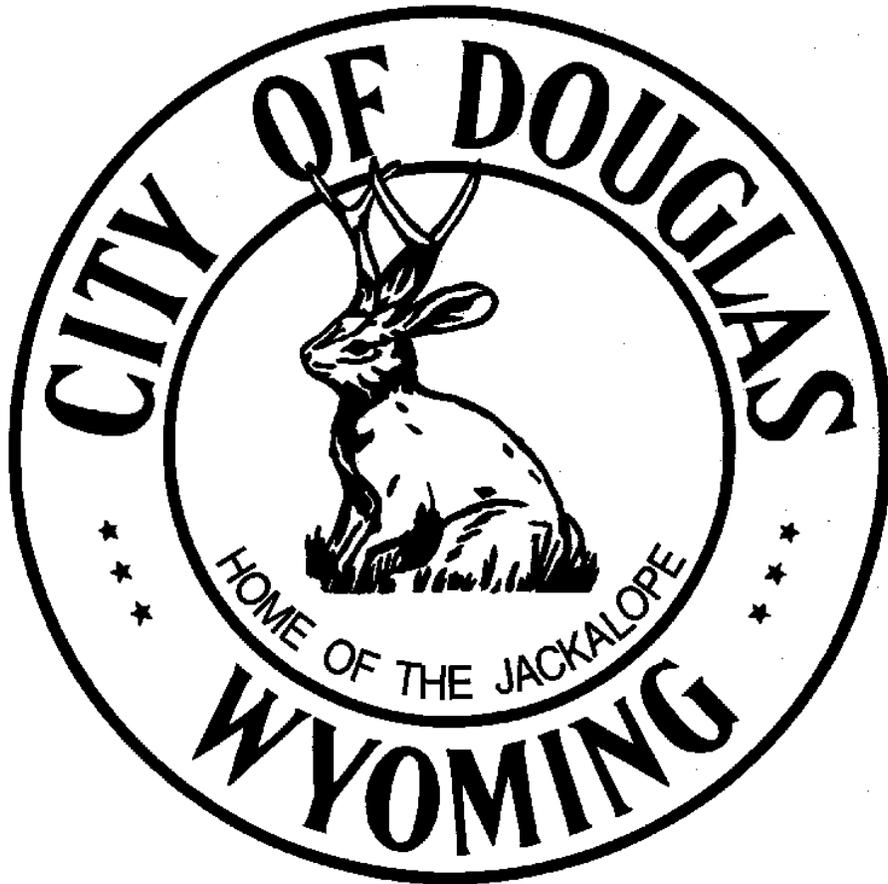


City of Douglas, Wyoming



AMENDMENTS AND SUPPLEMENTS TO THE: WYOMING PUBLIC WORKS STANDARD SPECIFICATIONS

March 2021

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**AMMENDMENTS AND SUPPLEMENTS TO THE:
WYOMING PUBLIC WORKS STANDARD SPECIFICATIONS**

I. Section 01010 – Summary of Work

A. DELETE this section in its entirety.

II. Section 01041 – Project Coordination

A. DELETE this section in its entirety.

III. Section 01090 – References

A. DELETE this section in its entirety.

IV. Section 01340 – Submittals

A. DELETE this section in its entirety.

V. Section 01442 – Partnering

A. DELETE this section in its entirety.

VI. Section 01505 – Temporary Facilities

A. DELETE this section in its entirety.

VII. Section 02050 – Removal and Disposal of Structures and Obstructions

A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

VIII. Section 02075 – Demolition of Asphalt and Portland Cement Concrete

A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

IX. Section 02110 – Clearing and Grubbing

A. Paragraph 3.01.B, DELETE the following language from the first sentence: "... more than three inches (3") (600 mm) in diameter, ...".

B. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

X. Section 02115 – Selective Clearing

A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XI. Section 02150 – Shoring and Underpinning

A. ADD the following as paragraph 3.01.B:

"Due to the physical characteristics of subsurface soils and groundwater flow conditions, open cuts and trenches may be very susceptible to instability. Install and maintain shoring, sheeting, bracing, and sloping necessary to support the sides of the excavation, to keep and prevent any movement which may damage adjacent pavements, utilities, or structures, damage or delay the work, or endanger life and health. Install and maintain

shoring, sheeting, bracing, and sloping as required by OSHA and other applicable governmental regulations and agencies.”

- B. ADD the following as paragraph 3.01.C:
”Do not stockpile excavated material adjacent to trenches and other excavations unless excavation sideslopes and excavation support systems are designed, constructed, and maintained for stockpile loads.”
- C. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XII. Section 02190 – Aggregates

- A. Paragraph 2.03.B.3, REPLACE the table in this paragraph with the following, which complies with WYDOT Standard Specifications, 2010 Edition:

Sieve Designation	Percentage by Weight Passing				
	Grading J	Grading GR	Grading L	Grading K	Grading W
2-inch	100				
1½-inch	90-100		100	100	100
1-inch		100	90-100	90-100	90-100
¾-inch		90-100			
½-inch		65-85	60-85		60-85
#4	35-75	50-78	35-55	40-65	45-65
#8		37-67	25-50	30-55	33-53
#30		13-35	10-30		
#200	0-15	4-15	3-15	3-15	3-12

- B. Paragraph 2.07.D, REPLACE the table in this paragraph with the following, which complies with WYDOT Standard Specifications, 2010 Edition:

Table Gradation Requirements Percentage by Weight Passing				
Sieve:	1 inch	¾-inch	½-inch	3/8-inch
1-1/4 inch	100			
1-inch	90-100	100		
¾-inch	65-90	90-100	100	
½-inch	50-85	55-90	90-100	100
3/8-inch	40-75	45-85	55-90	90-100
#4	30-60	30-65	35-70	45-85
#8	20-45	20-50	20-55	30-65
#30	5-25	5-30	5-35	10-40
#200	2-7	2-7	2-7	2-7

- C. Paragraph 2.08.A, REPLACE the table in this paragraph with the following, which complies with WYDOT Standard Specifications, 2010 Edition:

Sieve Designation	Percent Passing by Weight
	Plant Mix Wearing Course
1/2-inch	100
3/8-inch	97-100
#4	25-45
#8	10-25
#200	2-7

- D. Paragraph 2.09, DELETE this paragraph and the associated subparagraphs in their entirety.
- E. Part 4 Method of Measurement and Basis of Payment, page 10 of 10, DELETE this subsection in its entirety.

XIII. Section 02210 – Excavation and Embankment

- A. Paragraph 2.01.B, DELETE the last sentence in this paragraph.
- B. Paragraph 2.02.B, DELETE this paragraph in its entirety.
- C. Paragraph 2.03.A, REPLACE with the following:
”Rock Excavation: Removal of solid material which by actual demonstration cannot, in ENGINEER's opinion, be reasonably loosened or ripped by single-tooth, hydraulically operated ripper mounted on crawler tractor in good condition and rated at minimum 300 flywheel horsepower; and which must be systematically drilled and blasted or broken by power operated hammer, hydraulic rock breaker, expansive compounds, or other similar means prior to removal.”
- D. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XIV. Section 02220 – Trench Excavation

- A. Paragraph 3.03, ADD the following s paragraph 3.03.D:
“The traffic control requirements are supplemented in the Contract Documents in Section 02040 Temporary Traffic Control and Flagging Control.”
- B. Paragraph 3.12.A, REPLACE with the following:
“Due to the physical characteristics of subsurface soils and groundwater flow conditions, open cuts and trenches may be very susceptible to instability. Install and maintain shoring, sheeting, bracing, and sloping necessary to support the sides of the excavation, to keep and prevent any movement which may damage adjacent pavements, utilities, or structures, damage or delay the work, or endanger life and health. Install and maintain shoring, sheeting, bracing, and sloping as required by OSHA and other applicable governmental regulations and agencies.”
- C. Paragraph 3.15.A, REPLACE this paragraph with the following, subparagraphs a. and b. shall remain unchanged:
“Trench widths shall conform to the following: for pipelines less than 4-inches in diameter the trench width shall be a minimum of 18-inches wide; for pipelines greater than 4-inches in diameter the trench width shall be 24-inches greater than the diameter of the pipeline; for multiple conduits greater than 4-inches in diameter the trench width shall be 24-inches greater than the aggregate width of the pipes with a 12-inch space between the pipes. The trench width shall be increased as necessary for the shoring, sheeting and bracing.”
- D. Paragraph 3.16, ADD the following to the end of this paragraph as subparagraph D. “The Contractor shall completely backfill all excavations before stopping work at the end of each day. Open trenches (fenced or unfenced) shall not be allowed overnight after work has stopped for the day unless approved by the Engineer or City.

XV. Section 02222 – Rock Excavation

- A. DELETE this section in its entirety; no blasting will be allowed unless specifically identified in the Contract Documents.

XVI. Section 02225 – Trench Backfill

- A. Paragraph 2.01.A, DELETE paragraphs 1. and 2., REPLACE with the following:
 - 1. Type 1 Bedding Material, also referred to as bedding and encasement material or select backfill, shall conform to the gradation presented in the table at the end of this

paragraph. Bedding material shall be used six inches (6”) below and twelve inches (12”) above the pipeline(s). Other approved material for bedding and encasement shall consist of sand, sandy gravel, or fine gravel having a maximum size of three-quarter inch (3/4”) (20mm), uniformly graded, and a maximum plasticity of 6 as determined by AASHTO T-89 and T-90, as approved by the ENGINEER.

2. Certified copies of all sieve analysis and plasticity analysis for the above materials shall be submitted to the Owner and approved before construction starts. Other sieve or plasticity analysis may be required during construction as directed by the Engineer.
3. Type 2 Bedding Material also referred to as foundation material, shall conform to the gradation presented in the table at the end of this paragraph. Type 2 Bedding Material shall be placed from six (6) to twenty-four (24) inches below and to the spring line of the pipeline as directed by the ENGINEER to stabilize the subgrade below the pipeline in saturated or unstable materials.

Sieve Designation	Percent Passing by Weight	
	Type 1 Bedding	Type 2 Bedding
1-inch	-	100
¾-inch	90-100	85-100
3/8-inch	50-100	30-60
#4	35-100	0-10
#200	0-15	-

- B. Paragraph 2.01.B, ADD the following sentence to the end of this paragraph:
“Cement treated fill is also referred to in the Contract Documents and cement sand slurry and control density backfill.”
- C. Paragraph 3.01.A, ADD the following to the end of this paragraph as subparagraph 5.:
“Material excavated when frozen or when air temperature is less than 32 degrees F shall not be used as fill or backfill until material completely thaws. Material excavated during inclement weather shall not be used as fill or backfill until after material drains and dries sufficiently for proper compaction.”
- D. Paragraph 3.01.B.1, change the compaction requirement from 96% of maximum density to “...95% of maximum density...”.
- E. Paragraph 3.01.B.3, REPLACE the second sentence in this section with the following:
“Compaction testing will be performed by the ENGINEER or his subconsultant at an appropriate interval to verify the compaction means and methods.”
- F. Paragraph 3.01.B, ADD the following to the end of this paragraph as subparagraph 6.:
“When the excavated native material is not acceptable trench backfill material, and when approved by Engineer or Owner, Select Backfill shall be used for the trench backfill above the encasement material and below the base course of the roadway. The Select Backfill material shall meet the Type 1 Bedding Material specifications.
- G. Paragraph 3.02, DELETE paragraphs C. and D. in their entirety.
- H. Paragraph 3.03.A, REPLACE the first sentence in this paragraph with the following:
“Field density testing will be performed at appropriate intervals as determined by the ENGINEER.”
- I. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XVII. Section 02226 - Backfilling for Appurtenances

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XVIII. Section 02227 – Backfilling for Pavement

- A. Paragraph 3.01.A, ADD the following phrase to the end of the first paragraph: “...or as specified in the Contract Documents or called for in the Drawings.”
- B. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XIX. Section 02231 – Aggregate Sub-base and Base Coarses(sic)

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XX. Section 02273 – Rip Rap

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXI. Section 02280 – Topsoil

- A. Paragraph 1.01.C, DELETE the second sentence of this paragraph.
- B. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXII. Section 02290 – Watering

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXIII. Section 02510 – Portland Cement Treated Mixtures

- A. Part 4 Method of Measurement and Basis of Payment DELETE this subsection in its entirety.

XXIV. Section 02511 – Road Mix Bituminous Pavements

- A. DELETE this section in its entirety.

XXV. Section 02512 – Plant Mix Pavements

- A. Paragraph 2.01.A.2, DELETE the second sentence in this paragraph.
- B. Paragraph 3.02.B, REPLACE the words “Special Provisions”, with the following: “Contract Documents”.
- C. Paragraph 3.02.C REPALCE the “Minimum Ambient Temperature (°F)” table with the following table:

COMPACTED THICKNESS	SURFACE COURSE	SUBSURFACE COURSE
Less than 1”	60	55
1” to and including 2”	50	45
More than 2”	45	35

- D. Paragraph 3.02.I.1, REPLACE the compaction requirement for the bituminous mixture from “95%” to “97%”.
- E. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXVI. Section 02520 Portland Cement Concrete Pavement

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXVII. Section 02528 – Concrete Curbs and Combined Curbs and Gutters

- A. Paragraph 3.02.C, REPLACE this paragraph with the following:
”Subgrade material under concrete curbs, gutters and sidewalks shall be compacted to 95-percent of the maximum dry density as determined by ASTM D698-91, Standard Proctor.”
- B. Paragraph 3.04.E, DELETE this paragraph in its entirety.
- C. Paragraph 3.09, ADD the following as paragraph 3.09.E:
”Curb and gutter with a longitudinal grade of more than 0.005 feet per foot shall exhibit no signs of ponding. Any sections of curb and gutter which pond water shall be removed and replaced at the CONTRACTOR’s expense.”
- D. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXVIII. Section 02545 – Bituminous Material

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXIX. Section 02550 – Prime Coat

- A. Section 3.03.A, REPLACE the words “Special Provisions” with: “Contract Documents”.
- B. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXX. Section 02551 – Tack Coat

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXXI. Section 02552 – Seal Coat

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXXII. Section 02553 – Bituminous Surface Treatment

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXXIII. Section 02570 – Adjusting Street Fixtures

- A. Section 3.01.B, REPLACE the words “Special Provisions” with: “Contract Documents”.
- B. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXXIV. Section 02645 – Fire Hydrants

- A. Paragraph 2.01.A.3: REPLACE the fourth sentence with the following:
“Fire hydrants shall have five feet six inches (5.5’) of cover over the lead pipe.”

- B. Paragraph 2.01.A: ADD the following as subparagraph 5.:
“All fire hydrants shall be Super Centurion Model A-423 as manufactured by the Mueller Company. Fire hydrants shall be installed with the appropriate length of riser to allow for the operation of the nuts and bolts on the flange at the bottom of the hydrant (hydrant bury line set to finished grade).”
- C. Section 3.01.B, REPLACE the words “Special Provisions” with: “Contract Documents”.
- D. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXXV. Section 02665 Water Distribution and Transmission Systems

- A. Paragraph 1.02, ADD the following to the list of standards:
 - ”M. AWWA C104: Standard for Cement Mortar Lining for Ductile Iron Pipe and Fittings for Water
 - N. AWWA C105: ANSI Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems
 - O. AWWA C111: Standard for Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings
 - P. AWWA C512: Air Release, Air/Vacuum, and Combination Air Valves for Waterworks Service”
- B. REPLACE all references to the “Special Provisions” with: “Contract Documents”.
- C. Paragraph 2.01.A.1, ADD the following:
“All water main piping ranging in size from 4-inch through 12-inch shall be Class 235 PVC in conformance with AWWA C900 unless otherwise specified on the Drawings or in the Contract Documents. All water main piping and appurtenances shall match industry standard colors for water mains. Water main piping and appurtenances shall be blue in color if there is no industry standard color.”
- D. Paragraph 2.01.A.2.a, REPLACE the second sentence of this subparagraph with the following:
“All ductile iron pipe shall be Class 52 unless specified otherwise on the Drawings or in the Contract Documents.”
- E. Paragraph 2.01.A.2.d: REPLACE this subparagraph with the following:
”Ductile Iron Pipe shall be cathodically protected as detailed on the Drawings or in the Contract Documents.”
- F. Paragraph 2.01.B.1, REPLACE this subparagraph with the following:
“All fittings shall be mechanical joint fittings, AWWA C153 compact ductile iron fittings. All fittings shall be coated internally and externally with fusion bonded epoxy coating 6-8 mils thickness. Megalugs shall be provided on all fittings except solid sleeves; Megalugs shall be as manufactured by EBAA Iron, EBAA-200 with fusion bonded epoxy coating and stainless hardware, or approved equal.”
- G. Paragraph 2.01.B.2, REPLACE this subparagraph with the following:
”PVC sleeves may be used for pipe ranging in size from 4-inches through 8-inches in diameter. Solid sleeves larger than 8-inches in diameter shall be ductile iron with fusion bonded epoxy coating. PVC fittings for bends, tees and crosses are not allowed.”
- H. Paragraph 2.01.C, ADD the following as subparagraph 2.:
”Air release/vacuum relief valves shall be fusion bonded epoxy coated with stainless steel hardware; or ARI D-040 or approved equal.”

