODE**

WHEREAS, Chapter 16.04 of the Firestone Municipal Code was enacted to adopt the Firestone Development Code (“FDC”), which establishes comprehensive regulations pertaining to the use and development of land within the Town of Firestone; and

WHEREAS, the Board of Trustees desires to amend various sections of the Firestone Development Code as part of the Town’s overall annual FDC update process that will guide the growth and development of the Town and improve the administration of the FDC; and

WHEREAS, the Board of Trustees believes these amendments will improve the understanding and administration of the Firestone Development Code with regard to those regulations and their underlying goals.

NOW THEREFORE, BE IT ORDAINED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:¹

Section 1. Section 16.2.3.B.1, “Old Town Commercial (OTC), of the Firestone Development Code is hereby amended to read as follows:

1. Purpose

To provide for and encourage development and redevelopment that preserves and enhances the unique character and vitality of Old Town Firestone. Small-scale offices, retail, and residential uses are permitted. New development is encouraged to place residential above the ground floor. Design standards focus on creating a human-scaled, pedestrian-oriented and walkable downtown that invites commercial development and complementary residential opportunities. Continuous retail frontages, largely uninterrupted by driveways and parking, are encouraged. The zone district classifications of C-1, C-2, C-M, and NC from former Town zoning code and development regulations along First Street in Old Town Firestone are intended to be included in the OTC district. Developing and redeveloping non-residential properties adjacent to Grant Avenue between Colorado Boulevard and Second Street are intended to be included in the OTC district

Section 2. Section 16.2.5.G, “Use Overlay Districts (UO), of the Firestone Development Code is hereby amended by the addition of a new subsection 5, to read as follows:

5. Manufactured Home Park Use Overlay District (UO-2)

¹ Additions to the current text of the Code are indicated by underlining, and deletions are indicated by ~~strikethrough~~.

a. There is hereby created a Use Overlay District designated as the Manufactured Home Park Use Overlay District, and the provisions of this UO-2 district shall apply only to those areas within the R-A Low-Density Residential Zone District that are designated with the UO-2 Zone District on the Official Zone Map and located east of Weld County Road 17.

b. **Allowance for Manufactured Home Park Uses**

Notwithstanding the limitations applicable in the underlying zone district, manufactured home park uses, as defined by this FDC, shall be permitted in this overlay zone district.

c. **General Provisions**

i. All manufactured homes and manufactured home parks shall conform to the R-A zone district and single-family residential standards of this FDC, unless otherwise modified by this section.

ii. All manufactured home parks shall conform to the Town of Firestone Design Standards & Construction Specifications for Public Improvements (Standards and Specifications).

iii. All manufactured homes shall be located only in a Manufactured Home Park, as defined by this FDC.

iv. Existing manufactured homes, whether located within or outside of a Manufactured Home Park, shall be deemed conforming as of the effective date of this FDC. Existing manufactured homes shall only be upgraded or replaced with newer and higher quality contemporary manufactured homes.

v. *Permitted Principal Uses*

The following uses shall be permitted within a manufactured home park:

1. Any single-family dwelling unit regardless of its method of assembly, including Type 1 and Type 2 manufactured homes, module homes assembled after 1976, factory built homes or on-site built homes, provided such dwelling unit has been constructed no more than 10 years prior to the effective date of this FDC.

2. Community center.

3. Group care facilities.

vi. *Permitted Accessory Uses:*

1. Uses that are customarily incidental to any of the permitted principal uses and are located on the same lot or on an adjacent lot.
2. Recreational facilities.

d. Development Standards

- i. All manufactured homes are required to meet the provisions of C.R.S. § 24-32-3301 *et seq.*, as amended, and the Colorado Division of Housing administrative rules set forth in 8 C.C.R. 1302-14, as amended, which provide for comprehensive regulation of the installation of manufactured homes to ensure the safety, affordability and performance of such dwelling units.
 - ii. All interior streets shall meet all adopted Town Standards and Specifications.
 - iii. Interior streets, parking areas and walkways shall be adequately lighted to provide safe movement of vehicles and pedestrians at night.
 - iv. Landscaping that complies with the provisions set forth in this FDC shall be submitted as part of the required Final Development Plan for the park. All setback areas, with the exception of driveways and sidewalks, and other open space shall be landscaped to soften the exterior appearance of the mobile home park.
 - v. All manufactured homes shall be skirted between the floor and the ground surface with durable, all-weather construction as manufactured specifically for covering the undercarriage area of the mobile home.
 - vi. All manufactured homes constructed on existing lots located in the floodplain shall be installed on a permanent foundation.
- e. No replacement manufactured home shall be moved onto any lot, unless such manufactured home is certified pursuant to the "National Mobile home Construction and Safety Standards Act of 1974", 42 U.S.C. §5401 *et seq.*, as amended, or is certified by the Colorado Division of Housing pursuant to C.R.S. § 24-32-3301, *et seq.* and any administrative rules promulgated thereunder. A manufactured home presently located within a manufactured home park that is relocated within the same manufactured home park is exempted from the requirements of this section.

Section 3. Table 3-1 (Table of Permitted Uses), Use Standards for Vehicles and Equipment Use Category, of Section 16.3.1 of the Firestone Development Code, is amended to read as follows:

Vehicles and Equipment	Car Wash							S	S						3.2.C.7.b
	Outdoor Recreational Vehicle Storage								S						Minimum 1000' from Interstate, and Arterial, and Section Line Roadways
	Fueling Station						S	P	P				S		3.2.C.7
	Towing Facility								S						Minimum 1000' from Interstate, and Arterial, and Section Line Roadways
	Truck Stop								S						Minimum 1000' from Interstate, and Arterial, and Section Line Roadways
	Vehicle Sales and Rental								S						Minimum 1000' from Interstate, and Arterial, and Section Line Roadways
	Vehicle Service and Repair, Heavy								P						3.2.C.7.b
	Vehicle Service and Repair, Light						P	P	P						3.2.C.7.b

Section 4. Table 3-1 (Table of Permitted Uses), Use Standards for Warehouse and Freight Movement Use Category, of Section 16.3.1 of the Firestone Development Code, is amended to read as follows:

Warehouse and Freight Movement	Mini-warehouse/Self Storage								S						Minimum 1000' from Interstate, and Arterial, and Section Line Roadways
	Warehouse/Wholesale Distribution Center								S						Minimum 1000' from Interstate, and Arterial, and Section Line Roadways

Section 5. Table 3-1 (Table of Permitted Uses), Family Child Care Home Accessory Use Category, of Section 16.3.1 of the Firestone Development is amended to read as follows:

ACCESSORY USE	RESIDENTIAL					COMMERCIAL				OTHER				Use-Specific Standards
	RR	R-A	R-B	R-C	OTR	NC	RC	LI	OTC	DR	AG	OS	PLI	
Family Child Care Home (Small)	P	P	P	P	P						P			3.3.G.2

Section 6. Table 3-1 (Table of Permitted Uses) of Section 16.3.1 of the Firestone Development Code is amended by the addition of a new row, entitled “Family Child Care Home (Large), to be inserted alphabetically and to read as follows:

ACCESSORY USE	RESIDENTIAL					COMMERCIAL				OTHER				Use-Specific Standards
	RR	R-A	R-B	R-C	OTR	NC	RC	LI	OTC	DR	AG	OS	PLI	
Family Child Care Home (Large)	S	S	S	S	S						S			

Section 7. Section 16.3.3.G.2, “Family Child Care Home,” of the Firestone Development Code is hereby deleted in its entirety and re-enacted to read as follows:

2. Family Child Care Home

Family Child Care Homes shall comply with the Colorado licensing statutes codified at C.R.S. §26-6-101 *et seq.*, as amended, and the Department of Human Service Regulations codified at 12 CCR 2509-8 *et seq.*, as amended. Family Child Care Homes (Small) may serve no more than six (6) full time and two (2) part time children or students within a Single-Family Detached residence. Family Child Care Homes (Large) shall conform to the following standards:

- a. Family Child Care Homes (Large) shall serve no more than twelve (12) children;
- b. Family Child Care Homes (Large) shall not be located adjacent to or directly across the street from other Family Child Care Homes (Large); and
- c. Family Child Care Homes (Large) shall only be located on streets that accommodate on-street parking.

Section 8. Table 4-1 is amended to appear as follows:

TABLE 4-1: DIMENSIONAL AND DENSITY STANDARDS – RESIDENTIAL AND COMMERCIAL DISTRICTS (Additional standards may apply. See Use-Specific Standards in Section 3.2)								
		Minimum Lot Standards		Minimum Setbacks (ft.) [Ⓢ]				Max Height (ft)
District	Max/Min Density (DU/Acre)	Width (ft)	Net Area [Ⓢ] (sq ft)	Front	Street (all uses)	Interior Lot Line	Rear	
RR	1/na	100 (Flag lots: 50)	43,560	Principal: 30 Accessory: 40	30	10	Principal: 30 Accessory: 10	40
R-A	5/na	SFD: 45 Comer: 55 SFD-Alley: 35 Comer: 45	SFD: 4,500 SFD-Alley: 3,500 SFA: 2,000 SFA-Alley: 1,500	Principal SF: 14 10 for alley loaded 20 to front load garage Principal MF: 20 Accessory: 30	SF: 10 MF: 20	Principal SF: 5 [Ⓢ] Principal MF: 10 [Ⓢ] Accessory: 5 [Ⓢ]	Principal SFD: 20 2 for SFD-Alley loaded: 2 Principal SFA: 15 SFA-Alley: 2 Principal MF: 20 Accessory SF: 5 Accessory MF: 10	Prin-SF: 35 Prin-MF: 45 Acc: 25
R-B	10/5	SFA: 25 Comer: 35 MF: none	MF: 1,500 per DU					
R-C	20/10							

Section 9. Section 16.4.2.A.1.b.iv, “General Setback Requirements,” of the Firestone Development Code is hereby amended to read as follows:

ii. *Incidental Architectural Features*

Cornices, eaves, canopies, window wells, chimneys, bay windows, ornamental features, and other similar architectural features may encroach not more than two (2) feet into any required setback. Window well openings may encroach not more than three (3) feet into any required setback.

Section 10. Section 16.4.2.A.1.b, “General Setback Requirements,” of the Firestone Development Code is hereby amended by the addition of a new subsection viii, to read as follows:

viii. *Driveways*

Residential driveways may encroach into any required interior side setback provided these encroachments are at least three (3) feet from the side lot line and do not impact drainage conveyance or utilities.

Section 11. Section 16.5.4.E.8, “Lots,” of the Firestone Development Code is hereby amended to read as follows:

Wedge-shaped lots shall not be less than ~~forty~~ thirty-five (40 ~~35~~) feet in width at the front property line. Such lots shall conform to the minimum lot width for the district at the front setback line.

Section 12. Section 16.5.4.G.7, “Street Arrangement and Connections,” of the Firestone Development Code is hereby deleted in its entirety and re-enacted to read as follows:

7. Street Arrangement and Connections

- a. Local streets shall be arranged so that their use by through traffic will be discouraged. Traffic calming techniques such as use of grid patterning, diverters and curvilinear alignments are encouraged to reduce speeds and cut-through traffic. All traffic calming measures shall be approved by the Town Engineer.

- b. Where a subdivision borders the following, a minimum landscaped buffer area shall be provided as follows: thirty (30) feet adjacent to arterial streets and section line roadways, fifty (50) feet adjacent to railroad right-of-way, and one-hundred (100) feet adjacent to Interstate right-of-way. This buffer is in addition to any required right-of-way, and exclusive of any lot size requirements. No driveway access shall be permitted from the lot directly to any highway, freeway, arterial, section line roadways, or railroad right-of-way.
- c. Dead-end streets (excluding cul-de-sac or stub streets) shall not be permitted unless approved by the Board of Trustees
- d. Visibility into residential subdivision from arterial, section line, and collector roadways shall be emphasized and coordinated with street configurations including cul-de-sacs and parallel road loops, open space, and trail corridors. The backing of lots to arterials, section line, and collector roadways shall be limited. Continuous runs of lots which back to such roadways shall not exceed five-hundred (500) feet in length.
- e. Openings in the perimeter fence frontage shall serve to visually link intersecting streets, view corridors into and out of the development, pedestrian entryways, and parks or open space.

Section 13. Section 16.6.2.D.2.a, “Standards for Community Gateway Corridors,” of the Firestone Development Code is hereby deleted in its entirety and re-enacted to read as follows:

a. Arterials and Section Line Roadways

- i. A minimum thirty (30) foot landscaped buffer shall be maintained on either side of the arterial or section line roadway and located in a tract. This buffer should utilize a variety of live plant material and berming to provide year-round visual interest. A minimum ten (10) foot wide sidewalk shall be incorporated as an integral component of the landscape buffer and landscape area within the right-of-way.
- ii. Single-family detached residential lots shall be set back a minimum of one-hundred fifty (150) feet from the right-of-way along Firestone Boulevard west of Colorado Boulevard.
- iii. All fencing facing the arterial or section line roadway shall be a maximum of four (4) feet in height and should have an open character, such as split rail or picket. Opaque fencing is prohibited.
- iv. Parking shall be screened to the greatest extent reasonably practicable from the arterial or section line roadway using a combination of berming, walls, fencing and landscaping with a minimum cumulative height of three (3) feet. Such berming or screening walls and fencing may be located within the landscaped buffer prescribed in this Section. Parking, internal drives or streets may not extend into the landscape buffer excepting access drives from the right-of-way running perpendicular to the arterial or section line roadway.

- v. Garages and carports may not be used as a screen or barrier between the arterial or section line roadway and a development site.

Section 14. Section 16.6.3.B.5.a.i.(C), “Pocket Parks,” of the Firestone Development Code is hereby amended to read as follows:

Bordered on at least one (1) side by public streets (excluding major collector, section line, and arterial streets) to provide easy public access, visual surveillance, and on-street parking;

Section 15. Section 16.6.3.B.5.a.ii.(C), “Neighborhood Parks,” of the Firestone Development Code is hereby amended to read as follows:

Bordered on at least two (2) sides by public streets (excluding arterial or section line streets) to provide easy public access, visual surveillance and parking;

Section 16. Section 16.6.3.c..f.viii, “Areas Not Eligible,” of the Firestone Development Code is hereby amended to read as follows:

The first 150’ of oil and gas well and facility setbacks or the setback as identified in a Surface Use Agreement (SUA), whichever is greater; and

Section 17. Section 16.6.4.G.6, “Rooftop Mechanical Equipment,” of the Firestone Development Code is hereby amended to read as follows:

Rooftop mechanical equipment, including HVAC equipment, venting, and utility equipment that serves the structure, shall be screened. Screening shall be accomplished through the use of parapet walls or a sight-obscuring enclosure around the equipment constructed of one (1) of the primary materials used on the primary facades of the structure, and that is an integral part of the building’s architectural design. The parapet or screen shall completely surround the rooftop mechanical equipment to an elevation equal to or greater than the highest portion of the rooftop mechanical equipment being screened. In the event such parapet wall does not fully screen all rooftop equipment, then the rooftop equipment shall be enclosed by a screen constructed of one (1) of the primary materials used on the primary facade of the building so as to achieve complete screening.

Section 18. Section 16.6.5.D.2.d, “Access,” of the Firestone Development Code is hereby amended to read as follows:

d. *Access*

- i. All driveways shall be paved in concrete or asphalt.

- ii. All non-residential development shall be designed to allow for cross-access to adjacent properties to encourage shared parking and shared access points on public or private streets. When cross-access is deemed impractical by the Director on the basis of topography, the presence of natural features, vehicular safety, or convenience factors, this requirement may be waived provided that appropriate bicycle and pedestrian connections are provided between adjacent developments or land uses. Cross access easements shall be referenced as a note on the plat.

- iii. Whenever feasible, there shall be no direct driveway access (ingress or egress) from any single-family residential lots to any non-residential collector street, arterial street, section line roadway or highway. Whenever feasible, all single-family residential lots driveway access shall be limited to residential collector and local residential streets.

Section 19. Section 16.6.7.D.1.b.iii, “Diversification Standards,” of the Firestone Development Code is hereby deleted in its entirety and re-enacted to read as follows:

- iii. Housing types that apply to Table 6.7-1 include:

- (A) Single-family Detached;
- (B) Duplex;
- (C) Single-family Attached – Townhouse;
- (D) Multi-Family – six (6) units or less;
- (E) Multi-Family – Apartments (seven (7) units or more); and
- (F) Live-Work units.

Section 20. Section 16.6.7.E.3.b, “Width/Façade Ratio,” of the Firestone Development Code is hereby deleted in its entirety and re-enacted to read as follows:

The width of a front-loaded garage shall not exceed fifty-five (55) percent of the width of the front elevation for two-car garages or sixty-five (65) percent of the width of the front elevation for three-car garages.

Section 21. Section 16.6.12.C.2.i., “Exemptions,” of the Firestone Development Code is hereby amended to read as follows:

Town decorations, banners, signs or other elements located on Town property, right-of-way, utility poles, or streetlights and elements approved through the Town’s Special Events process.

Section 22. The row entitled “Maximum Number” of Table 6.12-6 of Section 16.6.12.J.2 of the Firestone Development Code is hereby amended to read as follows:

Standards	Non-Residential Zoning Districts	Multi-Family	Single-Family Zoning Districts
		Zoning Districts	
Maximum Number	1 per street frontage** (1 additional for every 500’ of frontage)**	1 per street frontage	1 per street frontage

Section 23. Table 6.12-6 of Section 16.6.12.J.2 of the Firestone Development Code is hereby amended by the addition of a new note to read as follows:

****** For non-residential zoning district temporary freestanding signs located within one-thousand two-hundred (1,200) feet of the Interstate 25 right-of-way, the maximum sign height may be increased to twelve (12) feet, the maximum sign area may be increased to sixty-four (64) square feet, and the maximum number of signs may be doubled.

