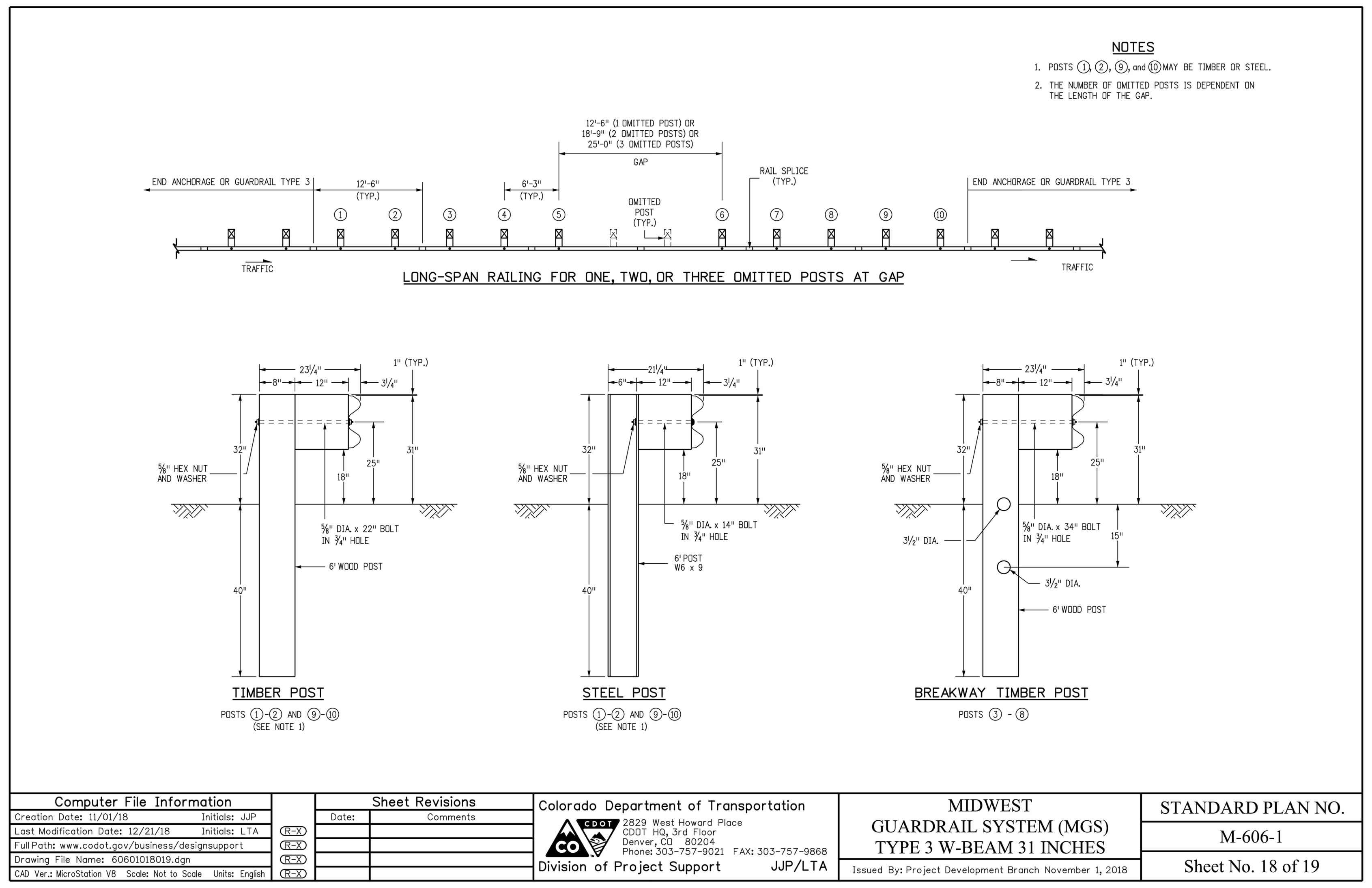

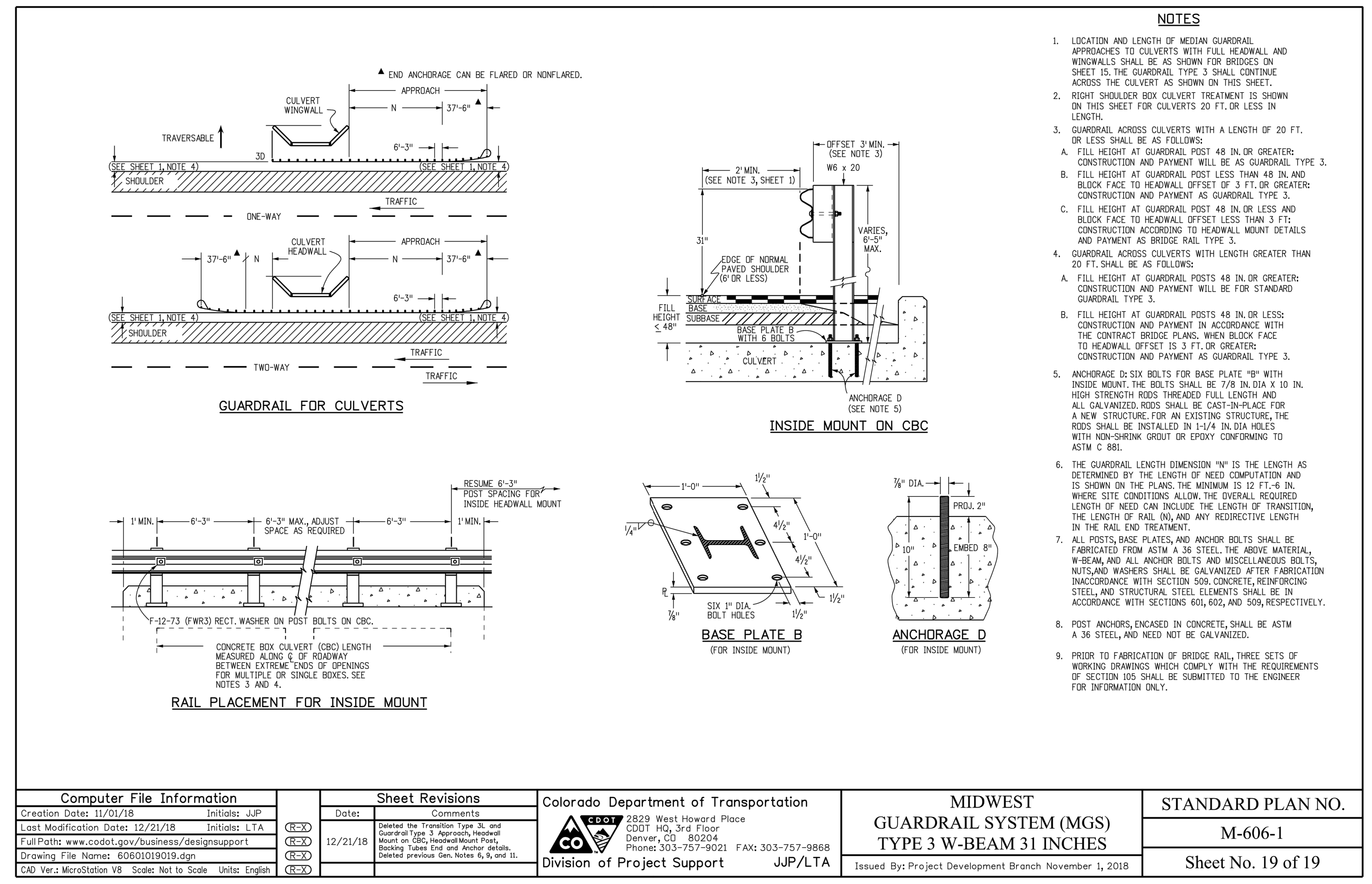

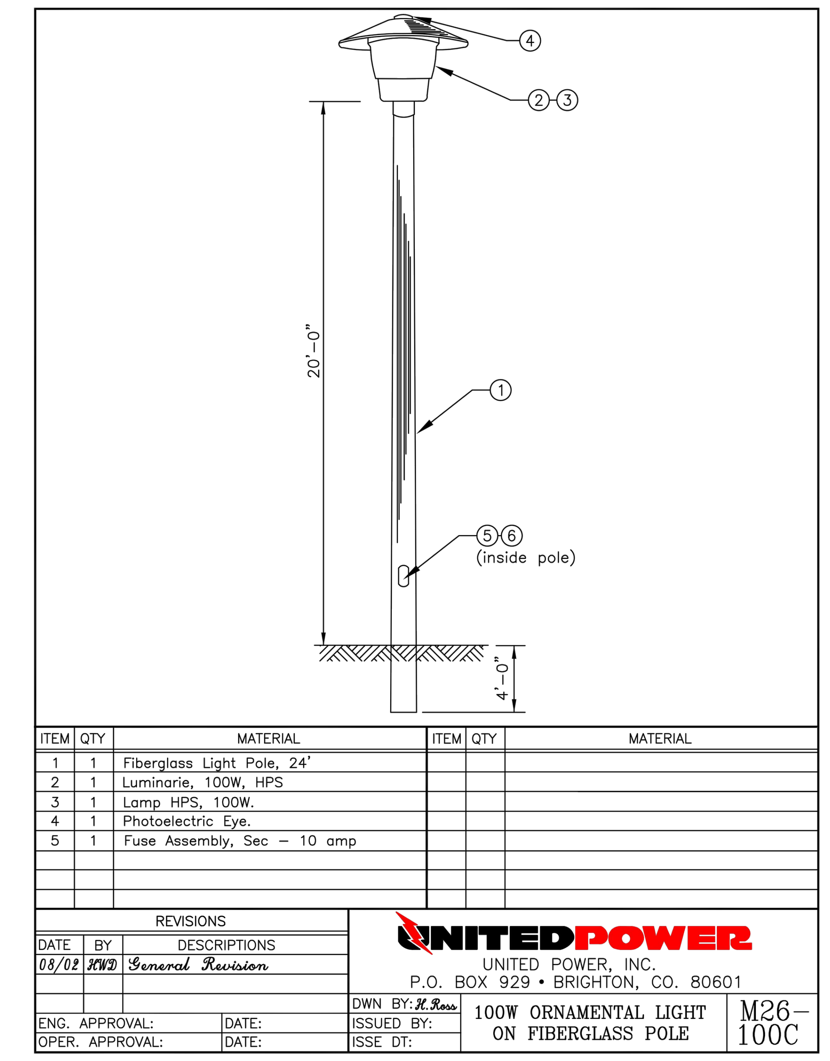

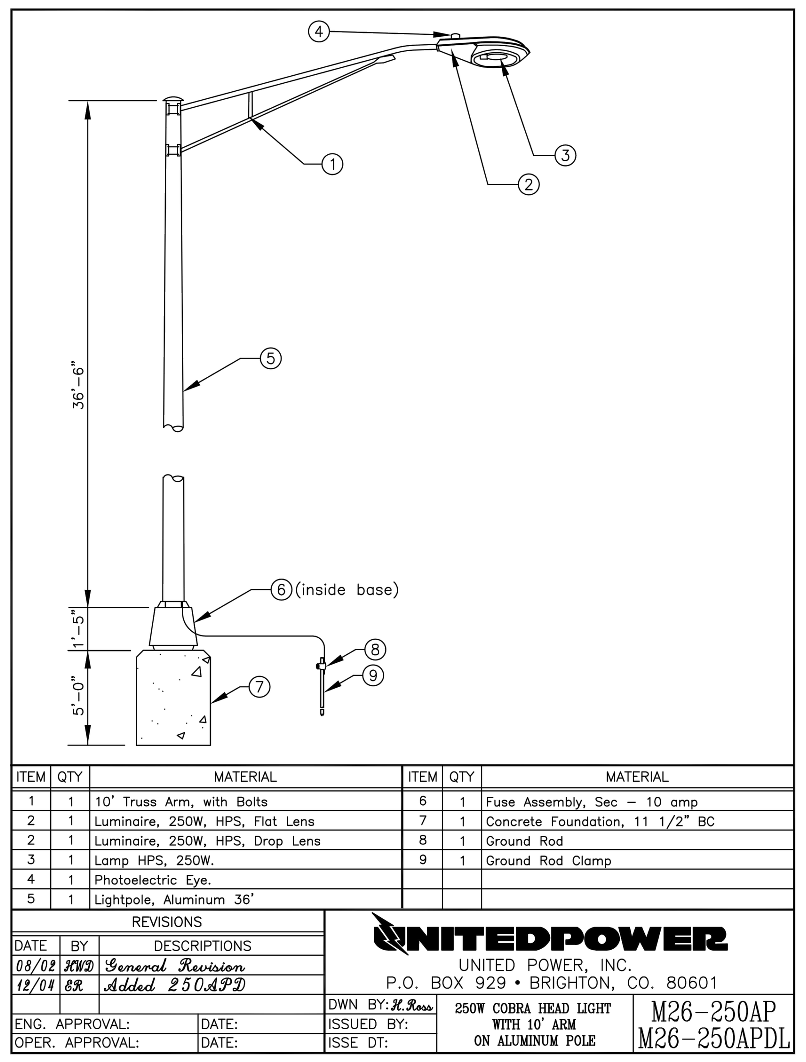

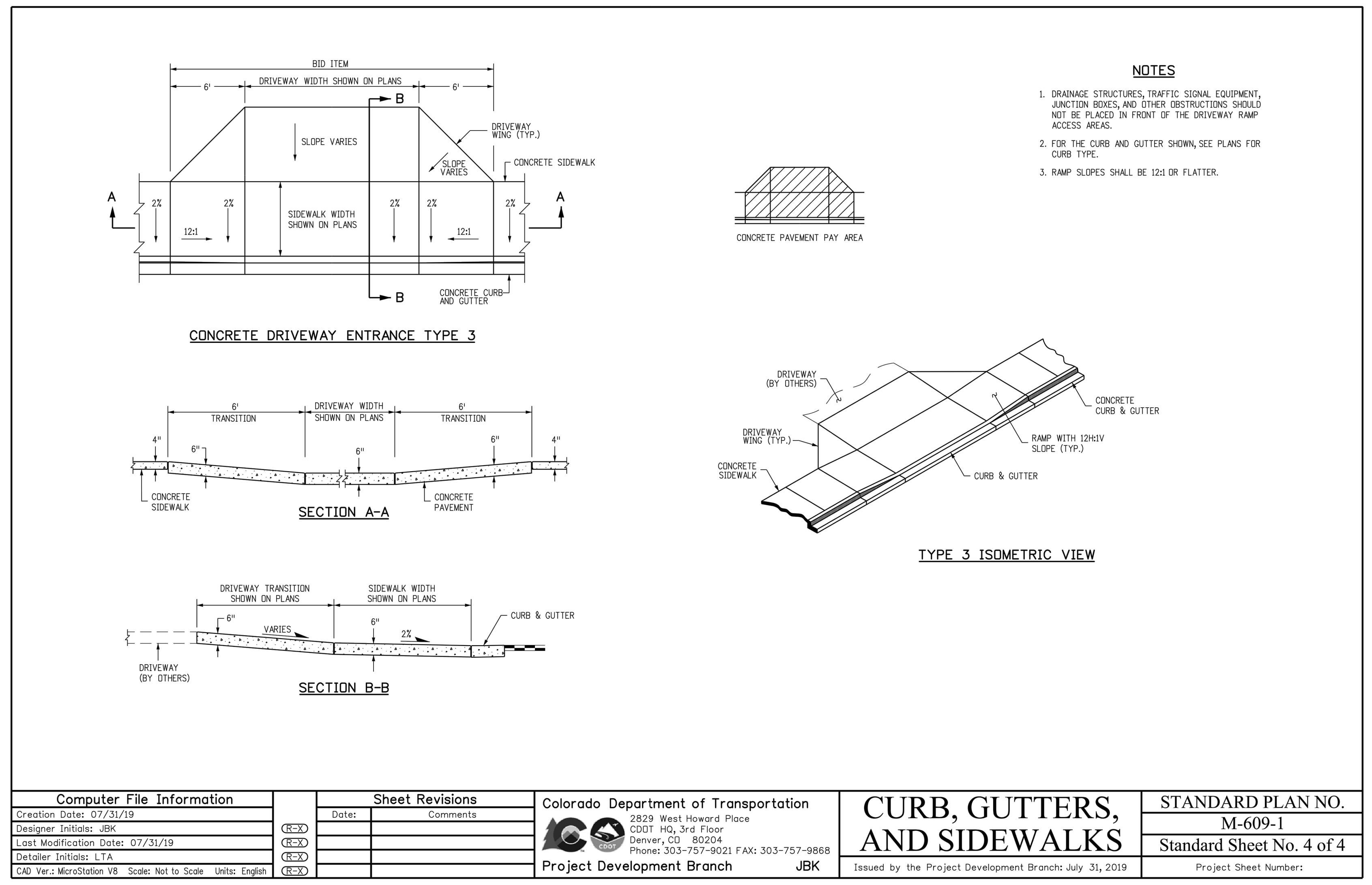

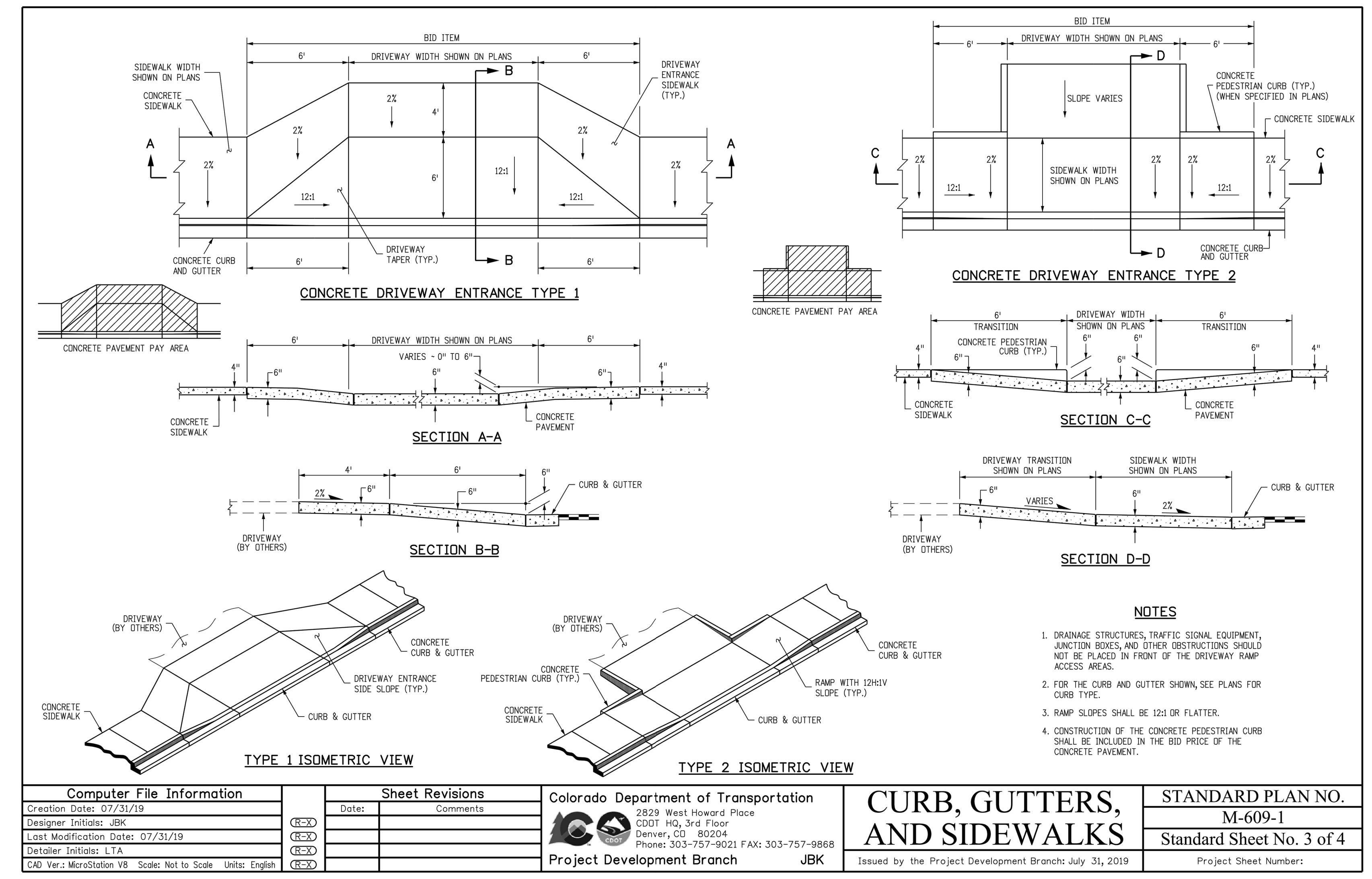

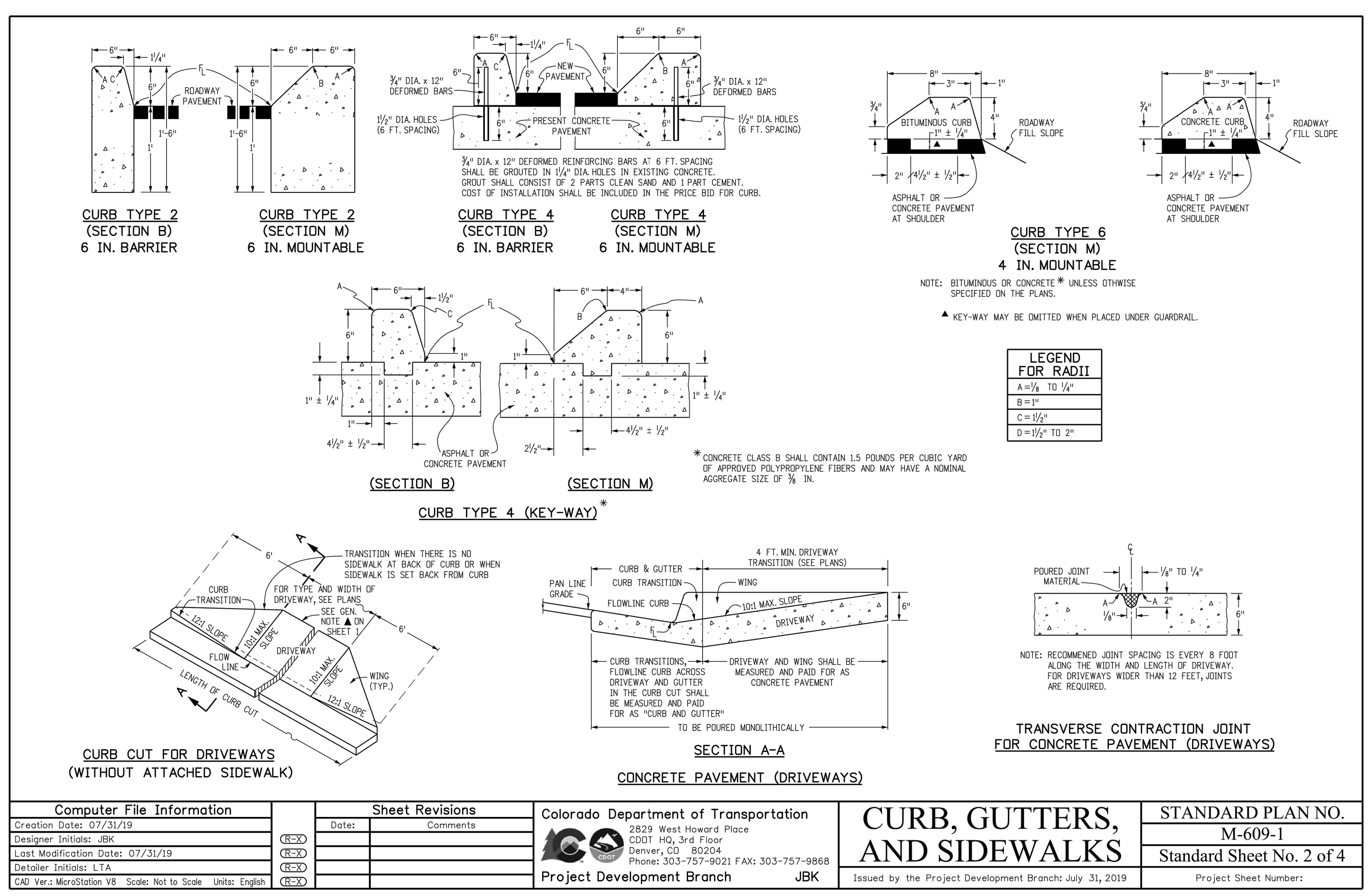

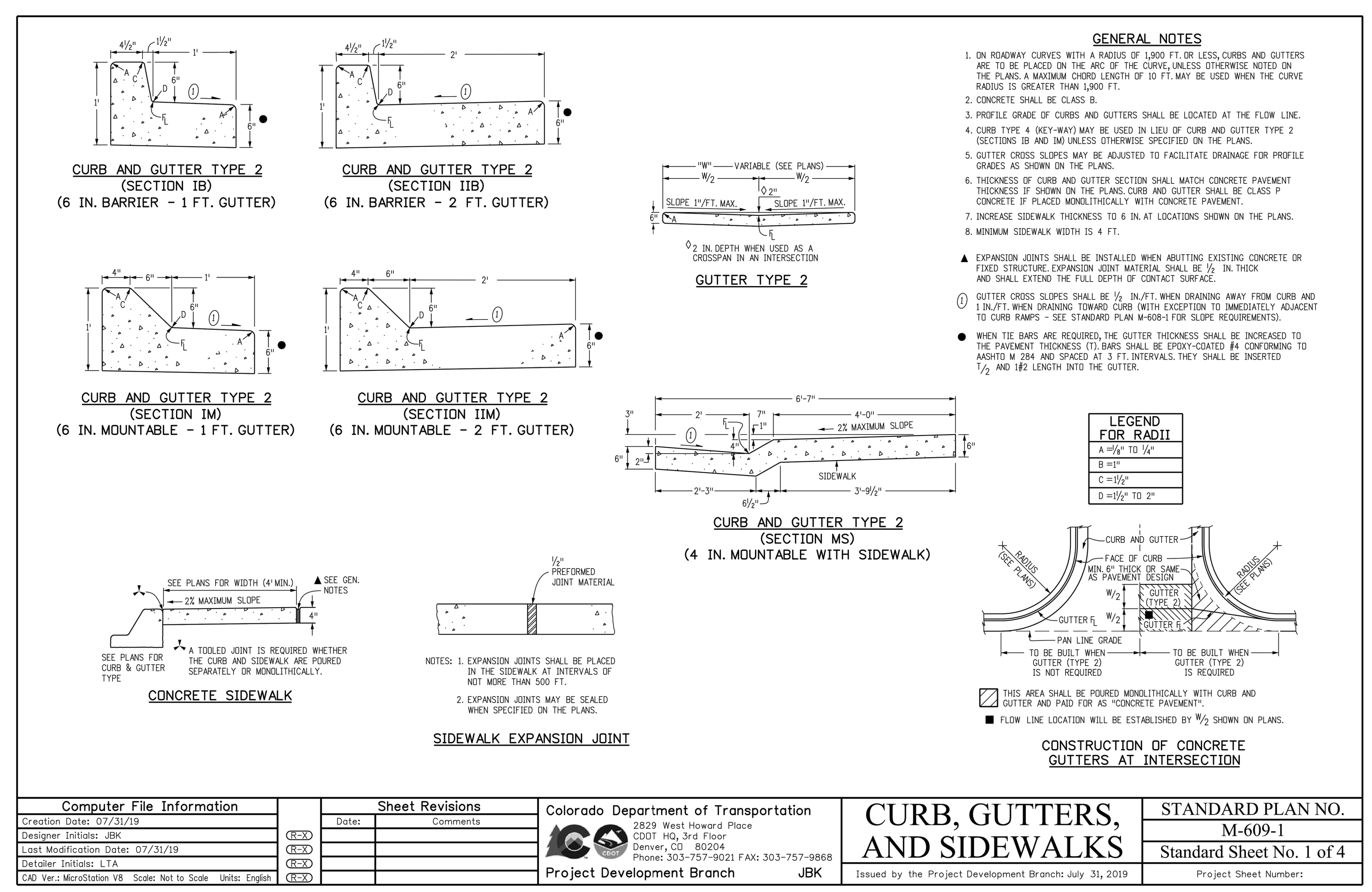

ENGINEER IN CHARGE:

PRELIMINARY NOT FOR CONSTRUCTION

STRATEGIC SITE DESIGNS

CONTACT INFORMATION
88 INVERNESS CIRCLE EAST, SUITE E-101
ENGLEWOOD, CO 80112
(720) 206-6931
CPERDUE@STRATEGICSITEDESIGNS.COM
ATTENTION: CHRISTOPHER PERDUE, P.E., M.B.A.