- I. Paragraph 2.01.D, DELETE this paragraph and the associated subparagraphs in their entirety.
- J. Paragraph 2.01.E.4, DELETE the last sentence in this paragraph.
- K. Paragraph 2.01.E, ADD the following as subparagraph 5.:
 “All valves larger than 16-inches in diameter shall be butterfly valves. Butterfly valves shall be as manufactured by the Mueller Company or American Flow Control.”
- L. Paragraph 2.01.F, ADD the following as subparagraph 6.:
 “All valves ranging in size from 4-inches to 16-inches in diameter shall be resilient seat gate valves in accordance with AWWA C509, Model A-2360 with mechanical joints as manufactured by the Mueller Company or Series 2500 manufactured by American Flow control. Gate valves shall be provided with fusion bonded epoxy coating. Gate valves ranging in size from 6-inches to 16-inches in diameter shall be equipped with mechanical joint fittings and megalugs.”
- M. Paragraph 2.01.G, ADD the following as subparagraph 2.:
 “An approved valve box adapter shall be used to keep the valve box centered over the valve.”
- N. Paragraph 2.01.H.1, REPLACE this subparagraph with the following:
 “All service lines shall be sized to meet the needed flow of the service. All service lines shall be polyethylene with a minimum size of one inch diameter. Polyethylene service lines shall be installed one size larger than normally specified for copper service lines.”
- O. Paragraph 2.01.H.1.a: DELETE this subparagraph in its entirety.
- P. Paragraph 2.01.I.1, REPLACE this subparagraph with the following:
 “Corporation Stops shall be brass with compression style fittings as manufactured by Mueller Company or Ford Meter Box Company.”
- Q. Paragraph 2.01.K, ADD the following to the paragraph title: “... also referred to as Service Saddles.”
- R. Paragraph 2.01.K, ADD the following as subparagraph 2.:
 “All service saddles shall be Style 317, with stainless steel straps, ductile iron high build epoxy coated body, CC threads as manufactured by Smith Blair, Inc. or Ford Meter Box”
- S. Paragraph 2.01.L.1, ADD the following sentence to the end of this subparagraph:
 “Curb Stops shall have compressions joints, six feet of bury depth, equipped with stainless steel operating rods as manufactured by the Mueller Company or the Ford Meter Box Company. Curb boxes shall be McDonald Model 5601 or approved equal.”
- T. Paragraph 2.01, ADD the following as subparagraph N:
”LOCATOR TAPE AND WIRE
 All water main piping and service lines shall have a three-inch-wide detectable trace tape installed 18-inches to 24-inches above the pipeline; the detectable tape shall be labeled “WATER”. All water mains shall have blue 12-gauge tracer/locator wire attached to the top of the pipe. The wire shall be #12 AWG high-strength copper clad steel conductor (HS-CCS), insulated with a 30 mil, high density, high molecular weight polyethylene (HDPE) insulation, and rated for direct burial use at 30 volts. Tracer wire for horizontal drilling applications shall be SoloShot 1245 EHS by Copperhead Industries, or approved equal. Wire connectors shall be Copperhead SnakeBite part # SCB-01-SR or approved equal. The tracer/locator wires shall end in tracer boxes alongside each fire hydrant. The tracer/locator boxes shall be plastic boxes with a minimum of two terminal blocks secured in place below a locking heavy cast-iron cover. C.P. mini box 2.5 inch or Handlay 2 3/8-inch cathodic test station box or equivalent shall be used. Tracer/locator

wire shall be installed on all service lines and wrapped around the curb stop or terminated in the meter pit (if applicable). The wire shall be continuous and tested following installation of the pipeline.”

U. Paragraph 2.01, ADD the following as paragraph O:

”METER PITS

Meter pits shall be insulated PVC with compatible insulation plugs; meter pits shall be 18-inches in diameter suitable in size for 1-inch diameter meters; meter pits shall be Mueller-Hunt Thermal Coil. Meter pits shall be equipped with dual check backflow preventers and integral touch read meter readouts installed in the lids. Meter pits shall be installed at least five feet behind the curb stop and slightly above finished grade.”

V. Paragraph 3.01.B.1, ADD the following sentences to the end of this subparagraph:

“If groundwater is allowed to enter the pipeline, the pipeline shall be removed, cleaned and replaced unless other means of cleaning and disinfection are approved by the ENGINEER. A plug shall be installed in the end of the pipe at all times.”

W. Paragraph 3.01.C.2, ADD the following sentence to the end of this subparagraph: “Stored pipe/materials that have any accumulated dirt or debris must be cleaned with an air lance, brushed, or swabbed prior to installation, no pipe with visible debris in it shall be installed.”

X. Paragraph 3.01.E, DELETE subparagraphs 7. and 8. in their entirety.

Y. Paragraph 3.02, ADD the following subparagraph:

“E. Valves shall be supported on a concrete foundation at least 8-inches (8”) by eighteen-inches (18”) square and four-inches (4”) thick.. All pressure tap auxiliary valves shall also be supported on concrete blocks.

Z. Paragraph 3.03.A, ADD the following subparagraph:

“4. Curb stops shall be supported on a concrete foundation at least six-inches (6”) square and three-inches (3”) thick.

AA. ADD the following immediately after Paragraph 3.06:

“3.07 CATHODIC PROTECTION

A. All metallic pipe, fittings, valves, hydrants, and other appurtenances shall be protected from corrosion by providing coatings and cathodic protection using pipe joint bonds, cross bonds, insulating joints, galvanic anode installation, and test stations.

B. Galvanic Anodes:

1. The number and size of the galvanic anode(s) required for fittings, valves, tees, couplings, fire hydrants, and pipelines shall be as shown on the drawings, specified herein or as required by Engineer. Galvanic anodes will not be required for low soil corrosivity areas (resistivities over 5,000 ohm-cm.) Magnesium anodes shall be used in medium soil corrosivity areas (resistivities over 1,500 ohm-cm, but below 5,000 ohm-cm.) Zinc anodes shall be used in high soil corrosivity areas (resistivities less than 1,500 ohm-cm.) If the number and size of the galvanic anodes are not specified or shown on the drawings for fittings/valves, then 1-18lb zinc anode shall be used for fittings/valves under 24-inches in diameter and 2-18lb zinc anodes shall be used for 24-inch fittings/valves.
2. Zinc anodes (for soil resistivities below 1,500 ohm-cm) shall be made of zinc conforming to ASTM B-418 Type II. The zinc ingot shall be cast around manufacturer's standard steel core. The zinc anode size and weight

may differ slightly because of variations in casting and mold shapes, but should be the manufacturer's standard and should approximate the following:

Bare Anode Weight (lb)	Bare Anode (in)	Packaged Anode Weight (lb)	Packaged Anode (in)	
			Diameter	Length
12	1.5 x 1.5 x 24	48	5	30
18	1.5 x 1.5 x 36	70	5	42
30	2 x 2 x 30	70	5	36

3. Magnesium anode (for soil resistivities between 1,500 and 5,000 ohm-cm) shall be made of magnesium conforming to ASTM B-80 AZ 63C. The magnesium ingot shall be cast around manufacturer's standard steel core. The magnesium anode size and weight may differ slightly because of variations in casting mold shapes, but should be manufacturer's standard and should be approximately the following:

Bare Anode Weight (lb)	Bare Anode (in)	Packaged Anode Weight (lb)	Packaged Anode (in)	
			Diameter	Length
9	3 x 3 x 13.5	24	6	17
17	4 x 4 x 17	42	6.5	19
32	5 x 5 x 21	70	8	30

4. The galvanic anodes, either zinc or magnesium, shall be packaged in a permeable cloth bag or cardboard chip-type tube containing a backfill mixture of the following chemical composition:

Ground Hydrated Gypsum	75 Percent
Powdered Bentonite	20 Percent
Anhydrous Sodium Sulfate	5 Percent

5. Backfill shall have a grain size so that 100 percent is capable of passing through a 20-mesh screen and 50 percent will be retained by a 100-mesh screen. The backfill mixture shall be thoroughly mixed and firmly packaged around the galvanic anode within the cloth bag or cardboard tube by means of adequate vibration. The packaged anode shall weigh a minimum of 2.0 times the weight of the anode alone. Backfill material shall be of sufficient quantity to cover all parts of the anode to a minimum thickness of one inch (1") (25mm).
6. Anodes packaged in cloth bags shall be protected in a plastic or heavy paper bag of sufficient mil thickness to permit normal handling and shipping without tearing. Cardboard tubes shall have devices to hold the anode in the center of the tube.
7. Iron pipe anodes for copper services shall be six-inch (6") (150mm) minimum diameter ductile or cast-iron pipe, ten-foot (10') (3.05m) minimum length. Iron pipe anodes shall consist of iron water mains abandoned in place during replacement or uncoated scrap iron pipe recovered from other water main replacements. Water mains abandoned in place used as iron pipe anodes may be left with the polyethylene wrap in place as long as the wrap is torn. No special backfill is required.

C. Wires:

1. No. 2 AWG wire for pipe joint bonding, No. 8 AWG wire for insulator, fitting bonding, and copper service line bonding with iron pipe anodes, and No. 12 AWG wire for test station and galvanic anode leads. Wire shall be single-conductor, stranded copper with 600-volt TW or better thermoplastic insulation. Wire insulation color shall indicate the function of each test station wire and shall be as follows:

Anodes – Black

Pipeline or Fitting Test Wires – Blue

Foreign Pipelines – White or as requested by Foreign Pipeline Owner

D. Thermite Welds:

1. The electrical connection of copper wire to ductile iron and cast-iron fittings and pipe shall be by the Thermite weld method. Thermite weld materials shall consist of wire sleeves, welders, and weld metal according to manufacturer's recommendations for each pipe type and diameter and wire size.
2. Coating materials for thermite welds shall consist of a pre-made thermite weld cap with coating, such as the Handy Cap by Royston (or approved equal). Royston Primer 747 should be used with the Handy Cap.

E. Joint Bonds:

1. Electrical continuity shall be provided for ductile iron pipe and fittings by electrically bonding all buried pipe joints and fittings. Bronze wedges are not an acceptable method of achieving electrical continuity. Joint bonds shall be No. 2 AWG single-conductor, stranded copper wire, with 600-volt TW insulation. The joint bond shall be eighteen inches (18") long and shall be supplied complete with a formed copper sleeve on each end of the bond wire.
2. Mechanical joint glands shall be bonded to valves, hydrants, or fittings using No. 8 AWG single-conductor, stranded copper wire, with 600-volt TW insulation. The gland bond shall be eighteen inches (18") long and shall be supplied complete with a formed copper sleeve on each end of the bond wire. 1-bond wire per gland for 10-inch and smaller diameter, 2-bond wires per gland for 12-inch diameter and larger.
3. Bonds shall be suitably coated to prevent corrosion of the pipe, bond, and connection.

F. Flange Insulating Kit:

1. Flange insulating kit shall consist of a full-face, Type E gasket and, for each bolt, two insulating washers, two steel washers, and one full-length phenolic or fiberglass reinforced epoxy insulating sleeve with washers. The complete assembly shall have an ANSI rating equal to that of the flange. The flange gasket shall be supplemented with a neoprene facing on each side and molded half O-rings in grooves on opposite sides of the insulating retainer to accomplish a seal. Acceptable insulators are manufactured by Pacific Seal, Inc., Burbank, California or approved equal.
2. The flanges must be checked to ensure that they do not have any sharp edges before installing the full-face gasket. Install the steel washer, the insulating washer, and then the insulating sleeve on the bolt before putting it in the flange. Make sure that the insulating sleeve is not too long or it

will break when the bolt is tightened. The maximum length should be slightly less than the thickness of the two flanges and the gasket combined. For buried insulators, install the single insulated washer so that the bolt and nut are electrically connected into the cathodic protected side of the insulator. Buried insulators should be both coated and tape wrapped.

G. Service Line Insulator:

1. The service line insulator should be a standard brass female-to-male fitting with a nylon dielectric bushing between. Its working pressure should be equal to or higher than the system on which it is to be installed. Take care to ensure that the insulator is correctly aligned during installation.

H. Bolts, Nuts and Washers:

1. All bolts, nuts, and washers installed below grade in medium to high soil corrosivity areas (below 5,000 ohm-cm soil resistivity) shall be Series 300 stainless steel. Bolts shall be tee-headed (Type 304 or 316 SS). Nuts shall be semi-finished heavy hex head ASTM A194 (Type 304 or 316 SS). Stainless steel washers (Type 304 or Type 316) shall be used. Bolts, nuts, and washers installed below grade in low soil corrosivity areas (over 5,000 ohm-cm soil resistivity) shall be fusion-bonded coated steel.

I. Cement:

1. All cement for buried applications shall be Type V Portland cement or modified Type II with equal sulfate resistance characteristics.

J. Ground Clamps:

1. Ground clamps for wire connection to copper service pipe shall be sized to fit the pipe and wire. All parts of the clamp shall be bronze, except the bolts and nuts which shall be stainless steel, as manufactured by O.Z. Gedney, Thomas and Betts, or equal.

K. Shop-Applied Coating:

1. All buried exterior and interior surfaces of all new ferrous metallic construction materials (fittings, fire hydrants, valves, tees, mechanical joint glands, etc.) shall be coated with one of the following tightly bonded factory-applied coatings:
 - a. Method B - The outside and inside surfaces shall be fusion-bonded epoxy coated in accordance to AWWA C213. This coating shall not be less than 10 mils in thickness unless otherwise specified. The interior coating shall be NSF approved for potable water service.
 - b. Method C – The outside and inside surfaces shall be coated with liquid epoxy or with fusion bonded epoxy in accordance to AWWA C550. The interior coating shall be NSF approved for potable water service.For all methods, the coating finish shall be pinhole free, and shall be inspected after cure for coating continuity using a holiday detector, in accordance with the coating manufacturer's recommendations and the applicable AWWA standards.

L. Field Coating:

1. Field exterior coating selection should be tailored to meet individual application requirements, surface conditions, and anticipated exposure. Coating manufacturer's written recommendations should be followed for product selection, surface preparation, compatibility with factory coating,

application, and repair procedures based on anticipated exposure. Primer and cover coats from different manufactures shall not be intermixed. Buried fittings, pipes, or appurtenances not factory-coated shall be coated with the following coatings and general guidelines.

- a. The fitting or pipe surface shall be cleaned by wire brush or sandblasting to remove all rust, mill scale, weld splatter, grease, dirt, dust, oil, and any other foreign matter. The surface shall be smooth and completely clean and dry prior to application of coating.
- b. Heat-shrink-to-fit sleeves meeting AWWA C-216, as manufactured by Raychem, Tapecoat, or approved equal are to be used only for field-coating clean, smooth fittings and pipe sections where the absence of sharp angles, edges, and bolts allow a tight bond to the pipe or fittings.
- c. Heat Applied Asphalt can be applied to wire or bond connections on top of the pipe or fittings. Do not apply to the bottom of fittings or pipe.
- d. Cold-applied tape coating, meeting AWWA C-209, shall consist of a suitable field primer and minimum 35-mil thick patch/repair/joint tape with aggressive adhesive and release liner four or six inches (4" or 6") (10mm or 15mm) wide. The tape shall be applied in spiral wrap with a 50 percent overlap. Acceptable cold-applied tap coatings are Tapecoat H35 Gray by Tapecoat, Polyken 1027 primer with Polyken 934-35 tape by Tyco, or approved equal.
- e. Water- or air-cured 100% epoxy coating can be applied to fittings and joint restraint systems that have angles, sharp edges, bolts, and nuts. It can also be applied to the bottom of pipes and fittings. Acceptable epoxy coatings are Aquata Pox by Raven, A-788 Splash Zone Compound by Koppers, or approved equal. The epoxy coating can be applied by brush in a layer 20-mil minimum thickness. The epoxy coating should overlap existing coating by two inches (2") (50mm) minimum. Do not backfill for six to eight hours after coating application to avoid damage to uncured epoxy coating. The coating shall then be protected from backfilling by using polyethylene encasement.
- f. In medium to high soil corrosivity areas, mastic shall be used to coat corporation stop and service saddles connected to non-metallic mains, ground clamps connected to copper service pipe, and stainless steel rods and harnesses, etc. The mastic shall be a corrosion resistant, waterproofing mastic installed in accordance with manufacturer's instructions and recommendations. Acceptable mastics are Polyken Solid Mastic No. 937 by Tyco, Roskote A51 by Royston or approved equal. The coating shall be protected from trench backfilling damage by using polyethylene encasement.

M. Installation - Low Corrosivity Areas (Soil resistivity greater than 5000 ohm-cm)

1. The buried exterior and interior surfaces of all new ferrous metallic construction materials (fittings, fire hydrants, valves, tees, mechanical joint glands, joint restraint systems, etc.) shall be coated as detailed above.

2. Copper service lines do not need corrosion protection in low corrosivity areas. Anodes are not needed in low corrosivity areas to protect fittings, valves, hydrants, or ductile iron pipe. Ductile iron pipe, valves, fittings, and mechanical joint glands do not need to be bonded together.
- N. Installation - Medium to High Soil Corrosivity Areas (Soil resistivity less than 5,000 ohm-cm)
1. The buried exterior and interior surfaces of all new ferrous metallic construction materials (fittings, fire hydrants, valves, tees, mechanical joint glands, joint restraint systems, etc.) shall be coated as detailed above.
 2. Ductile iron pipe shall be bonded at all joints and fittings. Hydrant valves shall be bonded to the swivel tees. Fire hydrant barrels shall be bonded to the shoes. The bonds shall be No. 2 AWG wires. Wire bond lengths to and around fittings shall be formed in the field so as to have two inches (2") (50mm) of slack after connections.
 3. All mechanical joint glands at valves, hydrants, or fittings shall be bonded to the main body using #8 AWG wires. Wire bond lengths to and around the glands and fittings shall be formed in the field so as to have two inches (2") (50mm) of slack after connections.
 4. Where PVC pipe is used on fittings, the galvanic anode lead wire shall be connected directly to the fitting.
 5. When PVC water main pipe is used, the copper service lines shall be bonded to an 8 to 10 foot (8'-10') (2.5 – 3m) section of old abandoned or used four-inch (4") (100mm) or larger ductile iron or cast iron pipe using No. 8 AWG wire and a ground clamp on the copper pipe. All compression couplings on copper pipe need jumper wires. As an alternate, galvanic anodes may be used also connected to the copper service line by a ground clamp. The type and size of these anodes shall be indicated on the plans or in an addendum to these specifications. The ground clamp shall be coated.
 6. All service saddles and corporation stops connected to non-metallic mains shall be coated as detailed above.
- O. Installation – Galvanic Anodes:
1. All prepackaged galvanic anodes shall be stored off the ground and kept dry at all times. Anodes shall be protected against weather, condensation, and mechanical damage. All damaged pre-packaged anodes shall be removed from the job site. Pre-packaged anodes shall be handled with care to prevent anode breakage or loss of backfill material. Anodes shall not be lifted, lowered, or held by the lead wire.
 2. Anodes shall be installed one foot below the pipe invert, alternating anode placement on opposite sides of pipe. Galvanic anodes shall be spaced equally around the pipeline or appurtenance and shall be located a minimum of two feet (2') (600mm) for zinc and three feet (3') (900mm) for magnesium from the metallic fittings at the bottom edge of the trench. Maximum anode spacing from fitting or pipeline shall be five feet (5') (1.5m).
 3. Galvanic anode strings shall consist of no more than five anodes for zinc and ten for magnesium. Anodes shall be spaced twenty feet (20')

minimum from the pipeline with ten feet (10') on-centers. The anode string header cable shall be terminated in a test station with a shunt to monitor the anode string current output and pipe potential.