Section 24. Section 16.11.3, "Terms Defined," of the Firestone Development Code is hereby amended by modifying the following definitions, to read as follows:

Gazebo.

An accessory structure no larger than two-hundred ~~one-hundred-fifty~~ (150 200) square feet which may be covered by a roof and enclosed with screening intended to be used for outdoor living activities.

Setback, Front

A setback that extends across the full frontage of a lot or tract on a public or private street. The front setback is defined by the front property line.

- a. In the case of rounded property corners at street intersections, the front setback is measured as if the corner is not rounded and the front and street side property lines are extrapolated to intersect.
- ~~b. In the case of corner or through lots, a front setback extends across all frontages.~~
- ~~e~~ b. For cul-de-sac lots and lots abutting a curved street, the front setback follows the curve of the front property line.
 - i. The minimum lot width requirement shall be met at the front setback line.
 - ii. In no event shall the front lot line be less than thirty-five (35) feet in width.
- ~~d~~ c. In the case of flag lots, a front setback extends across the entire flag portion of the lot and includes the flagpole portion of the lot.
- ~~e~~ d. In the case of a corner lot, through lot, or three (3) sided lot, there will be no rear setbacks, but only front and side setbacks.

Shed

An accessory building of not more than ~~one-hundred-fifty~~ two-hundred (150 200) square feet in floor area and not more than ~~fourteen~~ twelve (14 12) feet in ~~maximum~~ height.

Section 25. If any article, section, paragraph, sentence, clause, or phrase of this ordinance is held to be unconstitutional or invalid for any reason, such decision shall not affect the validity or constitutionality of the remaining portions of this ordinance. The Board of Trustees hereby declare it would have passed this ordinance and each part or parts hereof irrespective of the fact that any one part or parts be declared unconstitutional or invalid.

Section 26. Violations of this ordinance shall be punishable in accordance with Section 1.16.010 of the Municipal Code of the Town of Firestone, Colorado.

Section 27. All other ordinances or portions thereof inconsistent or conflicting with this ordinance or any portion hereof are hereby repealed to the extent of such inconsistency or conflict.

INTRODUCED, READ, ADOPTED, APPROVED, AND ORDERED PUBLISHED IN
FULL this ___th day of _____, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

APPROVED AS TO FORM:

Jessica Koenig, Town Clerk

William P. Hayashi, Town Attorney

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 8.a

Discussion/Action

Meeting Date: December 8, 2021

Initiated By: Jessica Clanton

Dept: Finance

AGENDA TITLE

Resolution 21-200: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, LEVYING GENERAL PROPERTY TAXES FOR THE 2021 TAX YEAR, TO HELP DEFRAY THE COSTS OF GOVERNMENT FOR THE TOWN OF FIRESTONE, COLORADO, FOR THE 2022 FISCAL YEAR

SUMMARY

The Board of Trustees must certify the mill levies for the 2022 fiscal year by December 15, 2021. This Resolution will certify the Town's general mill levy at 6.805 mills.

HISTORY AND PREVIOUS BOARD ACTION

On December 9, 2020, the Board certified the Town's mill levy at 6.805 mills for the 2021 fiscal year. The Board adopted the annual budget for the 2022 fiscal year on November 17th, 2021.

RECOMMENDATION

Staff recommends that the Board of Trustees approve the attached Resolution to formally certify the general property tax mill levy.

ALTERNATIVES

ATTACHMENTS

1. Reso 2022 BUDGET RESOLUTION MILL LEVY

FINANCIAL CONSIDERATIONS

RESOLUTION NO. 21-200

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, LEVYING GENERAL PROPERTY TAXES FOR THE 2021 TAX YEAR, TO HELP DEFRAY THE COSTS OF GOVERNMENT FOR THE TOWN OF FIRESTONE, COLORADO FOR THE 2022 FISCAL YEAR.

WHEREAS, the Board of Trustees of the Town of Firestone on November 17th, 2021 adopted the annual budget for the 2022 fiscal year in accordance with the Local Government Budget Law; and

WHEREAS, a general property tax mill levy is necessary to defray the general expenses of Town government for the 2022 fiscal year; and

WHEREAS, the 2021 valuation for assessment for the Town of Firestone as certified by the County Assessor is \$235,109,926; and

WHEREAS, the Town is exempt from the statutory property tax revenue limitation (5.5% limit) due to voter approval of Ballot Issue A at the April 2, 1996 regular municipal election; and

WHEREAS, the Town is exempt from the fiscal year spending limitation imposed by Article X, Section 20 to the Colorado Constitution, due to voter approval of Ballot Issue A at the April 2, 1996, regular municipal election; and

WHEREAS, the Board of Trustees must certify the mill levies for the 2022 fiscal year by December 15, 2021, and by this Resolution desires to so certify its general mill levy.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

Section 1. That for the purpose of meeting all general operating expenses of the Town of Firestone during the 2022 fiscal year, there is hereby levied a tax of 6.805 mills upon each dollar of the total valuation for assessment of all taxable property within the Town for the year 2021.

Section 2. That the Town Director of Finance is hereby authorized and directed to immediately certify to the County Commissioners of Weld County, Colorado, the mill levy for the Town of Firestone as herein above determined and set.

INTRODUCED, READ AND ADOPTED this _____ day of _____, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

Attest:

Jessica Koenig, CMC, Town Clerk

APPROVED AS TO FORM:

William P. Hayashi, Town Attorney

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 8.b

Discussion/Action

Meeting Date: December 8, 2021

Initiated By: Jessica Clanton

Dept: Finance

AGENDA TITLE

Resolution 21-199: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, PRESCRIBING THE TOWN OF FIRESTONE'S WATER RATES, FEES, TOLLS AND CHARGES AND STORAGE AND INFRASTRUCTURE INVESTMENT FEES

SUMMARY

Staff has prepared a resolution for consideration by the Board to increase water rates by 8% in accordance with Clear Water Solutions, Inc. 2018 Water Rate Study Update ("Water Rate Study"), to take effect on January 1, 2022. At this time, the Town is not passing the increase imposed on the Town from CWCWD onto the residents.

HISTORY AND PREVIOUS BOARD ACTION

The 2018 Water Rate Study recommended an 8% increase for 2019, 2020 as well as 2021. The staged increases over the past years have allowed the Town to keep pace with anticipated cost increases from water treatment, delivery, the Town's participation in the Northern Integrated Supply Project ("NISP"), purchase of Firestone Reservoir #1, and purchasing additional water rights, which are key components in the Town's long-term potable water delivery strategy.

Each year the Town is supplied the meter and yoke costs from its supplier for the upcoming year's cost of these supplies. The Town will need to adjust these fees to recoup its costs to the vendor for these supplies. The Town will also impose a \$25.00 administrative fee to cover Town costs in administering the meter and yoke requirements.

The Town allows hydrant meter rentals throughout the year through a Hydrant Construction Permit process, thus allowing the permittee to use water from a Town mandated fire hydrant. The increase in the current water usage rate per 1,000 gallons of water used is in line with our proposed commercial water rate.

RECOMMENDATION

Staff recommends that the Board of Trustees approve the attached resolution increasing the water rates by 8%, increasing the meter and yoke fees to cover costs being paid to the vendor for these supplies plus a \$25.00 administrative fee, and increasing the hydrant meter water usage rate to align with our proposed commercial water rate, to be effective on January 1, 2022.

ALTERNATIVES

ATTACHMENTS

1. Res No 21-199 A RESOLUTION PRESCRIBING WATER RATES, FEES, TOLLS AND CHARGES AND STORAGE AND INFRASTRUCTURE FEES

FINANCIAL CONSIDERATIONS

The increased rates are predicted to increase water rate revenue by approximately \$340,000 to keep pace with the predicted cost of service increases and program participation.

RESOLUTION NO. 21-199

A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, PRESCRIBING THE TOWN OF FIRESTONE'S WATER RATES, FEES, TOLLS AND CHARGES AND STORAGE AND INFRASTRUCTURE INVESTMENT FEES

WHEREAS, the Town of Firestone ("Town") for administrative efficiency desires to consolidate its water resource and services rates, fees, tolls and charges in one resolution; and

WHEREAS, the Town, which operates a municipal water facility and Central Weld County Water District ("CWCWD") are parties to various intergovernmental agreements concerning the provision of water service and facilities to the Town; and

WHEREAS, pursuant to such intergovernmental agreements, CWCWD from time to time increases its charges regarding its provision of water services to the Town; and

WHEREAS, after review and analysis of the costs of operating and maintaining the Town's water system, including completion of a water rate study and an analysis of capital needs, and in consideration of applicable CWCWD increases and increases in the costs of operating, maintaining and improving the Town's water system, the Board of Trustees has determined that increases in the Town's water system rates, fees, tolls and charges are necessary; and

WHEREAS, the Town's current water tap fees and monthly water rates do not adequately provide for the capital needs and operations of the Town's water system; and

WHEREAS, the Board of Trustees thus desires to increase certain rates, fees, tolls and charges regarding the provision of Town water services and water usage; and

WHEREAS, the Town's determination of Native Water Dedication Credits pursuant to the Town's Native Water Dedication Policy includes storage and delivery system development costs which it seeks to recover through the enactment of storage and infrastructure investment fees.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

Section 1. Water rates and charges. The following monthly rates and charges shall be imposed for water received from the Town of Firestone water system:

Meter Size	Residential Base Rate Charge	Non-Residential Base Rate Charge*	Water Included in Rate (Gallons)
5/8"	\$ 33.39	\$ 33.39	-0-
3/4"	51.19	51.19	-0-
1"	84.56	84.56	-0-
1-1/2"	166.88	166.88	-0-
2"	269.25	269.25	-0-
3"	-	502.89	-0-
6"	-	1,988.39	-0-

*Non-Residential accounts include Commercial, Industrial, Irrigation, Mobile Home Parks and Multi-Family

Water Charge Per 1,000 Gallons

Customer Type	Gallons	Rate
Commercial & Industrial	All usage	\$ 4.91
Irrigation Only	All usage	\$ 7.46
Mobile Home Parks	All usage	\$ 6.01
Multi-Family	All usage	\$ 4.90
Out-of-Town Rates	Base rates and gallon charges for any out-of-town service shall be two times the in-Town rates and charges.	

Water Charge Per 1,000 Gallons

Gallons	Rate
Residential	
0-5,000	\$ 3.16
5,001-20,000	\$ 5.57
20,001-40,000	\$ 8.91
Above 40,000	\$ 11.14

Section 2. Connection, Capital Investment and Repair Fees. The following connection and capital investment and repair fees shall be imposed, except that the Town of Firestone shall not be required to pay such connection fees for irrigation sprinkler systems for any public parks, rights-of-way, open space, or medians, or any facility developed, owned or paid for by the Town.

Meter Size	Total
5/8"	\$ 12,800
3/4"	\$ 19,200
1"	\$ 32,000
1-1/2"	\$ 66,000
2"	\$ 106,400

Connection and capital investment and repair fees as well as any other fees for taps requiring a meter larger than 2" shall be determined by the Board of Trustees on an individual basis considering such factors as type of use, contemplated volume demand for water, effect on the entire water system in the Town, connection and capital investment fees imposed by CWCWD, and all other factors relevant to the application. All taps requiring a meter larger than 2" and all taps applied for where the service requested is outside of the Town limits shall be by contract with the Board of Trustees. Out-of-town taps of 2" or less shall be charged fees at two times the amount of in-Town fees.

Section 3. Construction Hydrant Meter Rental Terms. The following fees shall be imposed for hydrant meters supplied by the Town for construction water use. A Hydrant Connection Permit must be obtained from the Town Clerk prior to any water being used from any fire hydrant. Such permit shall be valid for a period not to exceed 6 months.

Deposit	\$ 3,200.00 per meter
Administration Fee	\$ 25.00 per permit
Meter Rental	\$ 4.00 per day
Late Charge	\$ 5.00 per day
Water Usage Rate	\$ 4.91 per 1,000 gallons

Section 4. Meter & Yoke Fees. The following fees shall be imposed for Meter and Yoke assemblies installed by the Town for new service connections; such fees for taps requiring a meter larger than 2" shall be as set by contract with the Board of Trustees:

<u>Meter Tap Size</u>	<u>Administrative Fee</u>	<u>Meter & Yoke Cost</u>	<u>Total Meter & Yoke Fee</u>
5/8"	\$ 25.00	\$ 1,196.71	\$ 1,221.71
3/4"	25.00	1,275.59	1,300.59
1"	25.00	1,671.80	1,696.80
1-1/2" Commercial	25.00	4,399.70	4,424.70
1-1/2" Irrigation	25.00	3,331.90	3,356.90
2" Commercial	25.00	5,893.26	5,918.26
2" Irrigation	25.00	3,977.10	4,002.10

Section 5. Native Water Dedication Agreement Storage and Infrastructure Fees. The following fees shall be established for Native Water Dedication Agreements.

Ditch	Storage Multiplier	Starage Fee, per acre-foot of credit	Infrastructure Fee, per acre- foot of credit	Total Storage and Infrastructure Investment Fee, per acre-foot of credit
Lower Boulder Preferred	1.45	\$ 16,100	\$ 1,400	\$ 17,500
Lower Boulder Common	2.00	22,200.00	1,400.00	23,600
Coal Ridge	1.45	16,100.00	1,400.00	17,500
Godding	1.45	16,100.00	1,400.00	17,500
Rural	1.45	16,100.00	1,400.00	17,500
Last Chance	1.45	16,100.00	1,400.00	17,500

Section 6. This Resolution shall take effect on January 1, 2022 and at such date all other resolutions addressing the Town's water rates, fees, tolls and charges set forth herein shall be repealed in their entirety.

INTRODUCED, READ AND ADOPTED this _____ day of _____, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

Jessica Koenig, CMC, Town Clerk

APPROVED AS TO FORM:

William P. Hayashi, Town Attorney

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 8.c

Discussion/Action

Meeting Date: December 8, 2021

Initiated By:

Dept: Town Clerk

AGENDA TITLE

Motion to Cancel December 22, 2021 Board of Trustees Regular Meeting

SUMMARY

HISTORY AND PREVIOUS BOARD ACTION

RECOMMENDATION

ALTERNATIVES

ATTACHMENTS

None

FINANCIAL CONSIDERATIONS

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 8.d

Discussion/Action

Meeting Date: December 8, 2021

Initiated By: Julie Pasillas

Dept: Public Works

AGENDA TITLE

Resolution 21-207: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, ACTING BY AND THROUGH ITS WATER ACTIVITY ENTERPRISE APPROVING A PURCHASE AND SALE AGREEMENT WITH JAMIE BYBEE

SUMMARY

Resolution 21-207 and the Purchase and Sales Agreement between the Town of Firestone and Jamie Bybee is proposing the purchase and sale of 3 Common Shares of the New Consolidated Lower Boulder Reservoir and Ditch Company.

HISTORY AND PREVIOUS BOARD ACTION

Staff presented the potential purchase of 3 Common Shares of the New Consolidated Lower Boulder Reservoir and Ditch Company to the Board of Trustees at the October 13, 2021 meeting. Staff received direction from the Board to negotiate this purchase agreement. Jamie Bybee has agreed to all the terms staff negotiated and has agreed to the sale of the 3 shares. The New Consolidated Lower Boulder Reservoir and Ditch Company is one of five ditches the Town has identified as desirable water rights for the acquisition to add to the Town of Firestone water portfolio.

RECOMMENDATION

Staff recommends that the Board approve Resolution 21-207, a resolution approving the purchase of 3 Common Shares of the New Consolidated Lower Boulder Reservoir and Ditch Company from Jamie Bybee.

ALTERNATIVES

The Board may choose not to approve the resolution and provide staff with additional direction.

ATTACHMENTS

1. Res 21-207 Purchase and Sale Water Rights Agreement-Bybee
2. Purchase and Sales Agreement-3 Common Share-Bybee

FINANCIAL CONSIDERATIONS

The agreement includes a purchase price of \$90,000.00 for the purchase of 3 Common Shares of the New Consolidated Lower Boulder Reservoir and Ditch Company. Sufficient funds were budgeted for the water fund.

RESOLUTION NO. 21-207

**A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF
FIRESTONE, COLORADO, ACTING BY AND THROUGH ITS WATER
ACTIVITY ENTERPRISE APPROVING A PURCHASE AND SALE
AGREEMENT WITH JAMIE BYBEE**

WHEREAS, Jamie Bybee desires to convey certain water rights which the Town of Firestone ("Town"), acting by and through its Water Activity Enterprise, desires to purchase, subject to the terms and conditions set forth in a Purchase and Sale Agreement.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

1. The Purchase and Sale Agreement between the Town of Firestone, acting by and through its Water Activity Enterprise ("Buyer"), and Jamie Bybee ("Seller") for water rights is approved in substantially the same form as the copy attached hereto and made a part of this resolution, and the Mayor is authorized to execute the Agreement on behalf of the Town.

2. The Town Manager and other officers, employees and agents of the Town are further authorized to execute and deliver all documents necessary in connection with the closing of the purchase of the Water Rights, and to do all things necessary on behalf of the Town to perform all obligations of the Town under the Agreement, including without limitation the execution and delivery of all documents necessary or required with closing.

INTRODUCED, READ, AND ADOPTED this 8th day of December, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

APPROVED AS TO FORM:

Jessica Koenig, CMC Town Clerk

William P. Hayashi, Town Attorney

PURCHASE AND SALE AGREEMENT (Water Rights)

This Purchase and Sale Agreement ("Agreement") is entered into this 23 day of November, 2021 by and between JAMIE BYBEE ("Seller"), and the TOWN OF FIRESTONE WATER ACTIVITY ENTERPRISE ("Buyer"). Seller and Buyer may be referred to individually as a "Party" or collectively as "Parties."

