

City of Shasta Lake - Construction Standards Index

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CITY OF SHASTA LAKE CONSTRUCTION STANDARDS

All construction work shall conform to the City of Shasta Lake Construction Standards (latest revision), unless otherwise shown on the Plans or Contract Documents approved by the City Engineer.

ABBREVIATIONS:

AB	Aggregate Base
ASB	Aggregate Subbase
BCR	Begin Curb Return
☉	Centerline
DR	Dimension Ratio
ECR	End of Curb Return
EP	Edge of Pavement
ƒ	Flowline
HDPE	High Density Polyethylene
HMA	Hot-Mixed Asphalt
I.D.	Inside Diameter
NDCBU	Neighborhood Delivery and Collection Box Unit
O.C.	On Center
O.D.	Outside Diameter
O.G.	Original Grade
PCC	Portland Cement Concrete
PG	Performance Graded (HMA Binder)
PSE	Public Service Easement
PVC	Polyvinyl Chloride
ROW	Right-of-Way
SDR	Standard Dimension Ratio
SE	Slope Easement
SF	Square Feet
SW	Sidewalk
TI	Traffic Index
TYP	Typical

DEFINITIONS:

AASHTO	American Association of State Highway and Transportation Officials
ASTM	American Society for Testing and Materials / ASTM International
AWWA	American Water Works Association
Caltrans	California Department of Transportation
City, CoSL	City of Shasta Lake
City Engineer	City Engineer of the City of Shasta Lake
COSLCS	City of Shasta Lake Construction Standards (latest revision)
CSS	State of California Department of Transportation (Caltrans) Standard Specifications (latest revision)
CSP	State of California Department of Transportation (Caltrans) Standard Plans (latest revision)
DDW	State Water Resources Control Board, Division of Drinking Water
EPA	United States Environmental Protection Agency
NSF	National Sanitation Foundation
PG&E	Pacific Gas and Electric
REU	City of Redding Electric Utility

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023
				ABBREVIATIONS and DEFINITIONS	Date: 09/2023 Dwg No.:
					Scale: None 090.00
REVISION	BY	APPROVED	DATE		

MATERIALS

1. Hot Mix Asphalt (HMA) shall conform to Section 39, "Asphalt Concrete" of the CSS and shall consist of the following materials:
 - A. Type: HMA shall be Type "A".
 - B. Asphalt Binder: Asphalt binder for Type "A" HMA shall be steam-refined paving asphalt. The PG Grade shall be as approved by the City Engineer based upon the approved Job Mix Formula.
 - C. Aggregate: Aggregate for Type "A" HMA shall conform to 1/2-inch gradation.
2. Tack Coat shall conform to Section 94, "Asphaltic Emulsions" of the CSS and shall be Type SS1 or RS1 unless otherwise approved by the City Engineer.
3. Aggregate Base shall conform to Section 26, "Aggregate Bases" of the CSS and shall be Class 2 aggregate base (3/4-inch maximum). Compaction shall conform to Page 601.00.
4. Aggregate Subbase shall conform to Section 25, "Aggregate Subbases" of the CSS. Compaction shall conform to Page 601.00.
5. Subgrade compaction shall be 90% to 95% relative in accordance with Page 601.00
6. Geosynthetic Pavement Interlayer (Paving Fabric and Paving Mat) shall conform to Section 96, "Geosynthetics" of the CSS.
7. Shoulder Backing material shall be Class 2 aggregate base (3/4-inch maximum) and shall conform to Section 26, "Aggregate Bases" of the CSS.
8. Portland Cement Concrete (PCC) for general flatwork including curbs, gutters, sidewalks, and driveways shall conform to Section 90, "Concrete," of the CSS, and shall attain a minimum 28-day compressive strength greater than 2500 psi. High early strength (Type III) concrete may be substituted if the Contractor is planning on allowing traffic loads onto concrete pours within three (3) days after pouring. All concrete shall be plant-mixed and delivered by truck, unless concrete mixed on-site is specifically approved by the Engineer.
9. Pavement Striping and Markings shall consist of the following materials:
 - A. Thermoplastic (sprayable): Sprayable thermoplastic material used for traffic stripes shall conform to Caltrans Specifications PTH-02SPRAY. Thermoplastic material shall be free of lead, chromium, cadmium, barium and other toxic metals, and shall be applied at a minimum thickness of 90 mil (0.090").
 - B. Thermoplastic pavement markings: Thermoplastic material used for pavement markings shall conform to Caltrans Specification PTH-02ALKYD. Thermoplastic material shall be free of lead, chromium, cadmium, barium and other toxic metals, and shall be applied at a minimum thickness of 120 mil (0.12").
 - C. Paint: Paint for traffic stripes and marking shall comply with the following specifications:
 1. Waterborne Traffic Line (White, Yellow, Black) - Caltrans Specification PTWB-01R2.
 2. Acetone Based (White, Yellow, Black) - Caltrans Specification PT-150VOC(A)
 3. Waterborne traffic line for the international symbol of accessibility and other curb markings (Blue, Red, Green) - Federal Specification TT-P-1952E
 - D. Glass Beads: Glass beads used with paint shall comply with Caltrans Specification 8010-004. Glass beads used with molten thermoplastic shall be Type 2 beads complying with AASHTO M247 and shall have a coating that promotes adhesion of the beads to thermoplastic. Each lot of glass beads used in pavement markings shall contain less than 200 ppm each of arsenic and lead when tested under EPA Test Methods 3052 and 6010B or 6010C.
 - E. Retroreflective Pavement Markers: Retroreflective Pavement Markers shall conform to Section 81-3.02C, "Retroreflective Pavement Markers" of the CSS.
 - F. Marker Adhesive: Marker adhesive shall conform to Section 81-3.02D, "Hot Melt Bituminous Adhesive" of the CSS.
 - G. Pavement Striping Layout: Striping layout shall conform to the dimensions shown in the CSP.
 - H. Marking Templates: Marking templates shall be constructed of metal, plywood, plastic, or other standard template material and shall fit closely to the surface being marked. All marking templates shall conform to the dimensions shown in the CSP.

				CITY OF SHASTA LAKE Public Works Department STANDARD DRAWING	Approved: 	09-30-2023
					City Engineer	Date
				MATERIALS and REFERENCES	Date: 09/2023	Dwg No.:
REVISION	BY	APPROVED	DATE		Scale: None	100.00

1. VERTICAL CLEARANCE: Vertical clearance above the roadway surface shall not be less than:

- Bridges and sign structures: 18 feet for all street classification
- All other items: 18 feet for expressways
16 feet for arterials
14.5 feet for collectors and local roads

2. BRIDGES:

Width: Bridges shall have a minimum width between curbs of 28 feet. Width shall be increased to provide sidewalks, parking, bicycle lanes, or additional traffic lanes where needed.

Design Loads: Design live loading for any bridge shall not be less than AASHTO HS-20 loading.

3. GEOMETRIC DESIGN: The right-of-way width for particular streets shall be determined by the City Engineer and shall be determined by addition of the widths necessary to provide the various items to be contained therein. The following widths are considered to be the desirable minimum in each instance.

ITEM	MINIMUM WIDTH	STREET CLASSIFICATION
Center Median	22 Feet	Expressway
	12 Feet	Arterial, Collector
Travel Lane / Turn Lane	12 Feet	Expressway, Arterial, Collector
	11 Feet	Arterial, Collector
	10 Feet	Arterial, Collector, Local, Cul-De-Sac, Alley
Shoulder	6 Feet	Expressway, Arterial, Collector
Parking Lane	7 Feet	All Streets
Bicycle Lane	8 Feet	Expressway
	5 Feet	Arterial, Collector
Parking Lane with Bicycle Lane	14 Feet	Arterial, Collector
Divider between Frontage Road & Paralelling Road	8 Feet	All Streets
	Curb to Curb	
Right of Way Line to Curb Face or Shoulder	10 Feet	All Streets (Except Alley & Minor Collector)
Maximum Length Projected From Property Line of Intersecting Street to Center of Turn-Around	600 Feet	Cul - De - Sac

4. DESIGN SLOPE: The design slope of a street shall not exceed 8%. Potential exceptions may be allowed to permit short lengths (less than 500') of 10% slope, as approved by the City Engineer.

				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer _____ Date _____	
				BASIC STREET DESIGN STANDARDS		Date: 09/2023 Dwg No.:	
REVISION	BY	APPROVED	DATE			Scale: None	110.10

- The major functions of the urban streets fall into various Street Classifications, which each vary in design based primarily on projected traffic volumes.
- Expressway systems, including freeways and parkways, provide for expeditious movement of large volumes of through traffic between areas and across the City and are not intended to provide access to individual properties.
 - Arterial systems provide through traffic movement between areas and across the City. Direct access to abutting commercial property and multiple-family properties can be permitted subject to control of the location, number, and spacing of entrance and exit locations.
 - Collector streets, including cul-de-sacs, provide direct access to abutting parcels and are used for local traffic movements.

The alignment of all streets, both horizontal and vertical, shall be based upon the following:

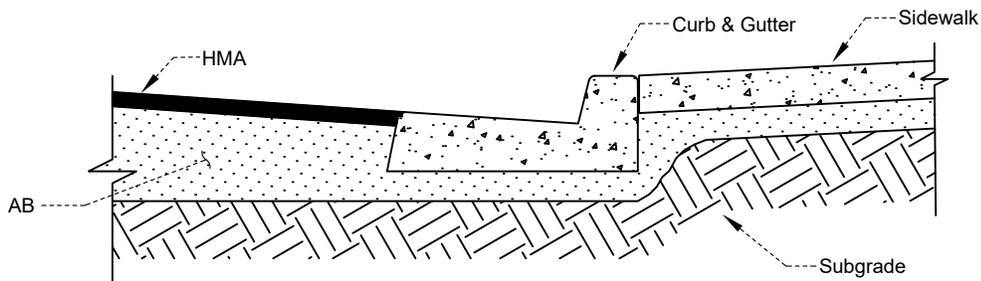
Page No.	Street Classification	Min. ROW (FT)	Pavement Width (Curb to Curb, FT)	Turn Lane or Median Width (FT)	Curb Type	Min. Sidewalk Width (FT)	Max. Grade (%)	Min. Centerline Curve Radius (FT)	Min. Tangent Between Adjacent Curves (FT)	Min. Curb Radius (FT)	Min. Stopping Sight Distance (FT)	Property Line Radii at Intersections (FT)	Design Speed (MPH)
	Alleyway			-	-	-				10			
	Frontage Road	45-60	32-40	-	Vertical	5	8	300	See Footnote B	10	155	30	25
113.10	Cul-De-Sac	50-60	32-40	-	Vertical	5	8	200	See Footnote B	-	155	20	25
112.10	Local Street	40, 50, 56	32-36	-	Vertical	5	8	200	See Footnote B	10	155	20	25
112.20	Minor Collector	60, 64	40-44	-	Vertical	5	8	500	See Footnote B	20	250	30	35
112.30	Major Collector	68, 80	48, 56	10, 12	Vertical	5-10 ^A	8	800	100	20	250	30	35
112.40	Minor Arterial	84	64	12	Vertical	5-10 ^A	7	1,000	100	20	360	40	45
112.50	Principal Arterial	96	60, 76	12, 18	Vertical	5-10 ^A	7	1,850	100	30	495	40	55
112.60	Principal Arterial	110	36 x 2, 39 x 2										
112.70	Expressway	130	36 x 2	22	Vertical	-	7	3,150	100	30	645	40	65

- A. Width varies with type/density of development.
 B. Minimum tangent length shall be determined by City Engineer.
- NOTES:**
- Medians may be established in any street (subject to approval by the Planning Commission), depending on whether it is also used for turning purposes.
 - Desirable minimum intersection spacing:
 - Arterial/Arterial intersections - 1 mile
 - Arterial/Collector intersections - 1/2 Mile
 - Arterial or Collector/Local intersections - 500 ft to 600 ft
 - Desirable Signal Spacing:
 - 1/2 Mile (ideal)
 - 1,200 ft (min.)

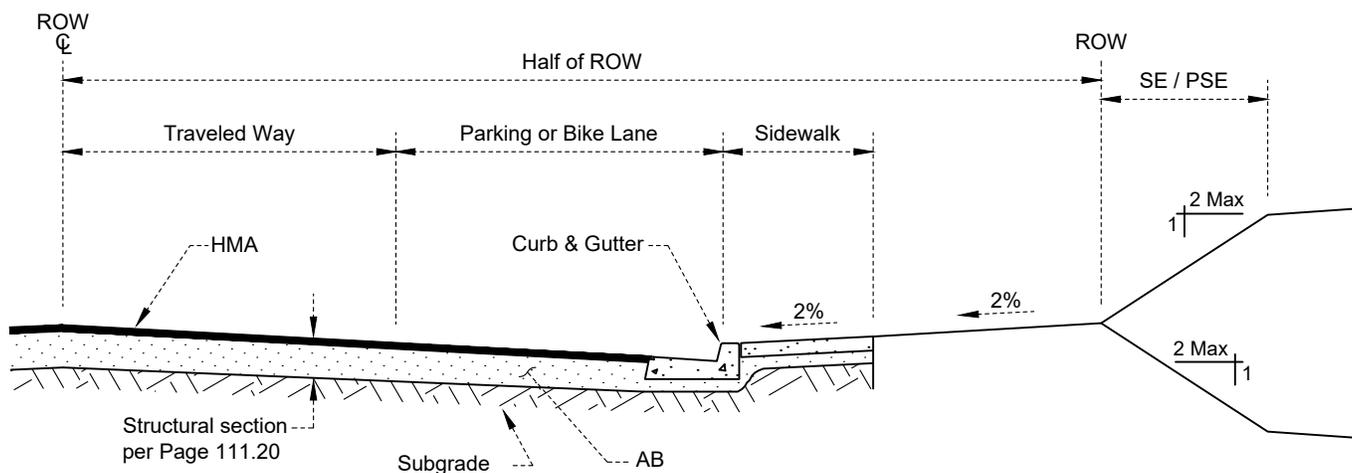
REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
 Public Works Department
STANDARD DRAWING
BASIC STREET DESIGN STANDARDS

Approved:  09-30-2023
 City Engineer _____ Date _____
 Date: 09/2023 Dwg No.: 110.20
 Scale: None



DETAIL SECTION AT CURB



TYPICAL HALF SECTION
Symmetrical about Centerline

NOTES

1. All materials shall conform to Page 100.00.
2. Compaction and density requirements shall conform to Page 601.00.
3. Full-width sidewalk shall be required on all streets unless otherwise directed by the City Engineer. See Pages 131.10, 131.20, and 131.30 for additional information.
4. Slope easement and/or public service easement width shall be determined by the City Engineer.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

STANDARD DRAWING

TYPICAL STREET CROSS SECTION LAYOUT

Approved:  09-30-2023

City Engineer _____ Date _____

Date: 09/2023 Dwg No.: 111.10

Scale: None

MINIMUM STRUCTURAL SECTIONS
Based on Caltrans Highway Design Manual Section 630
(Minimum Layer Thickness in Feet)

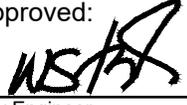
Street Classification	TI Minimum	Material	R-Value of Subgrade Material											
			5-9	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45+			
Expressway & Principal Arterial	10.0	HMA	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50	0.50
		AB	2.15	2.00	1.85	1.70	1.55	1.45	1.30	1.15	1.00	0.95	0.90	
		Full Depth HMA	1.30	1.25	1.20	1.15	1.10	1.05	1.00	0.95	0.90	0.85	0.80	
Minor Arterial	9.0	HMA	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	0.40	
		AB	2.00	1.90	1.75	1.60	1.50	1.35	1.20	1.10	0.95	0.85		
		Full Depth HMA	1.20	1.15	1.10	1.05	1.00	0.95	0.90	0.85	0.80	0.75		
Major Collector	8.0	HMA	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.35	
		AB	1.80	1.65	1.55	1.45	1.30	1.20	1.10	0.95	0.85	0.75		
		Full Depth HMA	1.05	1.00	0.95	0.95	0.90	0.85	0.80	0.75	0.70	0.65		
Cul-De-Sacs	7.0	HMA	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	
		AB	1.55	1.50	1.35	1.20	1.10	1.00	0.95	0.85	0.75	0.65		
		Full Depth HMA	0.90	0.85	0.85	0.80	0.75	0.70	0.65	0.60	0.55	0.50		
Minor Collector and Local Street with 151 to 300 Residences	6.0	HMA	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	
		AB	1.25	1.20	1.10	1.00	0.90	0.85	0.75	0.65	0.55	0.50		
		Full Depth HMA	0.75	0.70	0.70	0.65	0.60	0.60	0.55	0.50	0.50	0.50		
Local Street with 1 to 150 Residences and HMA Trails and Paths	5.5	HMA	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	0.20	
		AB	1.10	1.05	0.95	0.85	0.80	0.70	0.65	0.55	0.50	0.50		
		Full Depth HMA	0.65	0.65	0.60	0.60	0.55	0.55	0.50	0.45	0.45	0.45		

NOTES:
1. Alternate structural sections based on measured in-situ R-values utilizing subbase, base and HMA materials may be used subject to the approval of the City Engineer.

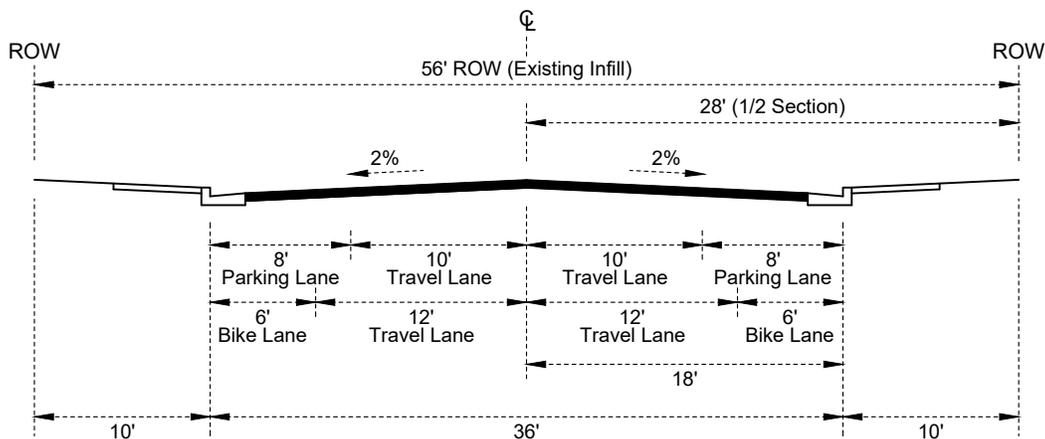
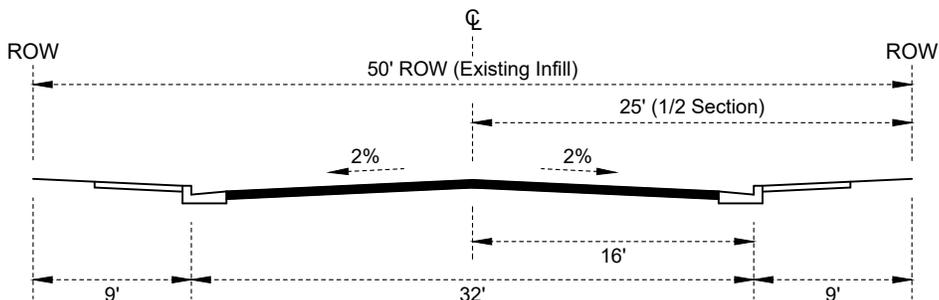
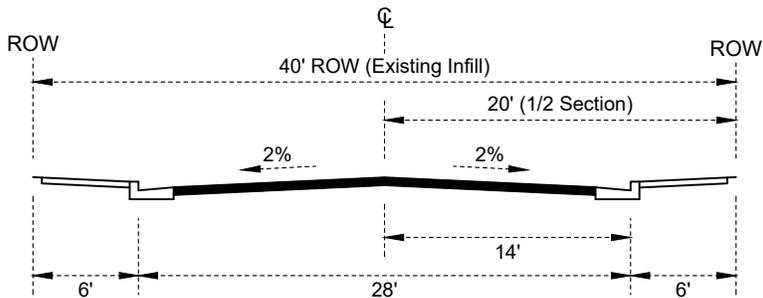
REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department
STANDARD DRAWING

MINIMUM STRUCTURAL SECTIONS

Approved:  09-30-2023
City Engineer _____ Date _____

Date: 09/2023 Dwg No.: 111.20
Scale: None



NOTE:

1. Lane lines shown are typical configurations. Proposed modifications shall be subject to approval by the City Engineer.
2. Existing infill street standards apply ONLY to existing infill right-of-way.
3. Design Standards:
 - Projected ADT: Less than 2,000.
 - Access: Intersections at grade with direct access to abutting properties.
 - Traffic Features: Traffic control measures as warranted to provide adequate safety.
 - Roadway Geometrics: Roadway geometrics shall conform to Page 110.10 and 110.20.
 - Structural Section: Structural section shall be as shown on Page 111.20.
 - Bicycles: As determined by the City Engineer.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**STREET STANDARD
LOCAL STREET (EXISTING INFILL)**

Approved:

09-30-2023

City Engineer

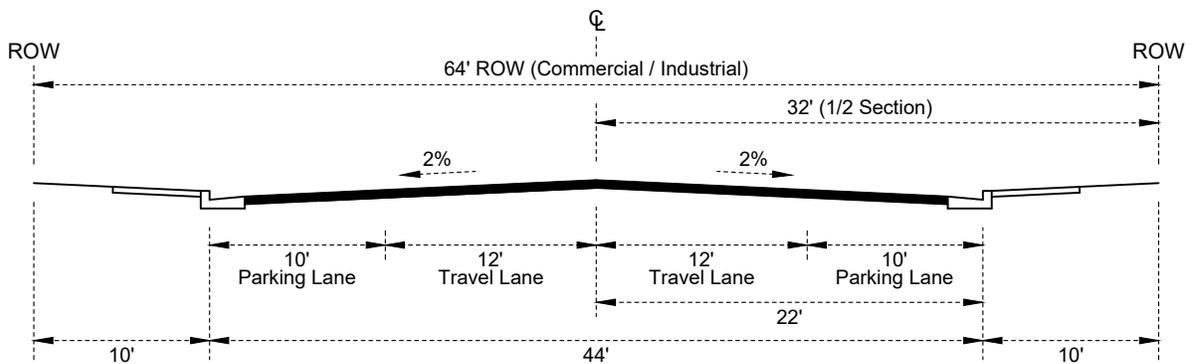
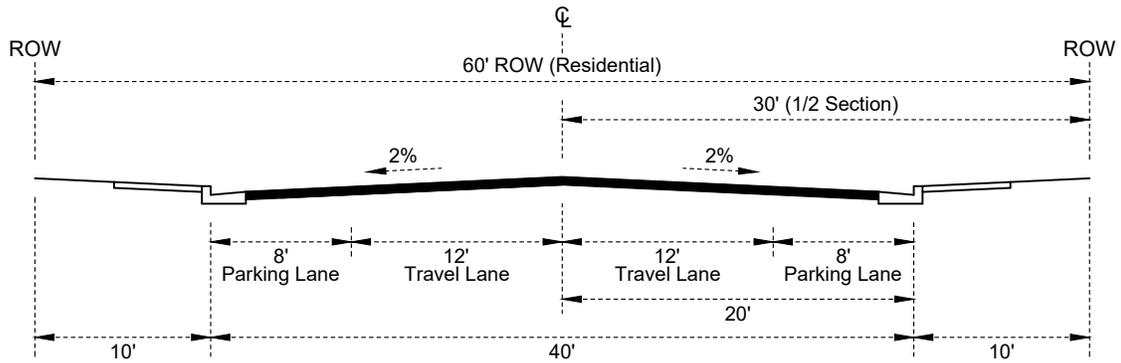
Date

Date: 09/2023

Dwg No.:

Scale: None

112.10



NOTE:

1. Lane lines shown are typical configurations. Proposed modifications shall be subject to approval by the City Engineer.
2. Design Standards:
 - Projected ADT: Up to 4,000.
 - Access: Intersections at grade with direct access to abutting properties.
 - Traffic Features: Traffic control measures as warranted to provide adequate safety, including traffic signals and parking restrictions.
 - Roadway Geometrics: Roadway geometrics shall conform to Page 110.10 and 110.20.
 - Structural Section: Structural section shall be as shown on Page 111.20.
 - Bicycles: As determined by the City Engineer.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

STREET STANDARD
MINOR COLLECTOR

Approved:

09-30-2023

City Engineer

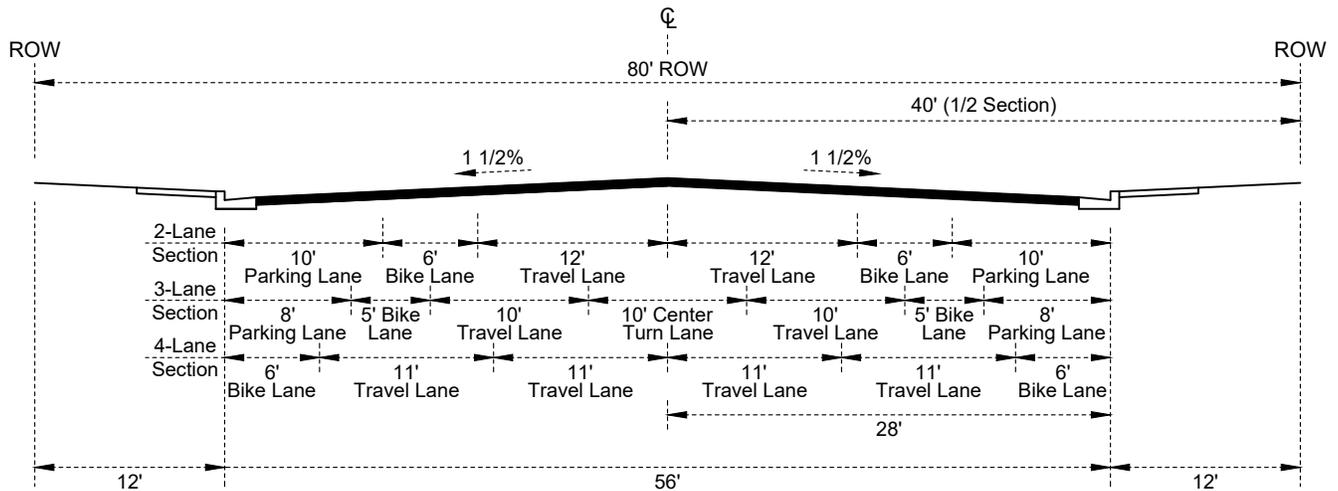
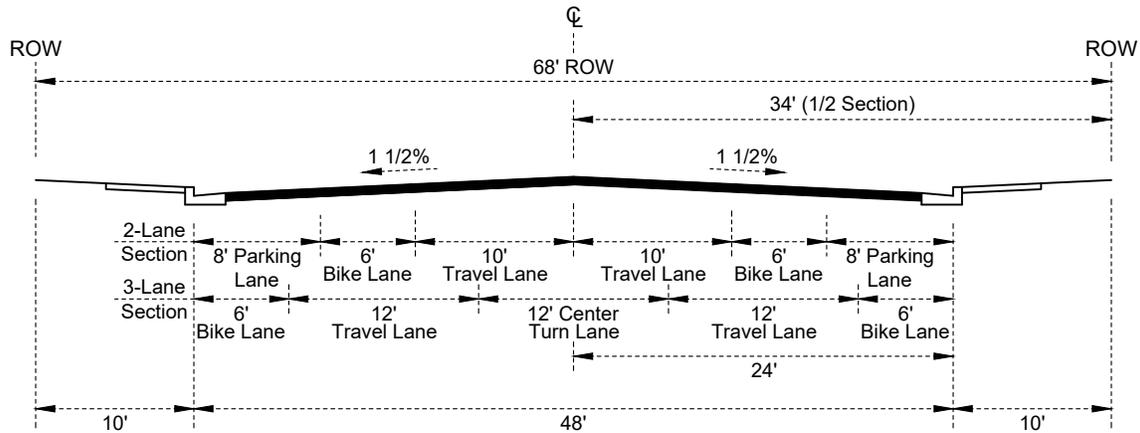
Date

Date: 09/2023

Dwg No.:

Scale: None

112.20



NOTE:

1. Lane lines shown are typical configurations. Proposed modifications shall be subject to approval by the City Engineer.
2. 80' ROW standard applies ONLY to existing 80' right-of-way.
3. Design Standards:
 - Projected ADT: Greater than 4,000.
 - Access: Intersections at grade with direct access to abutting properties.
 - Traffic Features: Traffic control measures as warranted to provide adequate safety, including traffic signals and parking restrictions.
 - Roadway Geometrics: Roadway geometrics shall conform to Page 110.10 and 110.20.
 - Structural Section: Structural section shall be as shown on Page 111.20.
 - Bicycles: As determined by the City Engineer.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**STREET STANDARD
MAJOR COLLECTOR**

Approved:

09-30-2023

City Engineer

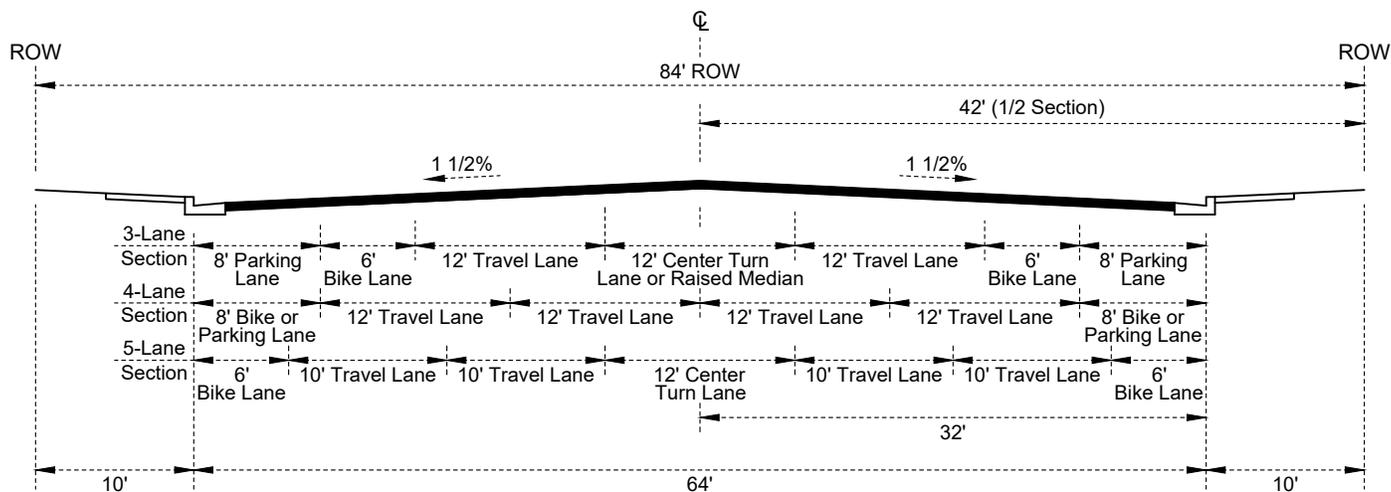
Date

Date: 09/2023

Dwg No.:

Scale: None

112.30



NOTE:

1. Lane lines shown are typical configurations. Proposed modifications shall be subject to approval by the City Engineer.
2. 84' ROW standard applies ONLY to existing 84' right-of-way. Special consideration shall be made for public service easements, intersection turn lanes, bus stops, and bike lanes.
3. Design Standards:
 - Travel Lanes: Two (2) to four (4).
 - Access: Intersections at grade with direct access to abutting properties. Subject to control of the location, number, and spacing of entrances and exits.
 - Traffic Features: Channelization used to control turning movements at intersections and at critical driveways. Traffic signals at major intersections. Parking and driveway restrictions as necessary.
 - Roadway Geometrics: Roadway geometrics shall conform to Page 110.10 and 110.20.
 - Structural Section: Structural section shall be as shown on Page 111.20.
 - Bicycles: As determined by the City Engineer.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**STREET STANDARD
MINOR ARTERIAL**

Approved:

09-30-2023

City Engineer

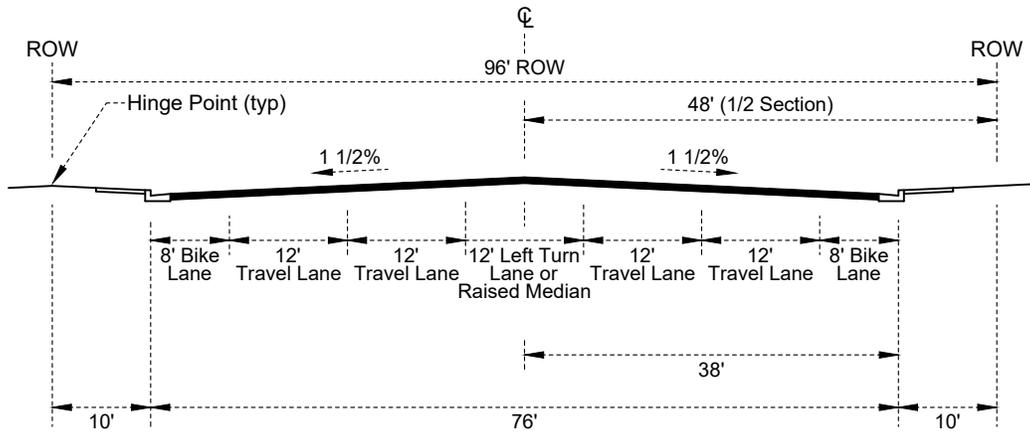
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Date: 09/2023

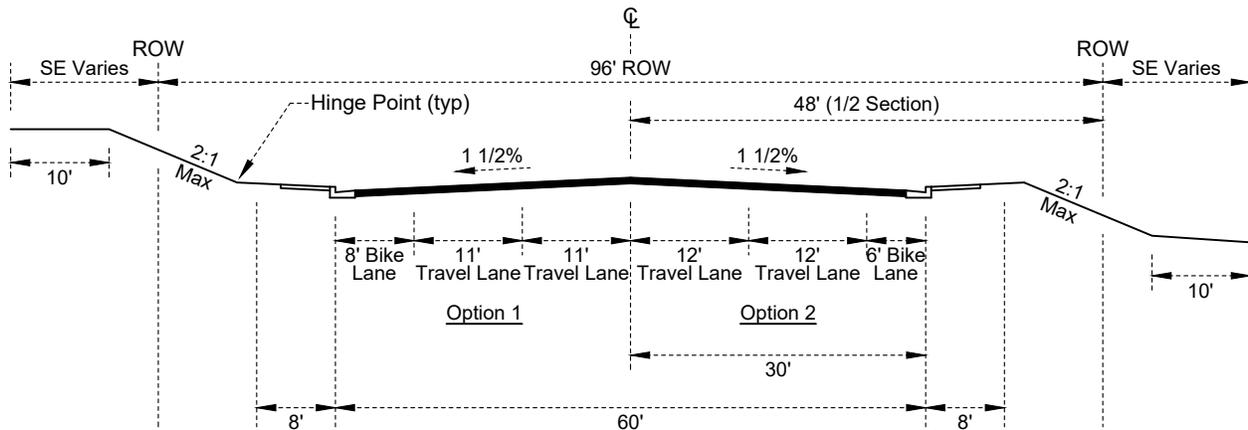
Dwg No.:

Scale: None

112.40



FLAT TERRAIN



STEEP / MODERATE TERRAIN

NOTE:

1. Lane lines shown are typical configurations. Proposed modifications shall be subject to approval by the City Engineer.
2. Design Standards:
 - Travel Lanes: Four (4) to six (6).
 - Access: Intersections at grade with direct access to abutting properties. Subject to control of the location, number, and spacing of entrances and exits.
 - Traffic Features: Channelization used to control turning movements at intersections and at critical driveways. Traffic signals at major intersections. Parking and driveway restrictions as necessary.
 - Roadway Geometrics: Roadway geometrics shall conform to Page 110.10 and 110.20.
 - Structural Section: Structural section shall be as shown on Page 111.20.
 - Bicycles: As determined by the City Engineer.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**STREET STANDARD
PRINCIPAL ARTERIAL**

Approved:

09-30-2023

City Engineer

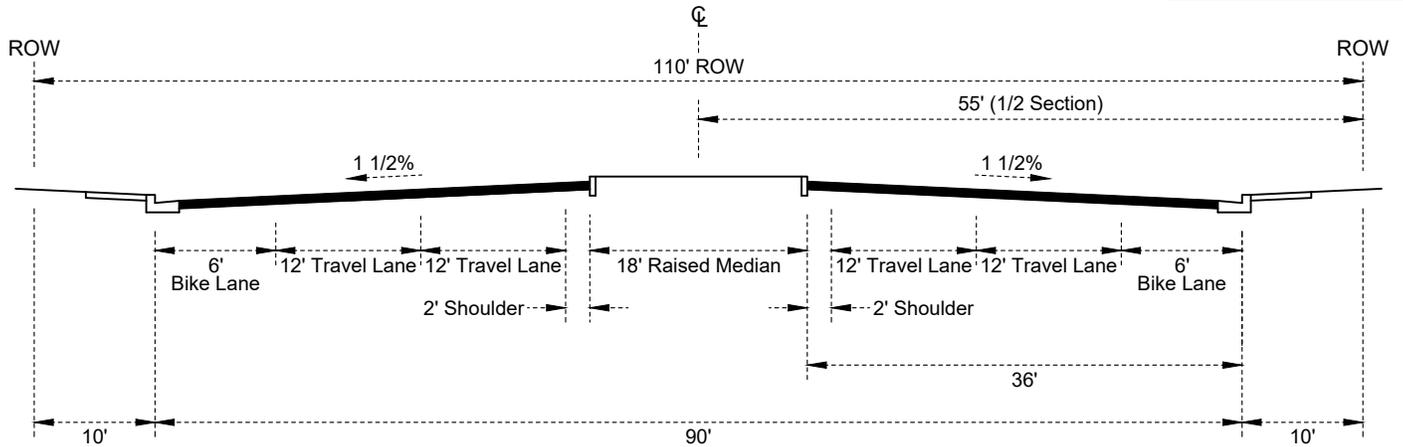
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Date: 09/2023

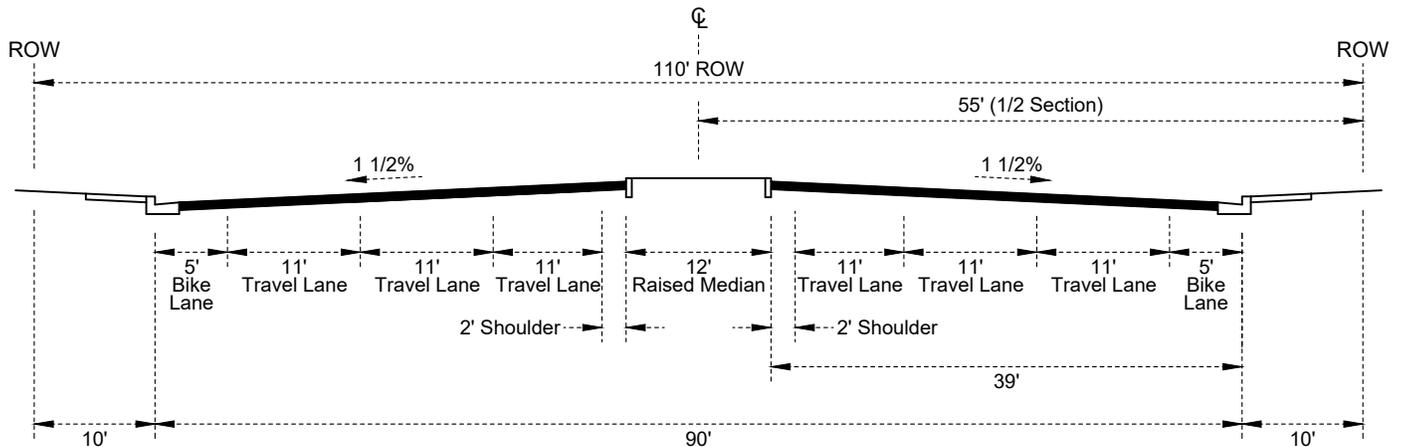
Dwg No.:

Scale: None

112.50



4-LANE OPTION



6-LANE OPTION

NOTE:

1. Lane lines shown are typical configurations. Proposed modifications shall be subject to approval by the City Engineer.
2. Design Standards:

Travel Lanes:	Four (4) to six (6).
Access:	Intersections at grade with direct access to abutting properties. Subject to control of the location, number, and spacing of entrances and exits.
Traffic Features:	Channelization used to control turning movements at intersections and at critical driveways. Traffic signals at major intersections. Parking and driveway restrictions as necessary.
Roadway Geometrics:	Roadway geometrics shall conform to Page 110.10 and 110.20.
Structural Section:	Structural section shall be as shown on Page 111.20.
Bicycles:	As determined by the City Engineer.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

STREET STANDARD
PRINCIPAL ARTERIAL

Approved:

09-30-2023

City Engineer

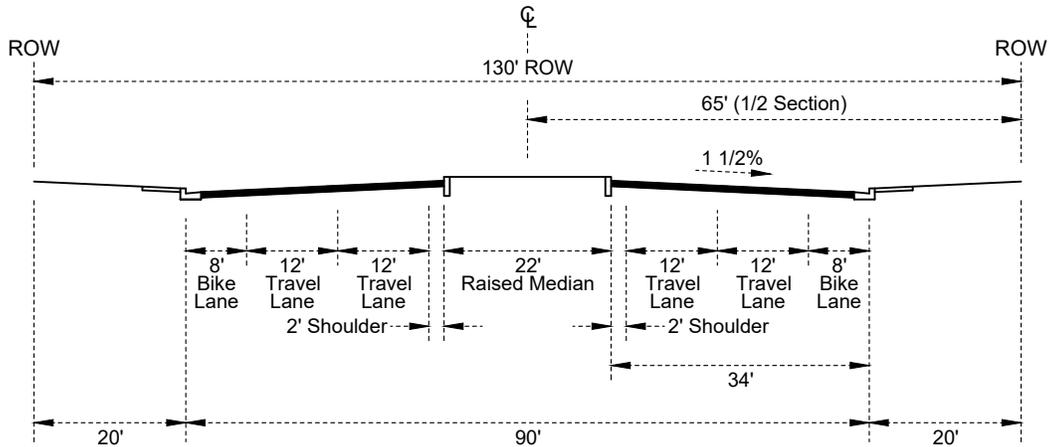
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Date: 09/2023

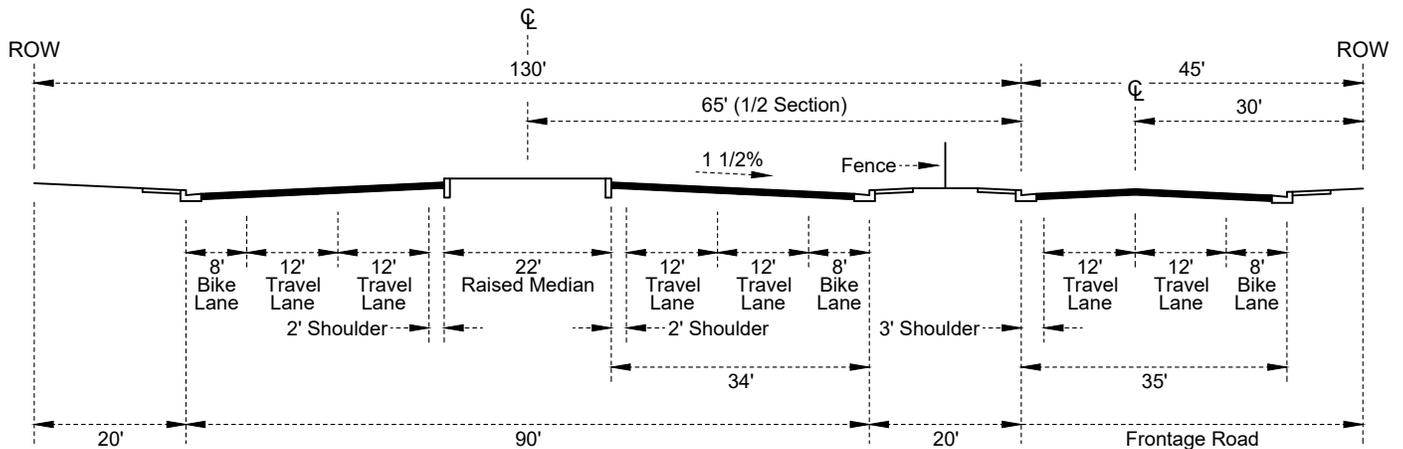
Dwg No.:

Scale: None

112.60



PARKWAY OPTION



STANDARD EXPRESSWAY (4-LANE)

NOTE:

- Lane lines shown are typical configurations. Proposed modifications shall be subject to approval by the City Engineer.
- Design Standards:
 - Travel Lanes: Four (4) to six (6).
 - Access: Adjacent property typically does not access expressway. Parallel frontage roads shall be installed where necessary.
 - Traffic Features: Traffic controls and safety features as required.
 - Roadway Geometrics: Roadway geometrics shall conform to Page 110.10 and 110.20.
 - Structural Section: Structural section shall be as shown on Page 111.20.
 - Bicycles: As determined by the City Engineer.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

STREET STANDARD
EXPRESSWAY

Approved:

09-30-2023

City Engineer

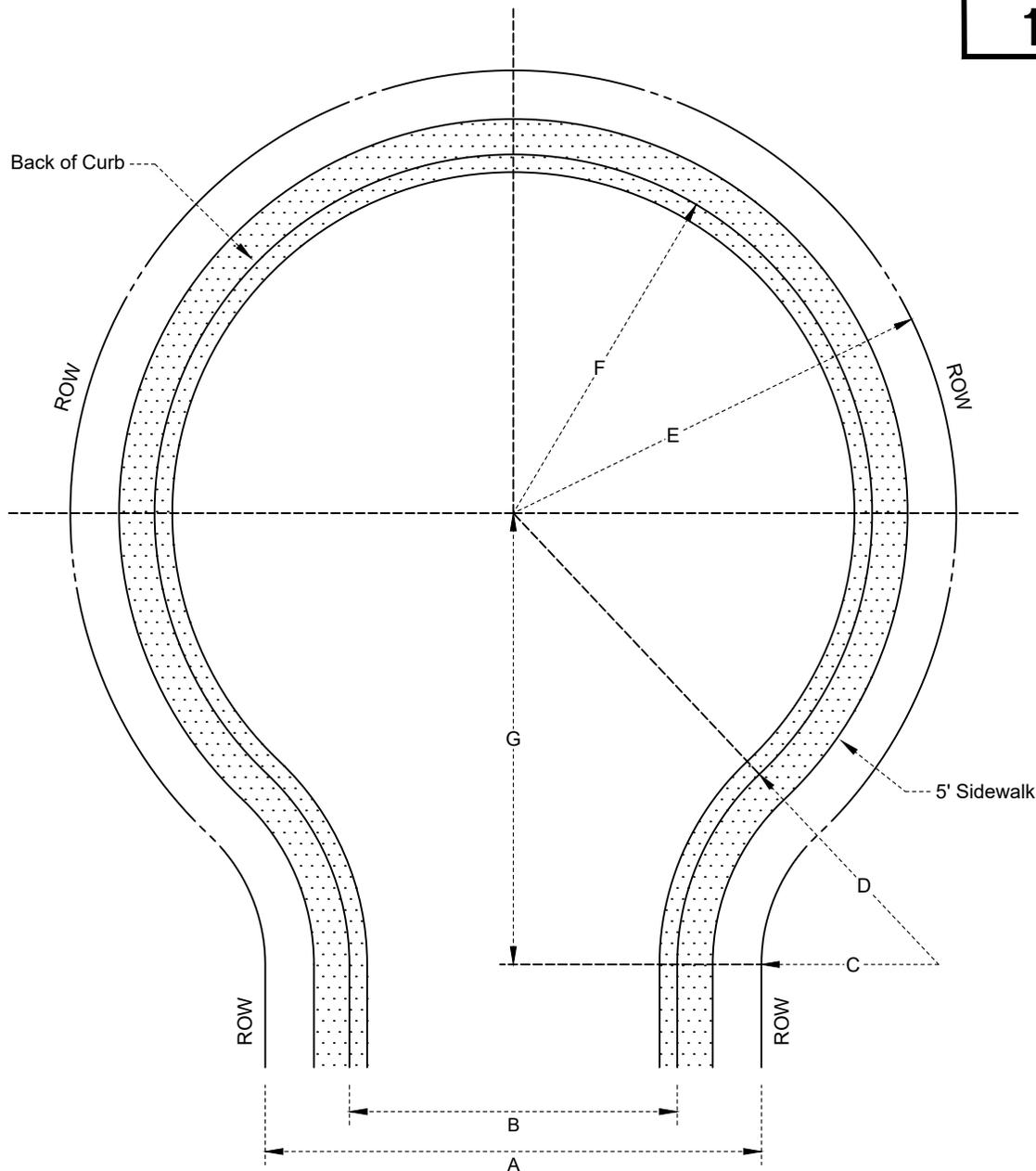
Date

Date: 09/2023

Dwg No.:

Scale: None

112.70



Data Table

Case	A	B	C	D	E	F	G
1*	50'	37'	20'	26.50'	50'	43.50'	53.62'
2*	50'	33'	20'	28.50'	50'	41.50'	53.62'
3*	56'	37'	20'	29.50'	50'	40.50'	50.95'
4	60'	41'	20'	29.50'	50'	40.50'	48.99'

NOTES:

1. Dimensions B, D and F are to back of curb.
2. Minimum ROW width = 50'.*
3. Minimum property line radius of cul-de-sac = 50'.*

* ROW width of less than 60' shall be limited to existing infill ROW only.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

TYPICAL CUL-DE-SAC DESIGN

Approved:

09-30-2023

City Engineer

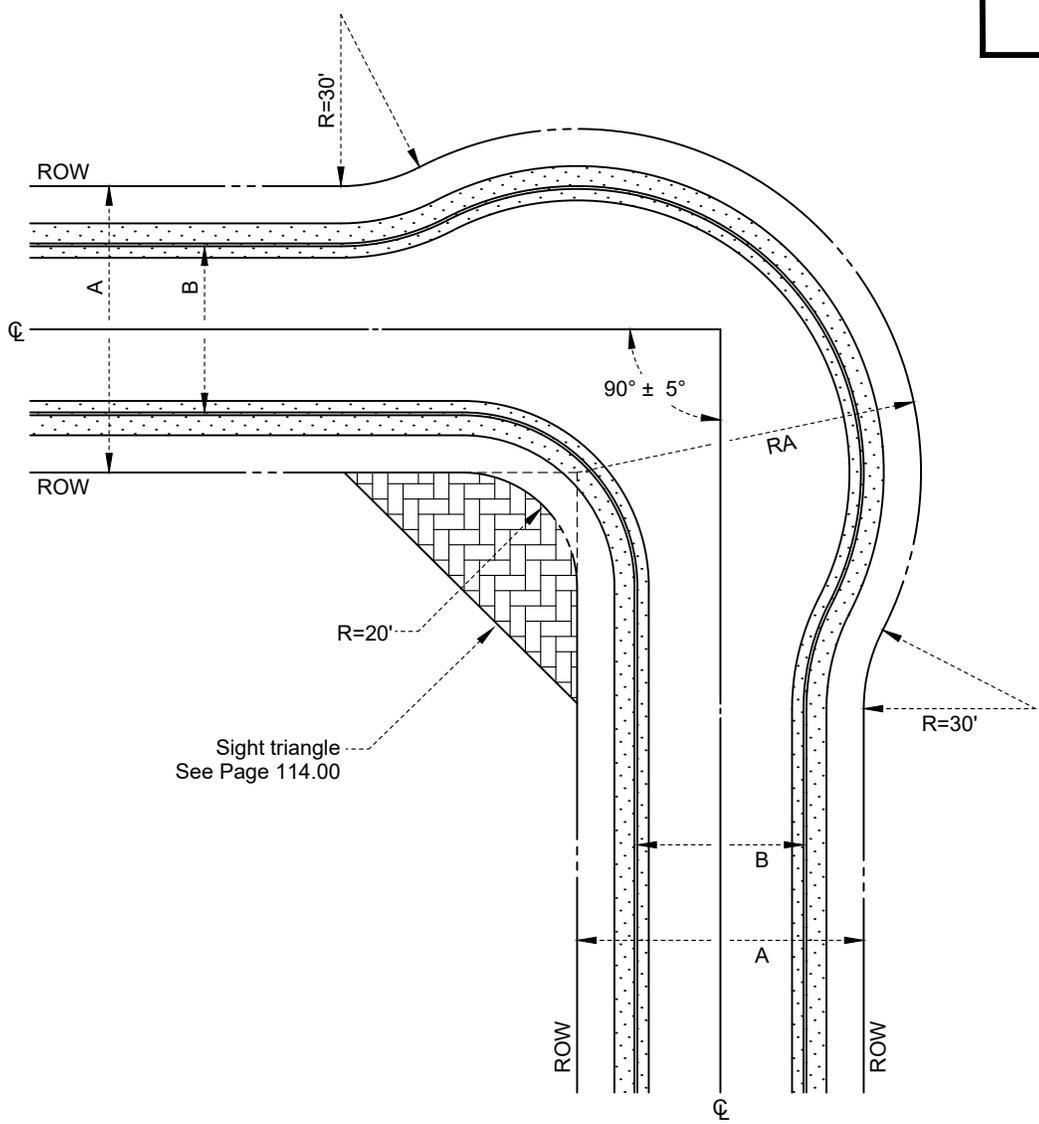
Date

Date: 09/2023

Dwg No.:

Scale: None

113.10



NOTES:

1. Intersection elbows are not required where the ROW centerline radius meets the minimum centerline curve radius shown on Page 110.20.
2. 'RA' = 50' where 'A' = 40'
60' where 'A' = 50'
68' where 'A' = 56'
72' where 'A' = 60'
3. A minimum of 50' of centerline tangent is required from the point of intersection of the centerlines to any adjacent ROW centerline curve.
4. ROW centerline angles at intersection elbows shall be between 85° and 95°.
5. See Page 114.00 for visibility control restrictions in sight triangles.
6. For curb-to-curb width (B), see Pages 112.10 through 112.80 (as applicable).

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

TYPICAL INTERSECTION ELBOW

Approved:

09-30-2023

City Engineer

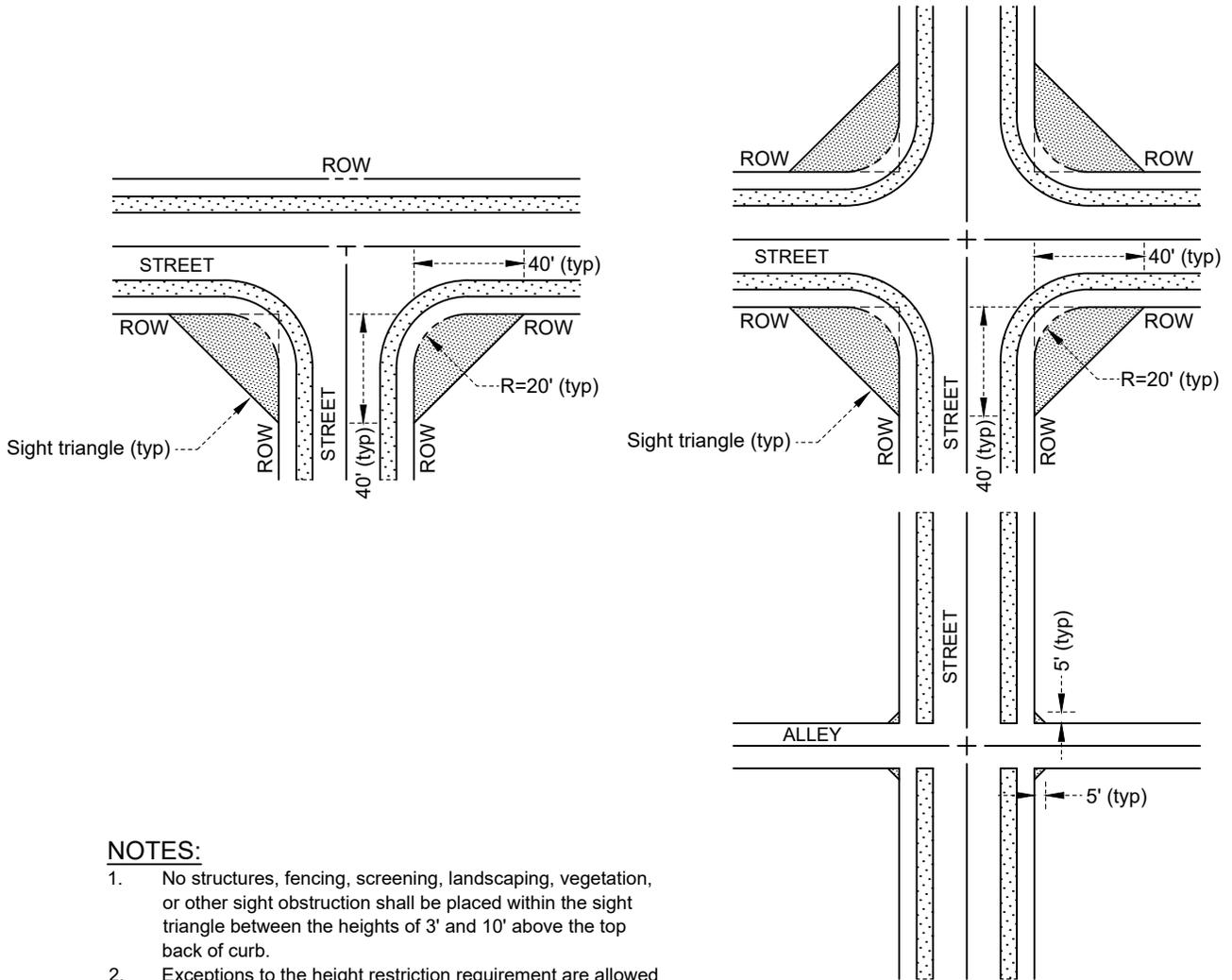
Date

Date: 09/2023

Dwg No.:

Scale: None

113.20



NOTES:

1. No structures, fencing, screening, landscaping, vegetation, or other sight obstruction shall be placed within the sight triangle between the heights of 3' and 10' above the top back of curb.
2. Exceptions to the height restriction requirement are allowed for street signage (street names and regulatory signs) and utility poles.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SIGHT TRIANGLE

Approved:

09-30-2023

City Engineer

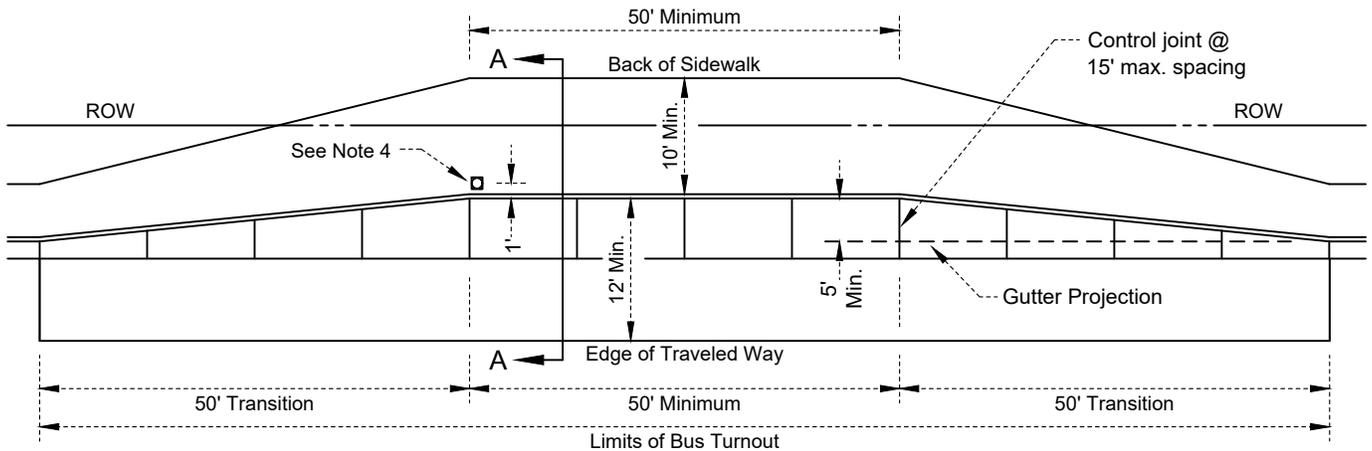
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Date: 09/2023

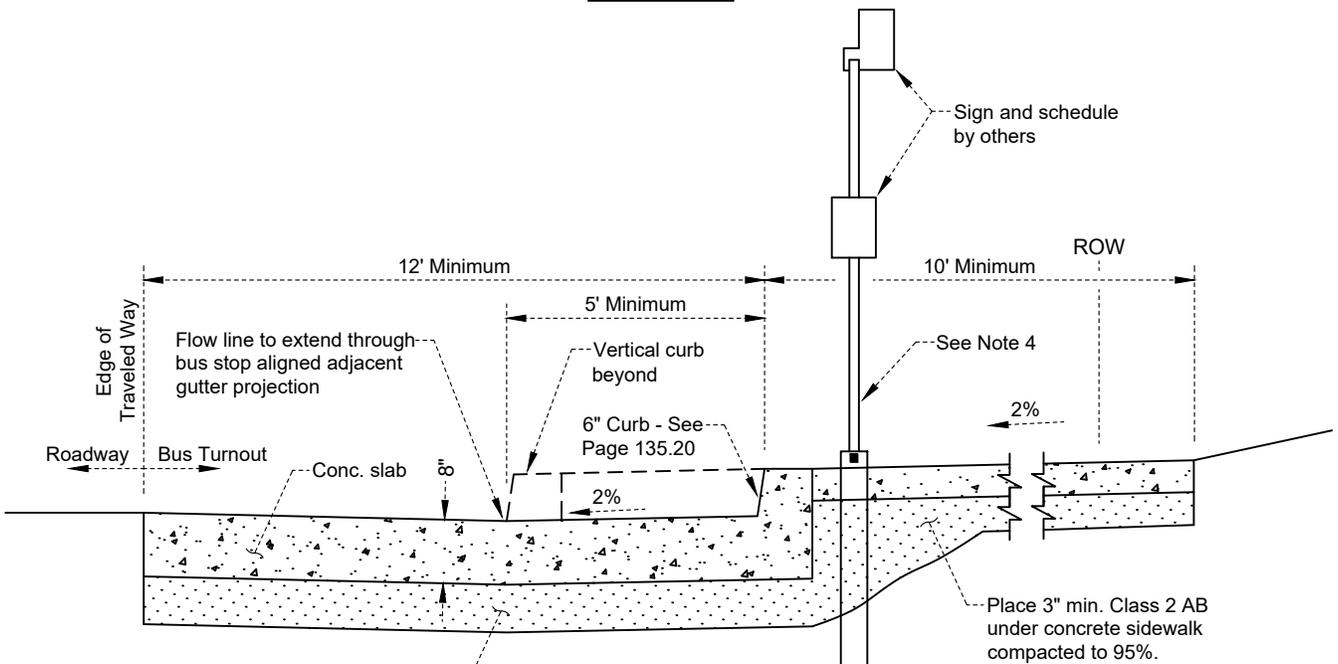
Dwg No.:

Scale: None

114.00



PLAN VIEW



Class 2 AB below concrete bus turnout. Thickness shall be equal to adjacent street base thickness or 6" minimum (whichever is greater), and shall be compacted to 95%.