4. Anodes may be installed vertically or horizontally. A minimum anode spacing of two feet (2') from other unprotected pipelines should be provided. Augered holes for vertical anodes shall be the width of the anode plus six inches (6") to allow thorough soil compaction around all sides of the anode to the specified depth. Augering equipment shall be suitable for soil conditions, with capabilities for auguring to a depth equal to 1.2 times the specified anode installation depth.
 5. Anodes shall be installed after auguring or trenching is completed. Remove the plastic or outer paper covering, if present on the anode, but leave the cloth or cardboard intact prior to installation of the anode. Anodes packaged in cardboard type chip-tubes shall be thoroughly perforated just prior to installation. Pre-packaged galvanic anodes shall be placed in the center of the augured hole or at the edge of the pipe trench, and the earth backfill thoroughly compacted around the anode in six inches (6") lifts to a point one foot (1') above the anode. Earth backfill material around each anode shall be native soil free of roots, organic matter, trash, and rocks. If sand backfill is used for pipe installation, cover anodes with one foot (1') of native material before placing sand. Stop backfill at specified grade to allow for placing of topsoil or pavement, when required.
 6. All anode wires shall be buried a minimum of twenty-four inches (24") below finish grade. Wires shall be handled with care. Splices or damage to the insulation on any wire shall be wrapped with two layers of Scotch No. 130C linerless rubber splicing high voltage tape and two layers of Scotch No. 88 vinyl electrical tape. Wire splices shall be made with suitably sized compression connectors.
 7. Galvanic anode connections to cast iron or ductile iron fittings, appurtenances, and pipe shall be made by the thermite weld method. The anode wire shall be wrapped once around the water main so that the wire can be attached to the top of the fitting or pipe. Any damage to the pipe or fitting interior coating shall be repaired in accordance with the coating manufacturer's recommendations.
- P. Installation – Thermite Welds:
1. The electrical connection of copper wire to ductile or cast iron pipe and ductile iron or cast iron fittings shall be by the thermite weld method. Before making the connection, the surface must be cleaned to bare metal by making a two-inch x two-inch (2" x 2") (50mm x 50mm) window in the coating and then filing or grinding the surface to produce a bright metal finish. The base metal and wire must be free of moisture for a successful connection. Place the wire on the bright metal area with the welder on the wire. A steel disc and cartridge should be placed in the welder before placing it over the wire. Wear leather gloves, protective eyewear, and ignite the powder with the flint gun striker. Hold the welder steady during ignition and do not breathe the smoke from the weld. Do

not allow either hot slag or welder to contact PVC pipe or pipe coatings. Do not remove the welder from the weld until it has partially cooled (approximately 20 to 30 seconds). After cooling, the connection should be lightly tapped several times with a hammer to remove slag and check for a sound connection. Wipe it with a dry cloth. Coat all finished thermite welds and cleaned pipe surface with a light coat of coal tar mastic primer. After the primer dries to a non-glossy appearance, remove the release from the thermite weld cap and press the cap firmly into place over the thermite weld. Damage to the coating not covered by thermite weld cap is to be repaired with cold-applied tape, asphalt, 100 percent epoxy coating, or approved mastic. Use care when placing the first backfill to prevent damage to wires. Clean welder mold after each ignition to prevent contamination of the next weld.

Q. Installation – Electrical Isolation:

1. Ductile or cast iron pipe shall be insulated from steel pipelines. All buried flange insulators shall be cathodically protected by using an approved mastic coating in conjunction with heat-shrink-to-fit sleeves.
2. Copper service lines shall be insulated on the City side of the curb stop. Copper service lines shall be electrically insulated on each side of the insulator for three feet (3') by wrapping the copper pipe with cold-applied tape coating or approved equal.

BB. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXXVI. Section 02670 – Hydrostatic Testing

- A. Paragraph 3.01.B, ADD the following to the end of this paragraph “The pressure gauge shall have a 4-inch dial with 2 psi pressure increments or less.”
- B. Paragraph 3.01.B.1.a, ADD the following to the end of this paragraph “the minimum test pressure shall be 150 psi.”
- C. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXXVII. Section 02675 – Disinfection

- A. Paragraph 3.01.H, DELETE subparagraphs 1. and 2. and REPLACE with the following:
 - “1. After final flushing and before the new water main is connected to the distribution system, acceptable bacteriological samples shall be collected from the new main. Samples will not be collected Friday through Sunday unless special arrangements are made with the ENGINEER and the testing laboratory. At least one bacteriological sample shall be collected for every twelve hundred feet (1200') of new water main or at the end of each valved section whichever is less. All samples shall be collected and delivered to a lab by the CONTRACTOR and shall be tested for bacteriological quality in accordance with the most recent edition of *Standard Methods for the Examination of Water and Wastewater* by a certified laboratory, and shall show the absence of any coliform organisms. A standard heterotrophic plate count may be required at the option of the OWNER or ENGINEER. A Turbidity analysis may also be required by the OWNER or ENGINEER to ensure the cleanliness of the new mains. All expenses associated with first-time

bacteriological sampling, heterotrophic plate counts, and turbidity samples shall be at the cost of the CONTRACTOR. All subsequent costs for retesting shall be the responsibility of the CONTRACTOR.

2. Samples for bacteriological analysis shall be collected in sterile bottles treated with sodium thiosulfate as required by the most current edition of *Standard Methods for the Examination of Water and Wastewater*. CONTRACTOR shall wear clean disposable latex or nitrile gloves and disinfect sample tap with 200 PPM chlorine solution or 70% isopropyl alcohol prior to bacteriological sampling. No hoses, fire hydrants, or permanent flushing hydrants shall be used in the collection of samples unless approved by OWNER or ENGINEER. Water service lines may be used for collection of samples. A combination flushing and sampling tap useful for mains up to and including eight-inch (8") diameter can also be temporarily installed. As another alternative, a corporation stop (with service saddle for PVC pipe) may be installed with a copper-tube gooseneck assembly. After samples have been collected, the gooseneck assembly may be removed and retained for future use and the corporation stop closed and capped. The corporation stop and service saddle shall be provided with corrosion protection. All taps made specifically for sampling and/or flushing purposes shall be at the CONTRACTOR's expense.
 3. If trench water has entered the new main during construction or, if in the opinion of the OWNER or ENGINEER, excessive quantities of dirt or debris have entered the new main, bacteriological samples shall be taken at additional intervals as required by the ENGINEER. All costs associated with additional sampling because of trench water, dirt, or debris in the main shall be charged to the CONTRACTOR.
 4. If initial disinfection fails to produce satisfactory bacteriological samples, additional flushing and sampling will be required, or at the ENGINEER's discretion the ENGINEER may direct the CONTRACTOR to re-chlorinate the main at CONTRACTOR's expense until adequate samples are obtained. All flushing water costs and other City costs associated with the need to rechlorinate and/or reflush the mains to obtain satisfactory bacteriological tests shall be charged to the CONTRACTOR.
- B. Paragraph 3.01.I, DELETE this paragraph in its entirety.
- C. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXXVIII. Section 02700 – Sanitary Sewer Systems

- A. REPLACE all references to the "Special Provisions" with: "Contract Documents".
- B. Paragraph 2.01.B, DELETE this paragraph and the associated subparagraphs in their entirety.
- C. Paragraph 2.01.C, DELETE this paragraph and the associated subparagraphs in their entirety.
- D. Paragraph 2.01.D, DELETE this paragraph and the associated subparagraphs in their entirety.
- E. Paragraph 2.01.E, DELETE this paragraph and the associated subparagraphs in their entirety.
- F. Paragraph 2.01.K, DELETE the first sentence and REPLACE with the following:
"Concrete bases shall be precast with precast troughs integrally cast in place."

- G. Paragraph 3.04.C.1.a, ADD the following note:
“The water test will only be used for leak testing manholes. All sewer mains will be air tested.”
- H. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XXXIX. Section 02725 – Storm Drains and Culverts

- A. REPLACE all references to the “Special Provisions” with: “Contract Documents”.
- B. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XL. Section 02776 – Concrete Sidewalks, Driveway Approaches, Curb Turn Fillets, Valley Gutters and Miscellaneous New Concrete Construction

- A. Paragraph 2.01.A, REPLACE the last sentence of this paragraph with “All items shall be Class 4000 with fiber mesh reinforcement.”
- B. Paragraph 3.01.B, DELETE this paragraph in its entirety.
- C. Paragraph 3.02.C, REPLACE the paragraph with the following:
“Subgrade material under concrete construction shall be compacted to 95-percent of the maximum dry density as determined by ASTM D698-91, Standard Proctor.”
- D. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XLI. Section 02805 – Relocate Street Signs, Utility Poles and Mailboxes

- A. Paragraph 3.01.E, DELETE the second sentence of this paragraph.
- B. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XLII. Section 02895 - Engineering Fabric

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XLIII. Section 02900 – Landscaping

- A. Paragraph 3.01.C.4, DELETE this subparagraph.
- B. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XLIV. Section 02915 – Unit Pavers

- A. DELETE this section in its entirety.

XLV. Section 03100 – Concrete Formwork

- A. Paragraph 1.07, DELETE this section in its entirety.
- B. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XLVI. Section 03200 – Concrete Reinforcement

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XLVII. Section 03251 – Expansion and Contraction Joints

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XLVIII. Section 03304 – Portland Cement Concrete

- A. Paragraph 2.01.A, REPLACE this paragraph with the following:
“ASTM C150, Type II Modified or Type V.
- B. Paragraph 2.06, ADD the following as subparagraph E:
“All concrete for flatwork, curb and gutter, sidewalk, and concrete pavement shall be provided with fibremesh, 1.5 pounds of fibremesh per cubic yard of concrete.”
- C. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

XLIX. Section 03305 – Concrete Quality Control

- A. Paragraph 3.01.C, DELETE 1., 2. and 3., REPLACE with the following:
”One cylinder each will be tested at 7 days, 14 days and 28 days. One cylinder will remain as a spare. Alternate testing schedules can be coordinated with ENGINEER as may be required or requested.”
- B. Paragraph 3.02, ADD the following note:
”Flexural strength testing of concrete will not be performed unless specified on the Drawings or in the Contract Documents, or as may be required under special project conditions.”
- C. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

L. Section 03310 – Concrete Work

- A. Paragraph 3.08, DELETE this section in its entirety.
- B. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

LI. Section 03345 – Concrete Finishing

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

LII. Section 03370 – Concrete Curing

- A. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

LIII. Section 03480 - Precast Concrete Units

- A. Paragraph 1.02.A, ADD the following language to the end of this sentence: “... as specified on the Drawings or in the Contract Documents.”
- B. Paragraph 1.02.B, DELETE this paragraph in its entirety.
- C. Paragraph 1.03.B, DELETE this paragraph in its entirety.
- D. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

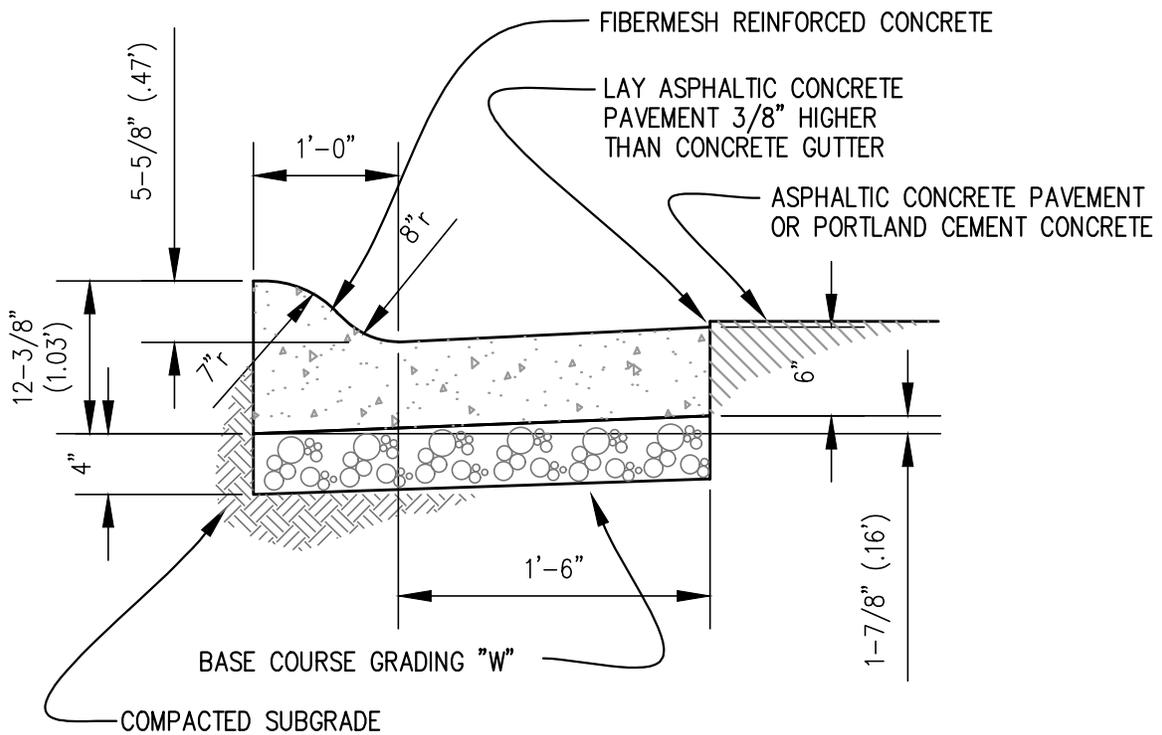
LIV. Section 03600 – Grout

- A. Paragraph 2.01.A, REPLACE this paragraph with the following:
”Portland Cement: ASTM C150, Type II Modified or Type V.
- B. Part 4 Method of Measurement and Basis of Payment, DELETE this subsection in its entirety.

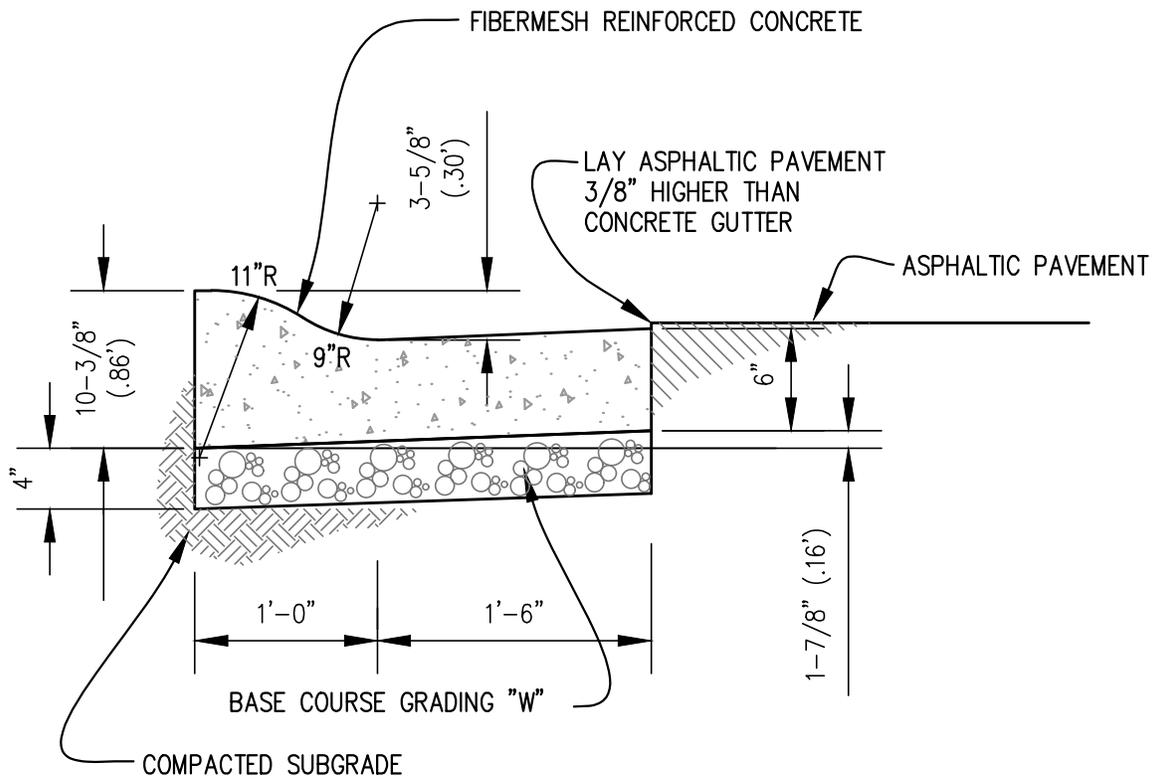
LV. Standard Drawings

- A. DELETE all of the Standard Drawings identified below:
 - 1. 02220-01 Typical Trench Detail
 - 2. 02528-01 Combined Curb and Gutter Details
 - 3. 02645-01 Typical Hydrant Installation Detail
 - 4. 02645-02 Water Valve Adjustment Detail
 - 5. 02645-03 Blow-off Valve
 - 6. 02665-01 Water Service Line
 - 7. 02665-02 Thrust Blocking Details
 - 8. 02665-04 Minimum Thrust Block Dimensions
 - 9. 02700-02 Standard Sanitary Sewer Manhole Detail (1995 rev.)
 - 10. 02700-02 Standard Sanitary Sewer Manhole Detail
 - 11. 02700-04 Typical Manhole Channel Details
 - 12. 02700-05 Sanitary Sewer Service Line
 - 13. 02700-06 Manhole Cover Detail
 - 14. 02665-05 Pipe Insulation Detail
 - 15. 02665-05 Pipe Insulation Detail #2
 - 16. 02776-01 Valley Gutter and Curb Turn Detail
- B. ADD the following Standard Details bound following these amendments and supplements:
 - 1. Type A Curb and Gutter
 - 2. Type A-1 Curb and Gutter
 - 3. Type B Curb and Gutter
 - 4. Concrete Curbwalk (Standard)
 - 5. Concrete Curbwalk (Alternate)
 - 6. Handicap Ramp
 - 7. Handicap Ramp Boulevard
 - 8. Boulevard Sidewalk Section
 - 9. Concrete Valley Gutter – Section
 - 10. Alley and Driveway Apron
 - 11. Bollard Detail
 - 12. Sanitary Sewer Manhole Detail
 - 13. Manhole Inverts
 - 14. Sanitary Sewer Service Connection Detail
 - 15. Thrust Block Notes and Details – Sheet 1 of 2
 - 16. Thrust Block Notes and Details – Sheet 2 of 2
 - 17. Valve Detail
 - 18. Fire Hydrant Detail
 - 19. Water Service Connection Detail
 - 20. Meter Pit Detail
 - 21. Miscellaneous Water Line Replacement – Typical Section/Trench Detail