RECITALS

WHEREAS, Seller owns and wishes to convey certain water rights as described below to Buyer, and

WHEREAS, Buyer desires to acquire said water rights pursuant to the terms and conditions contained hereafter;

NOW, THEREFORE, in consideration of the mutual promises and covenants contained herein, the Parties hereby agree as follows:

1. Description of Water Rights. Seller is the owner of 3.0 Common Shares of the New Consolidated Lower Boulder Reservoir and Ditch Company ("Lower Boulder Ditch Company") represented by certificate no. C110, hereinafter referred to as "Shares" or "Water Rights."
2. Purchase Price. The Purchase Price for the Water Rights and all rights appurtenant to the Water Rights shall be \$90,000.
3. Effective Date. The "Effective Date" of this Agreement shall be the date on which Seller gives written notice to Buyer that the Lower Boulder Ditch Company Board has voted not to exercise its Right of First Refusal to purchase the Water Rights. If the Lower Boulder Ditch Company Board exercises its Right of First Refusal to purchase the Water Rights, this Agreement shall terminate and be of no further force or effect, with all Parties released of their obligations hereunder and any Earnest Money paid hereunder returned to Buyer.
4. Warranty of Title. Seller warrants that title to the Water Rights will be conveyed to Buyer free and clear of all liens, encumbrances, assessments, and leases of any kind, subject to any rights or restrictions set forth in the Lower Boulder Ditch Company's by-laws. Subject to and excluding any rights or restrictions set forth in the Lower Boulder Ditch Company's by-laws, Seller agrees to warrant and forever defend the Buyer against all and every person claiming any interest in the Water Rights. This warranty shall survive the closing of the transaction and continue in full force and

effect and each Party shall be released from all obligations hereunder and any Earnest Money paid hereunder shall be returned to Buyer.

5. Due Diligence. Buyer shall have up to 45 days following the Effective Date of this Agreement ("Due Diligence Period") to terminate this Agreement if Buyer is dissatisfied with the Water Rights to be acquired hereunder for any reason. It shall be conclusively presumed that Buyer is satisfied with the Water Rights if Buyer fails to send written notice to Seller to the contrary on or before the expiration of the Due Diligence Period. If Buyer sends notice of its dissatisfaction with the Water Rights, Seller shall have 10 days following actual receipt of such notice of dissatisfaction to either to (1) give notice that Seller elects to cure some or all of the issues described in the notice, or (2) give notice that Seller elects not cure such issues. If Seller elects not to cure all such issues Buyer shall have as its exclusive remedies, the right to terminate this Agreement, or to waive any issues Seller has elected not to cure.
6. Assessments. All assessments levied by the Lower Boulder Ditch Company for year 2021 shall be paid by Seller. Assessments for the year 2022 and future years shall be paid by Buyer.
7. Transfer Fee. Any fees imposed by Lower Boulder Ditch Company to complete the transfer of the Water Rights shall be paid by Buyer.
8. Delivery of Stock Certificate. Possession of the original certificate(s) evidencing ownership of the Water Rights shall be delivered to the Buyer at the time of closing together with properly executed and notarized assignments, Special Warranty Deed and any and all other documents necessary to effectuate the transfer of the Water Rights from Seller to Buyer.
9. Closing. The closing for the purchase and sale of the Water Rights will take place on or before a date which is 70 days after the Effective Date of this Agreement.
10. Default. Time is of the essence herein and if any payment or any other condition thereof is not made, tendered or performed by either party, then this Agreement, at the option of the Party who is not in default, may be terminated in which case the non-defaulting party may recover such damages as may be proper. In the event of such default by Seller, where Buyer elects to treat this Agreement as being in full force and effect, the Buyer shall have the right to an action for specific performance and damages.

11. Historical Use & Transfer. Seller, or Seller's agent, agrees to meet with Buyer, or Buyer's agent, within 30 days of the Effective Date for the purpose of providing Buyer with information concerning the historic use of the Water Rights, which may include the following:

- a. Affidavits stating the manner in which the Water Rights have been used by Seller or its predecessors in title, identifying which acreage has been historically irrigated with the Water Rights represented by the shares, the method of irrigation and what crops have historically been irrigated on the acreage with the Water Rights.
- b. Information showing the historical use of the Water Rights.
- c. Seller's cooperation and participation in good faith with any requests necessary to complete any Catlin approval process of the Lower Boulder Ditch Company or any court proceedings as may be required to change the use of the shares.

12. Notices. All notices and operational communications under this agreement shall be in writing except as otherwise provided for in this Agreement. All such notices and communications shall be deemed to have been duly given on the date of service, if delivered and served personally, or served via e-mail on the person to whom notice is given. All notices shall be delivered by US Mail to the following addresses unless otherwise agreed upon by the Parties:

Buyer:

Town of Firestone
Attn: Julie Pasillas
9950 Park Ave.
Firestone, CO 80504

Seller:

Craig & Jamie Bybee
1540 Utica St.
Denver, CO 80204

13. Entire Agreement. This Agreement represents the complete agreement between the Parties and no oral modification shall be recognized. Any amendment or additions shall be made in writing signed by both parties.

14. Survival of Closing. The representations, warranties and indemnities made by the parties to this contract and the covenants and agreements to be performed or complied

16. Jurisdiction and Venue. This Agreement shall be governed and its terms construed under the laws of the State of Colorado and venue shall be in the County of Weld.

IN WITNESS WHEREOF, the Parties hereto have executed this Agreement on the date and year first above written

BUYER:

SELLER:

TOWN OF FIRESTONE

Jamie Bybee

By (signature):

By (signature):

Jamie Bybee

Date:

Date:

11/23/21

Print name:

Print name:

JAMIE Bybee

Title (if applicable):

Title (if applicable):

AGENDA INFORMATION MEMORANDUM

FIRESTONE TOWN BOARD OF TRUSTEES



AIM#: 8.e

Discussion/Action

Meeting Date: December 8, 2021

Initiated By: Dave Lindsay

Dept: Public Works

AGENDA TITLE

Resolution 21-209: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING CHANGE ORDER NO.1 TO THE AGREEMENT BETWEEN THE TOWN OF FIRESTONE AND INTEGRATED WATER SERVICES INC FOR CONSTRUCTION OF A PUMP STATION FOR THE ST. VRAIN WATER TREATMENT PLANT

SUMMARY

Included in the 2021 Budget were various design and construction tasks on the Gould Property (now the FAST Property) related to the development of an alluvial well field that will be used to provide raw water to the St. Vrain Water Treatment Plant. One of those projects will install pipelines that will connect the FAST Alluvial Well Field to the St. Vrain WTP. Firestone has already procured the pipe for this project and now just needs it installed. Because of the urgency to complete this pipeline project, we offered the work to Integrated Water Services. This is a change order to our current contract with IWS for the St. Vrain WTP Pump Station construction. The change order is for new work and not related to any changes we have encountered or are making. They are very capable of this type of installation project and have the advantage of being on the site already, ensuring they can complete the work in time for the WTP to be completed. Change Order No. 1 to W2020-9524.02 is attached for consideration by the Board of Trustees.

HISTORY AND PREVIOUS BOARD ACTION

On May 26, 2021, the Board of Trustees approved Resolution 21-68 awarding the construction contract for the St Vrain Water Treatment Plant Pump Station.

On November 10, 2021, the Board of Trustees approved payment of a pipe procurement work order for the purchase of the FAST Alluvial Pipeline PVC pipe.

RECOMMENDATION

Staff recommends the Board of Trustees approve the attached resolution approving Change Order No. 1 to contract W2020-9524.02 with Integrated Water Services, Inc. to allow for the installation of the FAST Alluvial Well Pipeline and authorize the Mayor to execute the change order on behalf of the Town.

ALTERNATIVES

NA

ATTACHMENTS

1. 21-209 IWS Change Order #1 Pump Station
2. W2020-9524.02 CO 1 (signed)
3. Pipeline Exhibit

FINANCIAL CONSIDERATIONS

This project was included in the 2021 Budget. The change order is for \$387,814.00 and will be paid from the Water Fund.

RESOLUTION NO. 21-209

**A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE,
COLORADO, APPROVING CHANGE ORDER NO.1 TO THE AGREEMENT
BETWEEN THE TOWN OF FIRESTONE AND INTEGRATED WATER SERVICES
INC FOR CONSTRUCTION OF A PUMP STATION FOR THE ST. VRAIN WATER
TREATMENT PLANT**

WHEREAS, the St. Vrain Water Treatment Plant Project (“Project”) requires the installation of pipelines to connect the Firestone Alluvial Supply Treatment (“FAST”) wells to the St. Vrain Water Treatment Plant; and

WHEREAS, to maintain the Project schedule it is essential that this work commence now and Integrated Water Services Inc. (“IWS”) which is currently on site and under contract for other Project duties has the ability to timely construct the pipelines; and

WHEREAS, staff thus request that the Board of Trustees approve Change Order No.1 which modifies the parties Agreement to provide for construction of pipelines to connect the FAST wells to the St. Vrain Water Treatment Plant.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

Change Order No. 1 to the Agreement between the Town of Firestone and Integrated Water Services Inc. for the Construction of a Pump Station for the St. Vrain Water Treatment Plant is approved in substantially the same form as the copy attached hereto and made a part of this resolution and the Mayor is authorized to execute the Change Order on behalf of the Town.

INTRODUCED, READ AND ADOPTED this ___ day of _____, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

Jessica Koenig, CMC, Town Clerk

APPROVED AS TO FORM:

William P. Hayashi, Town Attorney

No. 1

Effective Date: 2021.11.30

Project: St. Vrain WTP Pump Station	Owner: Town of Firestone	Owner's Contract No.: W2020-9524.02
Contract:		Date of Contract: May 26, 2021
Contractor: Integrated Water Services		Engineer's Project No.: 227704136

The Contract Documents are modified as follows upon execution of this Change Order:

Description:

The Town has requested the Contractor to provide a price for the FAST Alluvial Pipeline Supply project which will be added to this current contract. The Town has purchased the 4-inch and 8-inch diameter PVC pipe to be installed for the project. The Bid Schedule in the Project Manual will be modified to add Line Items 17-41 using the descriptions, quantities, unit prices, and total bid amounts as shown on the attached Bid Sheet.

Attachments (list documents supporting change):

Attachment A - Bid Tab from IWS

CHANGE IN CONTRACT PRICE:

Original Contract Price:

\$2,377,900.00

Increase/Decrease from previously approved Change Orders No. 0 to No. 0:

\$ _____

Contract Price prior to this Change Order:

\$2,377,900.00

Increase of this Change Order:

\$387,814.00

Contract Price incorporating this Change Order:

\$2,765,714.00

CHANGE IN CONTRACT TIMES:

Original Contract Times: ☐ Working days ☒ Calendar days

Substantial completion (days or date): November 1, 2021

Ready for final payment (days or date): December 31, 2021

Increase/Decrease from previously approved Change Orders
No. 0 to No. 0:

Substantial completion (days): _____

Ready for final payment (days): _____

Contract Times prior to this Change Order:

Substantial completion (days or date): November 1, 2021

Ready for final payment (days or date): December 31, 2021

Increase of this Change Order:

Substantial completion (days or date): March 3, 2022

Ready for final payment (days or date): March 10, 2022

Contract Times with all approved Change Orders:

Substantial completion (days or date): March 3, 2022

Ready for final payment (days or date): March 10, 2022

RECOMMENDED:

By: David M. [Signature]
Engineer (Authorized Signature)

Date: 11/30/2021
Approved by Funding Agency (if applicable):

ACCEPTED:

By: _____
Owner (Authorized Signature)

Date: _____

ACCEPTED:

By: Greg Dills DN: C=US,
E=gdills@integratedwaterservices.com,
O=IWS, OU=IWS, CN=Greg Dills
Date: 2021.12.01 07:42:13-07'00'

Contractor (Authorized Signature)

Date: _____

Date: _____

ATTACHMENT A

BID SHEET, BID FORM, BASE SCHEDULE

PROJECT: H-WELL PIPELINE
TOWN OF FIRESTONE, CO
11/12/2021

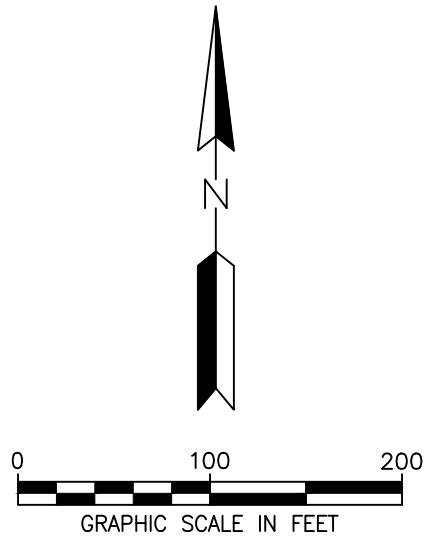
Item No.	Description	Unit	Estimated Quantity	Unit Price (Figures)	Unit Price (Written)	Bid Amount (Figures)
1	Mobilization/Demobilization (5% maximum)	LS	LS	\$17,557	Seventeen thousand five hundred fifty seven dollars	\$17,557
2	Sedimentation Control	LS	LS	\$12,582	Twelve thousand five hundred eighty two dollars	\$12,582
3	Utility Locates	LS	LS	\$2,048	Two thousand forty eight dollars	\$2,048
4	Topsoil Stripping, Stockpiling, and Replacement	SY	6000	\$4.27	Four dollars twenty seven cents	\$25,597
5	8-in MJ Plug	EA	1	\$307	Three hundred seven dollars	\$307
6	Install 8-in DR-18 C-900 Pipe (pipe supplied by Town)	LF	1710	\$112	One hundred twelve dollars	\$190,920
7	8-in MJ Gate Valve w/ Mega Lug	EA	3	\$2,919	Two thousand nine hundred nineteen dollars	\$8,758
8	4-in Mega Lug @ Tie-into V-Wells	EA	3	\$87	Eighty seven dollars	\$261
9	8-in 90 Degree Restrained Joint Bend	EA	2	\$885	Eight hundred eighty five dollars	\$1,770
10	8" x 8" MJ x MJ Tee	EA	3	\$2,663	Two thousand six hundred sixty three dollars	\$7,990
11	8" x 4" MJ Reducer	EA	3	\$744	Seven hundred forty four dollars	\$2,231
12	4-in MJ Restrained Joint Gate Valve	EA	3	\$1,233	One thousand two hundred thirty three dollars	\$3,699
13	Install 4-in DR-18 C-900 Pipe (pipe supplied by Town)	LF	430	\$99	Ninety nine dollars	\$42,608
14	4-in MJ 45 degree bend (restrained joint)	EA	2	\$237	Two hundred thirty seven dollars	\$474
15	4-in MJ 90 degree bend (retrained joint)	EA	1	\$1,453	One thousand four hundred fifty three dollars	\$1,453
16	Clay Cut-Off Wall (cut into trench wall)	EA	2	\$1,355	One thousand three hundred fifty five dollars	\$2,709
17	5' Dia Meter MH	EA	1	\$11,010	Eleven thousand ten dollars	\$11,010
19	8" Flow Meter	EA	1	\$5,894	Five thousand eight hundred ninety four dollars	\$5,894
19	20" x 8" MJ Restrained Joint Reducer	EA	1	\$5,102	Five thousand one hundred two dollars	\$5,102
20	Furnish and Install 20-in C-900 Pipe	LF	25	\$641	Six hundred forty one dollars	\$16,034
21	Fire Hydrant Assembly (paint purple)	EA	2	\$4,119	Four thousand one hundred nineteen dollars	\$8,239
22	Pipeline Markers	EA	6	\$622	Six hundred twenty two dollars	\$3,734
23	Flushing and Hydrostatic Testing	LS	LS	\$5,284	Five thousand two hundred eighty four dollars	\$5,284
24	Site Restoration and Reveg	LS	LS	\$11,552	Eleven thousand five hundred fifty two dollars	\$11,552

\$0
Total Base Bid \$ \$387,814

Total Bid (Written) Three hundred eighty seven thousand eight hundred fourteen dollars

10/7/2021 8:45:45 AM

Z:\27701472\dwg\DESIGN\CADD\3 Plansheets\C-101 OVERALL SITE PLAN.dwg



now part of



4025 AUTOMATION WAY, BLDG E
FORT COLLINS, CO 80525
PHONE: 970-223-4705
FAX: 970-223-4706
WWW.WENCK.COM

PRIMARY CONSULTANT:

acuity, llc

CLIENT:



FIRESTONE HORIZONTAL WELL PROJECT CITY OF FIRESTONE WELD COUNTY, COLORADO

PROJECT TITLE

ISSUE NO.:

1

DESCRIPTION:
PRELIMINARY DESIGN

DATE:
10/7/2021

CERTIFICATION:

I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE BOARD OF THE STATE OF COLORADO.