SECTION A-A

NOTES:

1. All materials shall conform to Page 100.00.
2. Sidewalk easement dedication to back of sidewalk shall be made as required.
3. Control joints shall be 1-1/2" minimum depth tooled joints.
4. Quick change sign base and galvanized pipe post per page 152.10.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

BUS TURNOUT DETAIL

Approved:

09-30-2023

City Engineer

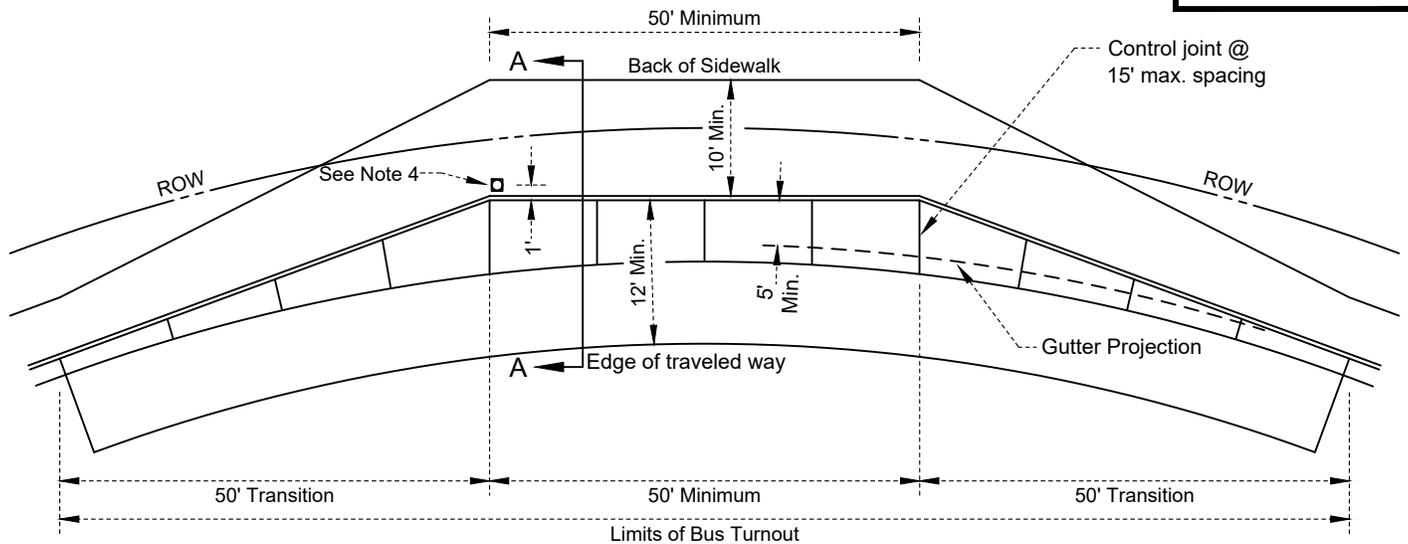
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Date: 09/2023

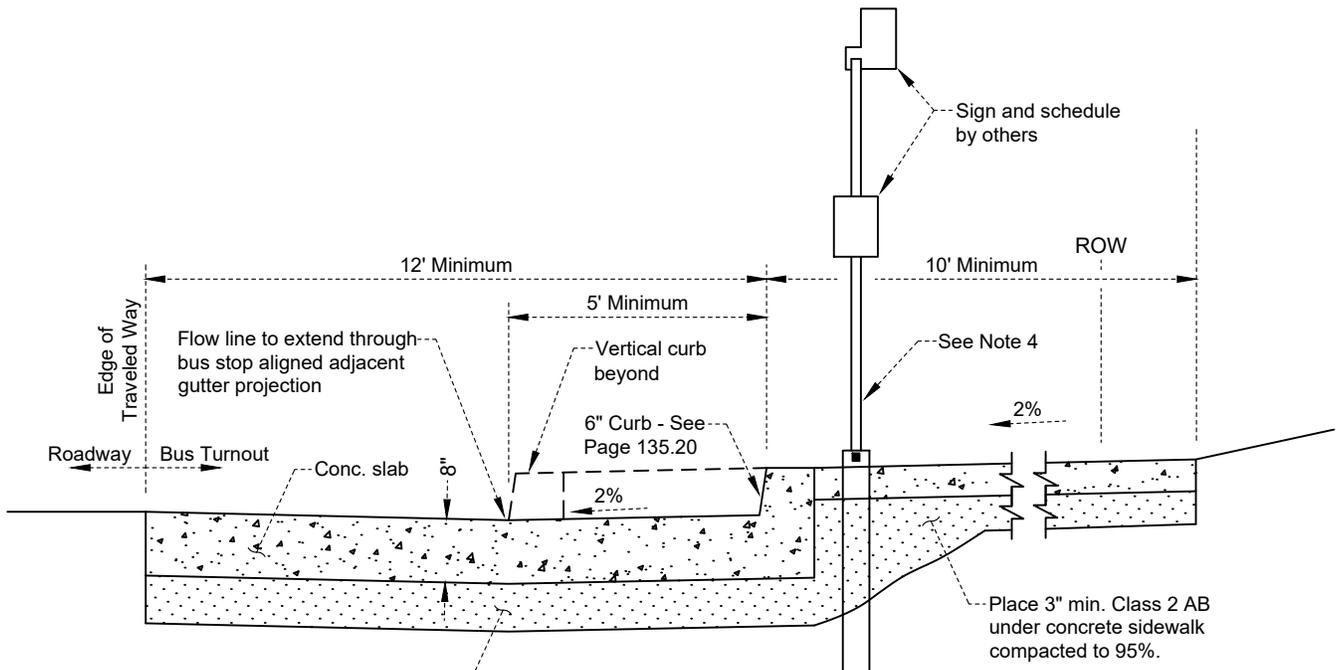
Dwg No.:

Scale: None

120.10



PLAN VIEW



Class 2 AB below concrete bus turnout. Thickness shall be equal to adjacent street base thickness or 6" minimum (whichever is greater), and shall be compacted to 95%.

SECTION A-A

NOTES:

1. Sidewalk easement dedication to back of sidewalk shall be made as required.
2. Control joints shall be 1-1/2" minimum depth tooled joints.
3. Subgrade shall be compacted in accordance with page 601.00.
4. Quick change sign base and galvanized pipe post per page 152.10.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

BUS TURNOUT DETAIL
(CURVED STREET)

Approved:

09-30-2023

City Engineer

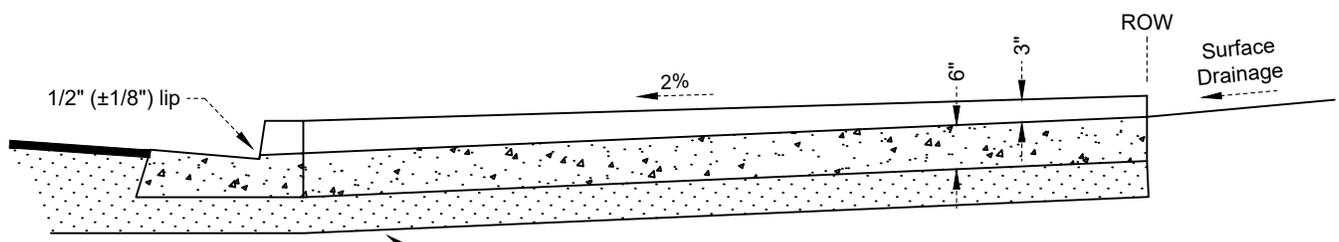
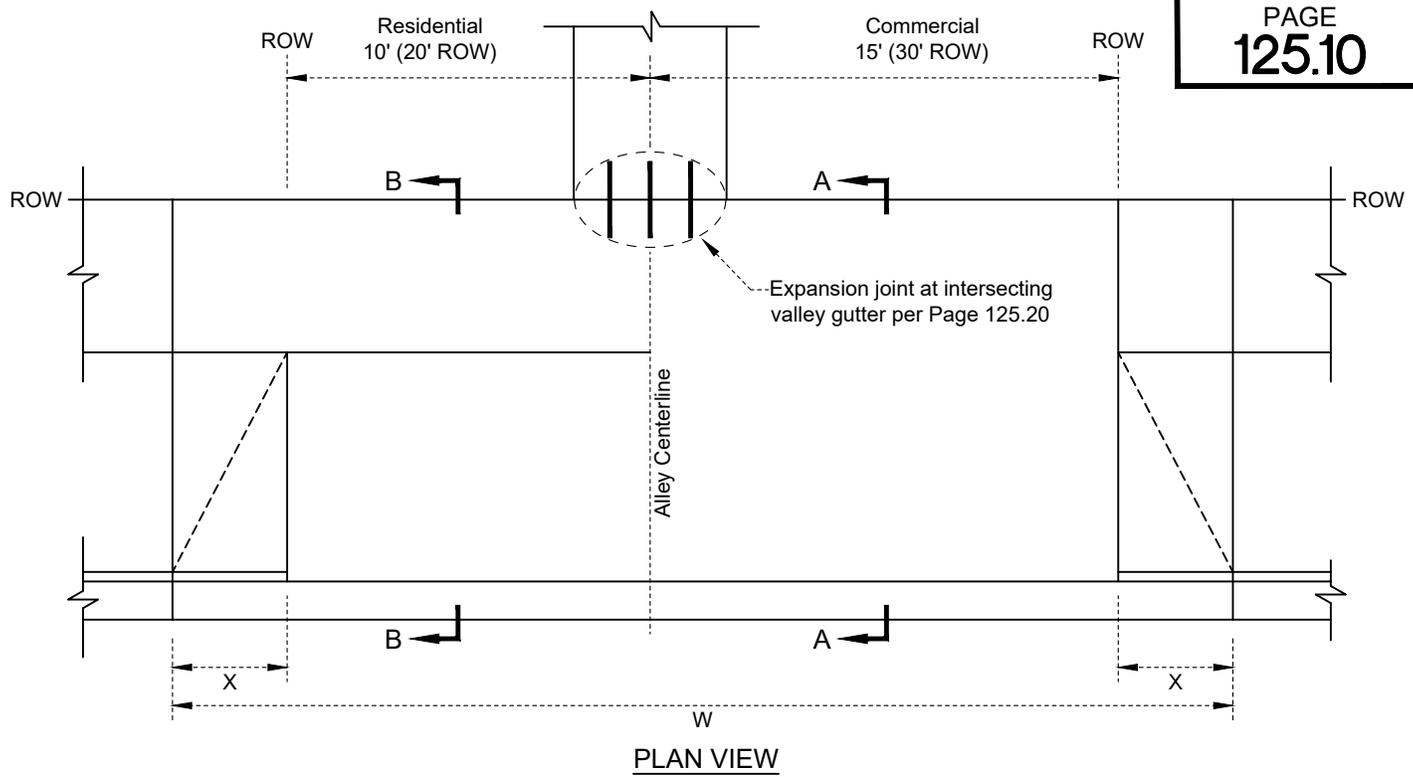
Date

Date: 09/2023

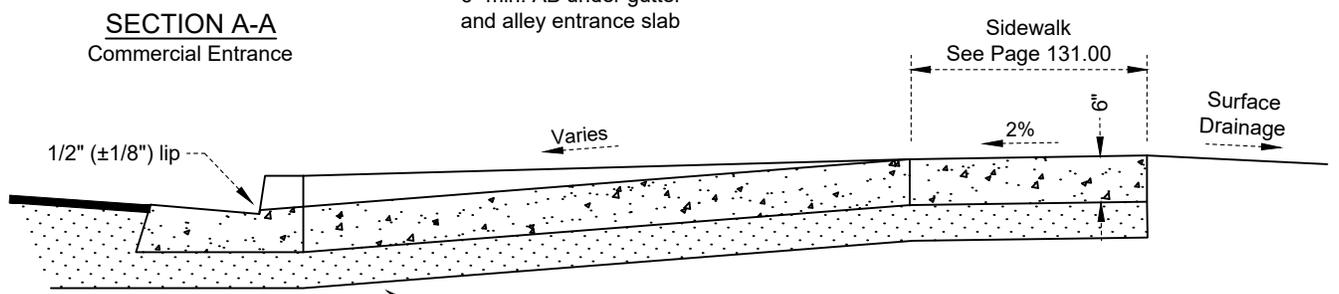
Dwg No.:

Scale: None

120.20



SECTION A-A
Commercial Entrance



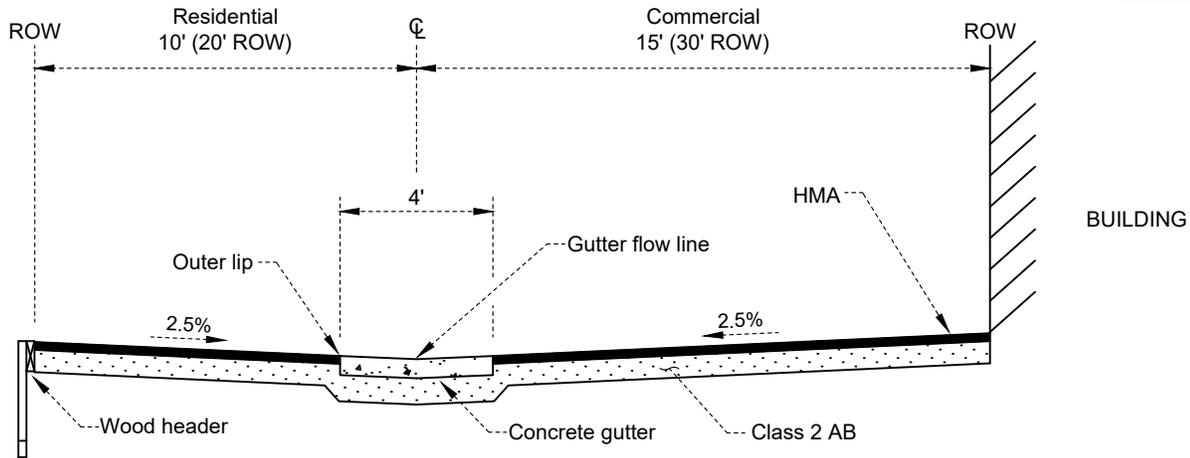
SECTION B-B
Residential Entrance

TABLE OF DIMENSIONS		
Curb Height	X	W (min.)
6 1/2" or less	2'-6"	17'
7" TO 7 1/2"	3'-0"	18'
8" TO 8 1/2"	3'-6"	19'
9" TO 9 1/2"	4'-0"	20'
10" TO 10 1/2"	4'-6"	21'
11" TO 12"	5'-0"	22'

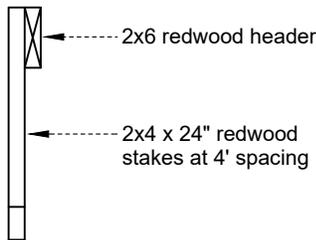
NOTES:

- All materials shall conform to Page 100.00.
- Weakened plane joints shall be to a depth of 2" and at intervals not to exceed 12' on center.
- Within the curb and gutter section, the top 3/4" of the control joint shall be filled with polyurethane sealant (SIKAFLEX-1A or equal).

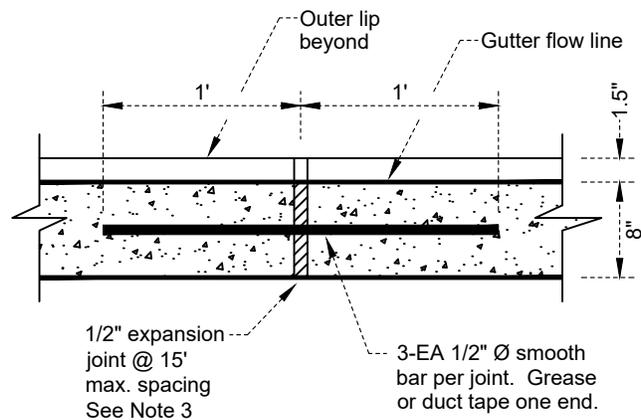
				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer _____ Date _____	
				STANDARD ALLEY ENTRANCE		Date: 09/2023 Dwg No.: _____	
						Scale: None 125.10	
REVISION	BY	APPROVED	DATE				



ALLEY SECTION



HEADER DETAILS

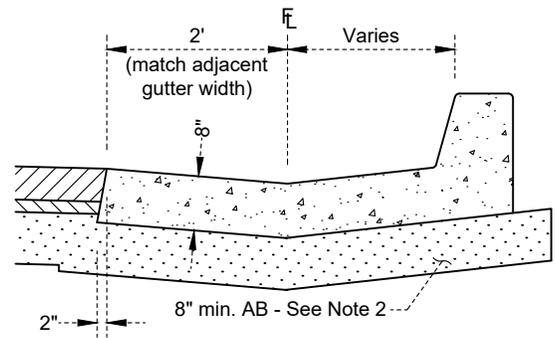
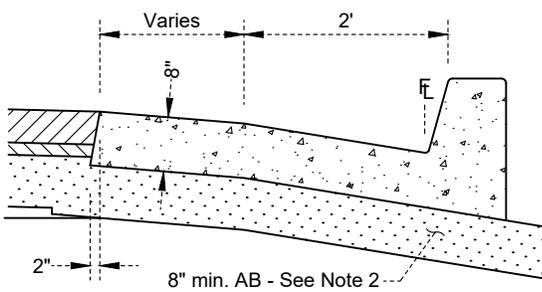
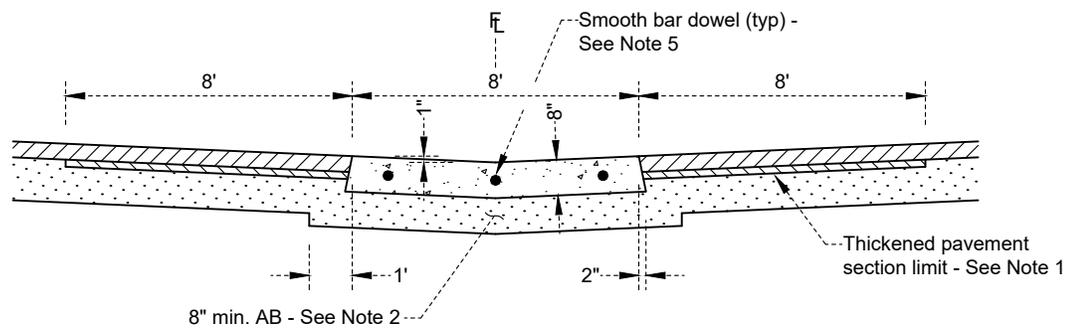
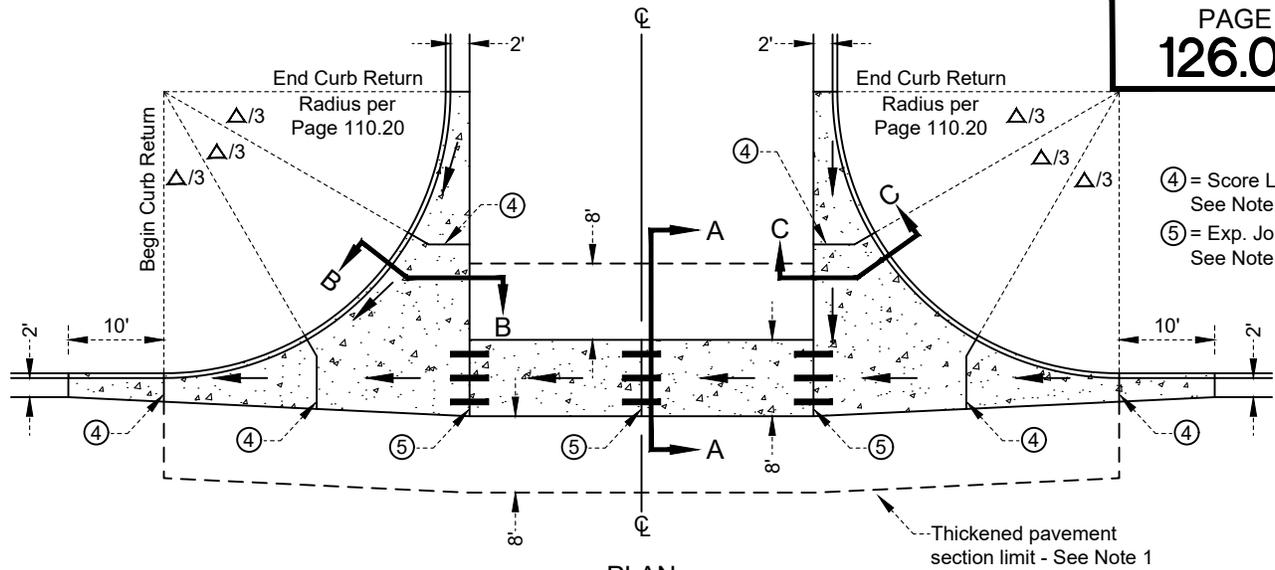


EXPANSION JOINT DETAIL

NOTES:

1. All materials shall conform to Page 100.00.
2. Surfacing and base thickness shall be determined in accordance with City standards or as directed by the Engineer, subject to the following minimum requirements:
AB: 4"
HMA: 2"
3. 1/2" pre-molded expansion joint material shall be held firmly in place prior to placing concrete.
4. Redwood headers shall be foundation grade or better.

				CITY OF SHASTA LAKE		Approved:	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer Date	
				ALLEY AND VALLEY GUTTER DETAILS		Date: 09/2023 Dwg No.:	
REVISION	BY	APPROVED	DATE			Scale: None 125.20	



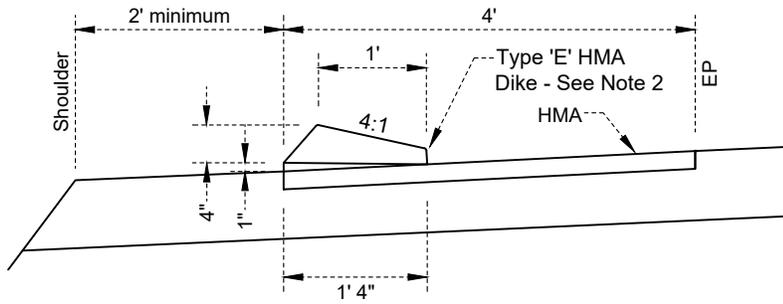
NOTES:

1. Thickened pavement section shall consist of street HMA section plus 2" HMA.
2. All materials shall conform to Page 100.00. A minimum of 8" AB shall be placed under all concrete.
3. Curb return, spandrels, and gutter shall be poured monolithically.
4. All score lines shall be 1/2" deep.
5. Expansion joint reinforcement shall consist of 3-EA 1/2" Ø smooth bar. Each bar shall be 4' long and shall be centered on the joint. Expansion joints shall be 1/2" wide and shall be filled with pre-molded expansion joint material.
6. When roll curb is used, the transition to vertical curb shall be complete 10' beyond the curb return. Vertical curb shall be used for all returns.
7. All concrete abutting HMA shall be constructed with a 2" batter.

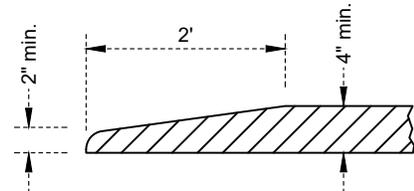
REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department
STANDARD DRAWING
CROSS GUTTER AND SPANDREL

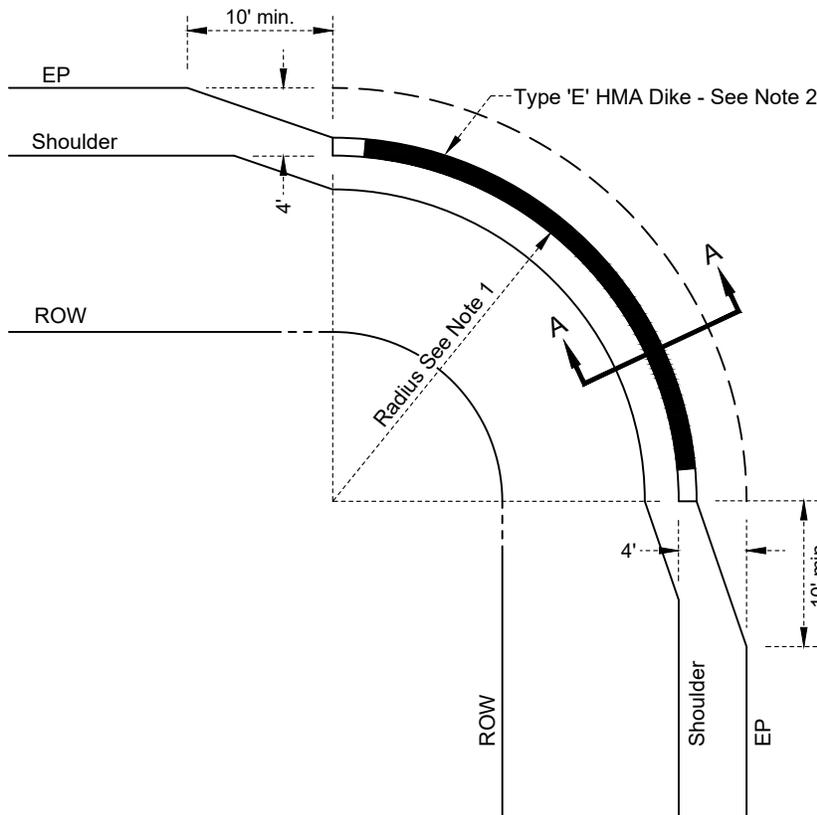
Approved: *WST/A* 09-30-2023
City Engineer Date
Date: 09/2023 Dwg No.:
Scale: None 126.00



SECTION A-A



END OF DIKE DETAIL



PLAN

NOTES:

1. Back of curb radius shall be determined by street classification - See Page 110.20.
2. Type 'E' HMA dike shall conform to CSP.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

HMA CURB RETURN

(for use at curb returns without concrete curbs)

Approved:

09-30-2023

City Engineer

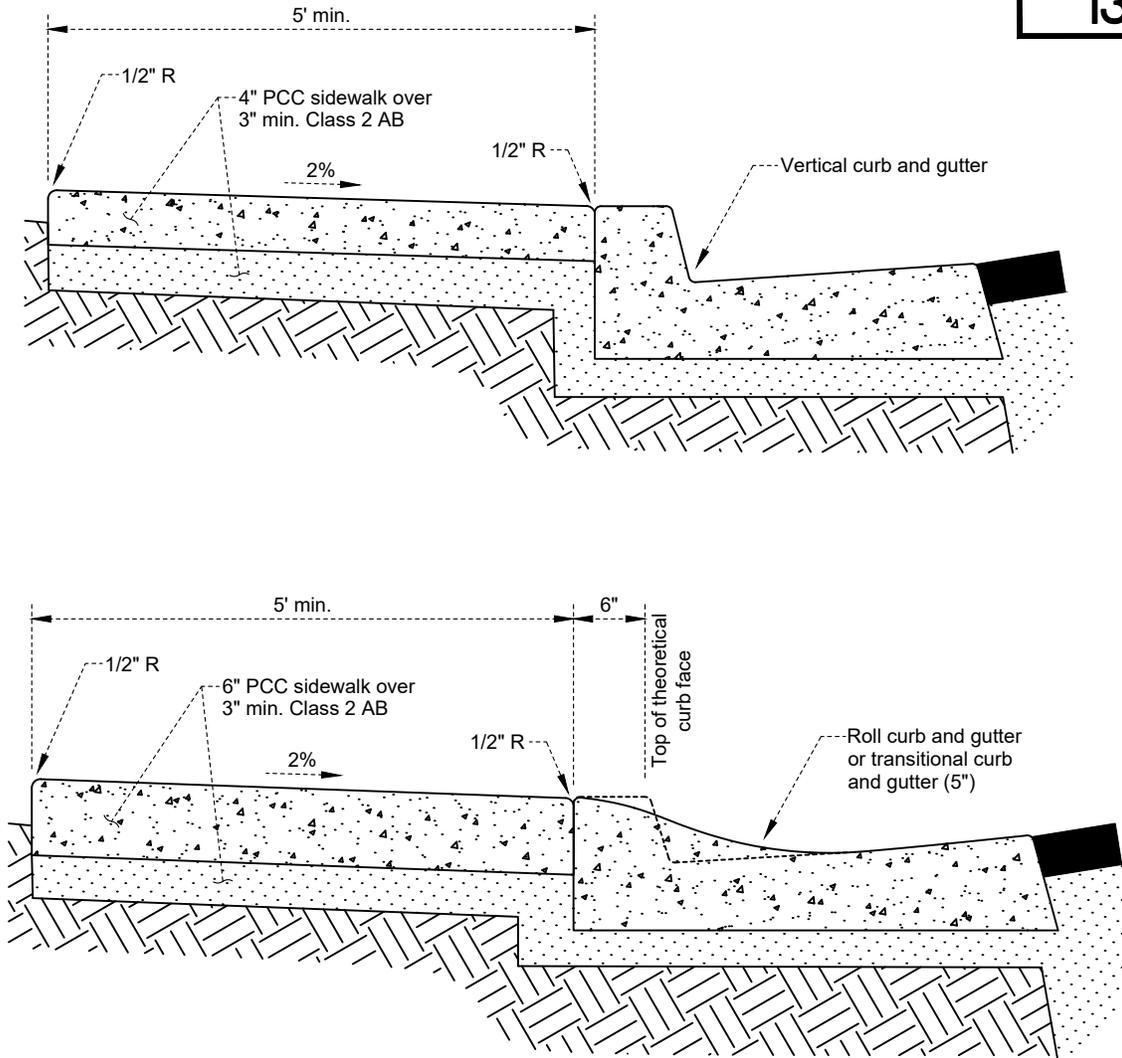
Date

Date: 09/2023

Dwg No.:

Scale: None

127.00



NOTES:

1. All material shall conform to Page 100.00.
2. Sidewalks shall maintain a minimum of 4' clear width at all times.
3. Sidewalk grades shall not exceed 5% except to match the grade of the adjacent street or roadway.
4. Sidewalks with continuous gradients shall have a level area at least 5' in length at intervals no greater than 400'.
5. Within all curb returns, sidewalk and curb ramps shall be a minimum of 6" thick.
6. Adjacent to roll curb and gutter, sidewalk shall be a minimum of 6" thick.
7. In areas where roll curb transitions to vertical curb or catch basins, sidewalk shall be a minimum of 6" thick.
8. All brooming shall be perpendicular to the curb.
9. Weakened plane joints shall be to a depth of 2" and at intervals not to exceed 12' on center.
10. 1/2" deep score lines shall be evenly spaced between weakened plane joints at 3' to 5' intervals.
11. All existing street signs shall be relocated and all required new signs placed per page 152.30 at the time of sidewalk installation. The City will provide the quick change base tube for the Contractor's installation for all existing signs.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SIDEWALK STANDARD

Approved:

09-30-2023

City Engineer

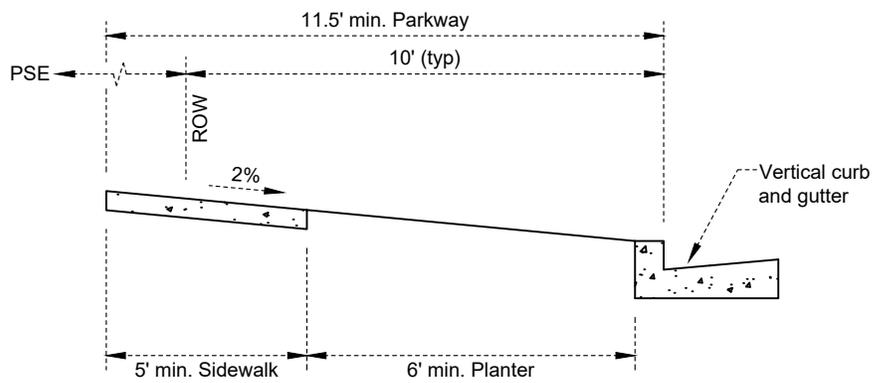
Date

Date: 09/2023

Dwg No.:

Scale: None

131.10



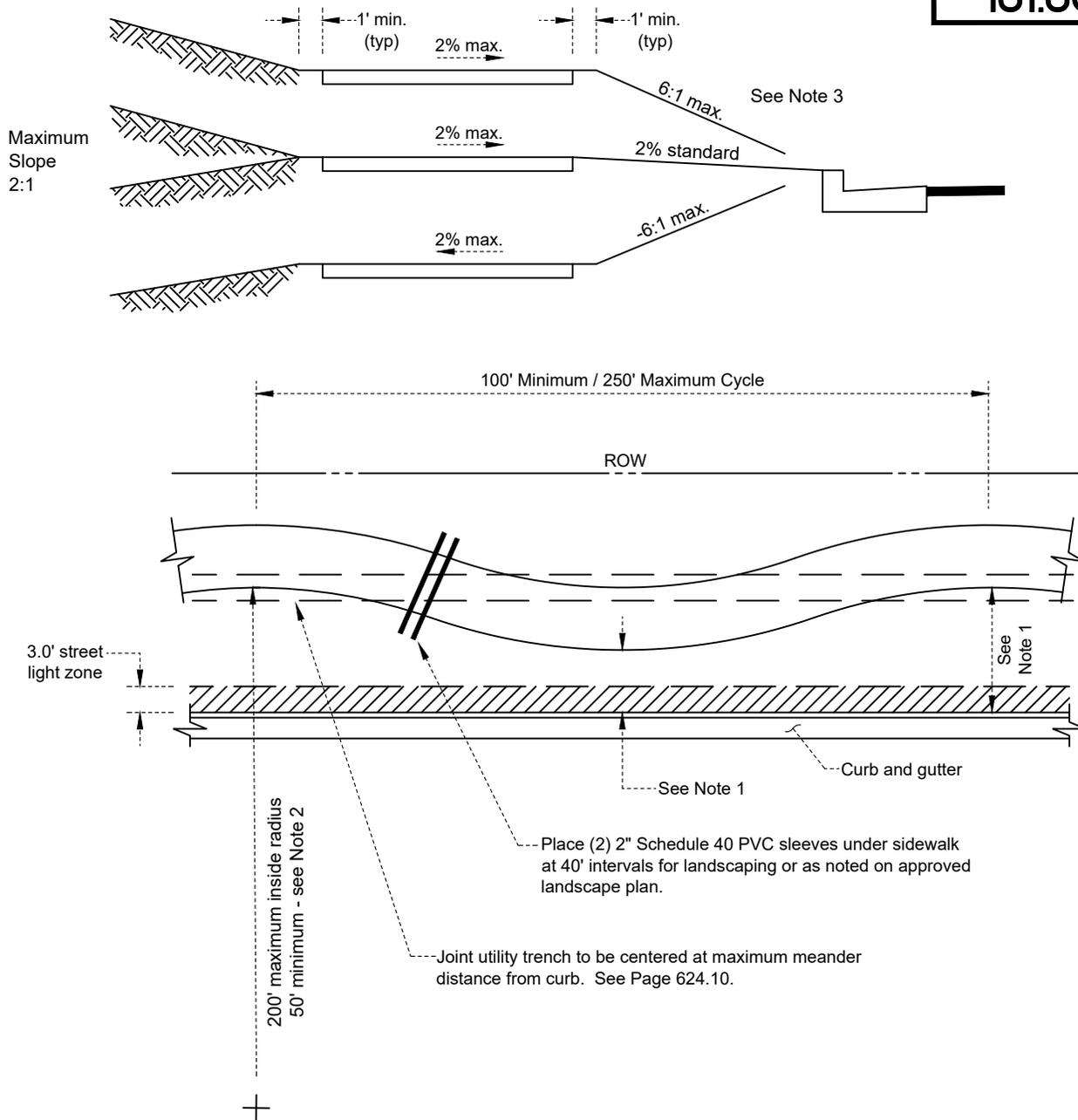
REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

STANDARD DRAWING

SEPARATED SIDEWALK
ALTERNATIVE

Approved:	
	09-30-2023
City Engineer	Date
Date: 09/2023	Dwg No.:
Scale: None	131.20



Notes:

1. Maximum and minimum meander distances shall be as specified on improvement plans. Typical meander distance shall be equal to sidewalk width.
2. The sidewalk curve radius should vary between 50 and 300 feet, and at each point of reverse curvature the radius should change to assist creating an arrhythmic layout.
3. The slope of the area between the curb and the sidewalk shall be 2% at all driveways and at all curb returns. Slope may increase to a maximum of 6:1 in all other areas.
4. Sidewalk width shall be as shown on improvement plans.
5. See Page 131.10 for sidewalk construction details.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

MEANDERING SIDEWALK

Approved:

09-30-2023

City Engineer

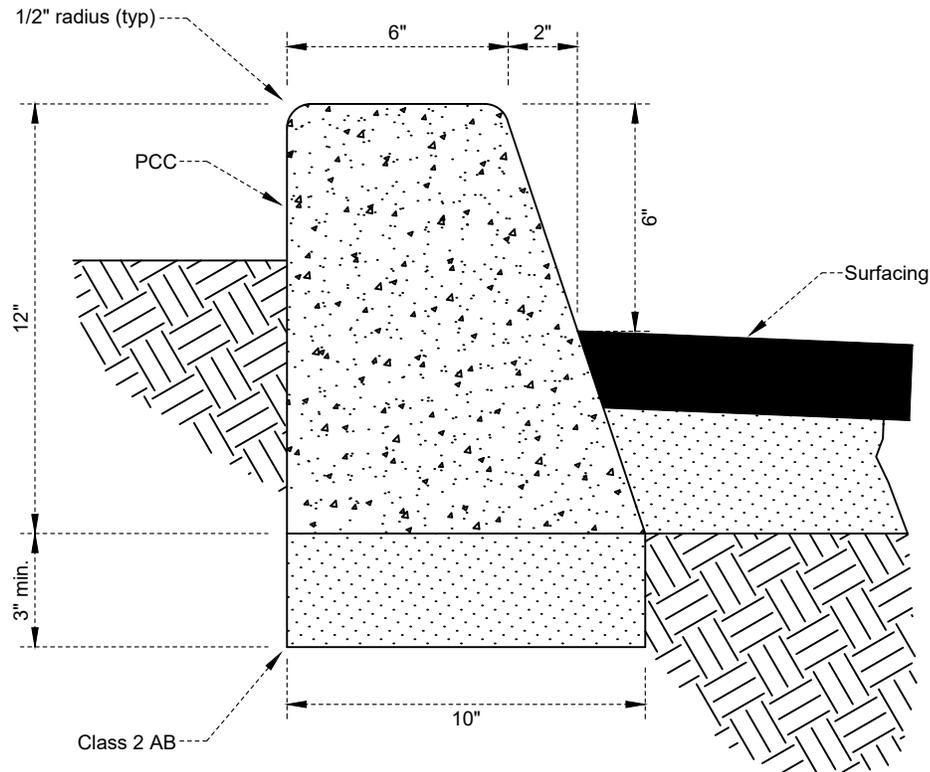
Date

Date: 09/2023

Dwg No.:

Scale: None

131.30



NOTES:

1. Curb-only section shall be used only in parking lots or as approved by the City Engineer.
2. All materials shall conform to Page 100.00. Concrete shall have 4" max. slump (1-1/2" max. slump for extruded curbs).
3. Cross sectional area = 0.66 sq. ft.
4. Weakened plane joints shall be to a depth of 2-inches and at intervals not to exceed 15' on-center. The top 3/4-inch of the weakened plane joint shall be filled with polyurethane sealant (SIKAFLEX-1A or equal).
5. All exposed surfaces shall receive a light broom finish parallel to the curb.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

CONCRETE CURB

Approved:

09-30-2023

City Engineer

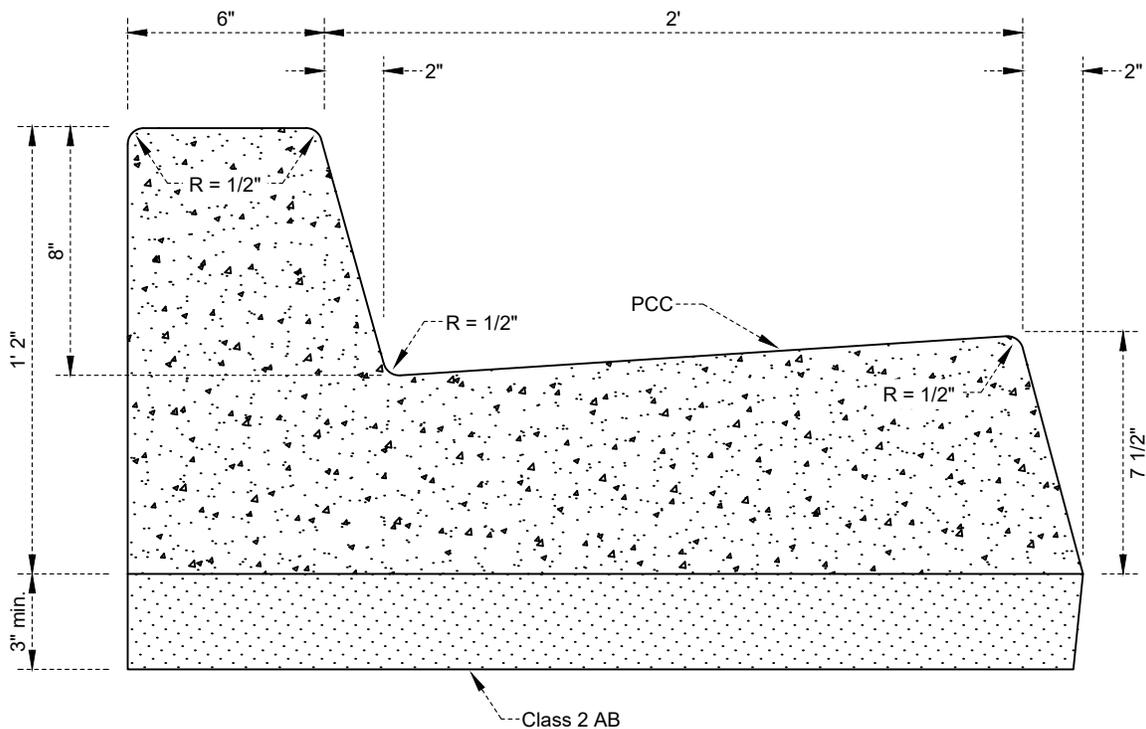
Date

Date: 09/2023

Dwg No.:

Scale: None

134.00



NOTES:

1. All materials shall conform to Page 100.00. Concrete shall have 4" max. slump (1-1/2" max. slump for extruded curb and gutter).
2. Cross sectional area = 1.81 SF.
3. Weakened plane joints shall be to a depth of 2" and at intervals not to exceed 12' on-center. The top 3/4" of the weakened plane joint shall be filled with polyurethane sealant (SIKAFLEX-1A or equal).
4. All exposed surfaces shall receive a light broom finish parallel to the direction of flow.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

8" CONCRETE CURB AND GUTTER

Approved:

09-30-2023

City Engineer

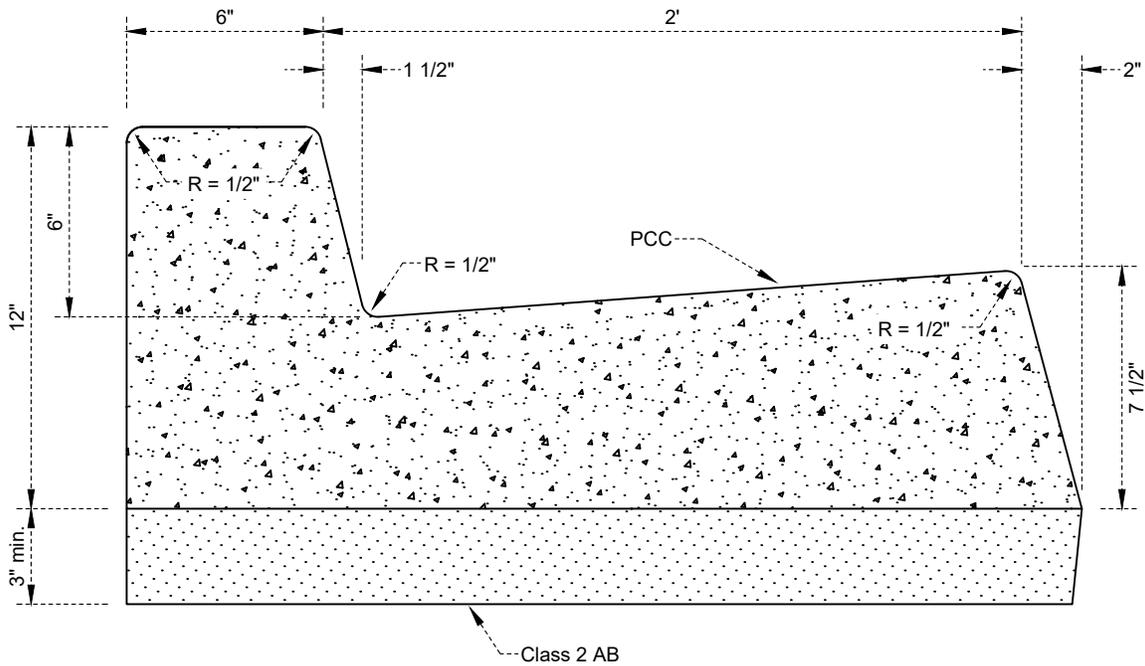
Date

Date: 09/2023

Dwg No.:

Scale: None

135.10



NOTES:

1. All materials shall conform to Page 100.00. Concrete shall have 4" max. slump (1-1/2" max. slump for extruded curb and gutter).
2. Cross sectional area = 1.70 SF.
3. Weakened plane joints shall be to a depth of 2" and at intervals not to exceed 16' on-center. The top 3/4" of the weakened plane joint shall be filled with polyurethane sealant (SIKAFLEX-1A or equal).
4. All exposed surfaces shall receive a light broom finish parallel to the direction of flow.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

6" CONCRETE CURB AND GUTTER

Approved:

09-30-2023

City Engineer

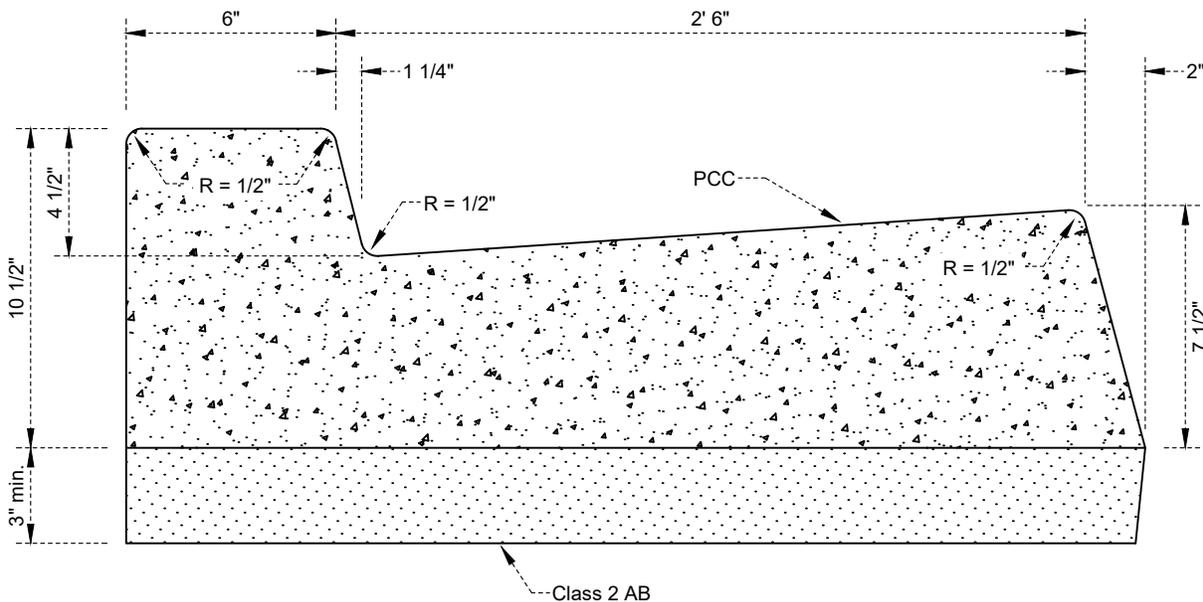
Date

Date: 09/2023

Dwg No.:

Scale: None

135.20



NOTES:

1. All materials shall conform to Page 100.00. Concrete shall have 4" max. slump (1-1/2" max. slump for extruded curb and gutter).
2. Cross sectional area = 1.97 SF.
3. Weakened plane joints shall be to a depth of 2" and at intervals not to exceed 12' on-center. The top 3/4" of the weakened plane joint shall be filled with polyurethane sealant (SIKAFLEX-1A or equal).
4. All exposed surfaces shall receive a light broom finish parallel to the direction of flow.
5. All sidewalk adjacent to 5" curb and gutter shall be no less than 6" thick.
6. When constructing a curb return adjacent to roll curb, the return shall be 5" vertical curb and gutter per this standard.
7. Transitions between roll and vertical curb shall be 5' long and shall be formed.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

5" CONCRETE CURB AND GUTTER
(vertical transition for roll curb)

Approved:

09-30-2023

City Engineer

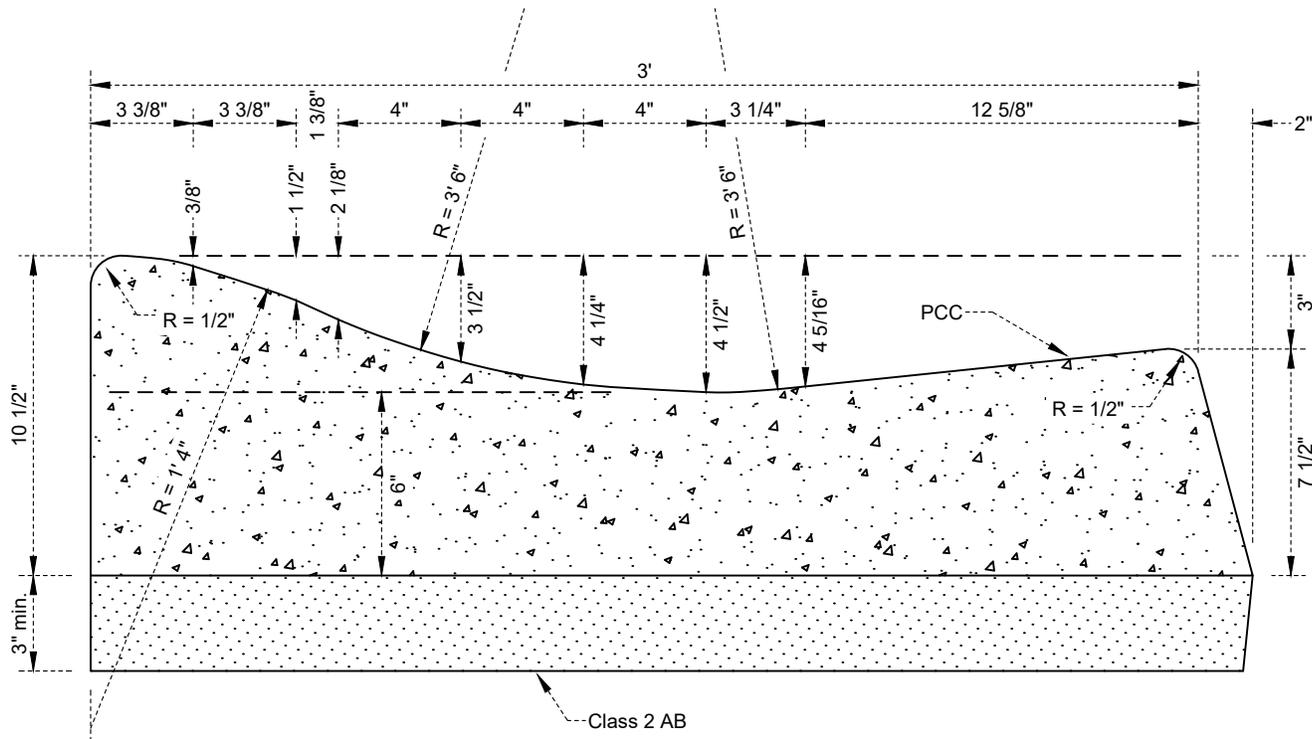
Date

Date: 09/2023

Dwg No.:

Scale: None

135.30



NOTES:

1. All materials shall conform to Page 100.00. Concrete shall have 4" max. slump (1-1/2" max. slump for extruded curb and gutter).
2. Cross sectional area = 1.84 SF.
3. Weakened plane joints shall be to a depth of 2" and at intervals not to exceed 12' on-center. The top 3/4" of the weakened plane joint shall be filled with polyurethane sealant (SIKAFLEX-1A or equal).
4. All exposed surfaces shall receive a light broom finish parallel to the direction of flow.
5. Roll curb and gutter is not permitted when grade of street is greater than 5% unless otherwise approved by the City Engineer.
6. All sidewalk adjacent to roll curb and gutter shall be no less than 6" thick.
7. When constructing a curb return adjacent to roll curb, the return shall be 5" vertical curb and gutter per Page 135.30.
8. Transitions between roll and vertical curb shall be 5' long and shall be formed.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

CONCRETE ROLL
CURB AND GUTTER

Approved:

09-30-2023

City Engineer

Date

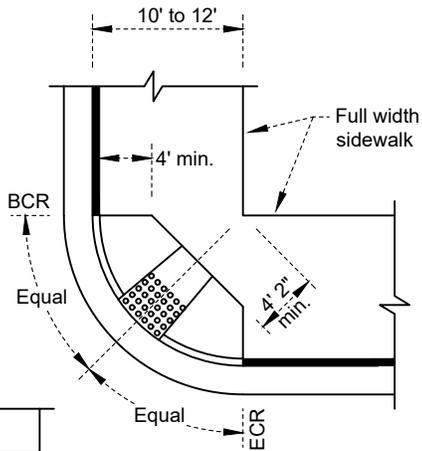
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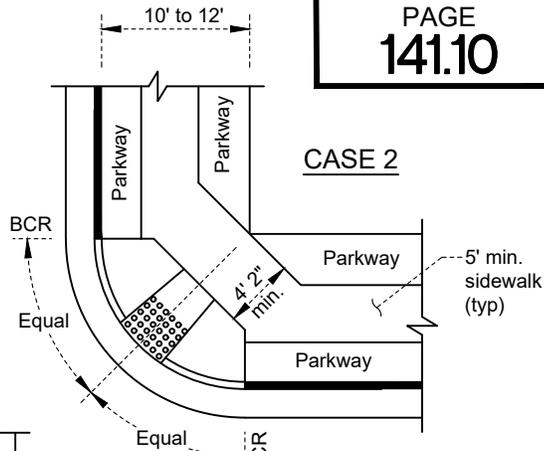
Scale: None

135.40

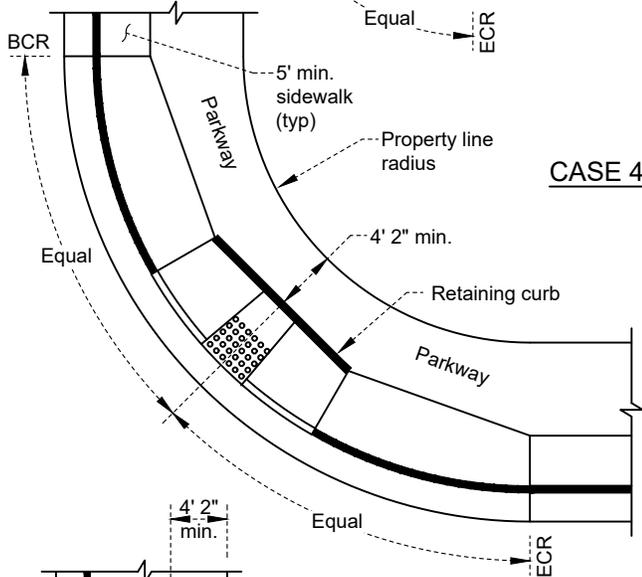
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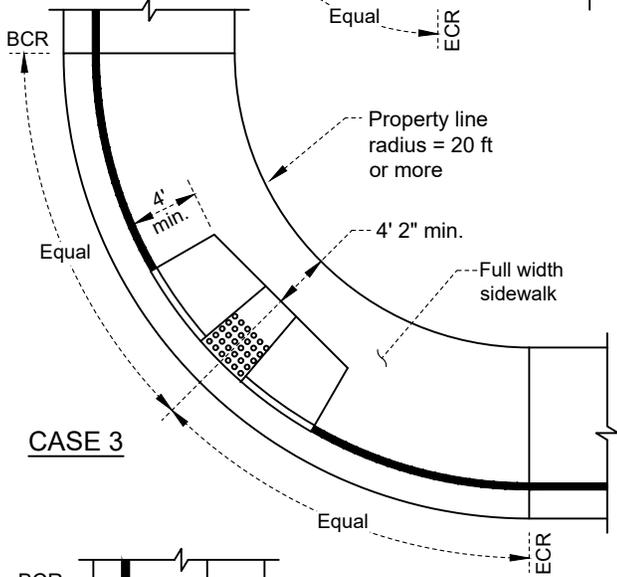
CASE 2



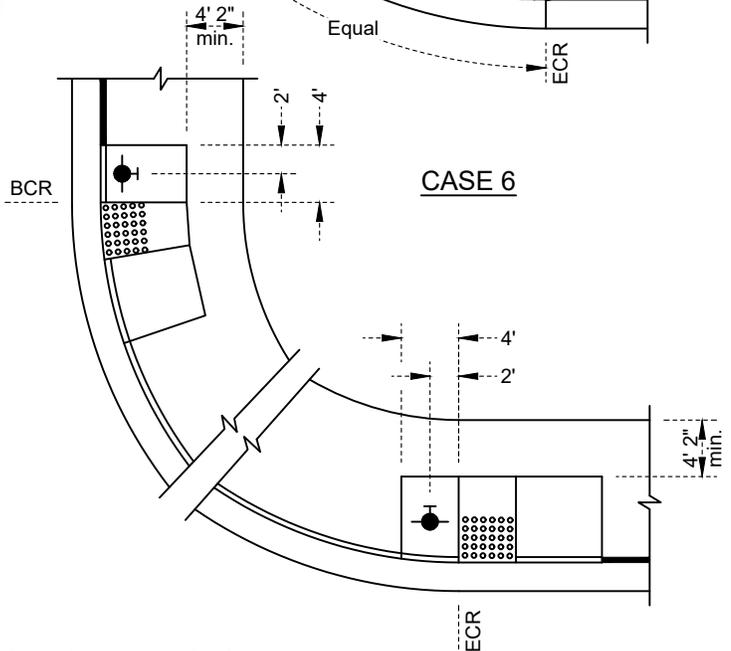
CASE 4



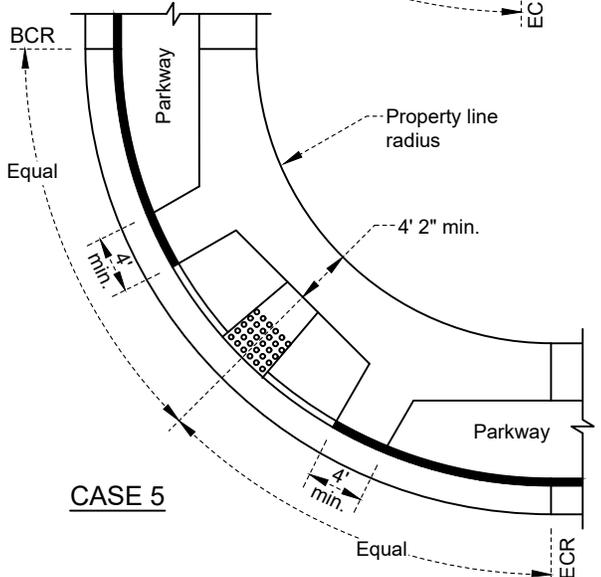
CASE 3



CASE 6



CASE 5



NOTES:

1. Installation of ramps at locations other than the middle of the curb return require the construction of two (2) ramps to serve both crosswalks (see Case 6).
2. Stamped or glued truncated domes are not allowed. Curb ramps shall have truncated domes pattern consistent with the most current Caltrans Standard Plans and/or direction from the State of California Division of State Architect's office for ADA compliance.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

CURB RAMP LOCATION

Approved:

09-30-2023

City Engineer

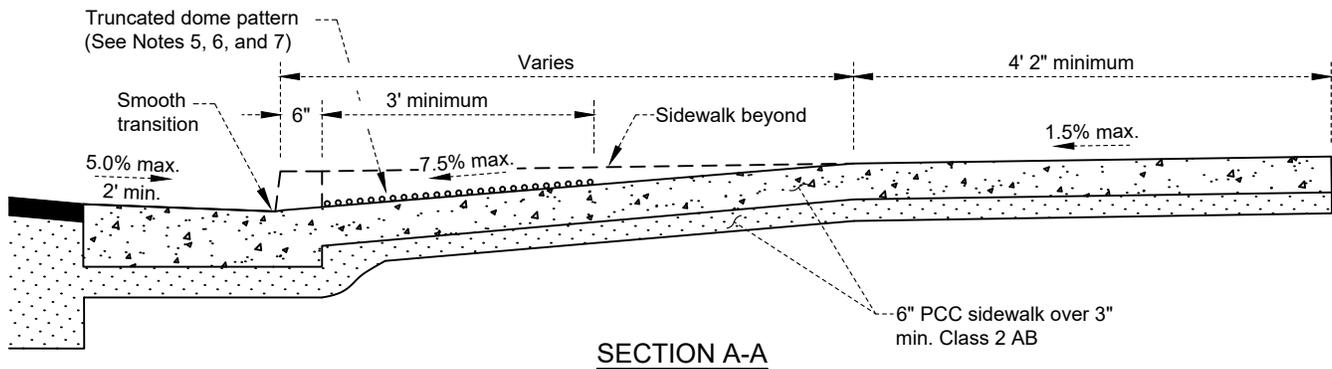
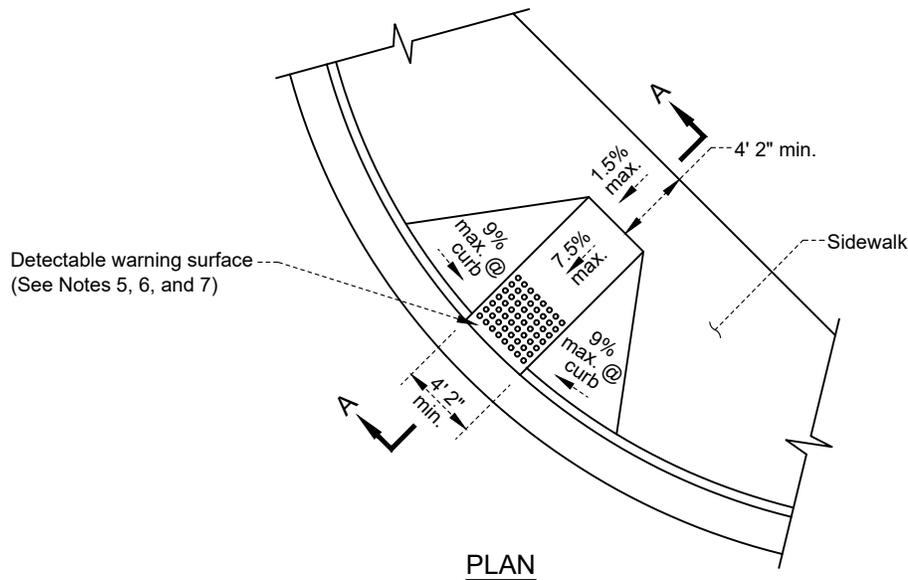
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Date: 09/2023

Dwg No.:

Scale: None

141.10



NOTES:

1. All materials shall conform to Page 100.00.
2. See Page 141.10 for ramp locations.
3. When adjacent to roll curb, use 5" vertical curb per Page 135.30 in all curb returns with a 5' transition to adjacent roll curb.
4. The texture of the ramp surface shall be rougher than the texture of the surrounding sidewalk, and shall be slip resistant.
5. Curb ramps shall have a detectable warning surface raised truncated dome pattern as shown on CSP A88A.
6. Detectable warning surface shall contrast visually with adjoining surfaces, either light-on-dark or dark-on-light. See ADA accessibility guidelines 4.29.2.
7. Detectable warning surface shall be wet set in concrete. Stamped or glued surfaces are not allowed. Curb ramps shall have truncated domes pattern consistent with the most current CSP and/or direction from the State of California Division of State Architect's office for ADA compliance.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

CURB RAMP LOCATION (Type A)

Approved:

09-30-2023

City Engineer

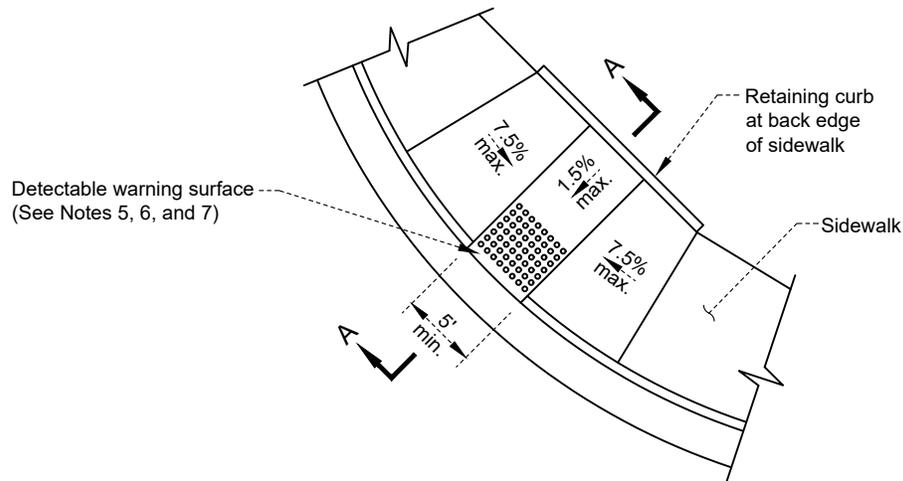
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Date: 09/2023

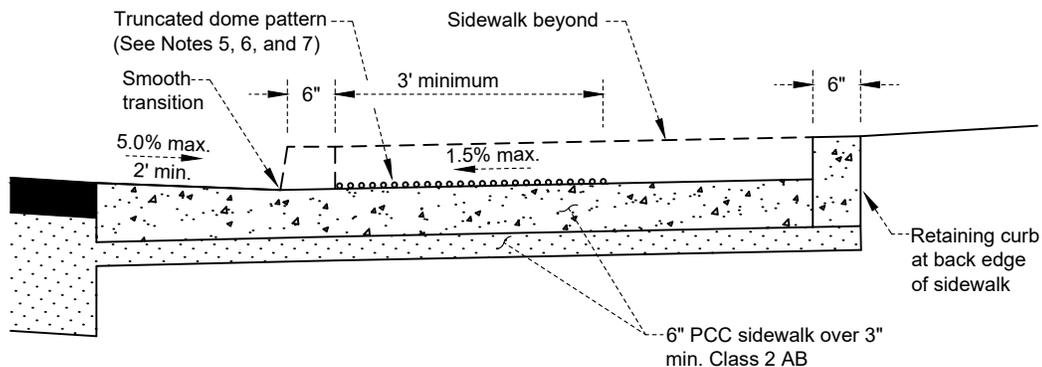
Dwg No.:

Scale: None

141.20



PLAN



SECTION A-A

NOTES:

1. All materials shall conform to Page 100.00.
2. See Page 141.10 for ramp locations.
3. When adjacent to roll curb, use 5" vertical curb per Page 135.30 in all curb returns with a 5' transition to adjacent roll curb.
4. The texture of the ramp surface shall be rougher than the texture of the surrounding sidewalk, and shall be slip resistant.
5. Curb ramps shall have a detectable warning surface raised truncated dome pattern as shown on CSP A88A.
6. Detectable warning surface shall contrast visually with adjoining surfaces, either light-on-dark or dark-on-light. See ADA accessibility guidelines 4.29.2.
7. Detectable warning surface shall be wet set in concrete. Stamped or glued surfaces are not allowed. Curb ramps shall have truncated domes pattern consistent with the most current CSP and/or direction from the State of California Division of State Architect's office for ADA compliance.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

CURB RAMP LOCATION (Type B)

Approved:

09-30-2023

City Engineer

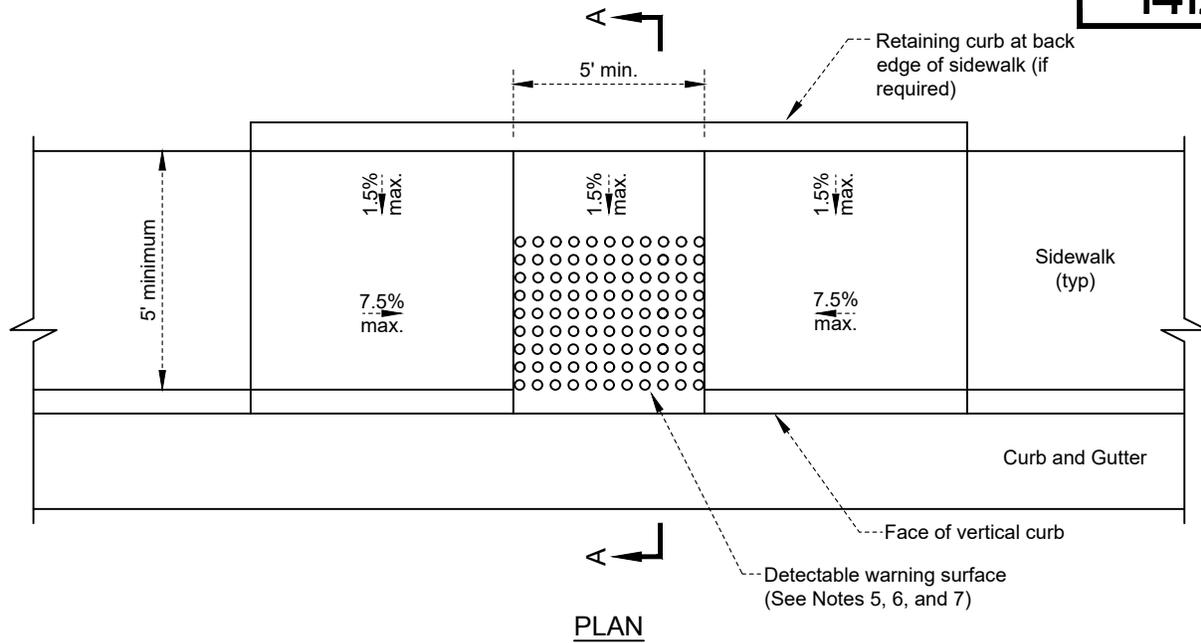
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Date: 09/2023

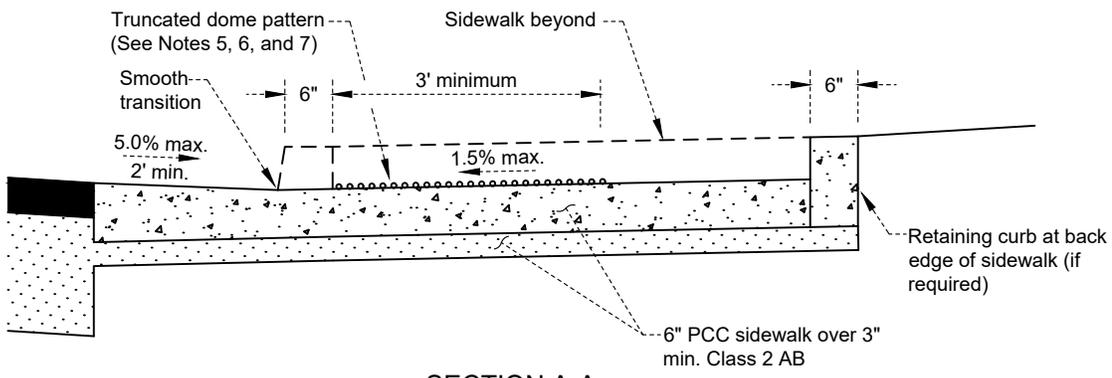
Dwg No.:

Scale: None

141.30



PLAN



SECTION A-A

NOTES:

1. All materials shall conform to Page 100.00.
2. See Page 141.10 for ramp locations.
3. When adjacent to roll curb, use 5" vertical curb per Page 135.30 in all curb returns with a 5' transition to adjacent roll curb.
4. The texture of the ramp surface shall be rougher than the texture of the surrounding sidewalk, and shall be slip resistant.
5. Curb ramps shall have a detectable warning surface raised truncated dome pattern as shown on CSP A88A.
6. Detectable warning surface shall contrast visually with adjoining surfaces, either light-on-dark or dark-on-light. See ADA accessibility guidelines 4.29.2.
7. Detectable warning surface shall be wet set in concrete. Stamped or glued surfaces are not allowed. Curb ramps shall have truncated domes pattern consistent with the most current CSP and/or direction from the State of California Division of State Architect's office for ADA compliance.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department
STANDARD DRAWING
CURB RAMP LOCATION (Type C)

Approved: *WST* 09-30-2023
City Engineer Date
Date: 09/2023 Dwg No.:
Scale: None 141.40

1. DRIVEWAYS - GENERAL

All driveway approaches in City right-of-way shall be constructed in conformance with City of Shasta Lake Municipal Code and the appropriate driveway Standard Drawings, or as modified for special situations described herein and approved by the City Engineer.