22. Typical Trench Detail
23. Air Release Manhole
24. Valve Restraint Block Detail
25. Standard Catch Basin

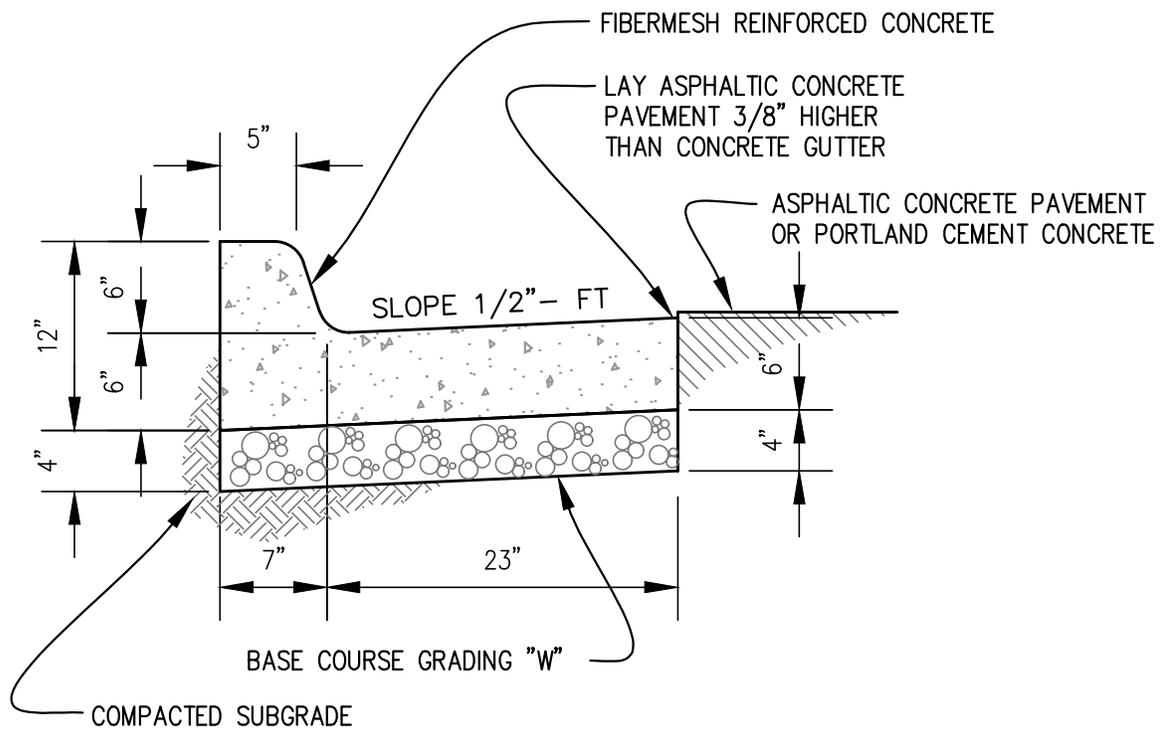


TYPE A CURB & GUTTER
 NOT TO SCALE



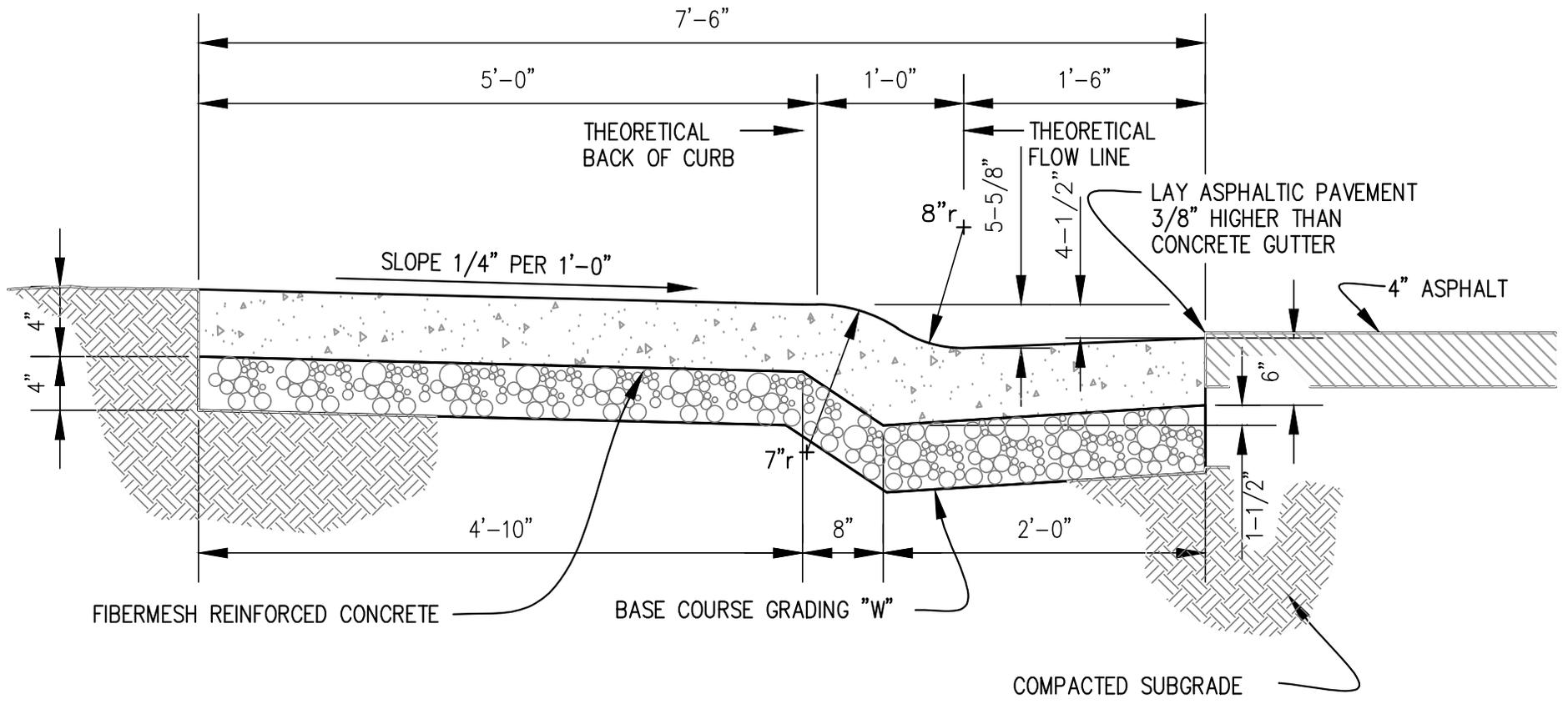
TYPE A-1 CURB & GUTTER

NOT TO SCALE



TYPE B CURB & GUTTER

NOT TO SCALE

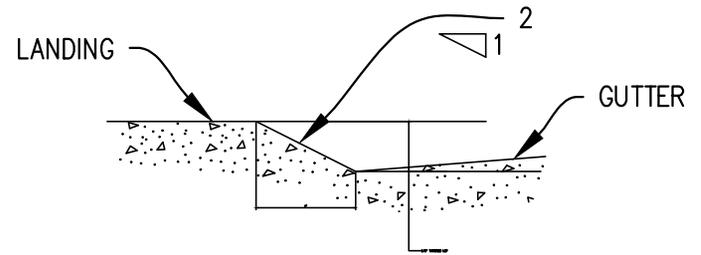
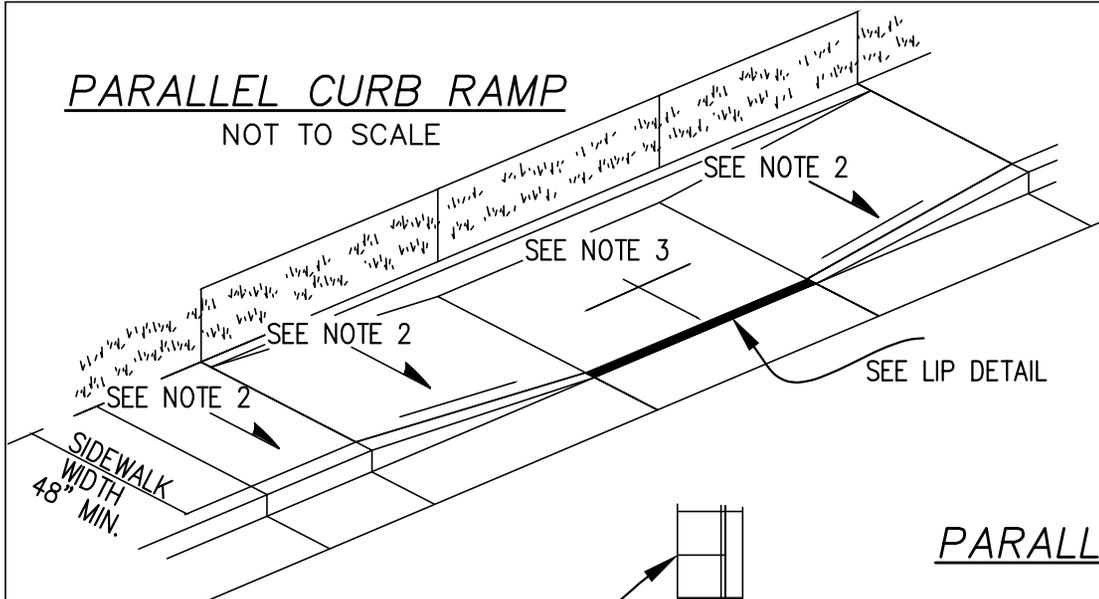


CONCRETE CURBWALK (STANDARD)

NOT TO SCALE

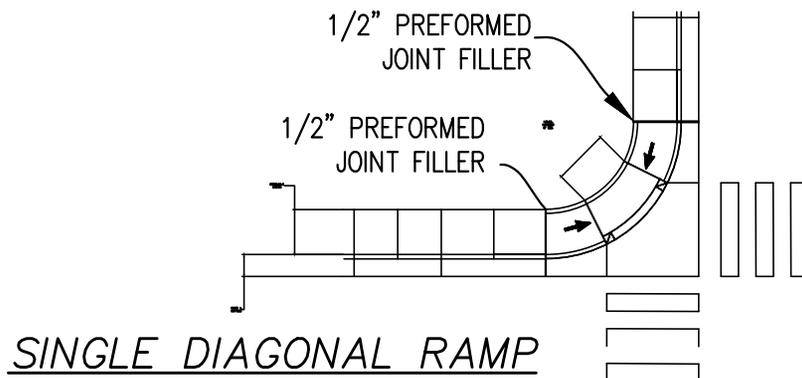
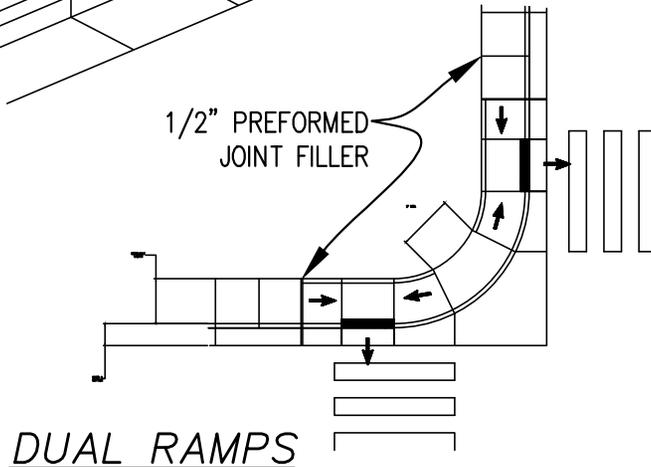
PARALLEL CURB RAMP

NOT TO SCALE



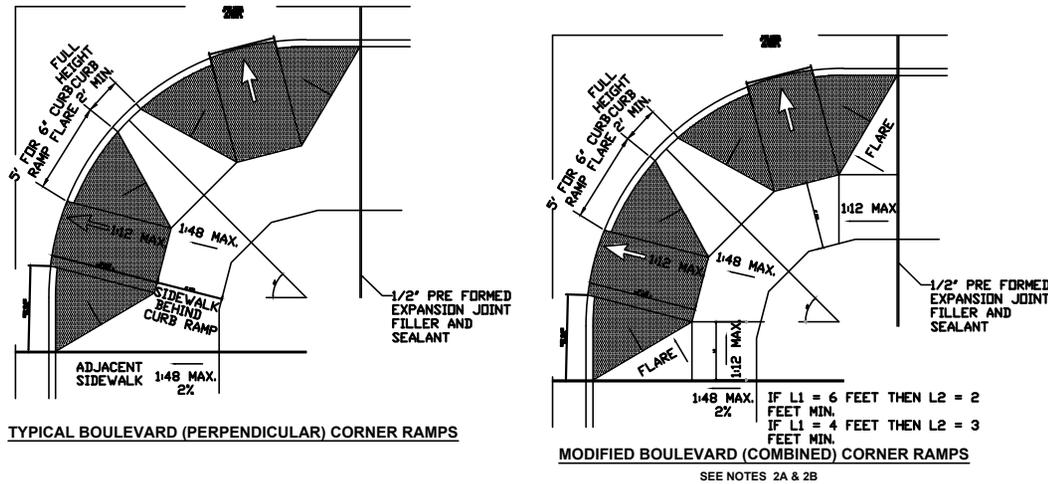
LIP DETAIL

PARALLEL CURB RAMP REQUIREMENTS



- ➔ 1. RAMP SLOPE: RAMP SLOPE SHALL BE 1:12. RAMP SLOPE SHALL NOT EXCEED 1:12 EXCEPT FOR SHORT RAMPS AS SHOWN HEREIN.
- ➔ 2. CROSS SLOPE: POSITIVE DRAINAGE SHALL BE PROVIDED BY SLOPING SIDEWALK AND/OR RAMP TOWARDS STREET AT 1:48. CROSS SLOPE SHALL NOT EXCEED 1:48.
- ➔ 3. LANDING SLOPE: LANDING SLOPE SHALL NOT EXCEED 1:48 IN ANY DIRECTION. POSITIVE DRAINAGE SHALL BE PROVIDED TOWARDS THE STREET AS SHOWN BY SINGLE TIP ARROW. LANDING CAN BE SLOPED IN EITHER DIRECTION TO A MAXIMUM OF 1:48 AS SHOWN BY DOUBLE TIP ARROW.
- ➔ 4. SINGLE DIAGONAL VS. DUAL CURB RAMPS: RAMPS ARE STRONGLY PREFERRED, HOWEVER, IT MAY BE NECESSARY AT SOME LOCATIONS TO PROVIDE ONLY ONE SINGLE DIAGONAL RAMP AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.
- ➔ 5. LIP DETAIL: STANDARD CURB RAMPS WILL REQUIRE THE FOLLOWING LIP DETAIL TO REDUCE THE AMOUNT OF NUISANCE DRAINAGE IN THE LANDING AREA.

BOULEVARD (PERPENDICULAR) CURB RAMP REQUIREMENTS



TYPE I CURB RAMPS SHALL BE CONSTRUCTED WHEN AVAILABLE RIGHT-OF-WAY PERMITS THEIR USE.

RAMP SLOPE: 1. ALLOWS A MAXIMUM SLOPE OF 1:10 IN EXISTING FACILITIES WHERE A 1:12 IS NOT POSSIBLE AS DEFINED IN ADA AS SITE INFEASIBILITY.