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BENCHMARK
NGS ROGGEN RM 1: RECOVERED A 3 1/2" BRASS CAP LOCATED 200' SOUTH OF FRONTAGE RD I-76 AND 2500' WEST OF COUNTY RD 73.

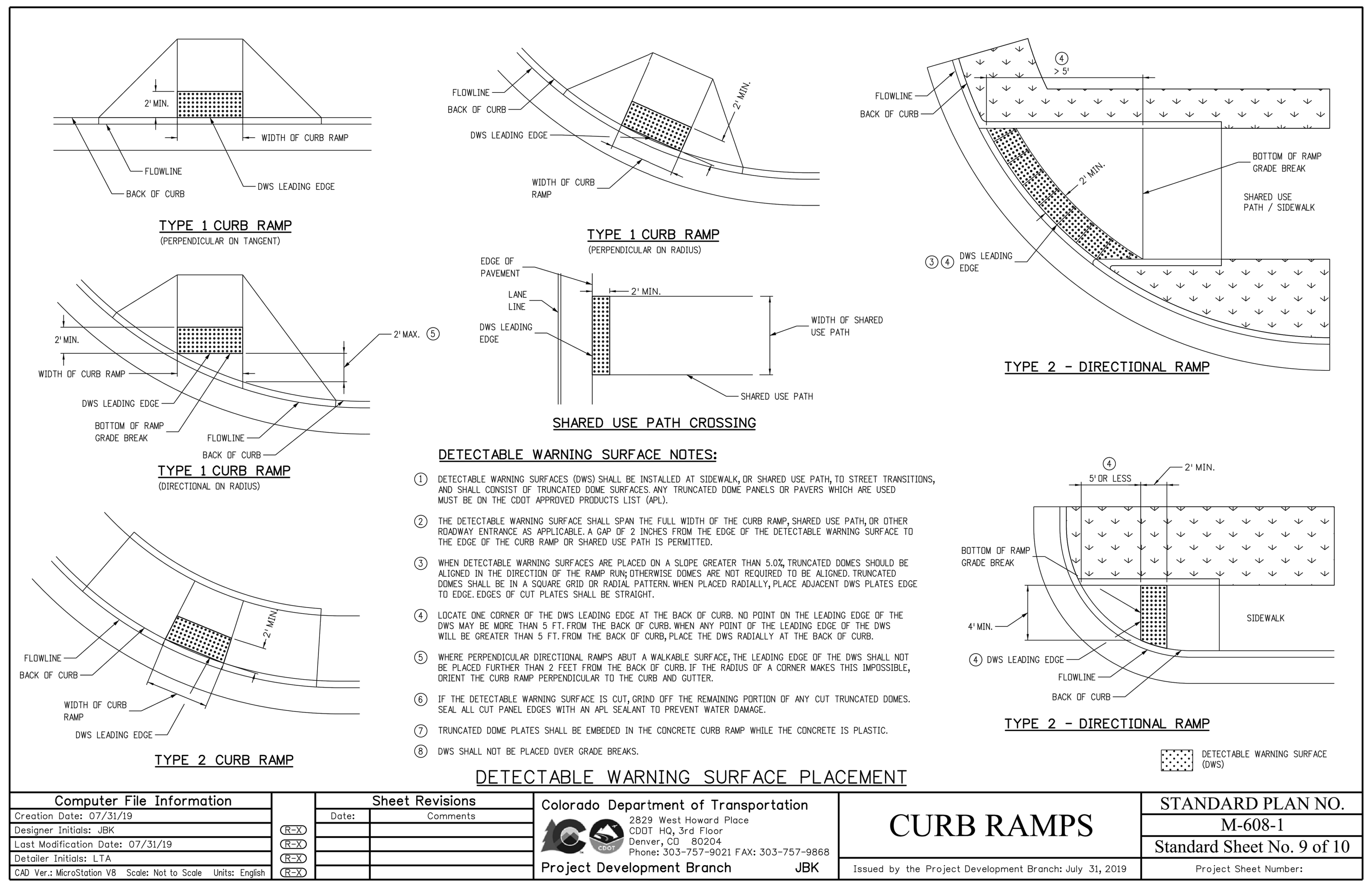
ELEVATION = 4721.56 (NAVD 88)

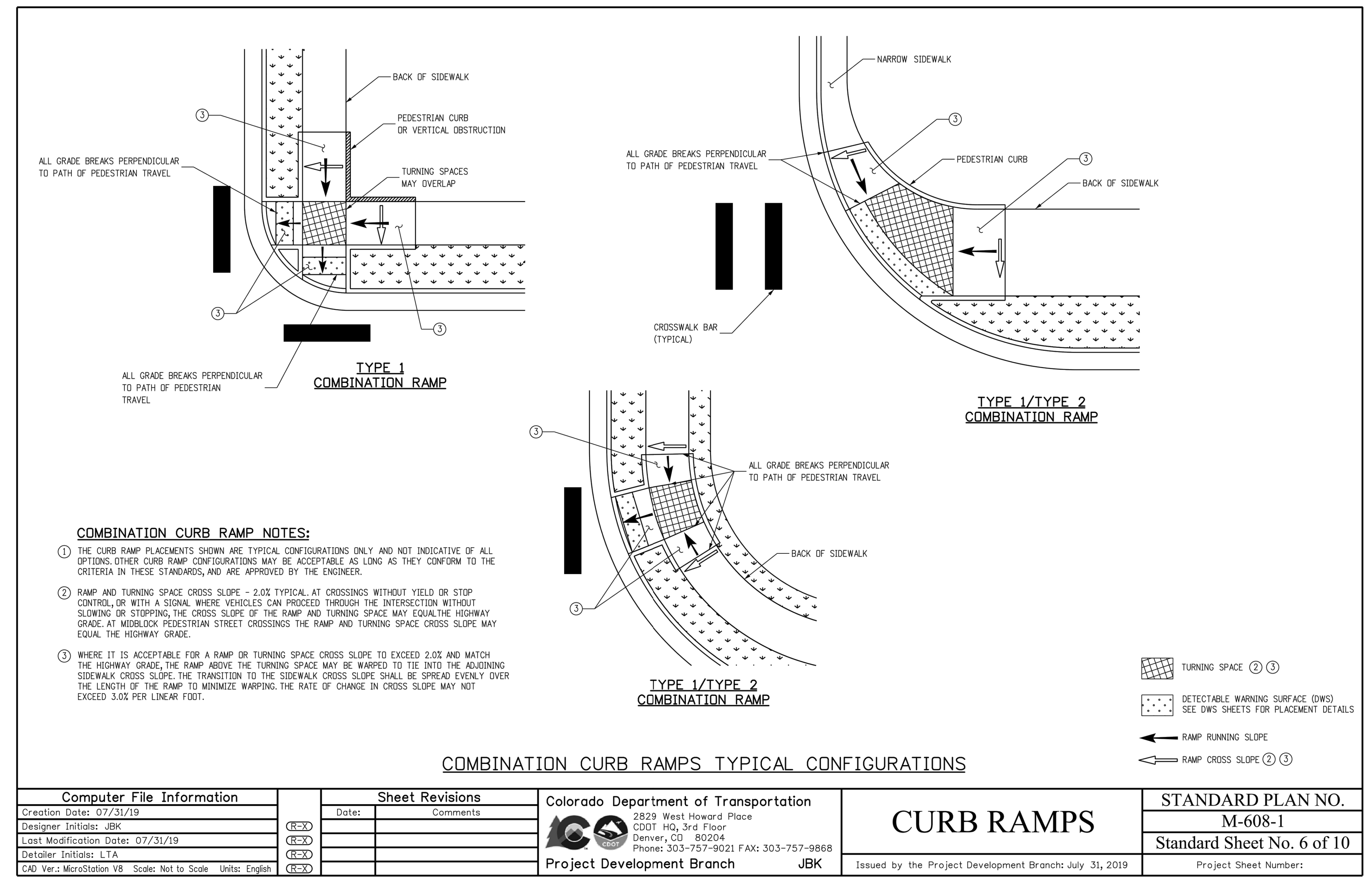
PIONEER VILLAGE
PA'S 1-4, 17 AND 21
TOWN OF KEENESBURG
WELD COUNTY, COLORADO

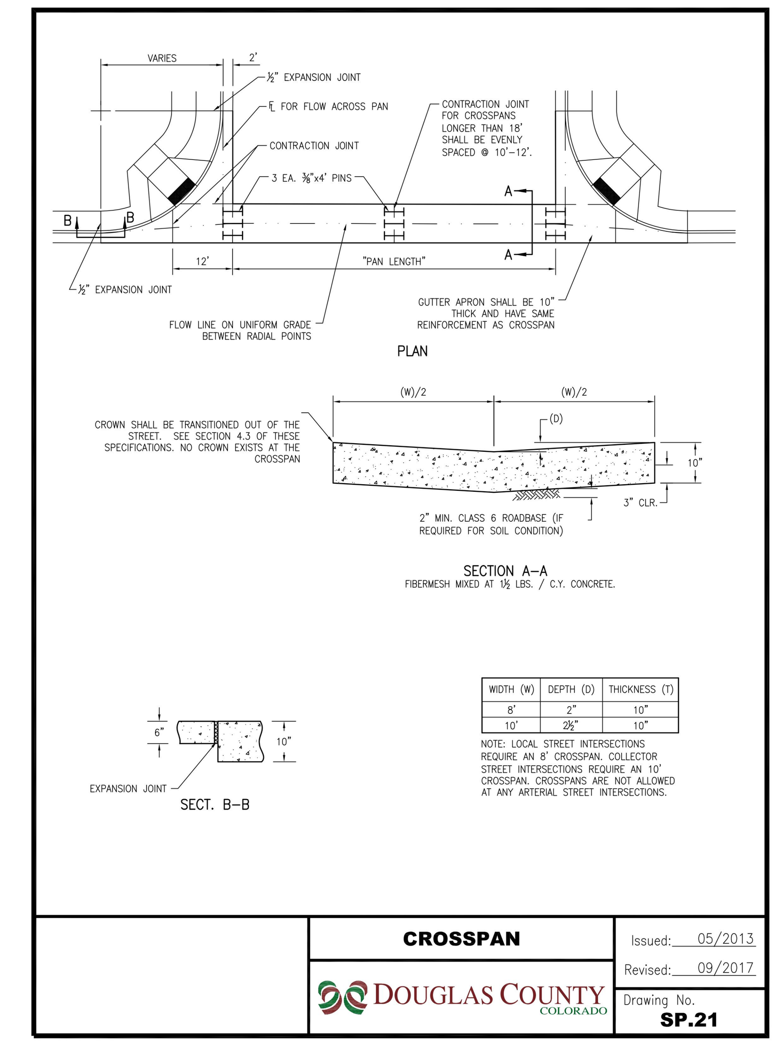
ROADWAY DETAILS

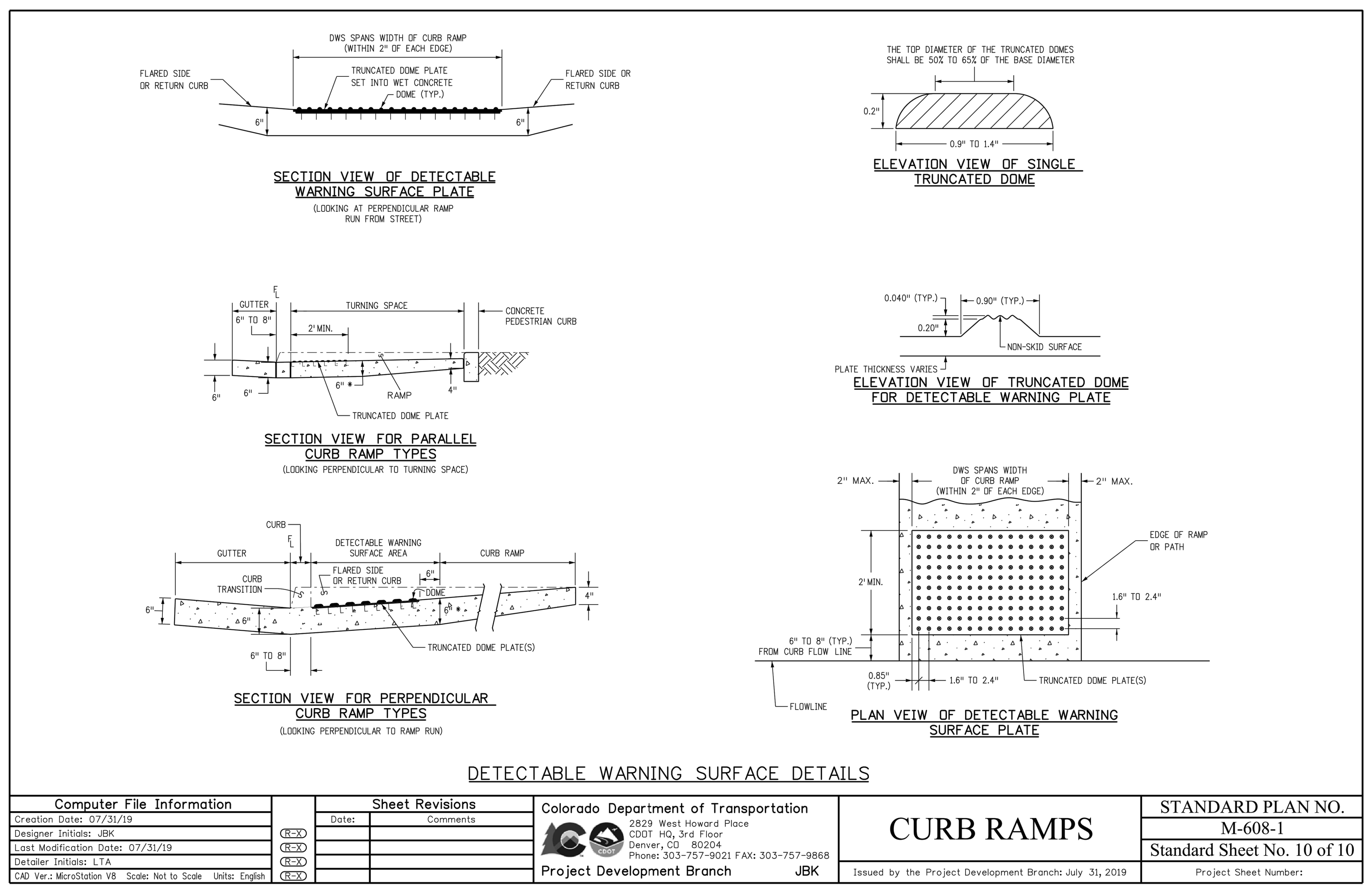
REV	DESCRIPTION	BY	DATE

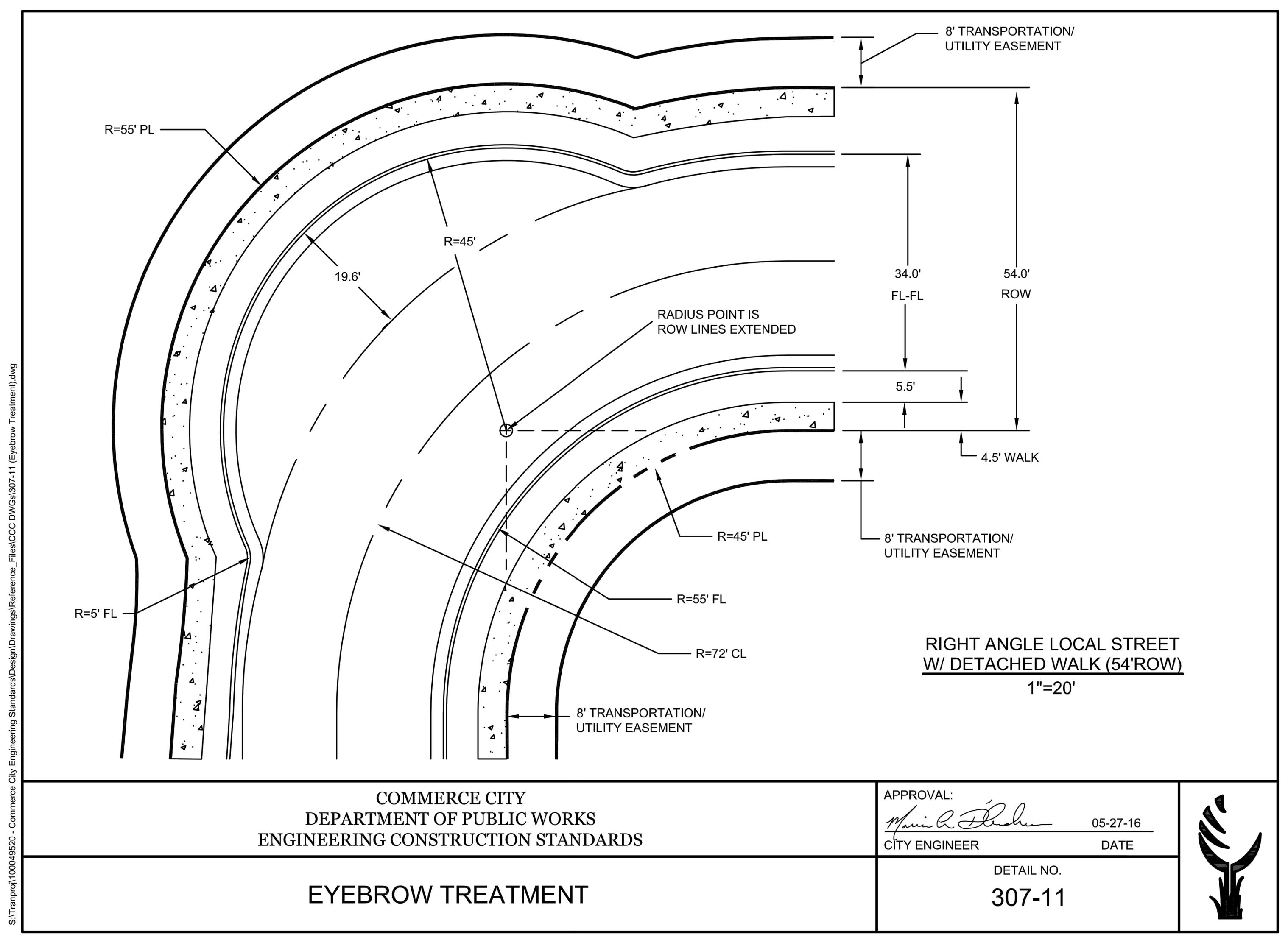
JOB NO:	1903-001
ORIGINAL ISSUE:	03/15/2021
DESIGN BY:	CLP
CHECKED BY:	CLP
SCALE:	NTS
SHEET NUMBER	C-8.00

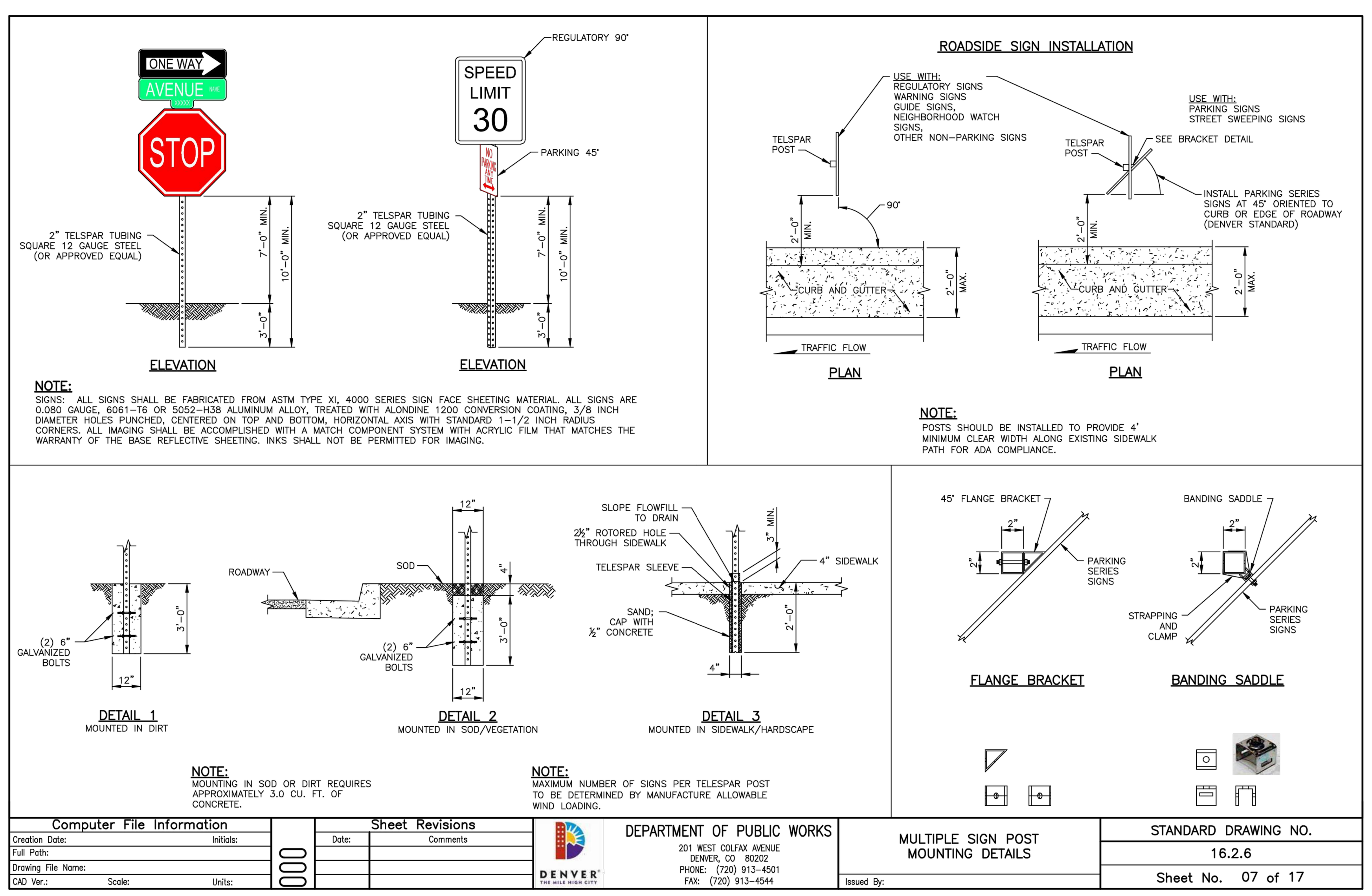


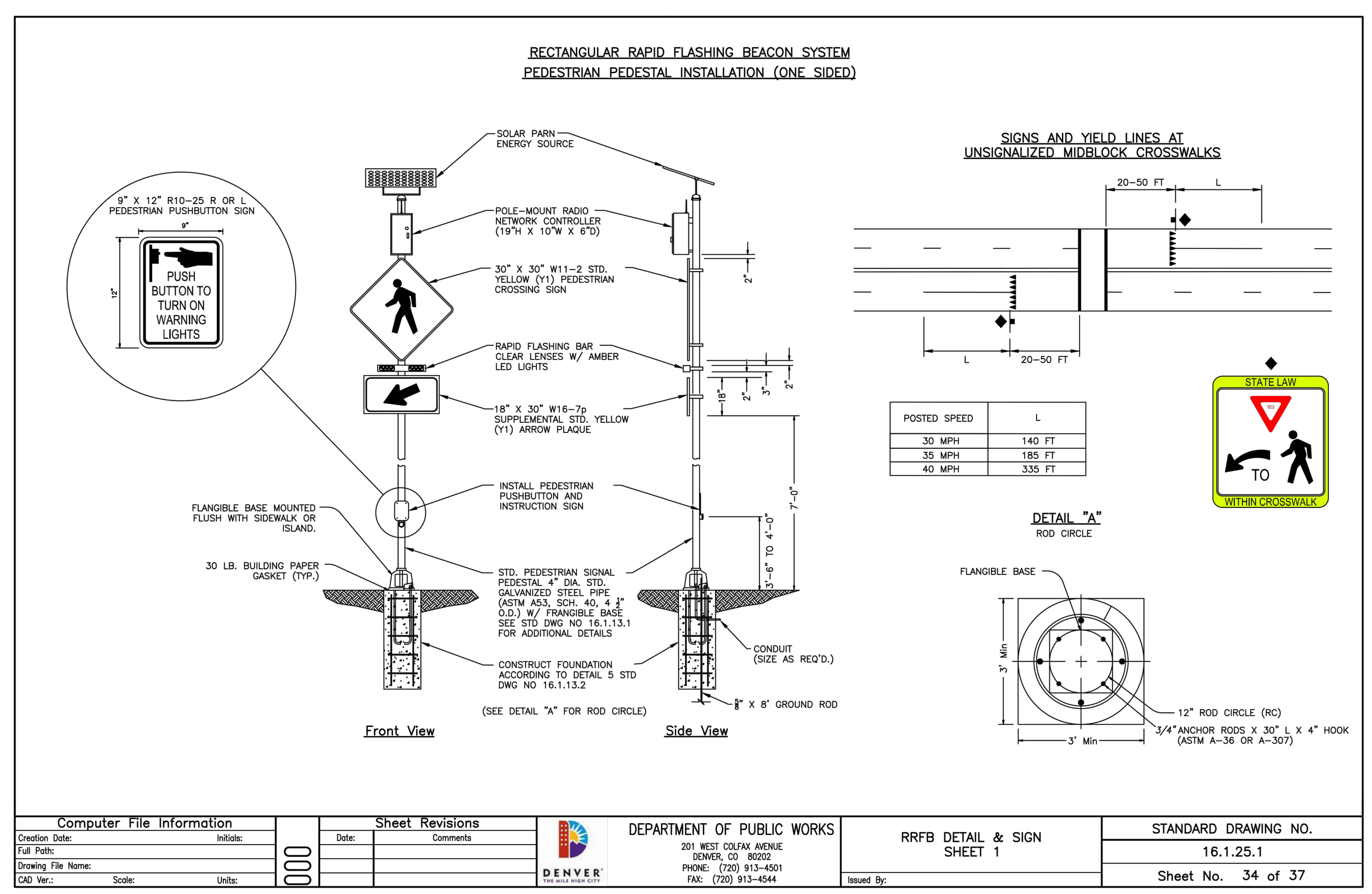


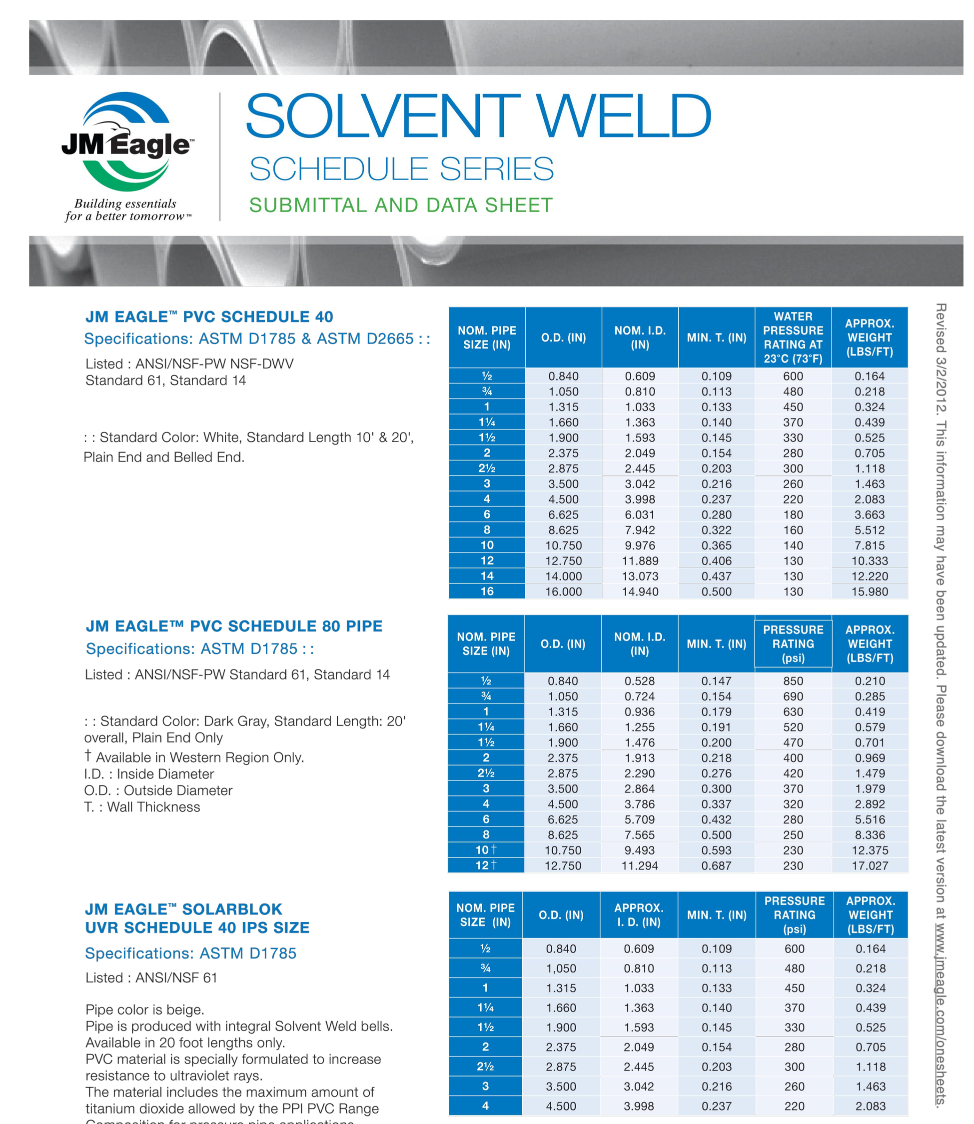












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ROADWAY AND DRY UTILITY DETAILS