LICENSE NO.:

DATE:

PROJECT NO.: 227701472

DWN BY: SAG

CHK'D BY: KO

APP'D BY: PAKM

ISSUE DATE: 10/07/2021

ISSUE NO.: 1

SHEET TITLE:
OVERALL SITE MAP

SHEET NO.:

C-101

AGENDA INFORMATION MEMORANDUM

FIRESTONE TOWN BOARD OF TRUSTEES



AIM#: 8.f

Discussion/Action

Meeting Date: December 8, 2021

Initiated By: Dave Lindsay

Dept: Public Works

AGENDA TITLE

Resolution 21-210: A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO, APPROVING AN AGREEMENT BETWEEN THE TOWN OF FIRESTONE AND LAYNE CHRISTENSEN COMPANY FOR EXISTING WELL MODIFICATIONS FOR THE ST. VRAIN WATER TREATMENT PLANT PROJECT

SUMMARY

This is a construction contract that will abandon some existing test wells we permitted through the State, make surface modifications to some of the monitoring wells we have permitted through the State, and will modify our three FAST Vertical Alluvial Wells to add underground meter vaults. We invited three well construction companies to bid on the work. We received two bids and one bidder declined due to workload. The two bids we received were within \$5,000 of each other (5%). As part of the bidding documents, we asked the contractors to tell us when they could complete the modifications to the FAST Vertical Wells because of an urgency to have this done as soon as possible. The apparent low bidder indicated they could not complete the FAST V-Well work until March, which is too late for us to complete that work. The second bidder, Layne Christensen Company, is able to complete the work by the end of January, within our required timeframe. Layne has worked for the Town previously, installing the pumps and control systems for the three FAST V-Wells, and is eminently qualified to perform the work.

HISTORY AND PREVIOUS BOARD ACTION

On August 11, 2021, the Board of Trustees approved Resolution 21-92, approving a design services contract with McGrane Water Engineers. The scope of services of that contract included working with the State to modify some of the Town's well permits and to abandon some others.

RECOMMENDATION

Staff recommends the Board of Trustees approve the attached resolution awarding construction contract W2021-9541.02 for 2022 Existing Well Modifications to Layne Christensen Company for an amount not to exceed \$109,220.00, and authorize the Mayor to execute the contract on behalf of the Town.

ALTERNATIVES

NA

ATTACHMENTS

1. 21-210 Layne Christensen CO FAST Res
2. W2021-9541.02 Layne Construction Contract (2021.12.03)
3. Bid Tabulation

FINANCIAL CONSIDERATIONS

This project is included in the 2022 Budget and will be paid from the Water Fund.

RESOLUTION NO. 21-210

**A RESOLUTION OF THE BOARD OF TRUSTEES OF THE TOWN OF
FIRESTONE, COLORADO, APPROVING AN AGREEMENT BETWEEN THE
TOWN OF FIRESTONE AND LAYNE CHRISTENSEN COMPANY FOR
EXISTING WELL MODIFICATIONS FOR THE ST. VRAIN WATER
TREATMENT PLANT PROJECT**

WHEREAS, the Town of Firestone ("Town") is in need of construction services for the St. Vrain Water Treatment Plant Project ("Project") to abandon some existing test wells, make surface modifications to certain monitoring wells and to modify the three Firestone Alluvial Supply Treatment ("FAST") wells to add underground meter vaults; and

WHEREAS, the Town requested bids from three qualified contractors and received two responses which as to cost were within five per cent however the low bidder was not able to complete the work within the Town's timeline; and

WHEREAS, staff thus recommends that the Town select Layne Christensen Company who is qualified, can complete the work within the Town's timeframe and having previously installed the pumps and control systems for the three FAST V-Wells is familiar with the Project.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF TRUSTEES OF THE TOWN OF FIRESTONE, COLORADO:

The Agreement between the Town of Firestone and Layne Christensen Company for existing well modifications for the St. Vrain Water Treatment Plant Project is approved in substantially the same form as the copy attached hereto and made a part of this resolution and the Mayor is authorized to execute the Agreement on behalf of the Town.

INTRODUCED, READ AND ADOPTED this ___ day of _____, 2021.

TOWN OF FIRESTONE, COLORADO

Bobbi Sindelar, Mayor

ATTEST:

APPROVED AS TO FORM:

Jessica Koenig, CMC, Town Clerk

William P. Hayashi, Town Attorney

CONSTRUCTION CONTRACT

THIS CONSTRUCTION CONTRACT (the "Construction Contract" or "Agreement") is made and entered into this ____ day of _____, 2021 (the "Effective Date"), by and between the **TOWN OF FIRESTONE**, a Colorado municipal corporation with an address of 9950 Park Avenue, P.O. Box 100, Firestone, Colorado 80504 (the "Town" or the "Owner"), and **LAYNE CHRISTENSEN COMPANY** an independent contractor with a principal place of business at 9303 New Trails Drive, Suite 200, The Woodlands, TX 77381 ("Contractor") (each a "Party" and collectively the "Parties").

WHEREAS, the Town requires services; and

WHEREAS, Contractor has held itself out to the Town as having the requisite expertise and experience to perform the required services.

NOW THEREFORE, for the consideration hereinafter set forth, the receipt and sufficiency of which are hereby acknowledged, the Parties agree as follows:

I. SCOPE OF WORK

A. Contractor shall complete all Work and perform all Services which are described or reasonably implied from the Scope of Work set forth in Exhibit A and the Contract Documents, attached hereto and incorporated herein by this reference and known as: **2022 Existing Well Modifications (W2021-9541.02)**

B. A change in the Scope of Work shall not be effective unless authorized as a written amendment to this Agreement or change order in accordance with the Contract Documents. If Contractor proceeds without such written authorization, Contractor shall be deemed to have waived any claim for additional compensation, including a claim based on the theory of unjust enrichment, quantum merit or implied contract. Except as expressly provided herein, no agent, employee, or representative of the Town is authorized to modify any term of this Agreement, either directly or implied by a course of action.

C. Within 10 days of the Effective Contract Date, Contractor shall provide the performance bond and labor & material payment bond and certificate of insurance required by the contract Documents.

II. DESIGN PROFESSIONAL

This Project has been designed by: McGrane Water Engineering, LLC,

who is hereinafter called DESIGN PROFESSIONAL and who is to act as FIRESTONE's representative, assume all duties and responsibilities and have the rights and authority assigned to DESIGN PROFESSIONAL in the Contract Documents in connection with completion of the Work in accordance with the Contract Documents.

III. CONTRACT TIMES; COMMENCEMENT AND COMPLETION OF WORK

A. The Work shall be substantially completed by **March 1, 2022**, and shall continue until Contractor completes the Scope of Services to the satisfaction of the Town, or until terminated as provided herein.

B. Either Party may terminate this Agreement upon 30 days advance written notice. The Town shall pay Contractor for all work previously authorized and completed prior to the date of termination. If, however, Contractor has substantially or materially breached this Agreement, the Town shall have any remedy or right of set-off available at law and equity.

C. Should a delay in completion constitute a compensable inconvenience to the Town and its residents, the liquidated damages established in this Section shall be enforced. Such damages are not a penalty, the parties recognize the delays, expense and difficulties involved in proving the actual loss suffered by the Town if the Work is not completed on time. For each day that all or a portion of the Work is delayed beyond the deadlines set forth in Section III hereof, plus any extensions thereof allowed, the Contractor shall be assessed the amount of two hundred fifty dollars (\$250) each day until the Work is complete.

IV. COMPENSATION

In consideration for the completion of the Work by Contractor, the Town shall pay Contractor, subject to all of the terms and conditions of the Contract Documents, an amount not to exceed **\$109,220.00** (the "Contract Price"). The Contract Price shall include all fees, costs and expenses incurred by Contractor, and no additional amounts shall be paid by the Town for such fees, costs and expenses.

V. PAYMENT PROCEDURES

Contractor may submit Applications for Payment for completed work per the UNIT-PRICE BID FORM or the LUMP-SUM BID FORM. Contractor may submit periodic invoices, which shall be paid by the Town within 30 days of receipt.

VI. RESPONSIBILITY

A. Contractor hereby warrants that it is qualified to assume the responsibilities and render the services described herein and has all requisite corporate authority and licenses in good standing, required by law.

B. The Work performed by Contractor shall be in accordance with generally accepted practices and the level of competency presently maintained by other practicing contractors in the same or similar type of work in the applicable community.

C. The Work performed by Contractor hereunder shall be done in compliance with applicable laws, ordinances, rules and regulations, including the Keep Jobs in Colorado Act, C.R.S. 8-17-101, et seq.

(the "Act") and the rules adopted by the Division of Labor of the Colorado Department of Labor and Employment implementing the Act (the "Rules").

D. The Town's review, approval or acceptance of, or payment for any completed Work shall not be construed to operate as a waiver of any rights under this Construction Contract or of any cause of action arising out of the performance of this Construction Contract.

E. Contractor hereby warrants to the Town that all materials and equipment used in the Work, and made a part of the Work, or placed permanently in the Work, shall be new unless otherwise specified in the Contract Documents. Contractor further warrants that all equipment and materials shall be of good quality, conform to the requirements of the Contract Documents and will be free from defects. All Work, materials, or equipment not conforming to the Contract Documents shall be considered defective.

F. The Contractor shall warrant and guarantee all materials and equipment furnished under the Contract and all Work performed for one year after the date of Substantial Completion. Under this warranty, Contractor agrees to repair or replace, at its own expense, any Work that is found to be defective. The expiration of the warranty period shall in no way limit the Town's legal or equitable remedies, or the period in which such remedies may be asserted, for work negligently or defectively performed.

VII. OWNERSHIP

Any materials, items, and work specified in the Scope of Work, and any and all related documentation and materials provided or developed by Contractor shall be exclusively owned by the Town. Contractor expressly acknowledges and agrees that all work performed under the Scope of Work constitutes a "work made for hire." To the extent, if at all, that it does not constitute a "work made for hire," Contractor hereby transfers, sells, and assigns to the Town all of its right, title, and interest in such work. The Town may, with respect to all or any portion of such work, use, publish, display, reproduce, distribute, destroy, alter, retouch, modify, adapt, translate, or change such work without providing notice to or receiving consent from Contractor.

VIII. INDEPENDENT CONTRACTOR

Contractor is an independent contractor. Notwithstanding any other provision of this Construction Contract, all personnel assigned by Contractor to perform work under the terms of this Construction Contract shall be, and remain at all times, employees or agents of Contractor for all purposes. Contractor shall make no representation that it is a Town employee for any purposes.

IX. INSURANCE

A. Contractor agrees to procure and maintain, at its own cost, a policy or policies of insurance sufficient to insure against all liability, claims, demands, and other obligations assumed by Contractor pursuant to this Construction Contract. At a minimum, Contractor shall procure and maintain, and shall cause

any subcontractor to procure and maintain, the insurance coverages listed below, with forms and insurers acceptable to the Town.

1. Worker's Compensation insurance as required by law.
2. Commercial General Liability insurance with minimum combined single limits of \$1,000,000 each occurrence and \$2,000,000 general aggregate. The policy shall be applicable to all premises and operations, and shall include coverage for bodily injury, broad form property damage, personal injury (including coverage for contractual and employee acts), blanket contractual, products, and completed operations. The policy shall contain a severability of interests provision, and shall include the Town and the Town's officers, employees, and contractors as additional insureds. No additional insured endorsement shall contain any exclusion for bodily injury or property damage arising from completed operations.

B. Such insurance shall be in addition to any other insurance requirements imposed by law. The coverages afforded under the policies shall not be canceled, terminated or materially changed without at least 30 days prior written notice to the Town. In the case of any claims-made policy, the necessary retroactive dates and extended reporting periods shall be procured to maintain such continuous coverage. Any insurance carried by the Town, its officers, its employees, or its contractors shall be excess and not contributory insurance to that provided by Contractor. Contractor shall be solely responsible for any deductible losses under any policy.

C. Contractor shall provide to the Town a certificate of insurance as evidence that the required policies are in full force and effect. The certificate shall identify this Construction Contract.

X. INDEMNIFICATION

Contractor agrees to indemnify and hold harmless the Town and its officers, insurers, volunteers, representative, agents, employees, heirs and assigns from and against all claims, liability, damages, losses, expenses and demands, including attorney fees, on account of injury, loss, or damage, including without limitation claims arising from bodily injury, personal injury, sickness, disease, death, property loss or damage, or any other loss of any kind whatsoever, which arise out of or are in any manner connected with this Construction Contract if such injury, loss, or damage is caused in whole or in part by, the act, omission, error, professional error, mistake, negligence, or other fault of Contractor, any subcontractor of Contractor, or any officer, employee, representative, or agent of Contractor, or which arise out of a worker's compensation claim of any employee of Contractor or of any employee of any subcontractor of Contractor.

XI. WORKERS WITHOUT AUTHORIZATION

A. Certification. By entering into this Construction Contract, Contractor hereby certifies that, at the time of this certification, it does not knowingly employ or contract with a worker without authorization who will perform work under this Construction Contract and that Contractor will participate in either the E-Verify

Program administered by the U.S. Department of Homeland Security and Social Security Administration or the Department Program administered by the Colorado Department of Labor and Employment to confirm the employment eligibility of all employees who are newly hired to perform work under this Construction Contract.

B. Prohibited Acts. Contractor shall not knowingly employ or contract with a worker without authorization to perform work under this Construction Contract, or enter into a contract with a subcontractor that fails to certify to Contractor that the subcontractor shall not knowingly employ or contract with a worker without authorization to perform work under this Construction Contract.

C. Verification.

1. If Contractor has employees, Contractor has confirmed the employment eligibility of all employees who are newly hired to perform work under this Construction Contract through participation in either the E-Verify Program or the Department Program.

2. Contractor shall not use the E-Verify Program or Department Program procedures to undertake pre-employment screening of job applicants while this Construction Contract is being performed.

3. If Contractor obtains actual knowledge that a subcontractor performing work under this Construction Contract knowingly employs or contracts with a worker without authorization who is performing work under this Construction Contract, Contractor shall: notify the subcontractor and the Town within 3 days that Contractor has actual knowledge that the subcontractor is employing or contracting with a worker without authorization who is performing work under this Construction Contract; and terminate the subcontract with the subcontractor if within 3 days of receiving the notice required pursuant to subsection 1 hereof, the subcontractor does not stop employing or contracting with the worker without authorization who is performing work under this Construction Contract; except that Contractor shall not terminate the subcontract if during such 3 days the subcontractor provides information to establish that the subcontractor has not knowingly employed or contracted with a worker without authorization who is performing work under this Construction Contract.

D. Duty to Comply with Investigations. Contractor shall comply with any reasonable request by the Colorado Department of Labor and Employment made in the course of an investigation conducted pursuant to C.R.S. § 8-17.5-102(5)(a) to ensure that Contractor is complying with the terms of this Section XI.

E. Affidavits. If Contractor does not have employees, Contractor shall sign the "No Employee Affidavit" attached hereto. If Contractor wishes to verify the lawful presence of newly hired employees who perform work under the Construction Contract via the Department Program, Contractor shall sign the "Department Program Affidavit" attached hereto.

XII. CONTRACT DOCUMENTS

The Contract Documents, which comprise the entire agreement between the Town and Contractor concerning the Scope of Services, consist of the following:

- A. Exhibit to this Construction Contract:
 - 1. Exhibit A: Scope of Work
 - 2. Exhibit B: Completed Bid Form (attached)
- B. Addenda numbers:
 - 1. Addenda #1

There are no Contract Documents other than those listed above in this Section XII.

XIII. MISCELLANEOUS

A. Governing Law and Venue. This Construction Contract shall be governed by the laws of the State of Colorado, and any legal action concerning the provisions hereof shall be brought in Weld County, Colorado.

B. No Waiver. Delays in enforcement or the waiver of any one or more defaults or breaches of this Construction Contract by the Town shall not constitute a waiver of any of the other terms or obligation of this Construction Contract.

C. Integration. This Construction Contract and any attached exhibits constitutes the entire agreement between the Parties, superseding all prior oral or written communications.

D. Third Parties. There are no intended third-party beneficiaries to this Construction Contract.

E. Notice. Any notice under this Construction Contract shall be in writing, and shall be deemed sufficient when directly presented or sent pre-paid, first class U.S. Mail to the Party at the address set forth on the first page of this Agreement.

F. Severability. If any provision of this Construction Contract is found by a court of competent jurisdiction to be unlawful or unenforceable for any reason, the remaining provisions hereof shall remain in full force and effect.

G. Modification. This Construction Contract may only be modified upon written agreement of the Parties.

H. Assignment. Neither this Construction Contract nor any of the rights or obligations of the Parties shall be assigned by either Party without the written consent of the other.

I. Governmental Immunity. The Town and its officers, attorneys and employees, are relying on, and do not waive or intend to waive by any provision of this Agreement, the monetary limitations or any other rights, immunities, and protections provided by the Colorado Governmental Immunity Act, C.R.S. § 24-10-101, *et seq.*, as amended, or otherwise available to the Town and its officers, attorneys or employees.

J. Rights and Remedies. The rights and remedies of the Town under this Construction Contract are in addition to any other rights and remedies provided by law. The expiration of this Construction Contract shall in no way limit the Town's legal or equitable remedies, or the period in which such remedies may be asserted, for work negligently or defectively performed.

K. Subject to Annual Appropriation. Consistent with Article X, § 20 of the Colorado Constitution, any financial obligation of the Town not performed during the current fiscal year is subject to annual appropriation, shall extend only to monies currently appropriated, and shall not constitute a mandatory charge, requirement, debt or liability beyond the current fiscal year.

IN WITNESS WHEREOF, the Parties have executed this Construction Contract as of the Effective Date.

TOWN OF FIRESTONE, COLORADO

Print Name : Bobbi Sindelar

Title : Mayor

ATTEST:

Town Clerk: Jessica Koenig

LAYNE CHRISTENSEN COMPANY

By: _____

Print Name : _____

Title : _____

STATE OF _____)

) ss.

COUNTY OF _____)

The foregoing instrument was subscribed, sworn to and acknowledged before me this ____ day of _____, 2021, by _____ as _____ of _____.