2. DRIVEWAY APRONS

- A. Residential driveway aprons shall be constructed between the curb and the property line with PCC per Page 148.10.
- B. Commercial driveway aprons to a parking lot or "drive-in" business shall be constructed between the curb and the property line with PCC per Page 148.20 or 148.30.
- C. An industrial driveway apron shall be constructed between the curb and the property line per Page 148.20 or 148.30 with an approved PCC structural section based on the traffic index (TI) and ability of the soil (R-Value) to withstand truck wheel loads.
- D. In all cases above, it shall be the responsibility of the abutting property owner to maintain the driveway apron in a safe and suitable condition for the traffic to be carried, whether pedestrian or vehicular.
- E. Driveway aprons shall have a minimum PCC thickness of 6".

3. HIGH VOLUME DRIVEWAYS (COMMERCIAL / INDUSTRIAL)

Commercial and industrial driveways that serve a substantial number of vehicles or trucks shall have dimensions, sight distance, geometrics, spacing, etc., determined by the City Engineer.

4. AMOUNT OF FRONTAGE ALLOWED FOR DRIVEWAYS

- A. Parcels (excluding single family) shall be limited to one (1) driveway cut per street frontage and not more than fifty percent (50%) of the frontage may be devoted to driveways.
- B. Single family parcels with a frontage of more than 56' shall be limited to two (2) driveway cuts per street frontage, and not more than fifty percent (50%) of the total frontage may be devoted to driveways.
- C. Single family parcels with a frontage of less than or equal to 56' shall be limited to two (2) driveway cuts per street frontage, and not more than 28' of the total frontage may be devoted to driveways.

5. ONE-WAY DRIVEWAYS

Parcels (excluding single family) shall be limited to two (2) driveways (for circular one-way use) per street frontage and shall conform to Page 148.20 or 148.30 (or as modified by the City Engineer for special situations).

6. DRIVEWAY WIDTH "W"

The width of driveways "W" shall be measured at the back edge of curb where curb and gutter or roll curb and gutter exists, back edge of sidewalk where sidewalk exists, or property line where no improvements exist. In the case of a radial lot, width "W" may be the larger of these values.

7. MINIMUM WIDTH "W"

- A. The minimum width of standard residential driveways shall be 12 feet.
- B. The minimum width of all other driveways shall provide for the safe and efficient movement of traffic and should be approximately 25'.

8. MAXIMUM WIDTH "W"

- A. The maximum width of driveways for one- and two-family residences with a frontage greater than 56' shall be 50% of the frontage, up to a maximum of 40'.
- B. The maximum width of driveways for one- and two-family residences with a frontage less than or equal to 56' shall be 28'.
- C. The maximum width of all commercial driveways shall be 40 feet.
- D. In the case of a driveway located adjacent to an alley, the driveway apron may be combined with the alley only when approved by the City Engineer, and the total combined width shall not exceed 40 feet.
- E. The driveway width may be modified by the City Engineer to facilitate turning movements, where curb lanes are used, and where necessary to provide for the safe and efficient movement of traffic.

				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer _____ Date _____	
				DRIVEWAY STANDARDS AND CRITERIA		Date: 09/2023 Dwg No.: 147.01	
				Scale: None			
REVISION	BY	APPROVED	DATE				

9. DISTANCE BETWEEN DRIVEWAYS

- A. No driveway shall be located closer than 3' feet from a side property line, except as allowed by specific Zoning Ordinance or Use Permit.
- B. The minimum length of full height curb between driveways on adjacent parcels shall be 6' feet except as allowed by specific Zoning Ordinance.
- C. No driveway shall be located closer than 6' from an existing or future alley entrance except as provided elsewhere in these Standards.
- D. Where two or more driveways are constructed on the same parcel and the frontage is greater than 56', the minimum length of full-height curb between driveways shall be 14'. Where practical, to provide curbside parking, the total length of full height curb between driveways shall be in multiples of 24'.
- E. Where two or more driveways are constructed on the same parcel and the frontage is less than or equal to 56', the minimum length of full-height curb between driveways shall be 9'.

10. DRIVEWAY GRADE (SLOPE)

The maximum grade for driveways within the public right-of-way (measured at the centerline) shall be limited to eight percent (8%). Areas required for pedestrian traffic shall not exceed two percent (2%).

11. DRIVEWAY DISTANCES FROM UTILITY OR SAFETY DEVICES

No driveway shall be located closer than 5' from a fire hydrant, traffic signal, street light standard, utility pole, guy wire, or any utility company service box.

12. UTILITY RELOCATION

Any necessary relocation of public or private utility facilities or other public improvements required to accommodate a driveway shall be accomplished without cost to the City.

13. SIGNAL AND ELECTRICAL CONDUIT

Where a traffic signal or highway lighting is planned or anticipated, a minimum of one 3" PVC conduit shall be placed under any new driveway apron and extend a minimum of one foot beyond the ends of the driveway without cost to the City. The conduit shall be placed behind, and 24" below, the top of curb, and shall be capped at both ends.

14. REMOVAL OF EXISTING DRIVEWAYS

When driveway construction is to take place on a parcel, any abandoned driveways shall be removed and replaced with standard curb, gutter, and sidewalk concurrently with the new construction and without cost to the City.

15. REMOVAL OF EXISTING CONCRETE

Where curb, gutter, and/or sidewalk is existing and no driveway depression has been provided, the concrete shall be sawcut and removed to the nearest score line or control joint beyond the 'X' distance on either side and replaced per the appropriate standards.

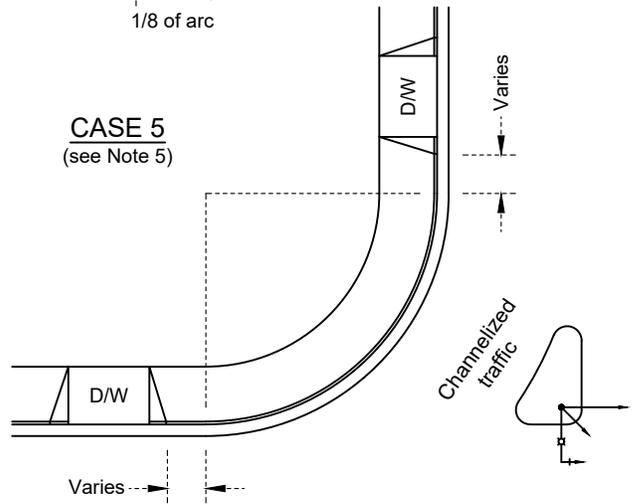
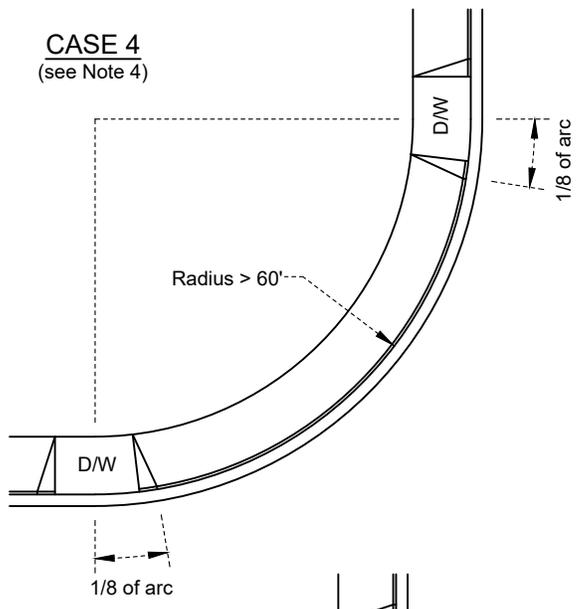
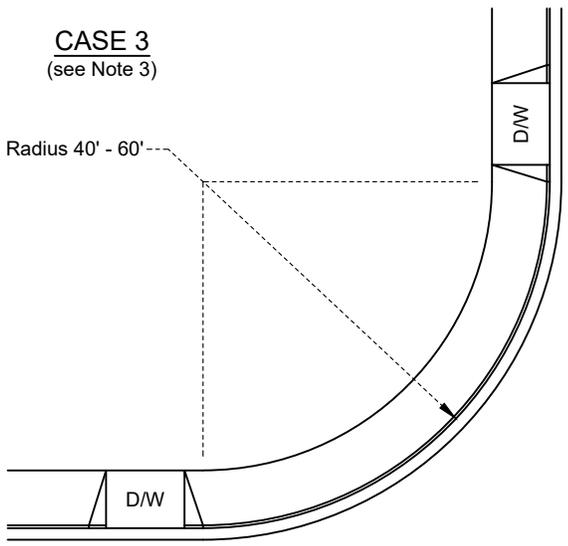
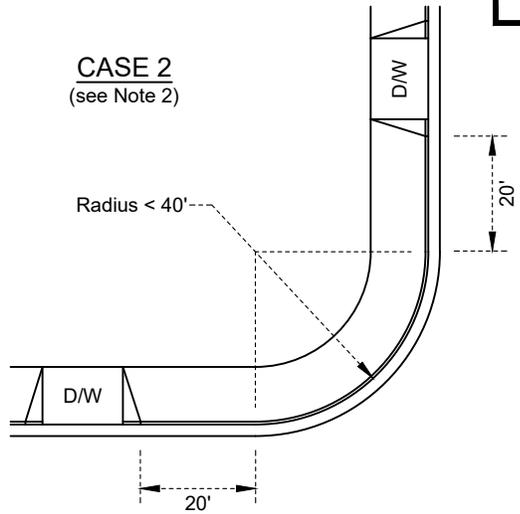
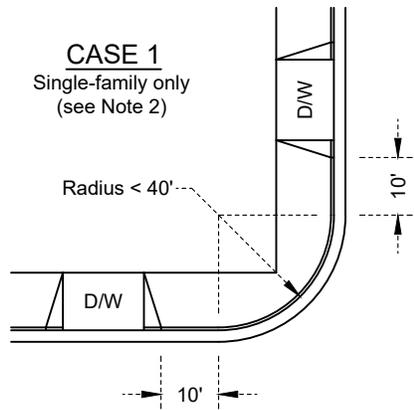
16. REMOVAL OF EXISTING ASPHALT CONCRETE

When a driveway is to be constructed adjacent to existing HMA, said HMA shall be removed to a neat vertical edge at a minimum of 12" off the new lip of gutter. The vertical edge shall receive a tack coat before placement of the new HMA per Page 611.00.

17. MODIFICATION

The above standards may be modified with written approval by the City Engineer.

				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer _____ Date	
				DRIVEWAY STANDARDS AND CRITERIA		Date: 09/2023 Dwg No.:	
REVISION	BY	APPROVED	DATE			Scale: None 147.02	



NOTES:

1. All radius distances measured to top face of curb.
2. Where radius of the curb return is less than 40', no portion of any driveway shall be permitted within the specified distance of the curb return according to the designated land use.
3. Where radius of the curb return is less than 60', no portion of any driveway shall be permitted within the curb return.
4. On all curb returns where the radius is more than 60', driveways may encroach upon each end of the return a maximum distance equal to 12.5% or 1/8 of the total length of the arc of the curb return, subject to the approval of the City Engineer.
5. On all curb returns where channelization and/or compound curves are to exist, driveways shall not be permitted within the curb returns and their location shall be subject to the approval of the City Engineer.

REVISION	BY	APPROVED	DATE

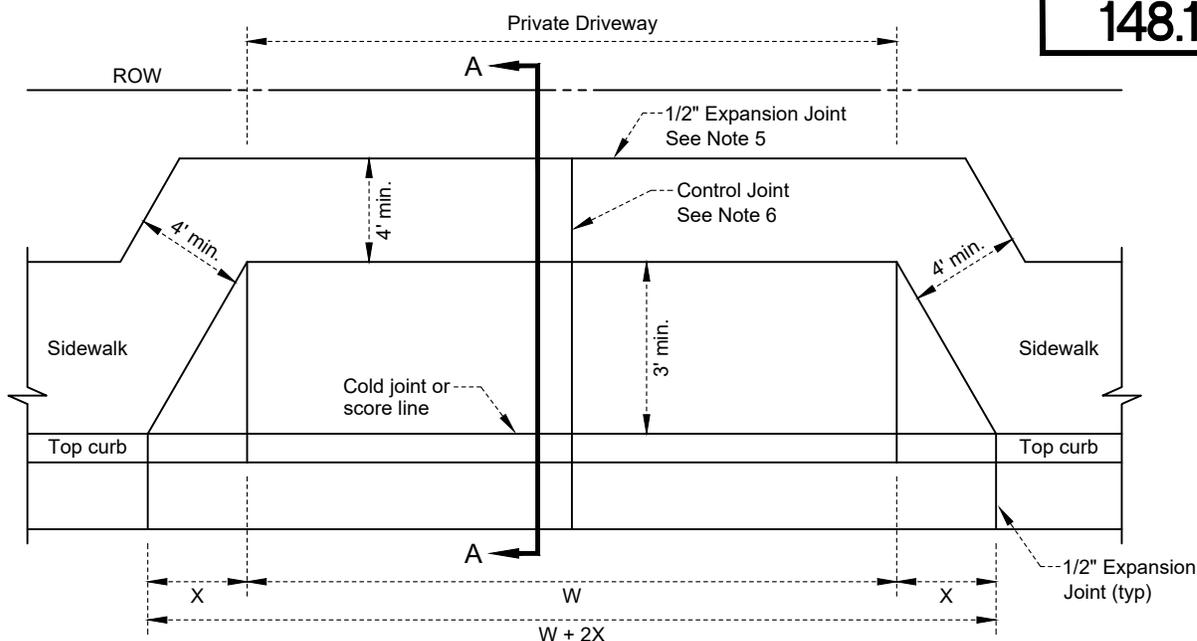
CITY OF SHASTA LAKE
Public Works Department
STANDARD DRAWING

STANDARD DRIVEWAY LOCATIONS

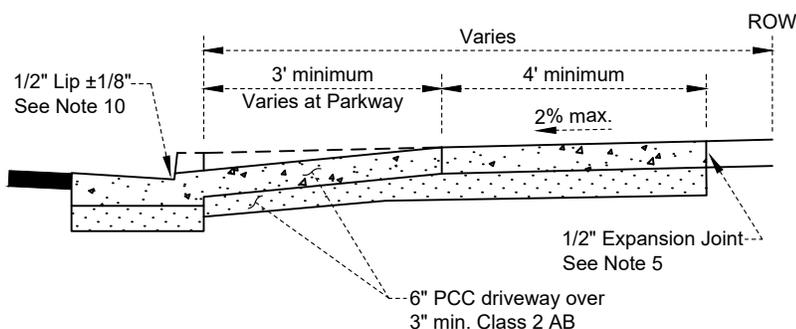
Approved:  09-30-2023
Date

City Engineer

Date: 09/2023 Dwg No.: 147.10
Scale: None



PLAN



SECTION A-A

TABLE OF DIMENSIONS			
Curb Face	X	W (min.)	W+2X' (min.)
6 1/2" or less	2' 6"	12'	17'
7" to 7 1/2"	3'	12'	18'
8" to 8 1/2"	3' 6"	12'	19'
9" to 9 1/2"	4'	12'	20'
10" to 10 1/2"	4' 6"	12'	21'
11" to 12"	5'	12'	22'

NOTES:

1. All driveway designs shall conform to Pages 147.01 and 147.02.
2. The driveway depth between the back of curb and the street edge of the sidewalk shall not be less than 3'.
3. When the sidewalk is not adjacent to the curb and the distance between the back of curb and the street edge of the sidewalk is less than 3', driveways shall be constructed with sides at right angles to the curb.
4. All materials shall conform to Page 100.00.
5. 1/2" pre-molded expansion joint material shall be held firmly in place prior to placing concrete.
6. Weakened plane joints shall be to a depth of 2" and at intervals not to exceed 12' on center.
7. 1/2" deep score lines shall be evenly spaced between weakened plane joints at 3' to 5' intervals.
8. Weakened plane joints and score lines shall correspond with those in the adjacent sidewalk unless otherwise specified.
9. The area included within the slope of the driveway shall be given a heavy broom finish perpendicular to the curb.
10. The top of the driveway lip shall be troweled straight and true.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

STANDARD RESIDENTIAL DRIVEWAY

Approved:

09-30-2023

City Engineer

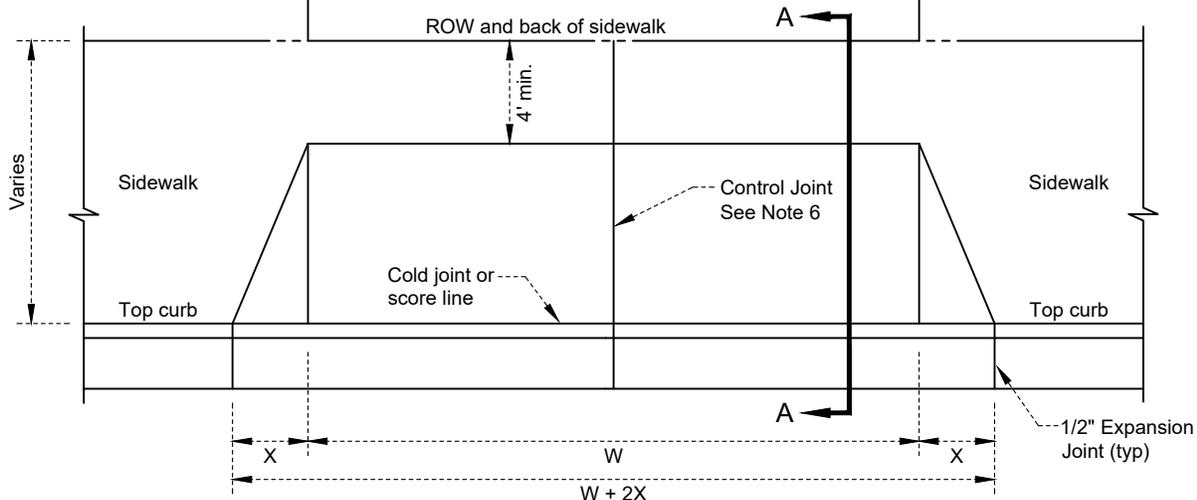
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Date: 09/2023

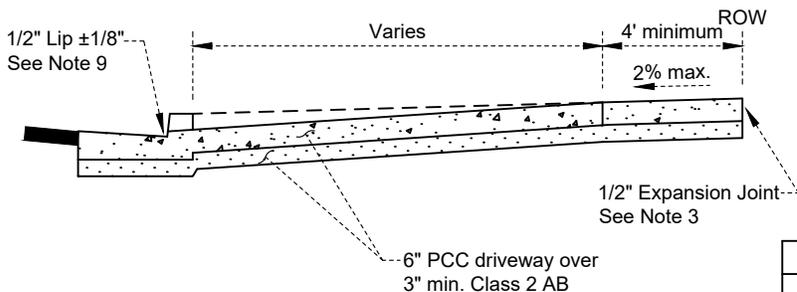
Dwg No.:

Scale: None

148.10



PLAN



SECTION A-A

TABLE OF DIMENSIONS			
Curb Face	X	W (min.)	W+2X' (min.)
6 1/2" or less	2' 6"	30'	35'
7" to 7 1/2"	3'	29'	35'
8" to 8 1/2"	3' 6"	29'	36'
9" to 9 1/2"	4'	28'	36'
10" to 10 1/2"	4' 6"	27'	36'
11" to 12"	5'	26'	36'

NOTES:

1. All driveway designs shall conform to Pages 147.01 and 147.02.
2. All materials shall conform to Page 100.00.
3. 1/2" pre-molded expansion joint material shall be held firmly in place prior to placing concrete.
4. Weakened plane joints shall be to a depth of 2" and at intervals not to exceed 12' on center.
5. 1/2" deep score lines shall be evenly spaced between weakened plane joints at 3' to 5' intervals.
6. Weakened plane joints and score lines shall correspond with those in the adjacent sidewalk unless otherwise specified.
7. The area included within the slope of the driveway shall be given a heavy broom finish perpendicular to the curb.
8. The top of the driveway lip shall be troweled straight and true.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

STANDARD COMMERCIAL AND INDUSTRIAL DRIVEWAY

Approved:

09-30-2023

City Engineer

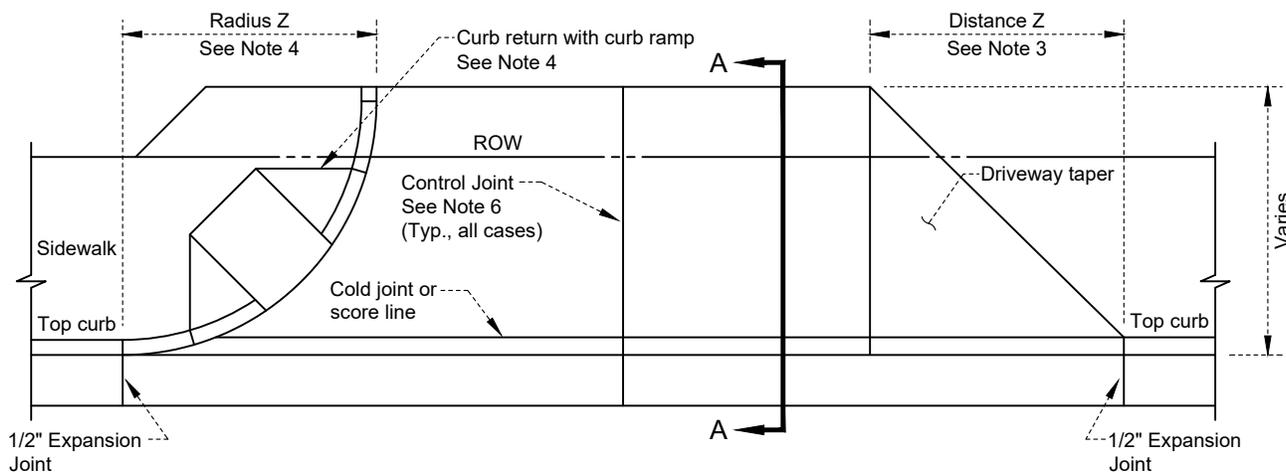
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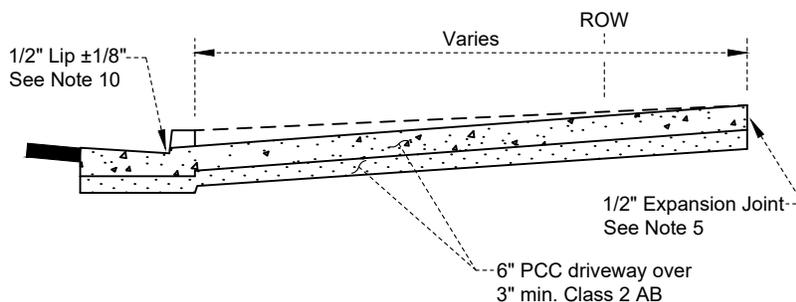
Scale: None

148.20



CASE A

CASE B



SECTION A-A

NOTES:

1. All driveway designs shall conform to Pages 147.01 and 147.02.
2. All materials shall conform to Page 100.00.
3. Distance 'Z' (extension of modified driveway) shall be of adequate size to facilitate vehicle right turns from curb thru lane. Length shall be determined by vehicle turn radius criteria and as approved by the City Engineer.
4. Curb returns may be used for modified driveways when radius 'Z' exceeds 15'. Curb ramps per Page 141.10 shall be designed into the curb returns.
5. 1/2" pre-molded expansion joint material shall be held firmly in place prior to placing concrete.
6. Weakened plane joints shall be to a depth of 2" and at intervals not to exceed 12' on center.
7. 1/2" deep score lines shall be evenly spaced between weakened plane joints at 3' to 5' intervals.
8. Weakened plane joints and score lines shall correspond with those in the adjacent sidewalk unless otherwise specified.
9. The area included within the slope of the driveway shall be given a heavy broom finish perpendicular to the curb.
10. The top of the driveway lip shall be troweled straight and true.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

MODIFIED COMMERCIAL AND INDUSTRIAL DRIVEWAY

Approved:

09-30-2023

City Engineer

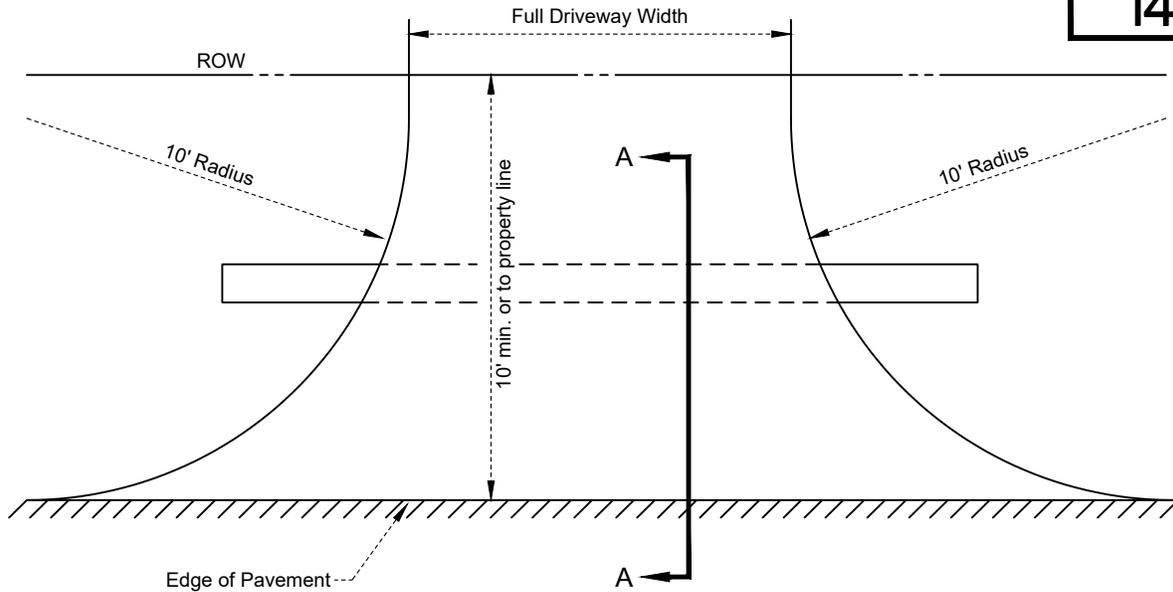
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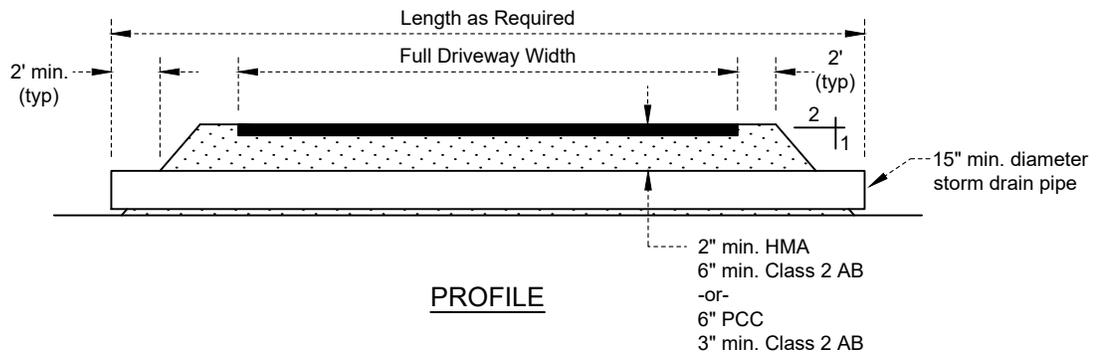
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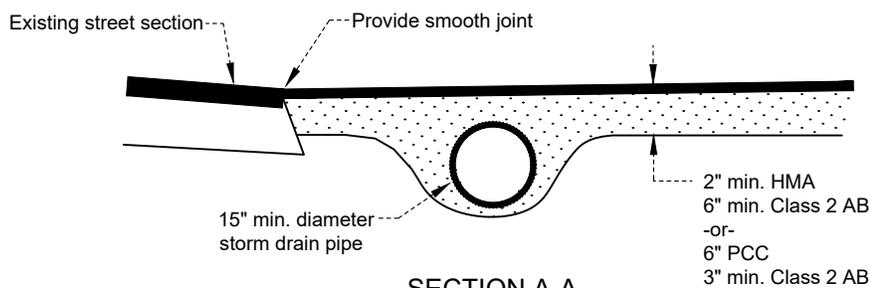
148.30



PLAN



PROFILE



SECTION A-A

NOTES:

1. All materials shall conform to Page 100.00.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

RESIDENTIAL DRIVEWAY CULVERT

Approved:

09-30-2023

City Engineer

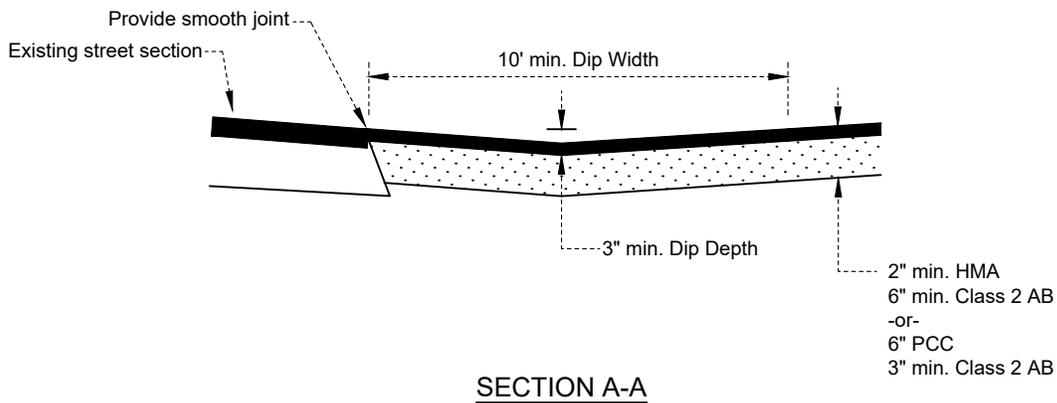
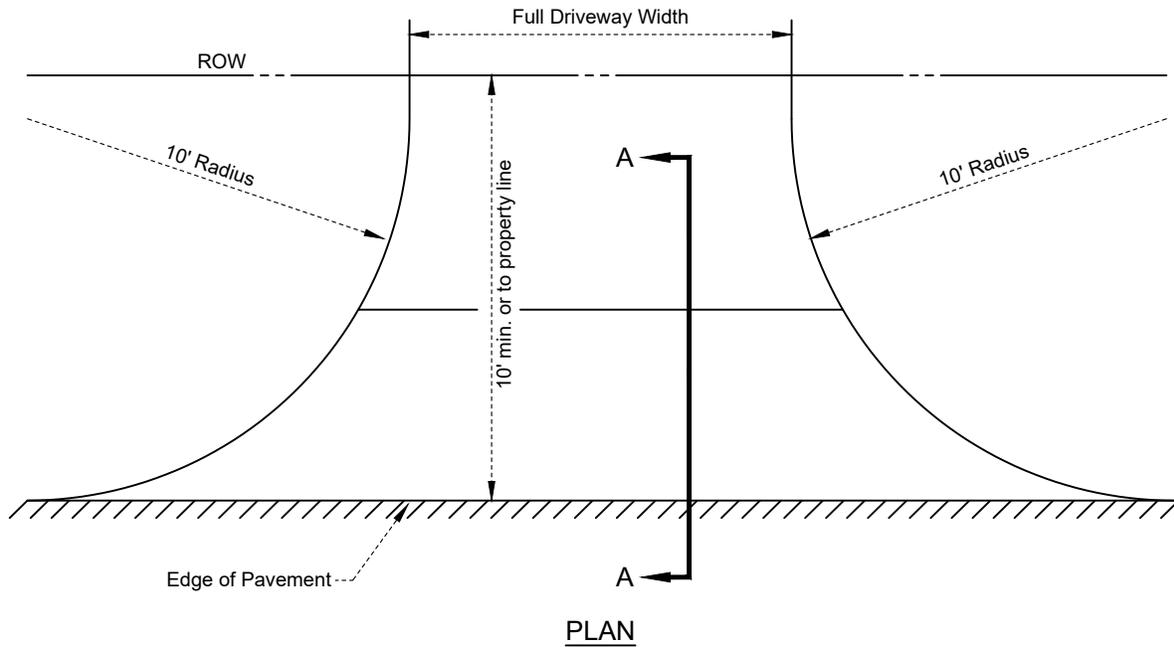
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Date: 09/2023

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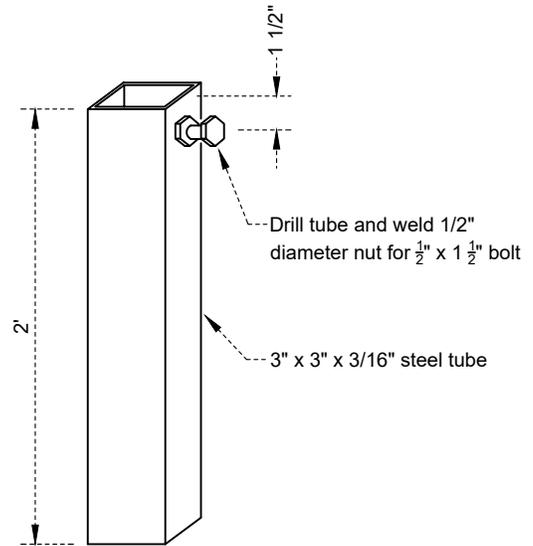
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149.10

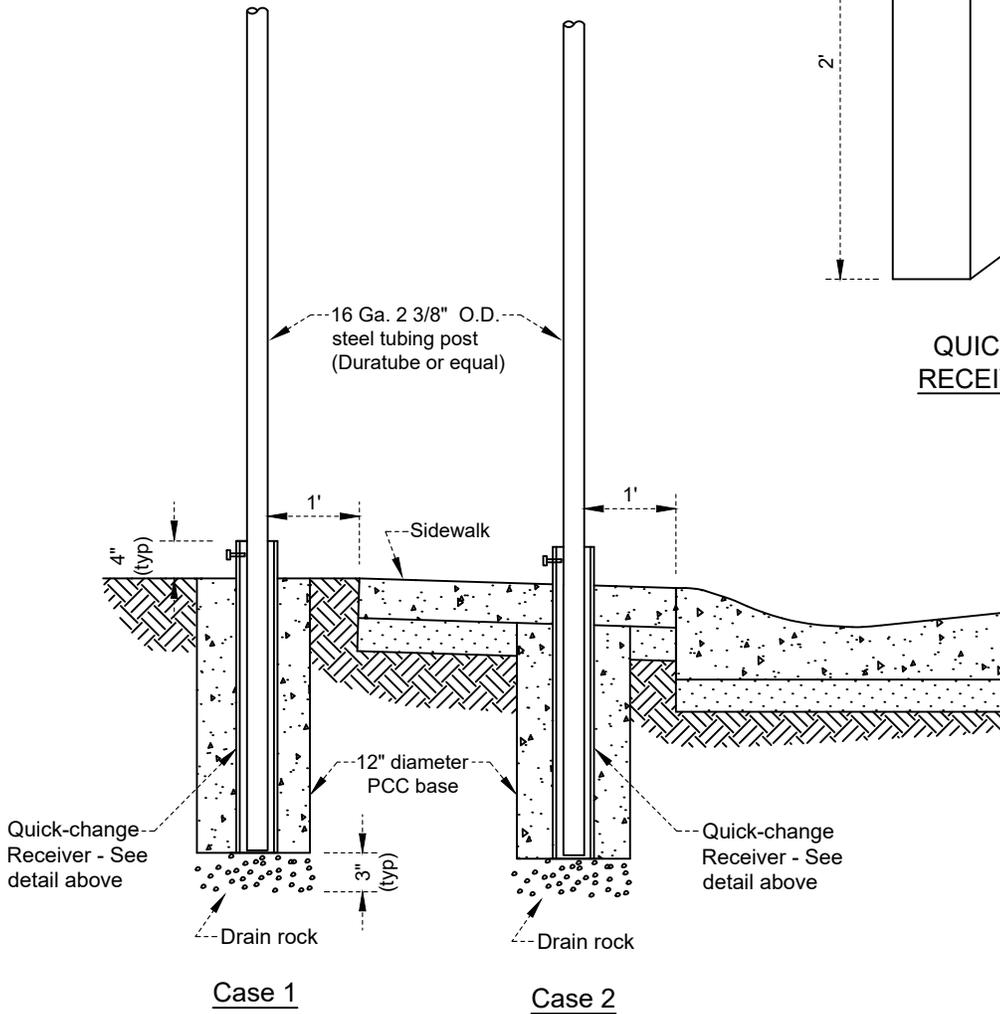


NOTES:
1. All materials shall conform to Page 100.00.

				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer _____ Date	
				RESIDENTIAL DRIVEWAY DIP		Date: 09/2023 Dwg No.:	
REVISION	BY	APPROVED	DATE			Scale: None	149.20



**QUICK-CHANGE
RECEIVER DETAIL**



**QUICK-CHANGE RECEIVER
INSTALLATION DETAIL**

NOTES:

1. Case 1 installation shall be used for installations behind sidewalks or where sidewalks do not exist. Case 2 installation shall be used for installations in sidewalks.
2. All materials shall conform to Page 100.00.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**QUICK CHANGE SIGNPOST
RECEIVER INSTALLATION**

Approved:

09-30-2023

City Engineer

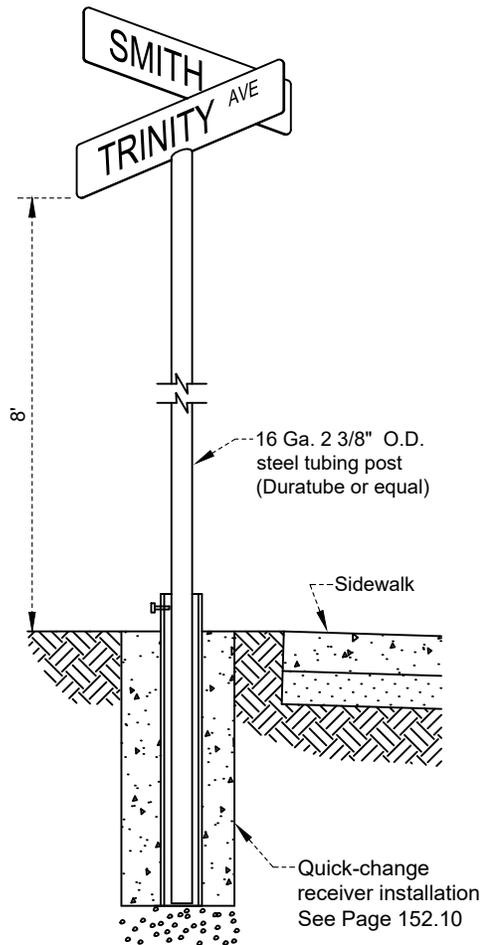
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Date: 09/2023

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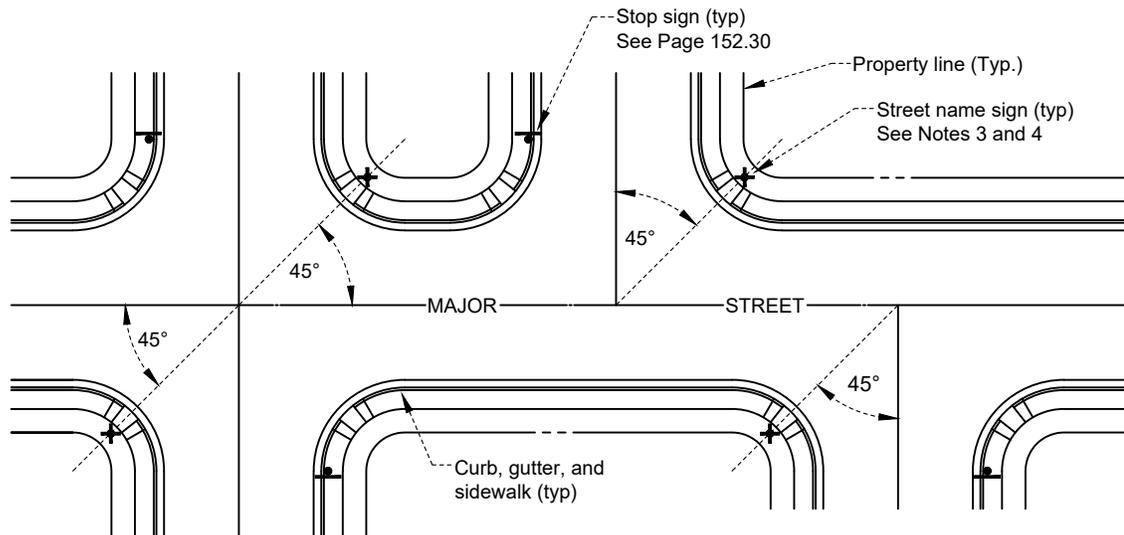
152.10



NOTES:

1. All variances in sign location shall be approved by the City Engineer.
2. Street sign to be located on the near right or far left side of intersection of the major street.
3. Street name signs in residential areas shall be installed 1' behind the back of sidewalk per Page 152.10.
4. Street name signs in commercial areas shall be installed 1' from the back of curb per Page 152.10.

**STREET NAME
SIGN ASSEMBLY**



TYPICAL SIGN LOCATION
For 30 ft curb radii at 90° intersections

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

STANDARD DRAWING

STREET NAME SIGN INSTALLATION

Approved:

09-30-2023

City Engineer

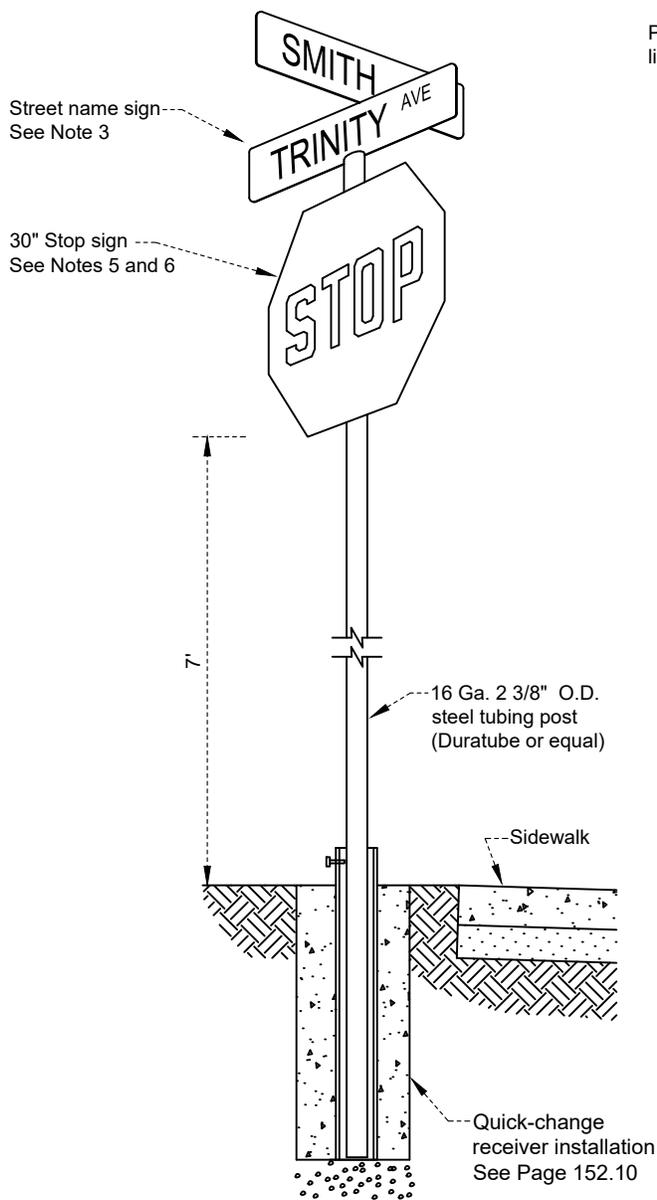
Date

Date: 09/2023

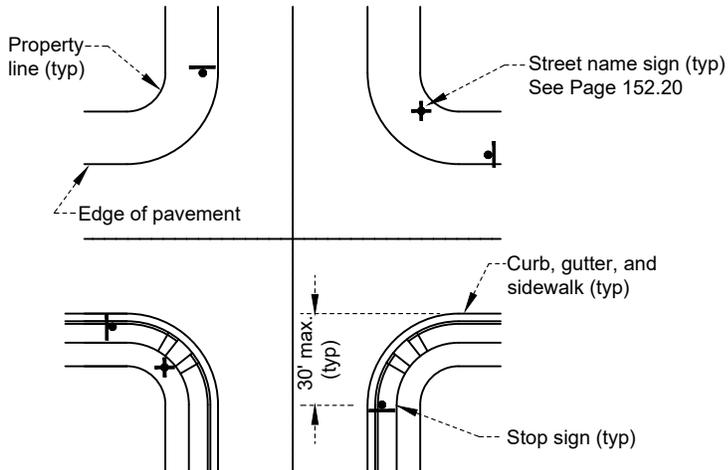
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Scale: None

152.20



STOP SIGN ASSEMBLY



TYPICAL STOP SIGN LOCATION

For 30' curb radii at 90° intersections

NOTES:

1. All variances in sign location shall be approved by the City Engineer.
2. Stop signs shall be located at the curb return. In areas where sidewalks are equal to or less than 4' wide or do not exist, the sign shall be installed either 1' behind the sidewalk or 1' of the edge of pavement. In areas where sidewalks are greater than 4' wide, the sign shall be installed 1' behind the back of curb.
3. When the City Engineer determines that the stop sign and the street name sign shall be incorporated on one standard, the installation shall maintain the 7' clearance below the stop sign.
4. For quick change receiver installation, see Page 152.10.
5. Stop sign shown for example. This detail shall apply to all regulatory and warning signs, and ground clearance of 7' to the bottom of all signs shall be maintained.
6. Retroreflective sheeting for all regulatory and warning signs shall conform to Section 82, "Signs and Markers" of the CSS.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**REGULATORY AND WARNING
SIGN INSTALLATION**

Approved:

09-30-2023

City Engineer

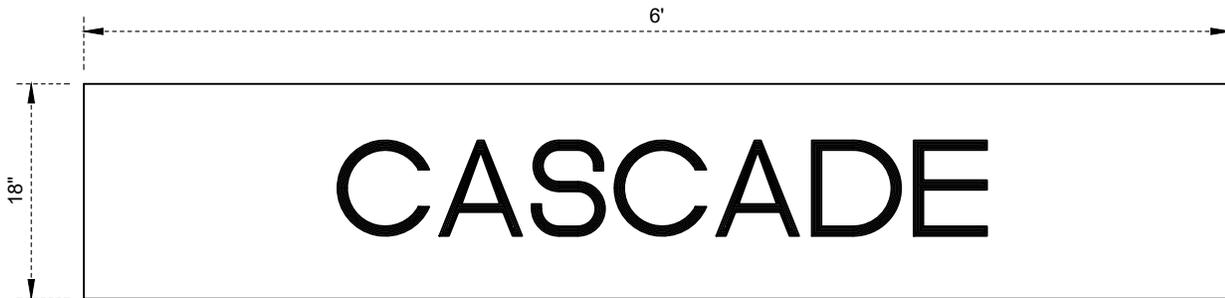
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Date: 09/2023

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152.30

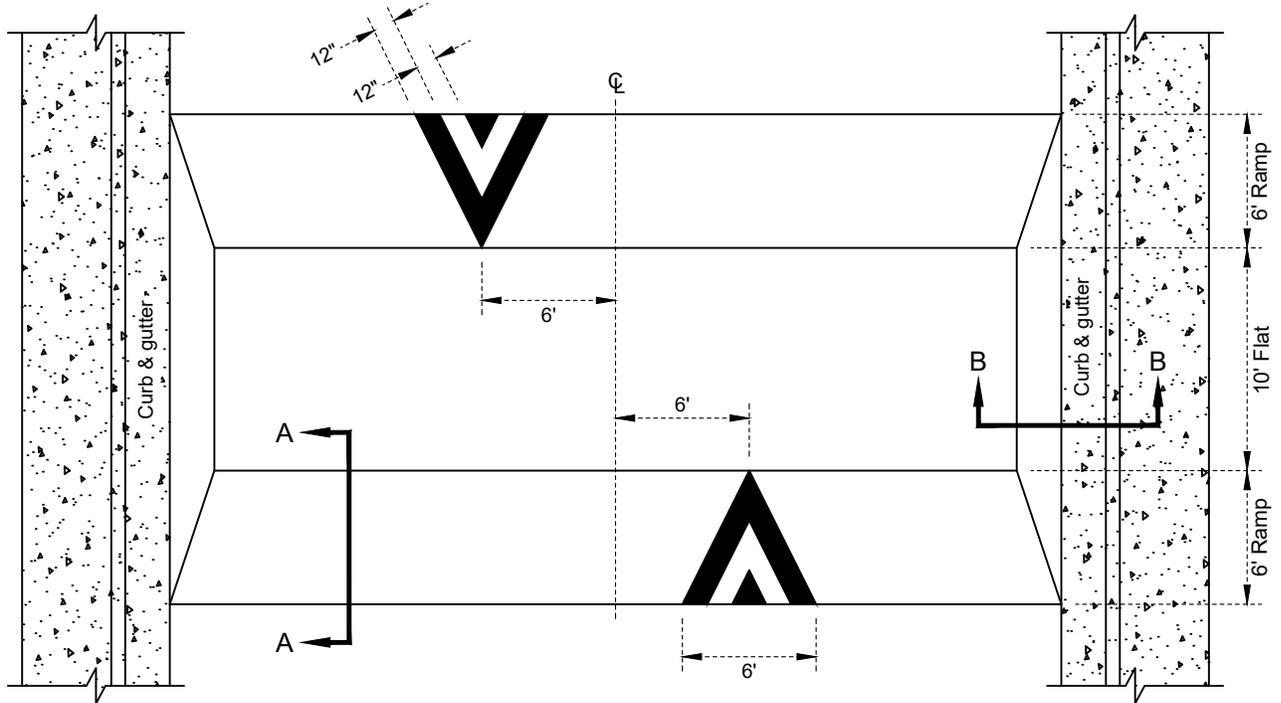


ILLUMINATED SIGN PANEL

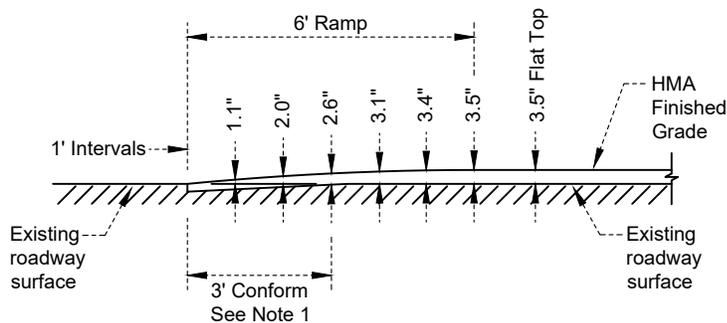
NOTES:

1. Internally illuminated street name sign configuration shall conform to CSP ES-7P Type 'A' with LED light engine.
2. Minimum vertical clearance from the bottom of the sign to the travelled way shall conform with Page 110.10.
3. Illuminated street sign lettering height shall be 8".

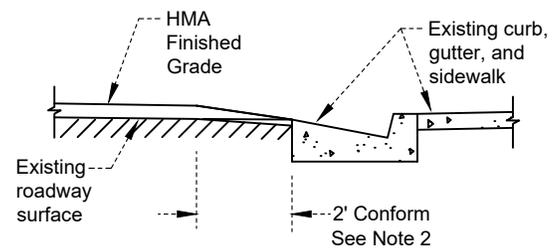
				CITY OF SHASTA LAKE Public Works Department	Approved:  Date: 09-30-2023
				INTERNALLY ILLUMINATED STREET NAME SIGN DETAIL	City Engineer _____ Date _____
REVISION	BY	APPROVED	DATE		Date: 09/2023 Dwg No.: Scale: None 154.20



PLAN VIEW



SECTION A-A



SECTION B-B

NOTES:

1. 3' wide x 1.5" min. depth cold plane conform (typ).
2. 2' wide x 1.5" min. depth cold plane conform (typ).
3. All speed table markings shall be 120 mil. (min.) thick white thermoplastic.
4. Layout reference marks shall be approved by the City Engineer prior to placement of striping or marking.
5. W17-1 ("SPEED HUMP") and W13-1P ("20 MPH") signage shall be installed approximately 75' ahead of the speed table installation in both directions in conformance with Page 152.30. Final signage location shall be approved by the City Engineer.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SPEED TABLE

Approved:

09-30-2023

City Engineer

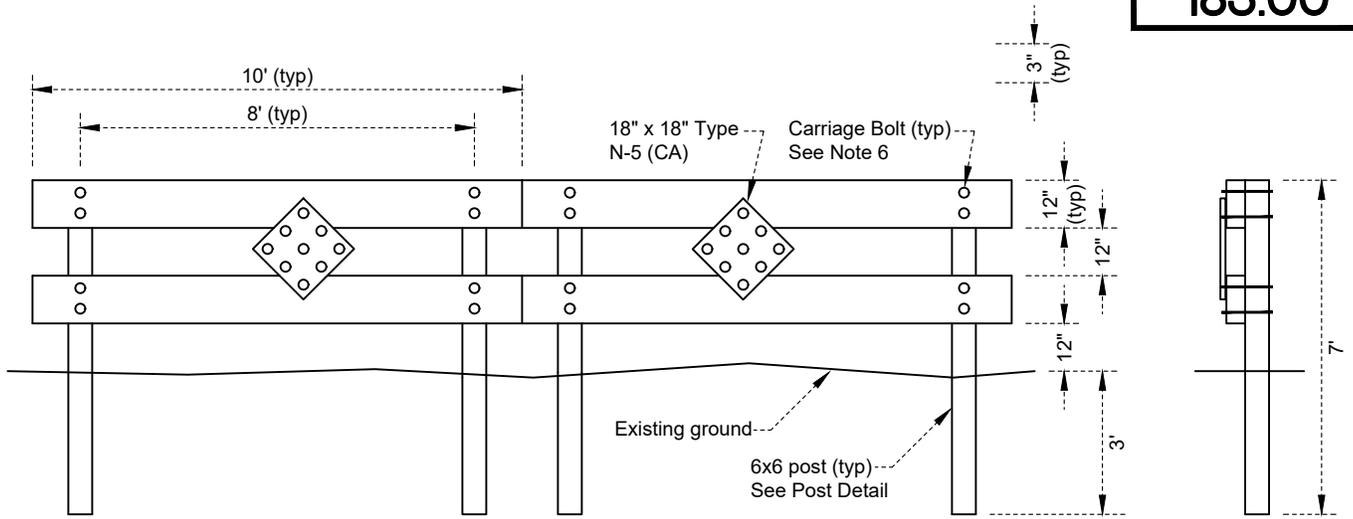
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Date: 09/2023

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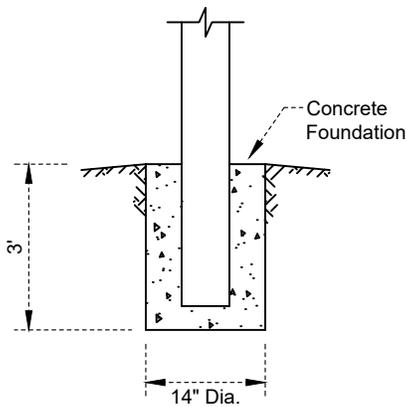
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180.00

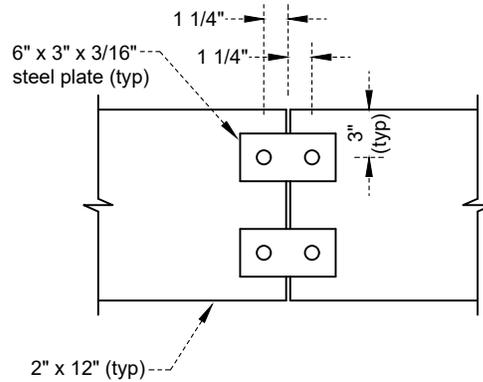


FRONT VIEW

SIDE VIEW



POST DETAIL



BUTT JOINT DETAIL

See Note 4

NOTES:

1. Concrete shall conform to Page 100.00.
2. Barricades shall be erected at street terminus as directed by the City Engineer.
3. All exposed surfaces shall be painted with two coats of white exterior grade paint.
4. Barricade installation shown is to be used for streets having curb to curb widths up to 40 feet. On wider streets, barricades shall be duplicated in multiples of 10' as directed by the City Engineer. All abutting barricade crossmembers shall be attached via butt joints as shown.
5. Signage shall be Type N-5 (CA) warning signs with safety reflectors.
6. All bolts shall be 2 1/2" galvanized carriage bolts with washers (each side) and nuts. Bolts shall be run completely down, and exposed threads shall be deformed to prevent removal.
7. Posts shall be 6" x 6" pressure treated lumber.
8. Barricades shall be 2" x 12" x 10' No. 2 or better Douglas Fir.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

TIMBER BARRICADE

Approved:

09-30-2023

City Engineer

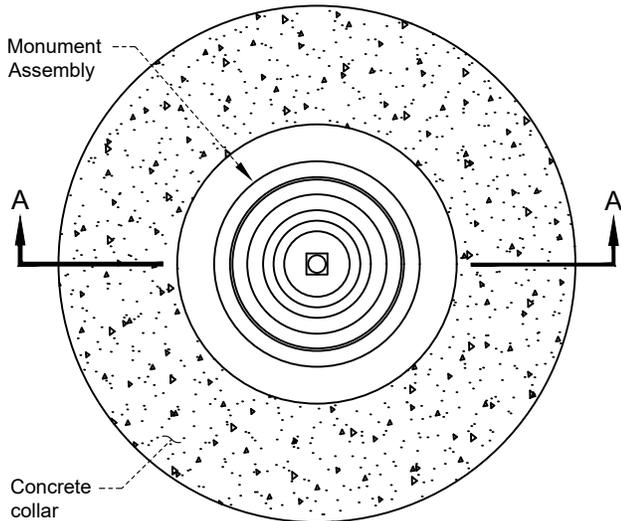
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Date: 09/2023

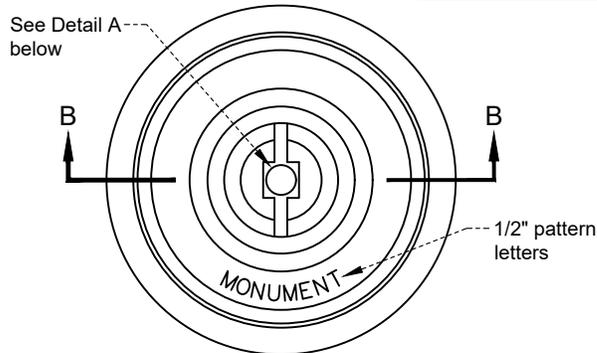
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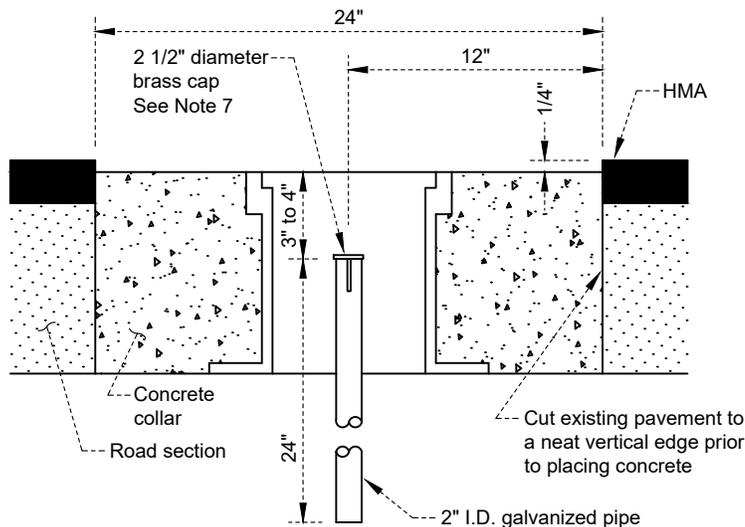
183.00



MONUMENT INSTALLATION

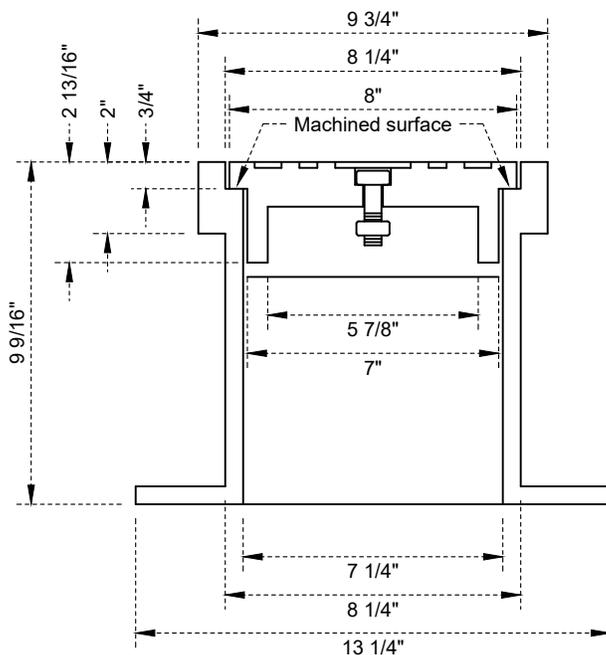


COVER DETAIL



SECTION A-A

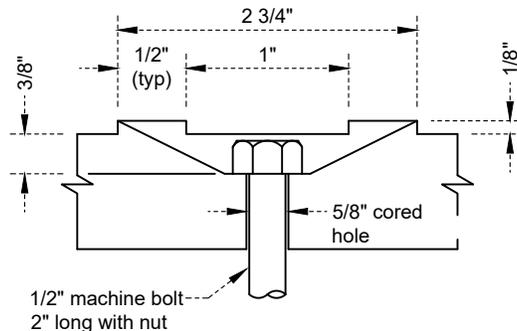
(Monument cover not shown)



SECTION B-B

NOTES:

1. Monument cover assembly shall be South Bay Foundry Model No. 1578 and 1579 or approved equal.
2. Bearing surface between frame and cover shall be machined to prevent rocking.
3. Casting shall be hot dip bituminous coated gray iron.
4. 2 1/2" diameter brass cap to be placed after pipe has been driven to finished elevation.
5. Top of brass cap shall not be placed less than 3" in depth from finished street grade.
6. All materials shall conform to Page 100.00.
7. Brass cap shall be punched and stamped with 'LS' or 'RE' number and shall be embedded in mortar placed in 2" I.D. galvanized pipe.