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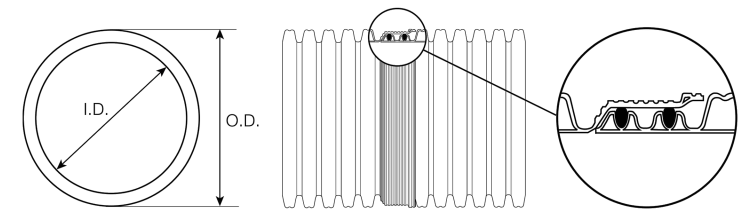
DIMENSIONS AND WEIGHTS

SUBMITTAL AND DATA SHEET

EAGLE CORR PE™ (DUAL WALL)

THIS SPECIFICATION REFERS TO 4"-60" PIPE FOR USE IN GRAVITY FLOW DRAINAGE APPLICATIONS.



NOMINAL I.D. IN (MM)	APPROX. O.D. IN (MM)	LAYING LENGTH (FT)	PIPE STIFFNESS PSI	AVERAGE UNIT WEIGHT LB/FT
4 (100)	5 (120)	20	50	0.4
6 (150)	7 (174)	20	50	1.1
8 (200)	9 (231)	20	50	1.7
10 (250)	11 (290)	20	50	2.5
12 (300)	14 (363)	20	50	3.2
15 (375)	17 (444)	20	42	4.8
18 (450)	21 (529)	20	40	6.3
24 (600)	28 (699)	20	34	11.2
30 (750)	35 (880)	20	28	15.8
36 (900)	42 (1055)	20	22	20.9
42 (1050)	47 (1204)	20	20	26.9
48 (1200)	54 (1367)	20	18	34.0
60 (1500)	67 (1693)	20	14	56.0

PRODUCT STANDARD: 4"-10" AASHTO M252 and ASTM F2648; 12"-60" AASHTO M294, ASTM F2306 and ASTM F2648

PIPE COMPOUND: ASTM D3350

GASKET: ASTM F477

JOINT PERFORMANCE: ASTM D3212

FITTINGS: AASHTO M252; AASHTO M294; ASTM F2306; ASTM F2648

INSTALLATION: ASTM D2321; Eagle Corr PE Installation Guide

MINIMUM AND MAXIMUM BURIAL DEPTH RECOMMENDATIONS

MINIMUM COVER HEIGHT

Minimum cover height for 4-inch to 48-inch (100 mm to 1,200 mm) diameters shall be at least 1 foot. Minimum cover height for 60-inch (1,500 mm) diameter pipe shall be at least 2 feet. Minimum cover height is measured from the crown of the pipe to the bottom of a flexible pavement section or to the top of a rigid pavement section. In addition to the minimum cover height requirements, an extra foot of temporary cover is recommended where heavy-duty construction equipment may travel over the pipe during the construction phase of the project.

TABLE 1

MINIMUM COVER HEIGHTS	
NOMINAL ID IN (MM)	MINIMUM COVER FT (M)
ID ≤ 48" (1200)	1 (0.3)
Id = 60 (1500)	2 (0.6)

BURIAL DEPTH RECOMMENDATIONS

The information contained herein describes the maximum allowable cover height for Eagle Corr PE™ (Dual Wall). These recommendations address maximum burial depths for pipe meeting the requirements of AASHTO M252 Type S, M294 Type S, ASTM F2306 and ASTM F2648. This analysis is based on the design method developed by the Plastic Pipe Institute. The PPI design method is based on the actual pipe corrugation profile, which is conservative as evidenced by a long history of analytically predicted burial depths matching successful field installations.

MAXIMUM COVER HEIGHT ANALYSIS

The type and compaction of backfill around the pipe significantly influence the maximum burial depth. The influence of the backfill and compaction is illustrated in Table 2 below. Table 2 was developed assuming the pipe is installed in accordance with ASTM D2321. These maximum cover height recommendations assume the native soil is of adequate strength and is suitable for installation. Additionally the calculations assume no hydrostatic load and soil density of 120 pounds per cubic feet. Detailed calculations for each of the conditions described in Table 2 are available upon request.

MINIMUM AND MAXIMUM BURIAL DEPTH RECOMMENDATIONS

(CONTINUED)

TABLE 2

DIAMETER IN (MM)	CLASS 1 COMPACTED	CLASS 1 DUMPED	CLASS 2 95%	CLASS 2 90%	CLASS 2 85%	CLASS 3 95%	CLASS 3 90%	CLASS 3 85%
MAXIMUM COVER PPI DESIGN METHOD (FT)								
4 (100)	60	20	40	28	20	28	21	19
6 (150)	63	22	43	30	22	31	23	21
8 (200)	61	20	41	28	20	29	21	19
10 (250)	61	20	40	28	20	28	21	19
12 (300)	55	17	35	24	17	25	18	16
15 (375)	55	17	35	24	17	24	18	15
18 (450)	53	16	34	23	16	23	17	14
24 (600)	54	16	34	23	16	24	17	14
30 (750)	51	14	32	21	14	22	15	13
36 (900)	49	13	31	20	13	21	14	12
42 (1050)	48	13	31	20	13	21	14	12
48 (1200)	48	13	30	20	13	20	14	11
60 (1500)	50	13	31	20	13	21	14	12

Notes:

1. Backfill material classes are based on backfill material as described and defined in ASTM D2321.
2. All compaction levels are based on standard proctor density.
3. Compaction and backfill material should be uniform throughout the backfill zone.
4. Backfill material and compaction levels (not shown in Table 1) may be acceptable; however special designs must be approved by JM Eagle or an engineer.
5. Deeper burial depths may be obtained by consulting an engineer for special designs.

PIPE PROPERTIES

Key pipe profile properties that influence the performance of the soil/pipe structure interaction include the moment of inertia of the profile (I), distance from the inside diameter to the neutral axis (c), and the area of a longitudinal profile section (As). Pipe stiffness (PS) is also important criteria. The minimum pipe stiffness, defined by AASHTO was used for this analysis. These key properties are summarized in Table 3 below:

TABLE 3

NOMINAL INSIDE DIAMETER (IN)	OUTSIDE DIAMETER (IN)	PIPE STIFFNESS, PS (PSI)	CROSS SECTIONAL AREA, A_s (IN^2/IN)	DISTANCE FROM INSIDE DIAMETER TO NEUTRAL AXIS, C (IN)	MOMENT OF INERTIA, I (IN^4/IN)	PITCH (IN)
SECTION PROPERTY SUMMARY						
4.0	4.7	50	0.076	0.14	0.0012	0.65
6.0	6.9	50	0.122	0.19	0.0037	0.78
8.0	9.1	50	0.146	0.28	0.0085	0.97
10.0	11.4	50	0.180	0.33	0.0171	1.29
12.0	14.3	50	0.183	0.47	0.0366	1.94
15.0	17.5	42	0.222	0.51	0.0549	2.59
18.0	20.8	40	0.244	0.58	0.0824	3.10
24.0	27.5	34	0.330	0.72	0.1593	3.10
30.0	34.6	28	0.370	0.95	0.3118	3.88
36.0	41.5	22	0.410	1.12	0.4986	5.17
42.0	47.4	20	0.446	1.18	0.5531	5.17
48.0	53.8	18	0.498	1.21	0.6551	5.17
60.0	66.7	14	0.660	1.44	1.2766	7.76

Notes:

1. Section property data is considered conservative however properties may change based on actual production dimensions.

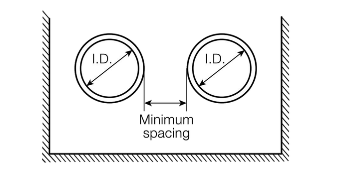
TABLE 4

NOMINAL ID IN (MM)	AVERAGE OD IN (MM)	MINIMUM TRENCH WIDTH[1] IN (M)
MINIMUM TRENCH WIDTHS		
4 (100)	5 (120)	21 (0.5)
6 (150)	7 (174)	23 (0.6)
8 (200)	9 (231)	25 (0.6)
10 (250)	11 (290)	27 (0.7)
12 (300)	14 (363)	30 (0.8)
15 (375)	17 (444)	34 (0.9)
18 (450)	21 (529)	38 (1.0)
24 (600)	28 (699)	46 (1.2)
30 (750)	35 (880)	55 (1.4)
36 (900)	42 (1055)	64 (1.6)
42 (1050)	47 (1204)	71 (1.8)
48 (1200)	54 (1367)	79 (2.0)
60 (1500)	67 (1693)	95 (2.4)

[1] Minimum trench width per ASTM D2321 = greater of OD + 16" or 1.25 × OD + 12".

TABLE 5

NOMINAL ID IN (MM)	MINIMUM SPACING IN (MM)
PARALLEL PIPE INSTALLATION MINIMUM SPACING	
ID ≤ 24 (600)	12 (300)
ID > 24 (600)	ID/2



INSTALLATION

(CONTINUED)

TABLE 6

Description of Material Classification as Defined in ASTM D2321

CLASS	TYPE	SOIL SYMBOL GROUP	DESCRIPTION ASTM D2487	PERCENTAGE PASSING SIEVE SIZES .075MM 1.5 IN (40 MM)	NO. 4 (4.75 MM)	NO. 200 (0.75 MM)	ATTERBERG LIMITS LL	PL	COEFFIENTS UNIFORMITY CU	CURVATURE Cc
IA	Manufactured Aggregates: open graded clean	none	Angular, crushed stone or rock, crushed slag, cinders or shell large void content, contain little or no fines	100%	< or = 10%	< 5%	Non Plastic	—	—	—
IB	Manufactured, Processed Aggregates: dense graded, clean	none	Angular, crushed stone (or other Class IA materials) and stone/sand mixtures with gradations selected to minimize migration of adjacent soils; contain little to no fines	100%	< or = 50%	< 5%	Non Plastic	—	—	—
II	Coarse-Grained Soils, clean	GW	Well-graded gravels and gravel-sand mixtures; little to no fines	100%	< 50% of coarse fraction	< 5%	Non Plastic	—	> 4	1 to 3
		GP	Poorly-graded gravels and gravel-sand mixtures; little to no fines	—	—	—	—	—	< 4	< 1 or > 3
		SW	Well-graded sands and gravelly sands; little to no fines	—	> 50% of coarse fraction	—	—	—	> 6	1 or 3
		SP	Poorly-graded sands and gravelly sands; little to no fines	—	—	—	—	—	< 6	< 1 or > 3
	Coarse-Grained Soils: borderline clean to w/fines		Sands and gravels which are borderline between clean and with fines	100%	varies	5% to 12%	Non Plastic	—	—	Same as for GW, GP, SW, and SP
III	Coarse-Grained Soils w/fines	GM	Silty gravels, gravel-sand-silt mixtures	100%	> 50% of coarse fraction	> 12% to < 50%	—	< 4 or <"A" Line	—	—
		GC	Clayey gravels, gravel-sand-clay mixtures	—	—	—	—	< 7 and >"A" Line	—	—
		SM	Silty sands, sand-silt mixtures	—	> 50% of coarse fraction	—	—	> 4 or <"A" Line	—	—
		SC	Clayey sands, sand-silt mixtures	—	—	—	—	> 7 and >"A" Line	—	—
IVA	Fine-Grained Soils: Inorganic	ML	Inorganic silts and very fine sands, rock flour, silty or clayey fine sands, silts with slight plasticity	100%	100%	> 50%	< 50	< 4 or <"A" Line	—	—
		CL	Inorganic clays of low to medium plasticity, gravely clays, sandy clays, silty clays, lean clays	—	—	—	—	> 7 and >"A" Line	—	—
IVB	Fine-Grained Soils: Inorganic	MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts	100%	100%	> 50%	> 50	< "A" Line	—	—
		CH	Inorganic clays of high plasticity, fat clays	—	—	—	—	> "A" LIne	—	—
V	Organic Soils	OL	Organic silts and organic silty clays of low plasticity	100%	100%	> 50%	< 50	< 4 or <"A" Line	—	—
		OH	Organic clays of medium to high plasticity organic silts	—	—	—	> 50	<"A" LIne	—	—
	Highly Organic	PT	Peat and other high organic soils	—	—	—	—	—	—	—

TABLE 7

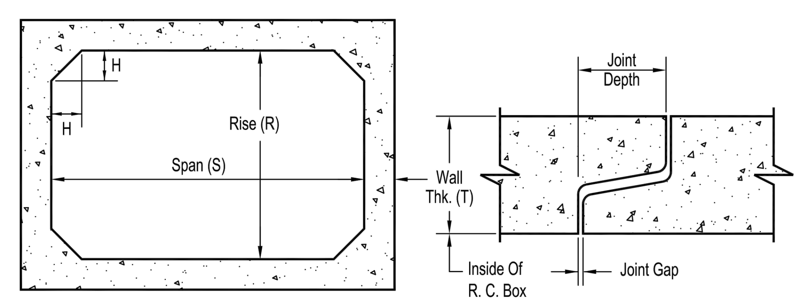
Recommendations for Installation and Use of Soils and Aggregates for Foundation, Embedment and Backfill.

	SOIL CLASS AS DEFINED IN TABLE 1.1 CLASS IA	CLASS IB	CLASS II	CLASS III	CLASS IV-A
General Recommendations and Restrictions	Do not use where conditions may cause migration of fines from adjacent soil and loss of pipe support. Suitable for use as a drainage blanket and underdrain in rock cuts where adjacent material is suitably graded.	Process materials as required to obtain gradation which will minimize migration of adjacent materials. Suitable for use as drainage blanket and underdrain.	Where hydraulic gradient exist check gradation to minimize migration. "Clean" groups suitable for use as drainage blanket and underdrain.	Do not use where water conditions in trench may cause instability.	Obtain geotechnical evaluation of processed material. May not be suitable under high earth fills and surface applied loads or under heavy vibratory compactors and tampers. Do not use where water conditions in trench may cause instability.
Foundation	Suitable as foundation and for replacing over-excavated and unstable trench bottom as restricted above. Install and compact in 6-inch maximum layers.	Suitable as foundation and for replacing over-excavated and unstable trench bottom. Install and compact in 6-inch maximum layers.	Suitable as foundation and for replacing over-excavated and unstable trench bottom as restricted above. Install and compact in 6-inch maximum layers.	—	Suitable only in undisturbed conditions and where trench is dry. Remove all loose material and provide firm, uniform trench bottom before bedding is placed.
Bedding	Suitable as restricted above. Install in 6-inch maximum layers. Level final grade by hand. Minimum depth 4 inches (6 inches in rock cuts).	Install and compact in 6-inch maximum layers. Level final grade by hand. Minimum depth 4 inches (6 inches in rock cuts).	Suitable as restricted above. Install and compact in 6-inch maximum layers. Level final grade by hand. Minimum depth 4 inches (6 inches in rock cuts).	Suitable only in dry trench conditions. Install and compact in 6-inch maximum layers. Level final grade by hand. Minimum depth 4 inches (6 inches of rock cuts).	Suitable only in dry trench conditions and when optimum placement and compaction control is maintained. Install and compact in 6-inch maximum layers. Level final grade by hand. Minimum depth 4 inches (6 inches in rock cuts).
Haunching	Suitable as restricted above. Install in 6-inch maximum layers. Work in around pipe by hand to provide uniform support.	Install and compact in 6-inch maximum layers. Work in around pipe by hand to provide uniform support.	Suitable as restricted above. Install and compact in 6-inch maximum layers. Work in around pipe by hand to provide uniform support.	Suitable as restricted above. Install and compact in 6-inch maximum layers. Work in around pipe by hand to provide uniform support.	Suitable only in dry trench conditions and when optimum placement and compaction control is maintained. Install and compact in 6-inch maximum layers. Work in around pipe by hand to provide uniform support.
Initial Backfill	Suitable as restricted above. Install to a minimum of 6 inches above pipe crown.	Install and compact to a minimum of 6 inches above pipe crown.	Suitable as restricted above. Install and compact to a minimum of 6 inches above pipe crown.	Suitable as restricted above. Install and compact to a minimum of 6 inches above pipe crown.	Suitable as restricted above. Install and compact to a minimum of 6 inches above pipe crown.
Final Backfill	Compact as required by the engineer.	Compact as required by the engineer.	Compact as required by the engineer.	Compact as required by the engineer.	Suitable as restricted above. Compact as required by the engineer.

Rinker MATERIALS™

Concrete Pipe Division

Reinforced Concrete Box Culvert



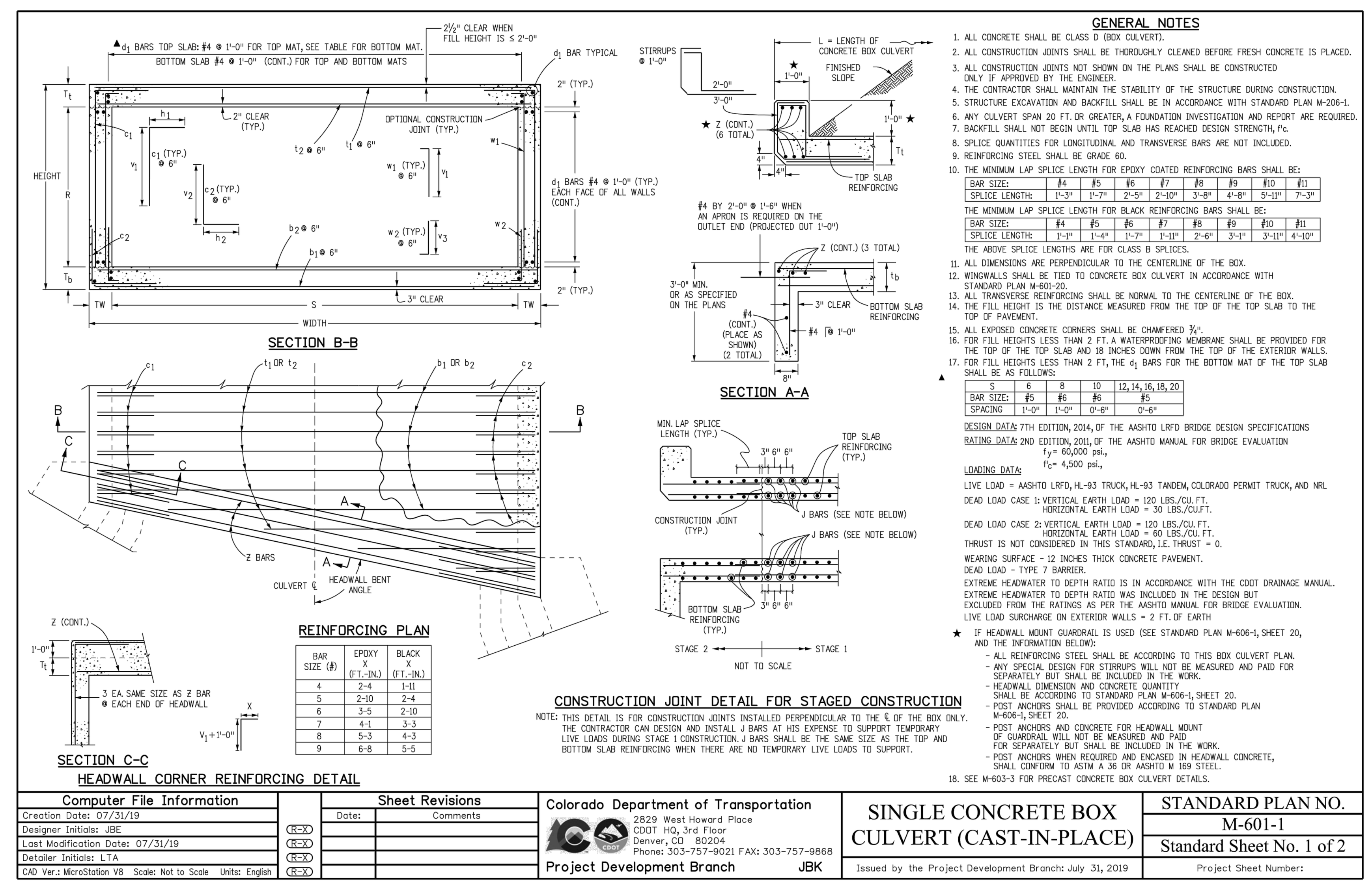
Section thru Box Culvert   Section thru Box Joint

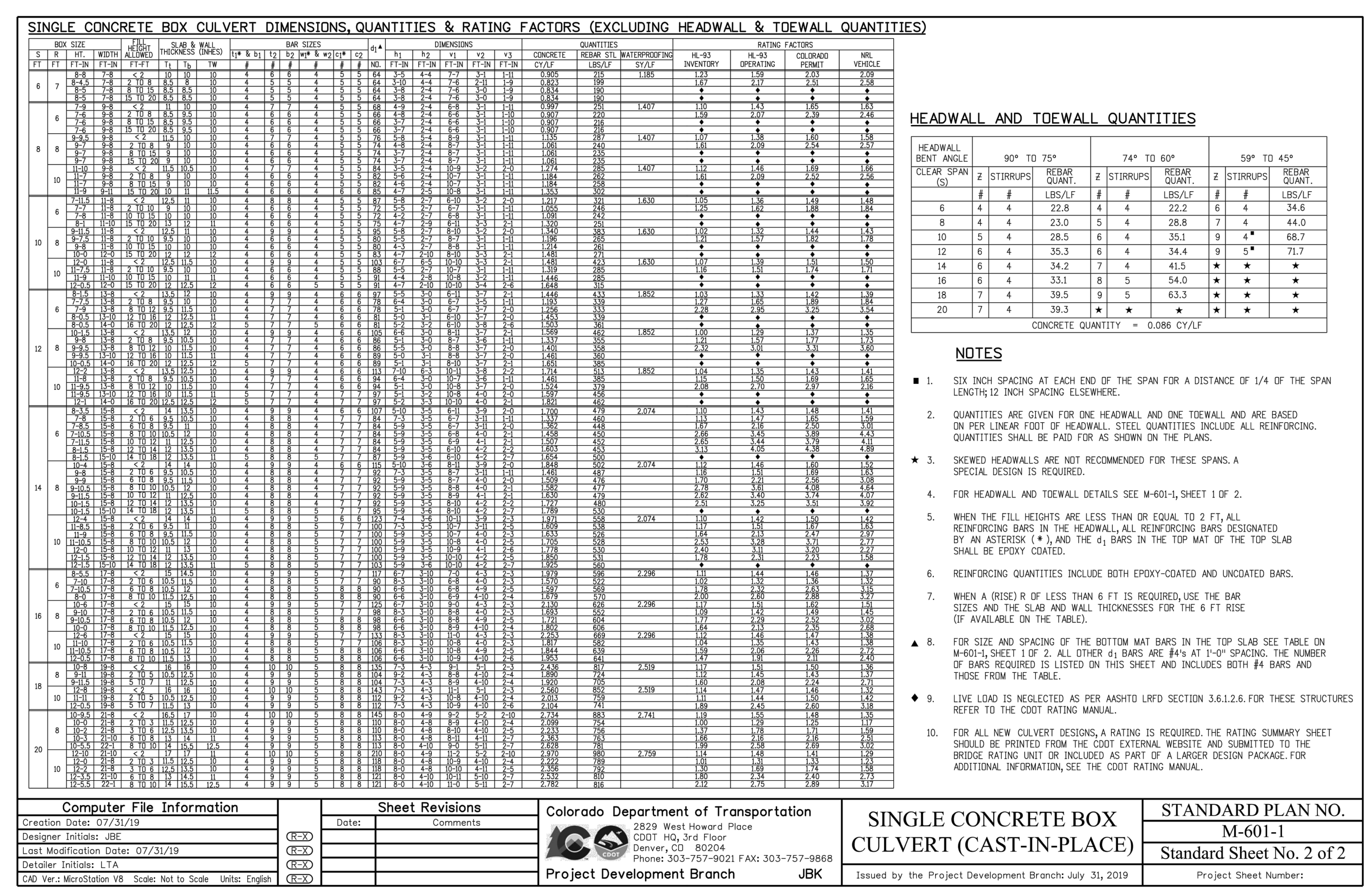
Rise (R) \ Span (S)	3	4	5	6	7	8	9	10	11	12
Standard Box Culvert Weights (lbs.) per Foot										
2	605	905								
3	705	1025	1425	1885	2410					
4		1155	1575	2060	2600	2800			4880	5700
5			1725	2235	2800	3000	3655	4375		
6				2410	3000	3200	3885	4625	5430	6300
7					3200	3400	4105	4875		
8						3600	4335	5125	5980	6900
9							4555	5375		
10								5625	6530	7500
11									6810	
12										8100
Wall (T)	4	5	6	7	8	8	9	10	11	12
Haunch (H)	7	7,8	7,8	7,8,12	8,12	8,12	12	12	12	12

Box dimensions may vary depending upon equipment availability.