My commission expires:

(SEAL)

Notary Public

DEPARTMENT PROGRAM AFFIDAVIT

To be completed only if Contractor participates in the Department of Labor Lawful Presence Verification Program

I, _____, as a public contractor under contract with the Town of Firestone (the "Town"), hereby affirm that:

1. I have examined or will examine the legal work status of all employees who are newly hired for employment to perform work under this public contract for services ("Agreement") with the Town within 20 days after such hiring date;

2. I have retained or will retain file copies of all documents required by 8 U.S.C. § 1324a, which verify the employment eligibility and identity of newly hired employees who perform work under this Agreement; and

3. I have not and will not alter or falsify the identification documents for my newly hired employees who perform work under this Agreement.

Signature

Date

STATE OF COLORADO)

) ss.

COUNTY OF _____)

The foregoing instrument was subscribed, sworn to and acknowledged before me this ____ day of _____, 2021, by _____ as _____ of _____.

My commission expires:

(S E A L)

Notary Public

EXHIBIT A
Scope of Work by McGrane Water Engineers
(22 pages)

SCOPE OF WORK

The project consists of three tasks described below.

TASK 1 – INSTALL PITLESS ADAPTERS AND MANHOLE METER VAULTS

1.1 Objective

Three production wells (referred to as, “West”, “Middle”, and “East”) were installed at the FAST site as shown on **Figure 2**. The objective of this task is to move the existing well head piping and flow meters below ground into 5-ft diameter concrete manhole meter vaults. A second pipeline contractor will connect to the stubbed 4-in discharge outside the manhole.

1.2 Existing Equipment

At each well site there is an existing above-ground discharge header that consists of from upstream to downstream:

- 4-in diameter 90 degree elbow
- 0.75 ft long 4” diameter spool;
- 1.5 ft long 4” diameter spool;
- 13 in long 4” diameter flow meter (McCrometer UltraMag);*
- 1 ft long 4” flanged spool;*
- 4-in wide 4” butterfly valve*; and
- 6-in long 4” flanged spool.

The items with asterisks (*) will be reused in the underground configuration. Other on-site equipment that will be reused includes:

- Support stand*;
- Metal conduit with wiring from the VFD to the flow meter*

Submittals for the above electronics are available upon request. A picture of the West Well discharge header is shown below:

West Well Photograph

McGrane Water Engineering, LLC
1669 Apple Valley Rd., Lyons, CO 80301. Website: www.mcgranewaterengineering.com



1.3 New Equipment and Materials

- A. Hanging Pitless Adapter (Owner Provided)
 - i. Manufactured by Mass
 - ii. 4-in “hanging” style with NPT threads
- B. Pipe: Schedule 40 steel pipe with 100 psi flanges.
- C. New Discharge Piping (Figure 8) will include:
 - i. A 5 ft spool with a threaded end to install into a hanging pitless adapter and a flanged end to connect to the check valve inside manhole.
 - ii. Check valve (w/ 100 psi flanges); and
 - iii. A 3 ft long flanged spool with a plain end with MJ plug.
- D. Epoxy paint: Green
- E. Five foot diameter standard concrete manhole (7 ft high) with steps, floor and cast iron lid
- F. Sealants:
 - i. Between lid, vault sections and floor: Butyl polymer joint sealant.

- ii. Waterproofing over sealed joints: Polymer-modified concrete repair mortar (Specchem Specpatch-30 or equivalent)
- G. Approximately 5-10 feet of metal electrical conduit to house flow meter power and 4-20 output cable between the VFD and flow meter within concrete manhole.
- H. **Submittals** for all new materials used in this section shall be submitted to the Engineer for review and approval prior to ordering.

1.4 Execution

The pump will be removed and installed by a Colorado licensed pump installer. Tasks include:

- A. Remove wellhead cover and upper 7 ft “pup” joint and discard;
- B. The pipe and vault excavation will be dug to a depth of seven feet;
- C. The pitless will be installed (facing north unless directed otherwise) according to manufactures recommendation at a burial depth of 5 ft. below ground surface;
- D. The hanging pitless will be screwed onto the top of the remaining drop pipe; lowered back in the well and engaged in the hanging device;
- E. The vault will be installed as shown in Figure 9 with 6-inches of ¾-in crushed rock below the vault floor;
- F. The cover, sections, and floor vault sections will be sealed with approved sealant;
- G. The sealed sections will be waterproofed with approved waterproofing sealant;
- H. Piping will be installed in the sequence shown on Figures 8 and 9 on the support stand;
- I. All piping within the vault (except the flow meter) will be painted with primer and green epoxy paint;
- J. The electric conduit will be extended (approximately 5 to 10 ft) from the variable speed drive into the vault and the cord will be connected (and extended if necessary);
- K. All holes in the manhole will be sealed with approved sealant;
- L. Conduct Startup (see below);
- M. Disinfect well according to State standards; and
- N. Place soil in 2 ft lifts around the excavation and compact with a sheep’s foot compactor

1.5 Startup

The Contractor is responsible for notifying the Engineer 48 hours in advance of setting the pump and initiating any start-up. The Contractor will start the equipment before and after the installation to confirm the equipment is operating within its expected range of production and power parameters, the Contractor will notify the Engineer immediately.

- A. Contractor Made Resistance Readings: Resistance readings shall be taken on the motor with pigtail and motor with drop cable attached.
- B. Start-up Data: The pump contractor shall measure and record for submission to the Engineer in the project O&M manuals the following data determined at the start-up of the pump.
 - i. Line-to-Line ohms, all phases
 - ii. Line-to-Ground meg ohms, all phases
 - iii. No Load Volts
 - iv. Static Water Level
 - v. GPM Flow Rate
 - vi. Pumping Water Level
 - vii. Running Amps
 - viii. Running Volts
- C. The Contractor will notify the Engineer if any equipment is not working within its normal range of operational parameters before proceeding with pulling the pumps.

TASK 2 – WELL ABANDONMENTS

2.1 Background

- A. The contractor will abandon eight existing wells at five sites shown on **Figure 1**.
- B. MWE is acting as the Town's representative and will submit all abandonment forms to the State.
- C. Five of the monitoring wells have 4-in square protective steel surface casings; two monitoring wells have flush mount monitoring well covers; test well GTW-1 has a round 8-in surface casing; and an old domestic well (permit no. 154183-F) has 4-in round steel casing extending above the ground surface.

McGrane Water Engineering, LLC

1669 Apple Valley Rd., Lyons, CO 80301. Website: www.mcgranewaterengineering.com

- D. The Contractor will provide the following information to MWE to complete the abandonment form (GWS-09) including:
- i. Section 9 - Intervals of casing removed; and
 - ii. Section 10 - Amount and type of material used and method of placement.
- E. **Appendix A** includes forms GWS-09 and the guidelines GWS-09A. Section 16.1 states:
- “16.1 Abandonment of Wells or Boreholes in Type II (unconfined bedrock aquifers) and Type III Aquifers (unconsolidated aquifers) -** Wells completed into unconfined bedrock aquifers and unconsolidated aquifers must be plugged, sealed, and abandoned by filling the well to the static water level with clean sand or clean gravel. Between the static water level and the ground surface, the borehole must be filled with clean native clays, cement, drill cuttings, or high solid bentonite grout to the ground surface. The uppermost five (5) feet of casing must be filled with grout or a permanent watertight cover must be installed at the top of the casing. If casing is removed, the hole must be filled as described above to within five (5) feet of the ground surface. The top five (5) feet of the hole must be filled with materials that are not more permeable than the surrounding soils that are adequately compacted to prevent settling.”
- F. Since all the wells except G-TW-1 are under 4-inches in diameter and are wells average approximately 38 feet in depth, those wells will be bid at a common unit rate.
- G. Test well G-TW1 has a 3-hp 4-in diameter pump installed that will be pulled and relinquished to the Engineer. A separate bid is included for the task work described in section 2.2B below.
- H. **Table 1** includes: the location; map figure (**Figs 2 – 6**); MH permit number, Owner’s designation, UTM location, depth, surface casing diameter and length, well diameter, screened interval and static water level when drilled.

Table 1 - Well Abandonment Details											
Location	Project Map	Owner's Designation	Permit No.	UTM E	UTM N	Depth	Surface Casing	Borehole Diameter (in)	Well Diameter (in)	Screen Int	SWL (ft)
Firestone Trail	Figure 5	FT-1 (4-in)	56575-MH	506550	4447170	53	4" x 4" steel (5')	9	4	30-50	24.5
	Figure 5	FT-2	56575-MH	506266	4446655	48	Flush	9	1.5	38-48	35
Sable Glen	Figure 6	Sable Glen (4-in)	56484-MH	504258	4444227	36	4" x 4" steel (5')	9	4	13-33	9
Vogel	Figure 5	Vogel (4-in)	56575-MH	506514	4445900	38	4" x 4" steel (5')	9	4	11-35	9
FAST	Figure 2	G-MW-1	057372-MH	505006	4447664	25	4" x 4" steel (5')	9	2	12-22	6.1
	Figure 2	G-TW-1	057372-MH	504991	4447664	28	8" round steel	9	6	15-25	7
	Figure 2	Dom. Well	#154183-F	505000	4447275	35	4" round steel	Unk	4	Unk	~9
Mountain Shadows Park	Figure 4	Flush MW near 20-in	57371-MH	504264	4446112	37	Flush	9	2	17-37	9

2.2 Execution

A. All wells will be abandoned according to State Standards. In general, abandonments include:

- i. Removing protective surface casing;
- ii. Cutting the well casing approximately 1 ft below ground surface;
- iii. Filling the well with sand to the water table;
- iv. Filling the remaining well with native clay or bentonite;
- v. Leveling the site;
- vi. Disposing of all casing and cement removed; and
- vii. Providing MWE information to complete the abandonment forms (GWS-09)

B. A separate bid item is provided for abandoning Test well G-TW-1 located on the northwest corner of the FAST site (**Figure 2**). The Contractor will notify the Engineer 24-hours in advance so the Engineer can notify the adjacent property owner (Garret Varra) where the well electrical is connect. The wellhead is shown in the picture below:



C. The Contractor will:

- i. Disconnect the power from the pole on the Varra property (~ 250 feet north);
- ii. Remove the buried cable between the power pole and the well, and wind and leave onsite. This may be done by pulling it out with a pickup truck. Once the cable is removed, the disturbed area will be leveled.
- iii. Remove the existing 5 hp pump set at a depth of approximately 20 ft.
- iv. Abandon the well according to State Standards; and
- v. Leave the pump, drop pipe, well cap, wellhead controls, and cable next to the well site for the Town to reuse.
- vi. If salvageable, the protective surface casing can be used for the wellhead improvements at MS-TW2 (see Task 3 below).

TASK 3 – WELLHEAD IMPROVEMENTS

3.1 Background

McGrane Water Engineering, LLC

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Task 3 involves replacing (or repairing if acceptable) existing 2'x 2' wellhead concrete well pads around fifteen wells with 4'x4' pads to meet State Standards. Two flush mounted wells (MS-MW2 and PS-MW-1) also need a small amount of cement added to the wellhead annulus. One existing production well (MS-TW2), which is permitted as a monitoring well, needs to have a protective 8-in diameter surface casing installed with locking cap. **Table 2** includes the UTM location, MH permit number, owner's designation and short description of the Contractor work that needs to be performed. The wells are located on **Figures 2 – 6**. Additional information is provided below. The Contractor is requested to arrange a site meeting if this information is inadequate to provide a confident bid. Since the work is repetitive, the bids will be received on a lump sum basis

Table 2 - Test Hole Permit Upgrades to Monitoring Wells					
Location	MH Permit No.	Owner's Designation	UTM E	UTM N	Necessary Work
FAST site (Figure 2)	057372-MH	G-MW-2	504983	4447494	Replace concrete pad
	058164-MH	G-MW-3	505081	4447665	Replace concrete pad
	058164-MH	G-MW-4	505033	4447580	Replace concrete pad
	058164-MH	G-MW-5	505072	4447485	Replace concrete pad
	058164-MH	G-MW-6	504966	4447650	Replace concrete pad
	60404-MH	G-MW-7	505268	4447633	Replace concrete pad
	60404-MH	G-MW-8	505145	4447376	Replace concrete pad
	60404-MH	G-MW-9	504974	4447284	Replace concrete pad
Pelican Shores (Figure 2)	58165-MH	PS-MW1 (W)	504942	4447643	Cement inner annulus; Expand concrete pad
	58165-MH	PS-MW2 (E)	504909	4447664	Replace concrete pad
Mountain Shadows Park (Figure 4)	307607-MH	MS-TW2	504182	4446031	Install 8-in well casing over 6-in well and install 4' x 4' pad
	56483-MH	MS-TW1\PA-10	504269	4446110	Replace Concrete Pad
	57371-MH	MS-MW2/TH3 (flush)	504271	4446209	Cement inner annulus; replace concrete pad
Varra Property (Figure 3)	057372-MH	V-MW1	505442	4447961	Replace concrete pad
		V-TW-1 (4-in)	505427	4447958	Replace concrete pad

3.2 Upgrade Concrete Pads

All fourteen wells have 2' x 2' concrete pads that need to be repaired or replaced with 4' x 4' x 4" thick concrete pads per State Standards. The method chosen needs to be approved by the Engineer prior to the work being completed.

3.3 Add concrete to Wells MS-MW2 and PS-MW-1 annuluses

At these two wells, we request the Contractor fill the well annulus with concrete to meet State Standards. Pictures of well PS-MW1 include:

Photos of PS-MW-1



Since the additional concrete is insignificant to the other wells with above-ground surface casing, we have not separated these two wells out on the bid sheet.

3.4 Mountain Shadows Monitoring Well MS-TW2



The Contractor will provide and install a 5 ft section of 8-in casing (with locking cover) over the existing 6-in diameter well (MW-TW2) and cement the lower 2 feet below ground. A separate lump sum bid for the surface casing is provided on the bid sheet. The surface casing removed from Well G-TW1 may be usable for this purpose (See Photo in Section 2.2.B).

A 4' x 4' concrete pad will be bid with the other wells as described in Section 3.3.

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MISCELLANIOUS ITEMS

Bid Items

The bid items are described on the bid form below. One hour of standby time and a unit cost for hourly rig work is requested and included in the bid total.

Agreement

The Contractor will contract directly with the Town of Firestone. This RFP and bid sheet below will be incorporated into the Town's Standard Contractor Agreement as an "Exhibit." A copy of the agreement is available upon request. No bonding is required.

Locates

The Drilling Contractor agrees to notify the Utility Notification Center of Colorado and clear the locations as your firm will be performing the digging and **will be responsible for any damage to buried utilities and your equipment** if underground utilities are encountered.

Work Schedule

Regular work hours are M-F 7 am to 5 pm unless otherwise approved by the Town. We anticipate it will take two weeks to complete the work.

Communication with the Engineer

The Contractor will notify Dennis McGrane (303) 917-1247 the day prior to each Task mobilization so that Mr. McGrane can observe the work being performed and can notify property owners at the Pelican Shores and the Varra properties. Prior to project close-out Mr. McGrane will inspect the work to determine if it was conducted according to the specifications. If not, the Engineer will prepare a punch list to be completed prior to final payment.

Coordination

The Engineer will provide the contact information for the pipeline contractor once it is determined. The Contractor will coordinate with the pipeline contractor (once identified) during Task 1 work so that both contractors are not scheduled to work at the FAST well vaults at the same time.

Payment

All work will occur at the unit rates provided in the bid sheet. A mobilization fee is provided for each tasks. The mobilization includes all costs to perform each task including mobilizing between wells. Payment details are included in the agreement with the Town.

Warranty

McGrane Water Engineering, LLC
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All of the equipment and labor furnished as part of these specifications will be guaranteed for a minimum of 12 months from the installation date.

Bid Date and Contracting Schedule

Please complete and execute the cost proposal below and email it to Dennis McGrane (dennis@mcgranewater.com) **by Tuesday, November 23, 2021 at 3:00 pm..** The Town will select a Contractor at their December 10th board meeting. We would like Task 1 (Install pitless adapter and meter vaults) to be completed before the pipeline contractor installs the water lines. The pipeline contract will also be awarded on December 8th so their schedule will be known prior to that time. The remaining work needs to be completed by February 28, 2022. Also please indicate the earliest date you can reasonably expect to complete Task 1 on the bid form. If you have any questions, please give us a call.

Sincerely,

MCGRANE WATER ENGINEERING, LLC.

A handwritten signature in blue ink that reads "Dennis McGrane". The signature is written in a cursive, flowing style.

Dennis McGrane, P.E., C.P.G.