DETAIL 'A'

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SURVEY MONUMENT BOX ASSEMBLY

Approved:

09-30-2023

City Engineer

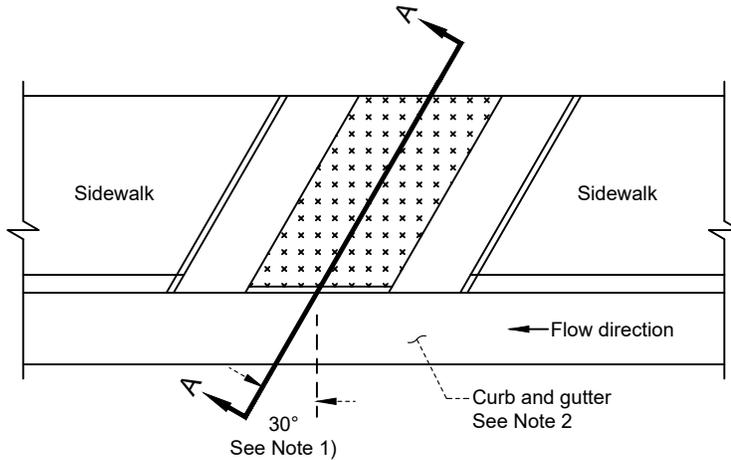
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Date: 09/2023

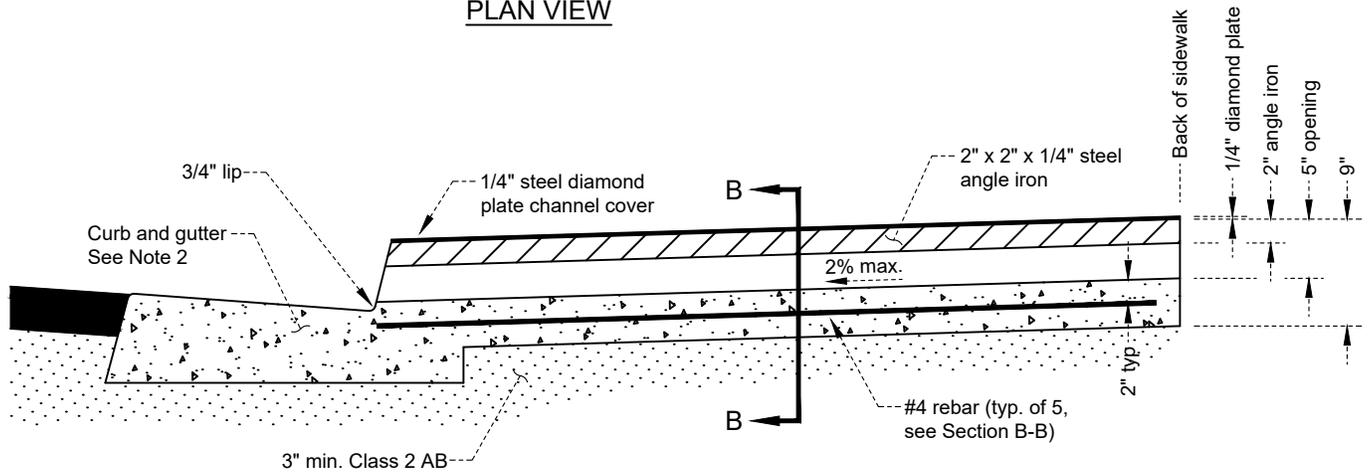
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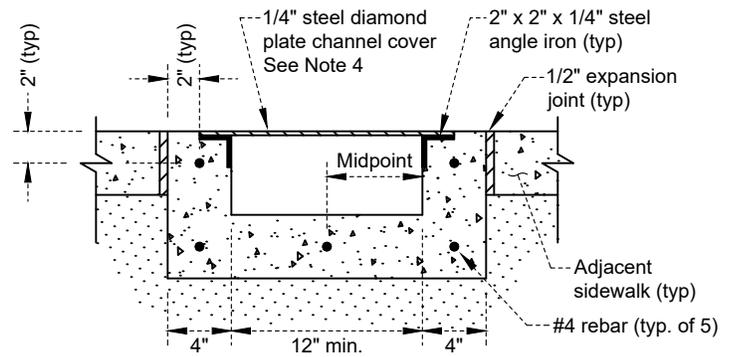
184.00



PLAN VIEW



SECTION A-A



SECTION B-B

NOTES:

1. Under sidewalk drain shall be constructed angled in the downstream direction, 30° off perpendicular to the face of curb, to insure proper flow.
2. Under sidewalk drain shall only be used on 6" or greater height vertical curbs.
3. If existing curb is rolled, transition to vertical curb shall be constructed on each side of sidewalk drain.
4. 1/4" steel diamond plate cover shall be secured to drilled and threaded angle iron with 3/8" dia. x 1/2" countersunk machine screws, 3 per side equally spaced.
5. Sidewalk drain width shall be 12" minimum / 18" maximum, sized as needed for anticipated flow. When required width exceeds 18", storm drain inlets shall be used.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

STANDARD DRAWING

UNDER SIDEWALK DRAIN

Approved:

09-30-2023

City Engineer

Date

Date: 09/2023

Dwg No.:

Scale: None

190.00

1. Pipeline Materials:

15" - 60":
Corrugated high density polyethylene pipe (HDPE) with an integrally formed smooth interior (per AASHTO M-294)
Reinforced concrete pipe (RCP), Class II minimum (per ASTM C76)
Cast-in-place concrete pipe (CIPCP)

Drainage Inlets (as applicable):
Caltrans Type 'GO' per CSP D73E
Caltrans Type 'G1' per CSP D73B
Caltrans Type 'GOL-7' per CSP D73A

Drainage Inlet Grate and Frame:
Caltrans 24-12X Grate per CSP D77B
Rectangular Frame per CSP D77A

Manhole Frame and Lid: D&L Foundry Model A-1024 (Standard and Bolt-Down)

2. Pipe shall be installed in conformance with the manufacturer's recommendations and COSLCS 610.00.
3. Pipeline backfill shall conform to Page 610.10. Structure backfill shall conform to Page 610.20.
4. HDPE storm drain pipe joints shall have either a soil-tight compression joint gasket or a corrugated coupler to match the pipe corrugations. Concrete pipe shall have all joints mortared.
5. Soft, wet, or spongy (unsuitable) material encountered in the trench at pipe subgrade shall be removed and replaced as directed by the City Engineer.
6. All pipe shall be carefully lowered into the trench to prevent damage. Under no circumstances shall pipe be dropped, rolled, or dumped into trenches.
7. Pipe ends shall be thoroughly cleaned before the pipe is joined. Whenever work ceases for any reason, the end of the pipe shall be covered. The interior of the pipe shall be kept free from dirt and debris as the work progresses. All pipe field cuts shall be made in accordance with the manufacturer's recommendations. Field cut pipe ends shall be made at right angles to the axis of the pipe except where pipes terminate in manholes.
8. All joints shall be made in accordance with the manufacturer's recommendations. Pipe lubricant shall be applied to all pipe gaskets prior to joint assembly. Lubricant shall be of a type specifically for the type of pipe being joined as required to make all joint connections.
9. Trace wire and warning tape shall be installed on all storm drain pipelines and shall conform to Page 608.00. Trace wire branches shall terminate inside manholes and drainage inlets.

				CITY OF SHASTA LAKE Public Works Department STANDARD DRAWING	Approved:  09-30-2023 City Engineer Date
REVISION	BY	APPROVED	DATE		Date: 09/2023 Dwg No.: Scale: None 200.01

General Design Criteria

Storm drainage design work shall include and/or address the following items:

1. All regulatory agency permits shall be obtained and/or consultation with regulatory agencies shall occur, as required, prior to submitting plans or drainage studies for approval.
2. Hydrology for drainage basins smaller than 10 acres may be calculated using either the Rational Method or the USDA Soil Conservation Service (SCS) Method. Hydrology for drainage basins larger than 10 acres shall be calculated using the USDA SCS Method. The following data sources shall be used:
 - A. Soil types shall be determined by using the UC Davis / NRCS Soilweb: <https://casoilresource.lawr.ucdavis.edu/gmap/>
 - B. Rainfall intensity data shall be obtained from the National Oceanic and Atmospheric Administration (NOAA) Precipitation Frequency Data Server: <https://hdsc.nws.noaa.gov/hdsc/pfds/>
3. The storm recurrence intervals used for all hydrology design work shall be the 10-, 25-, and 100-year events. Post-development peak flows shall not exceed existing pre-development peak flows for the 10-, 25-, and 100-year storm events at any point of discharge. If multiple floodplains are impacted by the project, this requirement applies to each floodplain, not the project as a whole.
4. Storm drainage systems shall be designed to handle the 10-year events without static head. During 25- and 100-year events, the storm drainage system may operate with static head; however, no damage due to ponding shall occur.
5. Each drainage basin shall be identified and correlated to calculations for that basin. Topographic mapping shall include contour intervals (maximum interval 5 feet) that are adequate to define the boundaries and slopes of each drainage basin. Run-on flow from basins located upstream of the project shall be included in all analysis work as appropriate.
6. Partial undetained release to a drainage feature is allowable, as long as the total release to the drainage feature does not exceed pre-development peak flow to that feature for all recurrence intervals. The acceptability of basin combinations shall require the approval of the City Engineer.
7. A total minimum clear width of 12' for collector streets, local streets, and cul-de-sacs and 24' for arterial streets and expressways shall be maintained for all storm recurrence intervals.
8. Individual lots shall be graded as best as possible towards the nearest street.
9. Placement of fills of any magnitude across an existing drainage course shall incorporate a means by which any 100-year events not handled by the drainage system can flow overland via essentially the same course as prior to placing the fill across the drainage course. Analysis of overland release routes shall demonstrate that adjacent structure floor elevations have at least 1' of elevation clearance above the expected adjacent 100-year water surface.
10. All storm drainage facilities located in non-roadway frontage locations shall have designated and improved maintenance access routes conforming to the following requirements:
 - A. All access routes shall be located in designated easements. The minimum storm drainage easement width shall be 15'.
 - B. Access routes shall be designed to the following:
 1. Width: 12' minimum
 2. Inside turning radius: 30' minimum
 3. Slope in the direction of travel: 8% maximum if unpaved, 12% maximum if paved
 4. Cross slope: 4% maximum
 5. Termination: Turning bulb with a minimum radius of 20' or a 60' hammerhead with a minimum width of 10'
 6. Loading: Access roads shall have a structural section sufficient to support heavy equipment

				CITY OF SHASTA LAKE		Approved:  09-30-2023	
				Public Works Department			
				STANDARD DRAWING		City Engineer _____ Date _____	
				STORM DRAIN		Date: 09/2023 Dwg No.:	
				GENERAL DESIGN CRITERIA		Scale: None 200.02	
REVISION	BY	APPROVED	DATE				

General Design Criteria (continued)

10. C. All access routes shall have an improved, gated entrance per COSLCS Page 630.00 with the following modifications:
 1. Type: Green belt (no public access)
 2. Width: 12' minimum between corner posts
 3. Signage: "EMERGENCY/MAINTENANCE ACCESS ONLY"

11. Detention shall be accomplished with purpose-built structures (earthen basins, engineered chamber systems, etc.). Using storm drain pipes that are a part of a storm drain system for detention is not allowed under any circumstances.

				CITY OF SHASTA LAKE Public Works Department	Approved: 	09-30-2023
					STANDARD DRAWING	City Engineer
				STORM DRAIN GENERAL DESIGN CRITERIA	Date: 09/2023	Dwg No.:
					Scale: None	200.03
REVISION	BY	APPROVED	DATE			

Pipeline Design Criteria

1. The minimum size of proposed culverts and pipelines shall be 15".
2. Storm drain pipelines shall be placed within the travelled way and not under sidewalks.
3. Storm drain pipelines shall be designed with a Manning's coefficient of:
 - A. Concrete pipe: $n=0.013-0.015$
 - B. Corrugated HDPE pipe with integrally formed smooth interior: $n=0.012$
4. Storm drain mains may be deflected at the factory pipe joint per the manufacturer's recommendations to 'curve' the pipe.
5. The minimum depth of cover over storm drain pipelines shall be 2' below street finished grade. The maximum depth of cover over storm drain pipelines shall be 15' below street finished grade.
6. Manhole spacing shall be 500 to 1,000 feet, or as approved by the City Engineer.
7. Storm drain pipeline outlets shall have treatments installed such that exit velocities shall be non-eroding. End treatments shall be as approved by the City Engineer.

Inlet Design Criteria

1. Inlets shall be spaced such that the 10-year storm event flows will be completely captured with no bypass. A portion of the 25-year and 100-year storm event flows may bypass to the next inlet. The designer shall demonstrate that the required clear area on streets is maintained during the 25-year and 100-year storm events at all times and in all locations with no damage due to ponding.
2. If an inlet submerges during the 25-year or 100-year event, the designer shall demonstrate that the curb height is not exceeded.
3. All newly constructed or modified storm drain inlets shall be labeled per COSLCS Page 202.00.

Detention Basin Design Criteria

1. Detention basins shall be designed to detain the 100-year storm event. A minimum 1' of freeboard shall be maintained at all times during the 100-year events.
2. The following elevations shall be shown and/or noted: Top, overflow outlet (manhole or area drain w/ trash grate), 100-year event maximum, bottom.
3. Orifice plates shall be sized to properly detain and release the 10-, 25-, and 100-year storm events.
4. Elevation, storage volume, and flow discharge calculations shall be submitted.
5. Detention basins shall be fenced, and shall have an access road to the detention pond overflow and outlet that shall meet the requirements for storm drain maintenance access routes.
6. Detention basin slopes shall be flat enough to allow vehicular access into the basin for maintenance equipment.
7. Detention basin pipeline outlets shall have treatments installed such that exit velocities shall be non-eroding. End treatments shall be as approved by the City Engineer.

				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer _____ Date _____	
				STORM DRAIN PIPELINE, INLET, AND DETENTION BASIN DESIGN CRITERIA		Date: 09/2023 Dwg No.: _____	
REVISION	BY	APPROVED	DATE			Scale: None 200.04	

PIPELINE ACCEPTANCE TESTING

The Contractor shall furnish all labor, equipment, and materials needed to complete the following items:

1. Video Inspection: Prior to acceptance of pipelines by the City Engineer, the Contractor shall provide to the City video inspection of the new storm drain.

All video inspection work shall be performed by a competent video service provider and shall be recorded in digital format. The video inspection shall be performed in color, shall pan in all directions so that all joints can be thoroughly examined, and shall be of sufficient resolution to allow the City Engineer to clearly see all pipe joints.

The video inspection files will be reviewed by the City Engineer. If any irregularities are observed on the tapes (open or offset joints, grade problems, etc.), the City Engineer MAY elect to have the main in question re-inspected using City forces and equipment. If, in the opinion of the City Engineer, any of the following tolerances are found to be exceeded in any section of sewer main, that section shall be deemed to have failed the video inspection acceptance test.

- a. Joint Offset: $\geq 0.25"$ in any direction
- b. Design Grade: +/- 20% of the Design Grade

When failure is observed, the Contractor shall be responsible for repairing or replacing the failed section of pipe at his own expense, including removal and replacement of all affected improvements and any and all other costs incurred in order to repair the pipe, as well as for all costs incurred by the City for the re-inspection of the storm drain.

The City may also perform a video inspection at any time during the guaranty period. Where any of the above tolerances are found to be exceeded in any section of storm drain, that section shall be deemed to have failed the video inspection acceptance test, and the Contractor shall be responsible for repairing or replacing the failed section of pipe at his own expense, including removal and replacement of all affected improvements and any and all other costs incurred in order to repair the pipe, as well as for all costs incurred by the City for the re-inspection of the storm drain.

2. Barrel deflection testing: The Contractor shall conduct barrel deflection testing for all plastic pipelines to ensure that vertical deflections do not exceed the allowable deflection. Deflection testing shall be completed at least 30 days after pipeline installation, and deflection shall not exceed 5%. The mandrel used for deflection testing shall meet the following requirements:

- a. Fabricated from steel and fitted with pulling rings at each end.
- b. Be rigid and nonadjustable with an odd number of legs (9 legs minimum).
- c. Have an effective length not less than its nominal diameter.
- d. Be stamped or engraved with the pipe material specification, nominal size, and outside diameter

If the mandrel is not able to travel unobstructed through the pipe and stops at any point, that section of pipeline will have failed the acceptance test. When failure is observed, the Contractor shall be responsible for repairing or replacing the failed section of pipe at his own expense, including removal and replacement of all affected improvements and any and all other costs incurred in order to repair the pipe. The use of a re-rounder will not be permitted at any time.

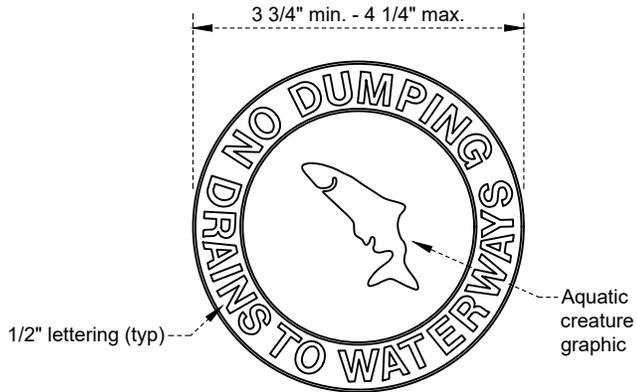
				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
				STORM DRAIN PIPELINE ACCEPTANCE TESTING	City Engineer _____ Date _____
					Date: 09/2023 Dwg No.: Scale: None 200.05
REVISION	BY	APPROVED	DATE		

MANHOLE ACCEPTANCE TESTING

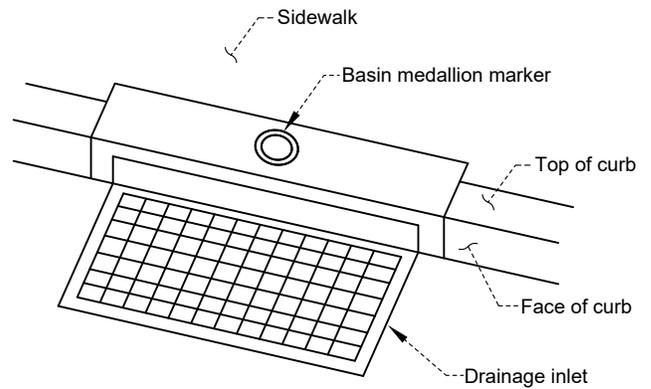
The Contractor shall furnish all labor, equipment, and materials needed to complete the following items:

1. Each manhole shall be vacuum tested in the presence of the City Engineer for acceptance after all backfilling and compaction is completed. The Contractor may pretest manholes immediately after assembly and prior to backfilling; pretesting is for the Contractor's convenience and need not be completed in the presence of City personnel.
2. All testing equipment and labor shall be provided by the Contractor.
3. All pipes entering the manhole shall be plugged, taking care to securely brace the plugs from being drawn into the manhole during the test.
4. The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturer's recommendation.
5. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to nine inches. The manhole shall pass if the time is greater than 60 seconds for 48" diameter manholes, 75 seconds for 60" diameter manholes, and 90 seconds for 72" diameter manholes.
6. If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout or epoxy. Retesting shall proceed until a satisfactory test is obtained. No grout shall be placed in the horizontal joints before testing.

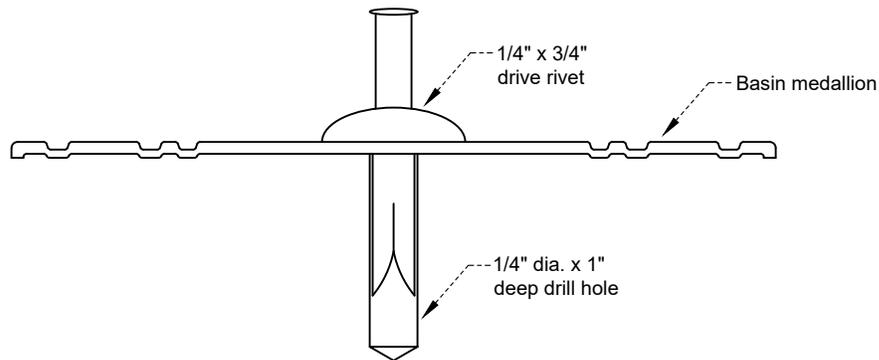
				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
				STORM DRAIN MANHOLE ACCEPTANCE TESTING	City Engineer _____ Date
					Date: 09/2023 Dwg No.: Scale: None 200.06
REVISION	BY	APPROVED	DATE		



BASIN MEDALLION DETAIL



BASIN MEDALLION
INSTALLATION - PLAN



BASIN MEDALLION
INSTALLATION - SECTION

NOTES:

1. Basin markers shall be installed on all inlet structures, private or public.
2. Basin markers may be obtained from the City of Shasta Lake Public Works Department.
3. Markers shall be installed with the center being 4 inches from face of curb and, where applicable, shall be installed facing the roadway.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

STORM DRAIN BASIN MEDALLION

Approved:

09-30-2023

City Engineer

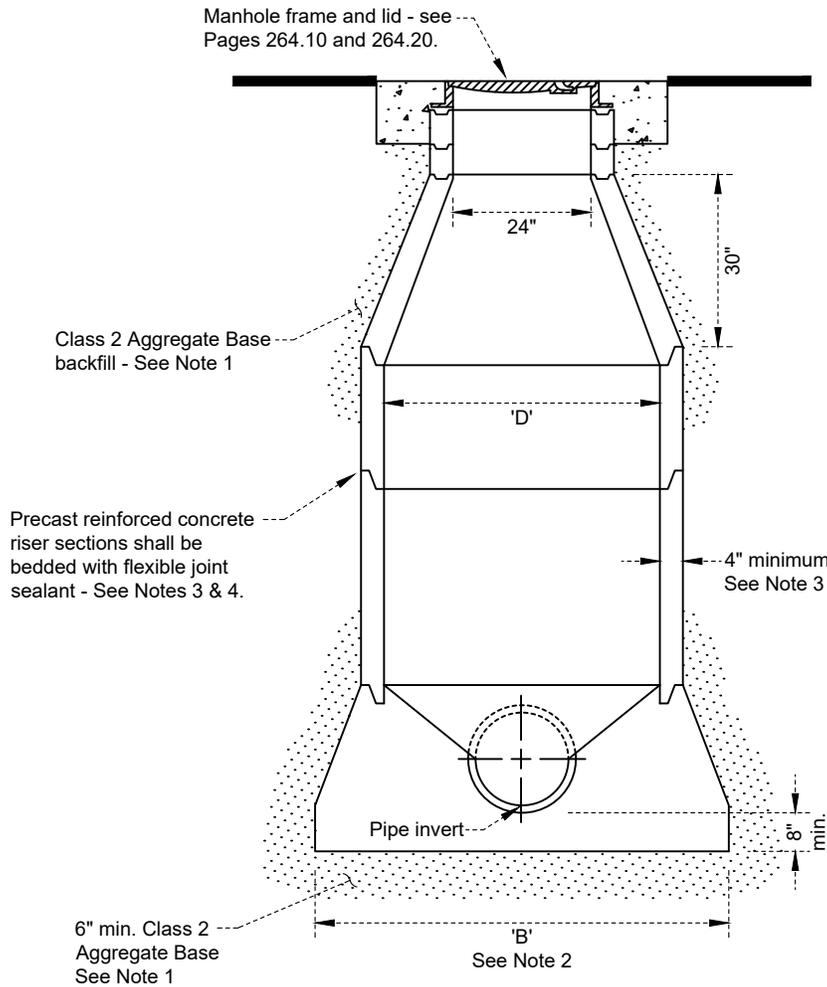
Date

Date: 09/2023

Dwg No.:

Scale: None

202.00



Outlet Diameter	'D'	'B'
15" - 24"	4'	6'
27" - 42"	5'	7'
48" & Larger	6'	8'

NOTES:

1. Structure backfill shall conform to Page 610.20.
2. Precast concrete bases manufactured by Cook Concrete Products, Teichert Aggregate, or approved equal may be used in lieu of poured in-place bases. See Page 363.00 for base details.
3. Precast reinforced concrete manhole segments shall conform to ASTM C478-70 (4" min. wall thickness). All sections shall have tongue and groove joints.
4. All manhole segments shall be bedded in double beads of flexible joint sealant (Kent Seal or approved equal).
5. Where manholes are not located in streets or the traveled way, the top of the manhole shall be set 12" to 24" above existing ground per Page 365.00 unless otherwise approved by the City Engineer.
6. The minimum drop across manholes shall be the difference in diameters of the upstream and downstream pipes or 0.2', which ever is greater.
7. Trace wire shall be installed in conformance with Pages 608.00 and 612.20.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

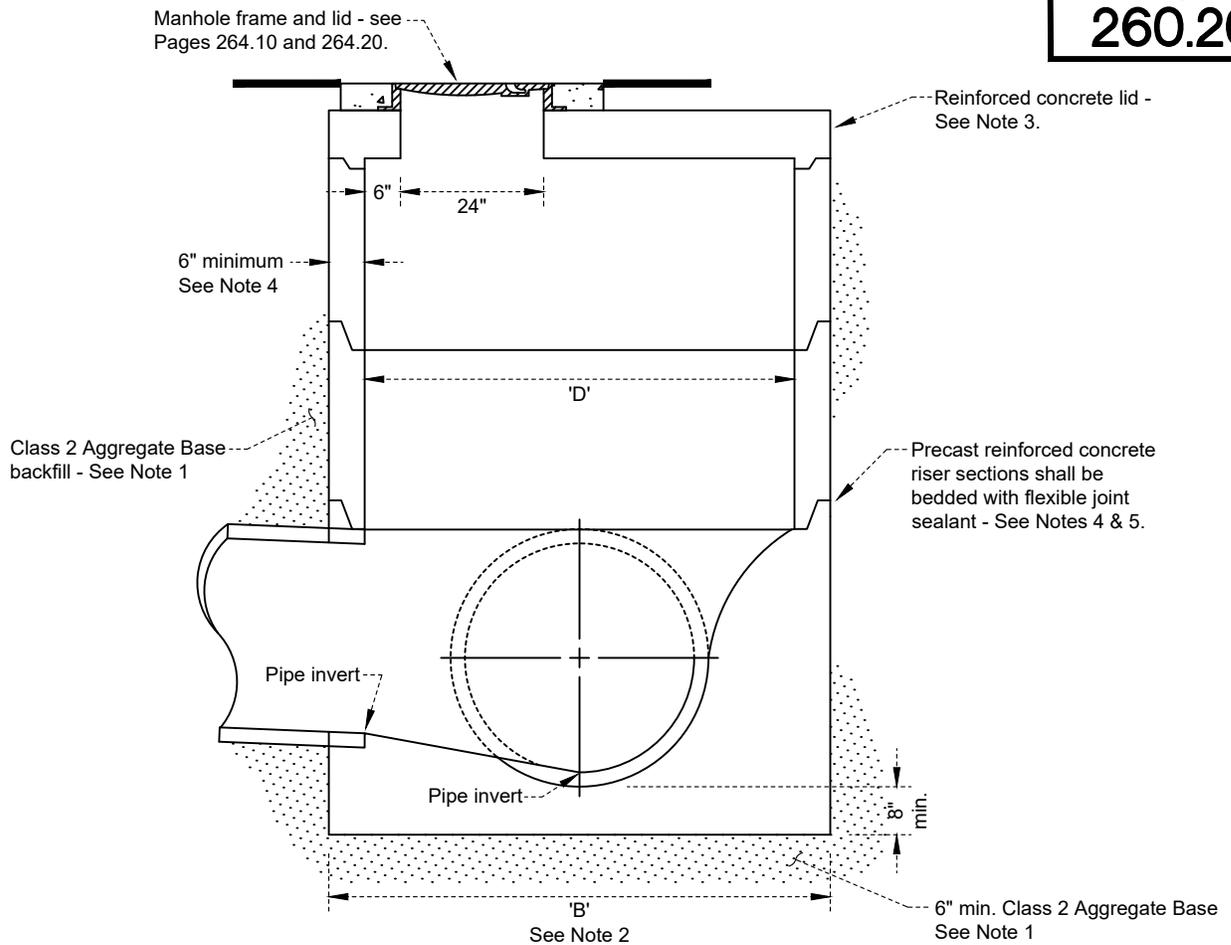
STANDARD DRAWING

TYPE 1
STORM DRAIN MANHOLE

Approved:  09-30-2023
Date

City Engineer _____ Date

Date: 09/2023 Dwg No.: 260.10
Scale: None



Outlet Diameter	'D'	'B'
15" - 24"	4'	6'
27" - 42"	5'	7'
48" & Larger	6'	8'

NOTES:

1. Structure backfill shall conform to Page 610.20.
2. Precast concrete bases manufactured by Cook Concrete Products, Teichert Aggregate, or approved equal may be used in lieu of poured in-place bases. See Page 363.00 for base details.
3. Flat reinforced concrete lid shall meet AASHTO HS20-44 requirements. Lid design shall be approved by the City Engineer prior to installation.
4. Precast reinforced concrete manhole segments shall conform to ASTM C478-70 (6" min. wall thickness). All sections shall have tongue and groove joints.
5. All manhole segments shall be bedded in double beads of flexible joint sealant (Kent Seal or approved equal).
6. Where manholes are not located in streets or the traveled way, the top of the manhole shall be set 12" to 24" above existing ground per Page 365.00 unless otherwise approved by the City Engineer.
7. The minimum drop across manholes shall be the difference in diameters of the upstream and downstream pipes or 0.2', which ever is greater.
8. Trace wire shall be installed in conformance with Pages 608.00 and 612.20.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**TYPE 2
STORM DRAIN MANHOLE**

Approved:

09-30-2023

City Engineer

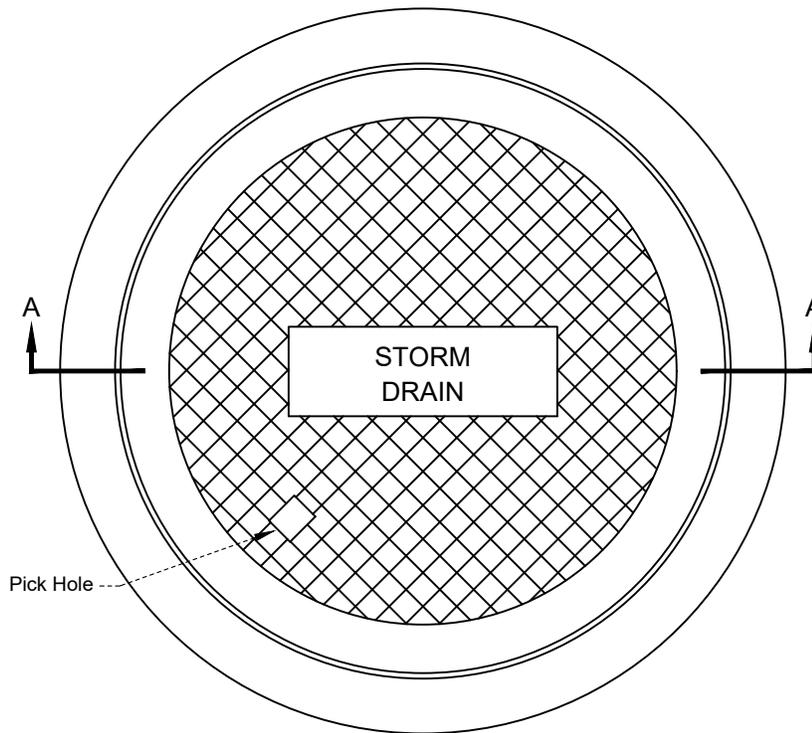
Date

Date: 09/2023

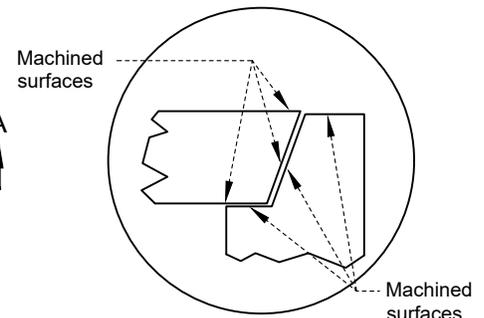
Dwg No.:

Scale: None

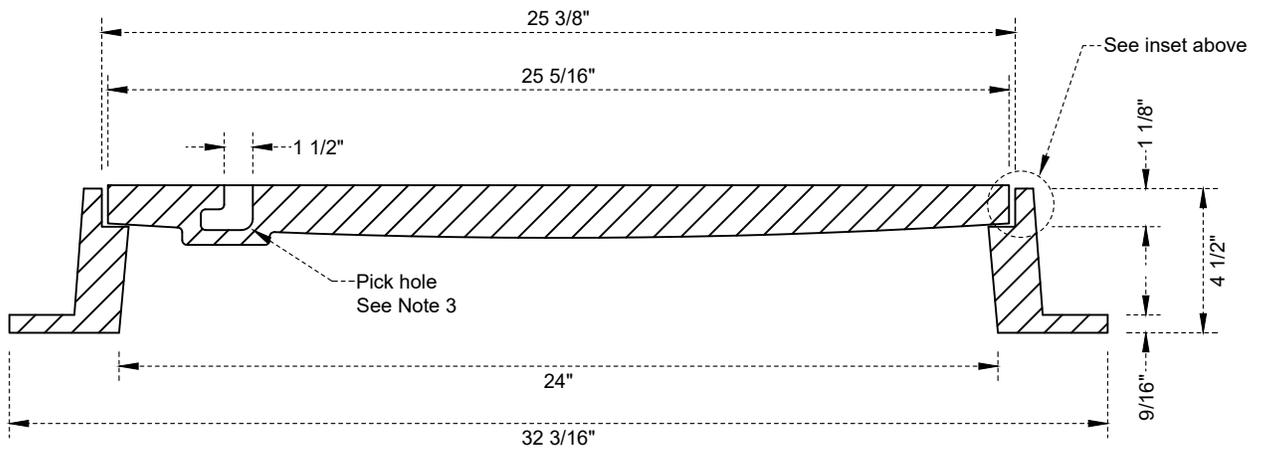
260.20



PLAN



INSET



SECTION A-A

NOTES:

1. Frame and cover shall be fully machined on surfaces as shown to provide a no-rock, no-stick fit, and shall be HS-20 traffic-rated.
2. Cover markings shall be "STORM DRAIN", "STORM SEWER", or "SD".
3. Lid shall be furnished with closed pickholes.
4. All parts of acceptable assemblies shall be interchangeable.
5. See Page 612.20 for concrete collar and grade adjustment details.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**24" STORM DRAIN
MANHOLE FRAME AND LID**

Approved:

09-30-2023

City Engineer

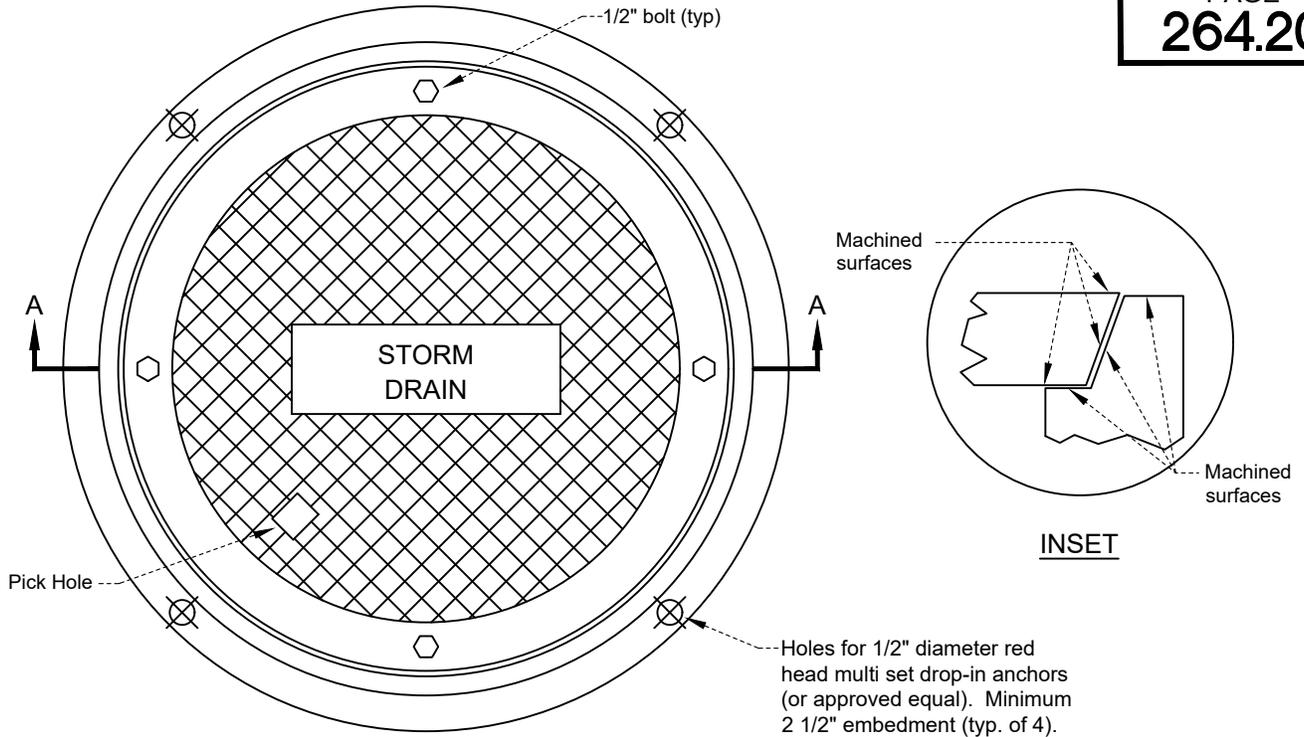
Date

Date: 09/2023

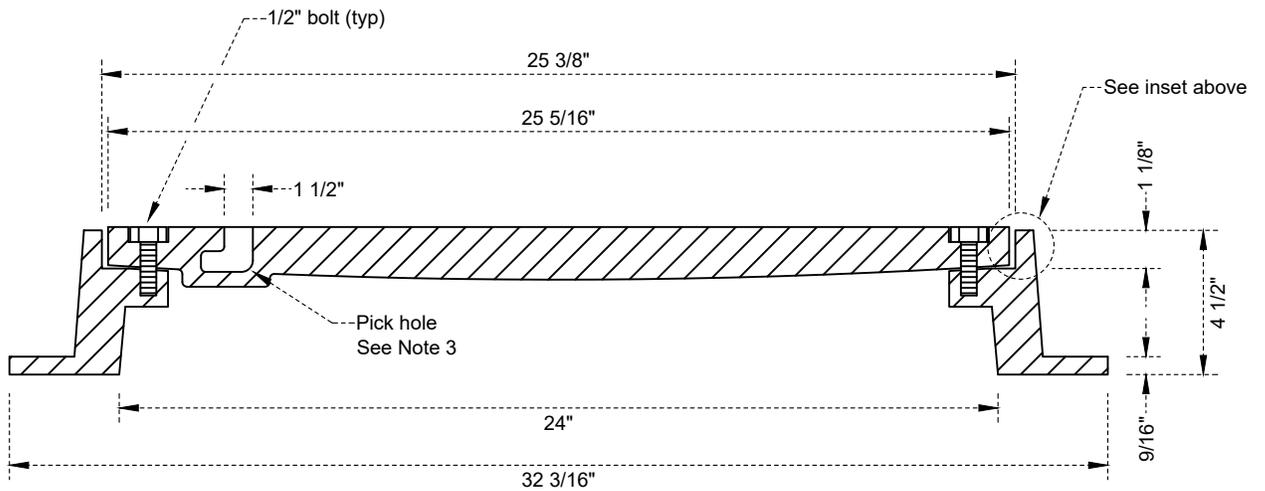
Dwg No.:

Scale: None

264.10



PLAN



SECTION A-A

NOTES:

1. Frame and cover shall be fully machined on surfaces as shown to provide a no-rock, no-stick fit, and shall be HS-20 traffic-rated.
2. Cover markings shall be "STORM DRAIN", "STORM SEWER", or "SD".
3. Lid shall be furnished with closed pickholes.
4. All parts of acceptable assemblies shall be interchangeable.
5. See Page 612.20 for concrete collar and grade adjustment details.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**24" STORM DRAIN
MANHOLE FRAME AND LID - BOLT DOWN**

Approved:

09-30-2023

City Engineer

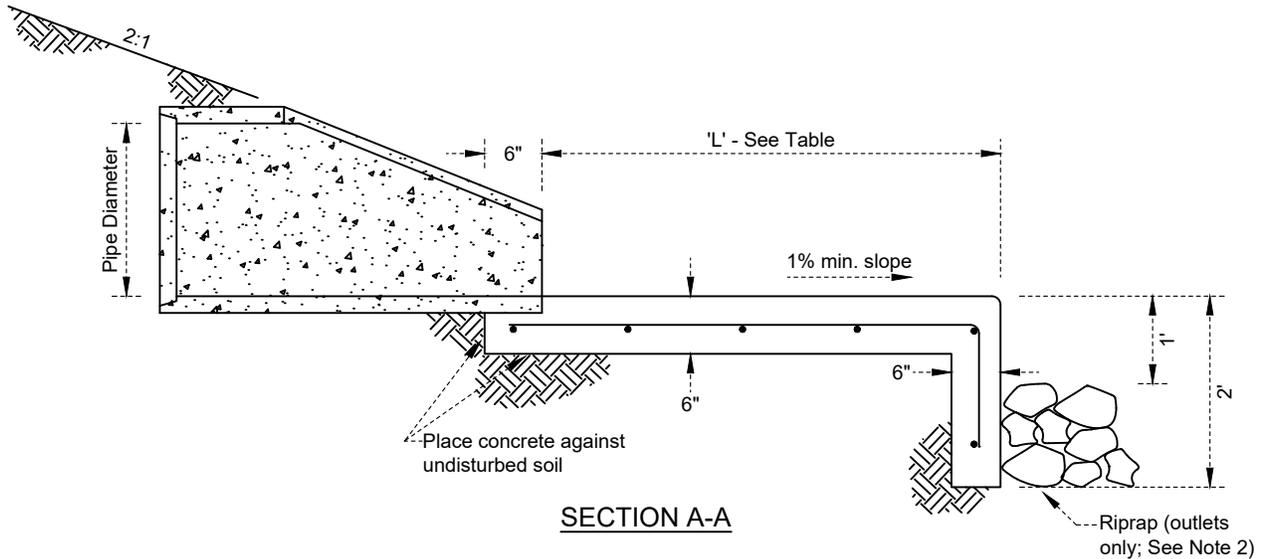
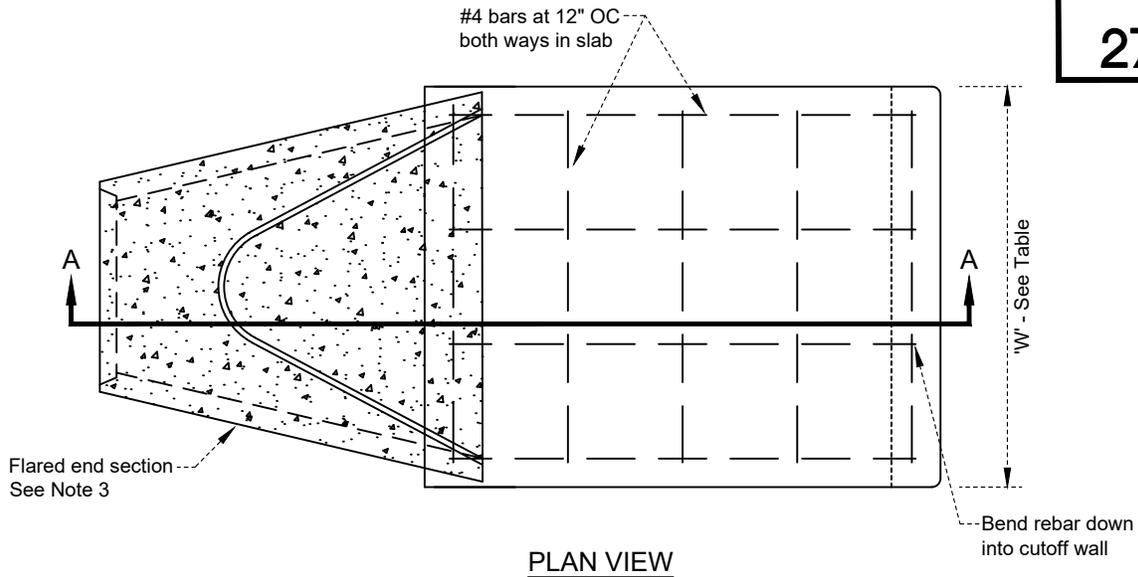
Date

Date: 09/2023

Dwg No.:

Scale: None

264.20



Pipe Diameter	'L'	'W'
15"	4'	3' 6"
18"	4'	3' 6"
24"	6'	4' 6"

NOTES:

1. Concrete shall conform to Page 100.00. Structure backfill shall conform to Page 610.20.
2. Riprap placement downstream of the structure shall extend as required to reduce velocity and prevent erosion.
3. Concrete flared end section shown (Oldcastle Precast or approved equal). Steel flared end sections (Contech or approved equal) may be used upon approval by the City Engineer. Where approved, steel flared end sections shall require additional end treatment behind flare.
4. Although depicted here as an outlet, flared end sections may be used as both inlet and outlet structures on storm drains not to exceed 24" pipe.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

FLARED END OUTLET - 15" to 24"

Approved:

09-30-2023

City Engineer

Date

Date: 09/2023

Dwg No.:

Scale: None

272.00

1. Pipeline Materials:

Gravity sewer (8" min. - 48"):
PVC SDR 35 and SDR 26 per ASTM D-3034 (8" to 15" diameter)
PVC PS46 and PS 115 per ASTM F679 (18" to 48" diameters)

Pressure sewer (6" - 48"):
PVC C900 per AWWA C900 (DR18 minimum, 6" to 48")
Fusible PVC C900 per AWWA C900 (DR18 minimum, 6" to 24")
Fusible HDPE (DR11 minimum, 6" to 36")

Wastewater connections/
laterals (4" or 6"):
PVC SDR 35 and SDR 26 per ASTM D-3034
ABS SDR 26 and SDR 23.5 per ASTM D-2751
ABS Schedule 40 DWV per ASTM D-1785 and D-2665
Fusible PVC C-900 per AWWA C900 (DR18 minimum)
Fusible HDPE (DR11 minimum)

2. The City Engineer may require the use of fused (jointless) pipe in areas of high groundwater, shallow cover, or unstable ground conditions.
3. The largest pipeline that can be tapped for a sewer connection lateral is 15 inch unless approved by the City Engineer. Sewer taps on live sewer mains shall be performed by the City of Shasta Lake.
4. Pipe shall be installed in conformance with the manufacturer's recommendations and Page 610.10.
5. Pipeline backfill shall conform to Page 610.10. Structure backfill shall conform to Page 610.20.
6. Soft, wet, or spongy (unsuitable) material encountered in the trench at pipe subgrade shall be removed and replaced as directed by the City Engineer.
7. All pipe shall be carefully lowered into the trench to prevent damage. Under no circumstances shall pipe be dropped, rolled, or dumped into trenches.
8. Pipe ends shall be thoroughly cleaned before the pipe is joined. Whenever work ceases for any reason, the end of the pipe shall be closed with a watertight fitting, plug or cover. The interior of the pipe shall be kept free from dirt and debris as the work progresses. All pipe field cuts shall be made in accordance with the manufacturer's recommendations. Field cut pipe ends shall be made at right angles to the axis of the pipe except where pipes terminate in manholes.
9. All joints shall be made in accordance with the manufacturer's recommendations. Pipe lubricant shall be applied to all pipe gaskets prior to joint assembly. Lubricant shall be of a type specifically for the type of pipe being joined, required to make all joint connections.
10. Trace wire and warning tape shall be installed on all sanitary sewer pipelines and shall conform to Page 608.00. Trace wire branches shall terminate inside cleanout boxes and manholes.

				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer _____ Date _____	
				SANITARY SEWER		Date: 09/2023 Dwg No.:	
				MATERIALS and CONSTRUCTION CRITERIA		Scale: None 300.01	
1		W. Bond	12/24				
REVISION	BY	APPROVED	DATE				

1. Design of sewer lines shall be based upon an average daily flow of 170 gallons per day per Household Equivalent (HE). Dry weather peaking factor shall be 1.70 for all services.
2. Pipelines shall be designed with a Manning coefficient of $n = 0.013$.
3. The minimum size gravity sewer main shall be 8".
3. The minimum slope (S, ft/ft) allowed for sewer pipelines shall be:

8" = 0.0040
 10" = 0.0030
 12" = 0.0025

Minimum slopes shall not be less than those required to produce a velocity of two feet per second (2.0 fps) when the sewer size selected is flowing full ($d/D = 1.0$) or half full ($d/D = 0.5$). Pipe sizes shall not be arbitrarily increased in order to take advantage of a flatter grade.

4. The minimum horizontal radius curvature for sewer mains shall be 1.5 times the manufacturer's recommendation. All curvature of flexible pipe shall be made by bending the pipe, and no deflection of the pipe joints shall be allowed. Vertical curvature is not permitted.
5. Minimum depth of cover:
 - A. 5.0' over gravity sewer mains
 - B. 4.5' over sewer connections/laterals at ROW line (per Pages 301.00 and 622.00)
 - C. 4.0' over sewer force mains unless otherwise noted by the City Engineer
6. Sewer mains shall not be designed with cover exceeding 10 feet from finish surface grade without approval by the City Engineer.
7. Manhole spacing:

A. Mainline sewers (8" to 12"):	500 feet maximum
B. Trunk sewers (15" to 30"):	700 feet maximum
C. Interceptor sewers (36" and larger):	800 feet maximum
D. All pipelines:	At all angle points in horizontal and vertical alignment and at all dead ends
8. Inside drop manholes shall only be permitted when approved by the City Engineer in accordance with Page 362.00. Outside drop manholes are not permitted.
9. No private force mains are allowed within City ROW unless approved by the City Engineer.

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
				STANDARD DRAWING	City Engineer _____ Date _____
				SANITARY SEWER DESIGN CRITERIA	Date: 09/2023 Dwg No.: Scale: None 300.02
REVISION	BY	APPROVED	DATE		

PIPELINE ACCEPTANCE TESTING

The Contractor shall furnish all labor, equipment, and materials needed to complete the following items:

1. Video Inspection: Prior to acceptance of pipelines by the City Engineer, the Contractor shall provide to the City video inspection of the new sewer main. Video of lateral runs is not required.

All video inspection work shall be performed by a competent sewer video service provider and shall be recorded in digital format. The video inspection shall be performed in color, shall pan in all directions so that all joints and lateral connections can be thoroughly examined, and shall be of sufficient resolution to allow the City Engineer to clearly see all pipe joints, wyes, manhole connections, and other fittings.

The video inspection files will be reviewed by the City Engineer. If any irregularities are observed on the tapes (open or offset joints, grade problems, etc.), the City Engineer MAY elect to have the main in question re-inspected using City forces and equipment. If, in the opinion of the City Engineer, any of the following tolerances are found to be exceeded in any section of sewer main, that section shall be deemed to have failed the video inspection acceptance test.

- a. Joint Offset: ≥ 0.25 " in any direction
- b. Design Grade: +/- 20% of the Design Grade

When failure is observed, the Contractor shall be responsible for repairing or replacing the failed section of pipe at his own expense, including removal and replacement of all affected improvements and any and all other costs incurred in order to repair the pipe, as well as for all costs incurred by the City for the re-inspection of the sewer main.

The City may also perform a video inspection at any time during the guaranty period. Where any of the above tolerances are found to be exceeded in any section of sewer main, that section shall be deemed to have failed the video inspection acceptance test, and the Contractor shall be responsible for repairing or replacing the failed section of pipe at his own expense, including removal and replacement of all affected improvements and any and all other costs incurred in order to repair the pipe, as well as for all costs incurred by the City for the re-inspection of the sewer main.

2. Barrel deflection testing: The Contractor shall conduct barrel deflection testing for all plastic pipelines to ensure that vertical deflections do not exceed the allowable deflection. Deflection testing shall be completed at least 30 days after pipeline installation. The mandrel used for deflection testing shall meet the following requirements:

- a. Fabricated from steel and fitted with pulling rings at each end.
- b. Be rigid and nonadjustable with an odd number of legs (9 legs minimum).
- c. Have an effective length not less than its nominal diameter.
- d. Be stamped or engraved on a segment other than the running with the pipe material specification, nominal size, and outside diameter (i.e. PVC D3034-8"-7.366")

Nominal Pipe Diameter	Allowable Barrel Deflection, % Diameter
8" - 12"	5.0%
14" - 30"	4.0%
36" - 48"	3.0%

If the mandrel is not able to travel unobstructed through the pipe and stops at any point, that section of pipeline will have failed the acceptance test. When failure is observed, the Contractor shall be responsible for repairing or replacing the failed section of pipe at his own expense, including removal and replacement of all affected improvements and any and all other costs incurred in order to repair the pipe. The use of a re-rounder will not be permitted at any time.

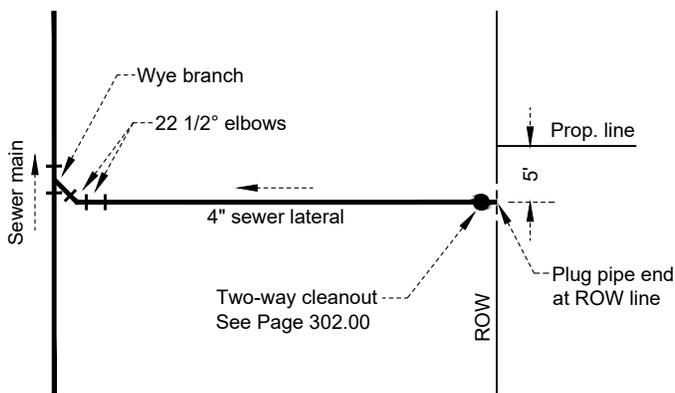
				CITY OF SHASTA LAKE Public Works Department STANDARD DRAWING	Approved:  09-30-2023 Date
				SANITARY SEWER PIPELINE ACCEPTANCE TESTING	Date: 09/2023 Scale: None
REVISION	BY	APPROVED	DATE		Dwg No.: 300.03

MANHOLE ACCEPTANCE TESTING

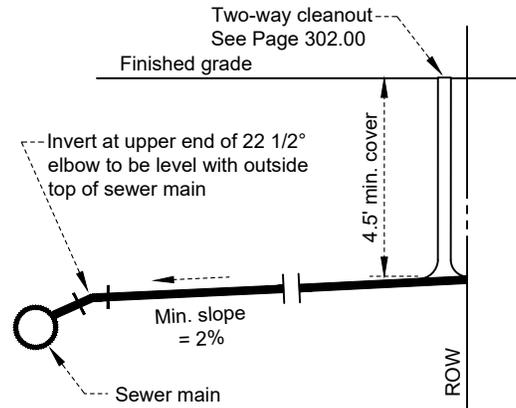
The Contractor shall furnish all labor, equipment, and materials needed to complete the following items:

1. Each manhole that can be isolated from the sanitary sewer system without causing backups shall be vacuum tested in the presence of the City Engineer for acceptance after all backfilling and compaction is completed. The Contractor may pretest manholes immediately after assembly and prior to backfilling; pretesting is for the Contractor's convenience and need not be completed in the presence of City personnel.
2. All testing equipment and labor shall be provided by the Contractor.
3. All pipes entering the manhole shall be plugged, taking care to securely brace the plugs from being drawn into the manhole during the test.
4. The test head shall be placed at the inside of the top of the cone section and the seal inflated in accordance with the manufacturer's recommendation.
5. A vacuum of 10 inches of mercury shall be drawn and the vacuum pump shut off. With the valves closed, the time shall be measured for the vacuum to drop to nine inches. The manhole shall pass if the time is greater than 60 seconds for 48" diameter manholes, 75 seconds for 60" diameter manholes, and 90 seconds for 72" diameter manholes.
6. If the manhole fails the initial test, necessary repairs shall be made with a non-shrink grout or epoxy. Retesting shall proceed until a satisfactory test is obtained. No grout shall be placed in the horizontal joints before testing.

				CITY OF SHASTA LAKE Public Works Department	Approved:  Date: 09-30-2023
				SANITARY SEWER MANHOLE ACCEPTANCE TESTING	City Engineer _____ Date _____
					Date: 09/2023 Dwg No.: Scale: None 300.04
REVISION	BY	APPROVED	DATE		

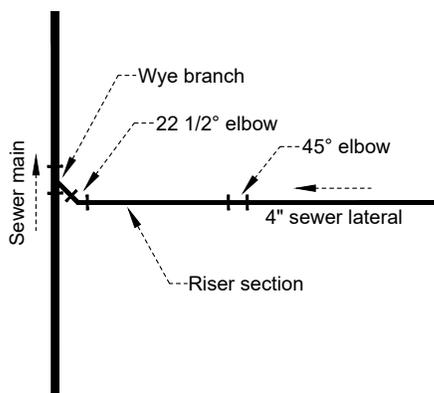


PLAN

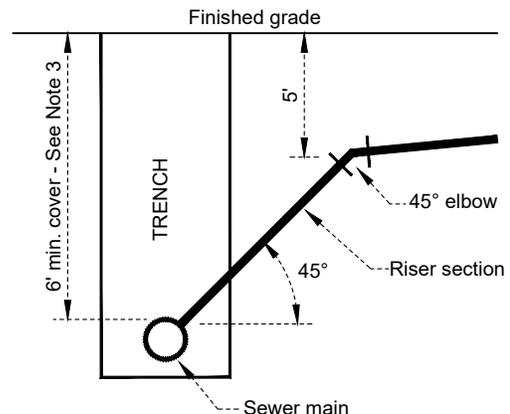


ELEVATION

TYPICAL HOUSE CONNECTION



PLAN



ELEVATION

RISER DETAIL

See Note 3

NOTES:

1. Backfill material shall conform to Page 610.10.
2. Sewer taps on live sewer mains shall be performed by City staff only. When tapping live mains, 90° taps are acceptable.
3. Risers shall be installed when the sewer main cover depth exceeds 6'. Risers shall bring the lateral up to approximately 5'. Vertical riser installations are not acceptable.
4. Where the sewer main is located in an easement, future lateral installation locations shall consist of a main line wye and plug.
5. Place 1" plastic conduit or 2x4 wood post upright at property line to mark the location of the sewer lateral cap. Marker shall be painted green.
6. Stamp "S" into the curb at the location of the lateral crossing.
7. Laterals shall be located near the middle of the lot wherever possible, and locations under driveways shall be avoided. In no case shall laterals be located within 5' of the property line.
8. Sewer laterals that require a backflow device be installed per the California Plumbing Code Section 710.0 shall have the backflow device installed near the cleanout.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

TYPICAL SANITARY SEWER LATERAL

Approved:

09-30-2023

City Engineer

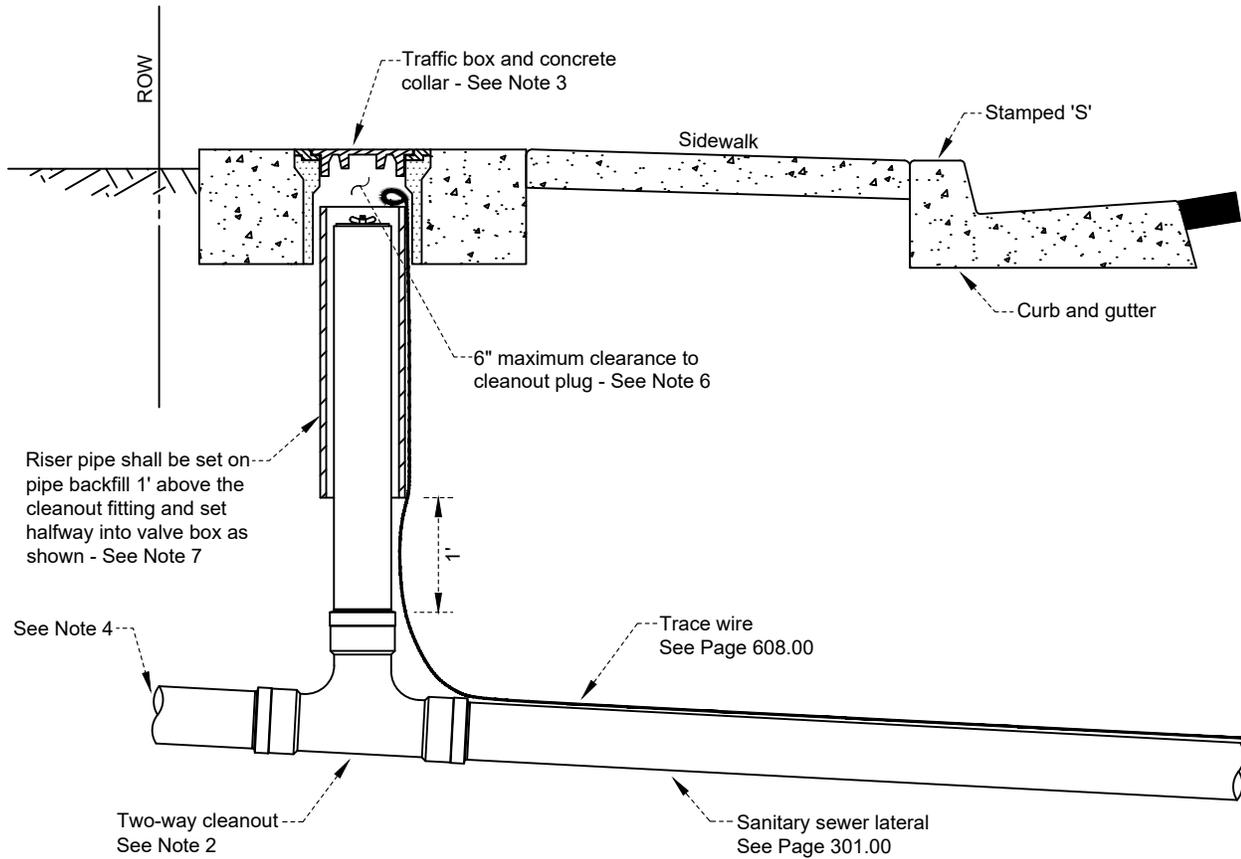
Date

Date: 09/2023

Dwg No.:

Scale: None

301.00



NOTES:

1. This standard is required for all new residential construction.
2. Two-way cleanout fitting shall be gasketed.
3. Where concrete flatwork exists, the lateral cleanout, traffic box, and concrete collar shall be placed as shown at the back of flatwork. If no concrete flatwork exists, the lateral cleanout, traffic box, and concrete collar shall be placed 1' off the property line. Traffic box and concrete collar installation shall conform with Page 612.10.
4. Following testing and acceptance by the City, the Contractor shall connect the building sewer to the new lateral. If the building sewer will be installed at a later time, the lateral shall be plugged with a gasketed end plug at the ROW line.
5. When a new 4" lateral is connected to an existing 6" lateral, the Contractor shall install a 4" x 6" eccentric reducer to accommodate the size change.
6. Cleanout plug shall be a mechanical gasketed end-of-pipe plug with wing nut (Cherne Industries or approved equal).
7. Riser pipe shall be 8" PVC SDR35. Trace wire shall be run on the OUTSIDE of the riser pipe.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SANITARY SEWER TWO WAY CLEANOUT

Approved:

09-30-2023

City Engineer

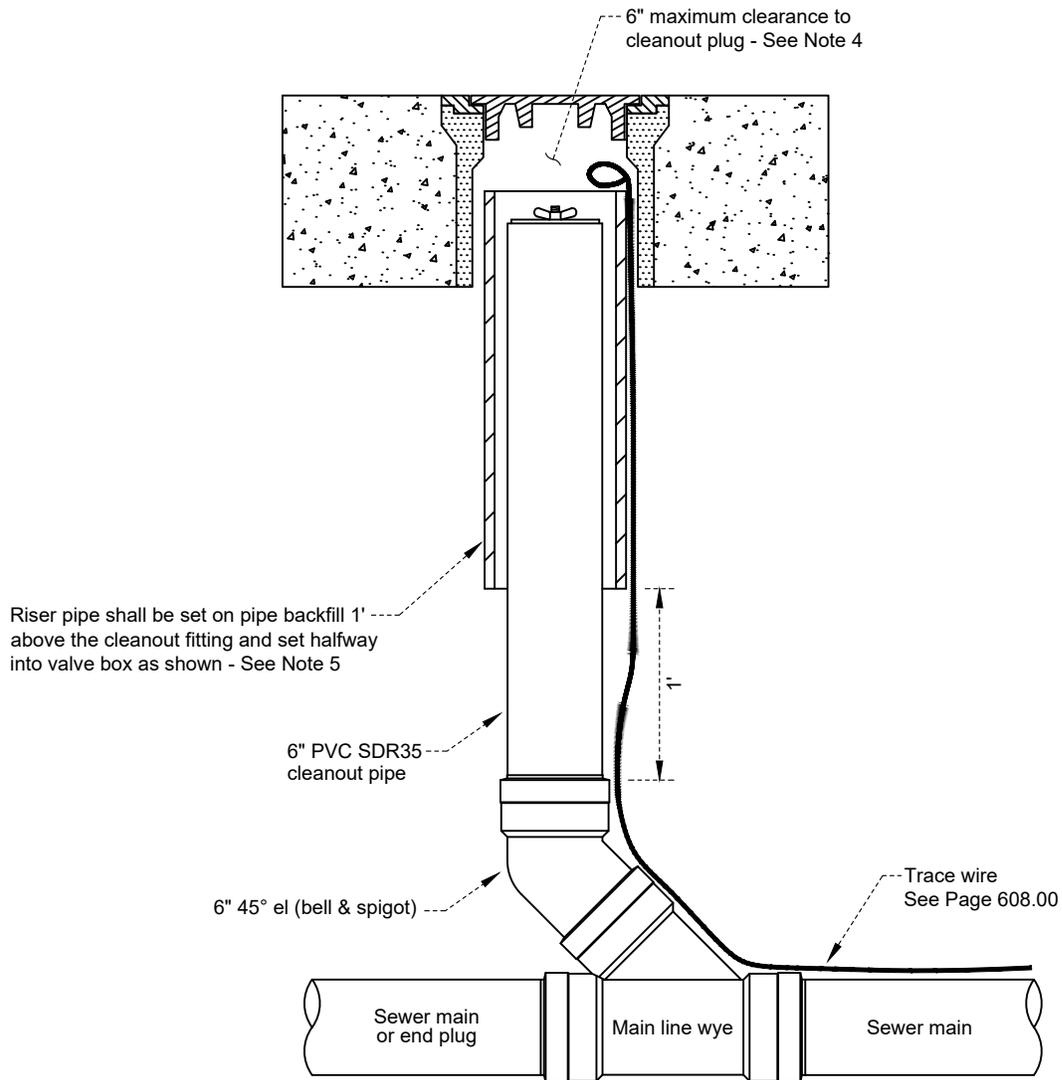
Date

Date: 01/2023

Dwg No.:

Scale: None

302.00



NOTES:

1. Backfill material shall conform to Page 610.10.
2. All fittings shall be gasketed. Cleanout pipe and fitting material shall be PVC SDR35 sewer pipe.
3. Traffic box and concrete collar installation shall conform with Page 612.10.
4. Cleanout plug shall be a mechanical gasketed end-of-pipe plug with wing nut (Cherne Industries or approved equal).
5. Riser pipe shall be 8" PVC SDR35. Trace wire shall be run on the OUTSIDE of the riser pipe.