Notes:

1. Produced to meet ASTM Specifications.
2. Contact a Concrete Pipe Division representative for details not listed on this sheet.
3. Walls, Slabs and Haunches are designed to meet ASTM / AASHTO standards and project specifications. Rinker 013





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TOWN OF KEENESBURG WELD COUNTY, COLORADO

STORM DETAILS

REV	DESCRIPTION	BY	DATE

JOB NO: 1903-001

ORIGINAL ISSUE: 03/15/2021

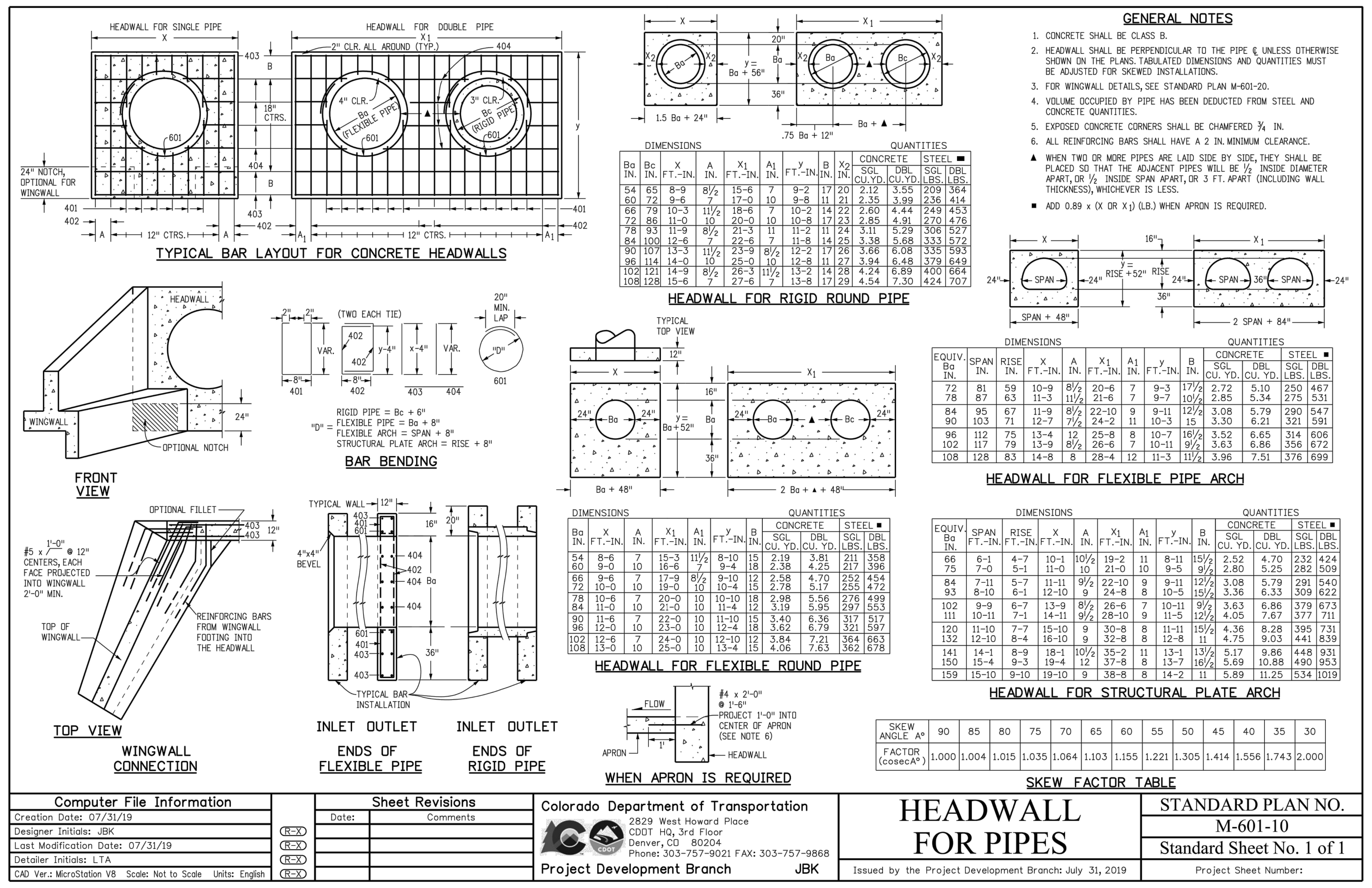
DESIGN BY: CLP

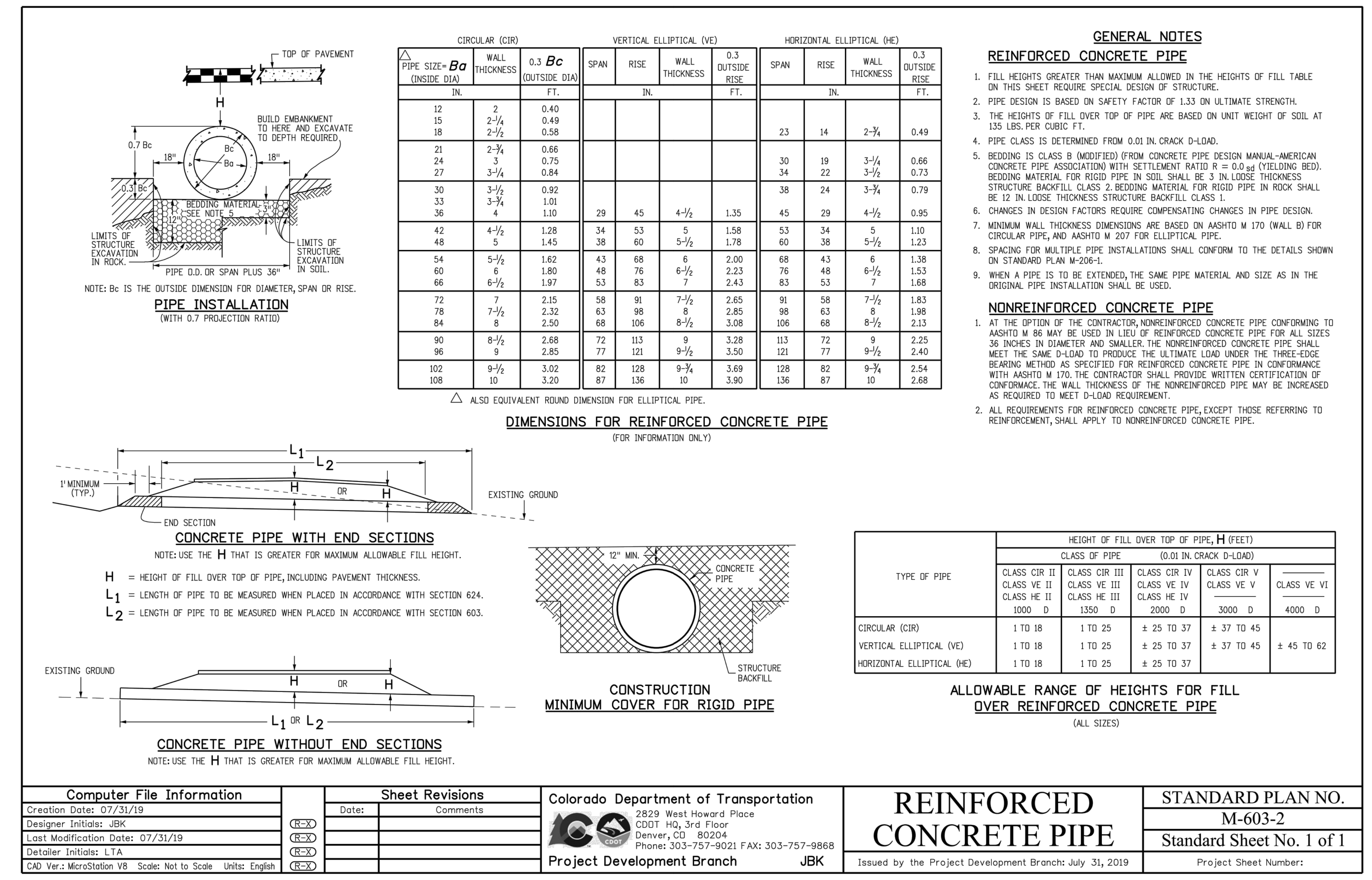
CHECKED BY: CLP

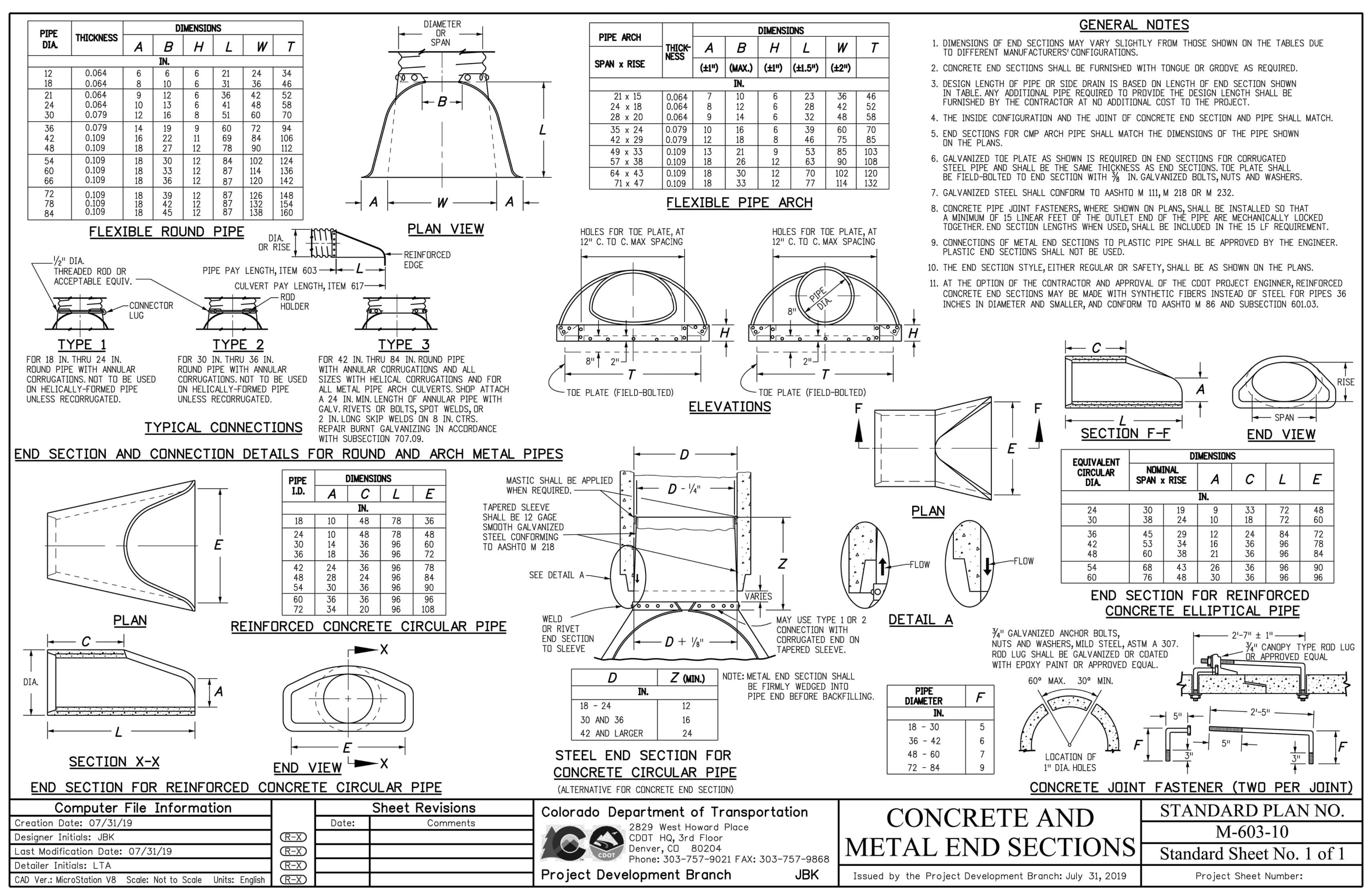
SCALE: NTS

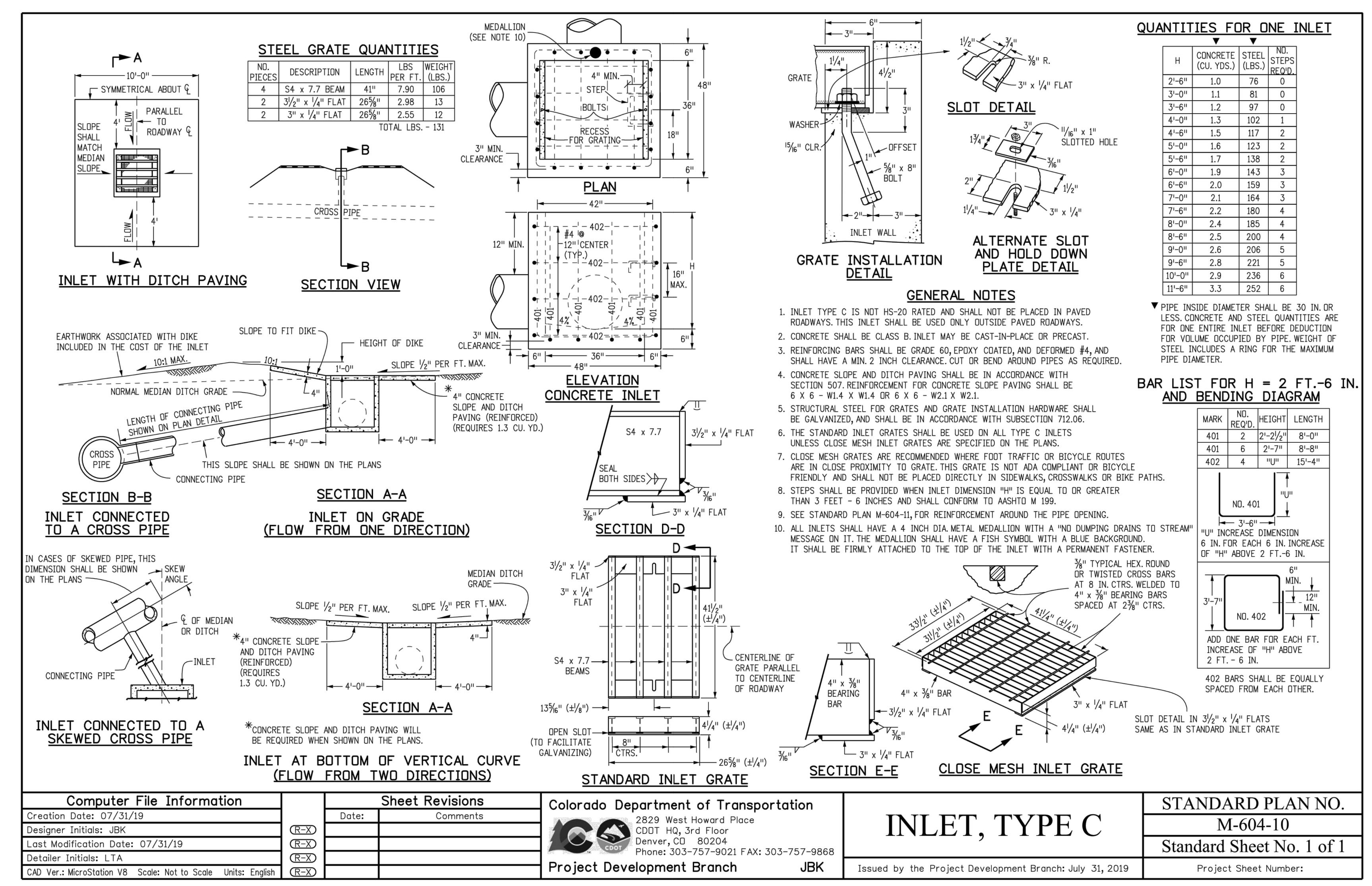
SHEET NUMBER

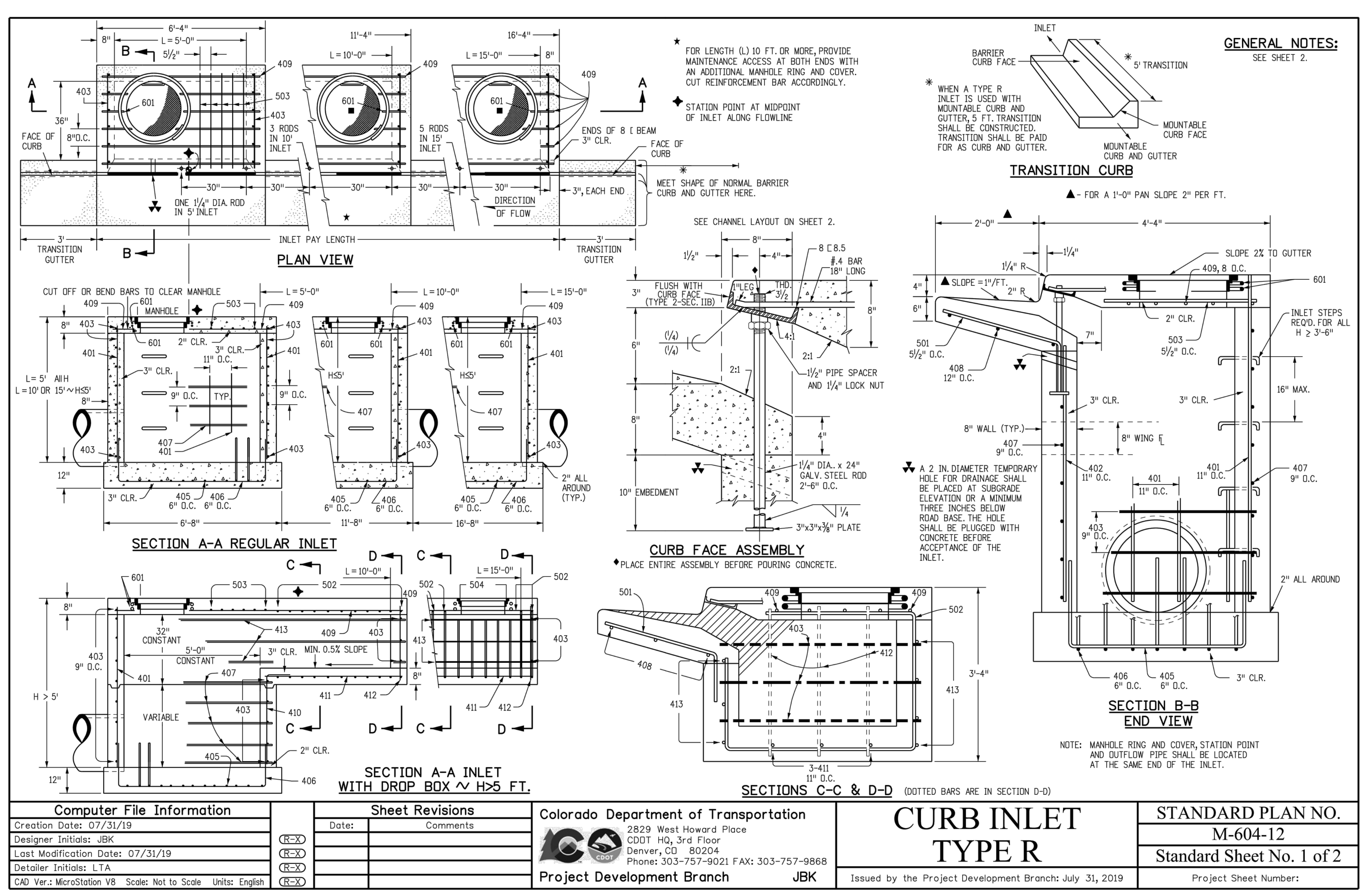
C-8.10

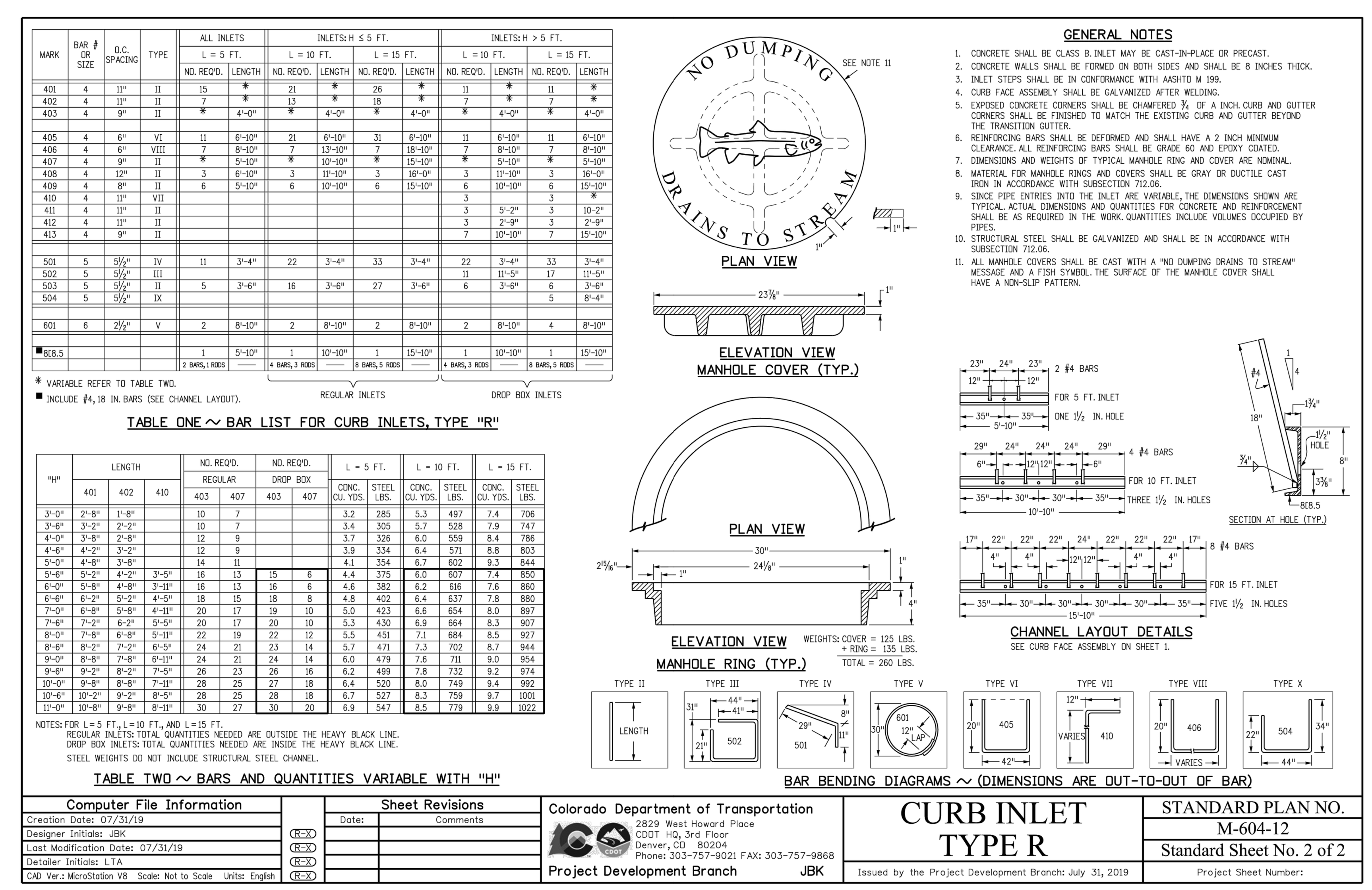












ENGINEER IN CHARGE:

PRELIMINARY NOT FOR CONSTRUCTION

CONTACT INFORMATION
88 INVERNESS CIRCLE EAST, SUITE E-101
ENGLEWOOD, CO 80112
(720) 206-6931
CPERDUE@STRATEGICSITEDESIGNS.COM
ATTENTION: CHRISTOPHER PERDUE, P.E., M.B.A.

STRATEGIC SITE DESIGNS

BASIS OF BEARINGS:
BEARINGS SHOWN HEREON ARE GRID BEARINGS DERIVED FROM GPS OBSERVATION BASED UPON THE COLORADO COORDINATE SYSTEM OF 1983 NORTH ZONE (NAD 83, 2011) REFERENCED TO THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 7, TOWNSHIP 2 NORTH, RANGE 64 WEST, SIXTH PRINCIPAL MERIDIAN, TAKEN TO BEAR SOUTH 00°30'28" EAST, A DISTANCE OF 2,612.70 FEET.

BENCHMARK
NGS ROGGEN RM 1: RECOVERED A 3 1/2" BRASS CAP LOCATED 200' SOUTH OF FRONTAGE RD I-76 AND 2500' WEST OF COUNTY RD 73.