Principal Engineer/Hydrogeologist

McGrane Water Engineering, LLC

1669 Apple Valley Rd., Lyons, CO 80301. Website: www.mcgranewaterengineering.com

BID FORM

Firestone - Miscellaneous Well Work						
Item	Amt.	Unit	Description	Unit Cost \$	Unit	Total Cost \$
Task 1 - Install Pitless Adapters and Buried Meter Vaults						
1	1	each	Mobilization (includes mobilization between 3 production wells and providing submittals as specified)	\$	each	\$
1.1	3	each	Remove pumping equipment and discard upper 7 foot long pump joint	\$	each	\$
1.2	1	LS	Excavate and fill for all work (including compaction)	\$	LS	
1.3	3	each	Install Pitless Adaptors (provided by Owner) at 5 ft burial	\$	each	\$
1.4	4	each	Reinstall pumps on hanging pitlesses using 7 ft less pipe	\$	each	\$
1.5	3	each	Provide and install manholes (with covers and stairs) and seal pipe and electrical access	\$	each	\$
1.6	3	each	Provide necessary piping as shown on Figures 7 and 8 (including compaction outside manholes)	\$	each	\$
1.7	3	each	Install all horizontal piping, check valves, and flow meters	\$	each	\$
1.8	3	each	Provide and install necessary electrical conduit between VFD and manholes	\$	each	\$
1.9	3	each	Record startup before and after pump pulls	\$	each	\$
Total \$ Task 1						\$
Task 2 - Well Abandonments						
2.0	1	LS	Mob/Demob to all eight wells described in Table 1 (includes providing a table of abandonment data to Engineer)	\$	LS	\$
2.1	7	each	Abandon wells per specifications	\$	each	\$
2.2	1	each	Abandon Well G-TW1 (includes: pulling pump, and disconnecting power and removing electrical cable to the power pole 250' away on the Varra property per specifications)	\$	each	\$
Total \$ Task 2						\$
Task 3 - Wellhead Improvements						
3.0	1	LS	Mob/Demob to all fourteen wells shown in Table 2.	\$	LS	\$
3.1	14	each	Upgrade existing concrete pads to 4' x 4' pads that meet State Standards. Two flush mount wells require additional cement in the well annulus	\$	each	\$
3.2	1	each	Provide and install an 8-in protective surface casing on Well MW-TW2 (Figure 4). The surface casing removed from G-TW1 may be adequate.	\$	each	\$
3.3	1	/hr	Standby Time	\$	/hr	\$
3.4	1	/hr	Hourly Rig Work	\$	/hr	\$
Total \$ Task 3						\$
Grand Total \$ (Tasks 1 - 3)						\$

CONTRACTOR BID AND ACKNOWLEDGEMENT

The Contractor acknowledges the above terms and conditions and is submitting the bid above in good faith based on the unit rates provided.

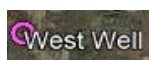
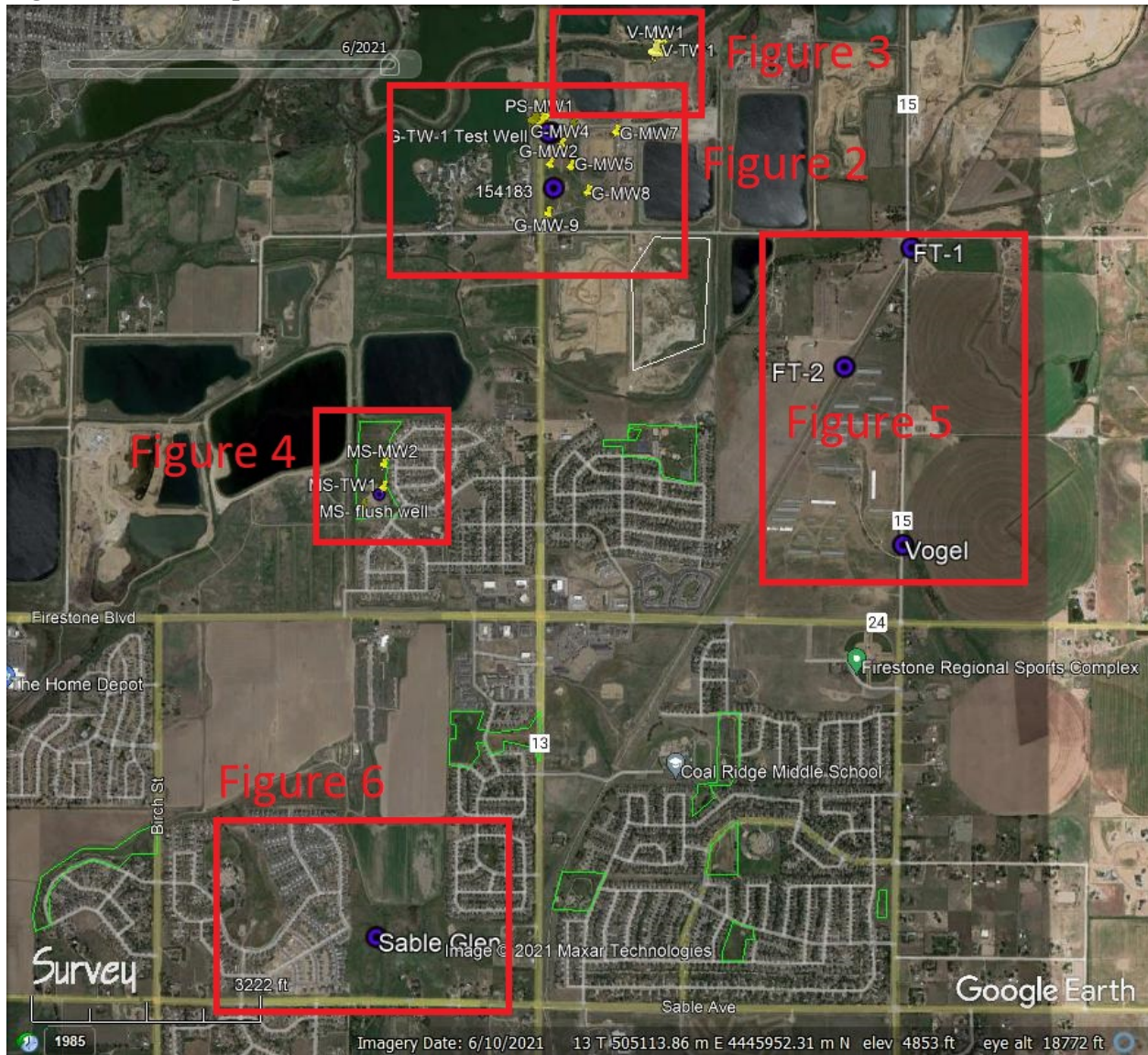
Contractor: _____ Date: _____

Contractor Signature _____ Date to complete Task 1: _____

Contractor Name (Printed) _____ Title: _____

FIGURES

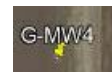
Figure 1 – Inset Map Locations



Meter Vault Installation



Well Abandonment

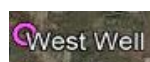


Wellhead Improvement

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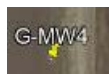
Figure 2 – FAST Site