REVISION	BY	APPROVED	DATE

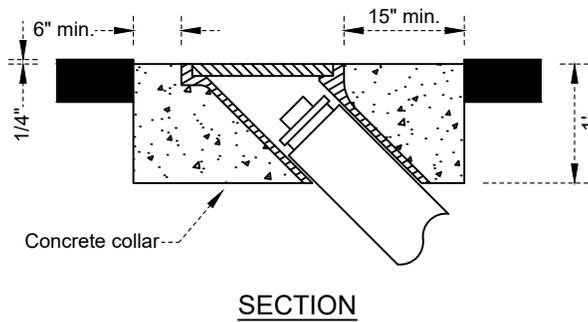
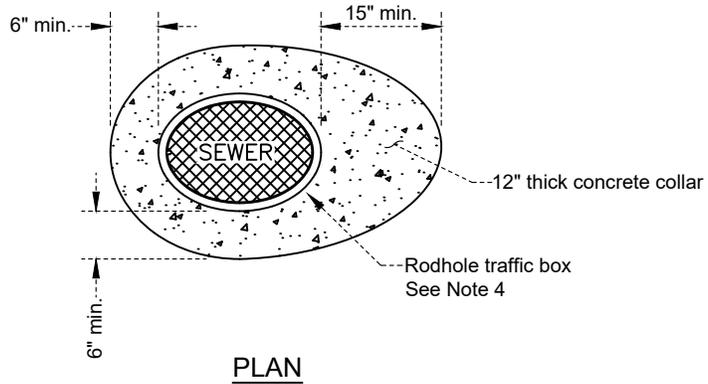
CITY OF SHASTA LAKE
Public Works Department

STANDARD DRAWING

SANITARY SEWER MAIN LINE CLEANOUT

Approved: *WST* 09-30-2023
City Engineer Date

Date: 09/2023 Dwg No.: 350.10
Scale: None



NOTES:

1. All material shall conform to Page 100.00.
2. Rodhole traffic boxes shall be installed on existing rodholes only. New mainline terminations shall occur at either a mainline cleanout (see Page 350.10) or a manhole (see Page 360.10).
3. Concrete collar around rodhole frame shall be oval to match frame assembly.
4. Rodhole traffic boxes shall be South Bay Foundry South Bay Foundry Model SBF 1249 or approved equal.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SANITARY SEWER RODHOLE TRAFFIC BOX

Approved:

09-30-2023

City Engineer

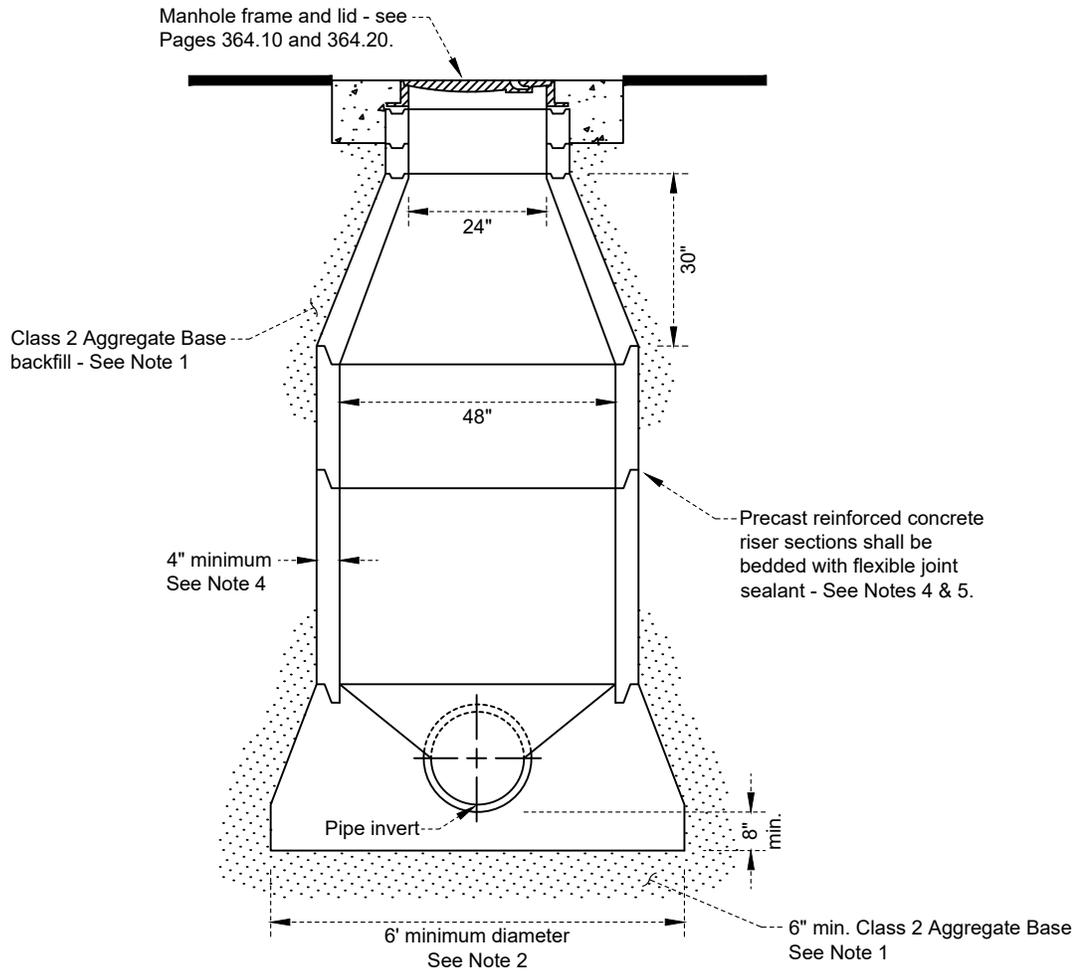
Date

Date: 09/2023

Dwg No.:

Scale: None

350.20



NOTES:

1. Structure backfill shall conform to Page 610.20.
2. Precast concrete bases manufactured by Cook Concrete Products, Teichert Aggregate, or approved equal may be used in lieu of poured in-place bases. See Page 363.00 for base details.
3. Eccentric type concrete cone sections shall be installed in place of concentric cones when directed by the Engineer. When eccentric cone sections are installed, the vertical wall shall be installed above the downstream pipe.
4. Precast reinforced concrete manhole segments shall conform to ASTM C478-70 (4" min. wall thickness). All sections shall have tongue and groove joints.
5. All manhole segments shall be bedded in double beads of flexible joint sealant (Kent Seal or approved equal).
6. Where manholes are not located in streets or the traveled way, the top of the manhole shall be set 12" to 24" above existing ground per Page 365.00 unless otherwise approved by the City Engineer.
7. 6' manholes shall be constructed at locations where pipe size is 30" or larger in diameter - see Page 361.00.
8. The minimum drop across manholes shall be the difference in diameters of the upstream and downstream pipes or 0.2', which ever is greater.
9. Trace wire shall be installed in conformance with Pages 608.00 and 612.20.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**TYPE 1 4' DIAMETER
SANITARY SEWER MANHOLE**

Approved:

09-30-2023

City Engineer

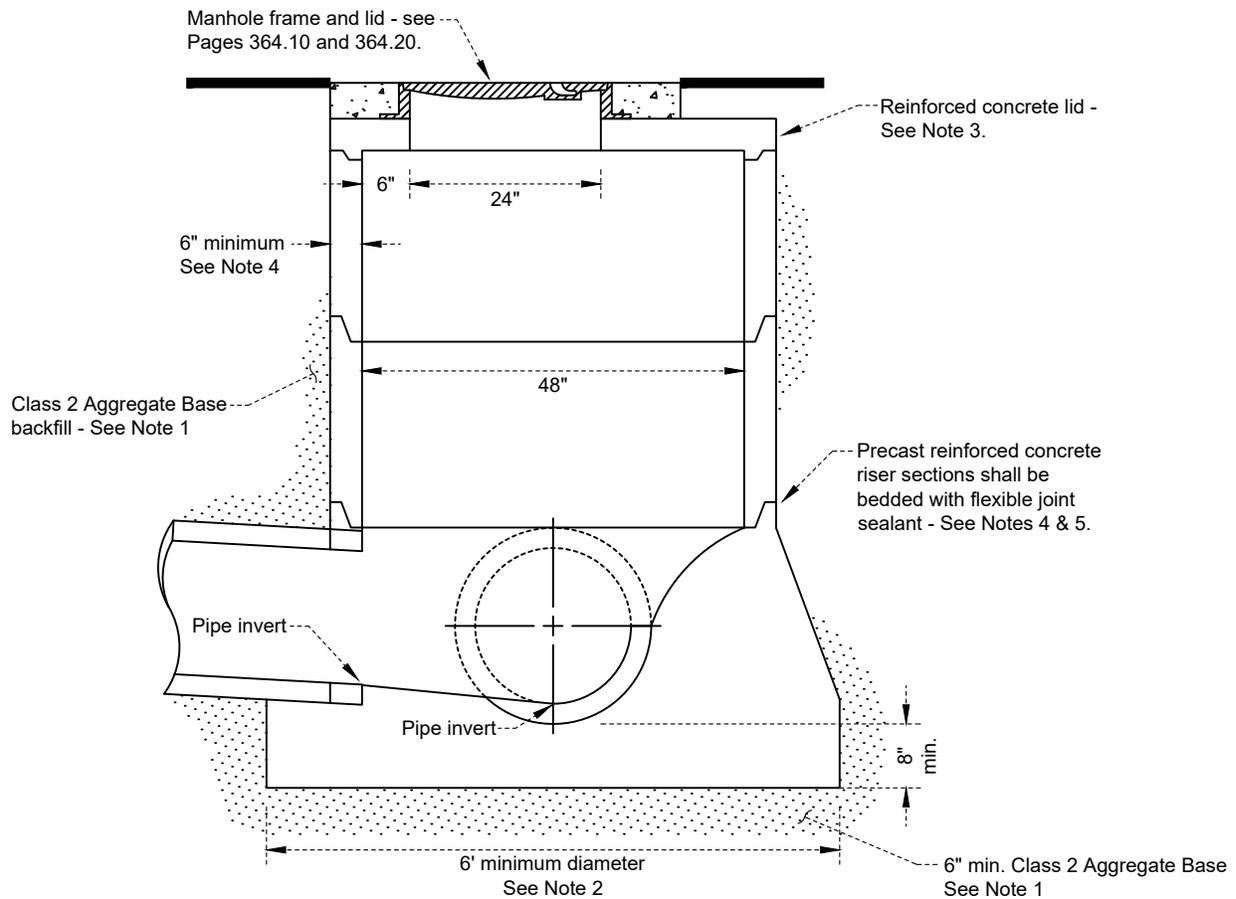
Date

Date: 09/2023

Dwg No.:

Scale: None

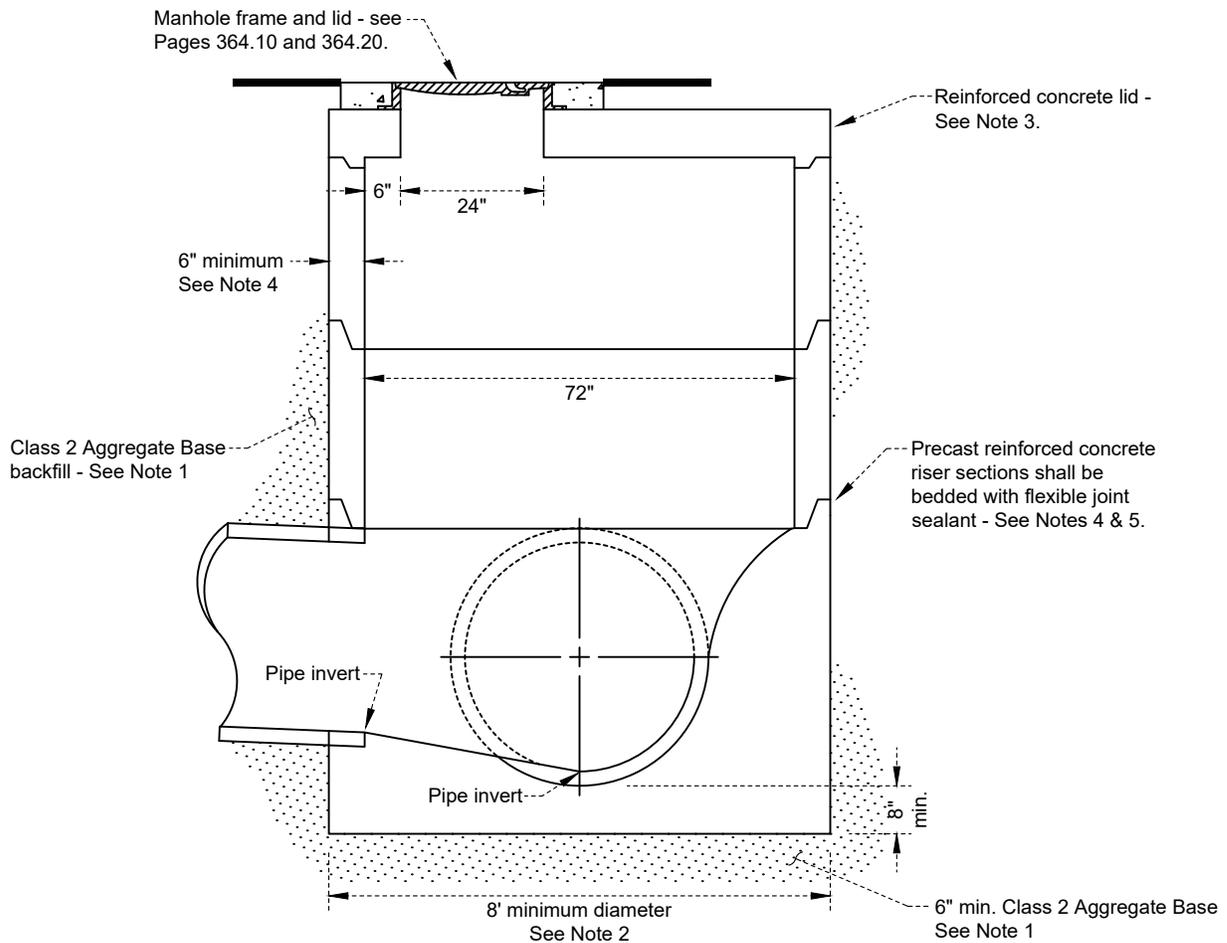
360.10



NOTES:

1. Structure backfill shall conform to Page 610.20.
2. Precast concrete bases manufactured by Cook Concrete Products, Teichert Aggregate, or approved equal may be used in lieu of poured in-place bases. See Page 363.00 for base details.
3. Flat reinforced concrete lid shall meet AASHTO HS20-44 requirements. Lid design shall be approved by the City Engineer prior to installation.
4. Precast reinforced concrete manhole segments shall conform to ASTM C478-70 (6" min. wall thickness). All sections shall have tongue and groove joints.
5. All manhole segments shall be bedded in double beads of flexible joint sealant (Kent Seal or approved equal).
6. Where manholes are not located in streets or the traveled way, the top of the manhole shall be set 12" to 24" above existing ground per Page 365.00 unless otherwise approved by the City Engineer.
7. 6' manholes shall be constructed at locations where pipe size is 30" or larger in diameter - see Page 361.00.
8. The minimum drop across manholes shall be the difference in diameters of the upstream and downstream pipes or 0.2', which ever is greater.
9. Trace wire shall be installed in conformance with Pages 608.00 and 612.20.

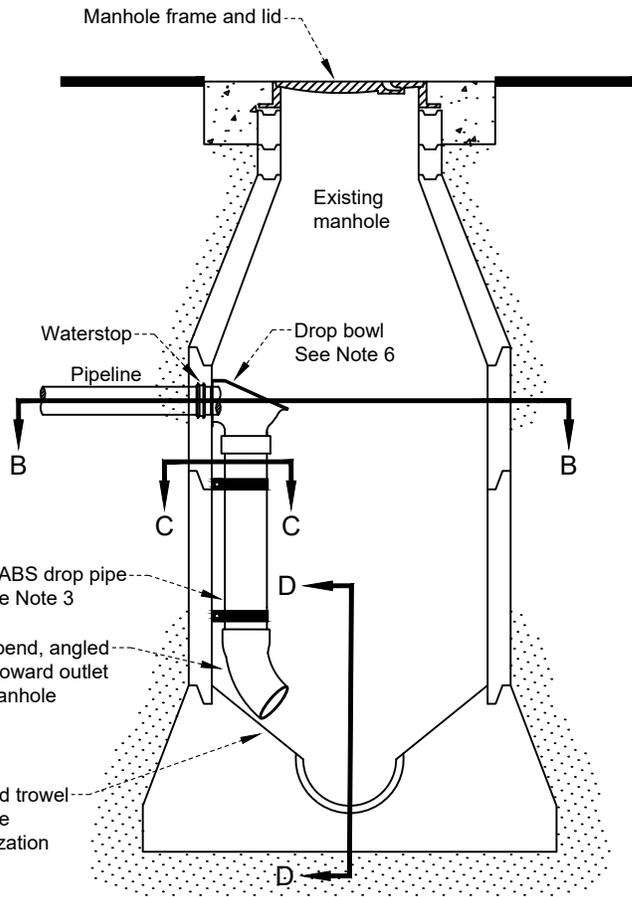
				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer Date	
				TYPE 2 4' DIAMETER		Date: 09/2023 Dwg No.:	
				SANITARY SEWER MANHOLE		Scale: None 360.20	
REVISION	BY	APPROVED	DATE				



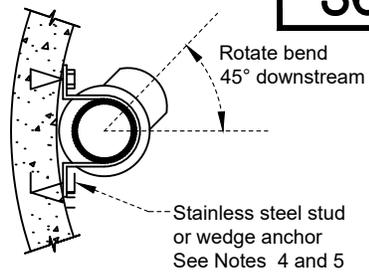
NOTES:

1. Structure backfill shall conform to Page 610.20.
2. Precast concrete bases manufactured by Cook Concrete Products, Teichert Aggregate, or approved equal may be used in lieu of poured in-place bases. See Page 363.00 for base details.
3. Flat reinforced concrete lid shall meet AASHTO HS20-44 requirements. Lid design shall be approved by the City Engineer prior to installation.
4. Precast reinforced concrete manhole segments shall conform to ASTM C478-70 (6" min. wall thickness). All sections shall have tongue and groove joints.
5. All manhole segments shall be bedded in double beads of flexible joint sealant (Kent Seal or approved equal).
6. Where manholes are not located in streets or the traveled way, the top of the manhole shall be set 12" to 24" above existing ground per Page 365.00 unless otherwise approved by the City Engineer.
7. 6' manholes shall be constructed at locations where pipe size is 30" or larger in diameter.
8. The minimum drop across manholes shall be the difference in diameters of the upstream and downstream pipes or 0.2', which ever is greater.
9. Trace wire shall be installed in conformance with Pages 608.00 and 612.20.

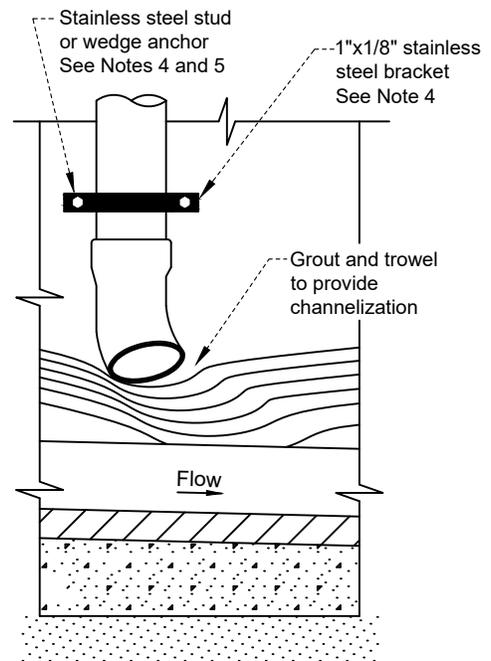
				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer Date	
				6' DIAMETER		Date: 09/2023 Dwg No.:	
				SANITARY SEWER MANHOLE		Scale: None 361.00	
REVISION	BY	APPROVED	DATE				



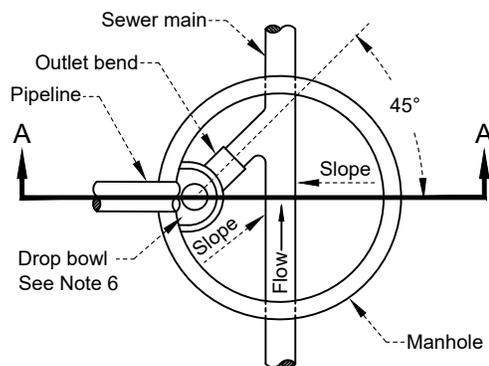
Section A-A



Section C-C



Section D-D



Section B-B



Drop Bowl Mounting Position

NOTES:

1. Inside drop manholes may be installed when the elevation difference is 6' or more on existing facilities and with special approval by the City Engineer.
2. Inside drop manholes may be utilized only with 8" or smaller inlet pipe.
3. Drop pipe shall be 6" ABS Schedule 40 DWV pipe.
4. 1"x1/8" stainless steel brackets shall be used to secure vertical drop pipe to the manhole wall, with a minimum of one bracket per joint of pipe and a minimum of two brackets per manhole installation.
5. All holes drilled into concrete for mounting brackets shall be sealed with watertight epoxy.
6. Drop bowl shall be Reliner by Duran, Inc. or approved equal.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SANITARY SEWER INSIDE DROP ASSEMBLY

Approved:

09-30-2023

City Engineer

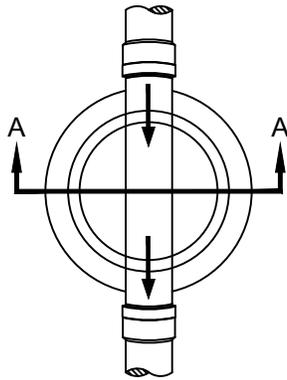
Date

Date: 09/2023

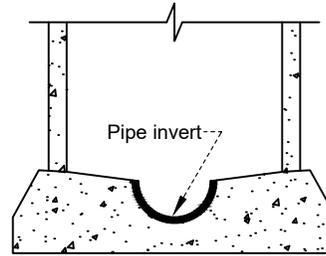
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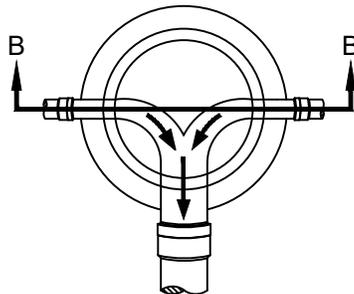
362.00



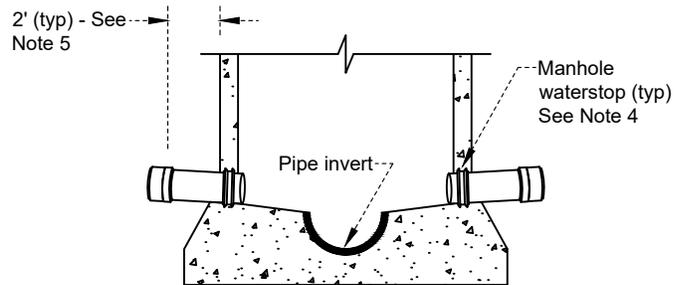
Plan A



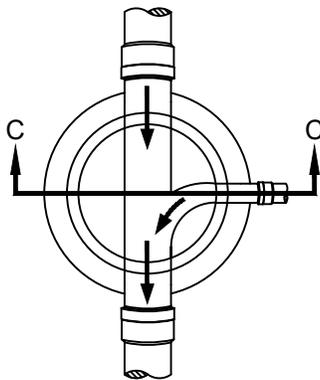
Section A-A



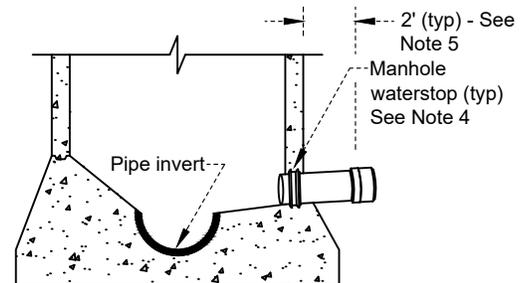
Plan B



Section B-B



Plan C



Section C-C

NOTES:

1. Concrete shall conform to Page 100.00. Structure backfill shall conform to Page 610.20.
2. Precast concrete bases manufactured by Cook Concrete Products, Teichert Aggregate, or approved equal may be used in lieu of poured in-place bases.
3. The minimum drop across manholes shall be the difference in diameters of the upstream and downstream pipes or 0.2', which ever is greater.
4. Where pipelines penetrate manhole walls, waterstops shall be installed around the pipe to form a watertight seal. Waterstops shall be centered in the manhole wall and grouted into the manhole wall with non-shrink grout on both faces. Precast manhole bases with pre-installed rubber push joints may be substituted for waterstops.
5. All pipelines shall have a pipe bell joint installed 2' outside of the manhole wall.
6. Flow channel may be hand-formed for poured-in-place bases.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

MANHOLE BASE DETAILS

Approved:

09-30-2023

City Engineer

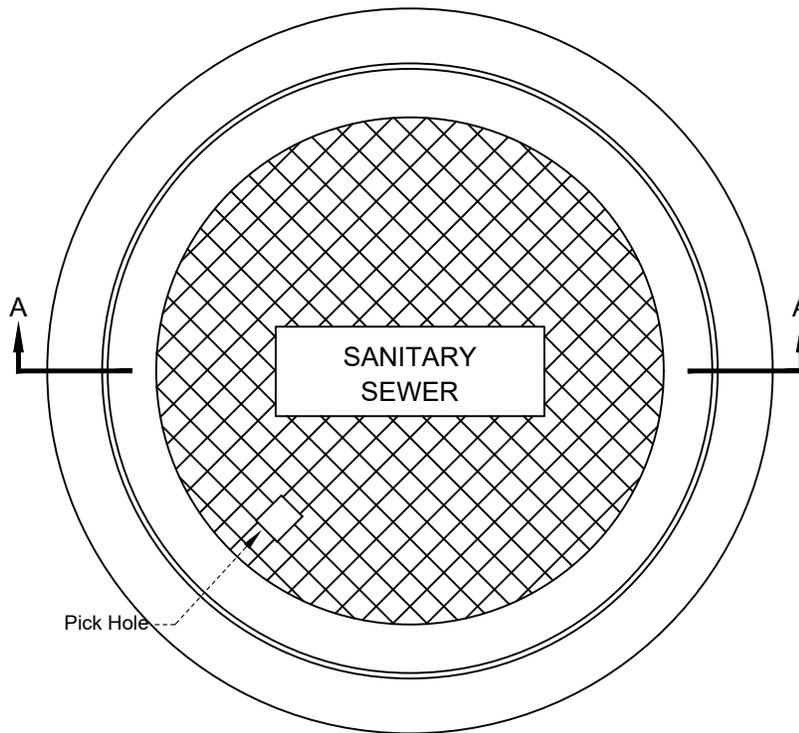
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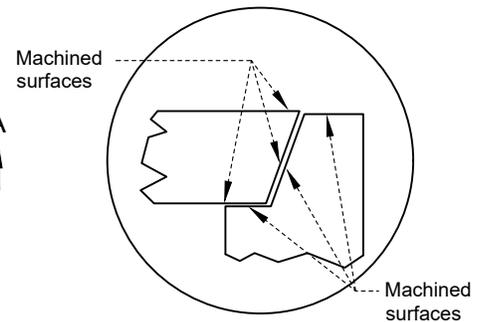
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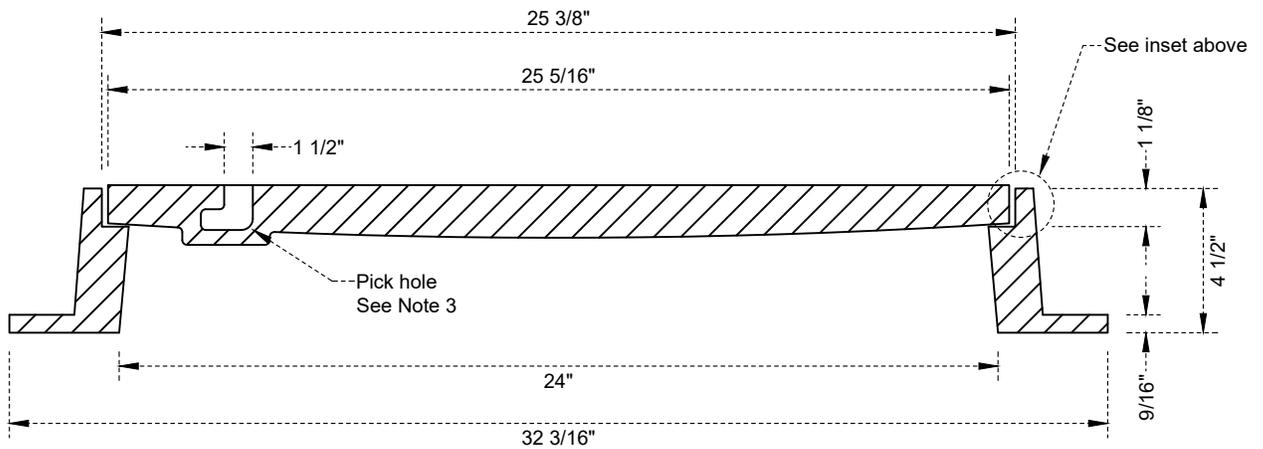
363.00



PLAN



INSET



SECTION A-A

NOTES:

1. Frame and cover shall be fully machined on surfaces as shown to provide a no-rock, no-stick fit, and shall be HS-20 traffic-rated.
2. Cover markings shall be "SANITARY SEWER", "SEWER", or "SS".
3. Lid shall be furnished with closed pickholes.
4. Frame and lid shall be D&L Supply Co. A-1024 or approved equal. All parts of acceptable assemblies shall be interchangeable.
5. See Page 612.20 for concrete collar and grade adjustment details.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

24" SANITARY SEWER
MANHOLE FRAME AND LID

Approved:

09-30-2023

City Engineer

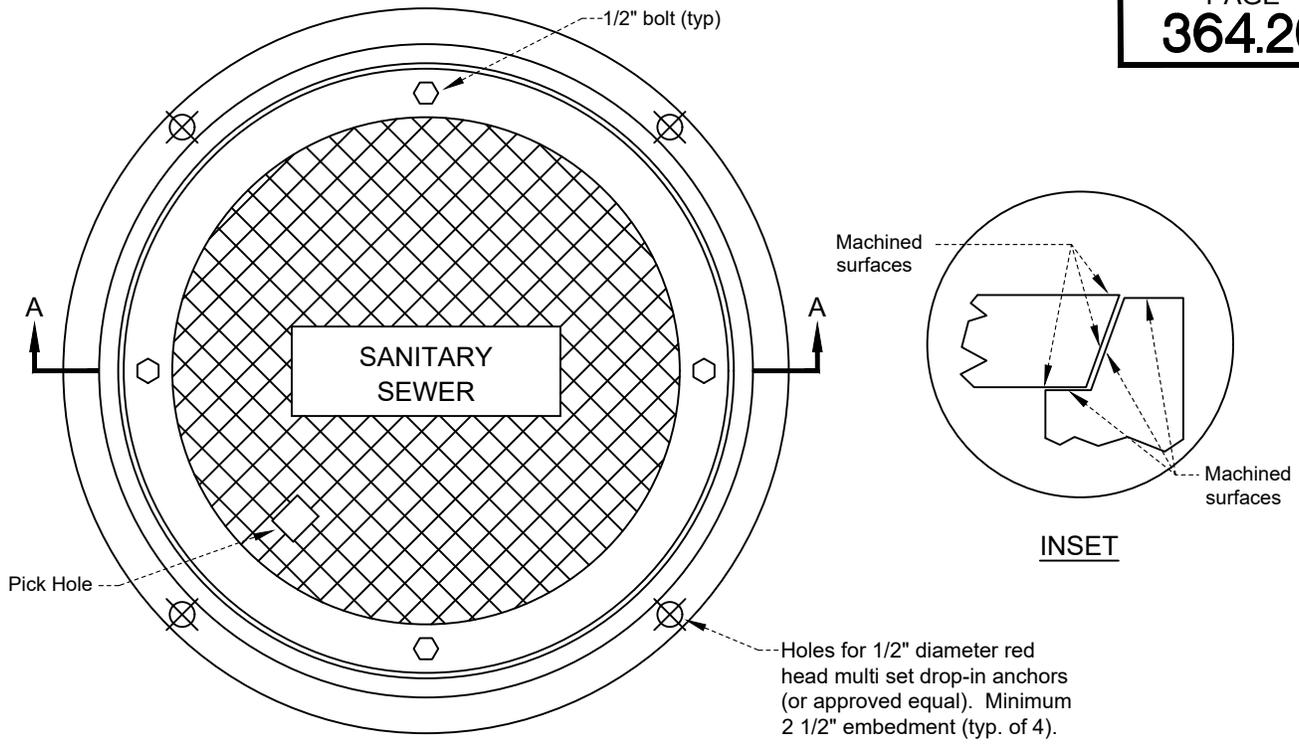
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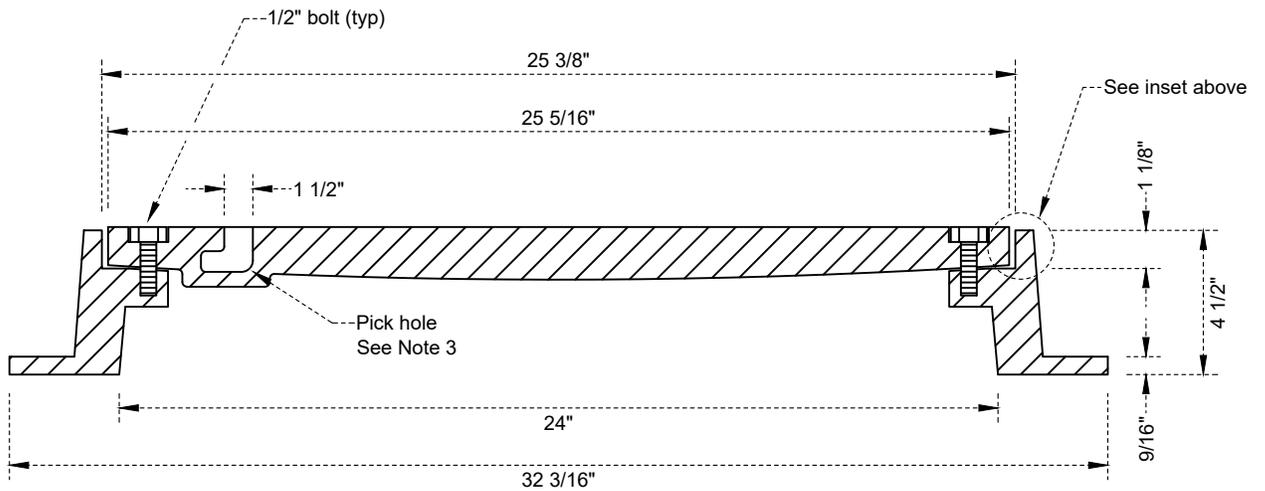
Dwg No.:

Scale: None

364.10



PLAN



SECTION A-A

NOTES:

1. Frame and cover shall be fully machined on surfaces as shown to provide a no-rock, no-stick fit, and shall be HS-20 traffic-rated.
2. Cover markings shall be "SANITARY SEWER", "SEWER", or "SS".
3. Lid shall be furnished with closed pickholes.
4. Frame and lid shall be D&L Supply Co. A-1024 or approved equal. All parts of acceptable assemblies shall be interchangeable.
5. See Page 612.20 for concrete collar and grade adjustment details.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**24" SANITARY SEWER
MANHOLE FRAME AND LID - BOLT DOWN**

Approved:

09-30-2023

City Engineer

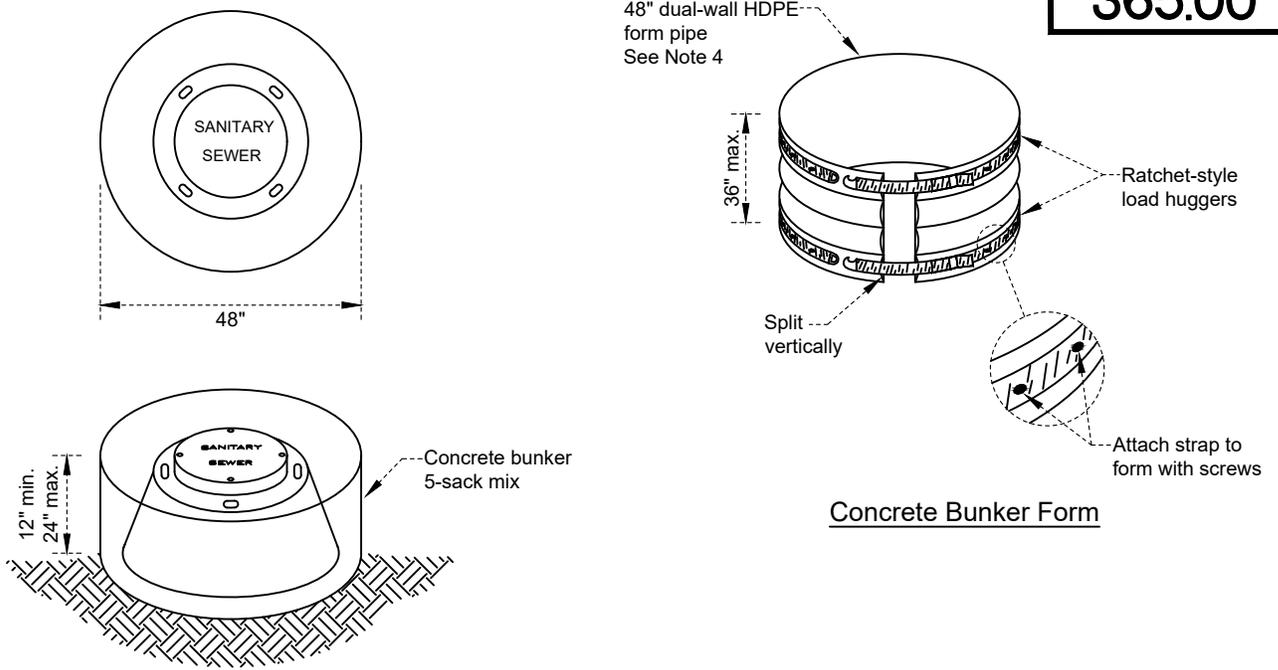
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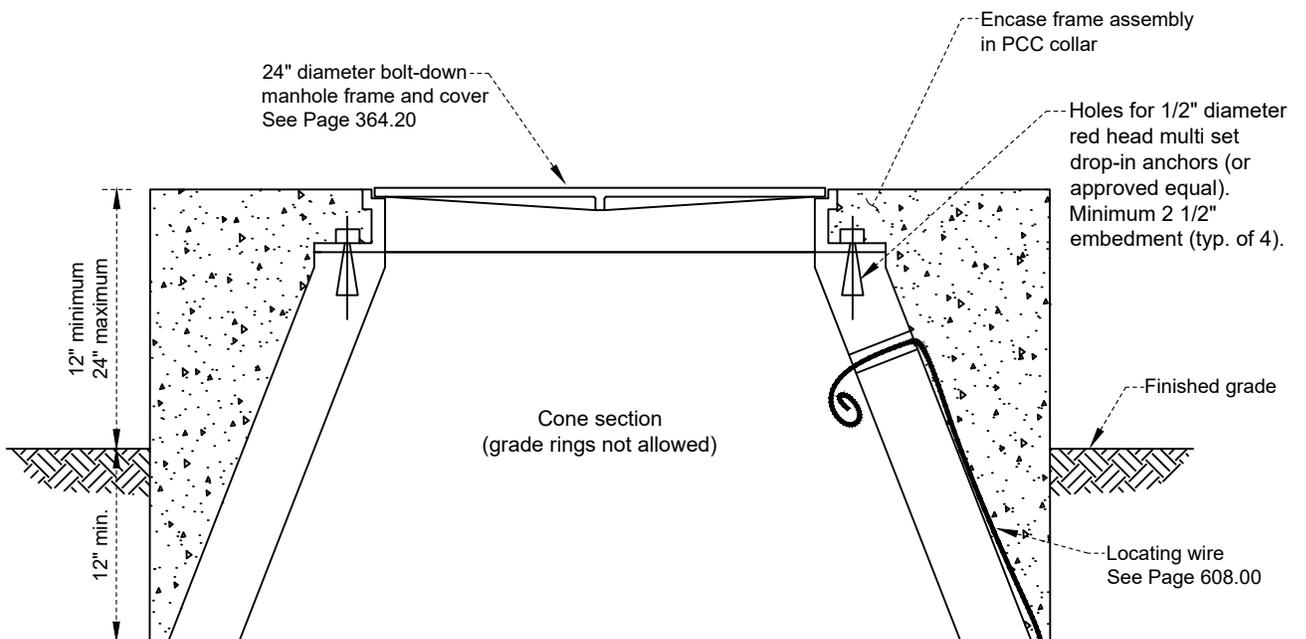
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Scale: None

364.20



Concrete Bunker Form



CONCRETE BUNKER DETAIL

NOTES:

1. Concrete shall conform to Page 100.00.
2. For sanitary sewer manhole construction information, see Page 360.10.
3. Excess locating wire shall be within 12" of the finished grade.
4. Form pipe shall be 48" dual wall HDPE. The internal face shall be smooth, the external face shall be corrugated, and the form pipe shall be split to allow for form removal following concrete placement.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**SANITARY SEWER ABOVE GROUND
MANHOLE INSTALLATION**

Approved:

09-30-2023

City Engineer

Date

Date: 09/2023

Dwg No.:

Scale: None

365.00

APPLICABILITY:

1. Sand and oil interceptors (also referred to as SOIs or oil/water separators) are required for industrial and commercial establishments where it is necessary to capture solids (sand, silt, sediment, sludge, etc.) and/or floatable material (oil, grease, etc.), such as auto repair facilities and car washes.
2. This standard applies to all new construction, tenant improvements, remodels, and existing systems which are in need of an upgrade.
3. SOIs shall be sized based on design information submitted by the developer's engineer and approved by the City Engineer.
4. Stormwater shall not enter the wash area. A roof is required over all areas that shed to a SOI.

SIZING CRITERIA:

1. Parameter: The parameters for sizing SOI units are hydraulic loading, retention time, and storage factor for one or more fixtures or industrial applications.

2. Sizing formula: The size of the SOI will be determined by using of the following formula:

$$\begin{matrix} \text{Number of} & & \text{Waste Flow} & & \text{Retention} & & \text{Storage} & & & & \text{Interceptor size} \\ \text{units washed} & \times & \text{Rate}^{**} & \times & \text{Time}^{***} & \times & \text{Factor}^{****} & = & & & \text{(liquid capacity)} \\ \text{per hour}^* & & & & & & & & & & \end{matrix}$$

- * Number of units washed per hour (i.e., autos, engines, parts, etc.)
- ** Waste flow rate in gallons per unit cleaned (for intermittent use) or gallons per hour (for constant use)
- *** Retention time = 2.0 hours
- **** Storage factors:
 - A. Self service/public: 1.5 hours
 - B. Employee operated automated/commercial 2.0 hours
 - C. Other industrial/commercial applications 2.0 hours

3. The minimum SOI size permitted by the City is 100 gallons.

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
				STANDARD DRAWING	City Engineer _____ Date
				SAND AND OIL INTERCEPTORS (SOI) APPLICABILITY AND SIZING	Date: 09/2023 Dwg No.: Scale: None 380.01
REVISION	BY	APPROVED	DATE		

DESIGN:

1. SOI construction shall include a sample monitoring station.
2. The use of alternate pretreatment systems in conjunction with or in lieu of a SOI unit shall be approved by the City Engineer prior to implementation. Design specifications shall be submitted with the application paperwork, and details of the alternate system shall be included with the improvement plans.
3. If an existing SOI is undersized but is otherwise structurally sound and installed properly, a business or owner may install an additional SOI in series with the existing SOI to satisfy the total size capacity required.
4. Sanitary tees shall be installed at the inlet and outlet of each SOI. The sanitary tee shall be installed so the top opening of the sanitary tee is visible and accessible from the manhole lids.
5. The SOI shall be installed as shallow as possible. The bottom of the SOI shall not be greater than 15 feet below grade to facilitate routine pumping, and the installation shall not exceed the tank manufacturer's design criteria for maximum cover (top of tank to grade).
6. No more than 24" of grade rings shall be used for a SOI installation. An eccentric concrete cone or reducing top (36" to 24" manhole or 48" to 24" manhole) shall be used if the top of the SOI is more than 24 " below finished grade (see Pages 360.10 and/or 360.20).
7. Manhole lids for SOIs shall not be bolted down.
8. All SOIs shall be properly installed and maintained. All internal plumbing of proper design and length shall be in place at all times. SOIs are required to be pumped when 25% of the internal capacity is occupied by oils, grease , or solids. Pumping is typically required every 12 months depending on use. SOI pumping is the responsibility of the business operator unless other agreements have been made between the business operator and property owner or property manager. The City shall not be responsible for maintenance or pumping of private SOIs.
9. Grated openings shall not be installed over the SOI. Trench drains and drop inlets shall be separate from the SOI tank.
10. SOIs and hydromechanical separators may be inspected by the City to ensure proper installation and maintenance.
11. Sludge and other waste hauling manifests related to SOI pumping shall be retained for a minimum of 3 years.

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
				SAND AND OIL INTERCEPTORS (SOI) DESIGN REQUIREMENTS	City Engineer _____ Date
					Date: 09/2023 Dwg No.: Scale: None 380.02
REVISION	BY	APPROVED	DATE		

APPLICABILITY:

1. Oil and grease interceptors (also referred to as OGIs or gravity grease interceptors) are required at commercial and industrial food and beverage facilities where it is necessary to capture grease, oil, and food solids before it enters the City sanitary sewer system.
2. This standard applies to all new construction, tenant improvements, remodels, and existing systems which are in need of an upgrade. OGIs must be installed outdoors or in a location outside of the food preparation area.
3. OGIs will be sized from information submitted on the facility's wastewater discharge application. Sizing criteria shall follow California Plumbing Code, Chapter 10. Gravity grease interceptors shall have a minimum retention time of 30 minutes and be a minimum size of 500 gallons.

SIZING CRITERIA:

1. OGI size shall be determined as follows:

<u>Drainage Fixture Units (DFUs)</u>	<u>OGI Size (gallons)</u>
≤ 8	500
21	750
35	1000
90	1250
172	1500
216	2000
307	2500
342	3000
428	4000
576	5000
720	7500

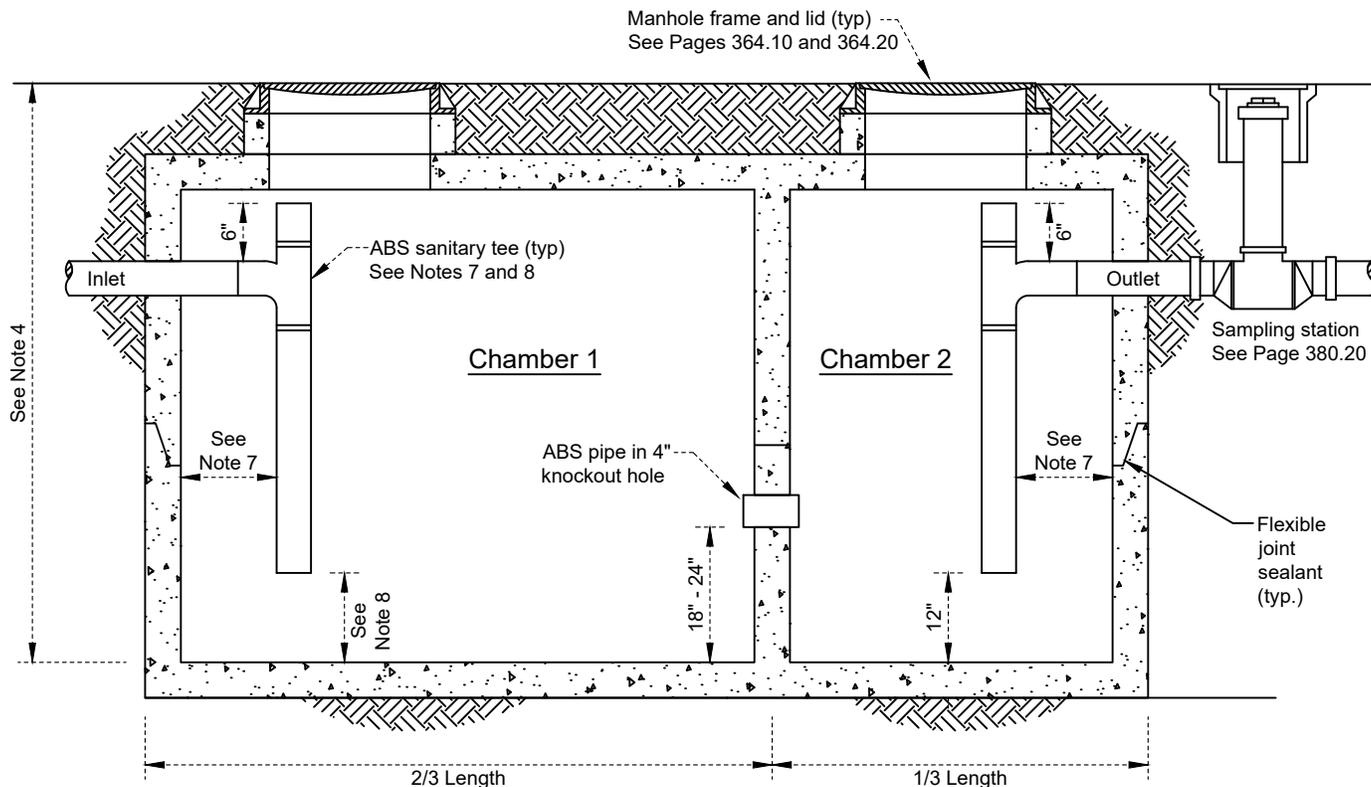
2. The minimum OGI size allowed by the City is 500 gallons. For very large facilities, the size will be established on a case by case basis. For OGIs larger than 3,000 gallons, multiple OGIs shall be installed in series to facilitate complete maintenance pumping (i.e. two 2,500 gallon OGIs shall be used when a total of 5,000 gallon capacity is required).

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
				OIL AND GREASE INTERCEPTORS (OGI) APPLICABILITY AND SIZING	City Engineer _____ Date
					Date: 09/2023 Dwg No.: Scale: None 380.03
REVISION	BY	APPROVED	DATE		

DESIGN:

1. OGI construction shall include a sample monitoring station.
2. All food wastes shall be screened and disposed of as solid waste. Garbage disposals are strongly discouraged; however, where disposals are installed, they shall be plumbed to the OGI.
3. If an existing OGI is undersized but is otherwise structurally sound and installed properly, a business or owner may install an additional OGI in series with the existing OGI to satisfy the total capacity requirement.
4. Sanitary tees shall be installed at the inlet and outlet of each OGI. The sanitary tee shall be installed so the top opening of the sanitary tee is visible and accessible from the manhole lids.
5. The OGI shall be installed as shallow as possible. The bottom of the OGI shall not be greater than 15 feet below grade to facilitate routine pumping, and the installation shall not exceed the tank manufacturer's design criteria for maximum cover (top of tank to grade).
6. No more than 24" of grade rings shall be used for an OGI installation. An eccentric concrete cone or reducing top (36" to 24" manhole or 48" to 24" manhole) shall be used if the top of the OGI is more than 24 " below finished grade (see Pages 360.10 and/or 360.20).
7. Manhole lids for OGIs shall not be bolted down.
8. All OGIs shall be properly installed and maintained. All internal plumbing of proper design and length shall be in place at all times. OGIs are required to be pumped when 25% of the internal capacity is occupied by oils, grease, or solids. Pumping is typically required every 3 months depending on use. OGI pumping is the responsibility of the business operator unless other agreements have been made between the business operator and property owner or property manager. The City shall not be responsible for maintenance or pumping of private OGIs.
9. Hydromechanical grease interceptors or other pre-manufactured devices shall only be allowed where space or other design constraints prohibit the installation of an OGI. The use of alternate devices shall be approved by the City Engineer prior to implementation. Design specifications for pre-manufactured devices shall be submitted with the wastewater discharge application, and details of the alternate system shall be included with the improvement plans.
10. OGIs and alternate devices may be inspected by the City to ensure proper installation and maintenance.
11. Sludge and other waste hauling manifests related to OGI pumping shall be retained for a minimum of 3 years, or as required by the Health Department.

				CITY OF SHASTA LAKE Public Works Department STANDARD DRAWING	Approved:  09-30-2023	
					City Engineer _____ Date _____	
				OIL AND GREASE INTERCEPTORS (OGI) DESIGN REQUIREMENTS	Date: 09/2023	Dwg No.:
					Scale: None	380.04
REVISION	BY	APPROVED	DATE			



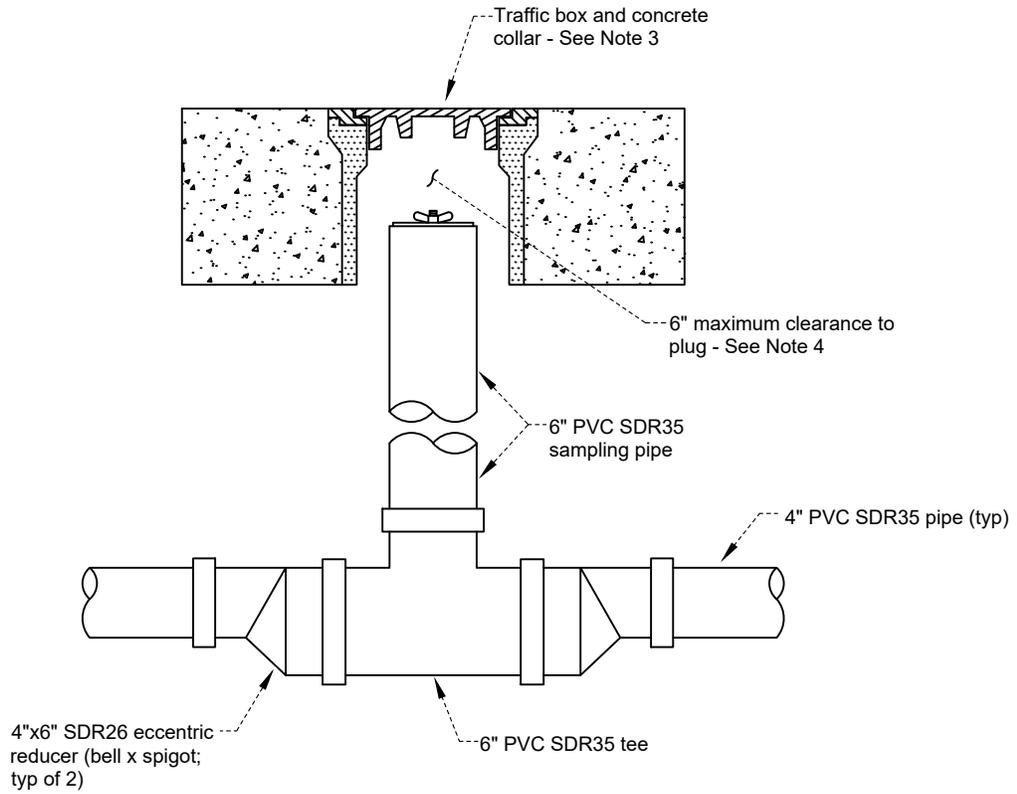
NOTES:

1. Interceptor tank shall have a minimum wall thickness of 3".
2. Interceptors that may be exposed to traffic loading shall be designed to AASHTO HS20-44 loading.
3. Structure backfill shall conform to Page 610.20.
4. The bottom of the SOI / OGI shall not be greater than 15 feet below grade, and the installation shall not exceed the tank manufacturer's design criteria for maximum cover (top of tank to grade).
5. No more than 24" of grade rings shall be used for a SOI / OGI installations. An eccentric concrete cone or reducing top (36" to 24" manhole or 48" to 24" manhole) shall be used if the top of the SOI / OGI is more than 24 " below finished grade (see Pages 360.10 and/or 360.20). If eccentric cones are installed, the vertical wall shall be over the inlet and outlet ends of the tank.
6. Inlet and outlet plumbing shall be secured in place with non-shrink grout. Sanitary tees shall be glued to the inlet and outlet plumbing.
7. ABS sanitary tees shall be aligned with the edge of the access cover to allow for maintenance cleaning.
8. OGIs shall have 12" clearance below the inlet sanitary tee. SOIs shall have 24" clearance below the inlet sanitary tee.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department
STANDARD DRAWING
SAND AND OIL (SOI) /
OIL AND GREASE (OGI) INTERCEPTOR

Approved: <i>WST</i>		Date: 09-30-2023
City Engineer	Date	
Date: 09/2023	Dwg No.:	
Scale: None	380.10	



NOTES:

1. Backfill material shall conform to Page 610.10.
2. All fittings shall be gasketed.
3. Traffic box and concrete collar installation shall conform with Page 612.10.
4. Plug shall be a mechanical gasketed end-of-pipe plug with wing nut (Cherne Industries or approved equal).

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SAMPLING STATION

Approved:

09-30-2023

City Engineer

Date

Date: 09/2023

Dwg No.:

Scale: None

380.20

MATERIALS

All pipe, fittings, valves, devices, appurtenances, and materials shall be lead free in accordance with the requirements of Section 116875 of the California Health and Safety Code.

1. Pipe

A. Services:

1. Minimum service size shall be 1". Service size shall be contingent on meeting fire flow requirements.
2. Service sizes up to 2" shall be 200 PSI polyethylene tubing (CTS) meeting the requirements of ASTM D2737, AWWA C901, and NSF 14 and 61.

Design and Construction Notes:

- a. 1" taps shall be a minimum of 2' apart. Taps larger than 1" shall be a minimum of 4' apart. All taps shall be a minimum of 4' from any joint, fitting, or coupler.
- b. Services shall consist of a continuous run of tubing from the main to the angle stop at the meter.
- c. Pipe materials used for the connection between meters and backflow prevention devices shall conform to Pages 431.10, 431.20, or 431.30.

B. Water Mains:

1. Minimum water main size shall be 8". Pipeline size shall be contingent on meeting fire flow requirements.
2. 8" through 18" water mains shall be either Pressure Class 350* ductile iron pipe (DIP) per AWWA C151 or DR 18* PVC C900 per AWWA C900.
3. Water mains larger than 18" shall be Pressure Class 350* ductile iron pipe per AWWA C151.
4. Water main sizing shall conform to the City of Shasta Lake Water Master Plan (where applicable) or as approved by the City Engineer.
5. DIP shall be cement mortar lined and bituminous coated per AWWA C104 and C153.

* Class rating subject to change based on pressure, separation, and other requirements.

Design and Construction Notes:

- a. Typical trench section, depths, and backfill shall conform to Page 610.10.
- b. Pipeline separation between potable water and non-potable pipelines shall conform to Page 661.01 and Page 661.02.
- c. System design layout, pipe sizing, and construction specifications shall be included with preliminary and final improvement plans.
- d. Localized distribution systems shall be allowed no more than two (2) transmission main connections, with all connection locations and configurations being approved by the City Engineer. All water services, fire hydrant runs, blowoffs, and other appurtenances shall only be connected to distribution mains.
- e. PVC C900 pipe shall not be stored or handled in a manner that will permit prolonged exposure to sunlight or high temperatures for extended periods.
- f. Where corrosive soil conditions exist (as determined by a geotechnical report or where petroleum odor exists in the trench):
 - i. PVC C900 shall not be installed.
 - ii. Buried DIP shall be tube encased with 8-mil polyethylene plastic per AWWA C105. Joints shall be securely sealed with adhesive tape.

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023
				WATER MATERIALS and DESIGN / CONSTRUCTION CRITERIA	City Engineer _____ Date _____
REVISION	BY	APPROVED	DATE		Date: 09/2023 Scale: None

MATERIALS (continued)

2. Fittings

A. General:

1. All miscellaneous fittings for water mains shall be ductile iron (DI) and shall conform to AWWA C110 or C153 for sizes 3" through 48".
2. DI fittings shall be cement mortar lined and bituminous coated per AWWA C104 and C153.
3. All exterior surfaces of all fittings shall have a petroleum asphaltic coating approximately 1 mil thick.
4. Bolts and nuts shall be low alloy steel with zinc coating/plating or stainless steel such that the bolts are cathodic to the coupling.

Design and Construction Notes:

- a. All exposed nuts and bolts shall be sprayed with rubberized undercoating, and all fittings (including joint restraints, service saddles, and valves) shall be wrapped with 6-mil polyethylene plastic and securely taped closed in accordance with AWWA C105.
- b. All mechanical joints shall be restrained.

B. Joint Restraints:

1. All joint restraint glands and harnesses shall be of DI casting, shall be of the type and size to fit the pipe being used (cast iron OD), shall have a pressure rating at least equal to that of the appurtenance the gland or harness is attaching to, and shall be capable of restraining joints that are fully deflected within the guidelines of AWWA C600 or C900 as applicable.
2. Mechanical joint restraint glands shall consist of one restraint gland coated with shopcoat, one wedge pie gasket, and nuts and t-bolts as needed, shall be capable of restraining standardized mechanical joint bells that conform to the requirements of AWWA C151 for sizes 3" through 64", and shall employ radial restraining pads with torque-off bolts. Full-circumference restraint rings are not allowed.
3. Bell and spigot restraint harness assemblies shall consist of two restraint glands coated with shopcoat and restraining rods (quantity as required). The bell-end gland shall either be full-circumference plain-ring gland (with no restraint grooves) or a half-circumference split-ring gland (with restraint grooves). The spigot-end gland shall be half-circumference split-ring gland with restraint grooves. Restraint glands shall employ either radial restraining pads with torque-off bolts or half-circumference restraint grooves.
4. Mechanical joint restraint fittings shall be EBAA Iron Series 1100 or 2000PV Megalug, Romac RomaGrip or PVC Romagrip, Sigma One-Lok, or approved equal. Restraint harnesses for bell and spigot connections shall be EBAA Iron Series 1500TD or 1900, Romac 600 series, Sigma PV-LOK, or approved equal.

C. Plain-End Couplers

1. Plain-end pipe couplers shall be sized based on the measured outside diameter (OD) of the pipes to be coupled and shall conform to AWWA C219.
2. Extended range (single adjustable gasket) couplers conforming to AWWA 219 shall be acceptable, as long as the gasket ranges of the coupler ends accommodate the measured OD of both pipes being coupled.
3. Couplers shall be ductile iron or steel and shall be fusion bonded epoxy or nylon coated.
4. Where joint restraint is required for plain-end pipe joints, integrated restraint plain-end couplers shall not be used. Where required, restraint harnesses shall be installed over the plain-end coupler (see Section 2 above).
5. Plain-end couplers shall be Romac 501 or XR501 series, Romac Macro HP, Smith Blair 411 or 441 series, or approved equal.

D. Flanged Coupling Adapters (FCA) and Restrained Flanged Coupling Adapters (RFCA)

1. FCAs and RFCAs shall be sized based on the measured outside diameter (OD) of the pipe to be coupled and shall conform to AWWA C219.
2. Extended range (single adjustable gasket) FCAs conforming to AWWA 219 shall be acceptable, as long as the gasket range of the coupler end accommodates the measured OD of the pipe being coupled.
3. Couplers shall be ductile iron or steel and shall be fusion bonded epoxy or nylon coated.
4. FCAs and RFCAs shall be Romac FCA501 series, Romac Macro HP FC series, Romac RFCA (DI and steel pipe), Romac RFCA-PVC (PVC C900), EBAA 2100 Series, or approved equal.