ELEVATION = 4721.56 (NAVD 88)

PIONEER VILLAGE
PA'S 1-4, 17 AND 21
TOWN OF KEENESBURG
WELD COUNTY, COLORADO

STORM DETAILS

REV	DESCRIPTION	BY	DATE

JOB NO:	1903-001
ORIGINAL ISSUE:	03/15/2021
DESIGN BY:	CLP
CHECKED BY:	CLP
SCALE:	NTS
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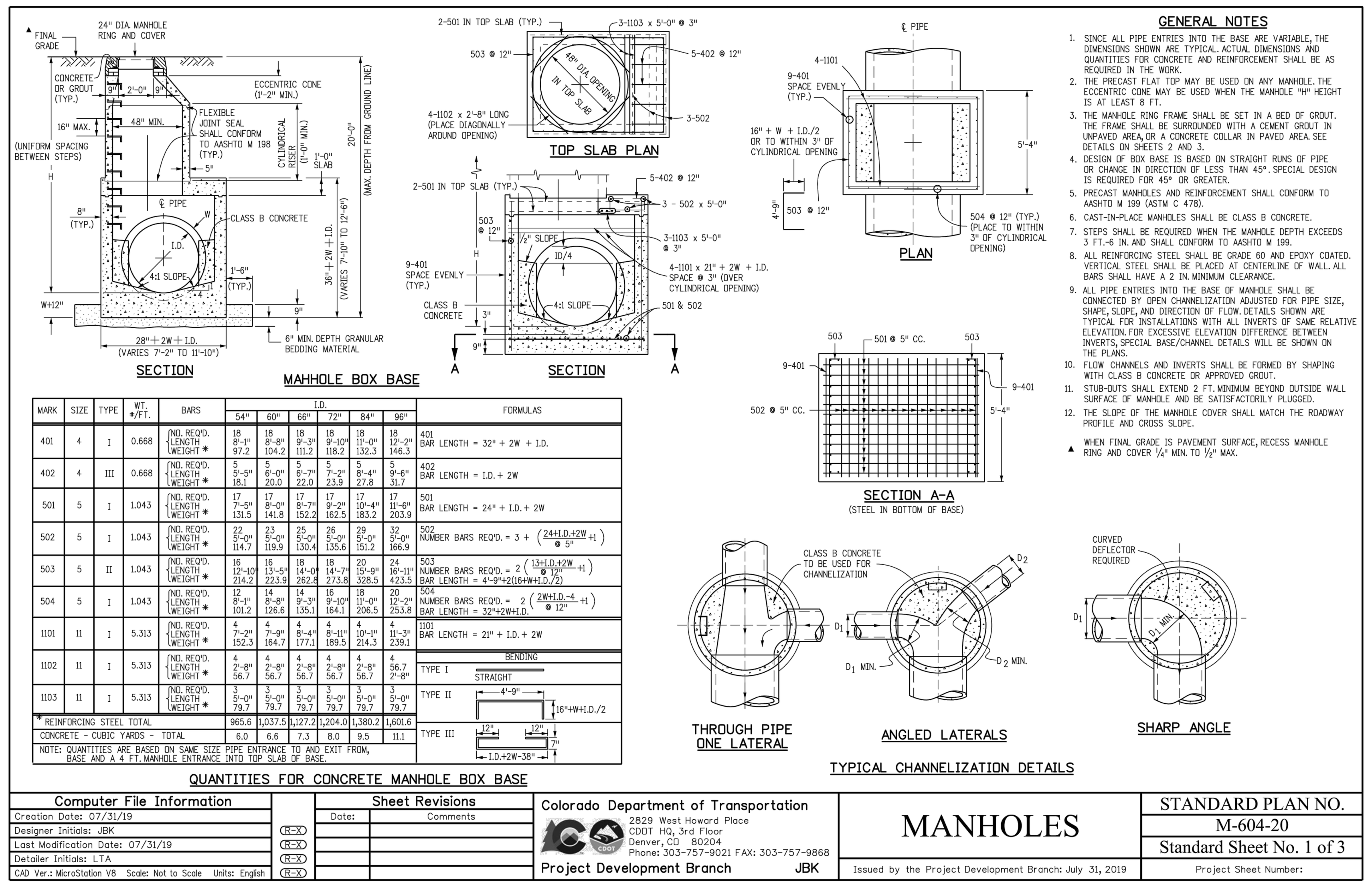

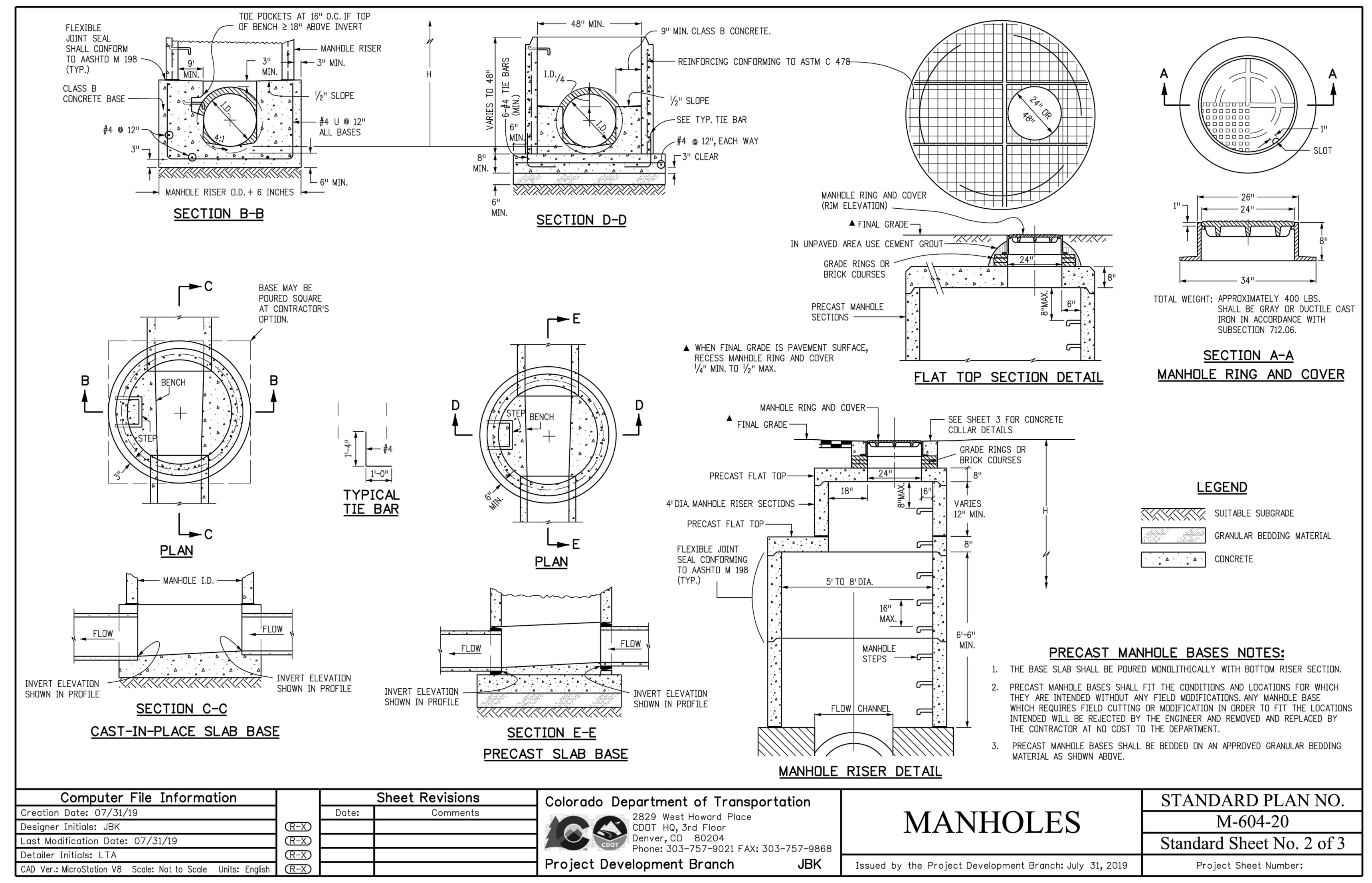

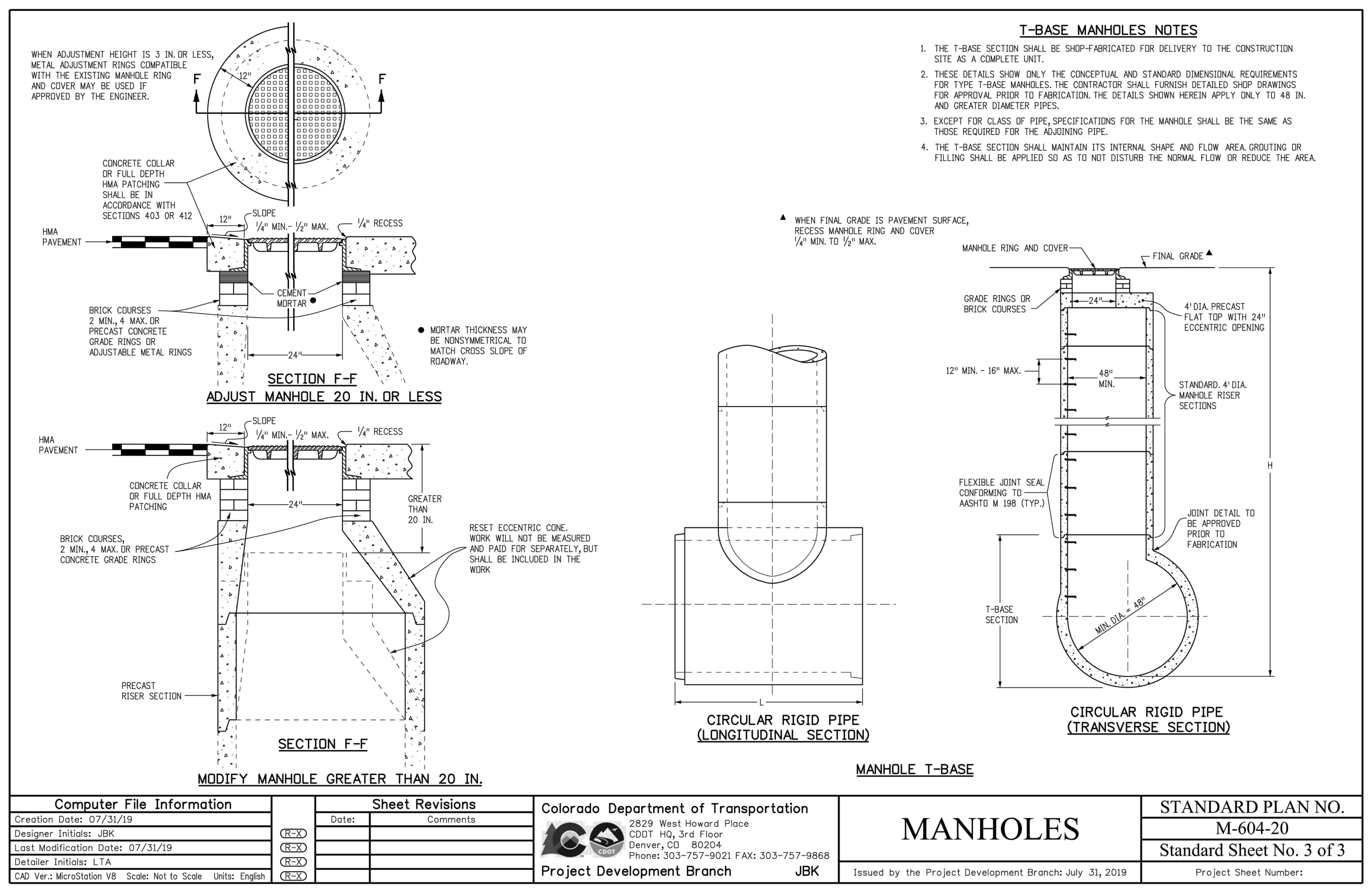

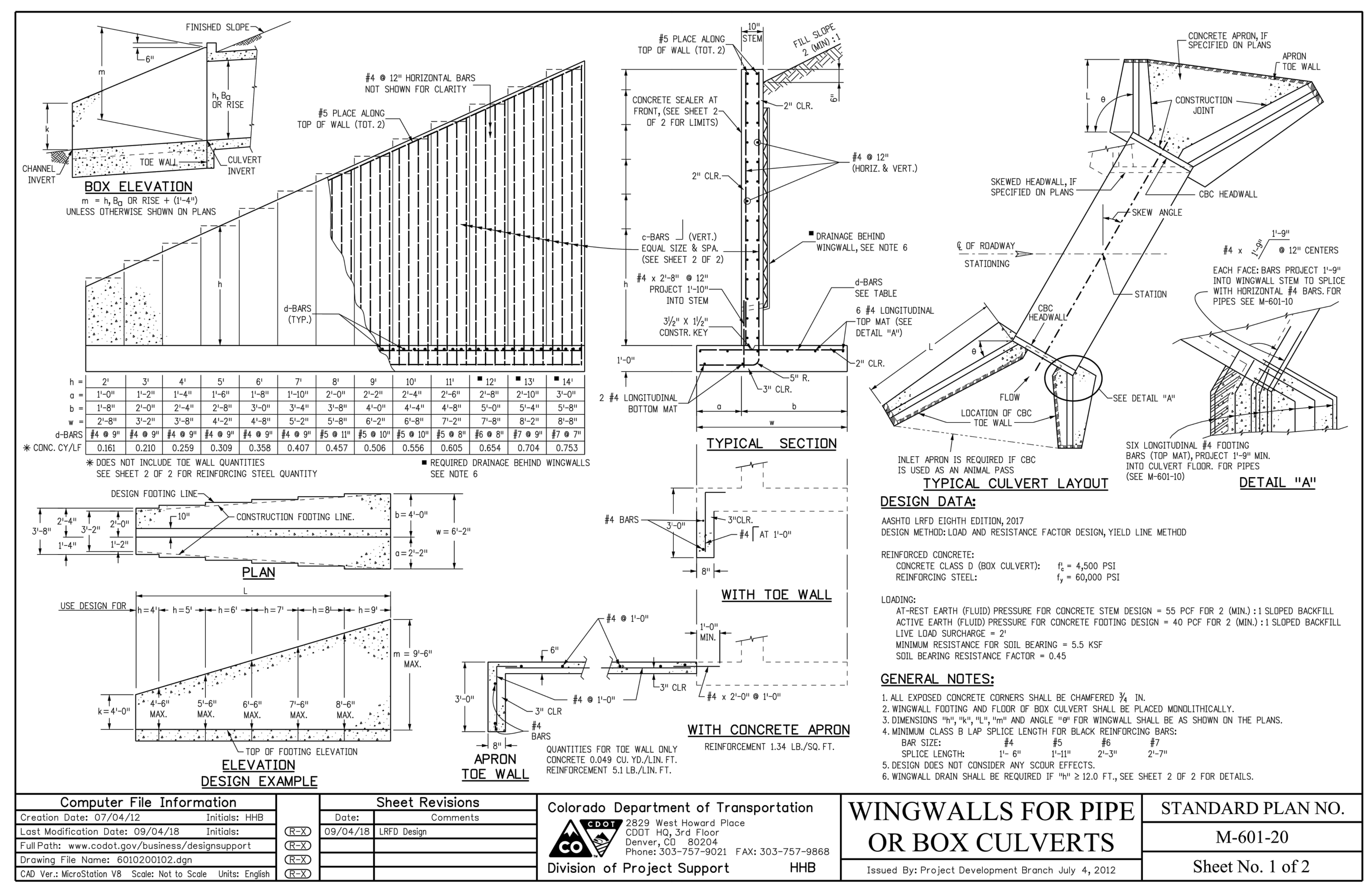

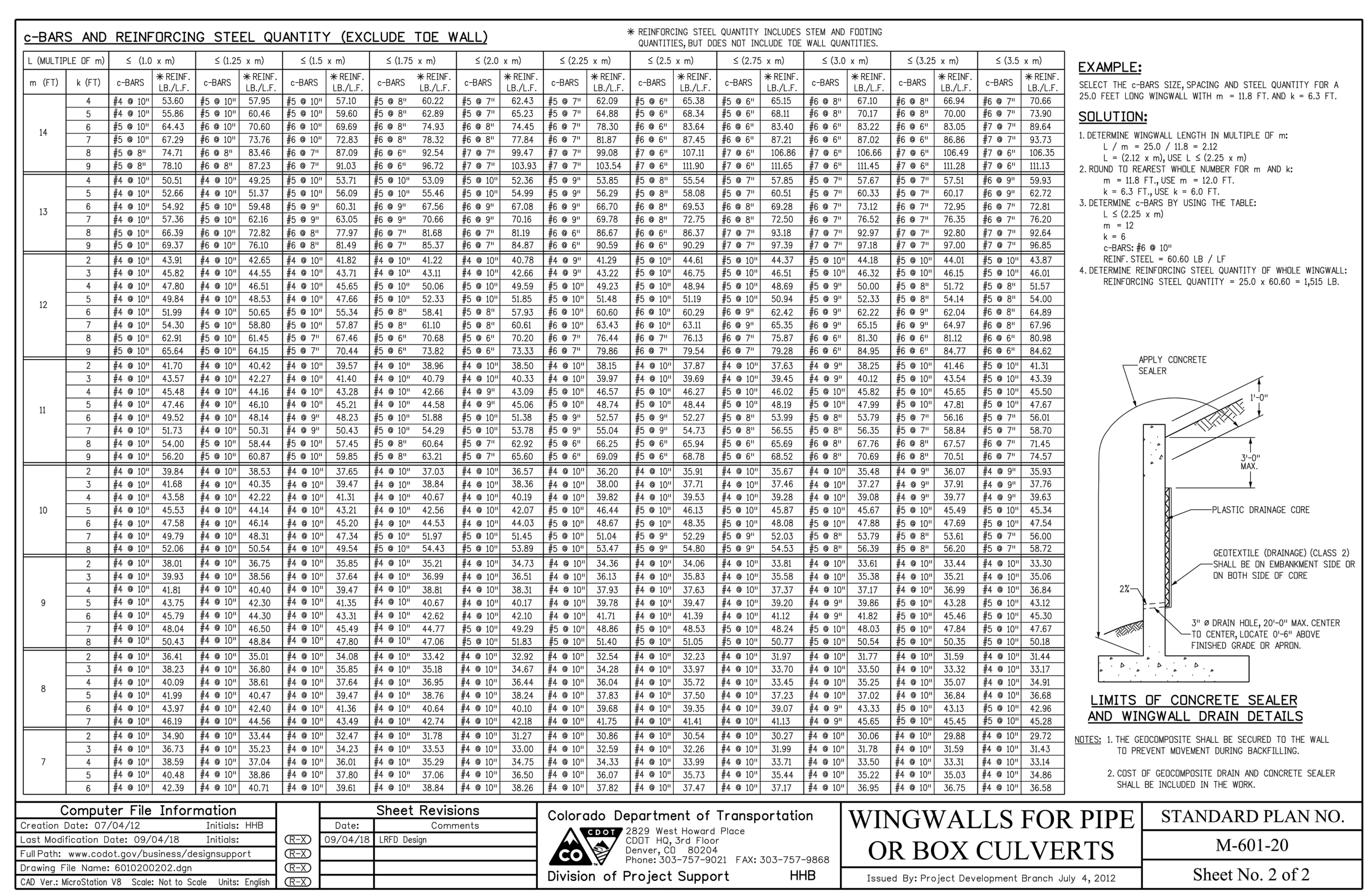

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BENCHMARK

NGS ROGGEN RM 1: RECOVERED A 3 1/2" BRASS CAP LOCATED 200' SOUTH OF FRONTAGE RD I-76 AND 2500' WEST OF COUNTY RD 73.

ELEVATION = 4721.56 (NAVD 88)

PIONEER VILLAGE
PA'S 1-4, 17 AND 21
TOWN OF KEENESBURG
WELD COUNTY, COLORADO

STORM DETAILS

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JOB NO:	1903-001
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SHEET NUMBER	C-8.12

GRAVITY SEWER

MEETS ASTM D3034 AND F679.

APPLICATIONS

JM Eagle's Ring-Tite PVC Gravity Sewer pipe is suitable for conveying domestic sanitary sewage, as well as certain industrial wastes.

DESCRIPTION

JM Eagle's Gravity Sewer pipe ASTM D3034 is available in SDR 35 and SDR 26 in 4- to 15-inch diameters and ASTM F679 is available in PS 46 and PS 115 in 18- to 48-inch diameters. It comes in 14- and 20-foot lengths.

The pipe can be directed to most existing sewer equipment. It can also be connected to IPS cast- or ductile-iron fittings with the appropriate adapters and/or transition gaskets.

JM Eagle Gravity Sewer pipe comes with Ring-Tite joints with locked-in gaskets. Joints meet or exceed ASTM D3212 for joint tightness, including a 22-inch Hg vacuum and a 25-foot head pressure test.

BENEFITS

JM Eagle's Ring-Tite Gravity Sewer pipe features an improved design for reserve strength and stiffness to increase load-bearing capacity, maximizing sewer system capacity at a reasonable cost.

- It is unaffected by the fluids found in ordinary domestic sewage; sewer gasses and the sulfuric acid generated by the completion of the hydrogen sulfide cycle; and corrosive soils both alkaline and acidic.
- Maintains performance against tuberculation, corrosion and external galvanic soil conditions without lining wrapping, coating or cathodic protection.
- It resists abrasion, gouging and scouring far better than most common piping materials.
- Its interiors stay smooth over long years of service while maximizing system capacity, allowing for savings in pumping costs, as well as savings on the size of the pipe required.
- The light weight of the pipe reduces manpower required for installation.
- It can be field-cut with a power saw or ordinary handsaw and be beveled without the use of expensive or complicated machinery.
- Gasketed tee and wye saddles for tapping into previously installed PVC sewer lines eliminate the need for field solvent welding.

PLEASE CONTACT YOUR JM EAGLE REPRESENTATIVE OR VISIT WWW.JMEAGLE.COM FOR MORE INFORMATION.

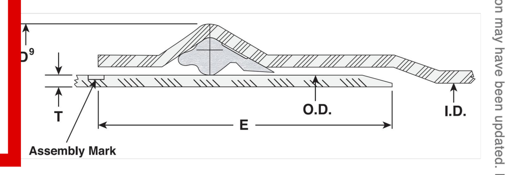
GRAVITY SEWER

SUBMITTAL AND DATA SHEET

JM EAGLE'S RING-TITE JOINT OFFERS ADDITIONAL BENEFITS.

- Seated in a deep groove, the flexible elastomeric Rieber gasket provides a tight seal that protects the line from shock, vibration and earth movement, and compensates for expansion and contraction of the pipe lengths.
- Quick and easy to assemble with a simple push, there's no field mixing or application of cement.
- The joint remains tight under normal operating conditions.

PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D' (IN)	APPROX. WEIGHT (LBS/FT)
SDR 35 (PS46) ASTM D3034						
4	4.215	3.975	0.120	3.50	4.685	1.05
6	6.275	5.915	0.180	4.25	6.995	2.36
8	8.400	7.920	0.240	4.75	9.360	4.24
10	10.500	9.900	0.300	6.00	11.700	6.64
12	12.500	11.780	0.360	6.25	13.940	9.50
15	15.300	14.426	0.437	7.25	17.048	14.18
[illegible]						
4	4.215	3.891	0.162	3.50	4.863	1.45
6	6.275	5.793	0.241	4.25	7.239	3.11
8	8.400	7.754	0.323	4.75	9.692	5.53
10	10.500	9.692	0.404	6.00	12.116	8.64
12	12.500	11.538	0.481	6.25	14.424	12.56
15	15.300	14.124	0.588	7.25	17.652	18.90
PS46, ASTM F679						
18	18.701	17.629	0.499	8.00	20.845	21.43
21	22.047	20.783	0.588	9.00	24.575	29.86
24	24.803	23.381	0.661	9.60	27.647	38.96
27	27.953	26.351	0.745	10.10	31.157	48.47
30 CIOD	32.000	30.184	0.853	16.75	35.612	64.18
36 CIOD	38.300	36.042	1.021	19.00	42.816	93.00
42 CIOD	44.500	41.948	1.187	22.43	49.604	—
48 CIOD	50.800	47.888	1.355	24.78	56.624	—
PS115, ASTM F679						
18	18.701	17.261	0.671	8.00	21.081	28.49
21	22.047	20.349	0.791	9.00	24.853	—
24	24.803	22.891	0.889	9.60	27.947	—
27	27.953	25.799	1.002	10.10	32.261	—
30 CIOD	32.000	29.070	1.148	16.75	36.248	—
36 CIOD	38.300	35.464	1.373	19.00	43.438	—
42 CIOD	44.500	41.072	1.596	22.43	51.356	—
48 CIOD	50.800	46.886	1.822	24.78	58.626	—



I.D. : Inside Diameter
O.D. : Outside Diameter
T. : Wall Thickness
D' : Bell Outside Diameter
E : Distance between Assembly Mark to the end of spigot

Product Standard:	ASTM 3034 (4"–15") ASTM F679 (18"–48")
Pipe Compound:	ASTM D1784 Cells Class 12454 or 12364
Gasket:	ASTM F477
Integral Bell Joint:	ASTM D3212
Pipe Stiffness:	ASTM D2412 F/ΔY = 46 PSI or 115 PSI
Pipe Length:	14 or 20 feet laying length
Installation:	ASTM D 2321 JM Eagle™ Installation Guide

PRESSURE CLASS/THICKNESS CLASS

Each of the following is a nationally recognized standards organization:

- American National Standards Institute (ANSI)
- American Water Works Association (AWWA)
- American Society for Testing and Materials (ASTM)
- Underwriters Laboratories (UL)
- National Fire Protection Association (NFPA)
- National Sanitation Foundation (NSF)
- Factory Mutual (FM)

TYTON JOINT®, FIELD LOK 350® and FLANGE TYTE® Gaskets meet the specifications, performance requirements and pressure ratings in accordance with standard: ANSI/AWWA C111/A21.11-Rubber-Gaskets Joints for Ductile-Iron Pressure Pipe and Fittings. These gaskets are manufactured in the following elastomer compounds: Styrene Butadiene-(SBR), Acrylonitrile Butadiene-(NBR) and Ethylene Propylene Diene Monomer-(EPDM), Polychloroprene-Neoprene® (CR) and Fluorocarbon (FKM)1.

All PROTECTO 401 CERAMIC EPOXY linings furnished with our products conform to U.S. Pipe's submittal BRO-068 (PROTECTO 401 Ceramic Epoxy Lined Ductile Iron Pipe & Fittings for Force Mains and Gravity Sewer Lines). U.S. Pipe certifies that our applicator met the requirements of the specifications.

United States Pipe and Foundry Company's ductile iron pipe meets or exceeds the requirements of the national standards listed above that relate to pipe manufacture and component performance.

We hereby certify material furnished by U.S. Pipe & Foundry Company, LLC, either for your stock or for direct shipment to your customer, are manufactured and tested in accordance with the above standards, and meet or exceed the requirements and recommendation therein.

Note: Check with your U.S. Pipe Sales Representative for availability.

For ready reference, standard for ductile iron pipe are listed below:

Standard Designation	Subject Covered
ANSI/AWWA C150/A21.50	Design
ANSI/AWWA C151/A21.51	Water Pipe
ANSI/AWWA C110/A21.10	Fittings – Cast Iron
ANSI/AWWA C153/A21.53	Fittings – Ductile Iron
ANSI/AWWA C111/A21.11	Rubber – Gasket Joints
ANSI/AWWA C115/A21.15	Flanged Pipe
ANSI/AWWA C104/A21.4	Cement – Mortar Linings
ANSI/AWWA C116/A21.16	Fusion Bonded Epoxy Coating
ANSI/AWWA C105/A21.5 & ASTM A674	Polyethylene Encasement for Ductile Iron Pipe
ANSI/AWWA C600	Installation
ASTM A746	Gravity Sewers
ASTM A716	Ductile Iron Culvert Pipe
NFPA Outside Protection 24	Fire Protection Piping

Any materials included but not covered by the above specifications will be per manufacturer's standard.

TYTON®, FIELD LOK 350® and FLANGE-TYTE® are Registered Trademarks of U.S. Pipe and Foundry Company, LLC.

MORE THAN JUST PIPE. US PIPE

PRESSURE CLASS/THICKNESS CLASS

SELECTION TABLE FOR DUCTILE IRON PIPE

This table shows pressure class of pipe necessary for the rated water working pressures. The thicknesses in this table are equal to or in excess of those required to withstand the rated working pressures plus a surge allowance of 100 psi. Ductile iron pipe for working pressures higher than 350 psi available.

SHORT FORM SPECIFICATION:

1. Scope

1.1. This specification covers the general requirements for U.S. Pipe Ductile Iron Pressure Pipe for conveying water and other liquids.

2. Conformance

2.1. Pipe
Ductile Iron Pipe, 3" through 64", shall meet the requirements of ANSI/AWWA C151/A21.51 and ANSI/AWWA C150/A21.50.

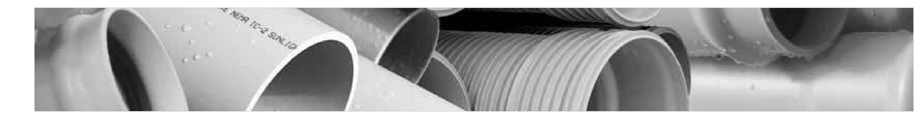
2.2. Joints
Rubber-gasket joints shall be TYTON® Joint 3" – 64" and meet the requirements of ANSI/AWWA C111/A21.11.