RAMP LENGTH: 2A. WHEN THE RAMP RISES ON A 1:12 TO CATCH THE ADJACENT SIDEWALK WHICH IS ALSO RISING ABOVE THE TOP OF CURB ELEVATION ON A 1:48 CROSS SLOPE. IF A PLANTING OR OTHER NON PEDESTRIAN AREA IS ADJACENT TO THE SIDEWALK AND THE RAMP ONLY HAS TO RISE 6" THE RAMP LENGTH IS 6'.

RAMP LENGTH: 2B. RAMP SYSTEM REDUCES THE HEIGHT THE RAMP MUST RISE THEREBY REDUCING THE LENGTH OF THE PERPENDICULAR RAMP.

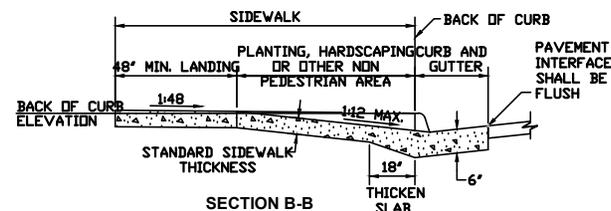
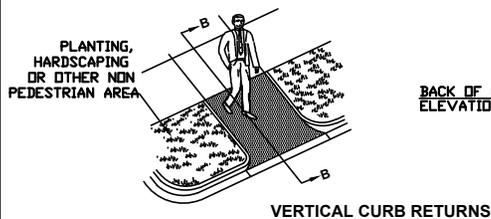
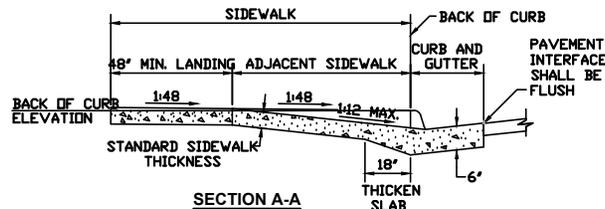
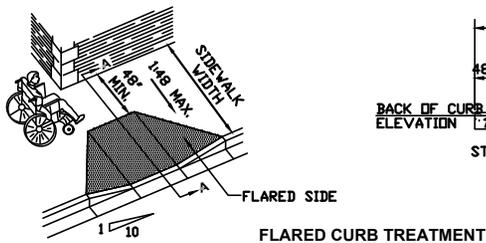
RAMP WIDTH: 3. POSSIBLE, 4' IN OTHER LOCATIONS, AND WHERE SITE INFEASIBILITY EXISTS ABSOLUTELY NO NARROWER THAN 3'.

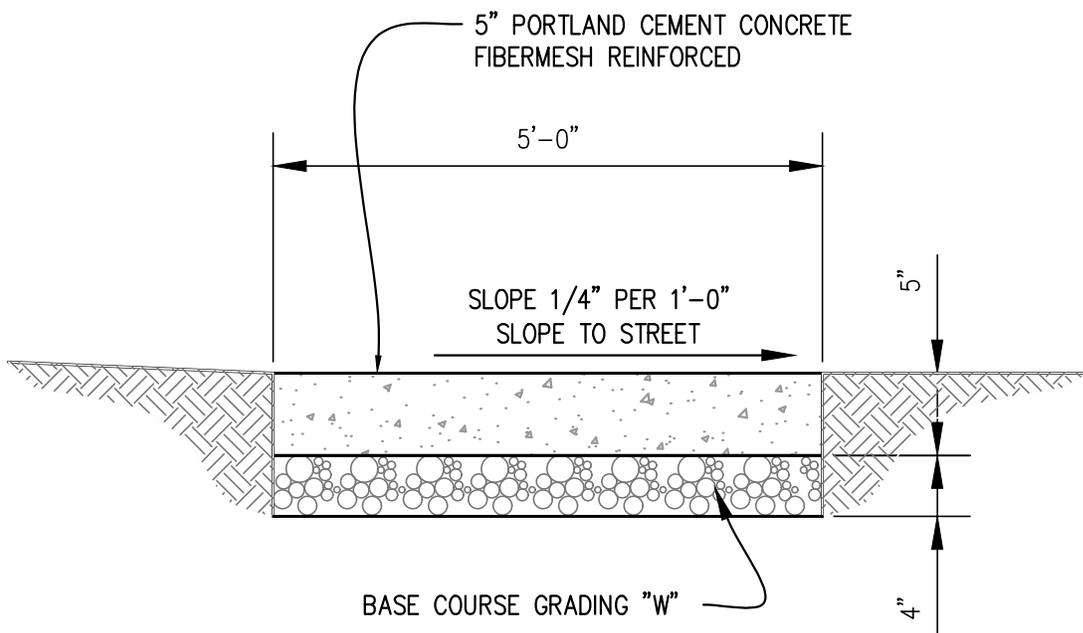
LEVEL LANDINGS: 4. DIRECTION DOES NOT EXCEED 1:48) SHALL BE PROVIDED AT THE TOP OF THE RAMP AND BE 48" MINIMUM IN THE LONGITUDINAL DIRECTION OF THE RAMP TO ALLOW FOR WHEELCHAIRS TURNING ONTO THE RAMP.

FLARED VS VERTICAL CURB RETURNS: 5. REQUIRED WHEN SIDEWALK IS LOCATED ADJACENT TO THE RAMP (SEE DETAIL). THE FLARE RATE ALONG THE CURB LINE SHALL NOT EXCEED 1:10. IF THE SIDES OF THE RAMP ARE ADJACENT TO A PLANTING, STRUCTURE OR OTHER NON PEDESTRIAN SURFACE, THE CURB RETURNS CAN BE VERTICAL. CURB RETURNS AND FLARES WILL BE MEASURED AND PAID FOR AS SIDEWALK.

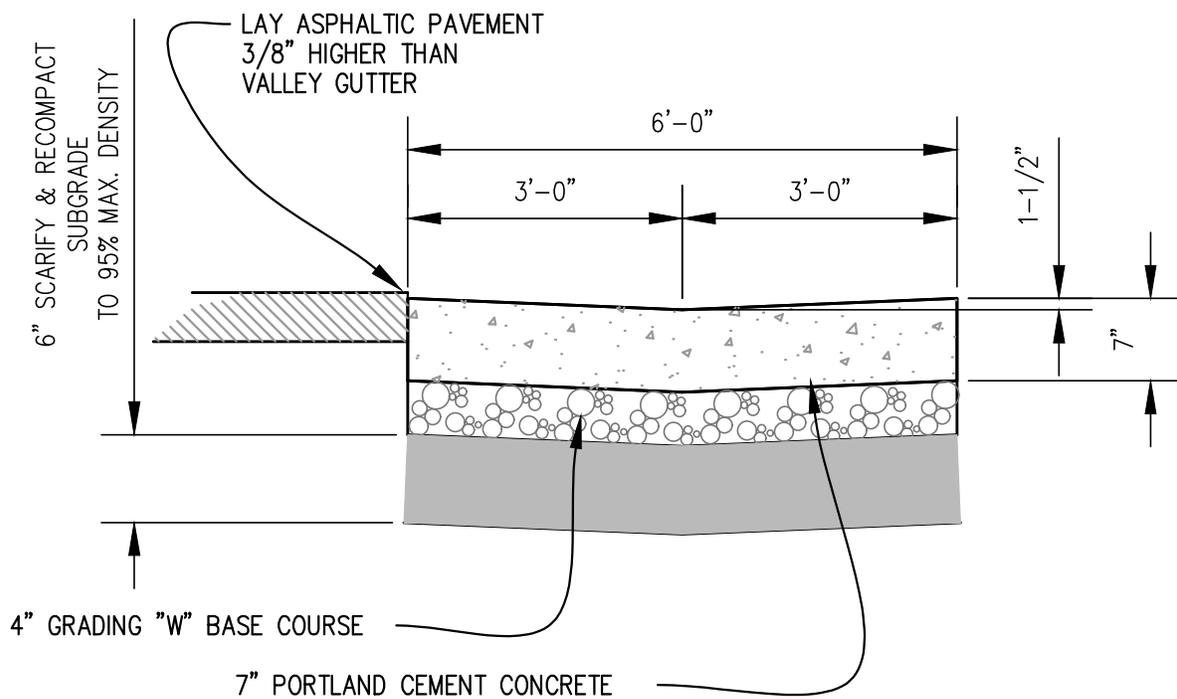
DIAGONAL VS DUAL CURB RAMPS: 6. RAMPS FOR INTERSECTIONS WITH TWO DIRECTIONS OF PEDESTRIAN MOVEMENT TEND TO CREATE MORE MOTOR VEHICLE CONFLICTS WITH PEDESTRIANS AND ARE DISCOURAGED. SITE INFEASIBILITY CONDITIONS MAY DICTATE A SINGLE DIAGONAL WHEELCHAIR BUT IS ONLY PERMITTED WHERE SHOWN IN THE PLANS OR DETERMINED BY THE ENGINEER.

INTERSECTION LOCATION: 7. CLOSE TO THE INTERSECTION AS POSSIBLE AND SHALL BE FULLY CONTAINED WITHIN PEDESTRIAN CROSSING MARKINGS WHERE PRESENT. CURB RAMPS SHALL BE PERPENDICULAR TO THE CURB AS SHOWN.





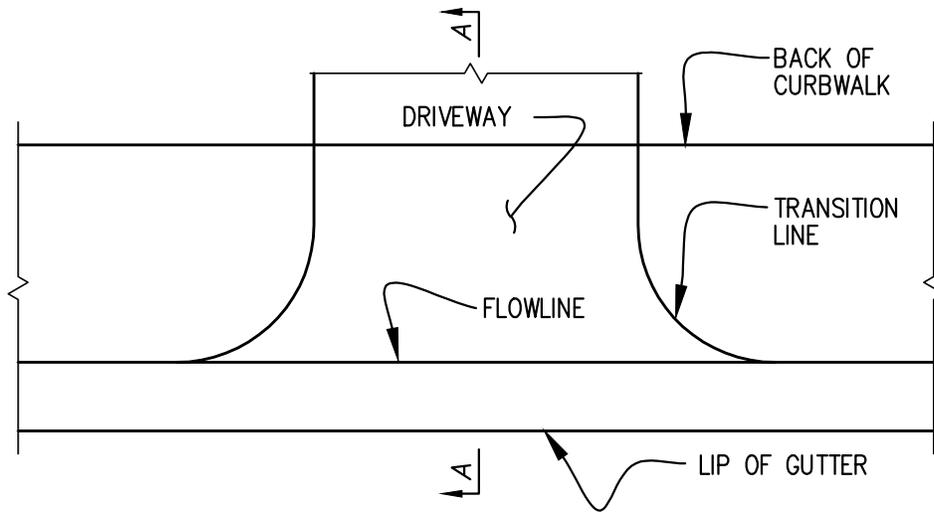
BOULEVARD SIDEWALK SECTION
NOT TO SCALE



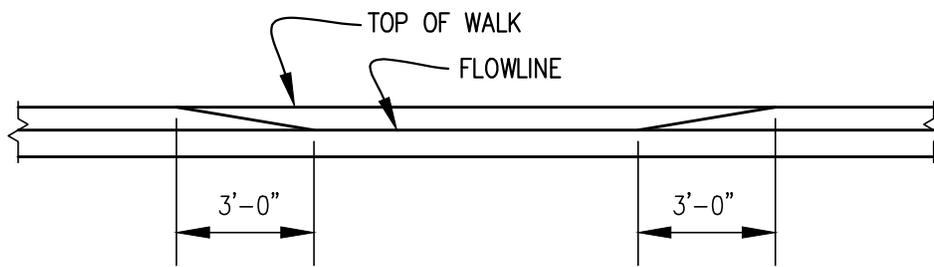
NOTES:

VALLEY GUTTERS SHALL BE REINFORCED WITH POLYPROPYLENE FIBERS OR NO. 4 BARS AT 18 INCHES O.C. EACH WAY

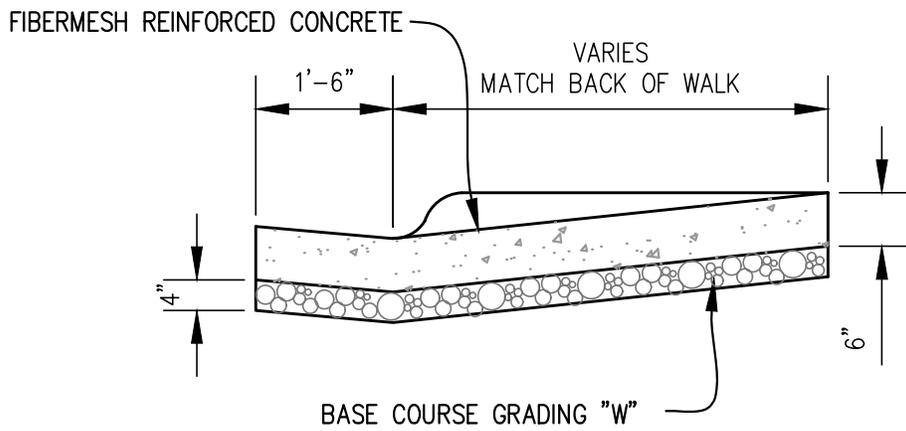
CONC VALLEY GUTTER – SECTION
NOT TO SCALE