				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer Date	
				WATER MATERIALS and		Date: 09/2023 Dwg No.:	
				DESIGN / CONSTRUCTION CRITERIA		Scale: None 400.02	
1		W. Bond	12/24				
REVISION	BY	APPROVED	DATE				

MATERIALS (continued)

3. Valves

A. Resilient Wedge Gate Valve (RWGV)

1. RWGV 2" through 24" shall conform to AWWA C509 or C515 and shall be NSF 61 certified.
2. Valve bodies shall be iron, and interior and exterior surfaces shall be coated with fusion bonded epoxy in accordance with AWWA C550.
3. Wedge shall be symmetrical and fully encapsulated with molded rubber.
4. RWGV shall have a non-rising stem (NRS) and open to the left.
5. Buried valves shall have a 2" square operating nut; exposed valves shall be hand wheel operated.

B. Butterfly Valve (BFV)

1. BFV 16" and larger shall conform to AWWA C504, Class 150B and shall be NSF 61 certified.
2. Valve bodies shall be iron, and interior and exterior surfaces shall be coated with fusion bonded epoxy in accordance with AWWA C550.
3. BFV shall be rubber seated. Disc edge shall be stainless steel.
4. BFV shall have a non-rising stem (NRS) and open to the left.
5. Buried valves shall have a 2" square operating nut; exposed valves shall be hand wheel operated.

Design and Construction Notes:

- a. The use of butterfly valves in place of RWGV shall be approved by the City Engineer prior to inclusion in the project.
- b. Above-ground BFV used at well sites, pump stations, and backflow devices may require Outside Screw and Yoke (OS&Y) rising stem operation.

C. Angle Meter Stop, Corporation Stop, and Curb Stop

1. All stops shall be full port ball valves, shall be lead-free, shall be NSF 61 certified, and shall be A.Y. McDonald, Ford, Jones, Mueller, or approved equal.
2. Angle stops shall have locking wings and shall be compression CTS x meter.
3. Corporation stops shall be AWWA taper thread x compression CTS.
4. Stainless steel insert stiffeners shall be used for all water service tubing connections.

D. Blowoff Valve

Blowoff valves shall be A. Y. McDonald model #76109BF or approved equal.

E. Combination Air / Vacuum Valve (CAVV)

1. CAVV shall have an iron body, a stainless steel float and trim, and a Buna-N seat or seal, and shall conform to AWWA C512.
2. CAVV shall be APCO, Valmatic, or approved equal.

4. Backflow Prevention Assembly

The City of Shasta Lake water utility requires backflow prevention assemblies to be installed as point of connection protection for the city's water distribution system where required by the City Engineer. These locations typically include, but are not limited to, commercial and industrial land uses, connections used for landscape irrigation purposes, properties with both City water service and wells, locations with booster pumps, etc. All new construction and renovation permits will be evaluated by the City to evaluate the degree of cross-connection hazard and determine when the installation of backflow prevention assemblies will be required.

Additionally, all connections to the City of Shasta Lake water distribution system for construction water purposes shall require the installation of a backflow prevention assembly provided by the City. The Contractor shall contact the City of Shasta Lake Public Works Department for additional information and current deposit and usage costs. Filling an untested or unapproved pipeline by opening gate valves connected to the City water system is not allowed.

Backflow prevention assemblies shall consist of a reduced pressure principle or double check assemblies. Assemblies shall be Febco, Watts, Wilkins, or approved equal.

				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer _____ Date _____	
				WATER MATERIALS and		Date: 09/2023 Dwg No.:	
				DESIGN / CONSTRUCTION CRITERIA		Scale: None 400.03	
REVISION	BY	APPROVED	DATE				

MATERIALS (continued)

5. Water Service Saddles

Water service saddles shall have ductile iron bodies and stainless steel straps, shall be capable of withstanding 150 psi internal pressure without leakage or overstressing.

Saddle bodies shall be either epoxy or nylon coated, and taps shall have iron pipe (IP) threads.

Service saddles shall be Ford FC 202 series, Smith Blair 317 series, Romac 202 NS series, or approved equal.

NOTE: For tapping saddles, see Page 400.40.

6. Fire Hydrants

Fire hydrants shall be dry barrel and shall conform to AWWA C502. All parts and accessories purchased for fire hydrants shall be manufactured and warranted by the hydrant manufacturer.

Fire hydrants shall have 5 1/4" main valve opening, two 2 1/2" hose nozzles and one 4 1/2" pumper nozzle, shall have a 1 1/2" pentagon operating nut, shall open left, and shall be painted red.

A blue retroreflective pavement marker shall be placed 1' off the centerline of the street on the hydrant side. See Page 100.00 for additional information.

Fire hydrants shall be Mueller Super Centurion A423 - 250, American AVK series 2780, Clow Medallion, or approved equal.

7. Water Meter Boxes

Meter Size	Box Size (min)	Cook Concrete ID*	Christy ID*
1"	11 3/4" x 22"	#1.2 Box	B16
1 1/2"	13 1/4" x 24 1/4"	#1.5 Box	N30
2"	17" x 30"	#2.0 Box	N36

* or Approved Equal

Design and Construction Notes:

- Generally, meter box lids shall be reinforced concrete with an AMR antenna hole.
- In driveways, areas with rolled curb, and other locations where vehicle traffic is possible over the box, meter box lids shall be HS-20 steel checker plate.
- Boxes and vaults for meters larger than 2" shall be approved by the City Engineer.

8. Traffic Box

Traffic boxes shall be concrete with cast iron lid and box trim. Extensions shall be either 8" PVC C-900 or 8" PVC SDR-35 pipe.

Traffic boxes shall be Christy G5 or approved equal.

9. Combination Air / Vacuum Valve Enclosure

A. Above ground assemblies:

- Above ground CAVV enclosures shall be fully accessible rectangular steel (14 gauge minimum) powder-coated insulated structures. There shall be no exterior hinges or anchor fasteners, and the door shall have a recessed lock. Structure shall have a continuous air gap at the base frame, and the top shall be crowned to allow for drainage.
- Above ground CAVV enclosures shall be Placer Waterworks SJARVW or approved equal.

B. Below ground assemblies:

- Below ground CAVV enclosures shall consist of concrete boxes with steel lids and riser pipes. Boxes shall be sized as follows:

Meter Size	Box Size (min)	Cook Concrete ID*	Christy ID*
2", 3", 4"	17" x 30"	#2.0 Box	N36
6", 8"	30" x 48"	#4.0 Box	N48

* or Approved Equal

- Lids shall be powder-coated steel checker plate and be sized to fit the concrete box. A 5 1/2" x 5 1/2" air vent tube opening shall be integrated into the lid, and a 6" x 8" x 18" power-coated air release vent tube riser shall be attached with welded hold-down nuts.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

STANDARD DRAWING

**WATER MATERIALS and
DESIGN / CONSTRUCTION CRITERIA**

Approved:  09-30-2023
City Engineer _____ Date _____

Date: 09/2023 Dwg No.: 400.04
Scale: None

MATERIALS (continued)

9. Combination Air / Vacuum Valve Enclosure (continued)

B. Below ground assemblies (continued):

3. Below ground CAVV enclosure lid assemblies shall be Placer Waterworks 218 lid with AV18-M vent tube riser or approved equal.

10. Trace Wire and Warning Tape

Trace wire and warning tape shall be installed on all water pipelines and shall conform to Page 608.00. Trace wire branches shall terminate inside traffic boxes and enclosures.

11. Rubberized Undercoating

Prior to thrust block placement and/or trench backfill, all buried nuts and bolts on appurtenances shall be sprayed with rubberized undercoating.

12. Pipe and Fittings Wrap

Prior to thrust block placement and/or trench backfill, all buried appurtenances shall be wrapped with 6-mil polyethylene plastic and securely taped closed in accordance with AWWA C105.

13. Reflective Tape

4" wide white reflective tape shall be applied to all above ground enclosures. Reflective tape shall be 3M Prismatic Conspicuity Tap Series 983 or approved equal.

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
				WATER MATERIALS and DESIGN / CONSTRUCTION CRITERIA	City Engineer _____ Date
					Date: 09/2023 Dwg No.: Scale: None 400.05
REVISION	BY	APPROVED	DATE		

CONTRACTOR QUALIFICATIONS FOR POTABLE WATER PROJECTS

All Contractors bidding on or performing work within the City of Shasta Lake involving connections to, or modifications of, the City's potable water distribution system shall carry a Water Distribution Operator, Grade 2 certification, and shall be required to maintain active certification throughout the entire duration of the project.

All work on new or existing potable systems shall be performed under the DIRECT SUPERVISION of the certified Operator employed by the Contractor. Note that this requirement applies to work performed on the City's system by a Contractor under contract with the City as well as with a private developer or property owner.

Examples of work that would require certification include, but are not limited to:

- Water distribution or transmission main installation, extension, or replacement
- Water main fitting, valve, or fire hydrant installation or replacement
- Miscellaneous work that involves depressurizing existing water mains for any reason

Contractors wishing to obtain certification shall contact the California Department of Public Health (CDPH). Contractors shall be aware that the certification process takes several months, due to exam scheduling requirements. Additional information can be obtained through the following website link:

https://www.waterboards.ca.gov/drinking_water/certlic/occupations/DWopcert.html

Effective Date 01/01/15

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 _____ Date
				STANDARD DRAWING	City Engineer _____ Date
				CONTRACTOR QUALIFICATIONS FOR POTABLE WATER PROJECTS	Date: 09/2023 Dwg No.: Scale: None 400.10
REVISION	BY	APPROVED	DATE		

WATER MAIN ACCEPTANCE - DISINFECTION AND BACTERIOLOGICAL TESTING

AWWA C651 (latest revision) presents essential procedures for disinfecting new or repaired water mains. All new water mains shall be disinfected before they are placed into service. All water mains taken out of service for inspection, repair, or other activity that might lead to contamination of water shall be disinfected before they are returned to service. Bacteria test results shall be approved by the City Engineer prior to placing the main into service.

The City requires that new water mains be disinfected by the introduction of chlorine such that the final solution should have a residual of 25 mg/l (25 ppm) and shall remain in contact for a minimum of 24 hrs. This may be accomplished by the tablet method on small diameter mains, which is described as follows. Other chlorination methods as described in AWWA C651 may be used with prior approval from the City Engineer.

1. 5-gram calcium hypochlorite tablets shall be placed in the upstream end of each section of pipe to be disinfected, per the table below. At least one tablet shall be placed in each hydrant branch and in other appurtenances. The tablets shall be attached by an NSF/ANSI 61 approved adhesive on the inside/top of the pipe. There shall be no adhesive on the tablet, except on the broad side attached to the surface of the pipe. If the tablets are attached before the pipe section is placed in the trench, their position shall be marked on the section, so it can be readily determined that the pipe is installed with the tablets at the top.

A chlorine concentration requirement of 25 mg/l (25 ppm) can be achieved as follows for both PVC C900 and Ductile Iron pipe using tablets containing 3.25-g of available chlorine per tablet:

<u>Pipe Diameter</u>	<u>Tablets per Nominal Pipe Lay Length</u>
4"	1
6"	1
8"	2
10"	3
12"	4

2. When installation has been completed, the main shall be filled slowly with water at a rate such that water within the main will flow at a velocity no greater than 1 ft/sec. Precautions shall be taken to assure that air pockets are eliminated. This water shall remain in the pipe for at least 24 hours. Valves shall be positioned such that the strong chlorine solution in the treated main will not flow into water mains in active service. After the required 24-hour soak period, CoSL Public Works will check that the free chlorine residual is 0.2 mg/l (0.2 ppm) or greater at each sampling point. If the residual is less than 0.2 mg/l (0.2 ppm), the disinfection process shall be repeated using alternate provisions listed in AWWA C651.
3. Following successful chlorine dosing, heavily chlorinated water shall then be flushed from the main, fittings, valves, and branches (see "Dewatering" below) until chlorine measurements show that the chlorine residual in the water leaving the main is equal to that of the surrounding area of the distribution system.
4. After flushing, CoSL Public Works will take an initial set of bacteriological samples and resample again after letting the main sit, with no water use, for a minimum of 16 hours. Samples shall be collected every 1,200 ft of the new water main, plus one set from the end of the line and at least one from each branch greater than one pipe length. Both sets of samples must pass for the main to be approved for release into the active water system. Alternate bacteriological testing options as listed in AWWA C651 may be used at the discretion of CoSL Public Works, as approved by the City Engineer.
5. At water tie-ins less than one pipe length (20') long, minimum disinfection shall be achieved by spray disinfecting or swabbing the new pipe sections and fittings with a 5%-minimum hypochlorite solution before installation and flushing the main from both directions, if possible, before returning the system to service.

FLUSHING

All flushing flows from pipelines shall be completely dechlorinated prior to release to the ground surface, and shall be released such that erosion and flooding of adjacent areas is avoided. Flushing into the City of Shasta Lake wastewater collection system shall require prior approval from the City Engineer.

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
REVISION	BY	APPROVED	DATE		

WATER MAIN ACCEPTANCE - HYDROSTATIC PRESSURE TESTING

Hydrostatic pressure and leakage testing of new water mains shall be successfully performed prior to placing new pipelines into service. Testing shall be performed using potable water from a fire hydrant equipped with a meter and backflow preventer (see Page 400.03). Upon approval of the City Engineer, hydrostatic pressure testing may be performed during the 24-hour soak period of bacteriological testing (see Page 400.20, Step 2).

The Contractor shall conduct combination hydrostatic pressure and leakage testing in accordance with AWWA C600 or C605 (as applicable) on all new water mains, new water services, and temporary water service piping, and shall furnish all necessary equipment and material to complete the work, including a hydraulic force pump with a calibrated test gauge. The City Engineer shall monitor the test, and shall witness all gauge calibrations.

On buried pipelines, the Contractor may, if field conditions permit, partially backfill the trench and leave the joints open for inspection and conduct an initial pressure test to satisfy himself that the pipeline will pass. However, the acceptance test on buried water mains shall only be conducted once all backfilling has been completed. On exposed water mains, the acceptance test shall be conducted after the piping has been completely installed, including all supports and hangers.

The test pressure shall not be less than 150 psi at any location, and the test pressure shall not be less than 1.25 times the working pressure at the highest point along the test section. Contact the Public Works Department at (530) 275-7400 to obtain working pressures for specific locations.

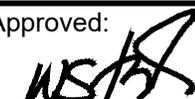
Hydrostatic pressure and leaking testing shall be conducted as follows:

1. After the pipeline has been installed, backfilled, and compacted, the Contractor shall conduct a combination hydrostatic pressure and leakage test of the pipeline between each valve section or pipe run as determined by the City Engineer. The pipe shall be slowly filled with water so that as much air as possible is removed, and the pipe shall be tested at the location and to the test pressure in the approved calculations for a minimum of two hours.
2. Leakage shall not exceed the allowable leakage calculated as follows:

$$L = \frac{S \cdot D \cdot \sqrt{P}}{148,000}$$

where: L = Allowable leakage, gallons per hour
 S = Length of pipeline tested, feet
 D = Nominal diameter of pipe, inches
 P = Average test

3. When the pressure test is conducted against closed metal-seated valves, an additional leakage allowance of 0.0078 gal/hour/nominal valve diameter (inches) for each closed valve within the section being tested shall be made.
4. If the pressure test discloses leakage greater than that allowed, the Contractor shall at his sole expense locate and repair the defective joints until the leakage is within the specified allowance. After the defects are corrected, the pressure test shall be repeated per the process listed above. This process shall be repeated as necessary until the new water main passes the pressure test.

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
				WATER MAIN ACCEPTANCE HYDROSTATIC PRESSURE TESTING	City Engineer _____ Date
					Date: 09/2023 Dwg No.: Scale: None 400.30
REVISION	BY	APPROVED	DATE		

OPERATION OF MAIN LINE WATER VALVES

Existing gate valves shall be turned only by City of Shasta Lake personnel. The Contractor shall not turn any gate valve not installed by him or her during the course of the project, unless specifically authorized in writing to do so by the City Engineer.

WATER MAIN SHUTDOWN PROCEDURES

1. Water main shutdowns may be required to install piping or appurtenances. Note that certification may be required to perform the work - see Page 400.10.
2. To schedule a shutdown or operation of distribution system valves by the City, the Contractor shall contact Public Works at least one (1) week in advance of the shutdown - 530.275.7400.
3. The Contractor will be required to coordinate the shutdown with the City, and to notify all affected customers at least two (2) full working days in advance of a shutdown. Public Works will assist the Contractor with identifying the limits of the shutdown area.
4. Shutdowns shall last no longer than 4 hours, unless otherwise approved by the City Engineer.

				CITY OF SHASTA LAKE Public Works Department	Approved: 	
					STANDARD DRAWING	09-30-2023 Date
				OPERATION OF MAIN LINE VALVES WATER MAIN SHUTDOWN PROCEDURES	City Engineer _____ Date _____	
					Date: 09/2023	Dwg No.:
REVISION	BY	APPROVED	DATE		Scale: None	400.40

MAIN LINE HOT TAPS ON WATER DISTRIBUTION SYSTEM

1. Hot taps are allowed on PVC C900, ductile iron, cast iron, asbestos cement, and steel main line pipe. Pipe OD shall be measured at the tap point to ensure a proper fit for the tapping sleeve.
2. Hot taps are not allowed whenever the tap diameter of the service line is greater than three-quarters (3/4) of the diameter of the main. Maximum tap sizes are 4" tap on 6" main, 6" tap on 8" main, 8" tap on 12" main, 12" tap on 16" main, and 12" tap on 18" main.
3. Hot taps are not allowed within four feet of joints, fittings, or service taps. Pipe shall be exposed by the Contractor for confirmation of spacing.
4. The Contractor shall have the tapping sleeve and valve fully installed with concrete support under the valve prior to inspection. The installation shall be approved by the City Engineer prior to making the tap.
5. Tapping sleeves shall have a stainless steel body, a stainless steel or ductile iron flange, and shall meet the requirements of AWWA C223. Approved tapping sleeves include Ford FAST, Romac SST, or approved equal.
6. Tapping sleeves shall be air-pressure tested at 50 psi to ensure a leak-free fit prior to tapping.
7. Exterior coatings that are removed or damaged during sleeve installation or the tapping process shall be replaced. Epoxy coatings shall be replaced with 3M Scotchkote 323 liquid epoxy or approved equal. Bituminous coatings shall be replaced with rubberized undercoat.
8. Valves used for hot tapping shall be either resilient wedge gate valves or valves specifically designed for hot taps, and shall be approved by the City Engineer.

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
				MAIN LINE HOT TAPS	City Engineer _____ Date
					Date: 09/2023 Dwg No.: Scale: None 400.50
REVISION	BY	APPROVED	DATE		

ABANDONING WATER MAINS AND SERVICES

Generally, existing water main piping (including services) being taken out of service shall be removed and disposed of. Existing water mains shall only be abandoned in place if specifically shown on the Plans or approved by the City Engineer.

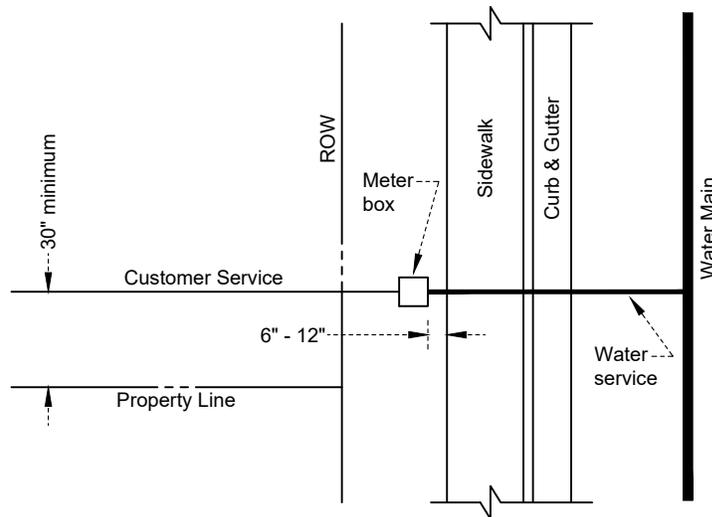
Pipelines shall not be abandoned until their use is no longer required. The Contractor shall notify the Engineer in advance of any intended pipe abandonment. All existing gate valves on the pipeline being abandoned shall be closed AFTER the existing main is abandoned. The ends of pipelines being abandoned in place shall be securely closed by a tight-fitting mechanical plug, or a plug poured out of either structural concrete or slurry cement. At the direction of the Engineer, abandoned pipe which may be subjected to surge pressure shall be blind flanged and thrust blocked instead of plugged.

All unused water service(s) to a property that is to be developed or redeveloped shall be abandoned and either completely removed or plugged at the main and abandoned in place as approved by the City Engineer.

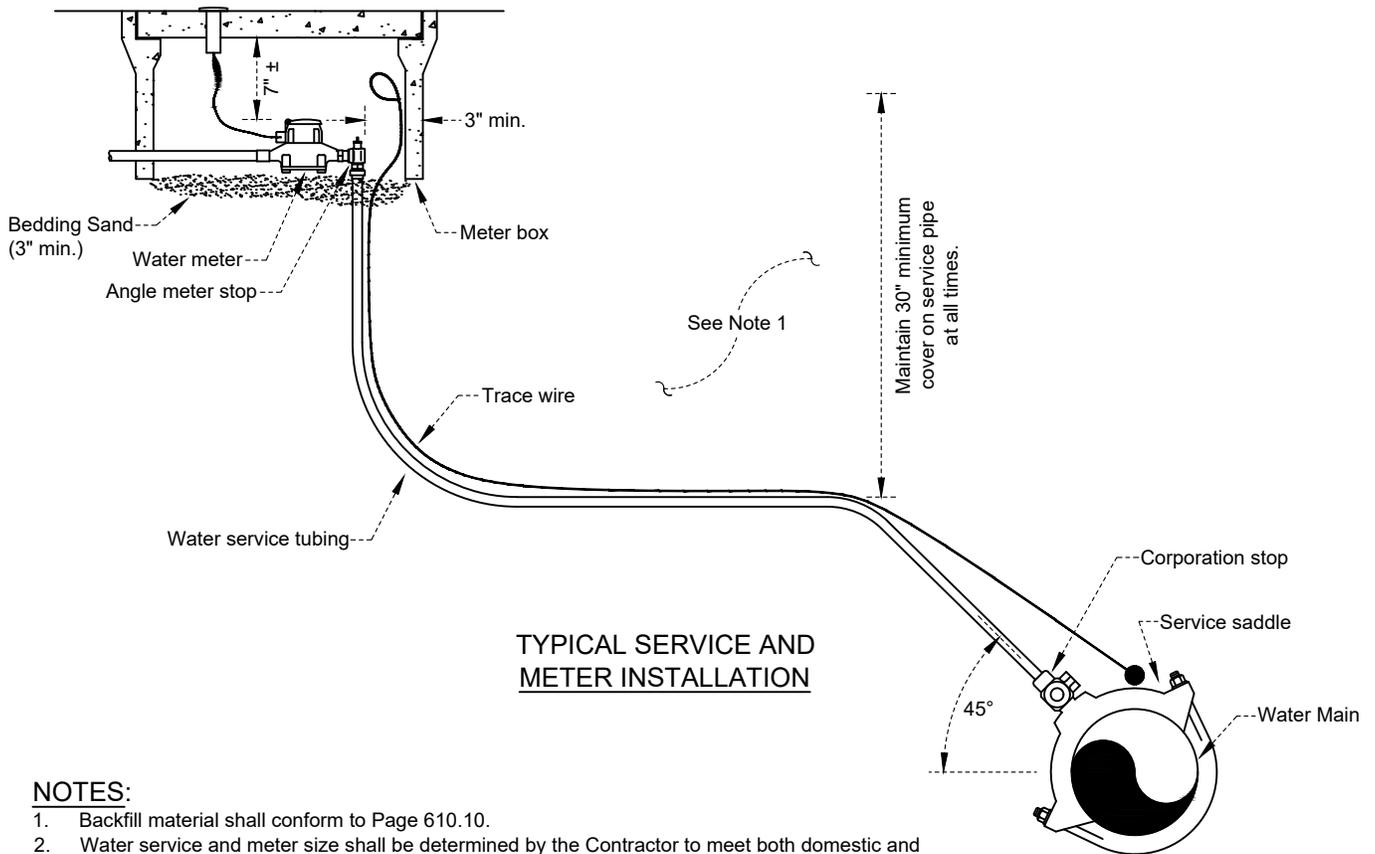
Services that are to be abandoned in place shall be disconnected from the water main. If the service was made via saddle, the Contractor shall remove the corporation stop and replace it with a brass plug. If the service was made via direct main tap, the Contractor shall remove the tap and cover the hole with a full circle repair clamp approved by the City.

The Contractor shall perform all notifications to existing customers that are affected by the shut down of the existing water main during the disconnection of the service(s) (see Page 400.40).

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 City Engineer Date
				ABANDONING WATER MAINS AND SERVICES	Date: 09/2023 Dwg No.: Scale: None 400.60
REVISION	BY	APPROVED	DATE		



SERVICE LAYOUT



TYPICAL SERVICE AND METER INSTALLATION

NOTES:

1. Backfill material shall conform to Page 610.10.
2. Water service and meter size shall be determined by the Contractor to meet both domestic and fire service demand at the same time. Minimum water service size shall be 1". Water meter shall be furnished and installed by the City of Shasta Lake.
3. Meter boxes and service piping shall be installed by the Contractor with a minimum horizontal clearance of 30" from all electrical transformers, light standards, and other utility boxes or vaults.
4. 1" and 1 1/2" service taps shall be at a 45° angle from horizontal.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**WATER SERVICE CONNECTION
SINGLE SERVICE (1" AND 1 1/2")**

Approved:

09-30-2023

City Engineer

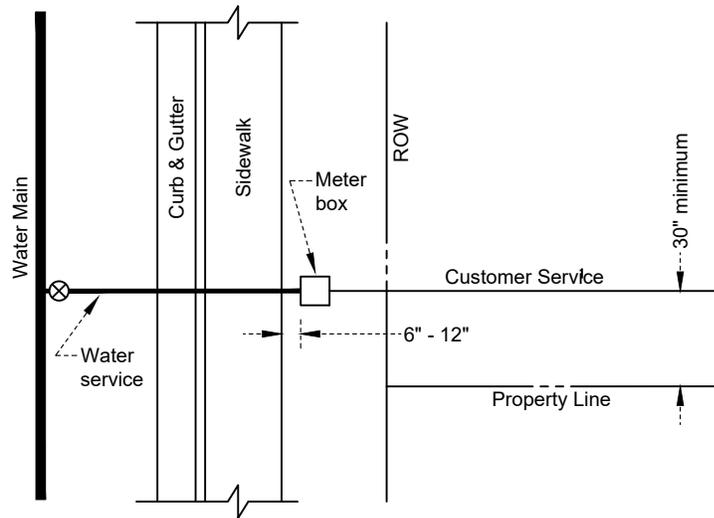
Date

Date: 09/2023

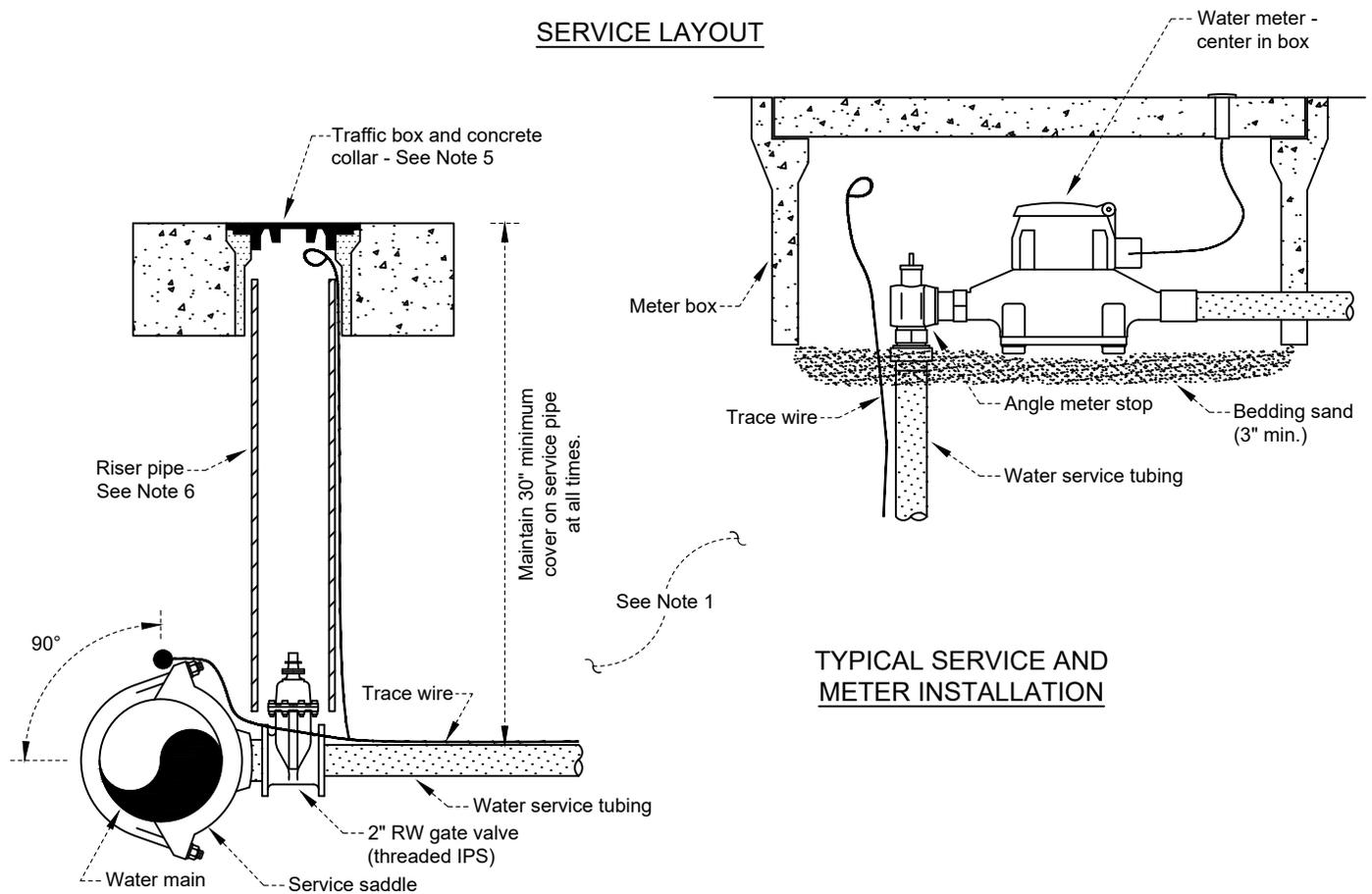
Dwg No.:

Scale: None

401.10



SERVICE LAYOUT



TYPICAL SERVICE AND METER INSTALLATION

NOTES:

1. Backfill material shall conform to Page 610.10.
2. Water meter shall be furnished and installed by the City of Shasta Lake.
3. Meter boxes and service piping shall be installed by the Contractor with a minimum horizontal clearance of 30" from all electrical transformers, light standards, and other utility boxes or vaults.
4. 2" service taps shall be installed horizontally.
5. Traffic box and concrete collar installation shall conform with Page 612.10.
6. Riser pipe shall be 8" PVC SDR35. Trace wire shall be run on the OUTSIDE of the riser pipe.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**WATER SERVICE CONNECTION
SINGLE SERVICE (2")**

Approved:

09-30-2023

City Engineer

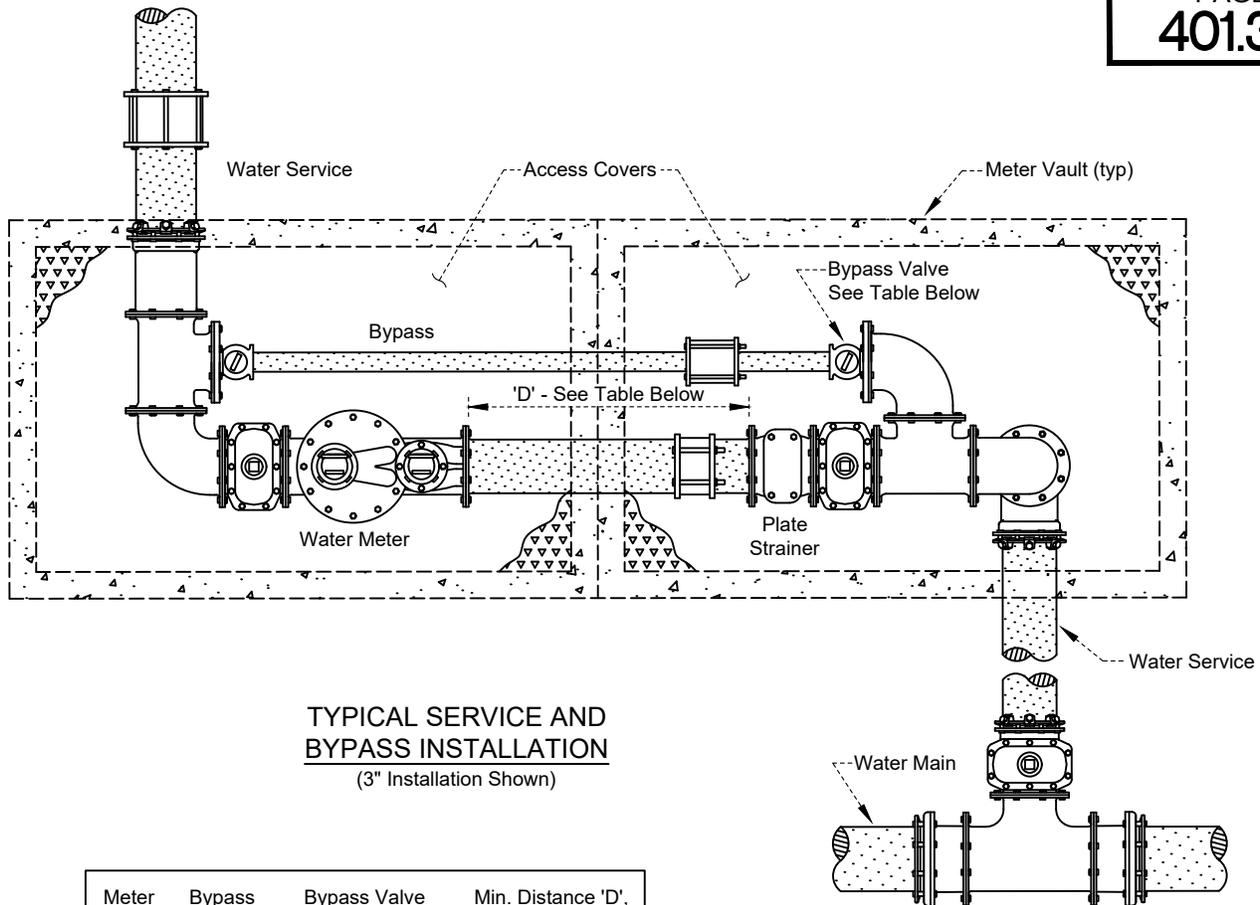
Date

Date: 09/2023

Dwg No.:

Scale: None

401.20



TYPICAL SERVICE AND BYPASS INSTALLATION
(3" Installation Shown)

Meter Size	Bypass Size	Bypass Valve Type	Min. Distance 'D', Strainer to Meter
3"	2"	Locking Curb Stop	15"
4"	4"	RWGV	20"
6"	4"	RWGV	30"
8"	6"	RWGV	40"
10"	8"	RWGV	50"

NOTES:

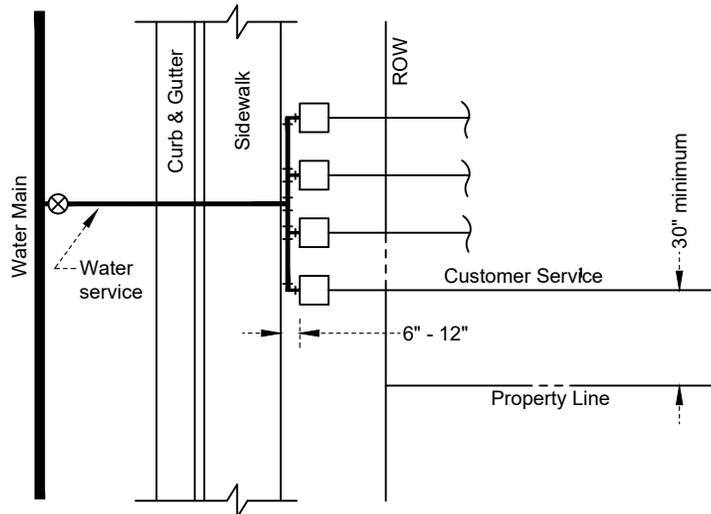
1. Backfill material shall conform to Page 610.10.
2. Vault drainage shall be provided by the Contractor.
3. Water service and meter size shall be determined by the Contractor. Water meter shall be furnished and installed by the City of Shasta Lake.
4. Meter vaults and service piping shall be installed by the Contractor with a minimum horizontal clearance of 30" from all electrical transformers, light standards, and other utility boxes or vaults.
5. Meter vault size shall be sufficient to enclose main service, bypass, and all components, and shall be approved by the City Engineer.
6. The maximum distance between the access vault lid and the top of the meter shall be 24"
7. Access covers shall provide direct access to all components for maintenance purposes. Covers shall be aluminum (non-traffic areas) or stainless steel (traffic areas), shall include lifting handles, slam locks, spring assist, and hold open latches, and shall be Halliday Products, Bilco, or approved equal.
8. Where power is available and where approved by the City Engineer, magnetic flow meters may be used for meters 8" and larger.

REVISION	BY	APPROVED	DATE

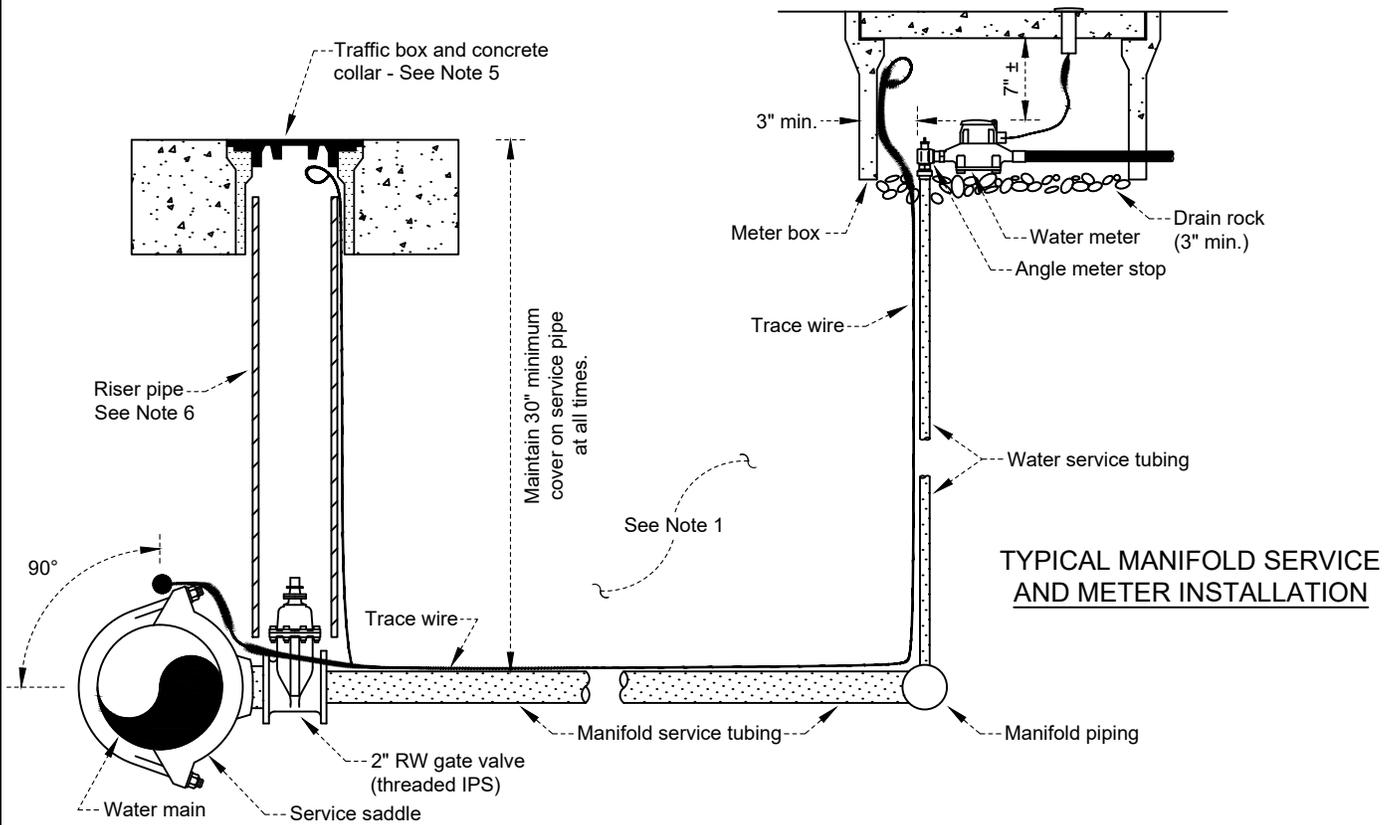
CITY OF SHASTA LAKE
Public Works Department
STANDARD DRAWING

WATER SERVICE CONNECTION
METER DETAIL - 3" AND LARGER

Approved: *WSTA* 09-30-2023
City Engineer Date
Date: 09/2023 Dwg No.:
Scale: None 401.30



MANIFOLD SERVICE LAYOUT



TYPICAL MANIFOLD SERVICE AND METER INSTALLATION

NOTES:

1. Backfill material shall conform to Page 610.10.
2. Manifold service tubing and manifold piping shall be 2" minimum, and manifold service and piping shall be the same size. Water services shall be 1" minimum. Water service and meter size shall be determined by the Contractor to meet both domestic and fire service demand at the same time. Water meter shall be furnished and installed by the City of Shasta Lake.
3. Meter boxes and service piping shall be installed by the Contractor with a minimum horizontal clearance of 30" from all electrical transformers, light standards, and other utility boxes or vaults.
4. 2" service taps shall be installed horizontally.
5. Manifolds shall be limited to four services.
6. Traffic box and concrete collar installation shall conform with Page 612.10.
7. Riser pipe shall be 8" PVC SDR35. Trace wire shall be run on the OUTSIDE of the riser pipe.

REVISION	BY	APPROVED	DATE

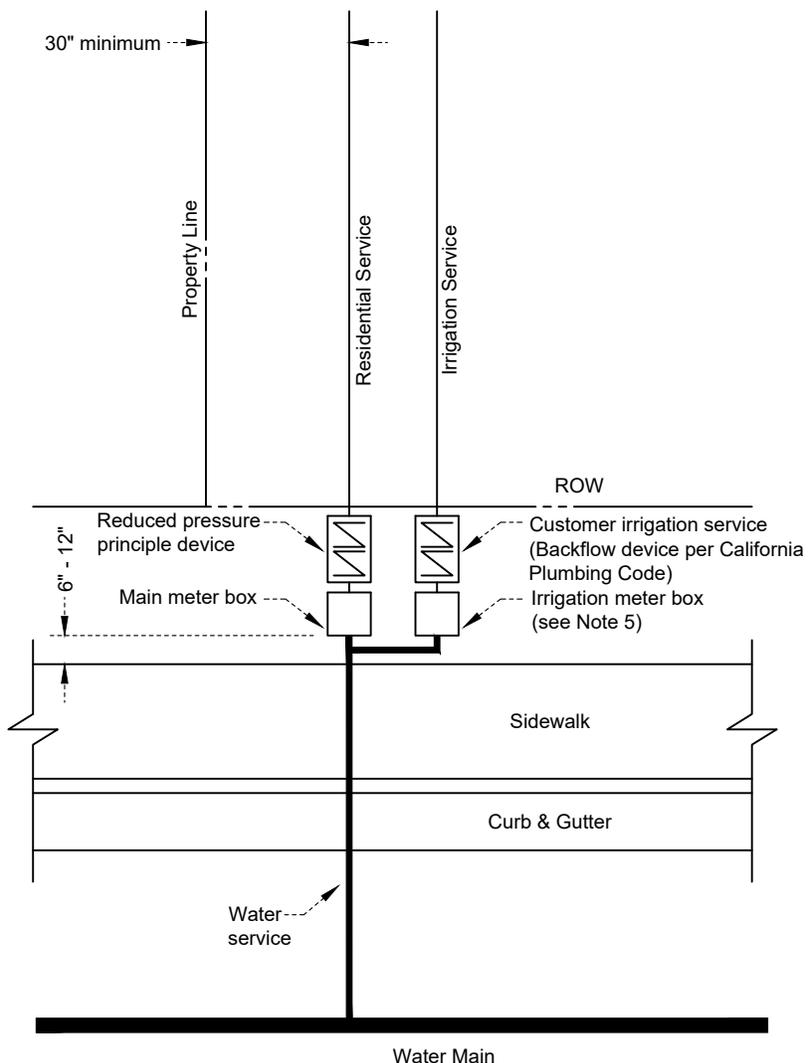
CITY OF SHASTA LAKE
Public Works Department
STANDARD DRAWING

**WATER SERVICE CONNECTION
MANIFOLD SERVICE**

Approved: *WST* 09-30-2023
Date

City Engineer _____ Date

Date: 09/2023 Dwg No.:
Scale: None 401.40



NOTES:

1. Water service shall be installed per Page 401.10.
2. Residential water service and meter size shall be determined by the Contractor to meet both domestic and fire service demand at the same time, taking into account anticipated irrigation demand. Minimum water service size shall be 1". All water meters shall be furnished and installed by the City of Shasta Lake.
3. Meter boxes and service piping shall be installed by the Contractor with a minimum horizontal clearance of 30" from all electrical transformers, light standards, and other utility boxes or vaults.
4. An approved reduced pressure principle device shall be located as close as practical (within 3') to the back of the residential water meter box.
5. Irrigation meter shall be located adjacent to the residential water meter as shown.
6. The irrigation meter size shall be equal to or less than the residential water meter.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**NON-RESIDENTIAL
IRRIGATION SUB-METER**

Approved:

09-30-2023

City Engineer

Date

Date: 09/2023

Dwg No.:

Scale: None

401.50

HORIZONTAL BENDS, DEAD ENDS, AND INLINE VALVES

Pipe Size	11¼° Bend	22½° Bend	45° Bend	90° Bend	Dead End & Inline Valve
3"	2'	3'	6'	13'	39'
4"	2'	3'	6'	14'	43'
6"	2'	4'	8'	19'	60'
8"	3'	5'	11'	25'	79'
10"	3'	6'	13'	30'	94'
12"	4'	7'	15'	35'	111'
14"	4'	8'	17'	40'	129'
16"	5'	9'	18'	44'	143'
18"	5'	10'	20'	48'	158'

Required Length of Restrained Pipe

Required Length of Restrained Pipe

REDUCERS

	3"	4"	6"	8"	10"	12"	14"	16"	18"
3"	--	14'	40'	64'	82'	101'	121'	135'	151'
4"	14'	--	31'	57'	77'	96'	117'	132'	148'
6"	40'	31'	--	33'	58'	81'	103'	120'	138'
8"	64'	57'	33'	--	32'	59'	84'	104'	124'
10"	82'	77'	58'	32'	--	33'	62'	85'	107'
12"	101'	96'	81'	59'	33'	--	33'	61'	86'
14"	121'	117'	103'	84'	62'	33'	--	33'	61'
16"	135'	132'	120'	104'	85'	61'	33'	--	32'
18"	151'	148'	138'	124'	107'	86'	61'	32'	--

Required Length of Restrained Pipe

Required Length of Restrained Pipe

TEES

Run Size

	3"	4"	6"	8"	10"	12"	14"	16"	18"
3"	1'	1'	1'	1'	1'	1'	1'	1'	1'
4"	1'	1'	1'	1'	1'	1'	1'	1'	1'
6"	18'	2'	1'	1'	1'	1'	1'	1'	1'
8"	46'	35'	13'	1'	1'	1'	1'	1'	1'
10"	68'	59'	42'	25'	6'	1'	1'	1'	1'
12"	90'	82'	68'	53'	38'	22'	8'	1'	1'
14"	111'	104'	92'	79'	66'	52'	40'	22'	6'
16"	127'	121'	110'	100'	88'	77'	66'	51'	38'
18"	143'	139'	129'	120'	110'	100'	90'	77'	65'

Branch Size

Required Length of Restrained Pipe

Required Length of Restrained Pipe

Note: All tee runs shall have 10' minimum restrained length on each side of tee.

NOTES:

- Joint restraint devices shall be used in lieu of thrust blocking for all pressure main and appurtenance installations unless design conditions require thrust blocking.
- The restrained lengths listed in the above tables are valid for the following installation conditions:
 - Soil Classification: SW (ASTM Std. D2487); Includes well-graded sands and gravelly sands with little or no fines
 - Trench Type: Type 5 (ANSI/AWWA C150/A21.50 and AWWA C605)
 - Test Pressure: 150 psi
 - Safety Factor: 2 to 1
 - Depth of Bury: 36" from surface to top of pipe
 - Pipe Type: PVC C900

Where installation conditions do not match those listed above, the required restrained lengths shall be recalculated to match the actual site conditions. All revised calculations shall be made with a test pressure of 150 psi minimum and a safety factor of 2 to 1. Revised restrained lengths shall be approved by the City Engineer PRIOR to pipe installation.
- All restraint fittings shall be factory manufactured and approved for use by the City Engineer PRIOR to pipe installation.
- All mechanical joint connections at fittings shall be restrained.

REVISION	BY	APPROVED	DATE

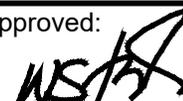
CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**THRUST RESTRAINT LENGTHS
PVC C900 PIPE**

Approved:



09-30-2023

City Engineer

Date

Date: 09/2023

Dwg No.:

Scale: None

402.10

HORIZONTAL BENDS, DEAD ENDS, AND INLINE VALVES

Pipe Size	11¼° Bend	22½° Bend	45° Bend	90° Bend	Dead End & Inline Valve
3"	1'	2'	4'	10'	22'
4"	2'	3'	5'	12'	27'
6"	2'	4'	7'	16'	38'
8"	3'	5'	9'	21'	49'
10"	3'	5'	11'	25'	59'
12"	3'	6'	12'	29'	70'
14"	4'	7'	14'	33'	79'
16"	4'	8'	16'	37'	89'
18"	4'	8'	17'	41'	98'

Required Length of Restrained Pipe

REDUCERS

	3"	4"	6"	8"	10"	12"	14"	16"	18"
3"	--	9'	26'	40'	52'	63'	74'	85'	94'
4"	9'	--	20'	36'	48'	60'	72'	82'	92'
6"	26'	20'	--	21'	37'	51'	63'	75'	86'
8"	40'	36'	21'	--	20'	37'	52'	65'	77'
10"	52'	48'	37'	20'	--	21'	38'	53'	67'
12"	63'	60'	51'	37'	21'	--	21'	38'	53'
14"	74'	72'	63'	52'	38'	21'	--	21'	38'
16"	85'	82'	75'	65'	53'	38'	21'	--	20'
18"	94'	92'	86'	77'	67'	53'	38'	20'	--

Required Length of Restrained Pipe

TEES

	Run Size								
	3"	4"	6"	8"	10"	12"	14"	16"	18"
3"	1'	1'	1'	1'	1'	1'	1'	1'	1'
4"	1'	1'	1'	1'	1'	1'	1'	1'	1'
6"	8'	2'	1'	1'	1'	1'	1'	1'	1'
8"	27'	22'	8'	1'	1'	1'	1'	1'	1'
10"	41'	37'	26'	16'	4'	1'	1'	1'	1'
12"	55'	51'	42'	33'	24'	14'	3'	1'	1'
14"	67'	64'	56'	49'	40'	32'	23'	14'	4'
16"	78'	76'	69'	62'	55'	48'	40'	32'	24'
18"	89'	86'	81'	75'	68'	62'	55'	48'	41'

Required Length of Restrained Pipe

Note: All tee runs shall have 10' minimum restrained length on each side of tee.

NOTES:

- Joint restraint devices shall be used in lieu of thrust blocking for all pressure main and appurtenance installations unless design conditions require thrust blocking.
- The restrained lengths listed in the above tables are valid for the following installation conditions:
 - Soil Classification: SW (ASTM Std. D2487); Includes well-graded sands and gravelly sands with little or no fines
 - Trench Type: Type 5 (ANSI/AWWA C150/A21.50 and AWWA C605)
 - Test Pressure: 150 psi
 - Safety Factor: 2 to 1
 - Depth of Bury: 36" from surface to top of pipe
 - Pipe Type: Ductile Iron (non-wrapped)
 Where installation conditions do not match those listed above, the required restrained lengths shall be recalculated to match the actual site conditions. All revised calculations shall be made with a test pressure of 150 psi minimum and a safety factor of 2 to 1. Revised restrained lengths shall be approved by the City Engineer PRIOR to pipe installation.
- All restraint fittings shall be factory manufactured and approved for use by the City Engineer PRIOR to pipe installation.
- All mechanical joint connections at fittings shall be restrained.

REVISION	BY	APPROVED	DATE

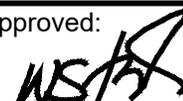
CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**THRUST RESTRAINT LENGTHS
DUCTILE IRON PIPE**

Approved:



09-30-2023

City Engineer

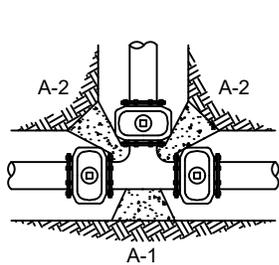
Date

Date: 09/2023

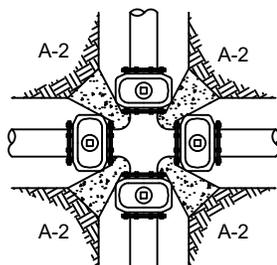
Dwg No.:

Scale: None

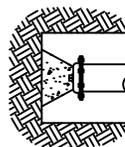
402.20



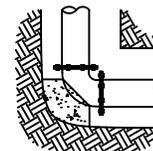
Tee



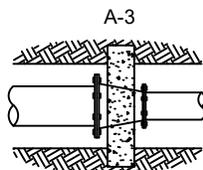
Cross



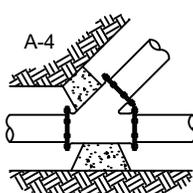
Dead End



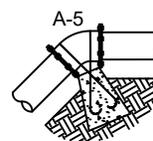
Bend



Straddle Block / Reducer



Wye



Vertical Bend

- A-1 See table below.
- A-2 See table below.
- A-3 Bearing area based on blocking embedded in trench walls.
- A-4 Bearing area to match that of 45° bend.
- A-5 Tie bars shall be #6 rebar (up to 12" pipe diameter).

Horizontal Bearing Area of Thrust Blocks in Square Feet								Vertical Volume of Thrust Blocks in Cubic Yards				
FITTING SIZE	TEE, CROSS		VALVE, DEAD END, WYE, HYDRANT	STRADDLE BLOCK	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
	A-1	A-2										
4	1.9	1.4	1.0	1.6	1.4	1.0	---	---	---	---	---	---
6	4.3	3.0	2.1	3.7	3.0	1.6	1.0	---	1.3	---	---	---
8	7.6	5.4	3.8	6.5	5.3	2.9	1.5	1.0	2.3	1.1	---	---
10	11.8	8.4	5.9	10.2	8.4	4.6	2.4	1.2	3.7	1.8	---	---
12	17.0	12.0	8.5	14.7	12.0	6.6	3.4	1.7	5.5	2.8	1.2	---

NOTES:

1. Concrete shall conform to Page 100.00.
2. Thrust blocking shall be poured against undisturbed earth, and shall be kept clear of all joints and appurtenances.
3. Tie rods shall be deformed galvanized cold rolled steel rebar, 40 ksi tensile strength.
4. Above horizontal bearing areas based on a test pressure of 150 psi and an allowable soil bearing stress of 2000 lbs/SF. To compute bearing areas for different test pressures and soil bearing stresses, use the following equation:

$$\text{Bearing Area} = (\text{Test Pressure} / 150) \times (2000 / \text{Soil Bearing Stress}) \times \text{Table Value}$$
5. Above vertical volumes based on test pressure of 150 psi and a unit weight of concrete of 4050 lbs per cubic yard. To compute bearing areas for different test pressures and soil bearing stresses, use the following equation:

$$\text{Volume} = (\text{Test Pressure} / 150) \times \text{Table Value}$$
6. Per Page 402.10 and 402.20, all mechanical joints shall be restrained.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**THRUST BLOCKS
AND ANCHOR DETAILS**

Approved:

09-30-2023

City Engineer

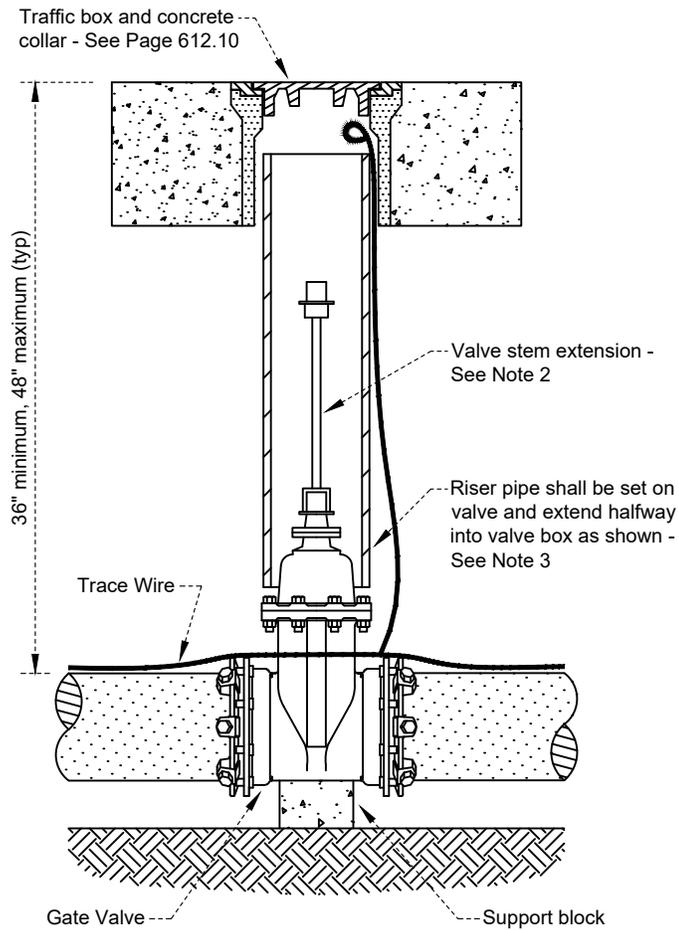
Date

Date: 09/2023

Dwg No.:

Scale: None

403.00



NOTES:

1. Backfill material shall conform to Page 610.10.
2. Valve stem extension shall be required when the valve operating nut is more than 4' below finished grade. When an extension is required, the minimum length shall be 2' and it shall bring the top operating nut within 2' of finished grade.
3. Riser pipe shall be 8" PVC SDR35.
4. Trace wire shall be run on the OUTSIDE of the riser pipe and shall conform to Page 608.00.
5. Per Page 402.10 and 402.20, all mechanical joints shall be restrained.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

WATER VALVE DETAIL

Approved:

09-30-2023

City Engineer

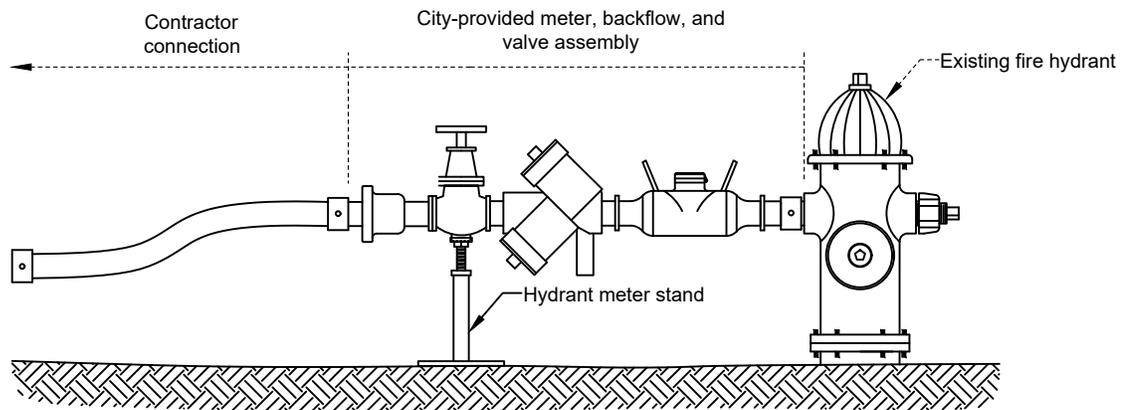
Date

Date: 09/2023

Dwg No.:

Scale: None

404.00

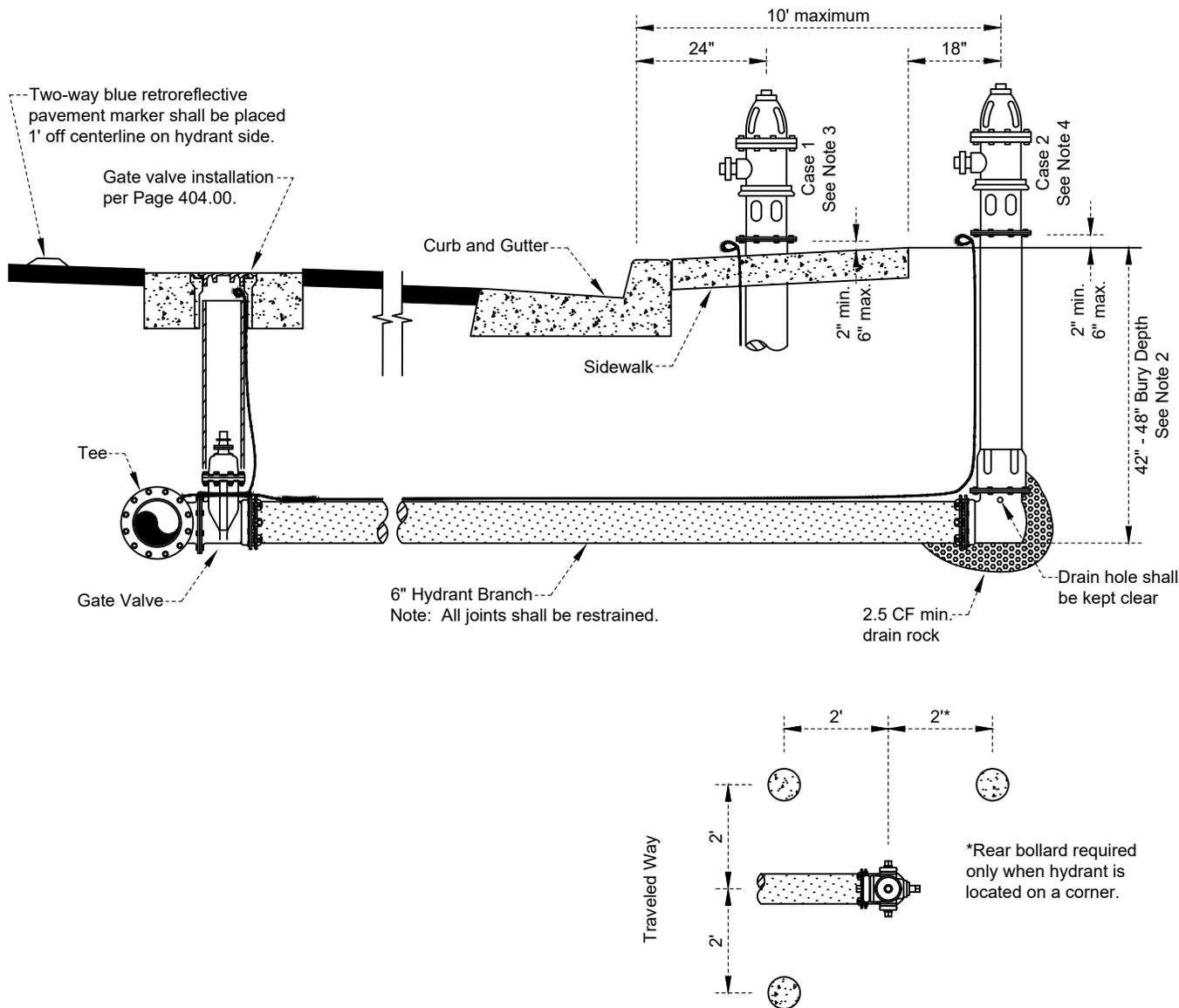


TEMPORARY WATER CONNECTION
FROM EXISTING FIRE HYDRANT

NOTES:

1. All connections to the City of Shasta Lake water distribution system for construction water purposes (including filling and flushing of new water mains) shall require the installation of a meter and backflow prevention assembly provided by the City. Filling an untested or unapproved pipeline by opening gate valves connected to the City water system is not allowed.
2. The Contractor shall contact the City of Shasta Lake Public Works Department for current deposit and usage costs. Hydrant meter applications can be obtained at City Hall, 4477 Main Street, Shasta Lake, California 96019, 530.275.7400.
3. Hydrants shall be operated by City personnel. Contractors shall utilize the shutoff valve provided by the City to operate the system.
4. Prior to placing new water mains into service, the new mains shall have passed hydrostatic pressure and bacteriological testing and have been approved for connection by the City.
5. Any final system tie-in components shall be cleaned and chlorinated prior to installation in the presence of City personnel.