2.3. Coating and Lining
Outside coating shall be an asphaltic coating approximately one mil thick. Pipe shall be cement-mortar lined per ANSI/AWWA C104/A21.4

Thickness, Dimensions and Weights of TYTON®, TR FLEX® and HP LOK® Joint Ductile Iron Pipe

Size (Inches)	Pressure Class (psi)	Nominal Thickness (inches)	OD* (inches)	TYTON® Joint	TR FLEX® Joint	HP LOK® Joint
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

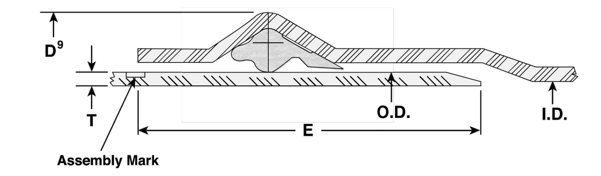
MORE THAN JUST PIPE. US PIPE



SUBMITTAL AND DATA SHEET

PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D' (IN)	APPROX. WEIGHT (LBS/FT)
Rated 200 psi (SDR 21)* (G) (P)						
1.5	1.900	1.709	0.090	3.45	2.26	0.44
2	2.375	2.135	0.113	3.70	2.83	0.54
2.5	2.875	2.585	0.137	3.95	3.42	0.79
3	3.500	3.146	0.167	4.20	4.17	1.17
4	4.500	4.046	0.214	4.50	5.36	1.93
6	6.625	5.955	0.316	5.20	7.89	4.23
8	8.625	7.754	0.410	5.90	10.27	7.18
10	10.750	9.667	0.511	6.70	12.79	11.20
12	12.750	11.465	0.606	8.10	15.17	15.82
Rated 250 psi (SDR 17)* (G) (P)						
1.5	1.900	1.641	0.112	3.45	2.29	0.58
2	2.375	2.078	0.140	3.70	2.84	0.66
2.5	2.875	2.517	0.169	3.95	3.55	0.94
3	3.500	3.063	0.206	4.20	4.22	1.42
4	4.500	3.938	0.265	4.50	5.56	2.36
6	6.625	5.803	0.390	5.20	8.19	5.11
8	8.625	7.553	0.508	5.90	10.66	8.69
10	10.750	9.410	0.632	6.70	13.28	13.55
12	12.750	11.160	0.750	8.10	15.75	19.20

* Prior to ordering or specifying, please consult JM Eagle™ for product and/or listing availability.
(G) Green pipe available in sizes 4"-12"
(P) Purple pipe available in sizes 2"-12"



I.D.: Inside Diameter
O.D.: Outside Diameter
T: Wall Thickness
D': Bell Outside Diameter
E: Distance between Assembly Mark to the end of spigot

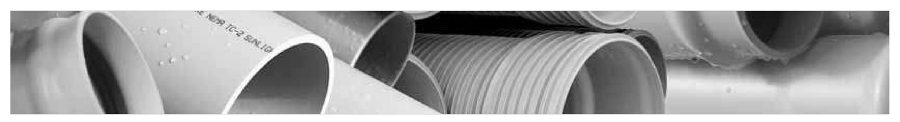
FLOW/FRICTION CHARTS

FLOW/FRICTION LOSS, RING-TITE™ PRESSURE PVC PIPE

1.5" I.P.S. O.D. (ASTM D2241) ACTUAL O.D. 1.900 INCH

FLOW (GAL/MIN)	SDR 32.5 (125 psi)		SDR 26 (160 psi)		SDR 21 (200 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
10	1.320	0.194	1.360	0.208	1.400	0.223
20	2.640	0.699	2.720	0.751	2.799	0.806
30	3.960	1.481	4.079	1.592	4.199	1.708
40	5.280	2.523	5.439	2.713	5.598	2.910
50	6.600	3.814	6.799	4.101	6.998	4.399
60	7.920	5.347	8.159	5.748	8.397	6.165
70	9.240	7.113	9.519	7.647	9.797	8.203
80	10.559	9.109	10.879	9.793	11.196	10.504
90	11.879	11.329	12.238	12.180	12.596	13.064
100	13.199	13.770	13.598	14.804	13.996	15.879
110	14.519	16.429	14.958	17.662	15.395	18.945
120	15.839	19.301	13.318	20.751	16.795	22.257
130	17.159	22.385	17.678	24.066	18.194	25.814
140	18.479	25.679	19.037	27.607	19.594	29.611
150	19.799	29.178	20.397	31.370	20.993	33.647
160	21.119	32.883	21.757	35.352	22.393	37.919
170	22.439	36.790	23.117	39.553	23.793	42.425
180	23.759	40.898	24.477	43.970	25.192	47.162

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, "Handbook of PVC Pipe Design and Construction."



FLOW/FRICTION LOSS, RING-TITE™ PRESSURE PVC PIPE

2" I.P.S. O.D. (ASTM D2241) ACTUAL O.D. 2.375 INCH

FLOW (GAL/MIN)	SDR 32.5 (125 psi)		SDR 26 (160 psi)		SDR 21 (200 psi)		SDR 17 (250 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
10	0.838	0.064	0.866	0.069	0.897	0.076	0.947	0.086
20	1.676	0.231	1.732	0.251	1.793	0.273	1.893	0.311
30	2.514	0.490	2.598	0.531	2.690	0.578	2.840	0.659
40	3.352	0.835	3.464	0.905	3.586	0.985	3.787	1.121
50	4.189	1.263	4.329	1.368	4.483	1.489	4.733	1.695
60	5.027	1.770	5.195	1.917	5.380	2.087	5.680	2.374
70	5.865	2.355	6.061	2.551	6.276	2.776	6.627	3.158
80	6.703	3.015	6.927	3.266	7.173	3.555	7.573	4.043
90	7.541	3.750	7.793	4.062	8.069	4.422	8.520	5.027
100	8.379	4.558	8.659	4.938	8.966	5.375	9.467	6.109
110	9.217	5.438	9.525	5.891	9.863	6.412	10.413	7.287
120	10.055	6.389	10.391	6.921	10.759	7.534	11.360	8.560
130	10.893	7.410	11.256	8.027	11.656	8.737	12.307	9.926
140	11.730	8.500	12.122	9.208	12.553	10.023	13.254	11.385
150	12.568	9.659	12.988	10.463	13.449	11.389	14.200	12.935
160	13.406	10.885	13.854	11.791	14.346	12.835	15.147	14.575
170	14.244	12.178	14.720	13.192	15.242	14.360	16.094	16.305
180	15.082	13.538	15.586	14.665	16.139	15.963	17.040	18.123

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, "Handbook of PVC Pipe Design and Construction."

FLOW/FRICTION CHARTS

(CONTINUED)

FLOW/FRICTION LOSS, RING-TITE™ PRESSURE PVC PIPE

2.5" I.P.S. O.D. (ASTM D2241) ACTUAL O.D. 2.875 INCH

FLOW (GAL/MIN)	SDR 32.5 (125 psi)		SDR 26 (160 psi)		SDR 21 (200 psi)		SDR 17 (250 psi)	
	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT	VELOCITY FT/S	PRESSURE DROP psi/100 FT
10	0.570	0.025	0.589	0.027	0.612	0.030	0.646	0.034
20	1.139	0.091	1.178	0.098	1.224	0.108	1.291	0.123
30	1.709	0.192	1.767	0.208	1.836	0.228	1.937	0.260
40	2.279	0.327	2.355	0.354	2.448	0.389	2.582	0.442
50	2.848	0.494	2.944	0.535	3.060	0.588	3.228	0.668
60	3.418	0.692	3.533	0.750	3.672	0.824	3.873	0.936
70	3.988	0.921	4.122	0.998	4.285	1.097	4.519	1.245
80	4.557	1.180	4.711	1.278	4.897	1.405	5.164	1.594
90	5.127	1.467	5.300	1.590	5.509	1.747	5.810	1.983
100	5.697	1.783	5.889	1.933	6.121	2.123	6.455	2.409
125	7.121	2.696	7.361	2.922	7.651	3.210	8.069	3.641
150	8.545	3.778	8.833	4.095	9.181	4.499	9.683	5.101
175	9.969	5.027	10.305	5.449	10.711	5.986	11.297	6.784
200	11.394	6.437	11.777	6.977	12.241	7.665	12.910	8.685
225	12.818	8.006	13.249	8.678	13.772	9.534	14.524	10.800
250	14.242	9.731	14.722	10.548	15.302	11.588	16.138	13.124
275	15.666	11.610	16.194	12.584	16.832	13.825	17.752	15.655
300	17.090	13.640	17.666	14.784	18.362	16.242	19.366	18.389

Based on calculation methods and design tables set forth by the Uni-Bell® PVC Pipe Association, "Handbook of PVC Pipe Design and Construction."

SHORT FORM INSTALLATION GUIDE/ WARNING

This information is furnished in order to provide a brief review of the installation requirements for JM Eagle™ I.P.S. PVC pipe. It is not intended to serve as or replace the function of the FULL VERSION product installation guide available upon request.

1. Check to see that the Rieber® gasket is properly seated in the bell groove, and that the bell and spigot are clean before assembly.
2. Apply the approved lubricant supplied with the pipe to the spigot end of the pipe, paying particular attention to the bevel. The coating should be equivalent to a brush coat of enamel paint.
3. Assemble the joint only to the reference mark provided on the spigot end.
4. If undue resistance to insertion of the spigot is encountered, or the reference mark does not reach the flush position, disassemble the joint and check the position of the rubber gasket, and remove any debris.
5. Curvature of the pipe shall be accomplished through longitudinal bending of the pipe barrel in accordance with the following table. Deflection of the joint is not allowed and may cause leakage.

PIPE SIZE (IN)	RADIUS (FT)	PIPE SIZE (IN)	RADIUS (FT)	PIPE SIZE (IN)	RADIUS (FT)
1.5	38	3	75	8	200
2	50	4	100	10	250
2.5	63	6	150	12	300

6. Prior to backfilling, check to see that the reference mark is flush with the end of the bell.
7. All taps performed on JM Eagle's pressure products, shall be in accordance with Uni-Bell® Publication UNI-PUB-08-07, "Tapping Guide for PVC Pressure Pipe."

Note: JM Eagle™ does not recommend direct tapping of IPS Pressure Pipe.

WARNING : RUPTURE HAZARD

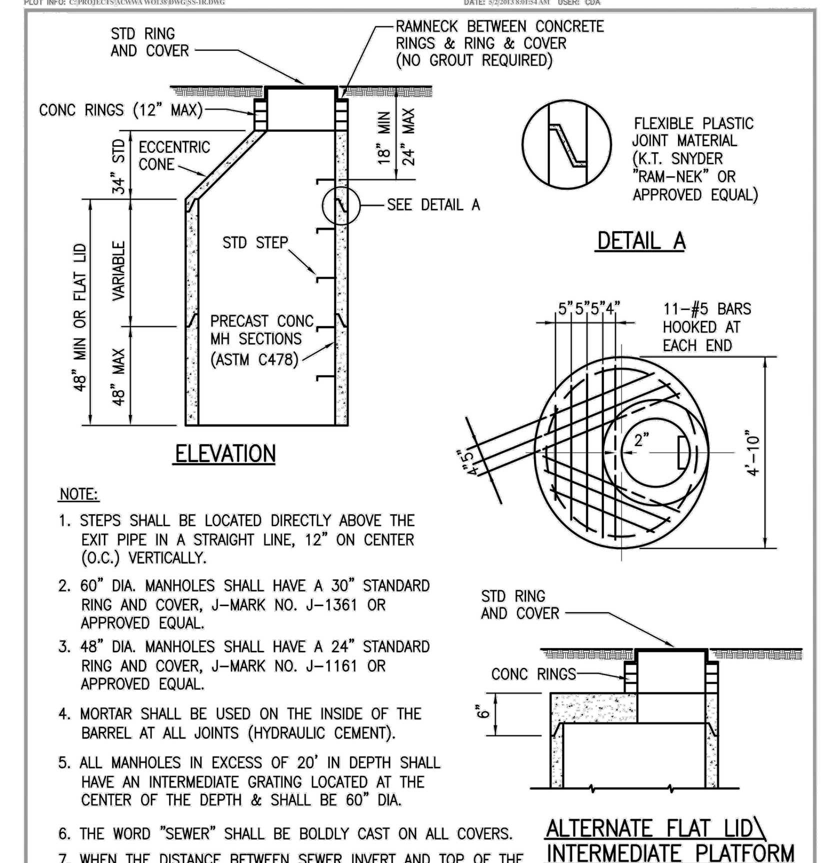
IMPROPER INSTALLATION OR MISUSE OF TAPPING TOOLS MAY CAUSE PIPES UNDER HIGH PRESSURE TO RUPTURE AND RESULT IN HIGH VELOCITY AIRBORNE FRAGMENTATION LEADING TO SERIOUS INJURIES AND/OR DEATH.

BEFORE AND DURING INSTALLATION, ALWAYS:
- Consult and follow the FULL VERSION of the product installation guide
- Closely follow job specifications
- Use protective gear and equipment

BEFORE AND DURING TAPPING, ALWAYS:
- Consult and follow Uni-Bell® Publication UNI-PUB-08-07, "Tapping Guide for PVC Pressure Pipe."
- Use the correct tapping tools
- Bleed air from pipes at high spot before tapping
- Use protective gear and equipment

Please contact JM Eagle™ Product Assurance at (800) 621-4404 to obtain FULL VERSION of the appropriate installation guide or for further assistance.

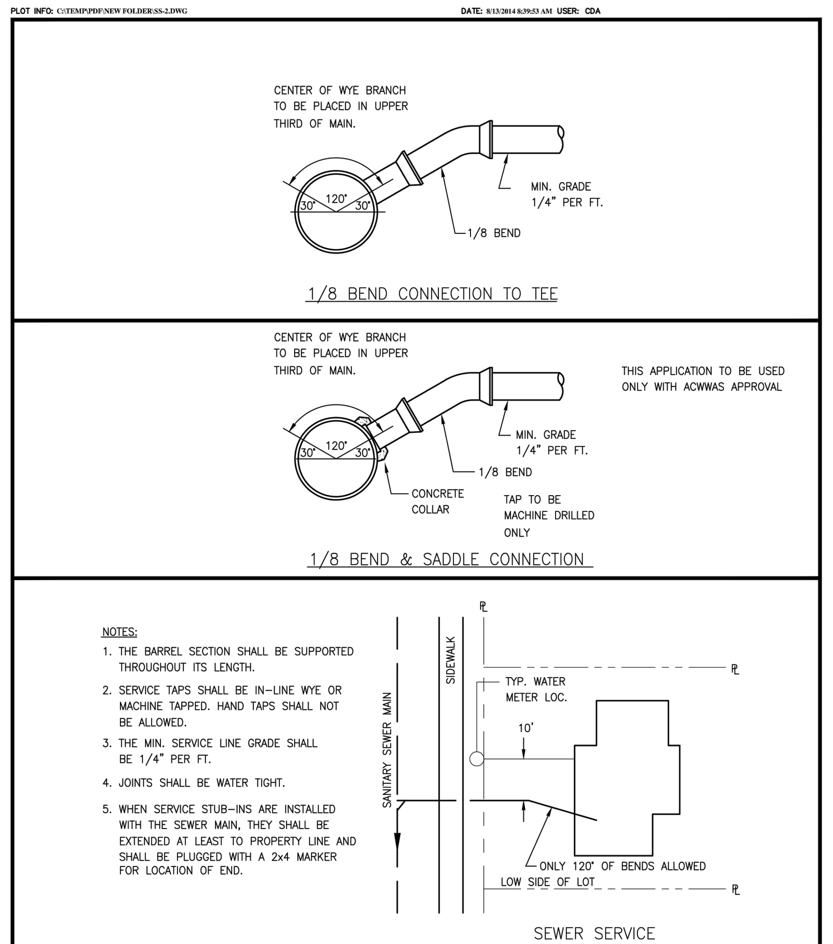
PLOT INFO: C:\PROJECTS\ACWWA WO138\DWG\SS-1R.DWG DATE: 5/2/2013 8:01:54 AM USER: CDA



NOTE:

1. STEPS SHALL BE LOCATED DIRECTLY ABOVE THE EXIT PIPE IN A STRAIGHT LINE, 12" ON CENTER (O.C.) VERTICALLY.
2. 60" DIA. MANHOLES SHALL HAVE A 30" STANDARD RING AND COVER, J-MARK NO. J-1361 OR APPROVED EQUAL.
3. 48" DIA. MANHOLES SHALL HAVE A 24" STANDARD RING AND COVER, J-MARK NO. J-1161 OR APPROVED EQUAL.
4. MORTAR SHALL BE USED ON THE INSIDE OF THE BARREL AT ALL JOINTS (HYDRAULIC CEMENT).
5. ALL MANHOLES IN EXCESS OF 20' IN DEPTH SHALL HAVE AN INTERMEDIATE GRATING LOCATED AT THE CENTER OF THE DEPTH & SHALL BE 60" DIA.
6. THE WORD "SEWER" SHALL BE BOLDLY CAST ON ALL COVERS.
7. WHEN THE DISTANCE BETWEEN SEWER INVERT AND TOP OF THE MANHOLE COVER IS LESS THAN 8'6", A FLAT TOP MANHOLE SHALL BE CONSTRUCTED.
8. NO MANHOLE INSERTS ALLOWED.

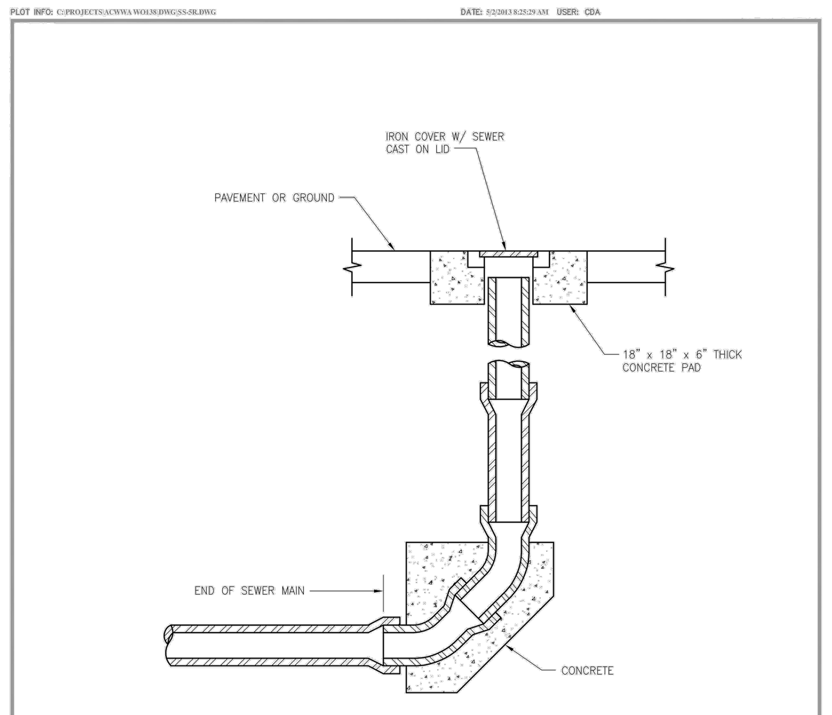
ARAPAHOE COUNTY Water and Wastewater Authority 13031 E Caley Ave, Centennial, Colorado 80111 Ph: (303) 790-4830 Fax: (303) 790-1718	STANDARD MANHOLE	REVISION DATE: 03/01/2013 FIGURE NO. SS-1 SHEET NO. 1 of 1



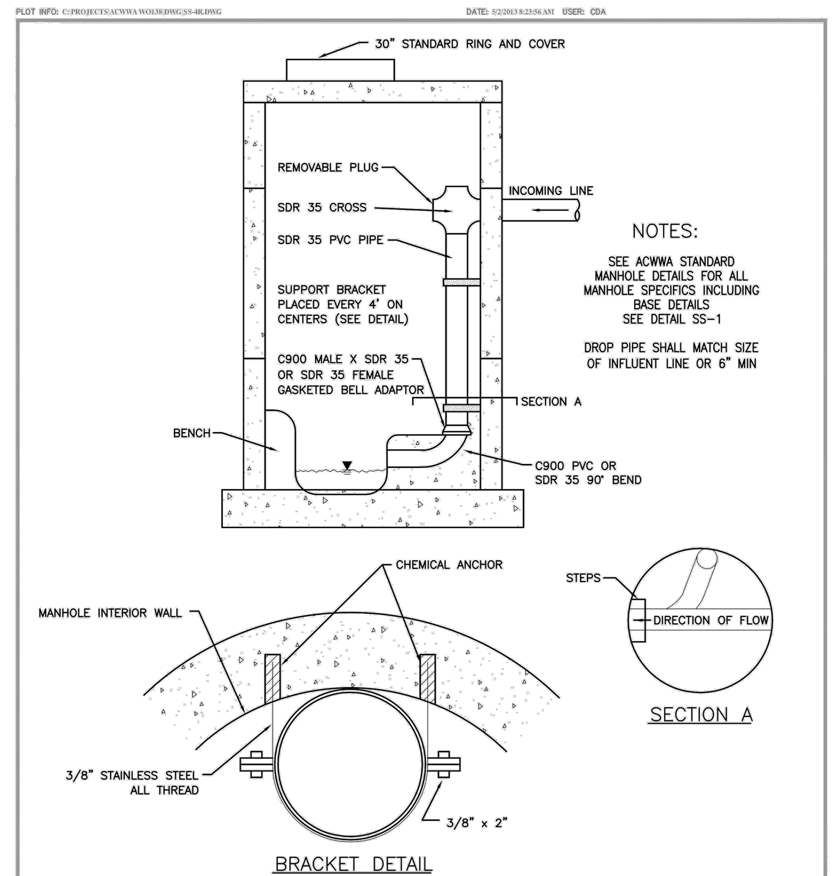
NOTES:

1. THE BARREL SECTION SHALL BE SUPPORTED THROUGHOUT ITS LENGTH.
2. SERVICE TAPS SHALL BE IN-LINE WYE OR MACHINE TAPPED. HAND TAPS SHALL NOT BE ALLOWED.
3. THE MIN. SERVICE LINE GRADE SHALL BE 1/4" PER FT.
4. JOINTS SHALL BE WATER TIGHT.
5. WHEN SERVICE STUB-INS ARE INSTALLED WITH THE SEWER MAIN, THEY SHALL BE EXTENDED AT LEAST TO PROPERTY LINE AND SHALL BE PLUGGED WITH A 2x4 MARKER FOR LOCATION OF END.

ARAPAHOE COUNTY Water and Wastewater Authority 13031 E Caley Ave, Centennial, Colorado 80111 Ph: (303) 790-4830 Fax: (303) 790-1718	SANITARY SEWER SERVICE	FIGURE NO. SS-2 SHEET NO. 1 of 1



ARAPAHOE COUNTY Water and Wastewater Authority 13031 E Caley Ave, Centennial, Colorado 80111 Ph: (303) 790-4830 Fax: (303) 790-1718	TERMINAL CLEANOUT	FIGURE NO. SS-5 SHEET NO. 1 of 1



NOTES:

SEE ACWWA STANDARD MANHOLE DETAILS FOR ALL MANHOLE SPECIFICS INCLUDING BASE DETAILS SEE DETAIL SS-1

DROP PIPE SHALL MATCH SIZE OF INFLUENT LINE OR 8" MIN

MANUFACTURE BRACKET FROM 3/8" STAINLESS STEEL.

NOTES:

MANHOLE SIZE VARIES WITH SIZE OF THE MAINLINE.
8" – 10" MAINLINE = 5' DIA. MANHOLE
12" – 15" MAINLINE = 6' DIA. MANHOLE
7' DIA. MANHOLE FOR LARGER MAINLINES.
STEPS INSTALLED OVER DOWNSTREAM INVERT OF MANHOLE.

ARAPAHOE COUNTY Water and Wastewater Authority 13031 E Caley Ave, Centennial, Colorado 80111 Ph: (303) 790-4830 Fax: (303) 790-1718	INSIDE DROP MANHOLE CONSTRUCTION DETAIL	FIGURE NO. SS-4 SHEET NO. 1 of 1

ENGINEER IN CHARGE:

PRELIMINARY NOT FOR CONSTRUCTION

STRATEGIC SITE DESIGNS

CONTACT INFORMATION
88 INVERNESS CIRCLE EAST, SUITE E-101
ENGLEWOOD, CO 80112
(720) 206-6931
CPERDUE@STRATEGICSITEDESIGNS.COM
ATTENTION: CHRISTOPHER PERDUE, P.E., M.B.A.

BASIS OF BEARINGS:

BEARINGS SHOWN HEREON ARE GRID BEARINGS DERIVED FROM GPS OBSERVATION BASED UPON THE COLORADO COORDINATE SYSTEM OF 1983 NORTH ZONE (NAD 83, 2011) REFERENCED TO THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 7, TOWNSHIP 2 NORTH, RANGE 64 WEST, SIXTH PRINCIPAL MERIDIAN, TAKEN TO BEAR SOUTH 00°30'26" EAST, A DISTANCE OF 2,612.70 FEET.

BENCHMARK

NGS ROGGEN RM 1: RECOVERED A 3 1/2" BRASS CAP LOCATED 200' SOUTH OF FRONTAGE RD I-76 AND 200' WEST OF COUNTY RD 73.

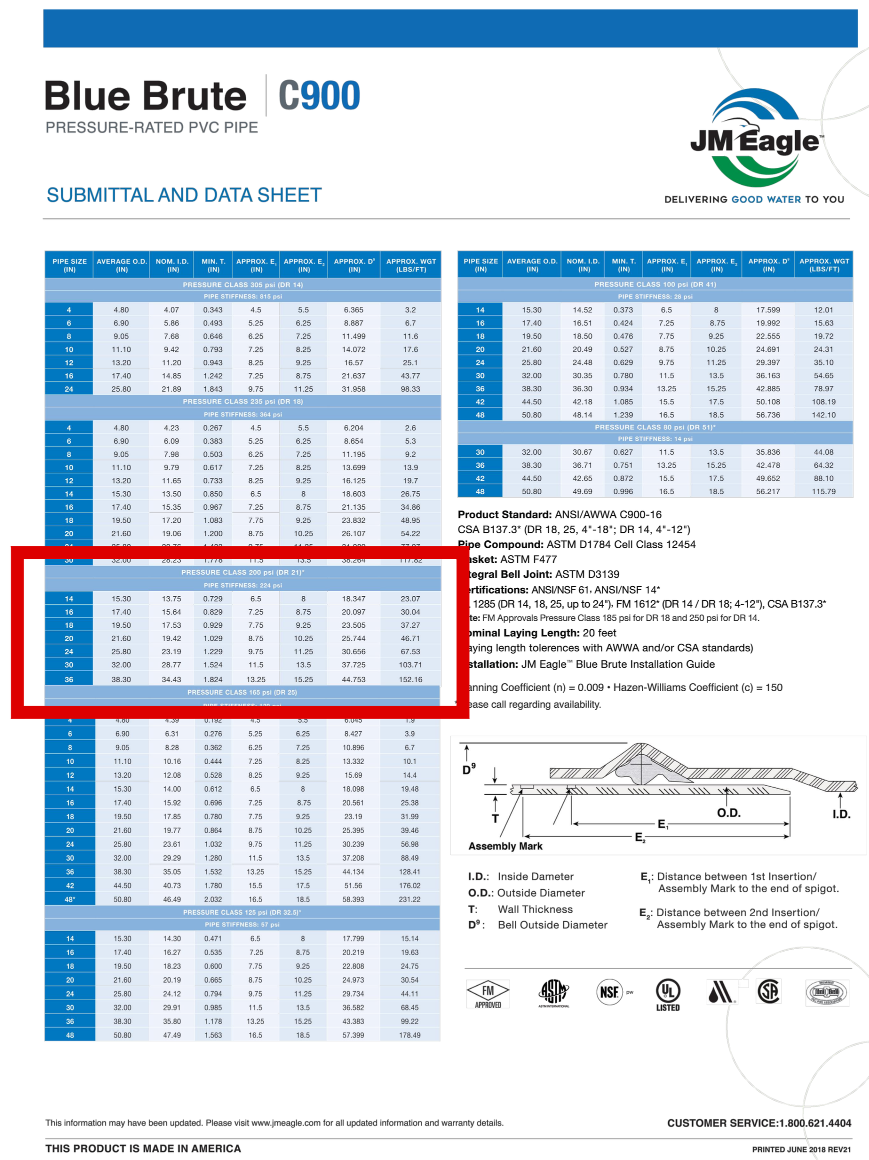
ELEVATION = 4721.56 (NAVD 88)

PIONEER VILLAGE
PA'S 1-4, 17 AND 21
TOWN OF KEENESBURG
WELD COUNTY, COLORADO

SANITARY SEWER DETAILS

REV	DESCRIPTION	BY	DATE

JOB NO:	1903-001
ORIGINAL ISSUE:	03/15/2021
DESIGN BY:	CLP
CHECKED BY:	CLP
SCALE:	NTS
SHEET NUMBER	C-8.20



COPPER TUBE DATA

Streamline® Copper Tube sets the standard for quality, consistency and service in the plumbing industries. With a full line of copper tube products to support most all plumbing supply and DWV applications, Streamline® Copper Tube is available in all common types including Type K, Type L, Type M and DWV. Each piece of tube is incised marked and color coded for easy, long lasting identity. Manufactured in accordance with applicable standards, our ongoing commitment to quality continues to make Streamline® Copper Tube the preferred and specified brand of industry professionals.