CURBWALK PLAN @ DRIVEWAY

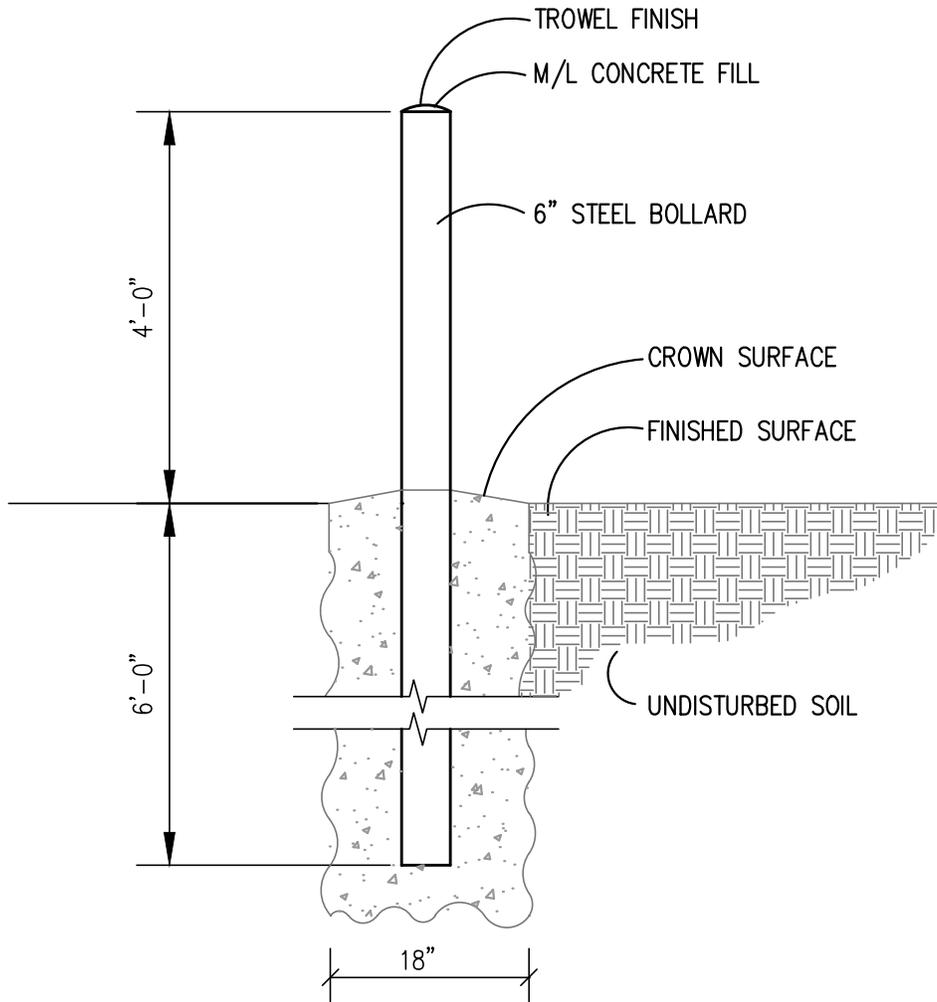


ELEVATION

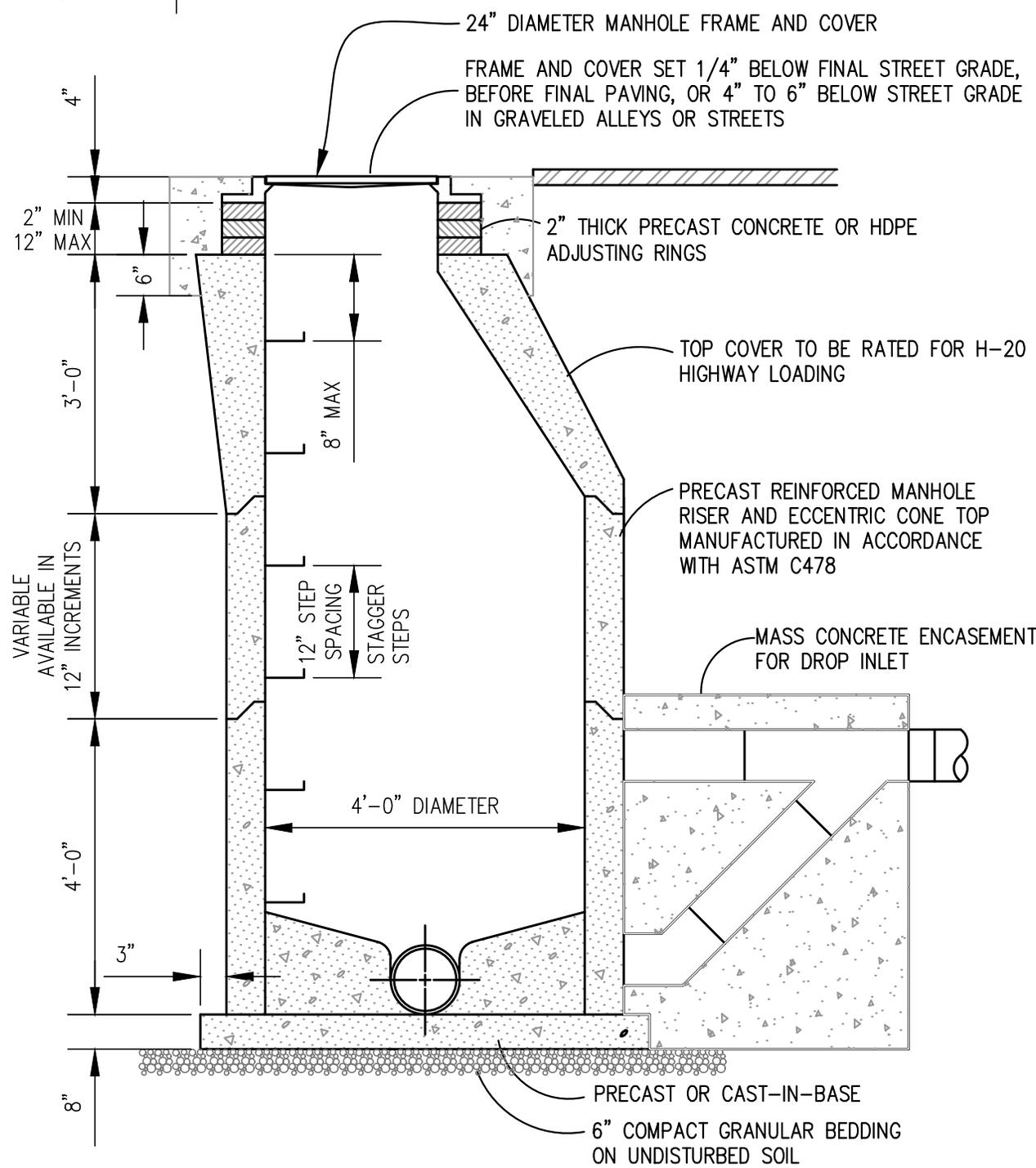
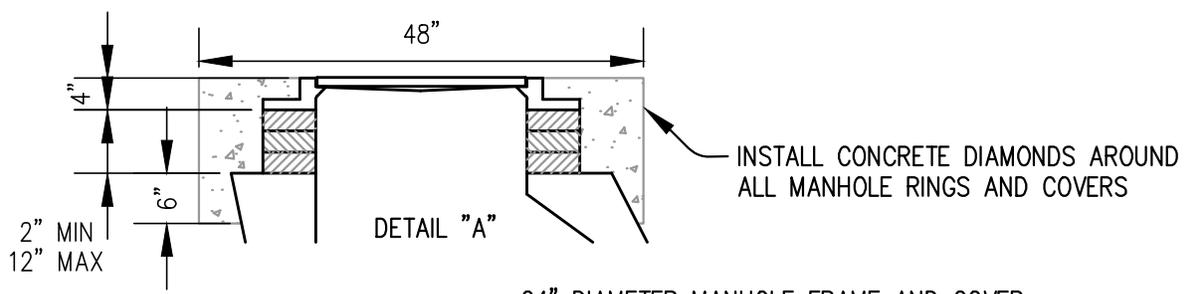


SECTION A-A

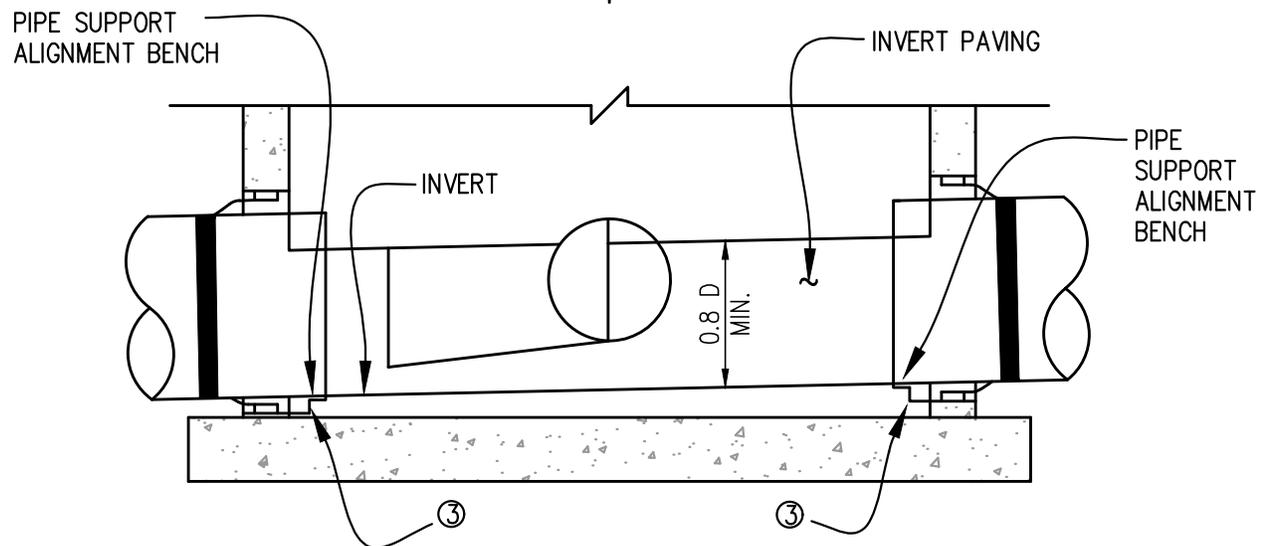
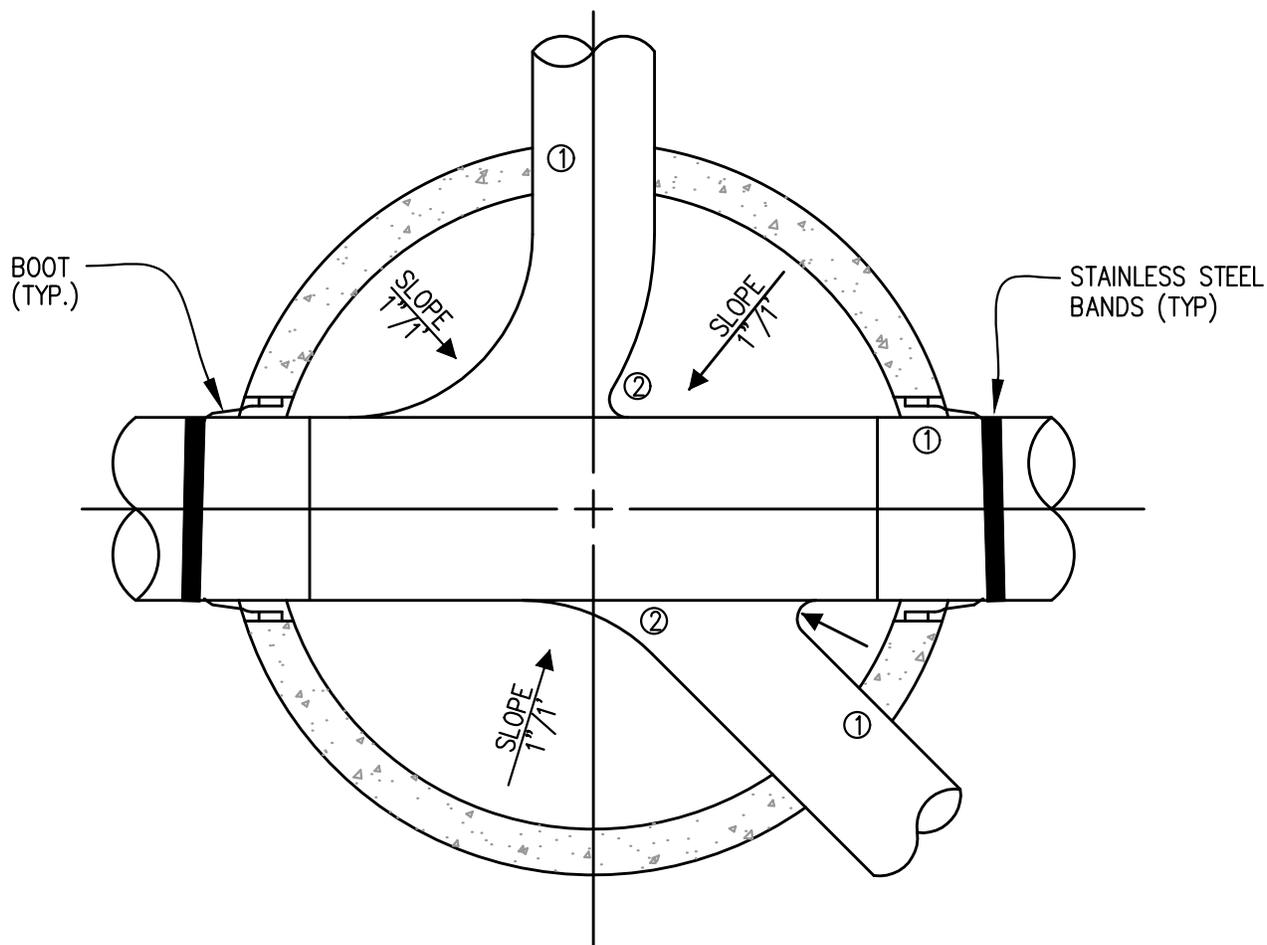
ALLEY AND DRIVEWAY APRON
NOT TO SCALE



BOLLARD DETAIL
NOT TO SCALE



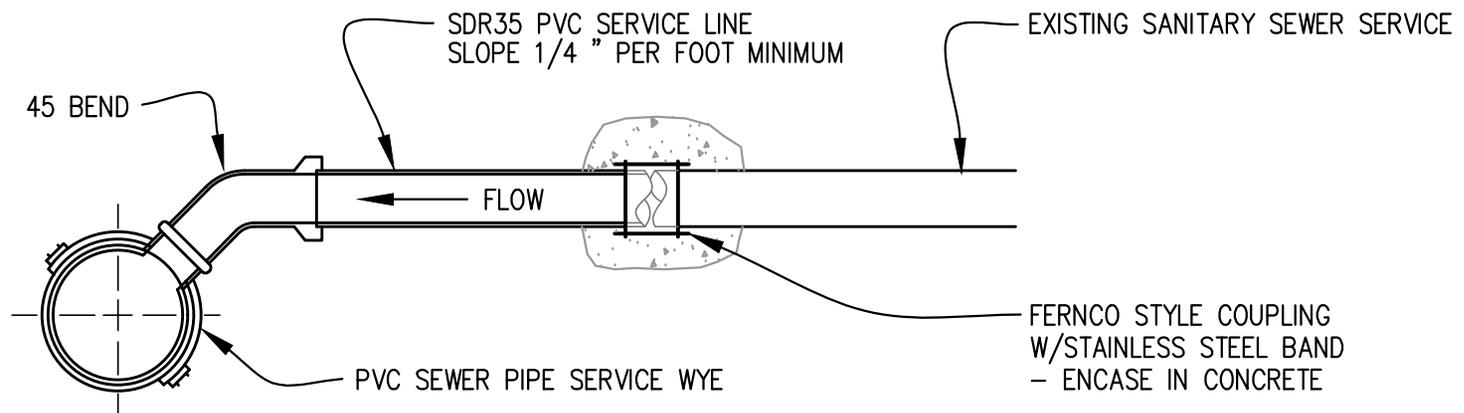
SANITARY SEWER MANHOLE DETAIL
 NOT TO SCALE



NOTES:

- ① 0.1 FOOT DROP BETWEEN THE INLET AND THE OUTLET INVERTS IS REQUIRED UNLESS NOTED ON THE PLANS.
- ② CURVED TRANSITIONS ARE REQUIRED.
- ③ GROUT ANNULAR SPACE AROUND THE PIPE.

MANHOLE INVERTS
NOT TO SCALE



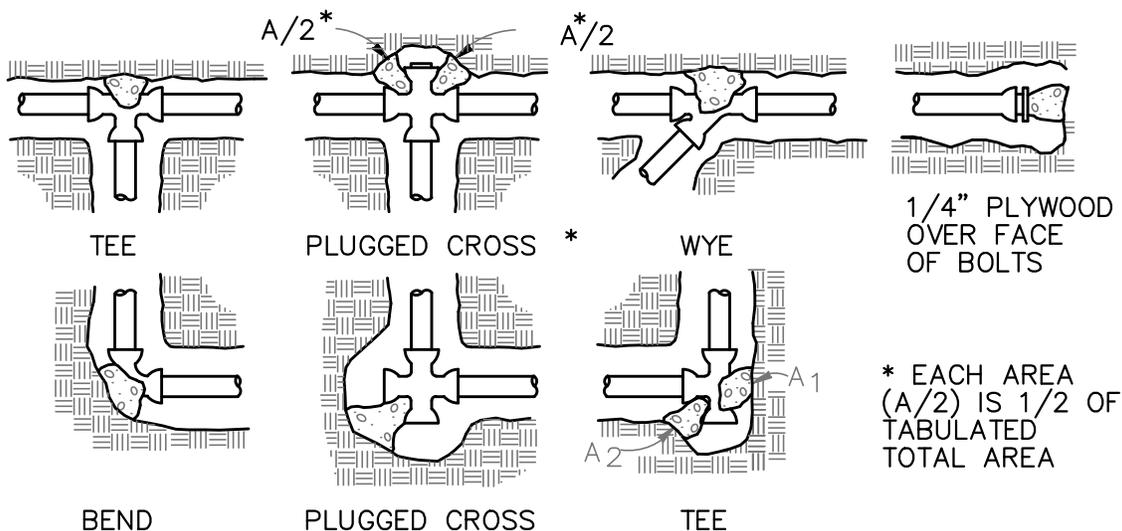
SANITARY SEWER SERVICE CONNECTION DETAIL

NOT TO SCALE

THRUST BLOCK NOTES

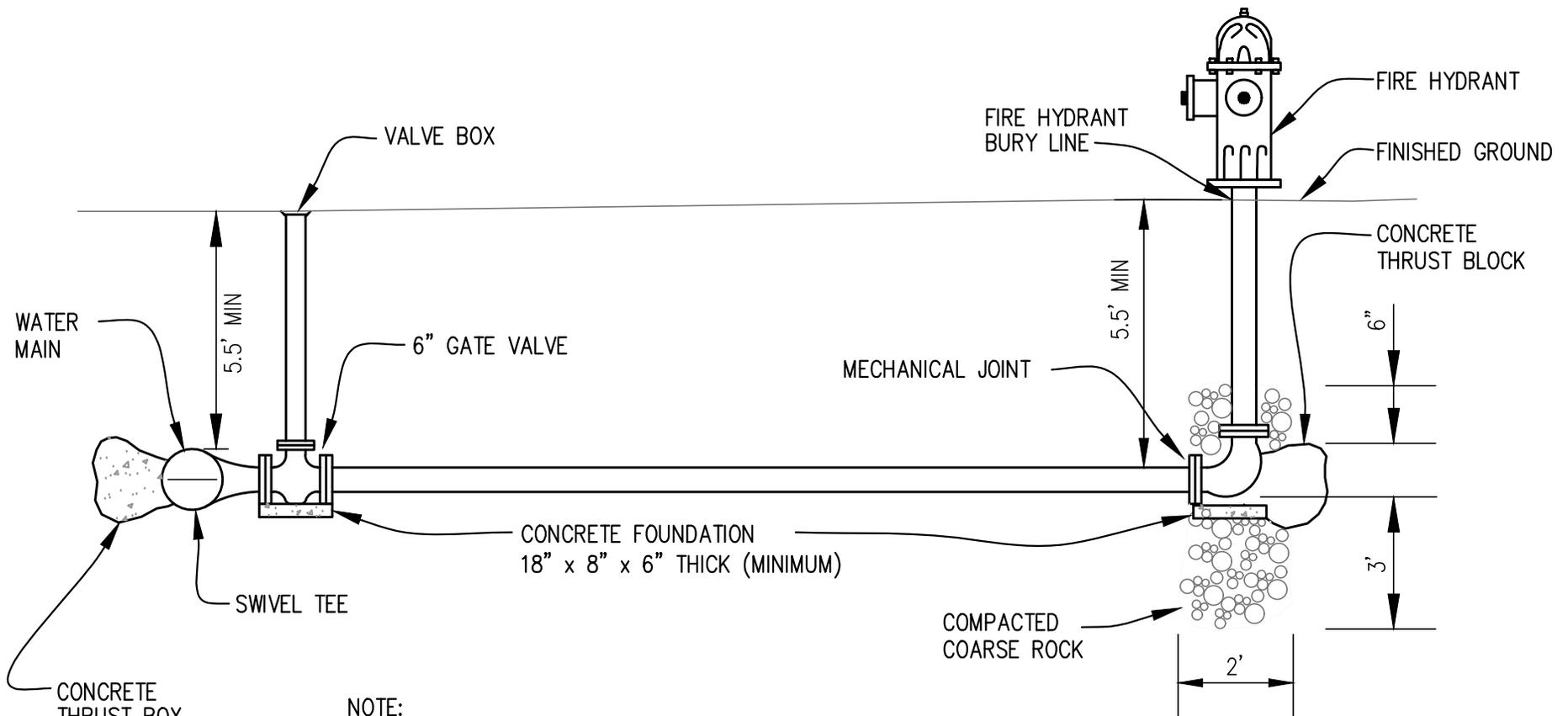
1. KEEP CONCRETE CLEAR OF JOINT AND JOINT ACCESSORIES. INSTALL POLY WRAP ALONG FITTING AND THRUST BLOCK INTERFACE.
2. CONCRETE THRUST BLOCKING SHALL BE POURED AGAINST UNDISTURBED EARTH. WRAP FITTING W/POLYETHYLENE SHEETING TO PREVENT CONCRETE FROM BONDING TO FITTING.
3. REQUIRED VOLUMES OR BEARING AREAS AT FITTINGS SHALL BE AS INDICATED, ADJUSTED, IF NECESSARY, TO CONFORM TO THE TEST PRESSURE(S) AND ALLOWABLE SOIL BEARING STRESS(ES) STATED IN THE SPECIFICATIONS.
4. THRUST BLOCKS FOR VERTICAL BENDS HAVING DOWNWARD RESULTANT THRUSTS SHALL BE THE SAME AS FOR HORIZONTAL BENDS.
5. BEARING AREA OF THRUST BLOCK SHALL NOT BE LESS THAN 1.0 SQ FT.
6. PROVIDE 18LB ZINC ANODE ON ALL FITTINGS UNDER 24" DIAMETER & 2-18LB ZINE ANODES ON ALL FITTINGS 24" DIAMETER AND ABOVE.
7. PROVIDE MEGALUGS ON ALL FITTINGS. MEGALUGS SHALL BE COATED WITH FUSION BONDED EPOXY.
8. PREFABRICATED THRUST BLOCKS SHALL ONLY BE ALLOWED W/ ENGINEER OR OWNER APPROVAL