Meter Vault Installation

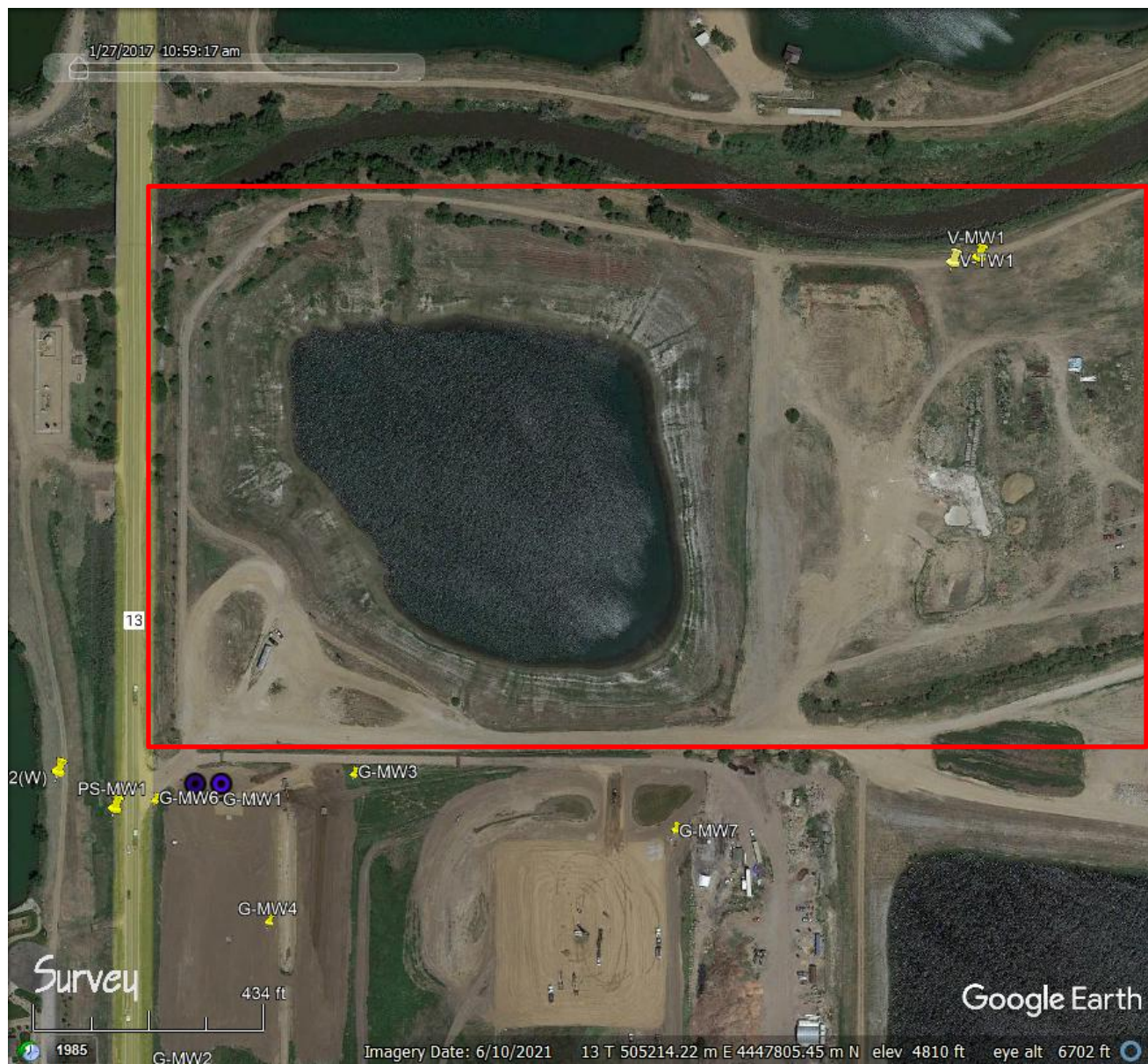


Well Abandonment

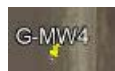


Wellhead Improvement

Figure 3 – Varra Site

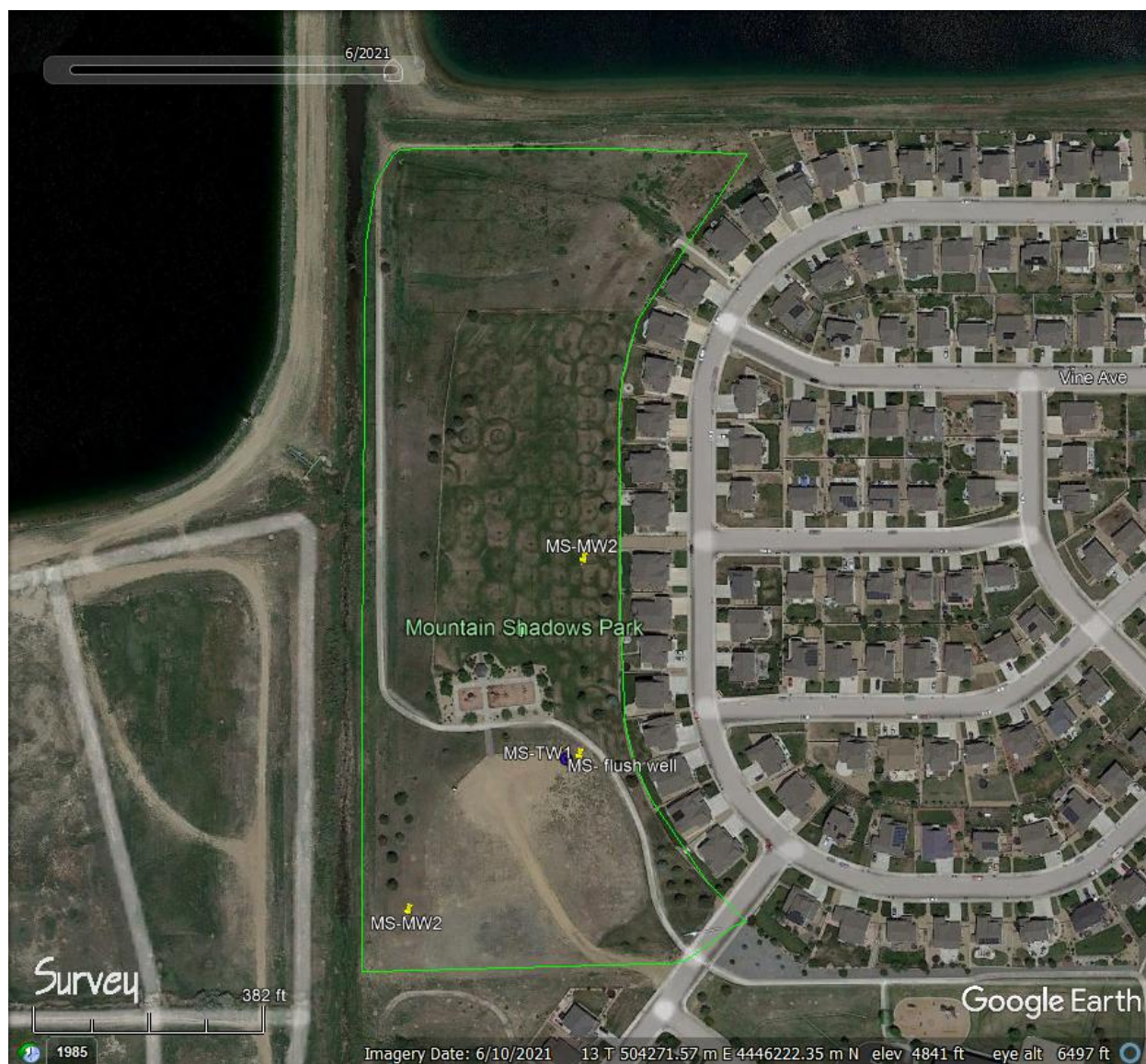


Well Abandonment



Wellhead Improvement

Figure 4 – Mountain Shadows Site

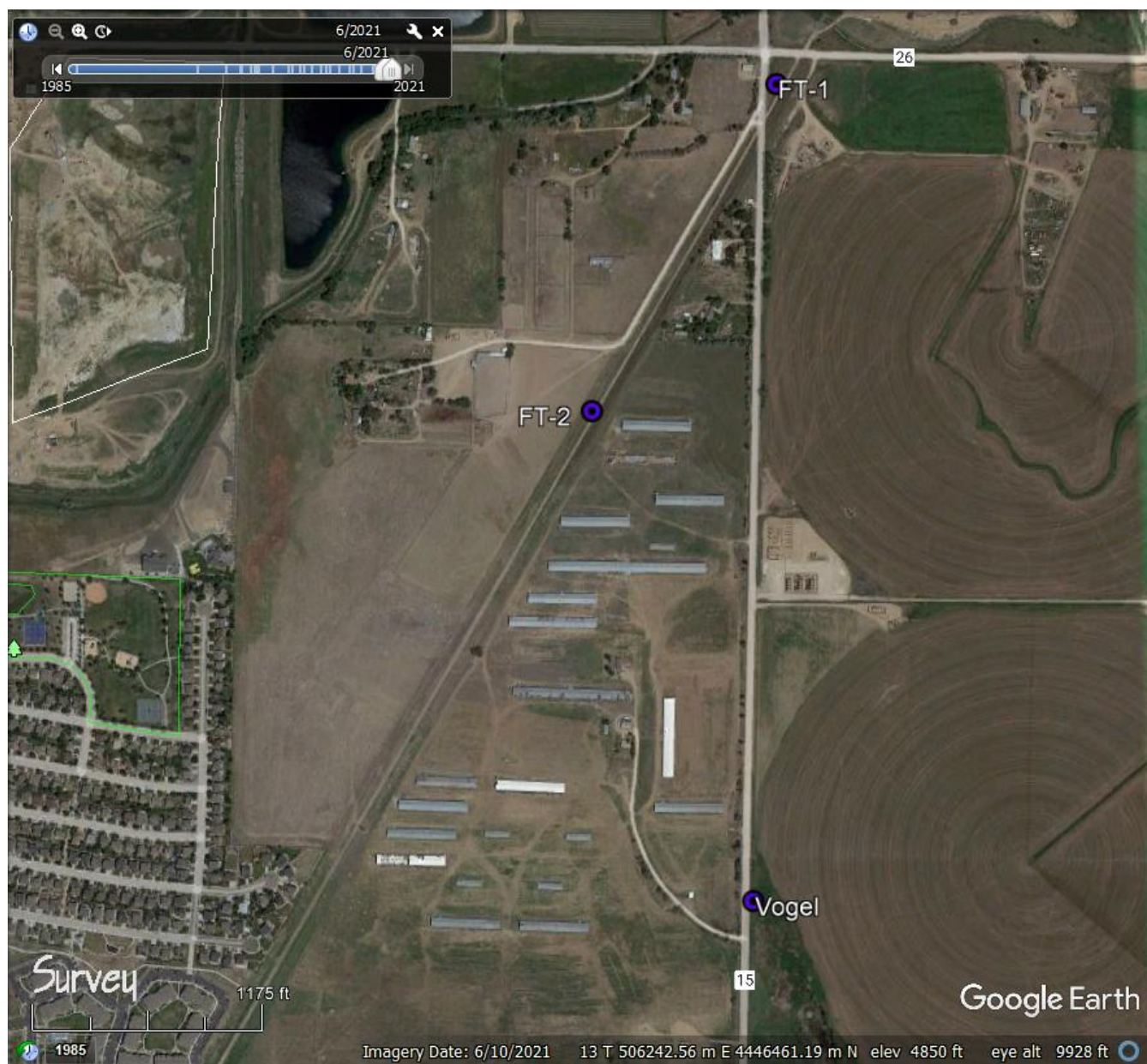


Well Abandonment



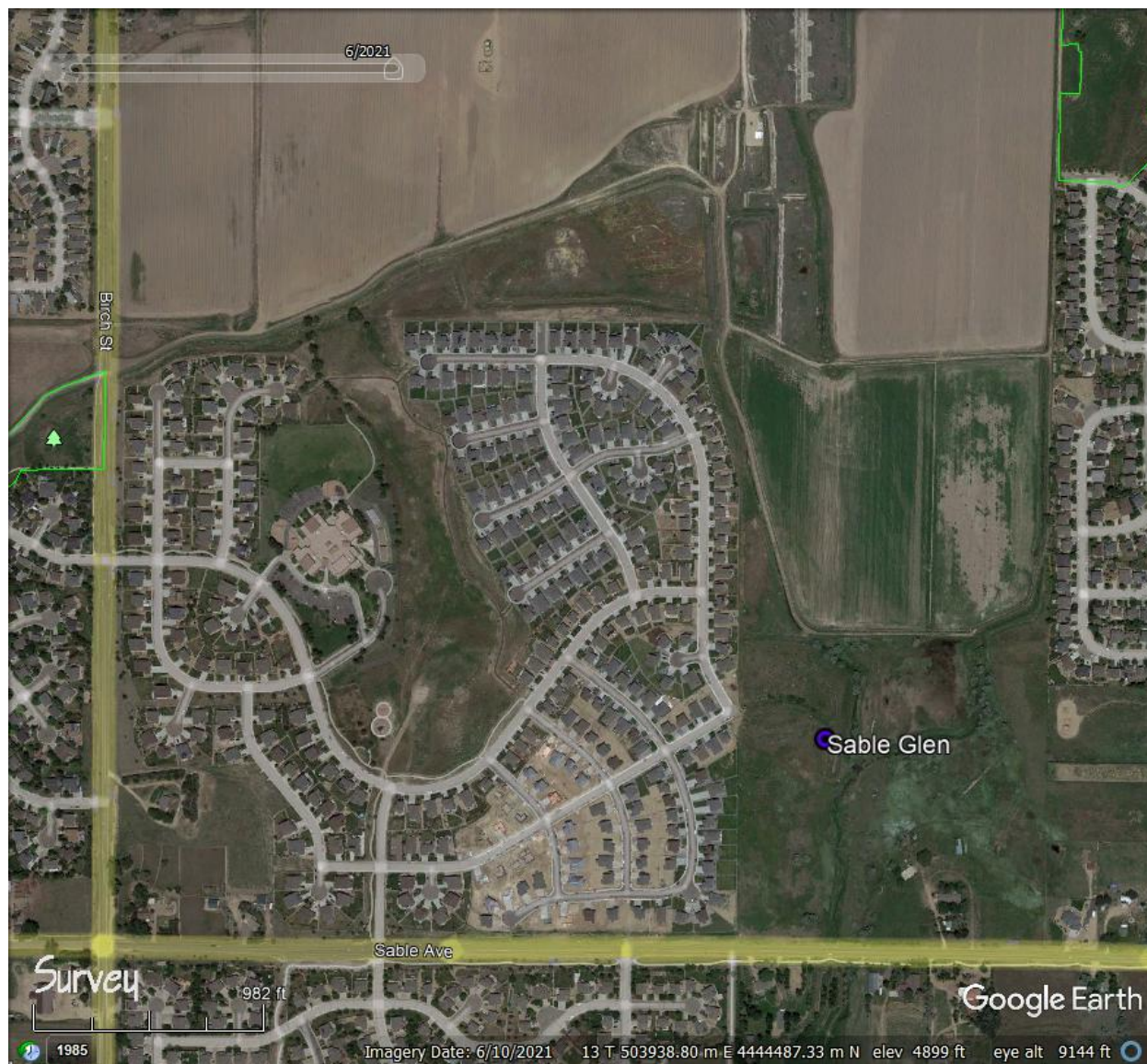
Wellhead Improvement

Figure 5 – Firestone Trail Sites



154183  **Well Abandonment**

Figure 6 – Sable Glen Site



154183

Well Abandonment

Figure 7 – Wellhead Piping and Meter Vault Schematic

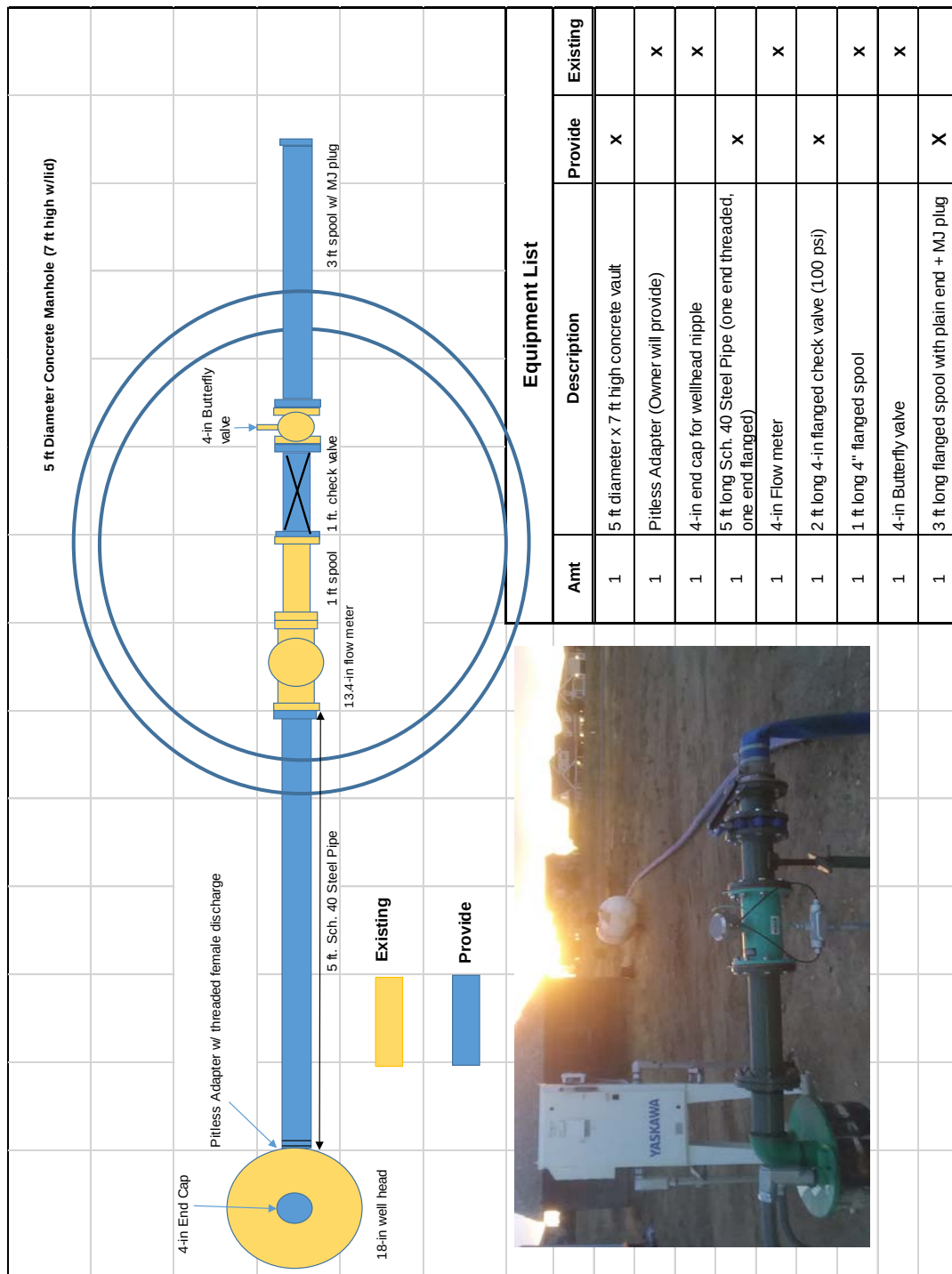


Figure 8 – Wellhead Piping and Meter Vault Schematic Cross Section

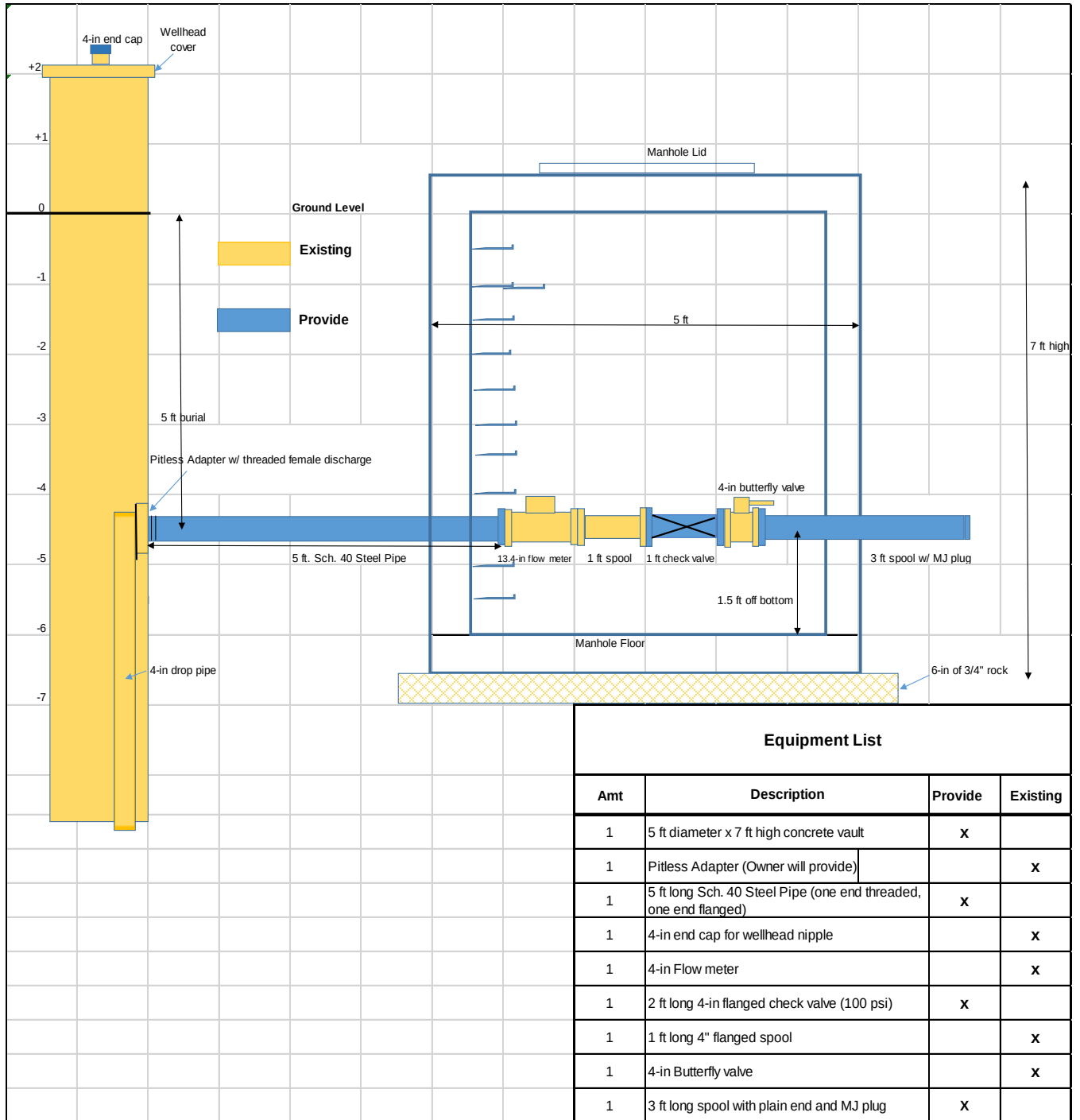


EXHIBIT B
Completed Bid Form
(2 pages)

BID FORM

Firestone - Miscellaneous Well Work						
Item	Amt.	Unit	Description	Unit Cost \$	Unit	Total Cost \$
Task 1 - Install Pitless Adapters and Buried Meter Vaults						
1	1	each	Mobilization (includes mobilization between 3 production wells and providing submittals as specified)	\$ 4890.00	each	\$4890.00
1.1	3	each	Remove pumping equipment and discard upper 7 foot long pump joint	\$ 1355.00	each	\$4065.00
1.2	1	LS	Excavate and fill for all work (including compaction)	\$ 12780.00	LS	12780.00
1.3	3	each	Install Pitless Adaptors (provided by Owner) at 5 ft burial	\$ 1915.00	each	\$ 5745.00
1.4	43	each	Reinstall pumps on hanging pitlesses using 7 ft less pipe	\$ 1020.00	each	\$4080.00
1.5	3	each	Provide and install manholes (with covers and stairs) and seal pipe and electrical access	\$ 6830.00	each	\$ 20490.00
1.6	3	each	Provide necessary piping as shown on Figures 7 and 8 (including compaction outside manholes)	\$ 3515.00	each	\$ 10545.00
1.7	3	each	Install all horizontal piping, check valves, and flow meters	\$ 1480.00	each	\$4440.00
1.8	3	each	Provide and install necessary electrical conduit between VFD and manholes	\$ 2040.00	each	\$ 6120.00
1.9	3	each	Record startup before and after pump pulls	\$ 720.00	each	\$ 2160.00
Total \$ Task 1						\$ 75315.00
Task 2 - Well Abandonments						
2.0	1	LS	Mob/Demob to all eight wells described in Table 1 (includes providing a table of abandonment data to Engineer)	\$ 2855.00	LS	\$ 2855.00
2.1	7	each	Abandon wells per specifications	\$ 1375.00	each	\$ 9625.00
2.2	1	each	Abandon Well G-TW1 (includes: pulling pump, and disconnecting power and removing electrical cable to the power pole 250' away on the Varra property per specifications)	\$ 2820.00	each	\$ 2820.00
Total \$ Task 2						\$ 15300.00
Task 3 - Wellhead Improvements						
3.0	1	LS	Mob/Demob to all fourteen wells shown in Table 2.	\$ 3355.00	LS	\$ 3355.00
3.1	14	each	Upgrade existing concrete pads to 4' x 4' pads that meet State Standards. Two flush mount wells require additional cement in the well annulus	\$ 960.00	each	\$ 13440.00
3.2	1	each	Provide and install an 8-in protective surface casing on Well MW-TW2 (Figure 4). The surface casing removed from G-TW1 may be adequate.	\$ 2280.00	each	\$ 2280.00
3.3	1	/hr	Standby Time	\$ 275.00	/hr	\$ 275.00
3.4	1	/hr	Hourly Rig Work	\$ 275.00	/hr	\$ 275.00
Total \$ Task 3						\$ 19625.00
Grand Total \$ (Tasks 1 - 3)						\$ 110240.00

\$3,060.00

\$74,295.00

\$109,220.00

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CONTRACTOR BID AND ACKNOWLEDGEMENT

The Contractor acknowledges the above terms and conditions and is submitting the bid above in good faith based on the unit rates provided.

Contractor: Layne Christensen Company Date: 11-22-21

Contractor Signature _____ Date to complete Task 1: End of January 2022

Contractor Name (Printed) Brian W Dellett Title: Senior Account Manager

Layne acknowledges receipt of Addendum No. 1 dated 11-18-21

Corrections made to the Bid Form and bid tabulation by DBL

Firestone - Miscellaneous Well Work - Bid Results										
Item	Amt.	Unit	Description	Unit Cost \$	Unit	Total Cost \$	Unit Cost \$	Unit	Total Cost \$	
Task 1 - Install Pitless Adapters and Buried Meter Vaults				Colorado Water Well			Layne (a Granite Company)			
1	1	each	Mobilization (includes mobilization between 3 production wells and providing submittals as specified)	\$ 3,711.00	each	\$ 3,711.00	\$ 4,890.00	each	\$ 4,890.00	
1.1	3	each	Remove pumping equipment and discard upper 7 foot long	\$ 1,000.00	each	\$ 3,000.00	\$ 1,355.00	each	\$ 4,065.00	
1.2	1	LS	Excavate and fill for all work (including compaction)	\$ 18,256.00	LS	\$ 18,256.00	\$ 12,780.00	LS	\$ 12,780.00	
1.3	3	each	Install Pitless Adaptors (provided by Owner) at 5 ft burial	\$ 500.00	each	\$ 1,500.00	\$ 1,915.00	each	\$ 5,745.00	
1.4	3	each	Reinstall pumps on hanging pitlesses using 7 ft less pipe	\$ 1,000.00	each	\$ 3,000.00	\$ 1,020.00	each	\$ 3,060.00	
1.5	3	each	Provide and install manholes (with covers and stairs) and seal pipe and electrical access	\$ 7,585.00	each	\$ 22,755.00	\$ 6,830.00	each	\$ 20,490.00	
1.6	3	each	Provide necessary piping as shown on Figures 7 and 8 (including compaction outside manholes)	\$ 4,025.00	each	\$ 12,075.00	\$ 3,515.00	each	\$ 10,545.00	
1.7	3	each	Install all horizontal piping, check valves, and flow meters	\$ 5,040.00	each	\$ 15,120.00	\$ 1,480.00	each	\$ 4,440.00	
1.8	3	each	Provide and install necessary electrical conduit between VFD and manholes	\$ 2,917.00	each	\$ 8,751.00	\$ 2,040.00	each	\$ 6,120.00	
1.9	3	each	Record startup before and after pump pulls	\$ 480.00	each	\$ 1,440.00	\$ 720.00	each	\$ 2,160.00	
Total \$ Task 1				\$ 89,608.00					\$ 74,295.00	
Task 2 - Well Abandonments										
2.0	1	LS	Mob/Demob to all eight wells described in Table 1 (includes providing a table of abandonment data to Engineer)	\$ 1,200.00	LS	\$ 1,200.00	\$ 2,855.00	LS	\$ 2,855.00	
2.1	7	each	Abondon wells per specifications	\$ 800.00	each	\$ 5,600.00	\$ 1,375.00	each	\$ 9,625.00	
2.2	1	each	Abandon Well G-TW1 (includes: pulling pump, and disconnecting power and removing electrical cable to the power pole 250' away on the Varra property per specifications)	\$ 2,200.00	each	\$ 2,200.00	\$ 2,820.00	each	\$ 2,820.00	
Total \$ Task 2				\$ 9,000.00					\$ 15,300.00	
Task 3 - Wellhead Improvements										
3.0	1	LS	Mob/Demob to all fourteen wells shown in Table 2.	\$ 1,200.00	LS	\$ 1,200.00	3355	LS	\$ 3,355.00	
3.1	14	each	Upgrade existing concrete pads to 4' x 4' pads that meet State Standards. Two flush mount wells require additional cement in the well annulus	\$ 300.00	each	\$ 4,200.00	960	each	\$ 13,440.00	
3.2	1	each	Provide and install an 8-in protective surface casing on Well MW-TW2 (Figure 4). The surface casing removed from G-TW1 may be adequate.	\$ 500.00	each	\$ 500.00	2280	each	\$ 2,280.00	
3.3	1	/hr	Standby Time	\$ 85.00	/hr	\$ 85.00	275	/hr	\$ 275.00	
3.4	1	/hr	Hourly Rig Work	\$ 295.00	/hr	\$ 295.00	\$ 275.00	/hr	\$ 275.00	
Total \$ Task 3							\$ 6,280.00			\$ 19,625.00
Grand Total \$ (Tasks 1 - 3)						\$ 104,888.00			\$ 109,220.00	