				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer Date	
				TEMPORARY HYDRANT CONNECTION		Date: 09/2023 Dwg No.:	
						Scale: None 405.00	
1	BA	W.Bond	11/25				
REVISION	BY	APPROVED	DATE				



NOTES:

1. Backfill material shall conform to Page 610.10.
2. Hydrant bury depth may vary with prior approval of the City Engineer.
3. Case 1 installation: Hydrant location for residential areas with planter strips or commercial and industrial areas where sidewalk width is greater than 7'.
4. Case 2 installation: Hydrant location for new residential construction or commercial and industrial areas where sidewalk width is less than 7'.
5. A minimum radius of 3' around fire hydrants shall be clear of all vaults, cabinets, street lights, vegetation, and other obstructions per Uniform Fire Code section 10.206.
6. No parallel underground utility shall be located within 4' of the fire service pipeline.
7. Bollards shall be installed as shown when hydrants are installed adjacent to the traveled way and no curb exists. Bollards shall conform to Page 670.00.
8. Hydrants shall be covered with an approved 'out-of-service' bag until accepted and placed into service.
9. Centerline markers shall conform to Page 100.00.
10. Trace wire shall conform to Page 608.00.

BOLLARD INSTALLATION DETAIL

See Note 7

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

FIRE HYDRANT INSTALLATION

Approved:

09-30-2023

City Engineer

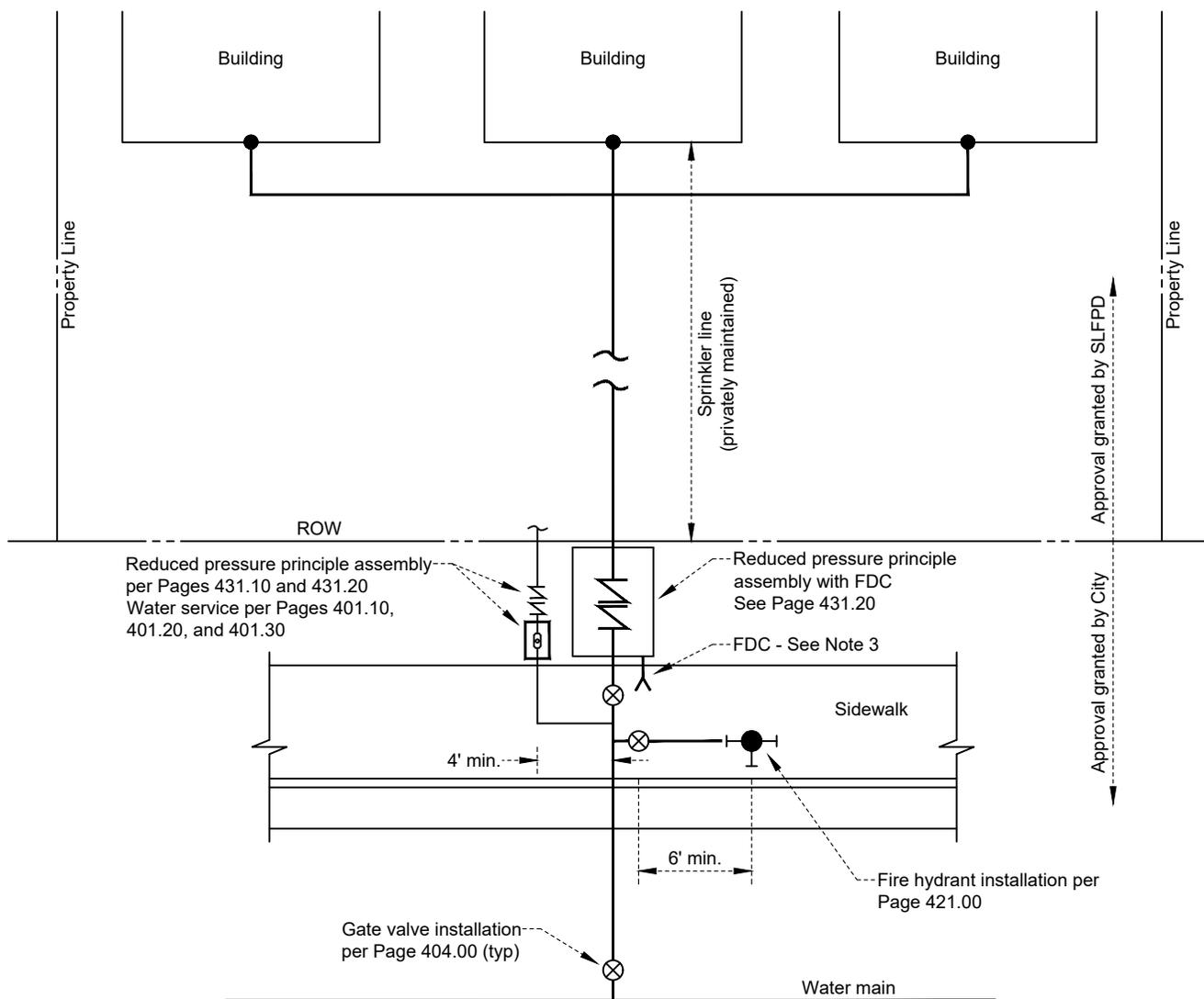
Date

Date: 09/2023

Dwg No.:

Scale: None

421.00



CASE 1
(fire service with
sprinkler system only)

NOTES:

1. Backfill material shall conform to Page 610.10.
2. Fire service pipeline shall be 6" diameter minimum.
3. Fire Department Connections (FDC) shall be 'FM' or 'UL' listed.
4. Distance between FDC and fire hydrant shall be 40 feet maximum unless otherwise approved by the Shasta Lake Fire Protection District (SLFPD).
5. When valves are required on fire service lines, indicator type valves shall be 'FM' or 'UL' listed and shall be approved both by the City Engineer and the SLFPD.
6. Fire service piping and appurtenances shall be inspected within the right-of-way by the City and on private property by the SLFPD.
7. Locating wire shall be installed on all pipelines.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

CASE 1 FIRE SERVICE
(Typical)

Approved:

09-30-2023

City Engineer

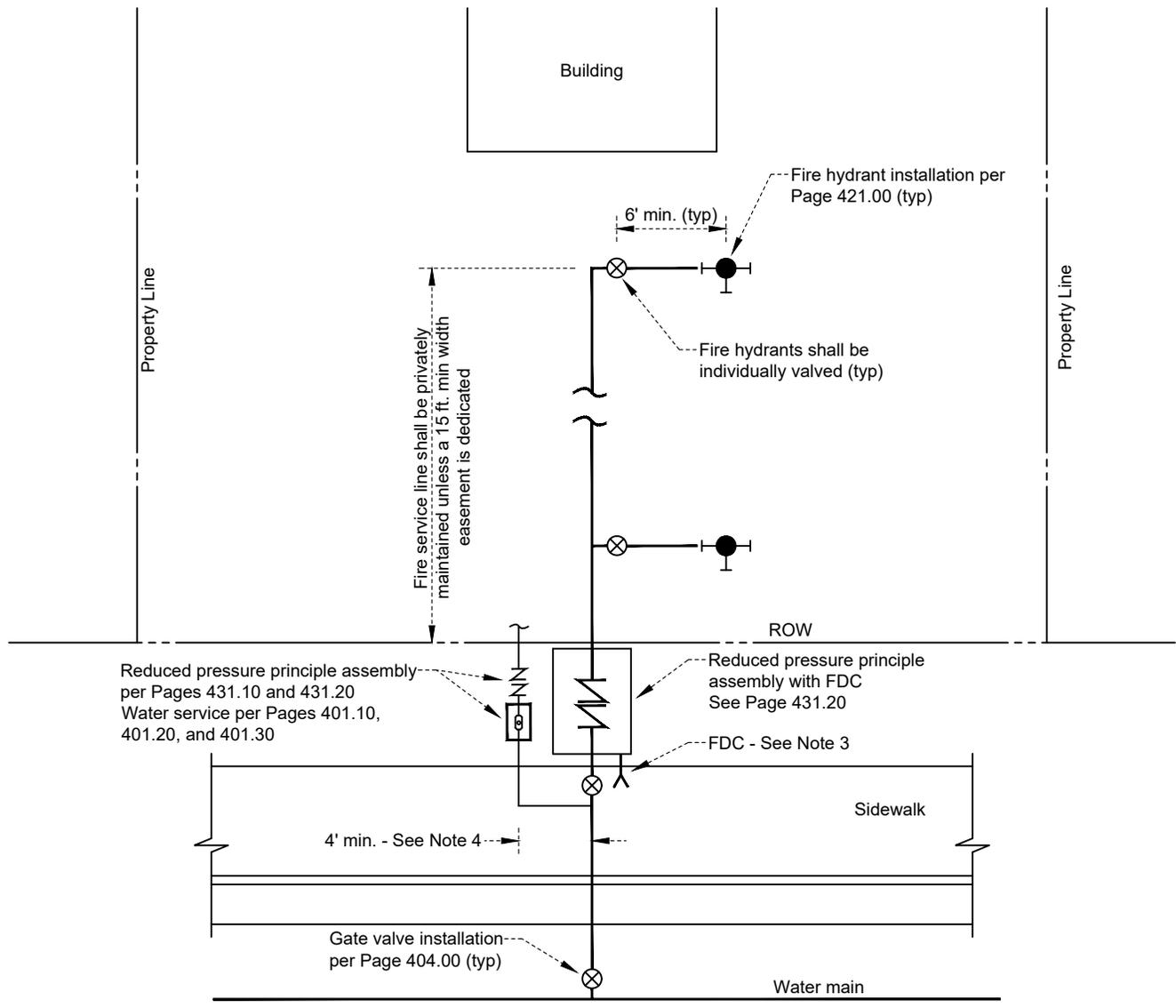
Date

Date: 09/2023

Dwg No.:

Scale: None

422.10

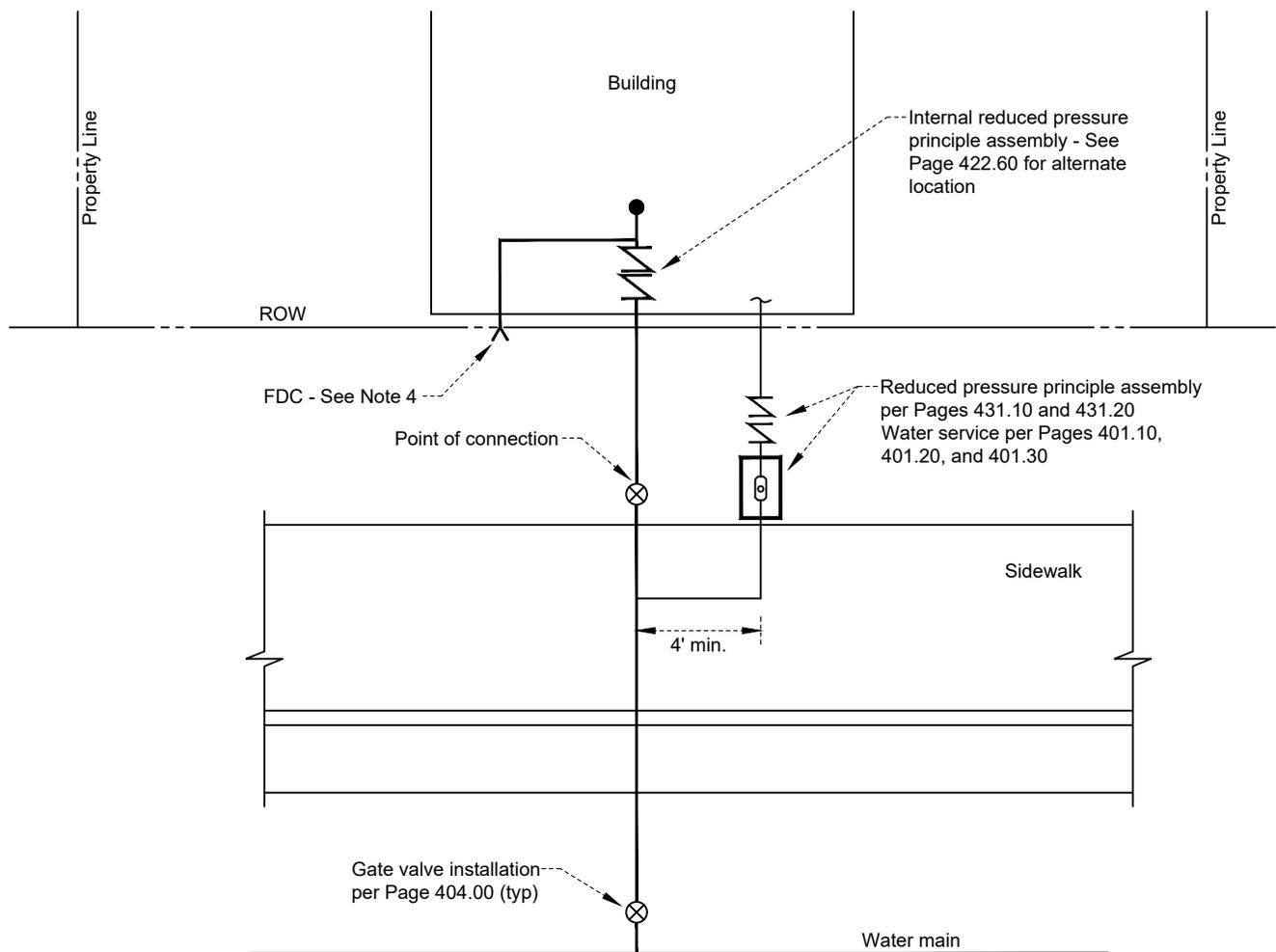


CASE 2
(fire service with hydrants only)

NOTES:

1. Backfill material shall conform to Page 610.10.
2. Fire service pipeline shall be 6" diameter minimum.
3. Fire Department Connections (FDC) shall be 'FM' or 'UL' listed.
4. Domestic services shall be outside of the fire service easement (when provided).
5. When valves are required on fire service lines, indicator type valves shall be 'FM' or 'UL' listed and shall be approved both by the City Engineer and the SLFPD.
6. Fire service piping and appurtenances shall be inspected within the right-of-way by the City and on private property by the SLFPD.
7. Locating wire shall be installed on all pipelines.

		CITY OF SHASTA LAKE	
		Public Works Department	Approved: 09-30-2023
		STANDARD DRAWING	Date
		CASE 2 FIRE SERVICE	City Engineer
		(Typical)	Date: 09/2023
REVISION	BY	APPROVED	DATE
			Dwg No.: 422.20
			Scale: None

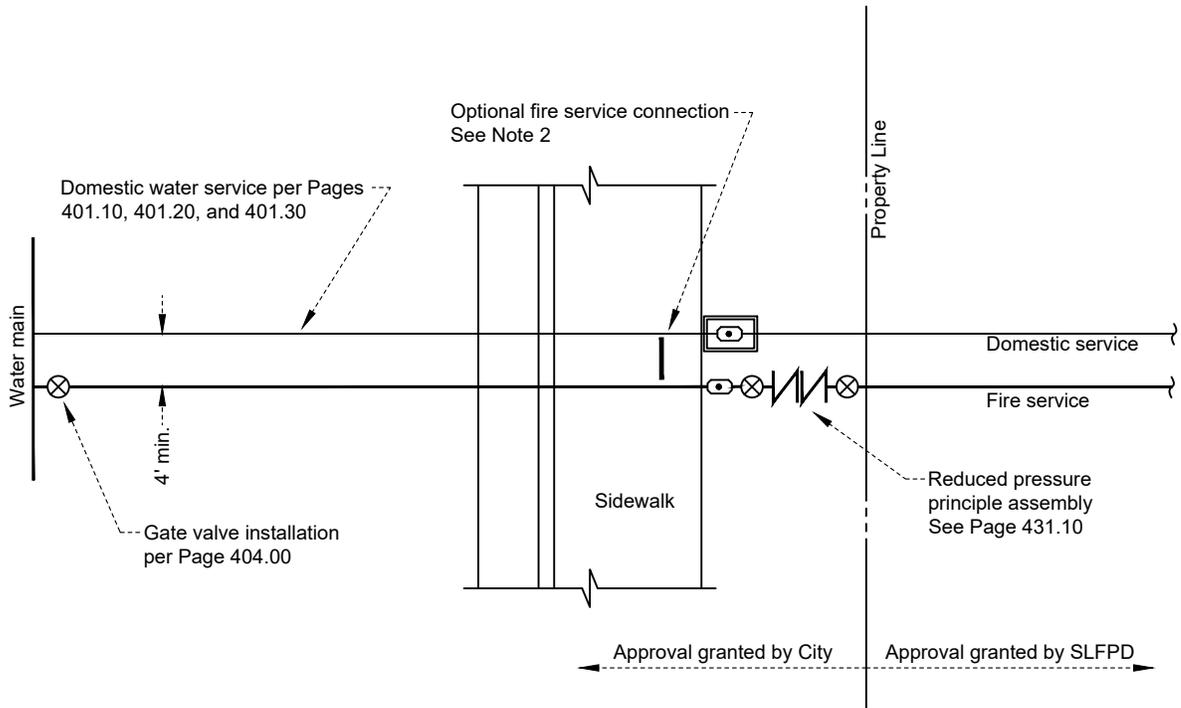


CASE 3
(fire service with
hydrants at internal location)

NOTES:

1. Backfill material shall conform to Page 610.10.
2. Fire service pipeline shall be 6" diameter minimum.
3. Internal location for RPP shall only be allowed with prior written approval from the Shasta Lake Fire Protection District (SLFPD)
4. Fire Department Connections (FDC) shall be 'FM' or 'UL' listed.
5. When valves are required on fire service lines, indicator type valves shall be 'FM' or 'UL' listed and shall be approved both by the City Engineer and the SLFPD.
6. Fire service piping and appurtenances shall be inspected within the right-of-way by the City and on private property by the SLFPD.
7. Locating wire shall be installed on all pipelines.

		CITY OF SHASTA LAKE	
		Public Works Department	Approved: 09-30-2023
		STANDARD DRAWING	Date
		CASE 3 FIRE SERVICE	City Engineer
		(non-typical)	Date: 09/2023
REVISION	BY	APPROVED	DATE
			Dwg No.: 422.30
			Scale: None



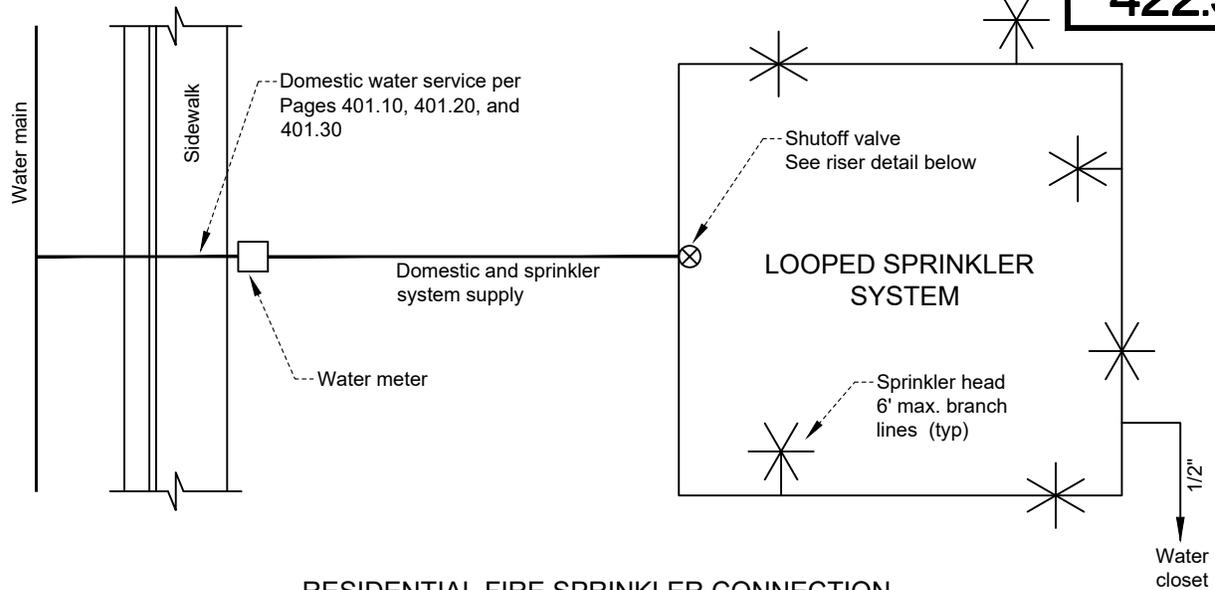
NOTES:

1. Backfill material shall conform to Page 610.10.
2. Where the existing domestic service is smaller than the required fire service, a separate fire service may be installed. A domestic service may be used to provide water for a fire service under the following conditions:
 - A. The domestic service shall be 1" minimum and the required fire service shall not be larger than the domestic service.
 - B. The fire service tap shall be installed upstream of the domestic water meter.
3. Reduced pressure principle (RPP) assemblies shall be inspected and tested by the City following installation.
4. An area 2' wide on all sides of the RPP enclosure shall be kept free of all vegetative obstructions.
5. When valves are required on fire service lines, indicator type valves shall be 'FM' or 'UL' listed and shall be approved both by the City Engineer and the SLFPD.
6. Fire service piping and appurtenances shall be inspected within the right-of-way by the City and on private property by the SLFPD.
7. Locating wire shall be installed on all pipelines.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
 Public Works Department
STANDARD DRAWING
FIRE SERVICE - NON-TYPICAL
 (1", 1 1/2", and 2")

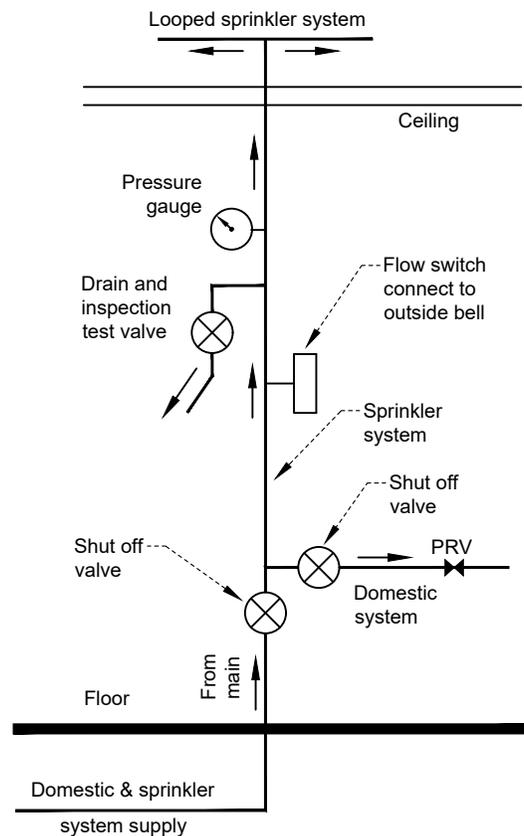
Approved:  09-30-2023
 City Engineer Date
 Date: 09/2023 Dwg No.:
 Scale: None 422.40



RESIDENTIAL FIRE SPRINKLER CONNECTION

NOTES:

1. Backfill material within City right-of-way shall conform to Page 610.10.
2. All private property construction work shall conform to the Building Code, Plumbing Code, and National Fire Protection Association (NFPA) section 13D.
3. Fire service piping and appurtenances shall be inspected within the right-of-way by the City and on private property by the Shasta Lake Fire Protection District (SLFPD).
3. A separate fire service shall be installed where the existing domestic service is smaller than the required residential fire flow (see Page 422.40).
4. Reduced pressure principle (RPP) assemblies are not required for a looped system connected to a water closet at the most remote location as approved by the SLFPD.
5. Above grade piping and valves shall be protected with adequate insulation or other measures to prevent freezing.
6. Underground fire sprinkler system piping shall be wrapped with 2" wide detectable metalized warning tape or piped with fire sprinkler CPVC pipe.
7. All piping passing through a slab shall pass through a sleeve for the full thickness of the slab. The sleeve shall have an inside diameter 1/2" larger than the outside diameter of the system pipe.



RISER DETAIL

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

RESIDENTIAL FIRE SERVICES

Approved:

09-30-2023

City Engineer

Date

Date: 09/2023

Dwg No.:

Scale: None

422.50

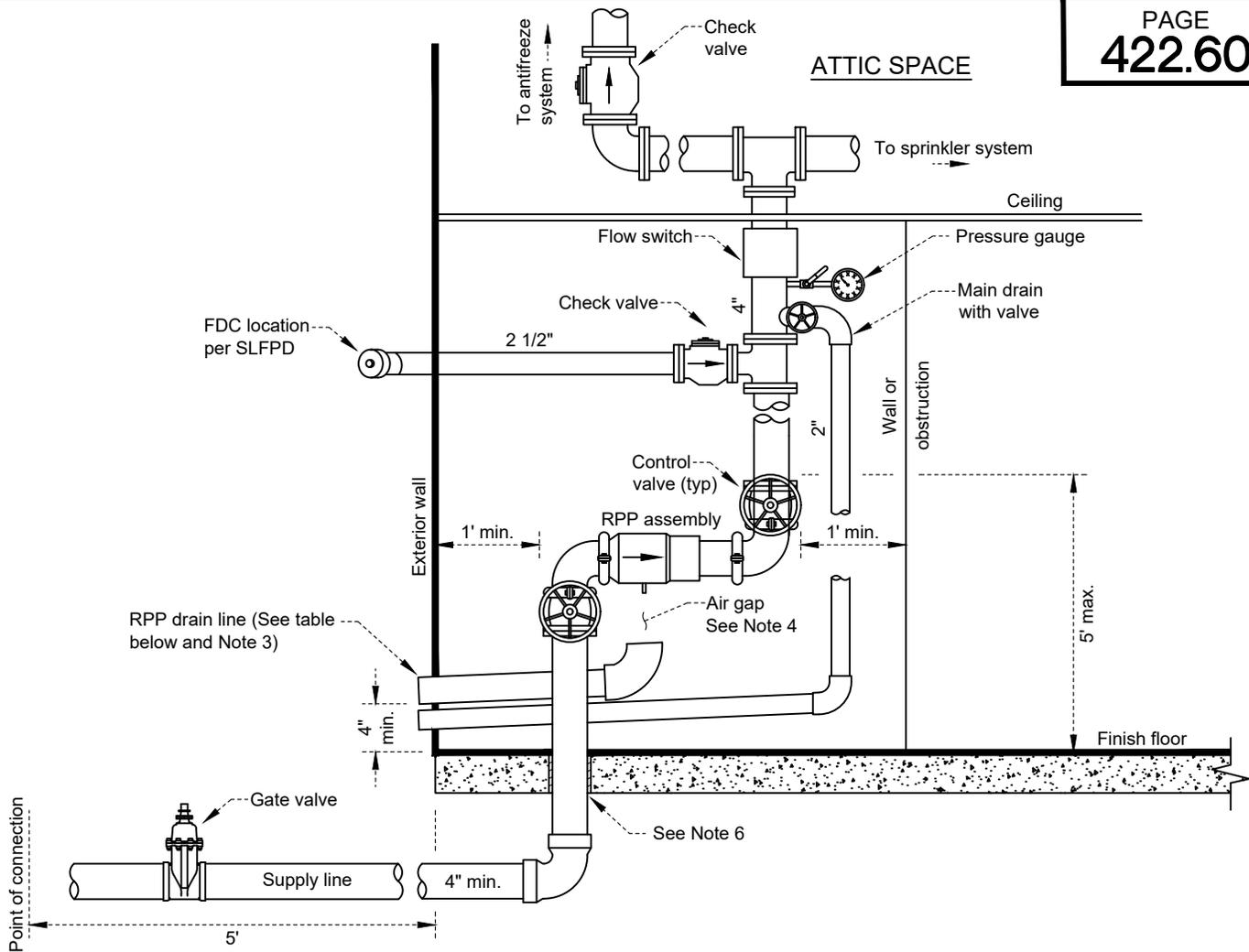


TABLE OF DIMENSIONS				
Supply main (Inches)	Assembly size (Inches)	Drain size (Inches)	Air Gap (Inches)	Install height (Inches)
4"	2"-3"	4"	8"	12"
6"	4"	6"	12"	18"
8"	6"	8"	16"	24"

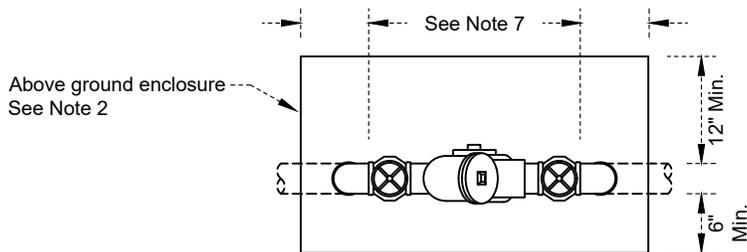
NOTES:

1. This internal-alternate location shall be used only with prior approval from the City and Shasta Lake Fire Protection District (SLFPD).
2. All private property construction work shall conform to the Building Code, Plumbing Code, and National Fire Protection Association (NFPA) section 13D.
3. Reduced pressure principle (RPP) assemblies shall be inspected and tested by the City following installation. RPP assemblies installed within the confines of a structure shall be located on an exterior wall and shall have a drain to the outside of the structure as shown in this standard. Drain piping shall not be affixed to nor supported by the RPP assembly.
4. RPP assemblies may require tamper switches on the shutoff valves. Contact SLFPD for additional information.
5. An air gap of not less than 2 times the diameter of the supply pipe shall be provided between the relief valve opening and the opening of the drain pipe as shown. A minimum vertical clearance of 1' shall be provided between the relief valve opening and the finished floor.
6. All piping passing through a concrete slab or base shall pass through a sleeve for the full thickness of the slab. The sleeve shall have an inside diameter 1/2" larger than the outside diameter of the carrier pipe and the carrier pipe shall be wrapped with foam pipe wrap or approved equal.

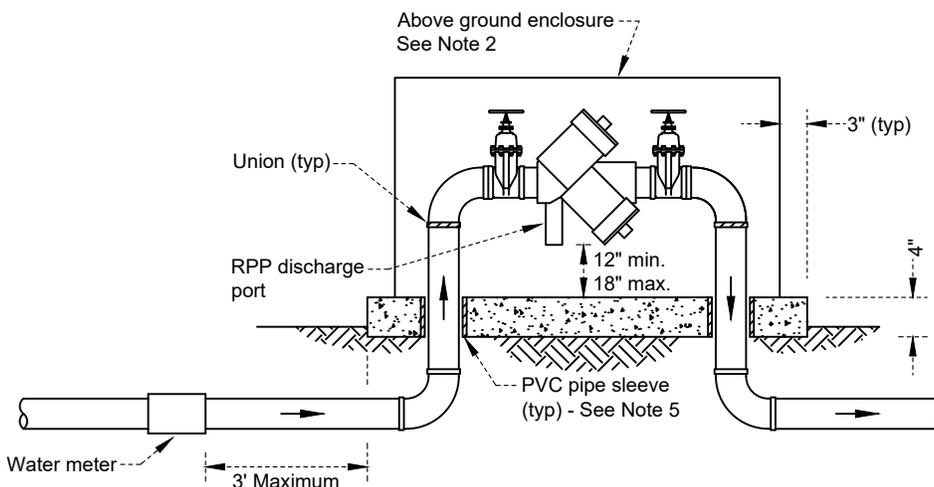
REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
 Public Works Department
STANDARD DRAWING
REDUCED PRESSURE PRINCIPLE (RPP)
BACKFLOW ASSEMBLY
 (Internal - Alternate Location)

Approved: *[Signature]* 09-30-2023
 City Engineer Date
 Date: 09/2023 Dwg No.:
 Scale: None 422.60



CLEARANCE DETAIL



ABOVE GROUND
INSTALLATION

NOTES:

1. All private property construction work shall conform to the Building Code, Plumbing Code, and National Fire Protection Association (NFPA) section 13D.
2. Above ground enclosures are required on all reduced pressure principle (RPP) assemblies per Pages 432.10 through 432.40.
3. No connections of any type shall be made between the water main and the RPP assembly.
4. All above ground piping installations 2" and smaller shall be rigid copper or brass pipe.
5. All piping passing through a concrete slab or base shall pass through a sleeve for the full thickness of the slab. The sleeve shall have an inside diameter 1/2" larger than the outside diameter of the carrier pipe and the carrier pipe shall be wrapped with foam pipe wrap or approved equal.
6. All RPP assemblies shall be inspected and tested by the City following installation.
7. Riser spacing shall be adequate to allow access for maintenance, testing or removal of RPP assembly.
8. Fire service piping and appurtenances shall be inspected within the right-of-way by the City and on private property by the Shasta Lake Fire Protection District (SLFPD).

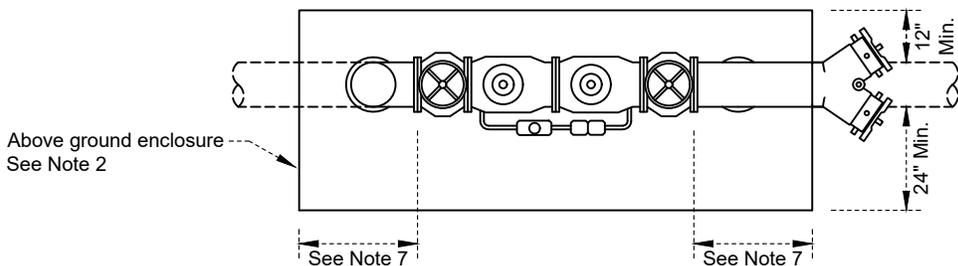
REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

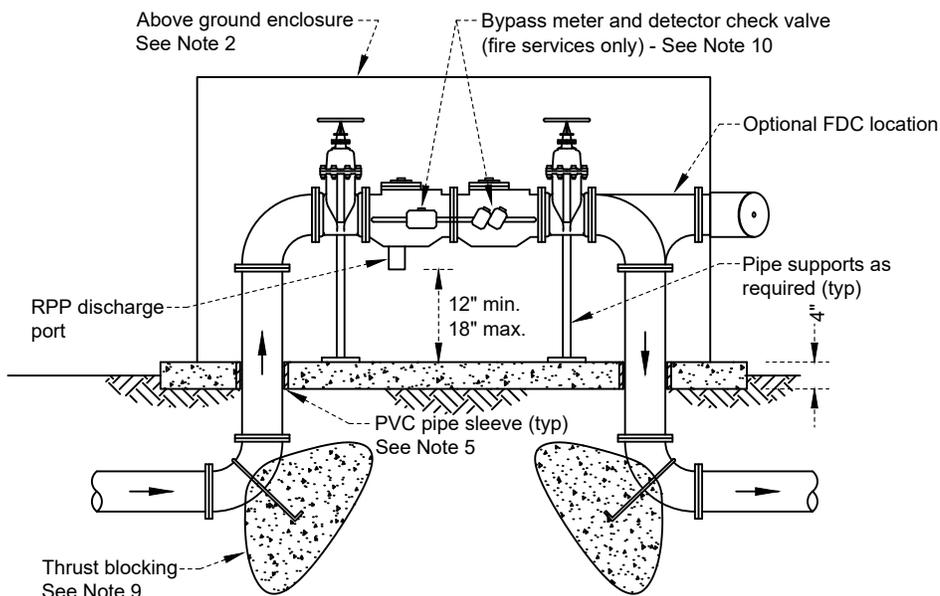
STANDARD DRAWING
REDUCED PRESSURE PRINCIPLE (RPP)
BACKFLOW ASSEMBLY
3/4" through 2"

Approved: *WST* 09-30-2023
City Engineer Date

Date: 09/2023 Dwg No.: 431.10
Scale: None



CLEARANCE DETAIL



ABOVE GROUND INSTALLATION

NOTES:

1. All private property construction work shall conform to the Building Code, Plumbing Code, and National Fire Protection Association (NFPA) section 13D.
2. Above ground enclosures are required on all reduced pressure principle (RPP) assemblies per Pages 432.10 through 432.40.
3. No connections of any type shall be made between the water main and the RPP assembly.
4. All above ground piping installations 4" and larger shall be ductile iron with flanged fittings.
5. All piping passing through a concrete slab or base shall pass through a sleeve for the full thickness of the slab. The sleeve shall have an inside diameter 1/2" larger than the outside diameter of the carrier pipe and the carrier pipe shall be wrapped with foam pipe wrap or approved equal.
6. All RPP assemblies shall be inspected and tested by the City following installation.
7. Riser spacing shall be adequate to allow access for maintenance, testing or removal of RPP assembly.
8. Fire service piping and appurtenances shall be inspected within the right-of-way by the City and on private property by the Shasta Lake Fire Protection District (SLFPD).
9. Thrust blocking shall be installed on all base bends per Page 403.00. In lieu of individual blocking or anchors, the Contractor may also place a continuous concrete block between base bends.
10. Where RPP assemblies are installed on fire services, a bypass line with a detector check valve and meter shall be installed. At the direction of SLFPD, RPP assemblies on fire services may also require tamper switches on the gate valves.

REVISION	BY	APPROVED	DATE

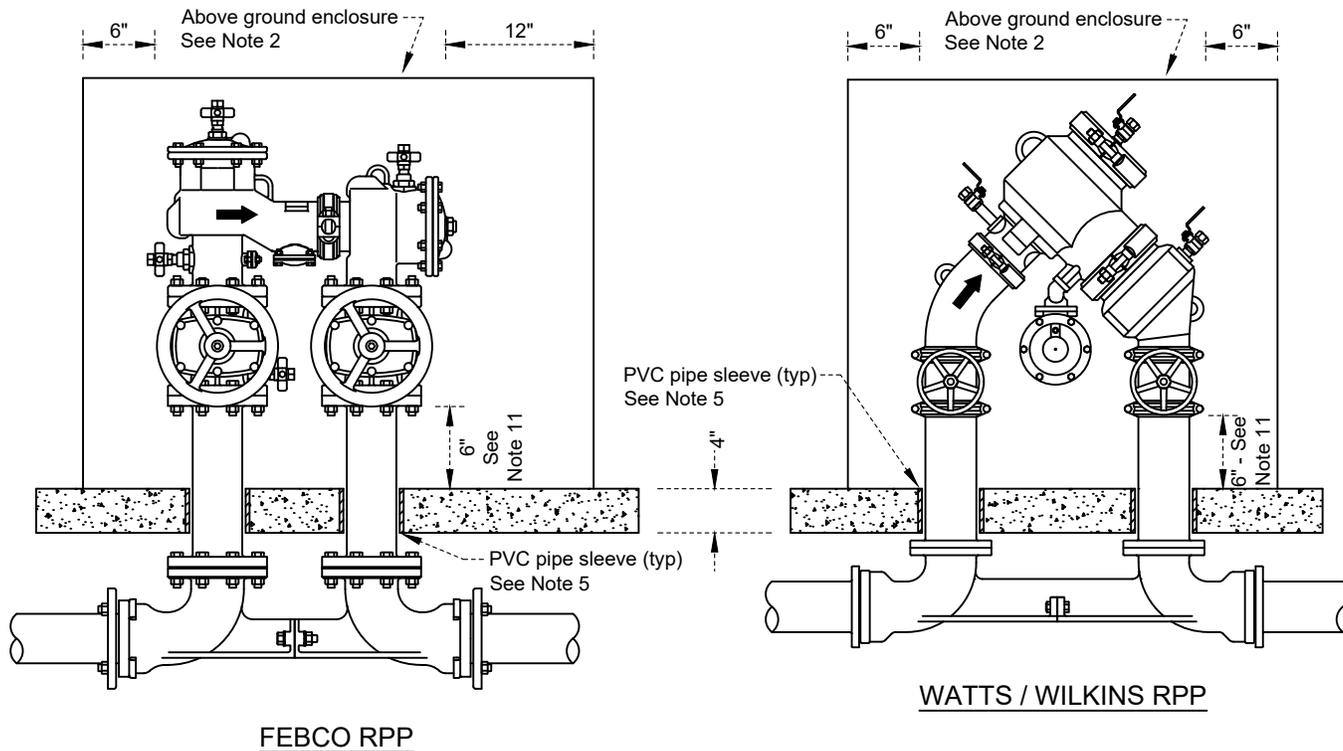
CITY OF SHASTA LAKE
Public Works Department

STANDARD DRAWING
REDUCED PRESSURE PRINCIPLE (RPP)
BACKFLOW ASSEMBLY
4" and Larger

Approved:  09-30-2023

City Engineer _____ Date _____

Date: 09/2023 Dwg No.: 431.20
Scale: None



NOTES:

1. All private property construction work shall conform to the Building Code, Plumbing Code, and National Fire Protection Association (NFPA) section 13D.
2. Above ground enclosures are required on all reduced pressure principle (RPP) assemblies per Pages 432.10 through 432.40.
3. No connections of any type shall be made between the water main and the RPP assembly.
4. All above ground piping installations 4" and larger shall be ductile iron with flanged fittings.
5. All piping passing through a concrete slab or base shall pass through a sleeve for the full thickness of the slab. The sleeve shall have an inside diameter 1/2" larger than the outside diameter of the carrier pipe and the carrier pipe shall be wrapped with foam pipe wrap or approved equal.
6. All RPP assemblies shall be inspected and tested by the City following installation.
7. Riser spacing shall be adequate to allow access for maintenance, testing or removal of RPP assembly.
8. Fire service piping and appurtenances shall be inspected within the right-of-way by the City and on private property by the Shasta Lake Fire Protection District (SLFPD).
9. Thrust blocking shall be installed on all base bends per Page 403.00. In lieu of individual blocking or anchors, the Contractor may also place a continuous concrete block between base bends.
10. Where RPP assemblies are installed on fire services, a bypass line with a detector check valve and meter shall be installed. At the direction of SLFPD, RPP assemblies on fire services may also require tamper switches on the gate valves.
11. Valve handles shall be installed exactly 6" above the enclosure concrete base.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**BACKFLOW ASSEMBLY - "N" PATTERN
3" through 10"**

Approved:

09-30-2023

City Engineer

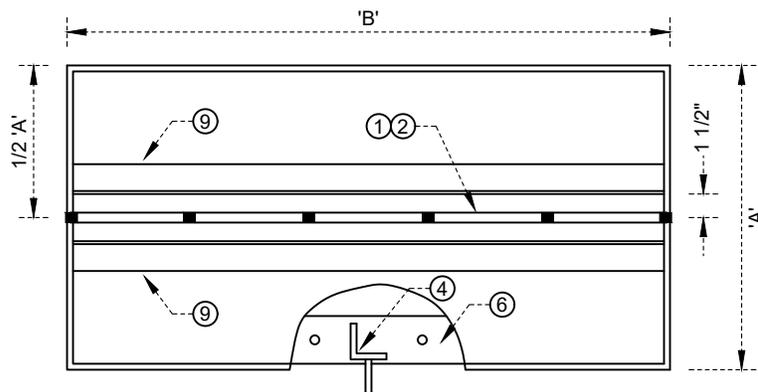
Date

Date: 09/2023

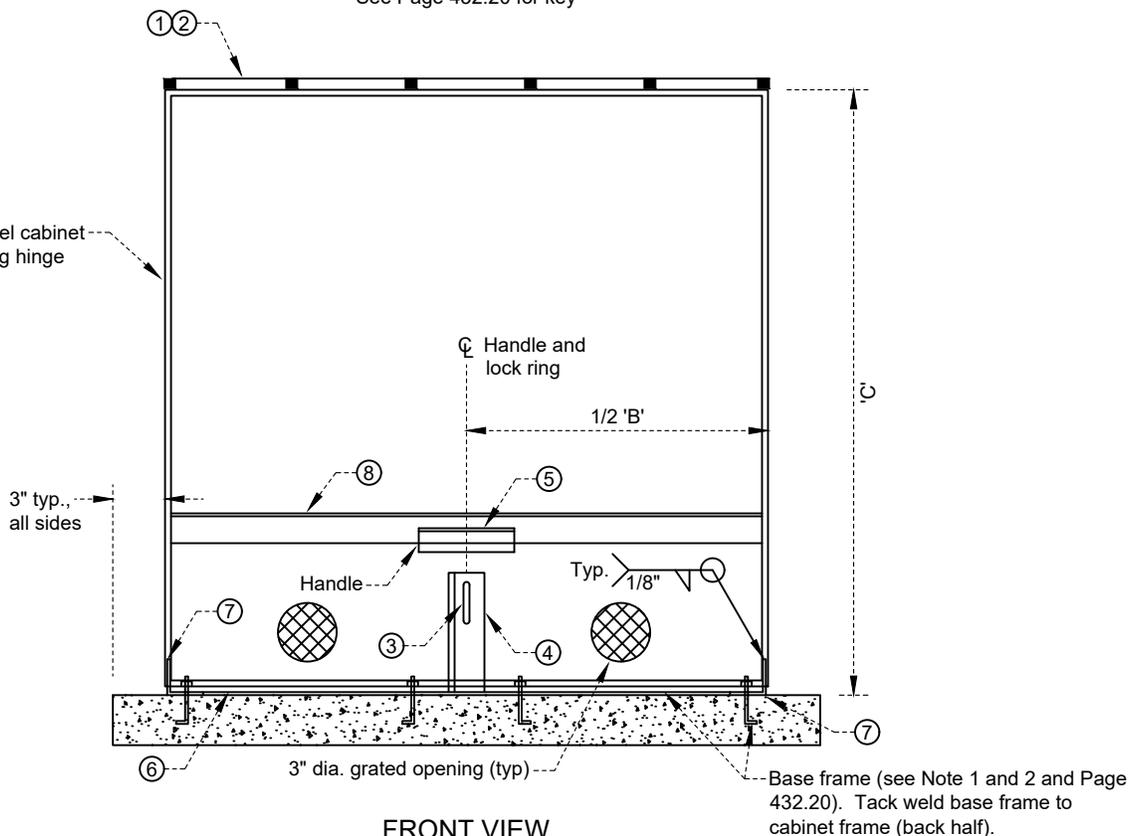
Dwg No.:

Scale: None

431.30



TOP VIEW
See Page 432.20 for key



FRONT VIEW
See Page 432.20 for key

14 gauge steel cabinet
with full-swing hinge
See Note 3

3" typ.,
all sides

3" dia. grated opening (typ)

Base frame (see Note 1 and 2 and Page 432.20). Tack weld base frame to cabinet frame (back half).

NOTES:

1. Cabinet shall be mounted on a 4" thick concrete slab with 3/8"x4" 'J' bolts (typical of six). Slab shall extend a minimum of 3" beyond cabinet.
2. All piping passing through the concrete slab shall pass through a sleeve for the full thickness of the slab. The sleeve shall have an inside diameter 1/2" larger than the outside diameter of the carrier pipe and the carrier pipe shall be wrapped with foam pipe wrap or approved equal.
3. Cabinet shall be painted with Olive Green powder coat paint inside and out.
4. Backflow assembly enclosures shall meet the manufacturer's specifications for all clearances and provide access for testing and maintenance as required.
5. Cabinet locks shall be provided by the City.

Cabinet Dimensions*

Dimensions for:	'A'	'B'	'C'
3/4" and 1" Assemblies	12 1/2"	25"	25"
1 1/2" and 2" Assemblies	20 1/2"	32"	32"

* Note: Dimensions may vary to accommodate non-typical fire service assembly installations.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

BACKFLOW ASSEMBLY ENCLOSURE
3/4" through 2"

Approved:

09-30-2023

City Engineer

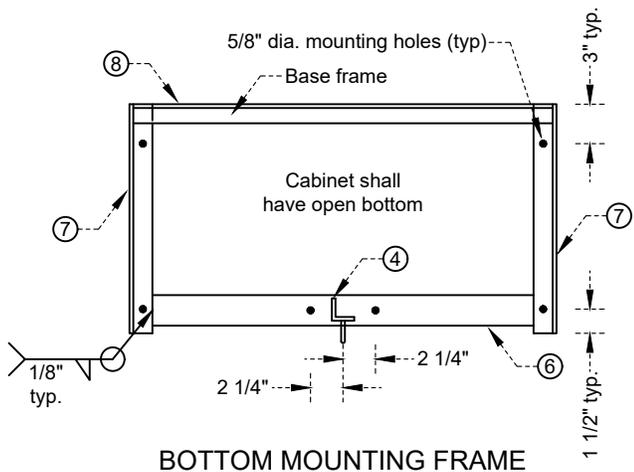
Date

Date: 09/2023

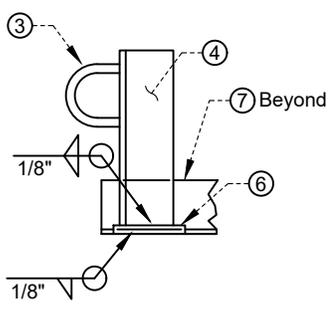
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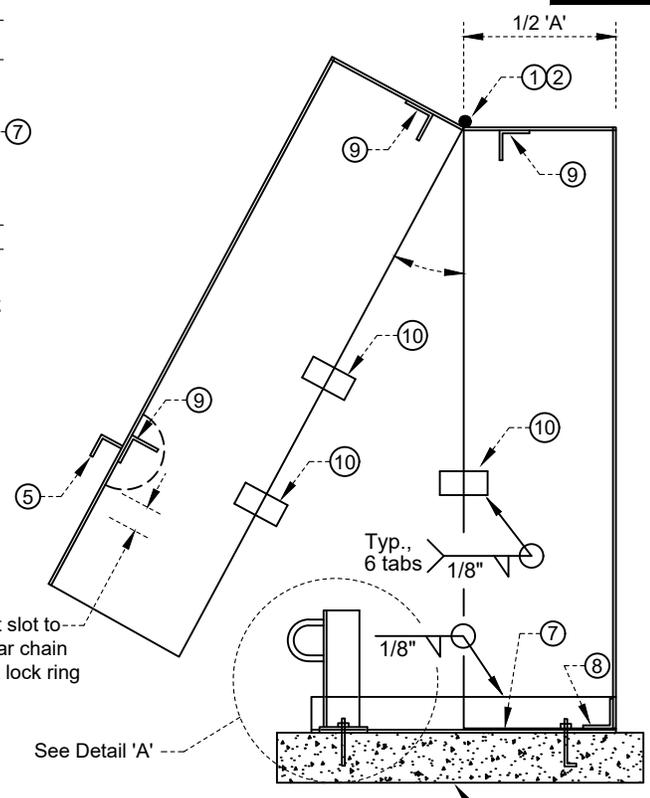
432.10



BOTTOM MOUNTING FRAME



DETAIL 'A'



SIDE VIEW

Base slab - See Notes 1 and 2

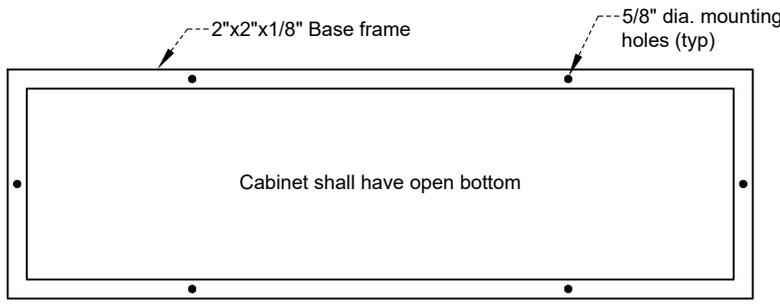
MATERIALS LIST FOR BACKFLOW ASSEMBLY ENCLOSURE

Item No.	Description	Length per Assembly Size		Qty.
		3/4" & 1"	1 1/2" & 2"	
①	5/16" Cold roll hinge pin	25"	32"	1
②	1/4" Pipe hinge	25"	32"	1
③	1/4" x 1 1/2" x 1 1/2" Chain link	n/a	n/a	1
④	1/4" x 1 1/2" x 1 1/2" Angle	5"	5"	1
⑤	1/8" x 1" x 1" Angle handle	4"	4"	1
⑥	1/4" x 2" Flat bar	22"	29"	1
⑦	1/8" x 1 1/2" x 1 1/2" Angle	12 1/2"	20 1/2"	2
⑧	1/8" x 1 1/4" x 1 1/4" Angle brace	24 3/4"	31 3/4"	1
⑨	1/8" x 1 1/4" x 1 1/4" Angle brace	25"	32"	3
⑩	1/8" x 1" Alignment tabs	2"	2"	6

NOTES:

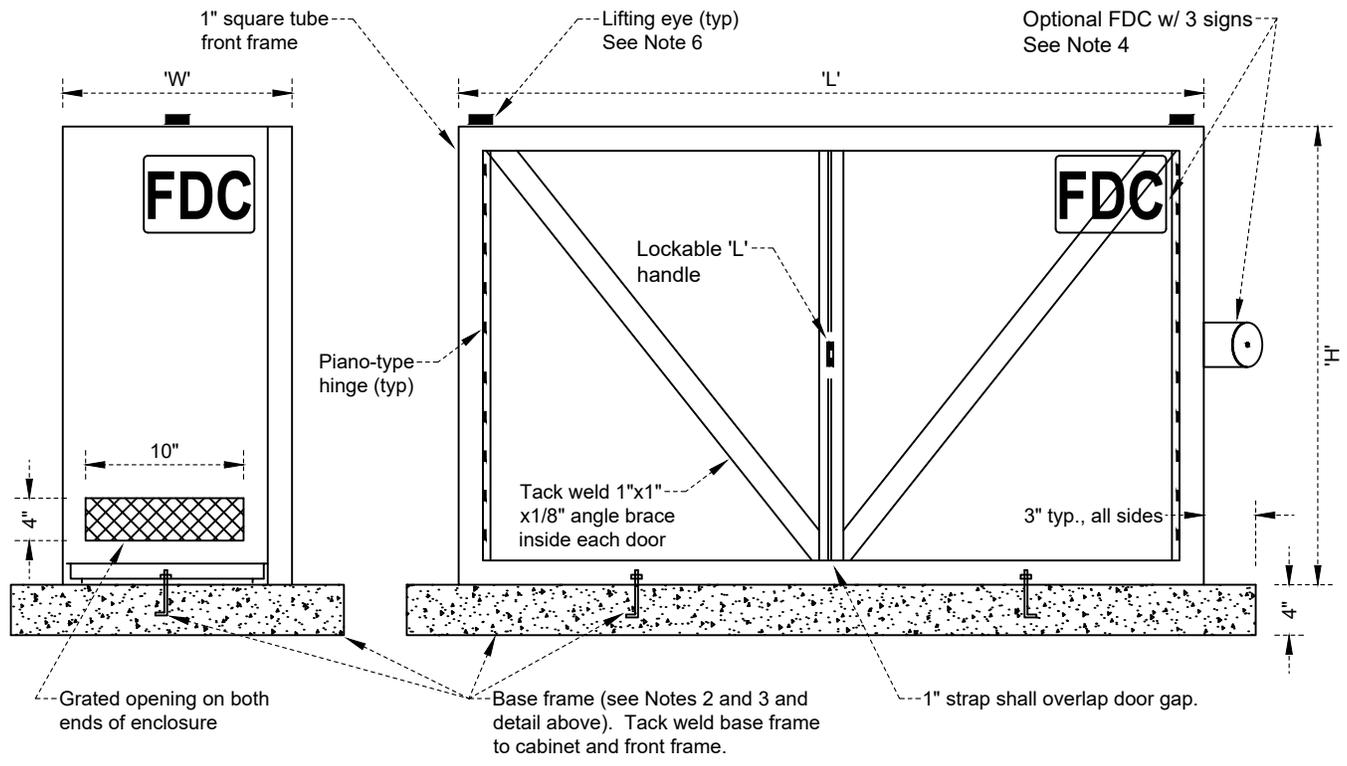
- Cabinet shall be mounted on a 4" thick concrete slab with 3/8"x4" 'J' bolts (typical of six). Slab shall extend a minimum of 3" beyond cabinet.
- All piping passing through the concrete slab shall pass through a sleeve for the full thickness of the slab. The sleeve shall have an inside diameter 1/2" larger than the outside diameter of the carrier pipe and the carrier pipe shall be wrapped with foam pipe wrap or approved equal.
- Cabinet shall be painted with Olive Green powder coat paint inside and out.
- Backflow assembly enclosures shall meet the manufacturer's specifications for all clearances and provide access for testing and maintenance as required.
- Cabinet locks shall be provided by the City.

				CITY OF SHASTA LAKE		Approved:  09-30-2023 Date	
				Public Works Department			
				STANDARD DRAWING		City Engineer _____ Date _____	
				BACKFLOW ASSEMBLY ENCLOSURE		Date: 09/2023 Dwg No.:	
				3/4" through 2"		Scale: None 432.20	
REVISION	BY	APPROVED	DATE				



BOTTOM MOUNTING FRAME

CABINET DIMENSIONS			
UNIT SIZE	'L'	'W'	'H'
3" and 4"	78"	24"	52"
6"	96"	24"	60"
8"	108"	30"	69"



LEFT VIEW

FRONT VIEW

NOTES:

1. Cabinet and doors to be 14 Ga. steel painted olive green powder coat paint inside & out. Preferred door opening is on the bypass meter side.
2. Cabinet shall be mounted on a 4" thick concrete slab with 3/8"x4" 'J' bolts (typical of six). Slab shall extend a minimum of 3" beyond cabinet.
3. All piping passing through the concrete slab shall pass through a sleeve for the full thickness of the slab. The sleeve shall have an inside diameter 1/2" larger than the outside diameter of the carrier pipe and the carrier pipe shall be wrapped with foam pipe wrap or approved equal.
4. When a Fire Department Connection (FDC) is included with the backflow assembly, a sign shall be installed on the three (3) sides of the enclosure visible from the street in the upper corner as shown. The signs shall read "FDC" in 6" high red reflective block lettering.
5. Backflow enclosures shall meet the manufacturer's specifications for all clearances and provide access for testing and maintenance as required.
6. Lifting eyes shall be 1/2"-13 UMC nut welded in place. Nuts shall be plugged with bolts after installation.
7. Cabinet locks shall be provided by the City.

REVISION	BY	APPROVED	DATE

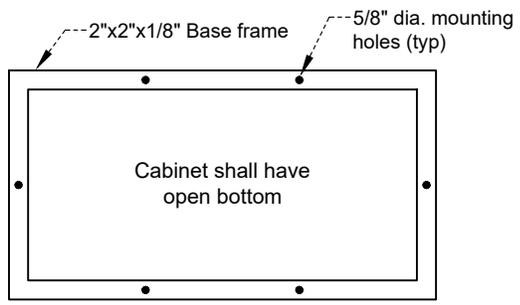
CITY OF SHASTA LAKE
Public Works Department

STANDARD DRAWING

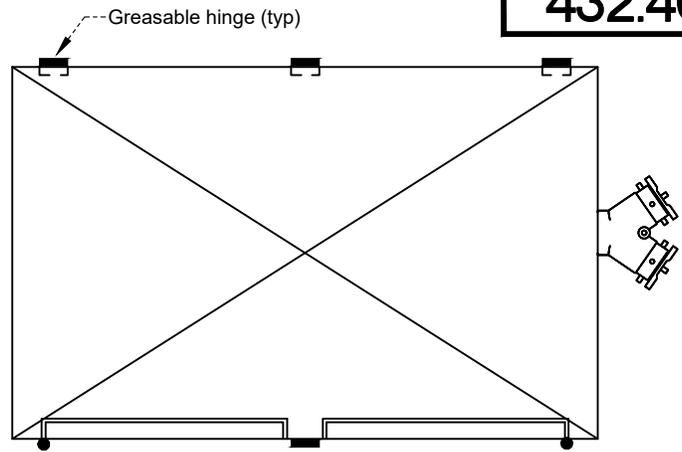
BACKFLOW ASSEMBLY ENCLOSURE
3" and Larger

Approved: *WST* 09-30-2023
City Engineer Date

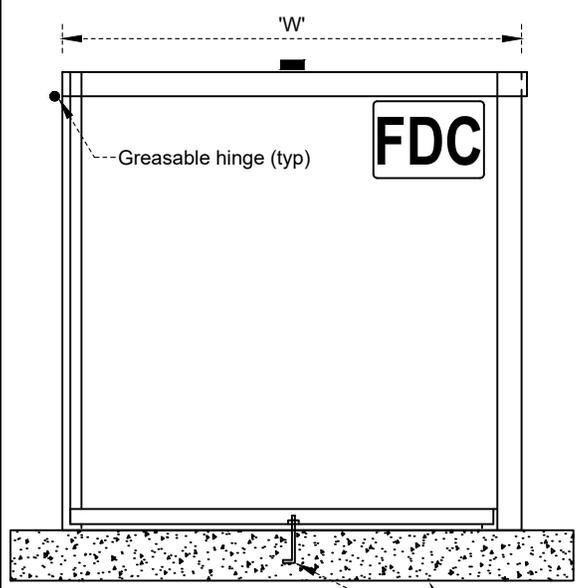
Date: 09/2023 Dwg No.: 432.30
Scale: None



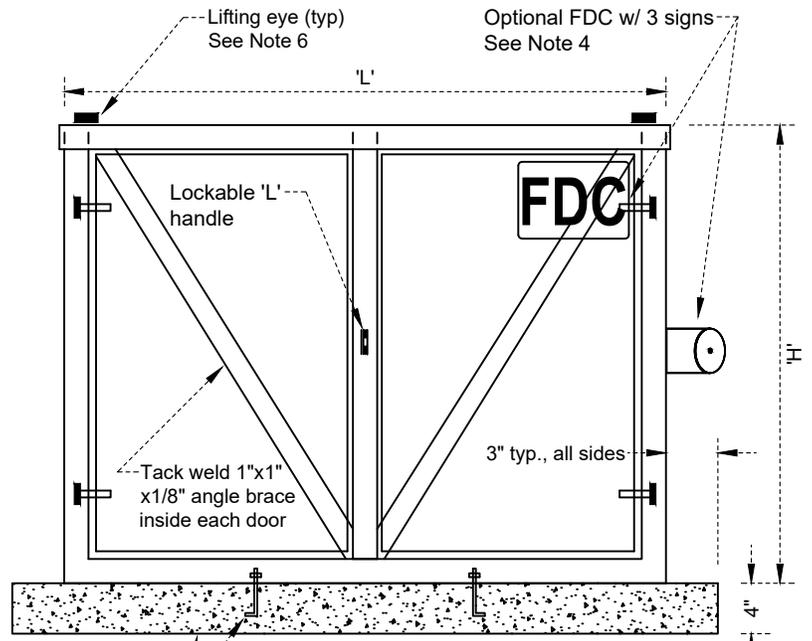
BOTTOM MOUNTING FRAME



TOP VIEW



LEFT VIEW



FRONT VIEW

Base frame (see Notes 2 and 3 and detail above). Tack weld base frame to cabinet and front frame.