THRUST BLOCK DETAIL



PLAN
NTS

BEARING AREA OF THRUST BLOCKS IN SQ. FT. (HORIZONTAL BENDS)							
FITTING SIZE	TEE, WYE, PLUG, OR CAP	90°BEND PLUGGED CROSS	TEE PLUGGED RUN		BEND ANGLE		
			A ₁	A ₂	45°	22-1/2°	11-1/4°
4	1.0	1.4	1.9	1.4	1.0	–	–
6	2.1	3.0	4.3	3.0	1.6	1.0	–
8	3.8	5.3	7.6	5.4	2.9	1.5	1.0
10	5.9	8.4	11.8	8.4	4.6	2.4	1.2
12	8.5	12.0	17.0	12.0	6.6	3.4	1.7
14	11.5	16.3	23.0	16.3	8.9	4.6	2.3
16	15.0	21.3	30.0	21.3	11.6	6.0	3.0
18	19.0	27.0	38.0	27.0	14.6	7.6	3.8
20	23.5	33.3	47.0	33.3	18.1	9.4	4.7
24	28.2	40.1	58.0	40.3	21.8	11.4	5.7
30	33.4	47.0	69.0	48.1	25.8	13.5	6.8

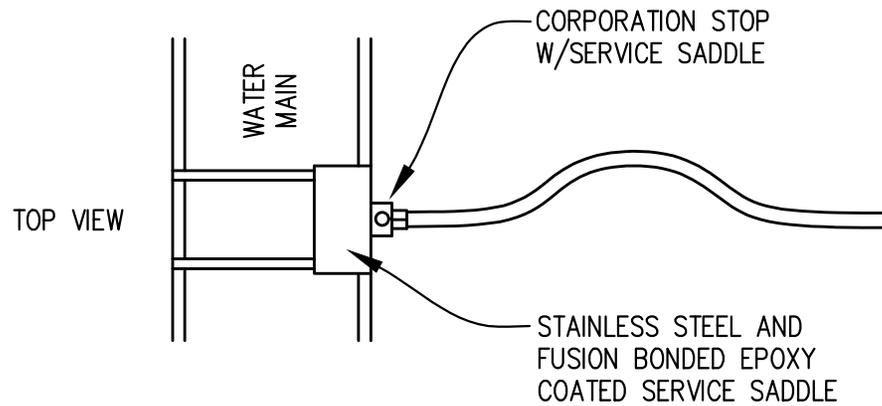
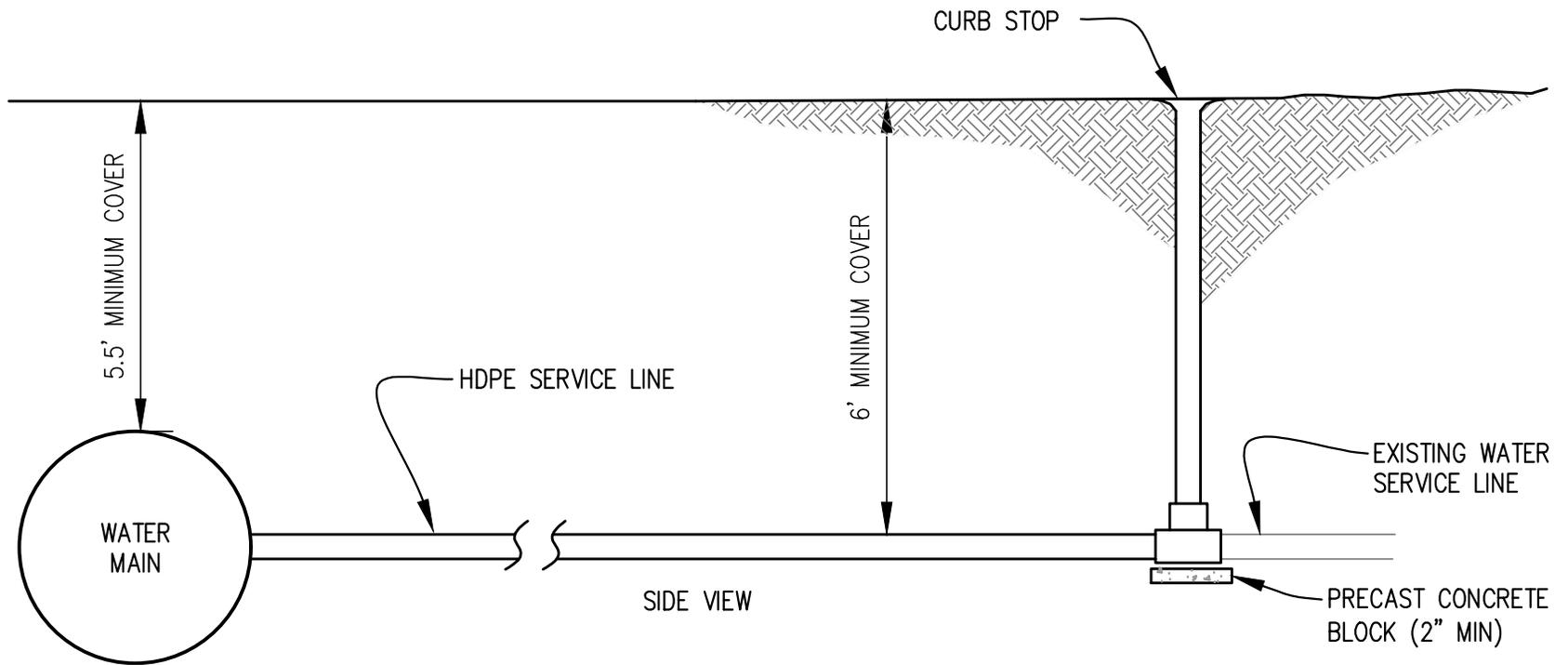


NOTE:

1. ALL NOTES PRESENTED IN THE STANDARD SPECIFICATIONS & AMENDMENTS FOR THE TYPICAL FIRE HYDRANT DETAIL SHALL APPLY.
2. REFERENCE STANDARD SPECIFICATIONS FOR MATERIALS AND MODEL NUMBERS FOR HYDRANTS, VALVES AND VALVE BOXES.