TYPE K — **RATED WORKING PRESSURE (PSIG)**

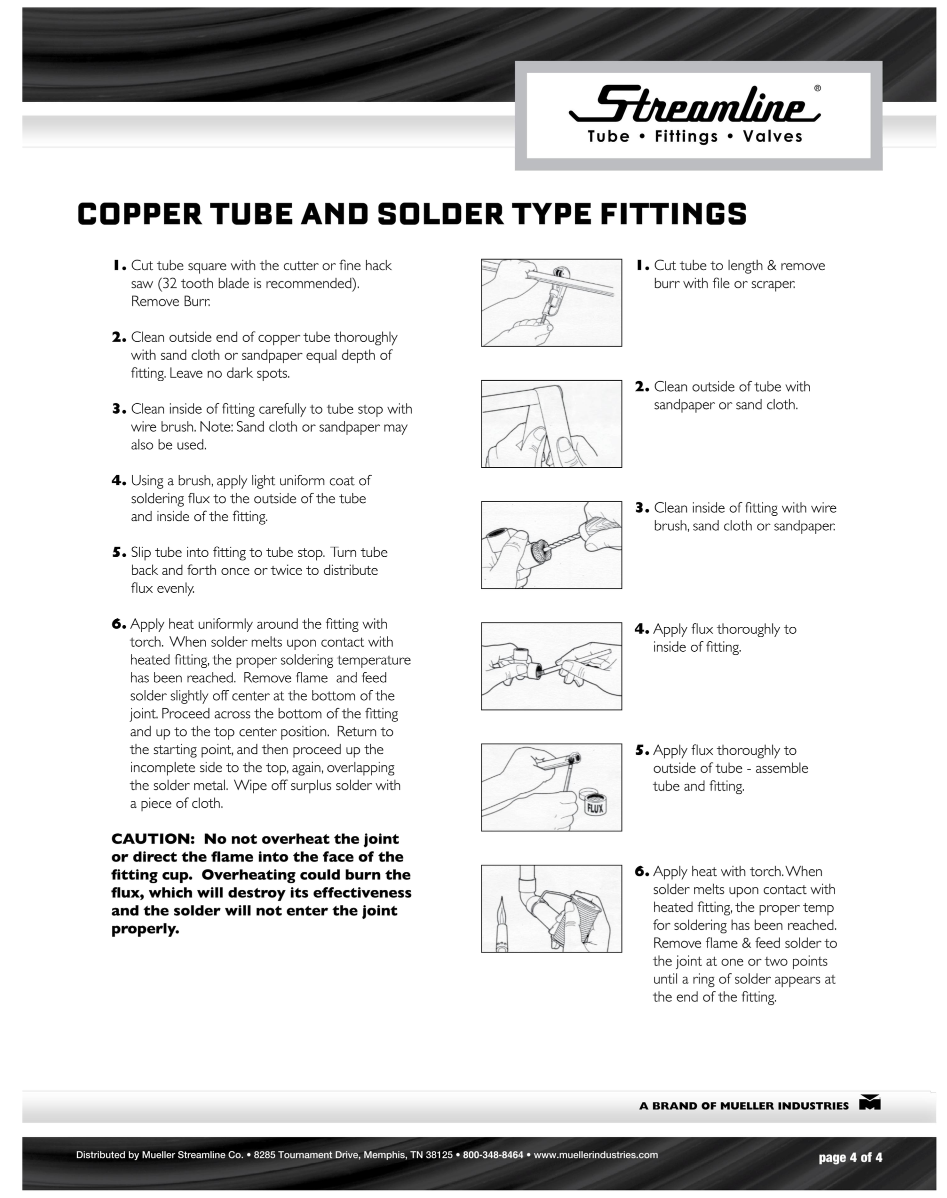
NOM. DIA.	WT/FT	FT/BNDL	150°F	200°F	300°F	400°F
1/4	0.145	500	913	860	842	537
3/8	0.269	500	960	904	885	565
1/2	0.344	500	758	713	698	446
5/8	0.418	200	626	589	577	368
3/4	0.641	200	724	682	668	426
1	0.839	100	557	524	513	327
1 1/4	1.04	100	452	425	416	266
1 1/2	1.36	100	420	396	387	247
2	2.06	–	370	348	341	217
2 1/2	2.93	–	338	319	312	199
3	4.00	–	328	308	302	193
3 1/2	5.12	–	311	293	286	183
4	6.51	–	306	288	282	180
5	9.67	–	293	276	270	172
6	13.90	–	295	277	271	173
8	25.90	–	314	295	289	184

TYPE L

NOM. DIA.	WT/FT	FT/BNDL	150°F	200°F	300°F	400°F
1/4	0.126	500	775	729	714	456
3/8	0.198	500	662	623	610	389
1/2	0.285	500	613	577	565	361
5/8	0.362	200	537	505	495	316
3/4	0.455	200	495	466	456	291
1	0.655	100	420	395	387	247
1 1/4	0.884	100	373	351	344	219
1 1/2	1.14	100	347	327	320	204
2	1.75	–	309	291	285	182
2 1/2	2.48	–	285	269	263	168
3	3.33	–	270	254	248	159
3 1/2	4.29	–	258	243	238	152
4	5.38	–	249	235	230	147
5	7.61	–	229	215	211	135
6	10.2	–	213	201	196	125
8	19.3	–	230	216	212	135

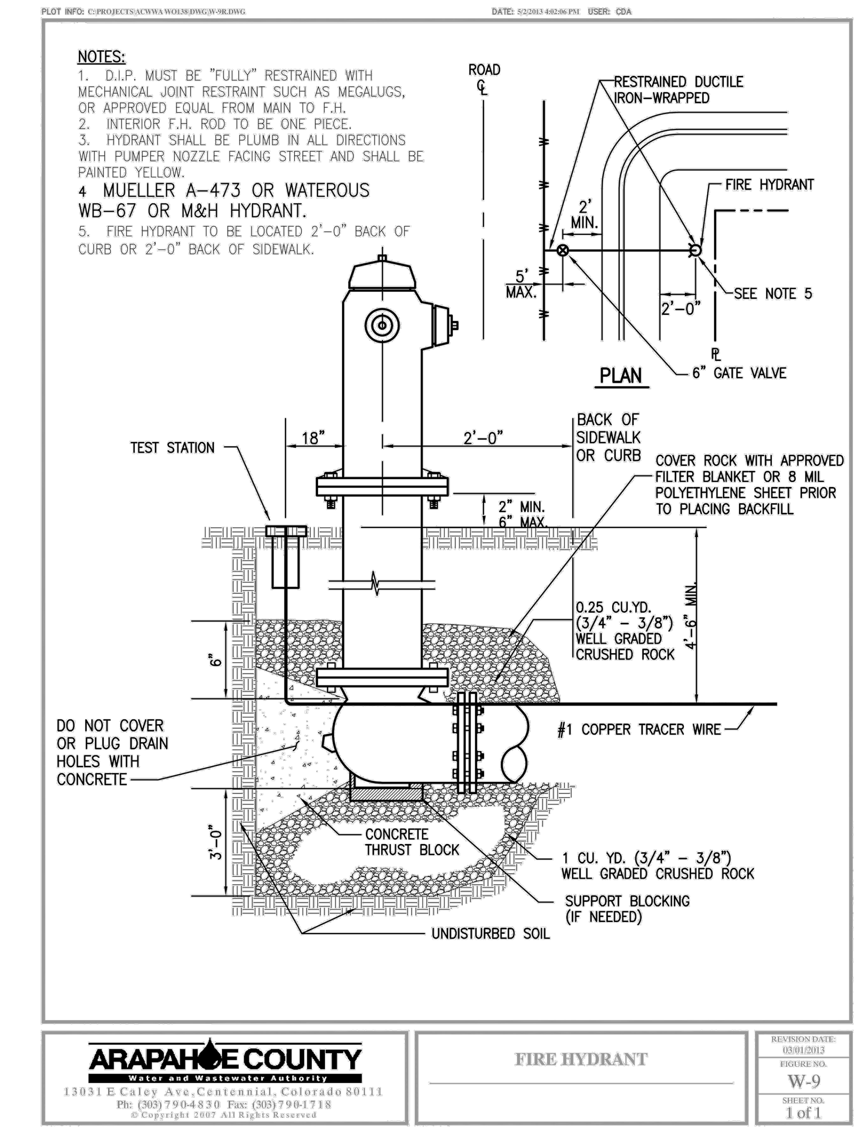
Tables give computed allowable stress for annealed copper tube at indicated temperature.

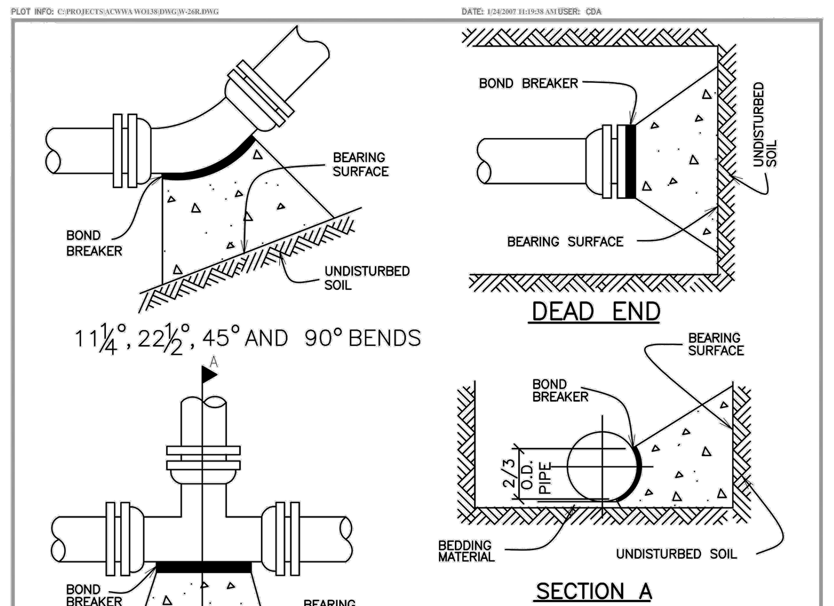
A BRAND OF MUELLER INDUSTRIES



NOTES:

1. D.I.P. MUST BE "FULLY" RESTRAINED WITH MECHANICAL JOINT RESTRAINT SUCH AS MEGALUGS, OR APPROVED EQUAL FROM MAIN TO F.H.
2. INTERIOR F.H. ROD TO BE ONE PIECE.
3. HYDRANT SHALL BE PLUMB IN ALL DIRECTIONS WITH PUMPER NOZZLE FACING STREET AND SHALL BE PAINTED YELLOW.
4. MUELLER A-473 OR WATEROUS WB-67 OR M&H HYDRANT.
5. FIRE HYDRANT TO BE LOCATED 2'-0" BACK OF CURB OR 2'-0" BACK OF SIDEWALK.





MINIMUM BEARING SURFACE AREA (IN SQUARE FEET)

SIZE OF PIPE	BENDS 11 1/4°	BENDS 22 1/2°	BENDS 45°	BENDS 90°	TEE OR DEAD END
4"	1.00	1.00	1.00	N.A.	1.50
6"	1.00	1.25	2.25	4.25	3.00
8"	1.00	2.00	4.00	8.00	5.25
12"	2.25	4.50	8.75	12.00	11.25
16"	3.75	7.50	14.50	27.00	19.00
20"	5.00	10.00	19.50	35.50	25.00
24"	7.00	14.00	27.75	51.00	36.00

NA = NOT APPLICABLE.

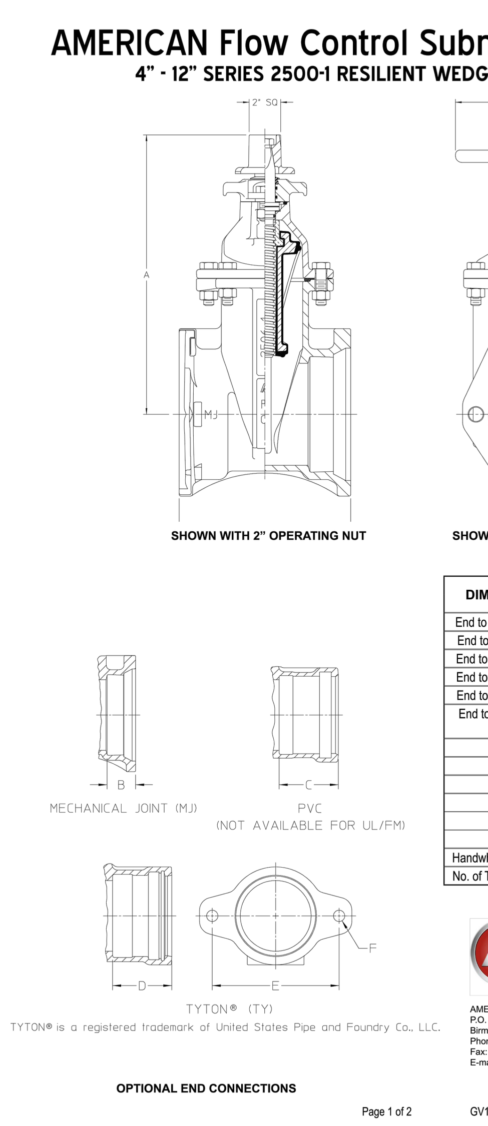
NOTES:

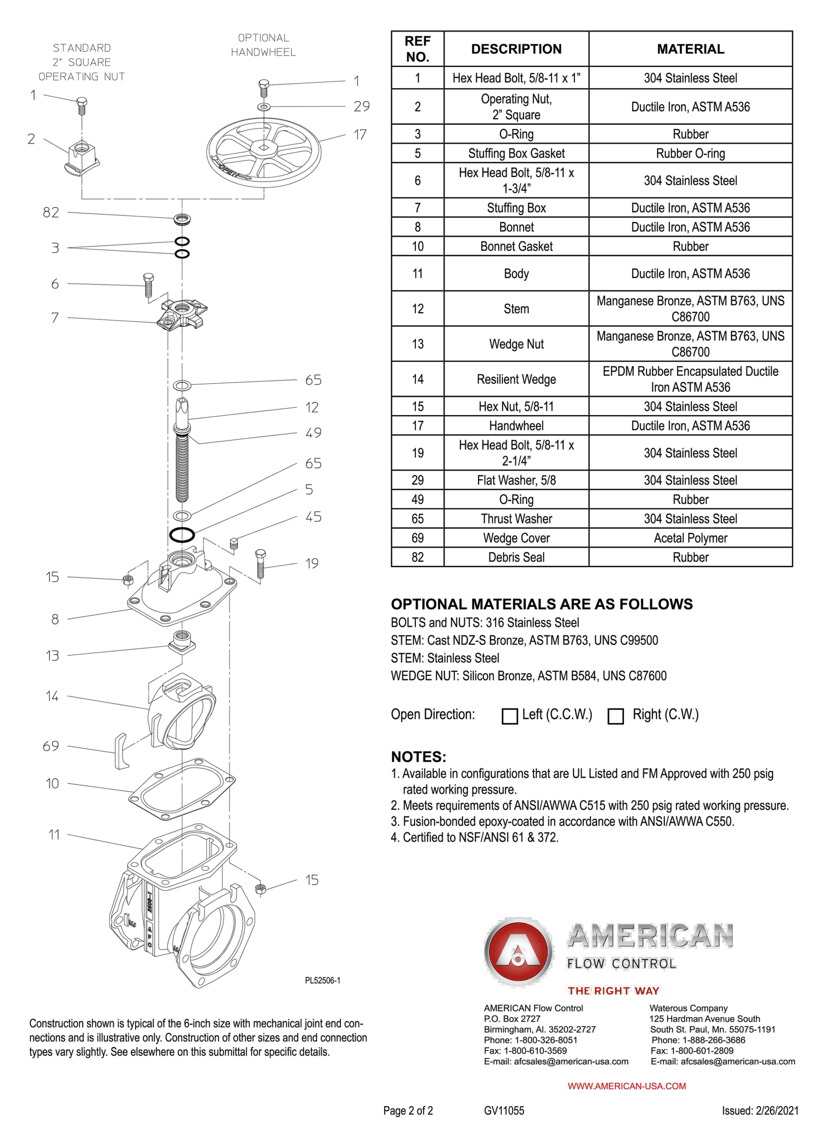
1.) BEARING SURFACES SHOWN IN CHART ARE MINIMUM.
2.) BASED ON 150 PSI INTERNAL PIPE PRESSURE PLUS WATER HAMMER. 4",6",8" AND 12" WATER HAMMER = 110 P.S.I. 16",20' AND 24" WATER HAMMER = 70 P.S.I.
3.) CONCRETE MUST BE MINIMUM OF 3000 PSI, AND CURE FOR 24 HOURS BEFORE TAMPING OR COMPACTING.
4.) BASED ON 3,000 psf SOIL BEARING CAPACITY.

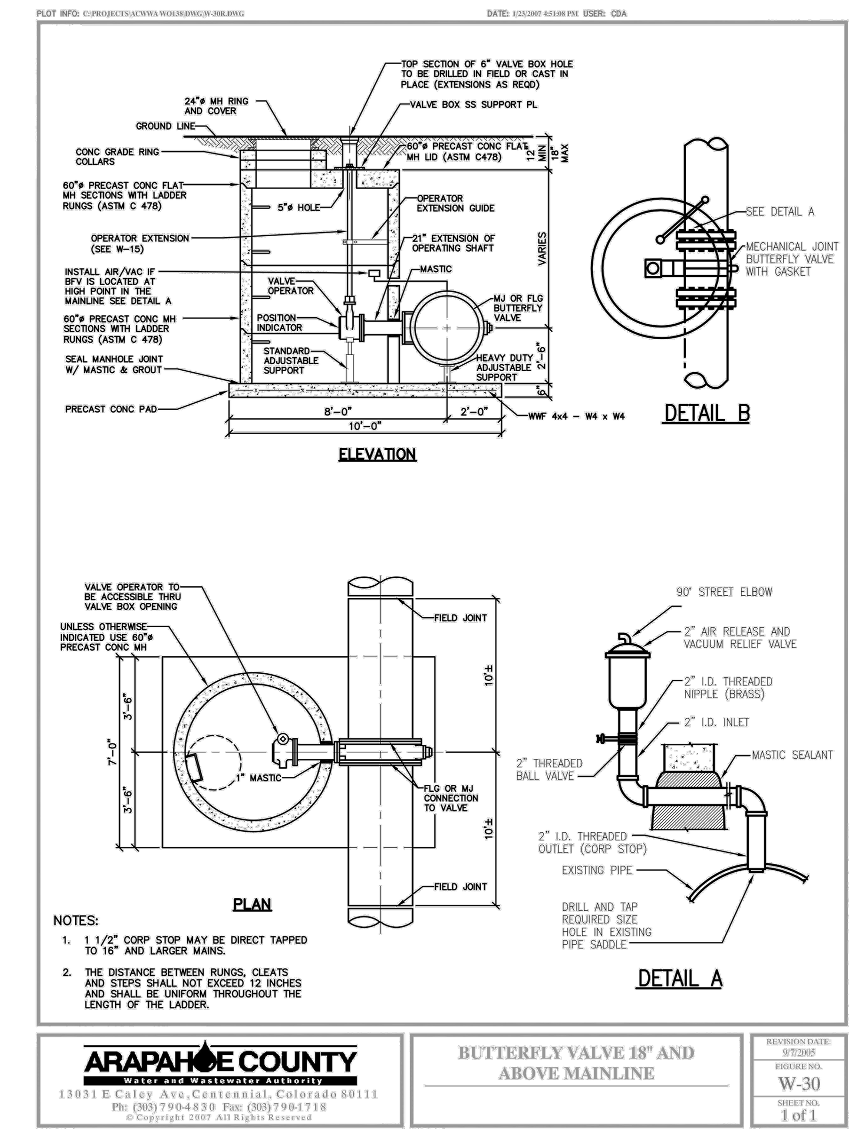
ARAPAHOE COUNTY Water and Wastewater Authority — 13031 E Caley Ave, Centennial, Colorado 80111 — Ph: (303) 790-4830 Fax: (303) 790-1718 — CONCRETE KICKBLOCKS BEARING SURFACES AND INSTALLATION — REVISION DATE: 03/01/2013 — FIGURE NO. W-26 — SHEET NO. 1 of 1

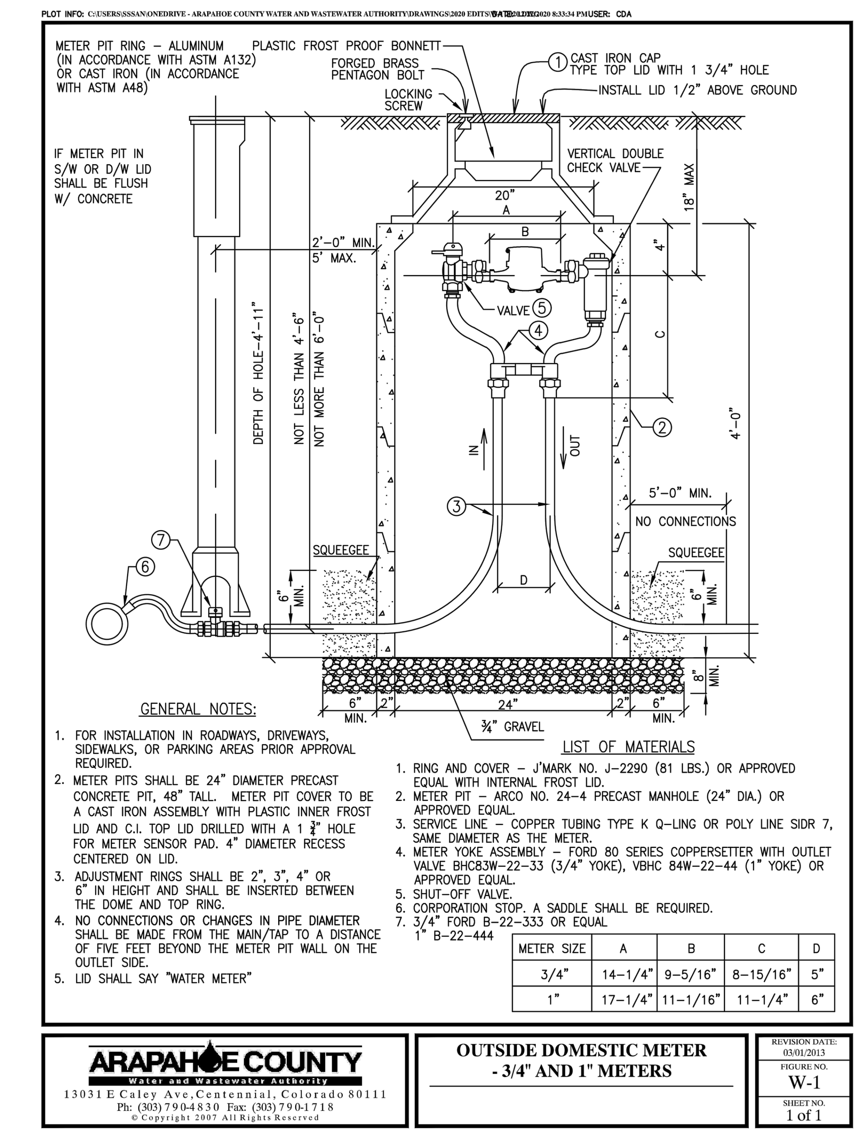
AMERICAN Flow Control Submittal Information