Hours/Units/Types Summary

PC	Title	Hours	Net Type	Amount	Info Type	Amount
1-00	Regular Pay	8,471.00	Direct Deposit Net	199,931.73	Informational	0.00
1-06	PD Shift Supervisor	-10.00	Net	210,188.37	Fringe Benefits	10.36
2-00	Overtime Pay	164.50	3rd Party Pay Net	0.00		
3-00	Paid Time Off & EIB	1,938.95				
5-00	Call Outs	16.00				
5-03	Standby	0.00				
7-00	Holiday, Holiday Worked	737.50				
8-10	PD Grant/Contracts	3.00				
8-00	Miscellaneous Pay	242.00				
8-25	Reserve Active Duty	80.00				
8-26	PHE - Public Health Emer	249.00				
8-27	Leave of Absence wo Pay	1.95				
8-28	PD POPS Programs	20.00				
9-01	Comp Time Earned	23.00				
9-02	Comp Time Used	99.50				
Grand Totals:		<u>12,036.40</u>		<u>410,120.10</u>		<u>10.36</u>

Pay Code Totals - Employee

PC	Title	Amount	PC	Title	Amount	PC	Title	Amount
1-01	Regular Pay	490,540.57	8-16	Employee Bonus	0.00	61-02	HSA7200	-6,873.46
1-03	Mayor/Trustee	2,150.00	8-20	Retro Pay (non-FPPA)	0.00	61-10	FSA- Dependent Care	-3,315.20
1-04	Temporary	2,772.00	8-25	Reserve Active Duty	0.00	61-11	FSA- Limited Purpose	-266.66
1-06	PD Shift Supervisor	7.08	8-26	PHE - Public Health Emergenc	5,414.11	61-12	FSA - Medical	-2,569.46
2-00	Overtime	8,525.17	8-28	PD POPS Programs	1,188.90	62-00	Dental Insurance	-941.86
3-01	PTO	37,865.78	9-02	Comp Time	2,702.31	63-00	Vision	-320.00
3-05	PTO Payout	7,901.21	19-00	3rd Party Pay	0.00	64-01	Voluntary/Ad Life	-1,051.20
3-10	Contract PTO	0.00	21-01	Stipend	0.00	64-03	Child Life	-40.80
4-00	EIB	3,229.18	21-02	Cell Phone Stipend	250.00	64-04	Spouse Life	-280.30
5-01	Call Outs	91.03	30-04	Life Ins > 50k	10.36	64-99	Accident Insurance	-865.20
5-02	PD Call Outs	539.84	50-01	FPPA 457	-1,405.57	70-01	Misc Deduction	0.00
5-03	Standby	0.00	50-02	FPPA PD Pension	-22,084.06	70-02	Child Support	-837.50
7-01	Holiday	15,745.21	50-03	FPPA ROTH	-400.00	70-03	Garnishment	-336.68
7-02	Holiday Work SW	5,638.35	51-01	PERA	-31,444.08	70-04	Equipment	-379.12
7-03	Holiday Work NSW	526.44	51-02	PERA+457	-586.59	70-05	ICMA Loan Payment	0.00
8-01	Misc Pay	0.00	51-03	PERA Life	-62.00	74-00	Soc Sec	0.00
8-02	Retro Pay	0.00	51-05	PERA 401k	-327.70	75-00	Medicare	-8,092.53
8-04	Bereavement	2,315.19	51-07	PERA 457 Roth	-859.04	76-00	FWT	-58,445.40
8-06	Snow Day	0.00	52-01	ICMA 401a	-250.00	77-00	SWT	-19,346.00
8-08	Pd Admin Leave	4,144.18	52-02	ICMA 457b-Pre	-807.74	79-00	3rd Party Medicare	0.00
8-10	PD Grant	192.69	52-04	ICMA 457b-Post	-323.08	85-00	Net Pay - check	210,188.37
8-12	Jury Duty	212.64	60-00	Health Insurance	-17,242.75	86-00	Dir Deposit	199,931.73
8-13	Military Leave	0.00	61-01	HSA3600	-2,077.80	89-00	3rd Party Net	0.00

Pay Code Totals - Employer

PC	Title	Amount	PC	Title	Amount	PC	Title	Amount
50-02	FPPA - Polic	16,855.55	62-00	Dental Insurance	5,817.70	75-00	Medicare	8,092.53
51-01	PERA	52,604.13	63-00	Vision Insurance	893.17	91-00	Long Term Disability	2,045.25
51-04	PERA AED/SAED	522.98	64-01	Voluntary/Ad Life	5.00	92-00	Short Term Disability	2,011.02
52-01	ICMA 401a	0.00	64-03	Child Life	0.80	93-00	Police Pension	5,840.99
52-02	ICMA 457b	988.48	64-04	Spouse Life	1.50	94-00	Basic Life & AD&D	1,444.17
60-00	Health Insurance	76,967.42	64-05	Accident -Employee	4.62	95-01	Employee Asst Plan	586.80
61-01	HSA3600	1,100.00	74-00	Social Security	0.00	98-00	State Unemployment	1,768.69
61-02	HSA7200	3,600.00						

Name	Total Paid
Total 4 RIVERS EQUIPMENT, LLC:	946.57
Total ACCESS/ADAMS DATA MANAGEMENT, LLC:	270.84
Total ACE HARDWARE OF FIRESTONE:	391.80
Total ADAMSON POLICE PRODUCTS:	411.81
Total AGFINITY-MEAD:	495.00
Total AIRGAS INC:	35.88
Total ALAN PLUMMER AND ASSOCIATES, INC:	123,596.33
Total ALERUS:	10,848.03
Total AMAZON:	1,366.63
Total AMERICAN CONSERVATION & BILLING SOLUTION:	400.00
Total AUSMUS LAW FIRM, P.C.:	1,200.00
Total B K TIRE, INC:	3,019.12
Total BAMBOO HR LLC:	.00
Total BAREFOOT RESIDENTIAL LLC:	585.02
Total BINFORD SUPPLY LLC:	8,161.47
Total Black Hills Energy:	2,666.31
Total BLUE MOON RENTAL LLC:	2,600.00
Total BLUE SPRUCE CONSTRUCTION GROUP INC:	5,747.20
Total BUDGET CONFERENCING:	239.58
Total C & W TRUCK AND TRAILER, LLC:	3,690.63
Total CARBON VALLEY CHAMBER OF COMMERCE:	675.00
Total CATHOLIC HEALTH INITIATIVES COLORADO:	900.00
Total CENTRAL STATES HOSE INC:	115.92
Total CENTRAL WELD COUNTY WATER DISTRICT.-TREA:	84,306.28
Total CENTURY LINK:	670.65
Total CESARE, INC:	2,632.00
Total CHASE PAYMENTNET:	76,718.00
Total CIGNA HEALTH & LIFE INSURANCE CO:	94,950.19
Total CINTAS FIRST AID & SAFETY:	327.07
Total CITY OF LONGMONT:	300.00
Total COLORADO ASSOCIATION OF CHEIFS OF POLICE:	455.00
Total COLORADO CIVIL GROUP INC.:	87,358.25
Total COLORADO GEOLOGICAL SURVEY:	275.22
Total COLORADO MUNICIPAL LEAGUE:	1,779.00
Total DANA KEPNER COMPANY INC.:	37,830.13
Total DBC IRRIGATION SUPPLY:	5,068.03
Total DEERE CREDIT, INC:	97,058.44
Total DELTA DENTAL OF COLORADO, INC:	6,969.50

Name	Total Paid
Total DINNEN LAW PC:	1,500.00
Total EMPLOYEE REIMBURSEMENTS & PER DIEMS:	816.92
Total ENTERPRISE FLEET MGMT CUSTOMER BILLINGS:	26,603.61
Total ENVIROTECH SERVICES INC.:	4,191.18
Total ERIC MATTHEW PRICE:	404.41
Total FACTORY MOTOR PARTS CO.:	51.32
Total FIDELITY NATIONAL TITLE-LONGMONT:	50.00
Total FIRST AMERICAN TITLE CO:	50.00
Total FLEXX PRODUCTIONS LLC:	646.82
Total FORCE AMERICA DISTRIBUTING:	1,790.91
Total FORD MOTOR CREDIT COMPANY, LLC:	35,402.18
Total FRANCE PUBLICATIONS, INC:	2,550.00
Total FRED DIEHL CONSULTING:	10,050.00
Total FRONT RANGE COMPLIANCE SERVICE, LLC: Total	62.50
FRONT RANGE PORTABLE RESTROOMS, LLC: Total	365.00
FRONTIER BUSINESS PRODUCTS:	10.92
Total FUZION FIELD SERVICES LLC:	8,653.50
Total GBSM INC:	4,952.50
Total GOLF & SPORT SOLUTIONS:	4,510.45
Total GOVERNMENTJOBS.COM, INC:	3,974.19
Total GRAINGER:	807.83
Total GREEN GIRL RECYCLING SERVICES:	166.00
Total GROUND SOLUTIONS:	7,040.00
Total GUARDIAN TITLE-DENVER:	10.90
Total HEI CIVIL:	1,745,773.55
Total HERITAGE TITLE (HIRNCH):	8.49
Total HOMES BY CREEKSTONE BUILDERS:	388.40
Total HYDRANT METER REFUNDS:	6,343.71
Total INTEGRATED WATER SERVICES, INC:	1,181,889.57
Total INTERSTATE BATTERY OF THE ROCKIES:	353.85
Total INTERSTATE FORD:	1,620.01
Total INTERWEST SAFETY SUPPLY, INC.:	179.34
Total KAMAKELE ENTERPRISES:	44.99
Total KATHLEEN A. OATIS:	1,250.00
Total KENZ & LESLIE DISTRIBUTING CO.:	2,231.15
Total KG CLEAN INC:	4,366.78
Total KIMBALL MIDWEST:	851.58
Total KS STATE BANK:	143,837.73

Name	Total Paid
Total L. L. JOHNSON DISTRIBUTING CO.:	7,979.41
Total L.A.W.S.:	4,014.03
Total LAND TITLE-DENVER-2:	233.60
Total LAST CHANCE DITCH COMPANY:	234.00
Total LENNAR COLORADO:	91.88
Total LEONARD RICE ENGINEERS, INC:	51,069.75
Total LITTLE THOMPSON WATER DISTRICT:	1,191.43
Total LONGMONT HUMANE SOCIETY:	1,166.67
Total MAC EQUIPMENT INC LONGMONT:	792.43
Total MAIN STREET MAT COMPANY, INC:	182.39
Total MCCANDLESS TRUCK CENTER, LLC:	292.44
Total MCDONALD FARMS ENTERPRISES INC:	1,138.00
Total MCI:	53.12
Total MELODY HOMES INC:	119.78
Total MISC VENDOR:	717.61
Total MOORE IACOFANO GOLTSMAN, INC:	12,547.18
Total MORGAN STANLEY SMITH BARNEY LLC:	3,311.99
Total MOUNTAIN STATES IMAGING, LLC:	11,320.29
Total MOUNTAIN VIEW GARAGE DOORS LLC:	380.00
Total MUTUAL OF OMAHA INSURANCE CO:	7,432.29
Total NCSI:	142.50
Total NEW IPT INC:	10,771.48
Total NORTHERN COLORADO CONSTRUCTORS, INC:	2,754.95
Total OFFICE DEPOT INC:	158.66
Total OLDCASTLE INFRASTRUCTURE:	3,325.00
Total O'REILLY AUTO PARTS:	1,465.03
Total PAUL D. BASSO:	1,000.00
Total PAWNEE BUTTES SEED INC:	11,400.00
Total PRAIRIE MOUNTAIN PUBLISHING:	1,133.87
Total PRE ACTION FIRE, INC:	360.00
Total PSYCHOLOGICAL DIMENSIONS, LLC:	700.00
Total PUREWATER DYNAMICS, INC:	537.73
Total RAMEY ENVIRONMENTAL COMPLIANCE, INC:	100.00
Total RDS ENVIRONMENTAL INC:	1,900.00
Total REDEMPTION ROAD COFFEE:	250.00
Total RESTITUTION / COURT REFUNDS:	480.00
Total RICHDELL CONSTRUCTION INC:	523,822.45
Total RIPTIDE CAR & PET WASH:	155.00

Name	Total Paid
Total ROCKY MOUNTAIN INFORMATION NETWORK, INC:	100.00
Total SAFE BUILT COLORADO INC:	54,400.53
Total SAFETY AND CONSTRUCTION SUPPLY INC:	1,590.89
Total SANTO CONSULTING GROUP LLC:	1,400.00
Total SCORCHING BRICK LLC:	221.65
Total SIMPLIFILE:	520.00
Total SNAP ON INDUSTRIAL:	146.06
Total SPROUT SOCIAL INC:	3,600.00
Total STANLEY M SLOWIK, INC:	536.04
Total STANTEC CONSULTING SERVICES INC:	6,590.74
Total STEVE BALCEROVICH:	1,250.00
Total SUMMIT DATA PROTECTION LLC:	11,350.00
Total SUMMIT ENTERTAINMENT OF THORNTON LLC:	5,903.32
Total SYMBOL ARTS:	854.75
Total TEST GAUGE INC - CO:	83.95
Total THROUGH THE ROOF PROMOTIONS LLC:	564.76
Total TIMBERLAN, INC:	26,334.25
Total TLTC DISTRIBUTING LLC:	1,007.04
Total TRAFFIC SIGNAL CONTROLS, INC:	188.00
Total TRANSWEST TRUCK TRAILER RV:	50.14
Total TRI-ELECTRONICS INC:	6,169.68
Total UME CUSTOM EMBROIDERY:	566.42
Total UNITED POWER-BRIGHTON:	103,670.71
Total UNIVERSITY AUTO PARTS, INC:	2249.67
Total UTILITY NOTIFICATION CENTER OF COLORADO:	539.88
Total UTILITY REFUNDS -1:	151.93
Total VALLI INFORMATION SYSTEMS:	5,210.82
Total VANCE BROTHERS INC:	281,765.00
Total VARRA COMPANIES:	1,942.35
Total VIA MOBILITY SERVICES:	11,376.00
Total VISION SERVICE PLAN - VSP:	1,213.91
Total WAAS CAMPBELL RIVERA JOHNSON & VELASQUEZ:	5,957.50
Total WAGNER EQUIPMENT CO.:	311.78
Total WAGNER WELDING SUPPLY CO.:	8.68
Total WANDS & WISHES OCCASIONS:	765.00
Total WEAR PARTS & EQUIP CO. INC:	2,626.40
Total WELD COUNTY DEPT OF PUBLIC HEALTH & ADMI:	767.00
Total WELD COUNTY INFORMATION TECHNOLOGY:	1,346.52

Name	Total Paid
Total WESTERN PAPER DISTRIBUTORS INC:	404.98
Total WESTWATER RESEARCH, LLC:	10,000.00
Total WEX BANK:	14,400.56
Total WICKHAM TRACTOR CO, Inc:	111.50
Total WILLIAMSON & HAYASHI, LLC:	16,668.50
Total WORKWELL OCCUPATIONAL MEDICINE LLC:	90.00
Total XPRESS BILL PAY / XPRESS SOLUTIONS:	2,226.30
Grand Totals:	5,120,819.36

**AGENDA INFORMATION
MEMORANDUM**

**FIRESTONE
TOWN BOARD OF TRUSTEES**



AIM#: 11.a

Executive Session

Meeting Date: December 8, 2021

Initiated By:

Dept: Town Clerk

AGENDA TITLE

An executive session pursuant to C.R.S. 24-6-402(4)(e)(I) for determining positions relative to matters that may be subject to negotiations, developing strategy for negotiations, and instructing negotiators and C.R.S. 24-6-402(4)(b) for a conference with an attorney for the Town for the purpose of receiving legal advice on specific legal questions concerning litigation issues regarding Central Weld County Water Districts service to the Town

SUMMARY

HISTORY AND PREVIOUS BOARD ACTION

RECOMMENDATION

ALTERNATIVES

ATTACHMENTS

None

FINANCIAL CONSIDERATIONS