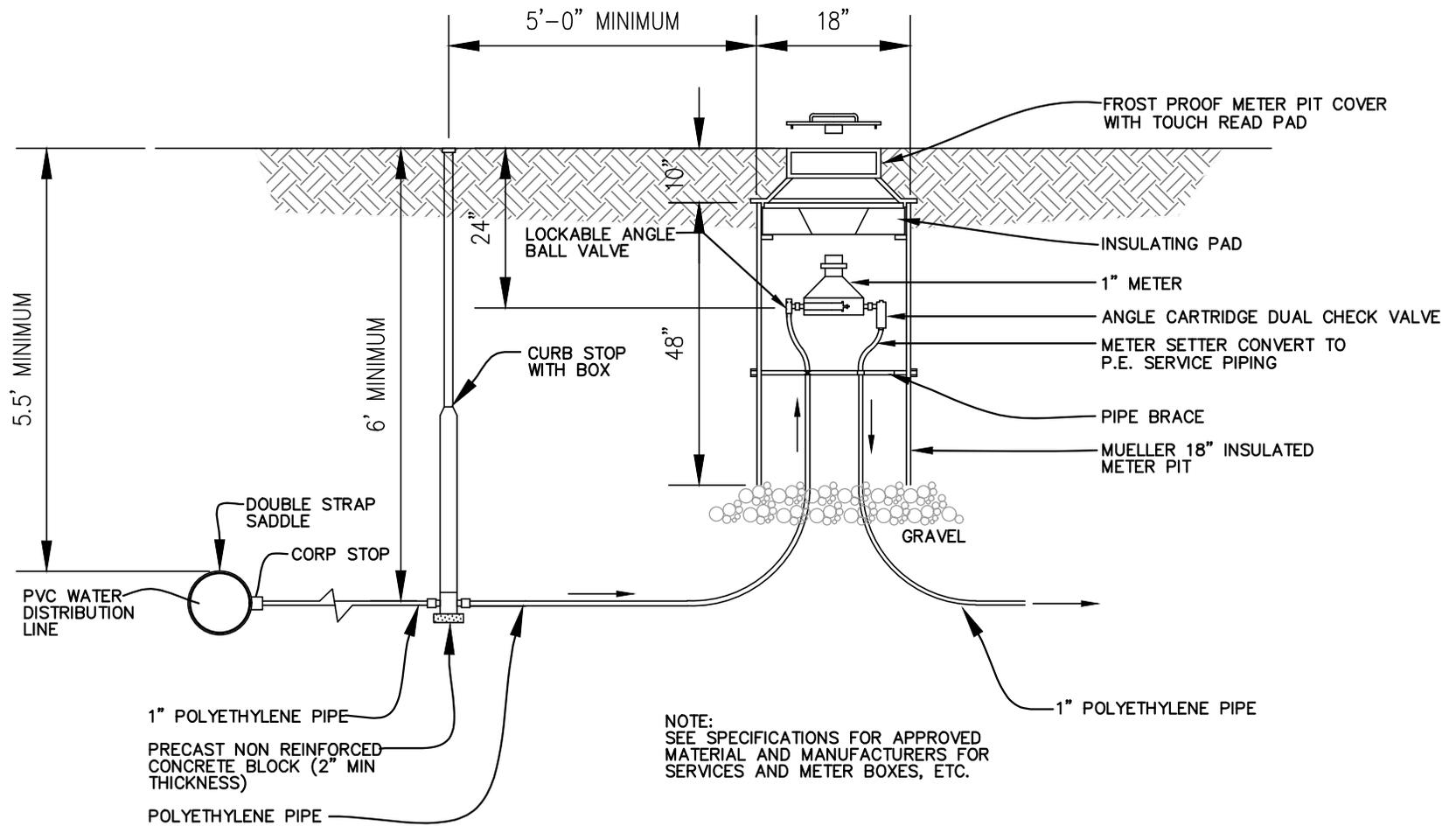
FIRE HYDRANT DETAIL

NOT TO SCALE



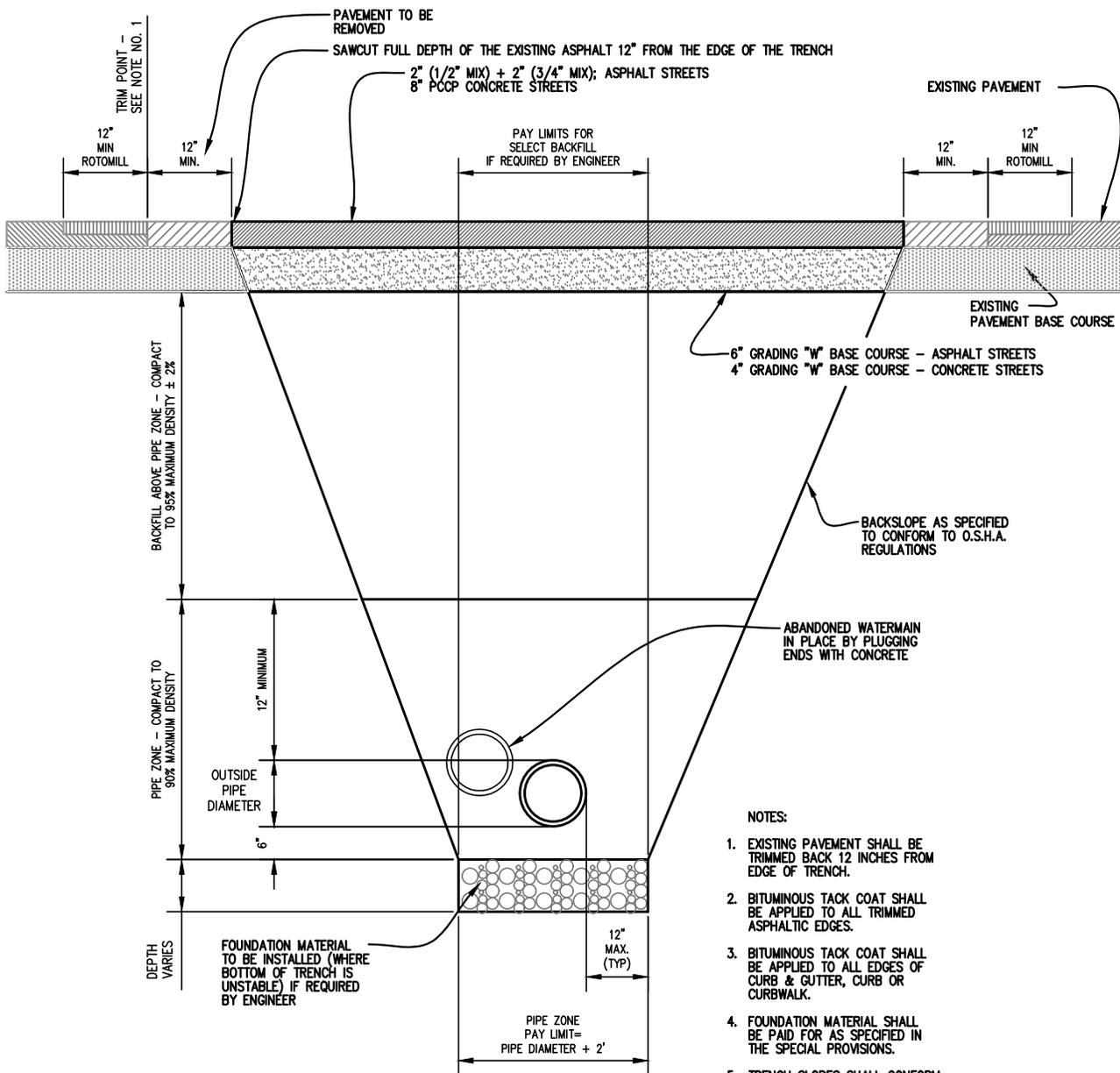
WATER SERVICE CONNECTION DETAIL

NOT TO SCALE



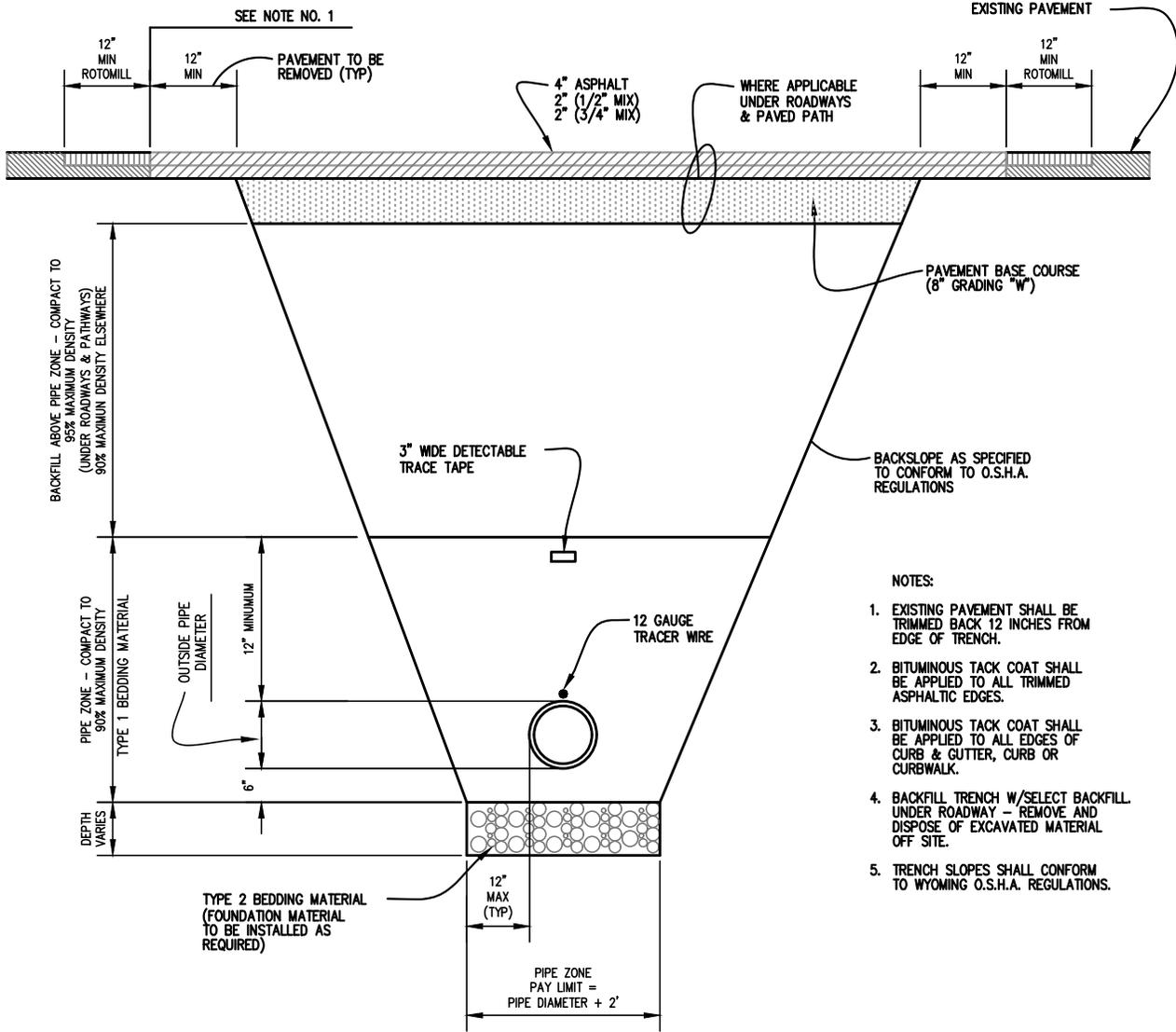
METER PIT DETAIL
NOT TO SCALE

THIS PAVEMENT SECTION TO BE USED FOR WATERLINE INSTALLATIONS ON STREETS NOT BEING RECONSTRUCTED



MISCELLANEOUS WATER LINE REPLACEMENT - TYPICAL SECTION/TRENCH DETAIL

NOT TO SCALE



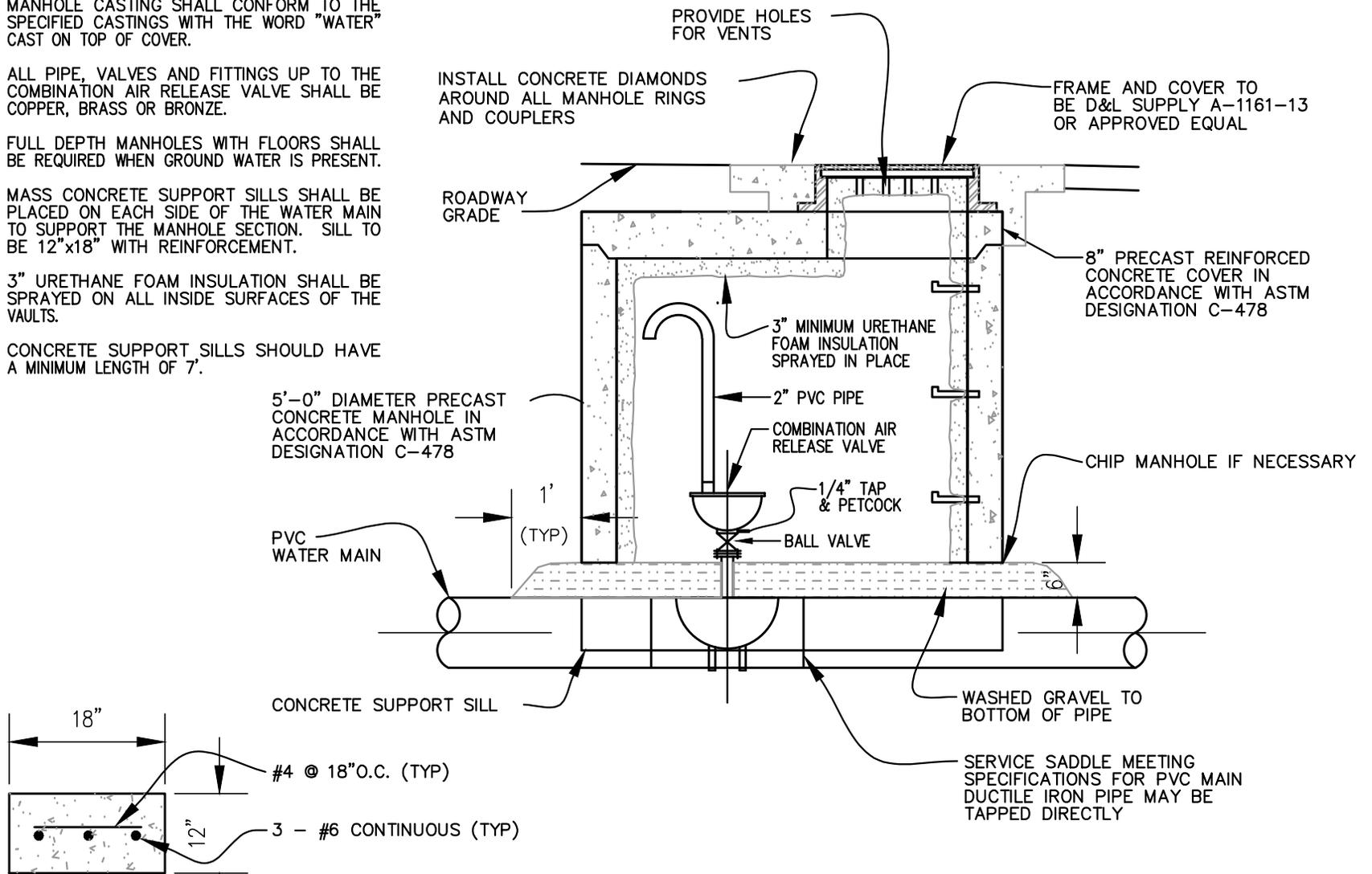
NOTES:

1. EXISTING PAVEMENT SHALL BE TRIMMED BACK 12 INCHES FROM EDGE OF TRENCH.
2. BITUMINOUS TACK COAT SHALL BE APPLIED TO ALL TRIMMED ASPHALTIC EDGES.
3. BITUMINOUS TACK COAT SHALL BE APPLIED TO ALL EDGES OF CURB & GUTTER, CURB OR CURBWALK.
4. BACKFILL TRENCH W/SELECT BACKFILL UNDER ROADWAY - REMOVE AND DISPOSE OF EXCAVATED MATERIAL OFF SITE.
5. TRENCH SLOPES SHALL CONFORM TO WYOMING O.S.H.A. REGULATIONS.

TYPICAL TRENCH DETAIL
NOT TO SCALE

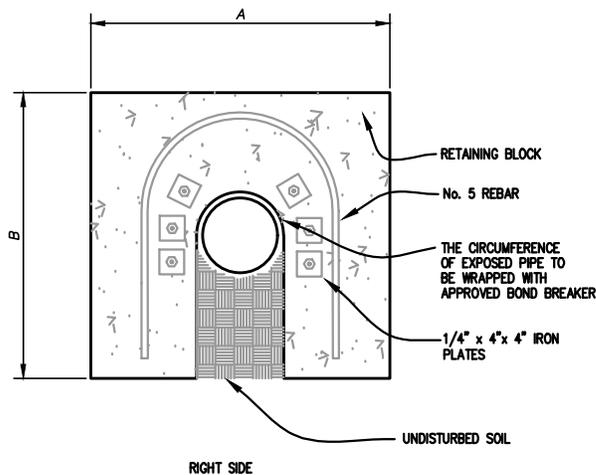
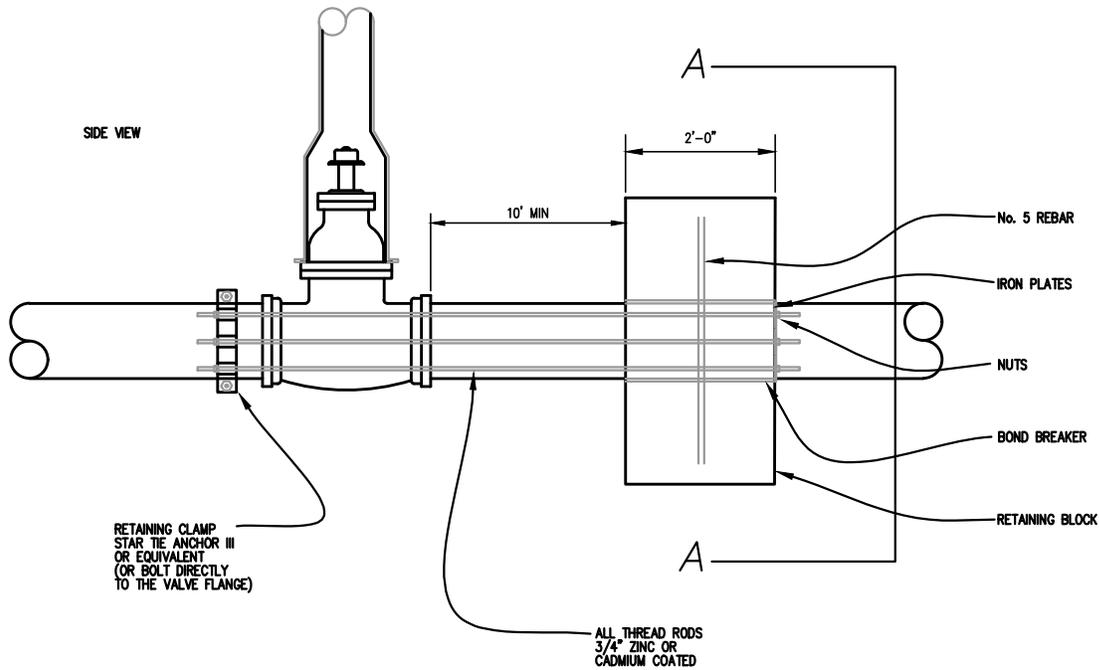
AIR RELEASE MANHOLE NOTES:

1. MANHOLE CASTING SHALL CONFORM TO THE SPECIFIED CASTINGS WITH THE WORD "WATER" CAST ON TOP OF COVER.
2. ALL PIPE, VALVES AND FITTINGS UP TO THE COMBINATION AIR RELEASE VALVE SHALL BE COPPER, BRASS OR BRONZE.
3. FULL DEPTH MANHOLES WITH FLOORS SHALL BE REQUIRED WHEN GROUND WATER IS PRESENT.
4. MASS CONCRETE SUPPORT SILLS SHALL BE PLACED ON EACH SIDE OF THE WATER MAIN TO SUPPORT THE MANHOLE SECTION. SILL TO BE 12"x18" WITH REINFORCEMENT.
5. 3" URETHANE FOAM INSULATION SHALL BE SPRAYED ON ALL INSIDE SURFACES OF THE VAULTS.
6. CONCRETE SUPPORT SILLS SHOULD HAVE A MINIMUM LENGTH OF 7'.



SILL DETAIL
NOT TO SCALE

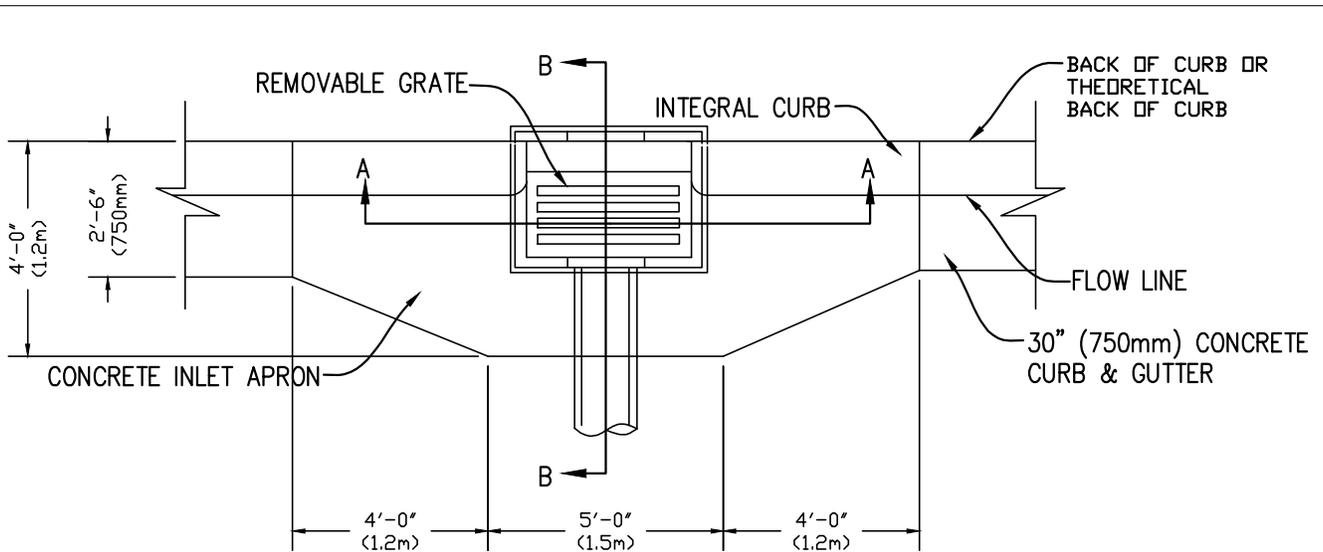
AIR RELEASE MANHOLE
NOT TO SCALE



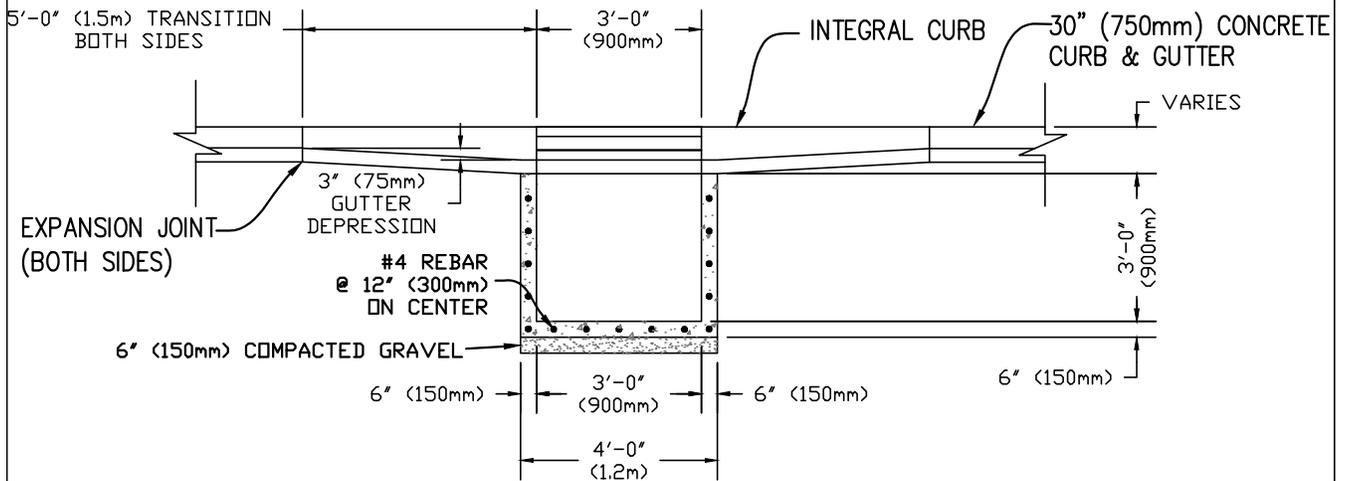
FITTING SIZES	A	B
4"	2'-4"	2'-0"
6"	2'-8"	2'-6"
8"	3'-6"	3'-3"
10"	3'-10"	3'-6"
12"	4'-0"	3'-10"

1. ALL CONCRETE MATERIAL SHALL BE POURED AND PLACED FIVE DAYS PRIOR TO ANY CONSTRUCTION WORK ON THE WATER MAIN. THREE DAYS LEAD TIME IS PERMISSIBLE, IF HI-EARLY STRENGTH CONCRETE IS USED.
2. RETAINER CLAMPS TO BE STAR TIE ANCHOR III OR EQUIVALENT.
3. VALVE RESTRAINTS TO BE APPROVED BY THE CPU PRIOR TO ANY CONSTRUCTION.
4. LOADING AND MATERIAL TO BE BASED ON 150 PSI WORKING PRESSURE WITH A MINIMUM SAFETY FACTOR OF 2:1
5. PLACE ALL COMPACTED BACKFILL OR SLURRY MIX BEFORE PRESSURIZING THE WATER MAIN.

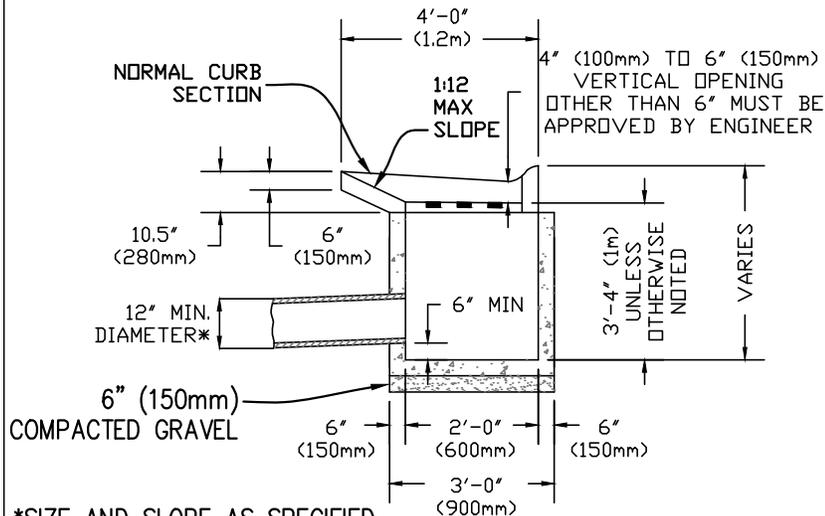
VALVE RESTRAINT BLOCK DETAIL
NOT TO SCALE



PLAN VIEW



SECTION A-A



*SIZE AND SLOPE AS SPECIFIED ON CONSTRUCTION DRAWINGS

SECTION B-B

STANDARD CATCH BASIN
NOT TO SCALE