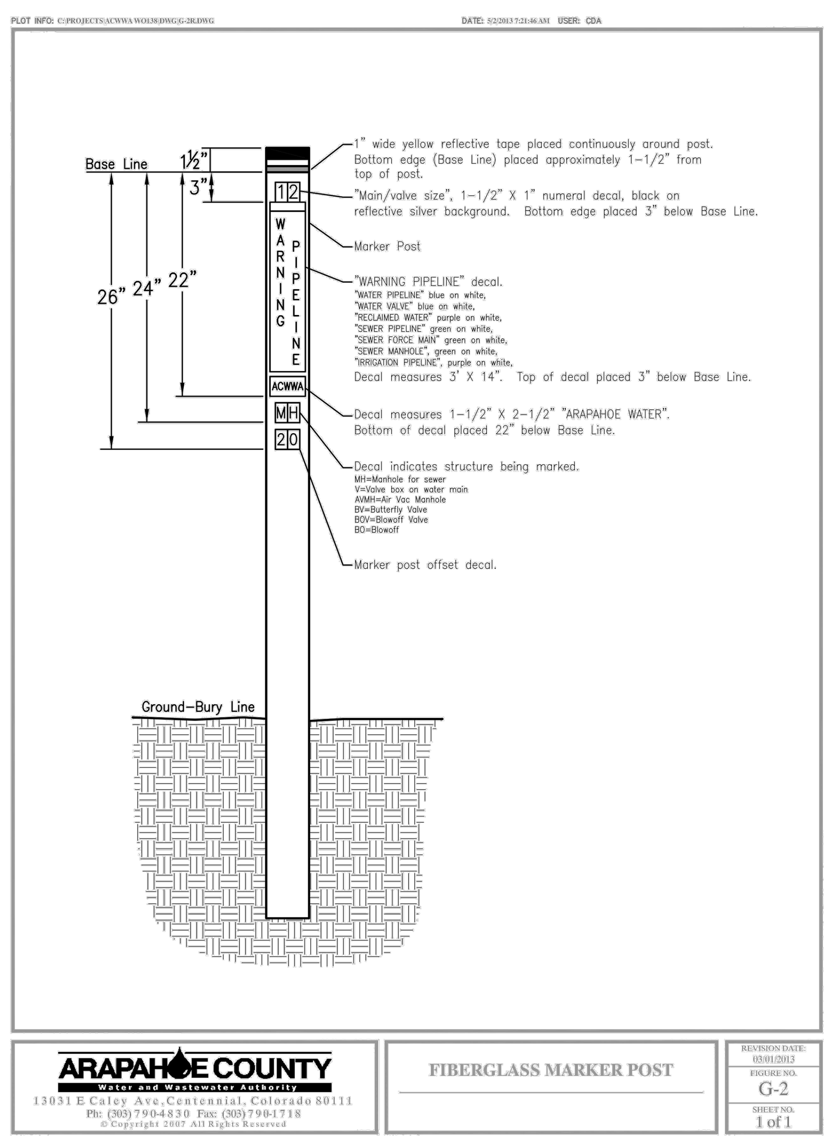
4" - 12" SERIES 2500-1 RESILIENT WEDGE GATE VALVE, NRS

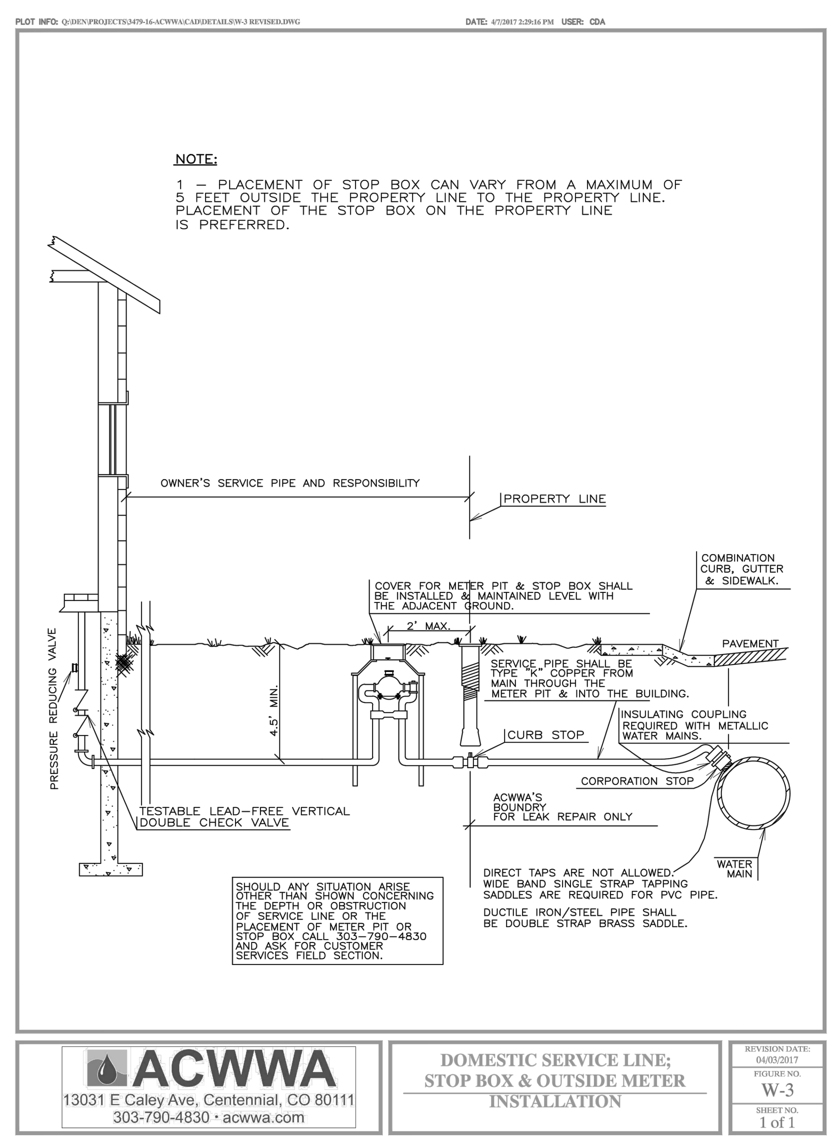


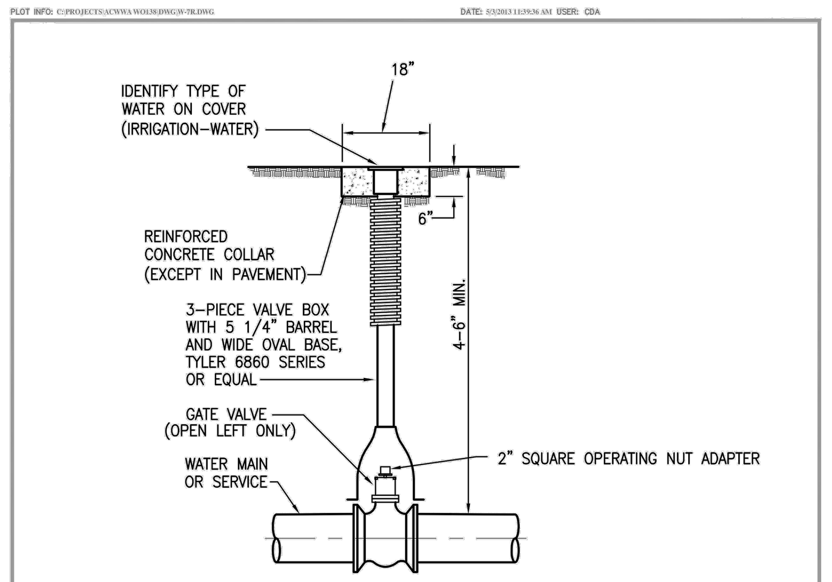








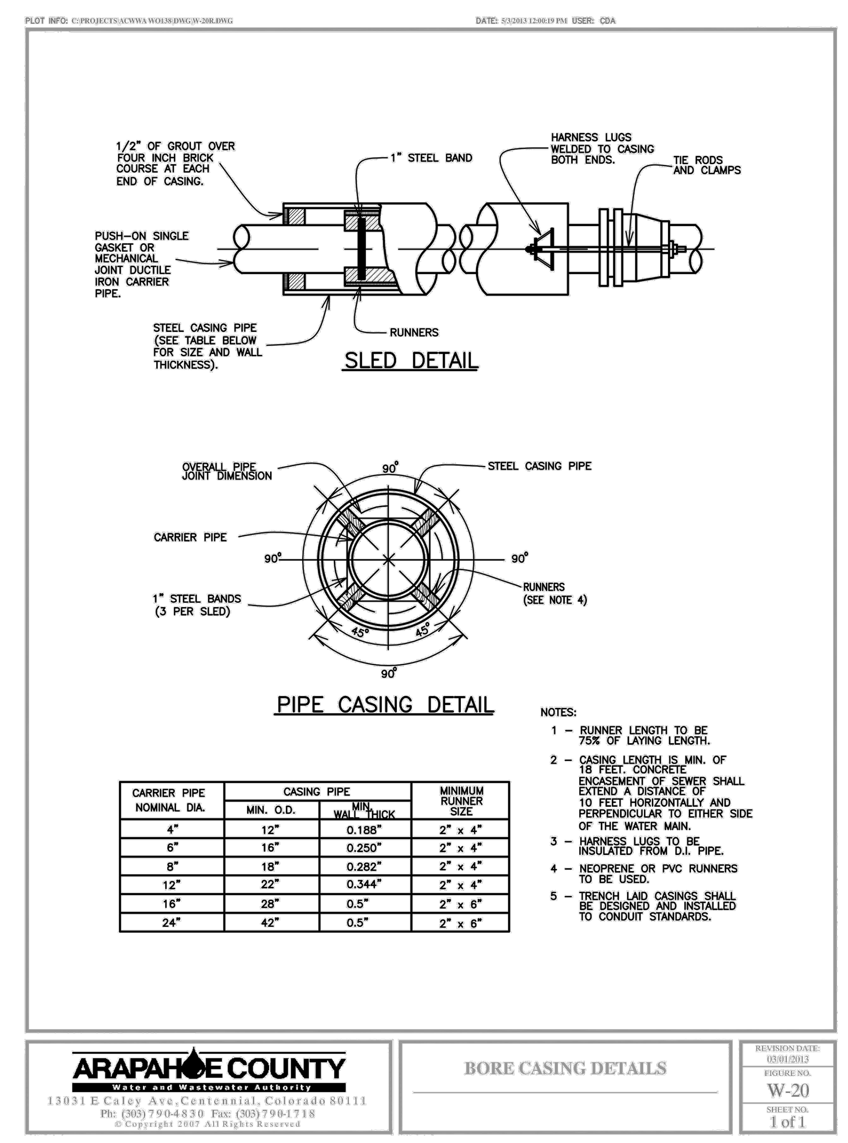


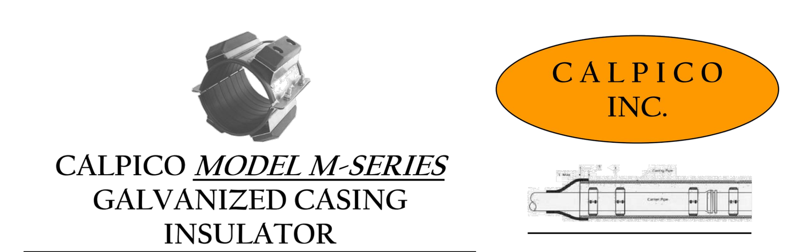


NOTES:

1. VALVE BOX COVER SHALL BE SET 1/4" BELOW FINAL GRADE OF ASPHALT/CONCRETE PAVEMENT.
2. VALVE BOXES PLACED IN AREAS OTHER THAN PAVEMENT (I.E. DIRT OR LANDSCAPING) SHALL HAVE A 18"SQX6" THICK REINFORCED CONCRETE COLLAR SET FLUSH WITH FINAL GRADE. CONCRETE PAD TO BE PLACED USING PROPER FORMS; SET SQUARE AND FLUSH WITH GROUND.
3. IF THE DISTANCE FROM FINAL GRADE TO THE OPERATING NUT IS GREATER THAN 6'-6", OPERATOR EXTENSIONS SHALL BE CONNECTED TO VALVE OPERATOR USING SET SCREW TO RAISE THE NUT TO WITHIN 12" BELOW GRADE.
4. TYLER 6860 SERIES BOX WITH WIDE OVAL BASE, OR APPROVED EQUAL, REQUIRED ON ALL VALVES INCLUDING ALL CURB STOPS EXCEPT 3/4" RESIDENTIAL SERVICES.
5. FOR FIRE HYDRANT VALVE, LID READS "FIRE". FOR OTHER UTILITIES VALVE BOX LID SHALL READ "SEWER", "IRRIGATION", ETC. RESPECTIVE TO THE TYPE OF SERVICE.
6. DO NOT RUN TRACER WIRE UP VALVE BOXES.

ARAPAHOE COUNTY Water and Wastewater Authority — 13031 E Caley Ave, Centennial, Colorado 80111 — Ph: (303) 790-4830 Fax: (303) 790-1718 — VALVE BOX STANDARD DOMESTIC WATER SYSTEM — REVISION DATE: 03/01/2013 — FIGURE NO. W-7 — SHEET NO. 1 of 1





CALPICO *MODEL M-SERIES* GALVANIZED CASING INSULATOR

Model M-6 * Model M-8 * Model M-12

- Bands are 14 gauge, hot rolled, pickled, and oiled carbon steel.
- Runners are abrasion resistant, and are attached mechanically with bolts and the bolt heads are TIG welded to the band.
- Bolting flanges are provided for extra strength.
- An extra heavy duty vinyl liner assures double insulation.
- Skids are available in polyethylene & phenolic.

Available in three band width sizes:

- MODEL M-6 - 6" wide band
- MODEL M-8 - 8" wide band
- MODEL M-12 - 12" wide band

SPECIFICATIONS

Band
- 14 gauge galvanized carbon steel
- 6", 8", & 12" wide

Bolts, Nuts, & Washers
- cadmium plated steel
- 5/16" diameter

Insulating Liner
- PVC
- .090" durometer
- Pls max. water absorption
- overlapping edges

Runners
- 1.25", 1.50" wide:
- LDPE
- 2.00" wide:
- HDPE

Risers
- 10 gauge steel on risers when used

1387 San Mateo Ave.; So. San Francisco, CA 94080
650 588-2241; 1-800-998-9115; 650 873-6952 fax

ENGINEER IN CHARGE:

PRELIMINARY NOT FOR CONSTRUCTION

CONTACT INFORMATION
88 INVERNESS CIRCLE EAST, SUITE E-101
ENGLEWOOD, CO 80112
(720) 206-6931
CPERDUE@STRATEGICSITEDESIGNS.COM
ATTENTION: CHRISTOPHER PERDUE, P.E., M.B.A.
STRATEGIC SITE DESIGNS

BASIS OF BEARINGS:

BEARINGS SHOWN HEREON ARE GRID BEARINGS DERIVED FROM GPS OBSERVATION BASED UPON THE COLORADO COORDINATE SYSTEM OF 1983 NORTH ZONE (NAD 83, 2011) REFERENCED TO THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 7, TOWNSHIP 2 NORTH, RANGE 64 WEST, SIXTH PRINCIPAL MERIDIAN, TAKEN TO BEAR SOUTH 00°30'28" EAST, A DISTANCE OF 2,612.70 FEET.

BENCHMARK

NGS ROGGEN RM 1: RECOVERED A 3 1/2" BRASS CAP LOCATED 200' SOUTH OF FRONTAGE RD I-76 AND 2500' WEST OF COUNTY RD 73.

ELEVATION = 4721.56 (NAVD 88)

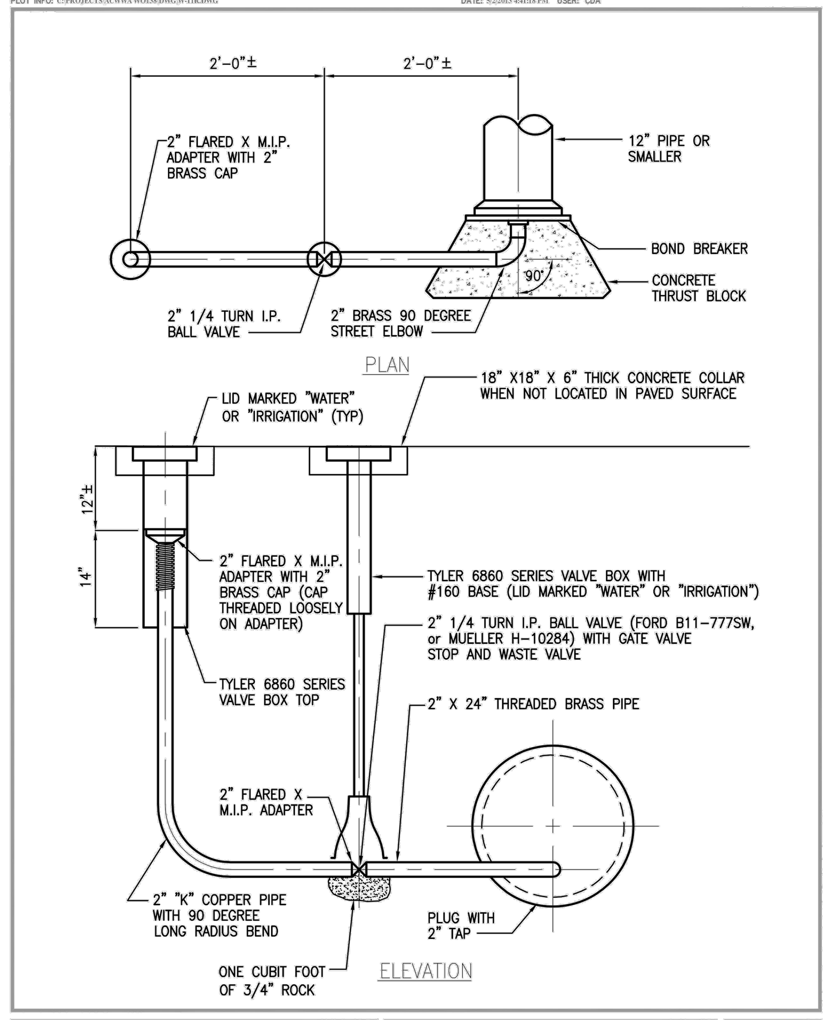
PIONEER VILLAGE
PA'S 1-4, 17 AND 21
TOWN OF KEENESBURG
WELD COUNTY, COLORADO

POTABLE WATER DETAILS

REV	DESCRIPTION	BY	DATE

JOB NO:	1903-001
ORIGINAL ISSUE:	03/15/2021
DESIGN BY:	CLP
CHECKED BY:	CLP
SCALE:	NTS
SHEET NUMBER	C-8.30

PLOT INFO: C:\PROJECTS\ACWWA WO138\DWG\W-11R.DWG DATE: 5/2/2013 4:41:18 PM USER: CDA

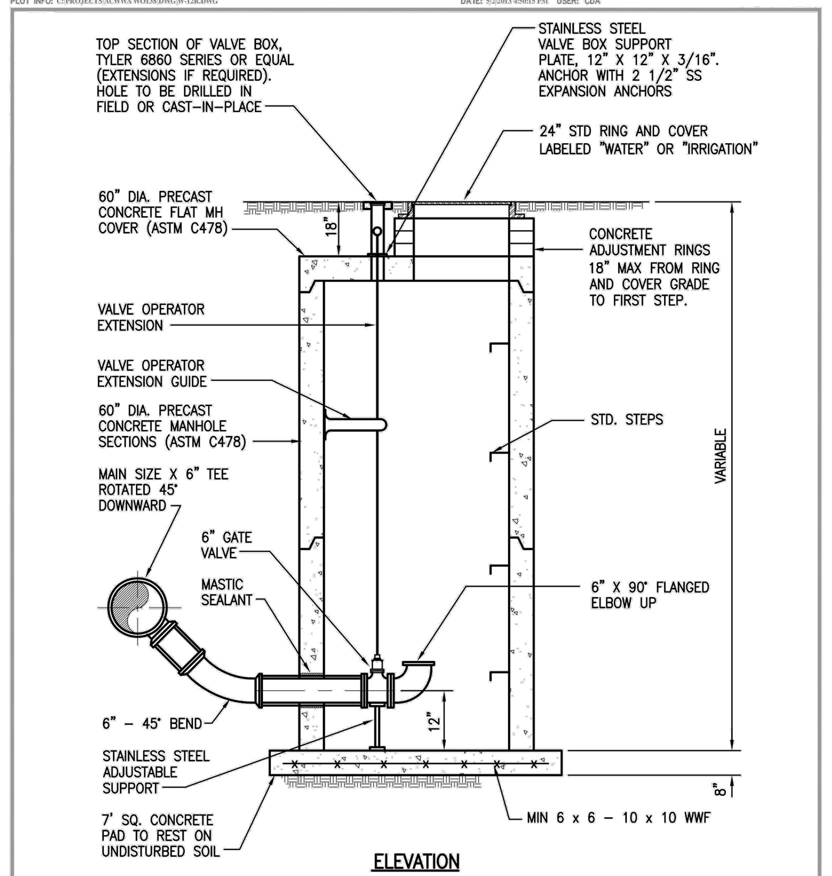


ARAPAHOE COUNTY
Water and Wastewater Authority
13031 E Caley Ave, Centennial, Colorado 80111
Ph: (303) 790-4830 Fax: (303) 790-1718

TEMPORARY BLOW-OFF INSTALLATION

REVISION DATE: 03/01/2013
FIGURE NO. W-11
SHEET NO. 1 of 1

PLOT INFO: C:\PROJECTS\ACWWA WO138\DWG\W-12R.DWG DATE: 5/2/2013 4:50:15 PM USER: CDA



NOTES:

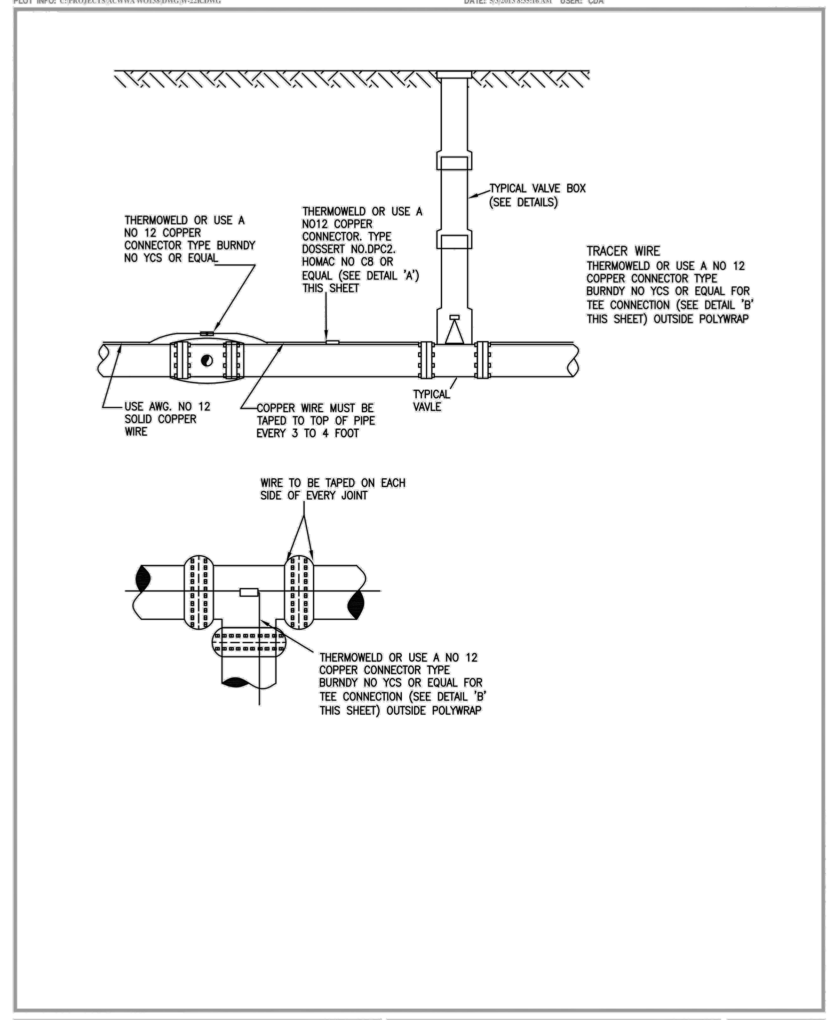
1. UPON ACWWA APPROVAL A FIRE HYDRANT MAY BE USED AS AN ALTERNATE BLOW-OFF. SEE DETAIL W-10.
2. ALL METAL SURFACES SHALL BE COATED WITH TWO COATS OF LIQUID EPOXY, 16 MIL DRY FILM THICKNESS IN ACCORDANCE WITH AWWA C210.

ARAPAHOE COUNTY
Water and Wastewater Authority
13031 E Caley Ave, Centennial, Colorado 80111
Ph: (303) 790-4830 Fax: (303) 790-1718

BLOW-OFF INSTALLATION FOR DOMESTIC AND IRRIGATION MAINS

REVISION DATE: 03/01/2013
FIGURE NO. W-12
SHEET NO. 1 of 1

PLOT INFO: C:\PROJECTS\ACWWA WO138\DWG\W-22R.DWG DATE: 5/3/2013 8:35:16 AM USER: CDA

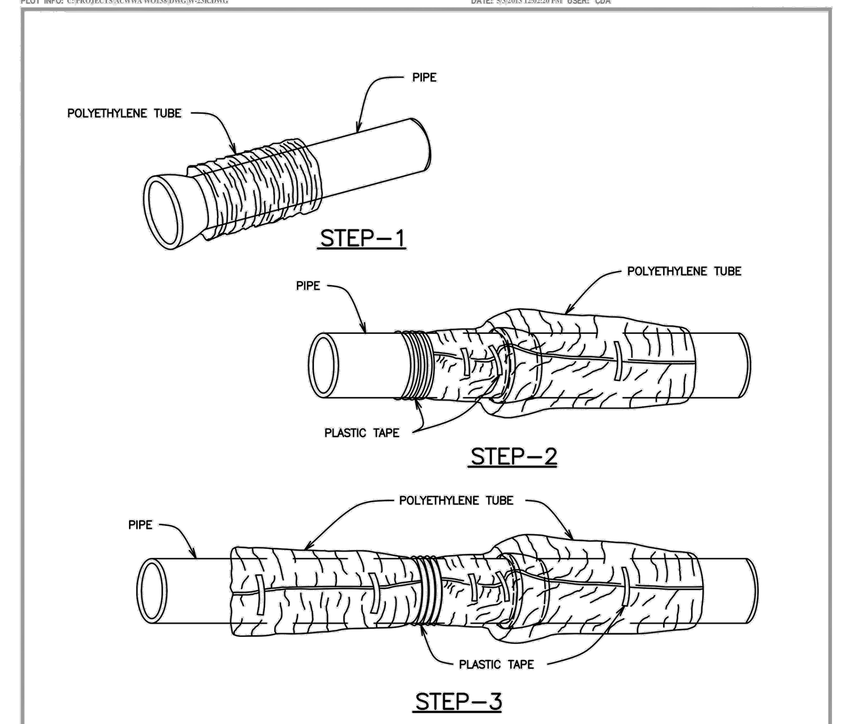


ARAPAHOE COUNTY
Water and Wastewater Authority
13031 E Caley Ave, Centennial, Colorado 80111
Ph: (303) 790-4830 Fax: (303) 790-1718

TRACER WIRE DETAILS (TO BE USED ON ALL WATER PIPE)

REVISION DATE: 03/01/2013
FIGURE NO. W-22
SHEET NO. 1 of 1

PLOT INFO: C:\PROJECTS\ACWWA WO138\DWG\W-23R.DWG DATE: 5/3/2013 12:02:20 PM USER: CDA



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 SHALL 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.

ARAPAHOE COUNTY
Water and Wastewater Authority
13031 E Caley Ave, Centennial, Colorado 80111
Ph: (303) 790-4830 Fax: (303) 790-1718

POLYETHYLENE WRAP DUCTILE IRON

REVISION DATE: 03/01/2013
FIGURE NO. W-23
SHEET NO. 1 of 1

ENGINEER IN CHARGE:

PRELIMINARY NOT FOR CONSTRUCTION

CONTACT INFORMATION
88 INVERNESS CIRCLE EAST, SUITE E-101
ENGLEWOOD, CO 80112
(720) 206-6931
CPERDUE@STRATEGICSITEDESIGNS.COM
ATTENTION: CHRISTOPHER PERDUE, P.E., M.B.A.

STRATEGIC SITE DESIGNS

BASIS OF BEARINGS:

BEARINGS SHOWN HEREON ARE GRID BEARINGS DERIVED FROM GPS OBSERVATION BASED UPON THE COLORADO COORDINATE SYSTEM OF 1983 NORTH ZONE (NAD 83, 2011) REFERENCED TO THE WEST LINE OF THE NORTHWEST QUARTER OF SECTION 7, TOWNSHIP 2 NORTH, RANGE 64 WEST, SIXTH PRINCIPAL MERIDIAN, TAKEN TO BEAR SOUTH 00°30'28" EAST, A DISTANCE OF 2,612.70 FEET.

BENCHMARK

NGS ROGGEN RM 1: RECOVERED A 3 1/2" BRASS CAP LOCATED 200' SOUTH OF FRONTAGE RD I-76 AND 2500 WEST OF COUNTY RD 73.

ELEVATION = 4721.56 (NAVD 88)

PIONEER VILLAGE
PA'S 1-4, 17 AND 21
TOWN OF KEENESBURG
WELD COUNTY, COLORADO

POTABLE WATER DETAILS

REV	DESCRIPTION	BY	DATE

JOB NO:	1903-001
ORIGINAL ISSUE:	03/15/2021
DESIGN BY:	CLP
CHECKED BY:	CLP
SCALE:	NTS
SHEET NUMBER	C-8.31