NOTES:

1. Cabinet and doors to be 14 Ga. steel painted olive green powder coat paint inside & out. Preferred door opening is on the bypass meter side.
2. Cabinet shall be mounted on a 4" thick concrete slab with 3/8"x4" 'J' bolts (typical of six). Slab shall extend a minimum of 3" beyond cabinet.
3. All piping passing through the concrete slab shall pass through a sleeve for the full thickness of the slab. The sleeve shall have an inside diameter 1/2" larger than the outside diameter of the carrier pipe and the carrier pipe shall be wrapped with foam pipe wrap or approved equal.
4. When a Fire Department Connection (FDC) is included with the backflow assembly, a sign shall be installed on the three (3) sides of the enclosure visible from the street in the upper corner as shown. The signs shall read "FDC" in 6" high red reflective block lettering.
5. Backflow enclosures shall meet the manufacturer's specifications for all clearances and provide access for testing and maintenance as required.
6. Lifting eyes shall be 1/2"-13 UMC nut welded in place. Nuts shall be plugged with bolts after installation.
7. Cabinet locks shall be provided by the City.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

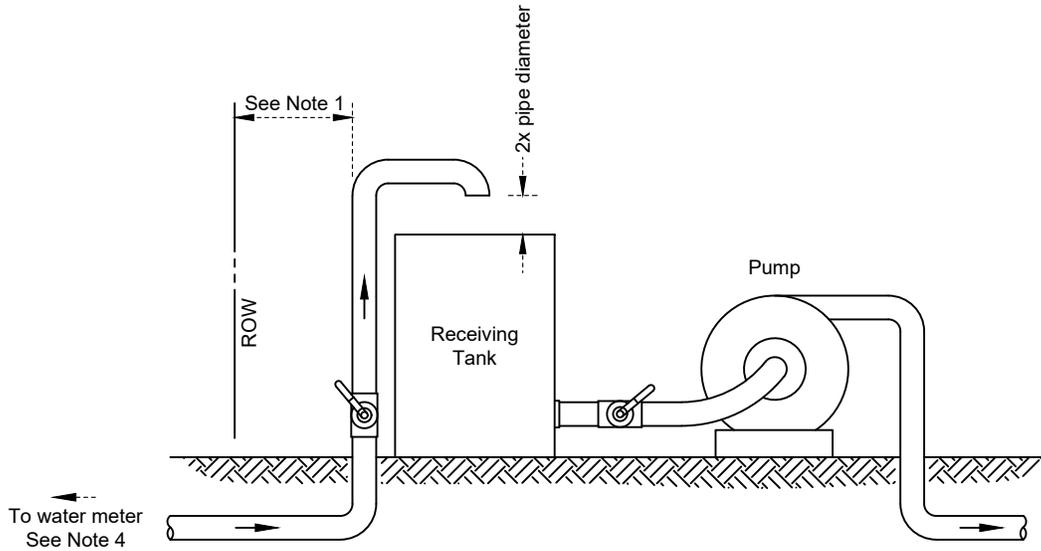
STANDARD DRAWING

BACKFLOW ASSEMBLY ENCLOSURE
"N" Pattern, 3" through 10"

Approved:  09-30-2023
Date

City Engineer _____ Date

Date: 09/2023 Dwg No.: 432.40
Scale: None



NOTES:

1. Receiving tank shall be located as close to property line as practical. Location to be approved by the City Engineer.
2. No connections or branches shall be installed between the water meter and receiving tank.
3. Service piping to the receiving tank shall be 1" minimum.
4. See Pages 401.10 through 401.50 for service connections.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

AIR GAP SEPARATION DETAIL

Approved:

09-30-2023

City Engineer

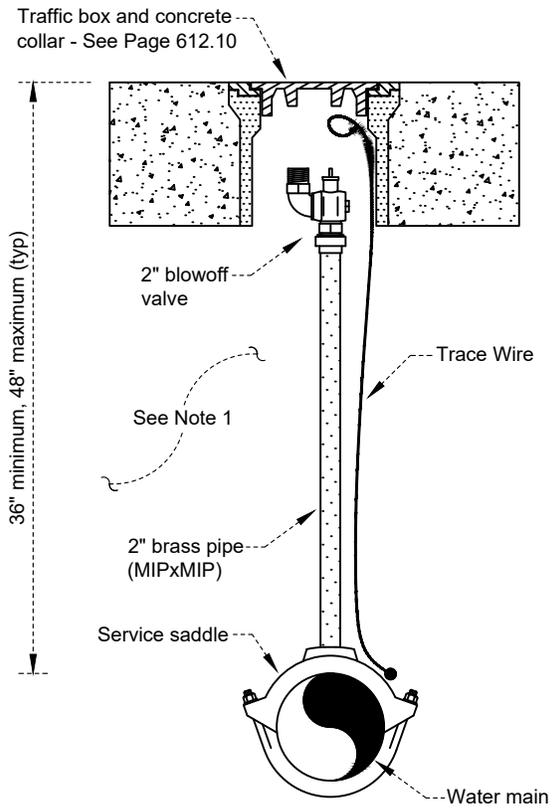
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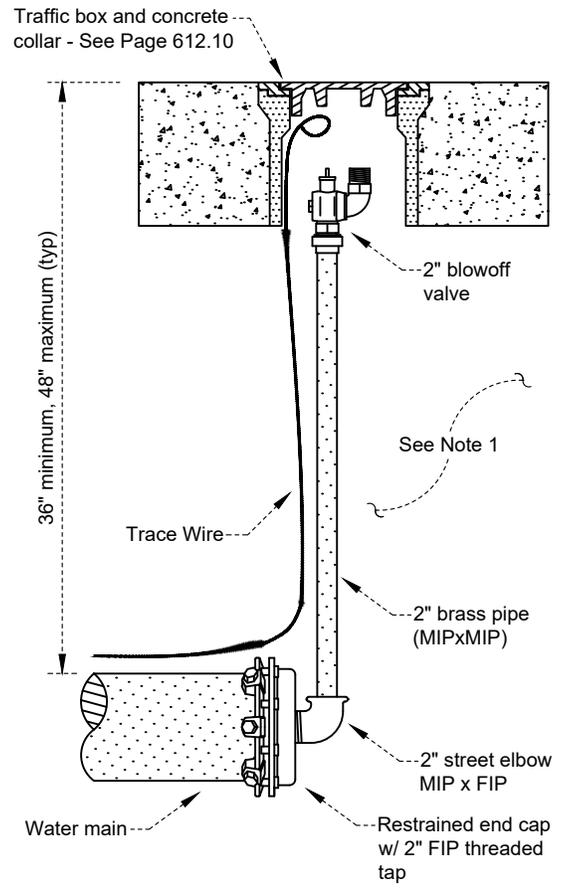
Dwg No.:

Scale: None

441.00



**MID-LINE
INSTALLATION**



**END-OF-LINE
INSTALLATION**

NOTES:

1. Backfill material shall conform to Page 610.10.
2. Blowoffs shall be installed at the end of all dead end water mains, as well as at inline sag locations where sediment is likely to collect.
3. Blowoff valves and piping for 8" through 12" mains shall be 2". Blowoff sizing for larger mains shall be as approved by the City Engineer.
4. Blowoffs shall not discharge to a drain without an air gap separation.
5. Where blowoffs are installed via hot tap, a corporation stop shall be installed on the service saddle.
6. Blowoff valve outlets shall be capped after installation.
7. Trace wire shall conform to Page 608.00.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

BLOWOFF INSTALLATION

Approved:

09-30-2023

City Engineer

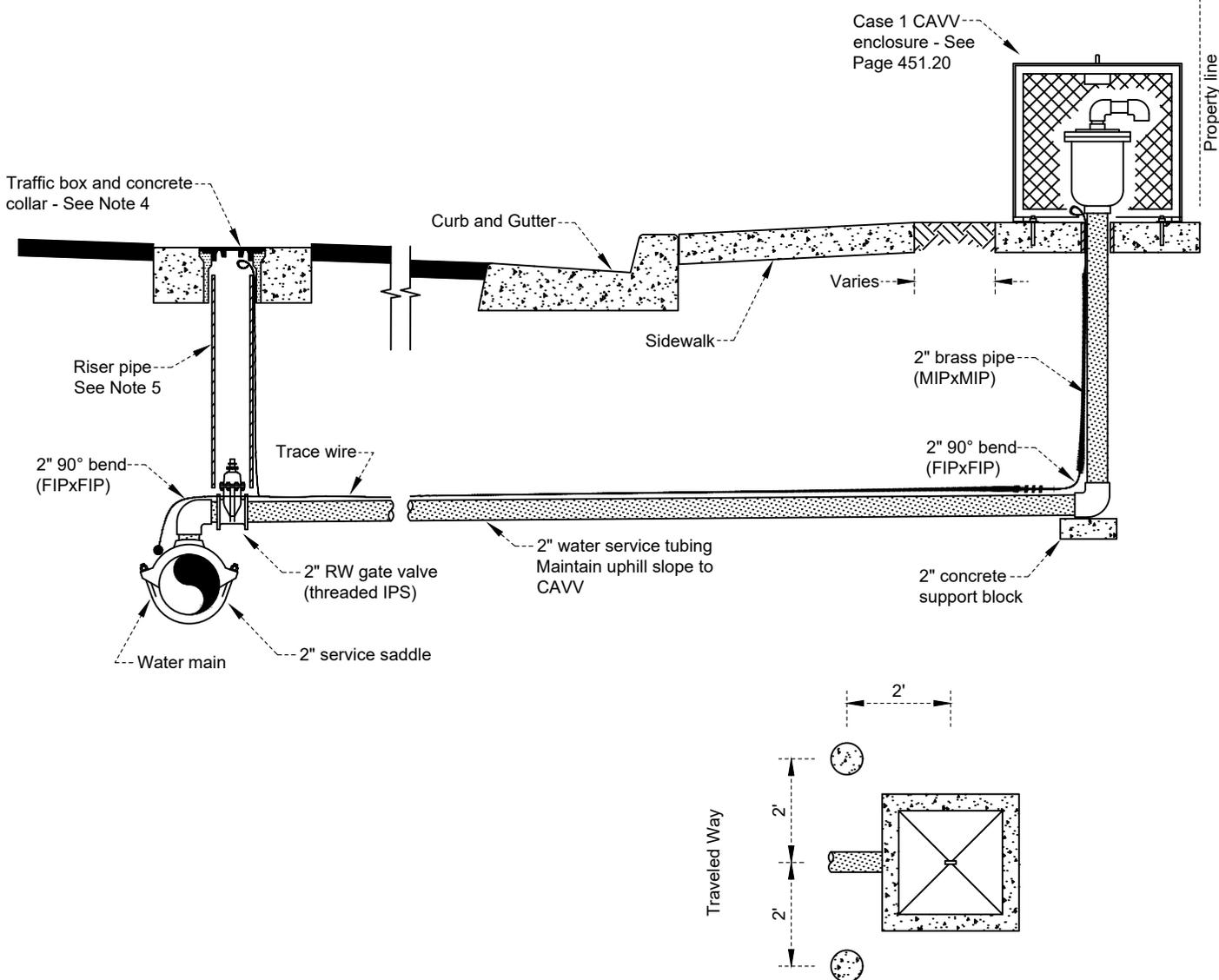
Date

Date: 09/2023

Dwg No.:

Scale: None

450.00



BOLLARD INSTALLATION DETAIL

See Note 3

NOTES:

1. Backfill material shall conform to Page 610.10.
2. Piping shall be 2" brass unless otherwise noted.
3. Bollards shall be installed as shown when above ground CAVV enclosures are installed adjacent to the traveled way and no curb exists. Bollards shall conform to Page 670.00.
4. Traffic box and concrete collar installation shall conform with Page 612.10.
5. Riser pipe shall be 8" PVC SDR35. Trace wire shall be run on the OUTSIDE of the riser pipe.
6. CAVVs shall be installed at all pipeline high points, in change-in-grade locations where air pockets may accumulate in the water main, and at intervals of 1500' to 2000' on long pipe runs lacking a clearly defined high point. See Page 450.20 for above ground (Case 1) and underground (Case 2) CAVV installation details.
7. The minimum acceptable CAVV size shall be 2" as shown. CAVV sizing shall be engineered according to the manufacturer's specifications and approved by the City Engineer.
8. Trace wire shall conform to Page 608.00.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

COMBINATION AIR / VACUUM VALVE (CAVV)
TYPICAL SERVICE LINE

Approved:

WST

09-30-2023

City Engineer

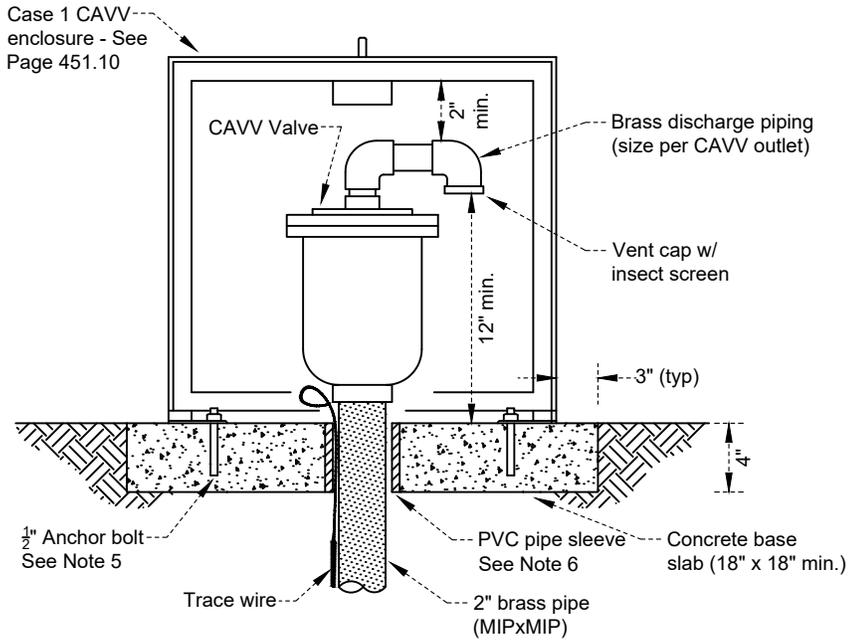
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Date: 09/2023

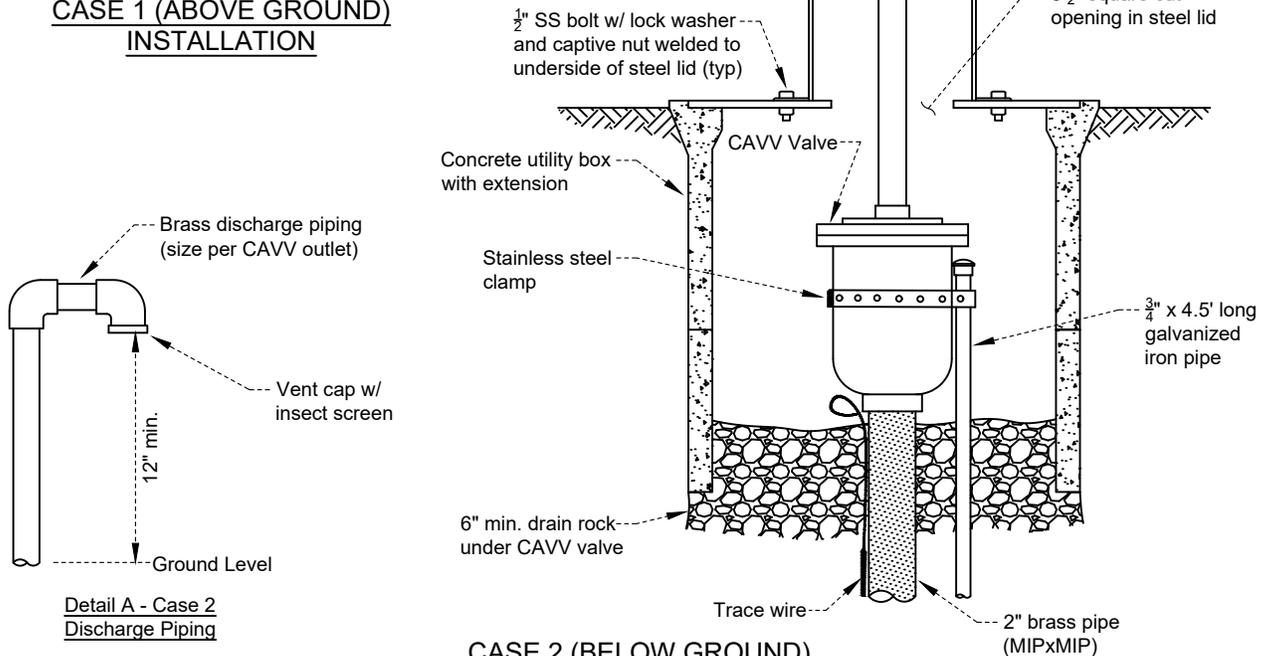
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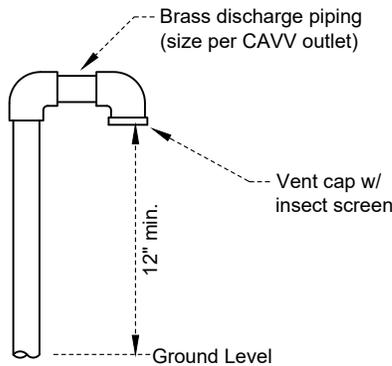
451.10



**CASE 1 (ABOVE GROUND)
INSTALLATION**



**CASE 2 (BELOW GROUND)
INSTALLATION**



**Detail A - Case 2
Discharge Piping**

NOTES:

1. Backfill material shall conform to Page 610.10.
2. Concrete shall conform to Page 100.00.
3. Piping shall be 2" brass unless otherwise noted.
4. The minimum acceptable CAVV size shall be 2". CAVV sizing shall be engineered according to the manufacturer's specifications and approved by the City Engineer.
5. Enclosure anchor bolts shall be stainless steel (SS) and shall be embedded in the concrete base slab a minimum of 2" and a maximum of 3". Hold-down hardware shall include SS nuts, lock washers, and washers.
6. All piping passing through a concrete slab or base shall pass through a sleeve for the full thickness of the slab. The sleeve shall have an inside diameter 1/2" larger than the outside diameter of the carrier pipe and the carrier pipe shall be wrapped with foam pipe wrap or approved equal.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

STANDARD DRAWING

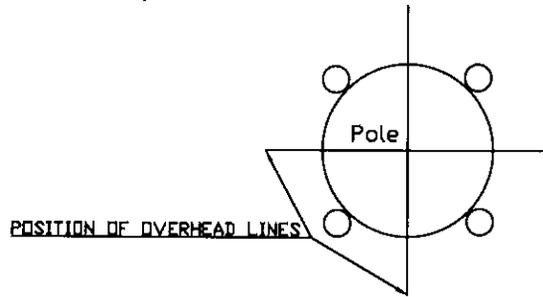
**COMBINATION AIR / VACUUM VALVE (CAVV)
TYPICAL INSTALLATION DETAIL**

Approved: *WST* 09-30-2023
Date

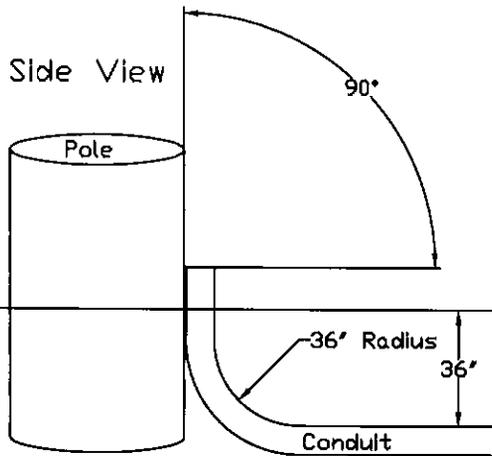
City Engineer _____ Date _____

Date: 09/2023 Dwg No.: 451.20
Scale: None

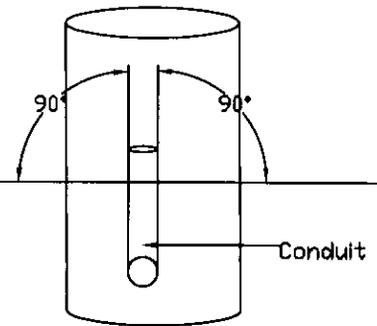
Top View



Side View



Front View



Installation Notes

1. Riser bends will be Schedule 80 PVC.
2. Riser bends will be located in the center of a quadrant of the pole and must be against the pole and parallel to the pole.
3. Riser bends must have a minimum of 36" of cover at the lower end.
4. Riser bends must also be perpendicular to level grade.
5. Call COSL Electric to mark location of riser prior to installation.

(530)275-7445

DRW/REV. A.O. / JJC

CHECKED T.D.

DATE 08/14/18

SCALE NTS

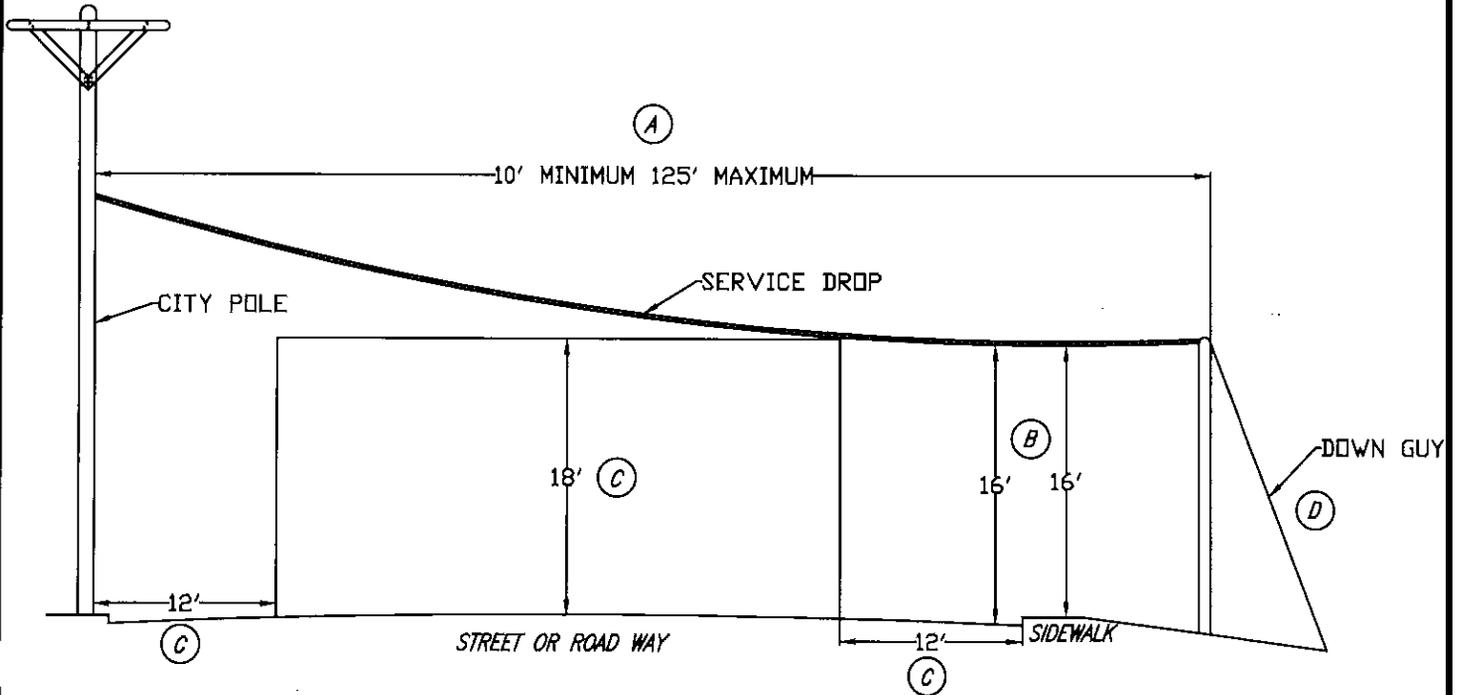
Requirements For 12KV Primary Riser

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET 1 OF 1

DRAWING NUMBER

PP001-1



Clearance for Service Drops and Poles

- (A) Service Poles will be a minimum of 10' away from a City Pole or vertical plane of a through conductor on a City Pole and a maximum of 125' away from a City Pole
- (B) Service Drop will have a minimum clearance of 16' at edge of road or top of sidewalk which ever is higher
- (C) The Service Drop will have a minimum of 18' of clearance at a point 12' from edge of Road or Face of Sidewalk or Curb.
- (D) A Down Guy can be required on a Service Pole with any Service Span length, but will be required for a Service Span of over 100' and need to be able to hold a minimum of 2500 pounds.

DRN./REV. A.O. / JJC

CHECKED T.D.

DATE 08/14/18 SCALE NTS

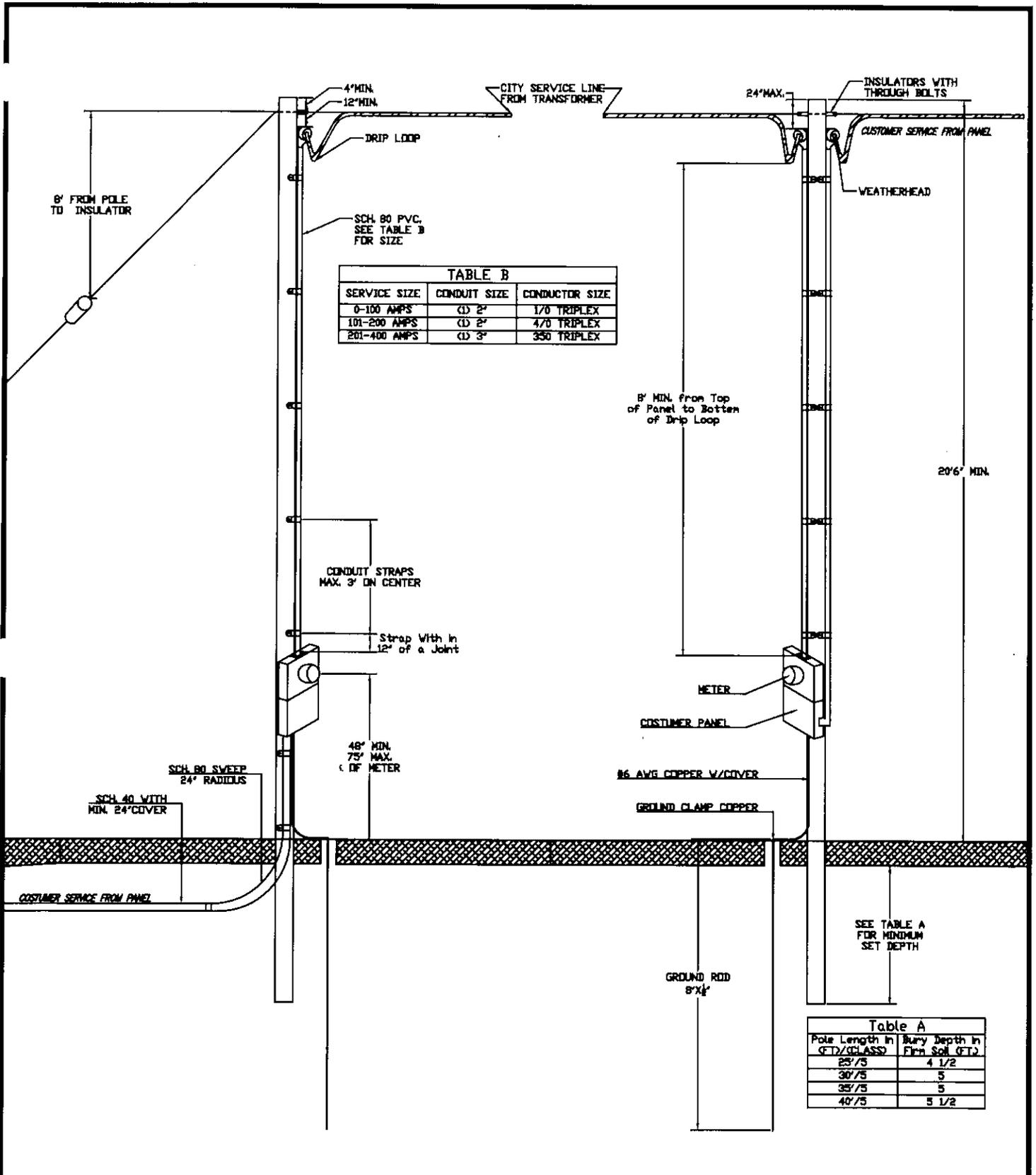
Clearance For Service Drops and Poles

SHEET 1 OF 1

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

DRAWING NUMBER

SD001-1



DRN	JJC
CHECKED	T.D.
DATE	SCALE
08/14/18	NTS

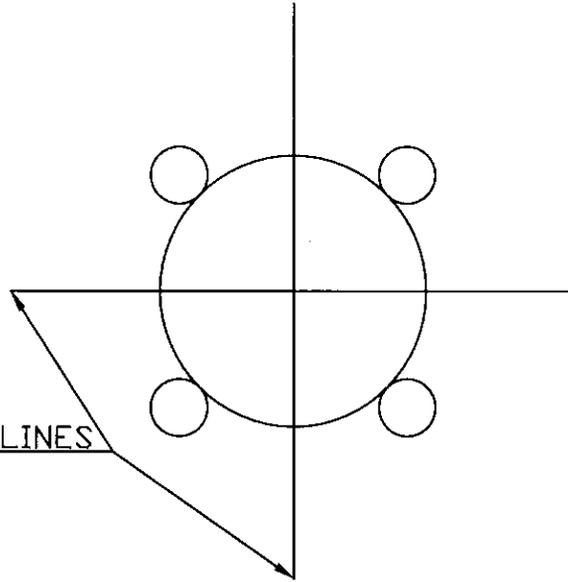
Customer Owned Service Pole Requirements

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

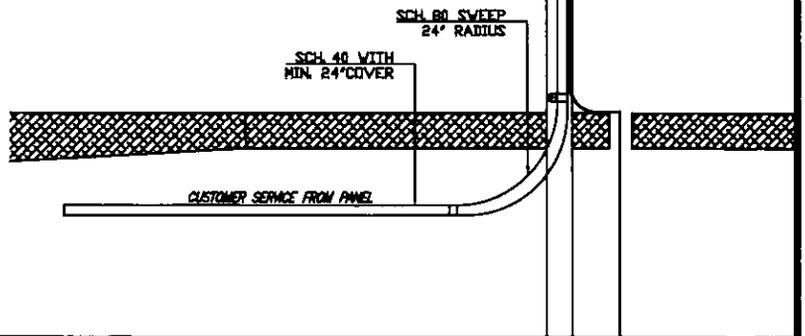
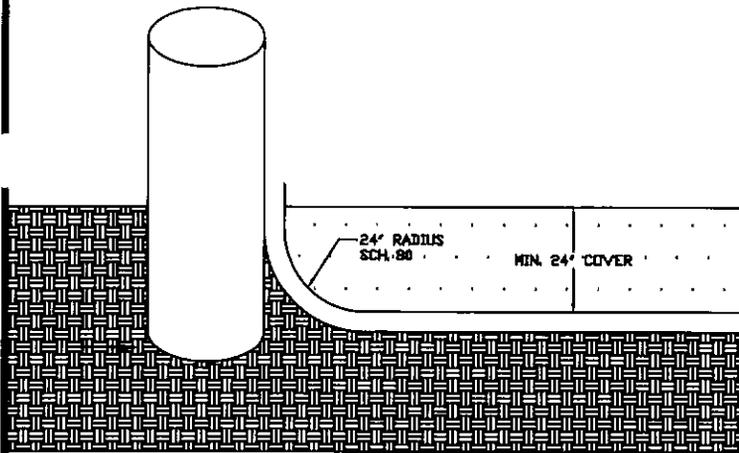
SHEET	1	OF	3
DRAWING NUMBER			
SP001-1			

TOP VIEW OF POLE

POSITION OF OVERHEAD LINES



EQUIPMENT AND CONDUITS SHALL BE CENTERED IN 1 OF THE QUADRANTS SHOWN.
 $\frac{1}{2}$ OF THE POLE SHALL BE DESIGNATED AS CLIMBING AREA AND NOT BE USED FOR ANY PURPOSE.



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DATE	SCALE
08/14/18	NTS

Conduit and Equipment Placement on Pole

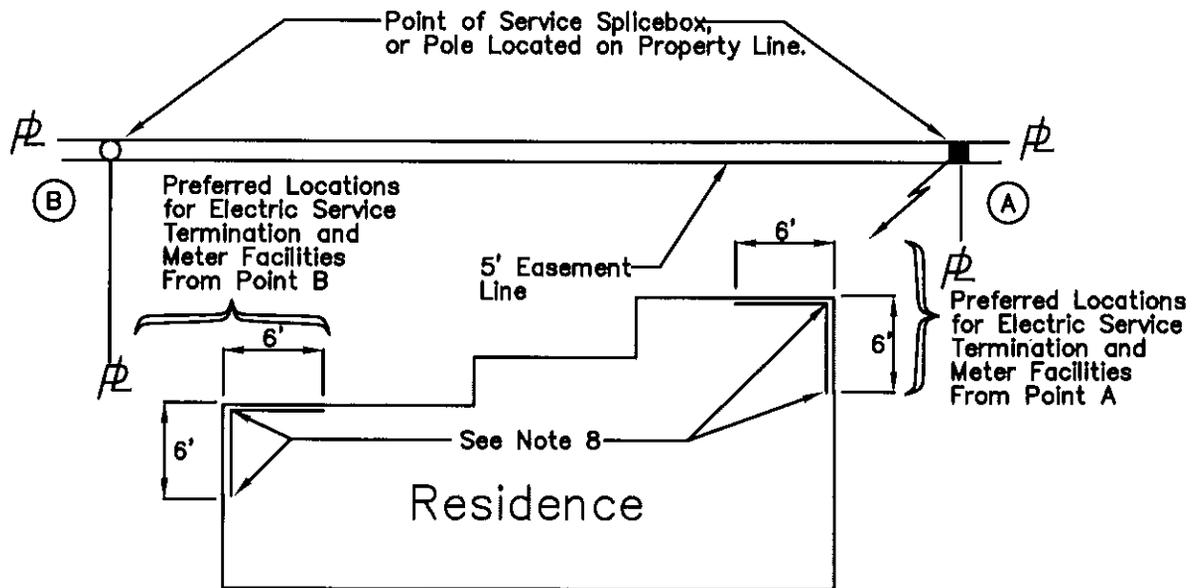
CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET	2	OF	3
DRAWING NUMBER			
SP001-2			

**CITY OF SHASTA LAKE ELECTRIC DEPARTMENT
CONSTRUCTION REQUIREMENTS APPLICABLE FOR ALL TYPES OF SERVICE
(i.e., Residential, Commercial, and Industrial)**

1. The Developer/Customer shall establish service from the City of Shasta Lake's Electric Department and provide all necessary easements for Electric Supply Facilities as required by the City of Shasta Lake's Electric Department.
2. The Developer/Customer shall furnish and install all substructures specified by the City of Shasta Lake.
3. The Developer/Customer shall be responsible to locate and properly place electric utility facilities within utility easements and public right of way.
4. It is the responsibility of the Developer/Customer to set all primary boxes so that the box lid is at the same elevation as the lowest final elevation of the adjacent sidewalk, top of curb or pavement edge (existing, proposed, or future). All secondary boxes will be set at the same elevation and slope of the adjacent sidewalk, curb or pavement.
5. The Developer/Customer shall furnish and install (unless otherwise shown) all conduits for services, secondary and primary conduits. Below grade conduits shall be Schedule 40 PVC.
6. The Developer/Customer shall perform all trenching and backfill per the City of Shasta Lake requirements.
7. All conduit and substructures to be used by the Electric Department must be inspected prior to backfilling. Failure to obtain an inspection will require the installer to expose any or all of the buried facilities for an inspection. Call (530) 275-7445, prior to backfilling, to schedule an inspection by the Electric Department.
8. Bell ends shall be placed on all conduit terminations. Bell ends shall be Schedule 40 PVC.
9. All conduits installed by the Developer/Customer shall be cleaned by using brushes and/or swabs.
10. All conduits without conductors shall have a minimum 1250lb. polyester MULETAPE, or an equal (especially designed for that purpose) pull line provided and installed by the Developer/Customer. Pull line must be continuous, with no knots.
11. Conduit systems are for future use as well as initial cable installation; therefore, the Developer/Customer shall use all care required during the pulling of cable to insure that the conduit is not damaged.
12. All conduit sweeps shall be Schedule 40 PVC. All conduit riser bends shall be Schedule 80 PVC. Conduit sweeps or bends shall not be cut or otherwise modified. All joints shall be glued per manufacturer's specification and provide a water tight fit.
13. Conduit runs shall be limited to not more than 3-90' bends, or a combination of angles with not more than 270' deflection throughout the conduit run, unless otherwise shown on City of Shasta Lake approved plans.
14. All conduit and wire sizing will be by the City of Shasta Lake Electric Department staff.
15. The Developer/Customer shall furnish and install all low voltage (0-600V) cable. Cable shall be XLPE insulated, NEC type "U.S.E.-2" Aluminum, unless specified by the City. Service cables are normally sized to match customer main panel rating.
16. The Developer/Customer shall coil 6' of cable in each splice enclosure with the ends protected by plastic caps taped secure to the cable. All cable will be spliced and terminated by the City of Shasta Lake.
17. There shall be no splices in low voltage (600V) wire except in City approved splice enclosures.
18. The neutral conductor of low voltage (600V) tri-plex cable shall be insulated with a yellow pigmented XLP compound for easy identification. Single conductor cable used as neutral without yellow marking (pigmented) shall be identified at each splicing point by approved white electrical tape.
19. All new panels over 200 amp rating shall be served by an underground service.
20. The City of Shasta Lake will determine all points of service. Service points normally shall provide minimum cable lengths and provide accessibility for operations and maintenance.
21. All electric meter service panels shall be installed so that the centerline of the meter socket is not less than 48" above final grade, and not more than 72" above final grade.
22. Electric meter service panels must be UL listed service equipment and be inspected by the City of Shasta Lake Building Department.
23. All electric meter service panels must be located on an external wall and must have an external main disconnect. All electric service used on the premises shall be supplied exclusively by the City except for electricity produced by customer-owned generation equipment which shall be interconnected on the customer's side of the electric meter in accordance with all applicable requirements. Customer shall not, directly or indirectly, sell, sublet, assign or otherwise dispose of the electric service, or any part thereof.
24. The Developer/Customer shall furnish, install, own, and maintain conduit 2 feet from their outer building line to their terminating facility.
25. Replacement or enlargement of low voltage wire and conduit due to relocation or increased load shall be the responsibility of the Developer/Customer.
26. The Developer/Customer is to note that the City of Shasta Lake Electric Department will require reimbursement for all costs associated with the relocation of their facilities requested by the Developer/Customer or necessitated by the construction of improvements required as a condition of approval of the Developers/Customers project.
27. Groundwater/stormwater intrusion and migration in any trench is the responsibility of the customer and/or their trenching agent for the life of the facilities placed in the trench.
28. All utility padmount transformers and switchgear equipment pads shall be located within 8' of a paved driveable access.
29. The Developer/Customer shall furnish and install street light base, conduit, standard, arm, luminaire, and conductor per the City of Shasta Lake requirements.

DESIGNED A.O./JJC T.D.	<h2 style="margin: 0;">Electric Service Construction Requirements</h2>	SHEET 1 OF 1				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 2px;">DATE REVISION</td> <td style="width: 50%; padding: 2px;">SCALE</td> </tr> <tr> <td style="padding: 2px;">05/29/20</td> <td style="padding: 2px;">NTS</td> </tr> </table>	DATE REVISION	SCALE	05/29/20	NTS	CITY OF SHASTA LAKE ELECTRIC DEPARTMENT	DRAWING NUMBER SR001-1
DATE REVISION	SCALE					
05/29/20	NTS					

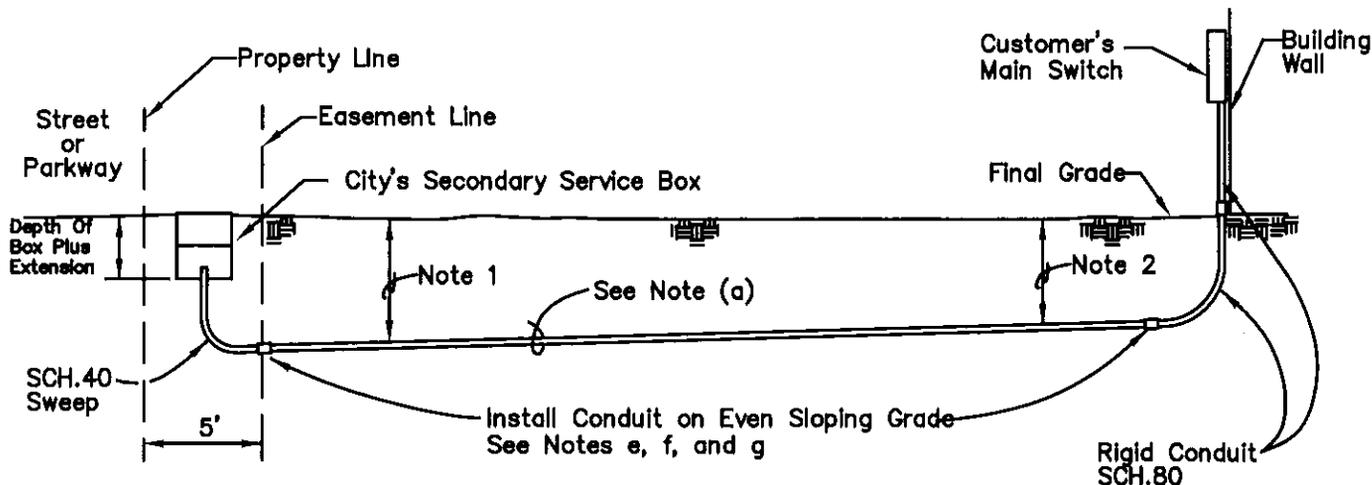


-  Walls on which underground electric service termination and meter facilities are permitted.
-  Walls on which underground electric service termination and meter facilities are permitted but not preferred.
-  Outside building walls.
-  Service Trench, Conduit, & Conductor by the customer
-  Property Line

NOTES:

1. Underground electric service termination facility and meter shall be attached to the wall facing and nearest the point of service as determined by City of Shasta Lake Electric Department when subdivision was developed.
2. The meter location shall be accessible for inspection, reading, and testing.
3. If a preferred location is not practicable, consult City of Shasta Lake Electric Department.
4. If there is any doubt as to point of service contact City of Shasta Lake Electric Department.
5. Contact the City of Shasta Lake Electric Department for utility trench layout across front of lot.
6. There shall be no splices in the service wires except at the point of service. All services over 100' require City of Shasta Lake Electric Department approval.
7. For underground service the customer shall coil 6' of wire in pull box at the point of service for future splicing by the City of Shasta Lake. If pole is point of service, consult the City of Shasta Lake Electric Department for length of wire to be coiled on pole for future splicing by City of Shasta Lake.
8. If building side wall is less than 5' from property line this area cannot be used for a meter location.

A.O./J.C.		Underground Single Family Residential Service (Meter Location)	SHEET 1 OF 5
T.D.			
DATE	SCALE	CITY OF SHASTA LAKE ELECTRIC DEPARTMENT	DIVISION NUMBER
05/29/20	NTS		SR002-1



NOTES:

1. Minimum Secondary conduit cover at box location = 24".
2. Minimum Secondary conduit cover at termination facilities = 24".
3. Appropriate excavation depth shall be provided such that standard 24" radius 90° bends may be installed as shown. Conduit bends shall not be cut or otherwise modified.

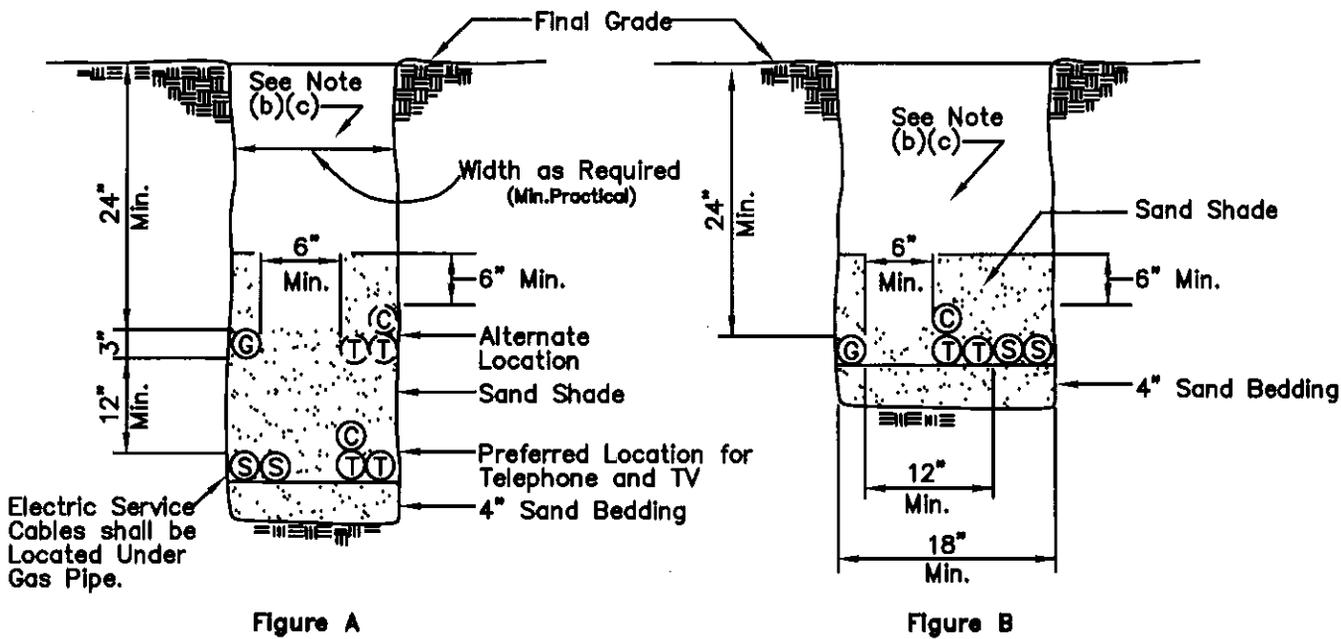


Fig. 4 TYPICAL SERVICE TRENCH DESIGN

- | | |
|----------------------------------|------------------------------|
| G - Gas Pipe | T - Telephone Service |
| S - Electric Services in Conduit | C - Cable Television Service |

(NOTES, SEE SHEET 3 OF 5)

A.O./J.C.
T.D.

**Underground Single Family Residential Service
(Trench Detail)**

SHEET 2 OF 5

DATE 05/29/20 SCALE NTS

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

DRAWING NUMBER
SR002-2

CUSTOMER SHALL FURNISH AND INSTALL AT OWN EXPENSE:

- a. Service lateral conduits and sweeps from point of service to terminating facility; Size shall be based on ampere capacity of bus or service equipment, whichever is greater. See Sheet 4.
- b. Backfill and compaction to meet City requirements. Shade all utilities with 6" of sand cover.
- c. Depths and separation shown are minimums. Variances may be required if larger diameter facilities are to be installed. Gas facilities shall conform to provisions of C.P.U.C. G.O. 112C and electric facilities to provisions of C.P.U.C. G.O. 128.
- d. Electric service conduit shall be Schedule 40 PVC or greater, as specified by the City of Shasta Lake Electric Department. All sweeps shall be PVC schedule 40, all riser sweeps and/or conduit to extend above final grade shall be PVC schedule 80.
- e. If the bottom of the customer's main switch is at a lower elevation than the ground around the service splice box, water migration towards customer termination facilities will exist. It shall be the customer's responsibility to install duct seal and a customer owned intermediate splice box to prevent water intrusion. The City of Shasta Lake Electric Department assumes no responsibility for water intrusion.
- f. A water and/or sewer service is not allowed in a joint trench with electric, where there is a water or sewer service crossing a joint trench, contact the City of Shasta Lake Electric Department for clearance requirements.
- g. Ground water/storm water intrusion and migration in any trench is the responsibility of the customer and/or their trenching agent for the life of the facilities placed in the trench.

A.O./J.C.		Underground Single Family Residential Service (Service Trench Notes)	SHEET 3 OF 5	
T.D.			DRAWING NUMBER	
DATE REVISION	SCALE	CITY OF SHASTA LAKE <small>ELECTRIC DEPARTMENT</small>	SR002-3	
05/29/20	NTS			

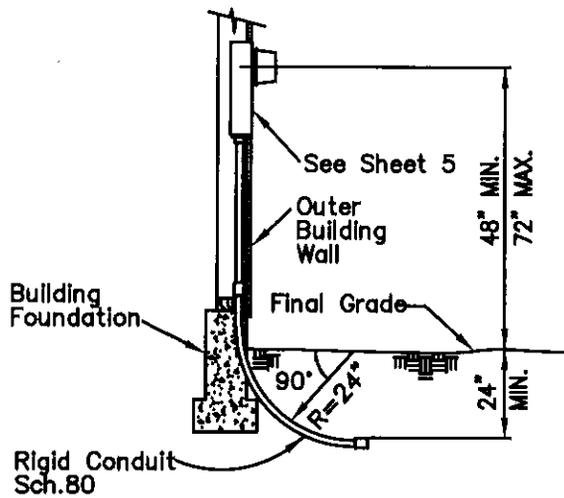


Fig.1 RECESSED MOUNTED

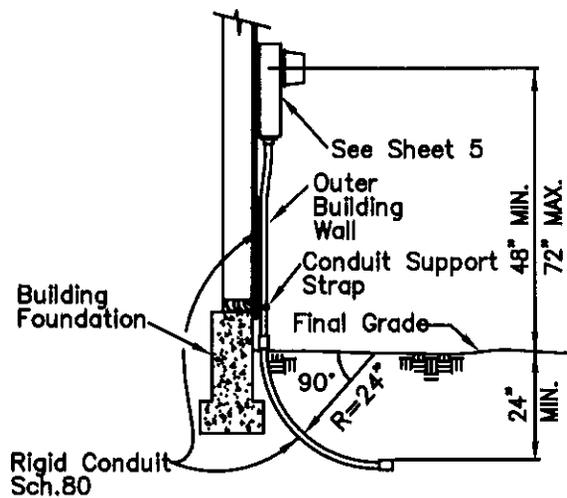


Fig.2 SURFACE MOUNTED SERVICE

SERVICE TERMINATION ENCLOSURE

TERMINATION ENCLOSURE

CUSTOMER INSTALLED SERVICE EQUIPMENT OR BUS CAPACITY	CUSTOMER FURNISHED & INSTALLED SERVICE CONDUIT FOR 3 WIRE SERVICE NO. & SIZE	CUSTOMER FURNISHED & INSTALLED SERVICE WIRE FOR 3 WIRE SERVICE (NOTE 6 & 7)
0-100 AMPS	1-2"	1/0 TRIPLEX
101-200 AMPS	1-2"	4/0 TRIPLEX
201-400 AMPS	1-3"	350 TRIPLEX

1. All conduit installed shall be Schedule 40 PVC. Exposed conduit shall be Schedule 80 PVC.
2. Any PVC exposed to sunlight will be schedule 80 or equal.
3. Verify meter and service location with the City Electric Department before installation.
4. Customer shall furnish, install, own and maintain conduit 2' from their outer building line to his terminating facility.
5. Service lateral conduit specified in conduit and wire table (above) is limited to not more than 3-90° bends, or a combination of angles with not more than 270° deflection through the service run, unless shown otherwise on City of Shasta Lake Electric Department approved plans.
6. All service wire shall be XLP insulated N.E.C. type "U.S.E.-2" Aluminum. All exposed cable ends shall be protected by plastic caps and taped secure to the cable.
7. All new services for 201-400 AMP will have 1-3" conduit minimum.

A.O./J.C.
T.D.

Underground Single Family Residential Service
(Termination Enclosure Mounting)

SHEET 4 OF 5

DATE REVISION SCALE
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CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

DRAWING NUMBER
SR002-4

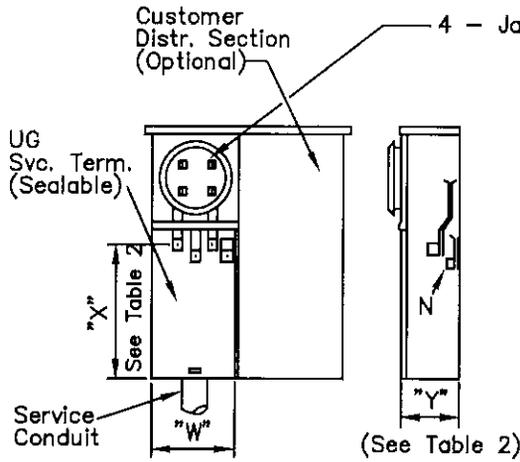


Fig. 1 TYPICAL UG SERVICE TERMINATION ENCLOSURE COMBINATION METER SOCKET PANEL (Residential 0-200 Amp.)

Table 2. (Ref. Fig. 1)

MAXIMUM CAPACITY	"W" MIN. DIM.	"X" MIN. DIM.	"Y" MIN. DIM.
125A	7"	8"	4"
200A	7"	11"	5 1/2"

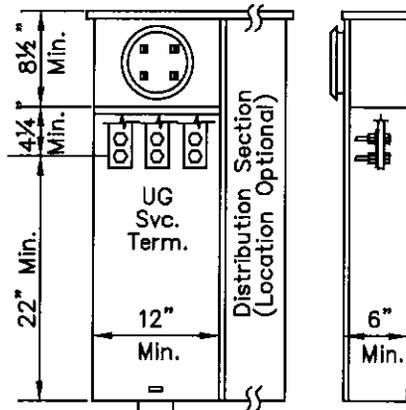


Fig. 2 TYPICAL SERVICE TERMINATION ENCLOSURE COMBINATION METER SOCKET PANEL FOR CLASS 320 METER

(Residential 120/240v, 201-320 Amp. Service)
4-Jaw Meter Socket Only. No Bolt on Panel Accepted.

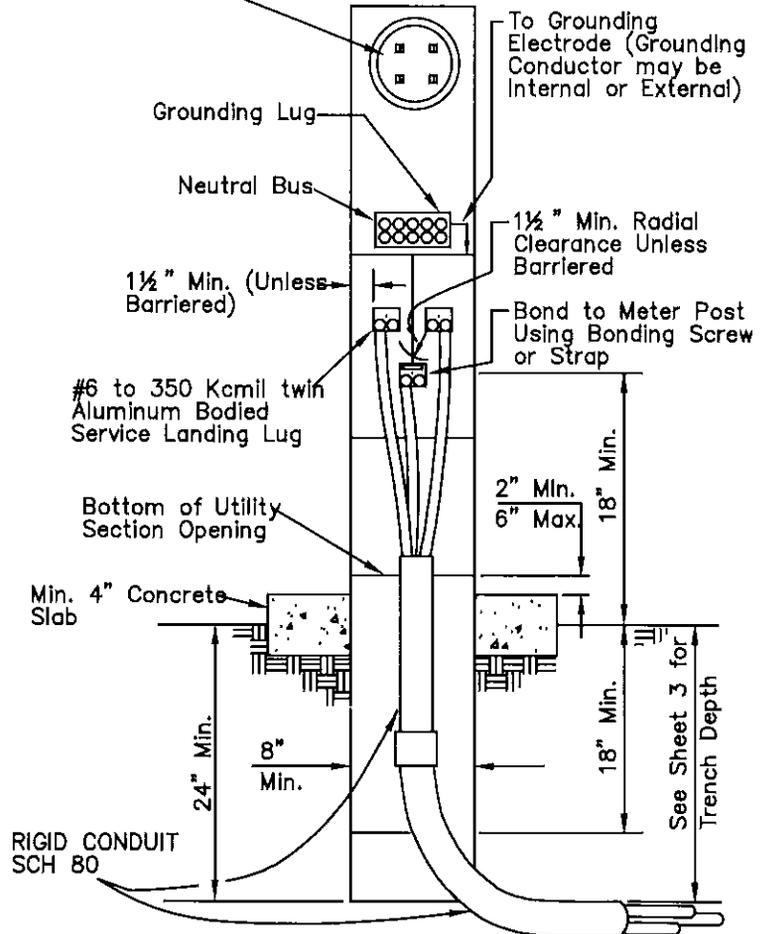


Fig. 3 METER POST FOR SERVICE TO A MOBILE HOME (0 through 200 amps)

NOTES:

1. Conductors to class 320 meter panels shall be terminated with compression lugs with Nema pads shown in Figure 2. See Sheet 4 for wire sizes applicable to subject panels.
2. Replacement or enlargement of service lateral conduits and conductors due to relocation or increased load will be accomplished by the customer. The conduit that is on, within or under the building, will be owned, maintained, and replaced by the applicant.
3. Where the applicant's terminating facilities are appreciably lower in elevation than at the street end, both ends of the conduit will be sealed to avoid the possibility of a static head of water against the Duxseal at the lower end of the conduit run.

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Underground Single Family Residential Service (Termination Enclosure Types)

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET	5	OF	5
DRAWING NUMBER			
SR002-5			

**MINIMUM SPECIFICATIONS FOR UNDERGROUND
SECONDARY AND SERVICE CONDUCTORS**

Maximum Normal Operating Temperature..90°C Dry 90°C Wet Insulation TypeXLPE	
Conductor Size AWG or KCMIL	Insulation Thickness Mils
12-10 8-2 1-4/0 213-500 501-1000	45 60 80 95 110
Outer CoverMoisture Resistant Nonmetallic ApplicationDry or Wet Locations	

NOTES:

1. All 600 Volt secondary and service conductors supplied by customer/contractor shall be XLPE insulated type U.S.E.-2 cable.
2. All cable shall be stamped U.S.E.-2 and meet all specifications of the above table.
3. Cables stamped with the following markings are acceptable:
 - a. U.S.E.-2 - XLPE
 - *b. U.S.E.-2 - RHW-2 RHH
 - c. U.S.E.-2 - XPLE RHW-2 RHH
4. All requirements shall be met in order to be connected to City of Shasta Lake electrical system.
(*XLPE insulation must be verified via manufacturer's product data sheet and purchase invoices).

A.O. / JJC		600 Volt Secondary and Service Conductors	SHEET 1 OF 1
T.D.			DRAWING NUMBER
DATE	SCALE	CITY OF SHASTA LAKE ELECTRIC DEPARTMENT	SR003-1
06/03/20	NTS		

1. GENERAL NOTES

- a. The information shown on this drawing is intended to advise customers of the minimum requirements for customer owned service poles for temporary underground electric service. These requirements have been established by the State of California and the City in the interest of safety to the public and to workers. The city cannot establish service to poles which do not meet these minimum requirements. The maintenance of customer service poles in with these conformity requirements is the sole responsibility of the customer.
- b. Inspection and approval is required before service can be connected.
- c. When single phase service larger than 100 amps or three phase service is desired, consult the City.
- d. The use of temporary service poles shall be restricted to installation of a temporary nature such as building construction, temporary sales locations, or other uses requiring electric service for one year or less. Temporary service poles shall be furnished and installed by the customer. If the temporary service is to be established at the permanent meter location, consult the City.
- e. Temporary power poles will not be located in the shaded area as shown in Fig.1. In no case shall the pole be located closer than 3' from the box.
- f. Address number shall be attached to meter pedestal as shown. Minimum 2" numbers are required.

2. GROUNDING NOTES

The grounding system shall conform to the minimum grounding requirements of the Electrical Safety Orders as follows:

- a. The path to ground from circuits, equipment and conductor enclosures shall be permanent and continuous. All metallic enclosures and conduit enclosing service entrance conductors shall be connected to the common ground.
- b. A continuous grounding conductor shall be extended from the neutral terminal of the service switch to a grounding electrode. The ground conductor shall be No.8 AWG copper minimum for No.2 AWG copper (or aluminum equivalent) or smaller service entrance conductors and No.6 AWG copper for No.1 or 1/0 AWG copper (or aluminum equivalent) service entrance conductors. The ground conductor shall be protected against mechanical injury by rigid steel conduit or armor cladding connected to the grounding electrode by means of an approved conduit grounding hub and clamp or approved armor grounding hub and clamp. The connection to the grounding electrode must be above ground or otherwise readily accessible for inspections.
- c. A metallic underground water piping system, either local or supplying a community, shall always be used as a grounding electrode where such piping system is available. If the buried portions of the metallic piping system is less than 10 feet in length (including well castings bonded to the piping system) or there is a probability that the piping system may be disconnected, it shall be supplemented by one or more of the following electrodes driven 8 ft. into the ground: (1) Galvanized pipe not smaller than 3/4" inside diameter. (2) Copper clad steel or non-ferrous rod not smaller than 1/2" diameter. (3) Iron (or steel) rod not smaller than 5/8" diameter.

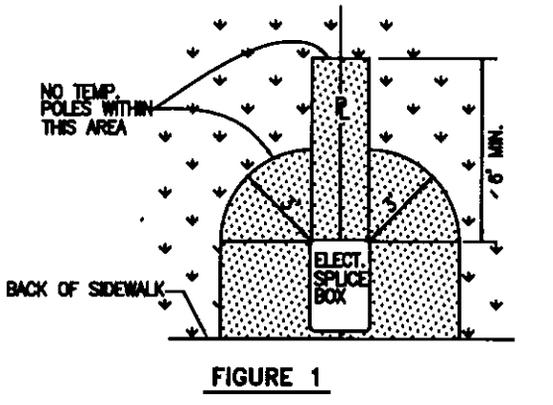
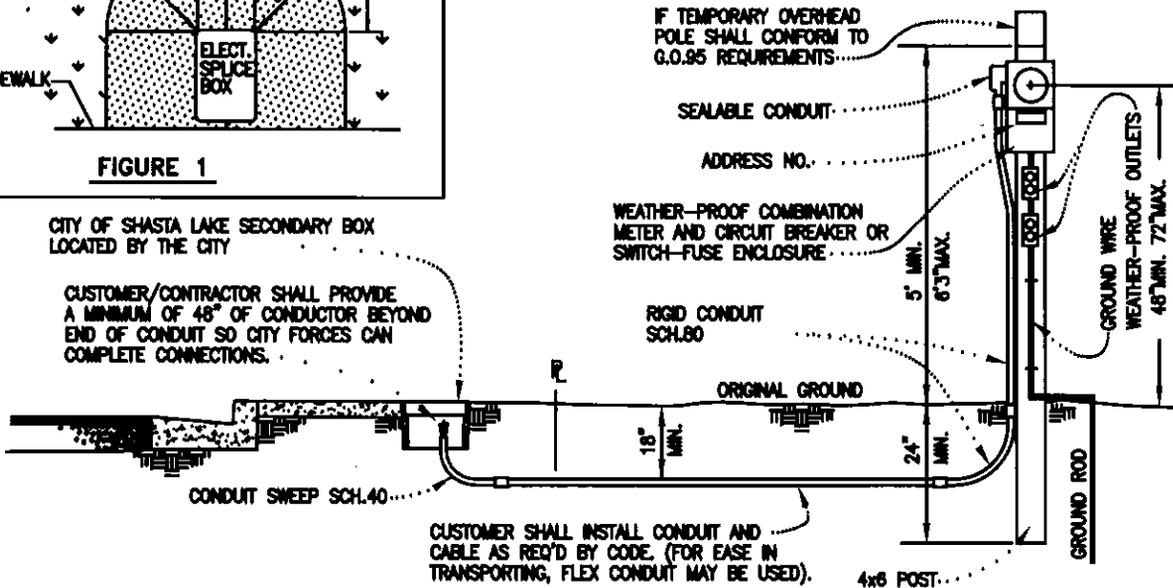


FIGURE 1

CITY OF SHASTA LAKE SECONDARY BOX LOCATED BY THE CITY

CUSTOMER/CONTRACTOR SHALL PROVIDE A MINIMUM OF 48" OF CONDUIT BEYOND END OF CONDUIT SO CITY FORCES CAN COMPLETE CONNECTIONS.

CAUTION: NON-METALIC WATER PIPE IS NOT SUITABLE FOR USE AS A GROUNDING ELECTRODE.



CUSTOMER SHALL INSTALL CONDUIT AND CABLE AS REQ'D BY CODE. (FOR EASE IN TRANSPORTING, FLEX CONDUIT MAY BE USED).

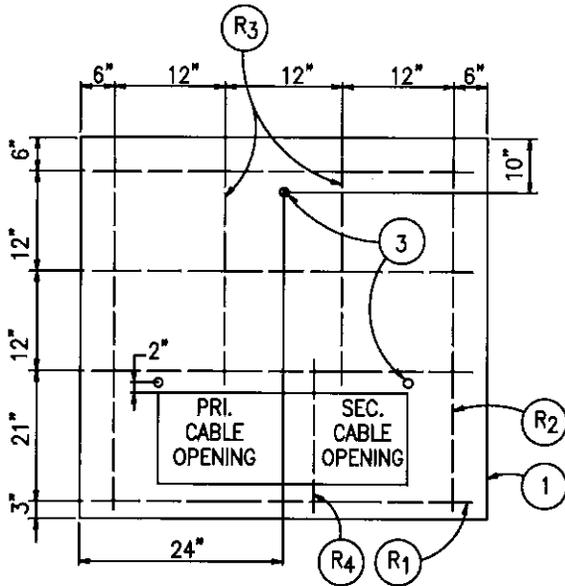
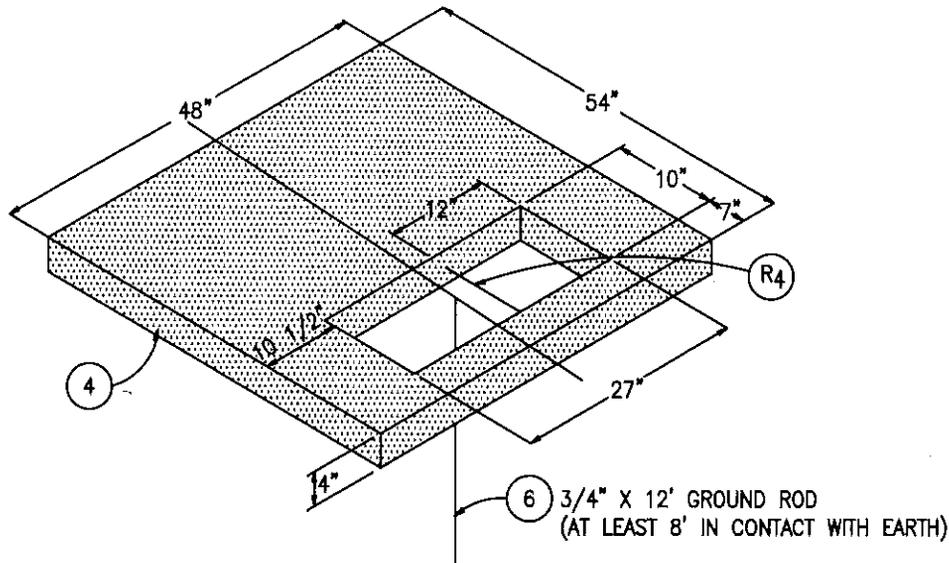
4x6 POST.

A.O./J.C.	
T.D.	
DATE	SCALE
08/13/20	NTS

Temporary Underground Electric Service

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET 1 OF 1
DRAWING NUMBER
SR004-1



REINFORCING IRON		
TYPE NO.	REQ'D	DESCRIPTION
R ₁	4	1/2" X 3'-6"
R ₂	2	1/2" X 4'-0"
R ₃	2	1/2" X 2'-7"
R ₄	1	1/2" X 1'-11"

ITEM	QUANTITY	DESCRIPTION UPD-1P
1	6 CU. FT.	CONCRETE, CLASS "A", 5 1/2 SACK MIX
2	13.4 LBS	REINFORCING RODS, SEE TABLE ABOVE
3	3	THREADED INSERTS FOR 1/2" LIFTING BOLTS.
4	1	TRANSFORMER PAD
5	2	3E BOX EXTENSION
6	1	3/4"x 12' GROUND ROD

NOTES:

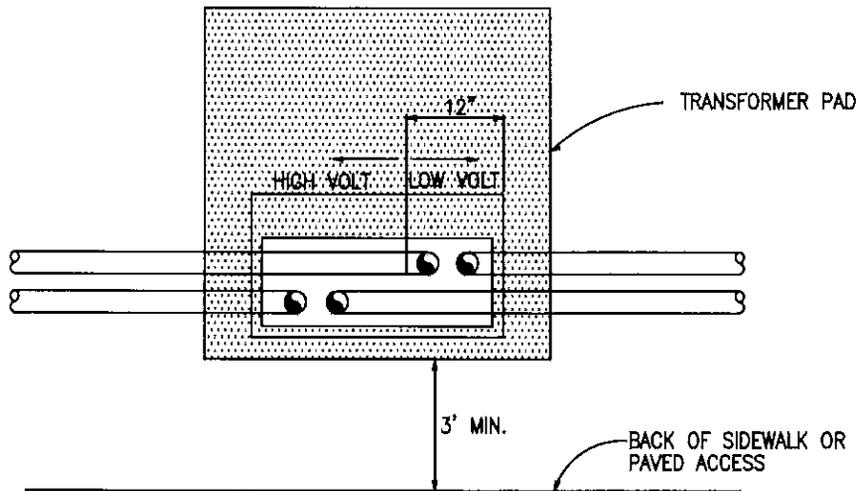
1. ABOVE PAD MAY BE PRECAST OR Poured IN PLACE. IF Poured IN PLACE OMIT ITEM 3.
2. SEE DRAWING SR006-1 FOR PAD CLEARANCES.
3. SEE DRAWING SR007-1 AND SR007-2 FOR PAD BARRIER PROTECTION.
4. ALL SOIL WILL BE COMPACTED UNDER AND AROUND THE PAD BY JETTING AND/OR WACKER TO A MINIMUM OF 90% RELATIVE DENSITY.
5. CUSTOMER INSTALLED.

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DATE	SCALE
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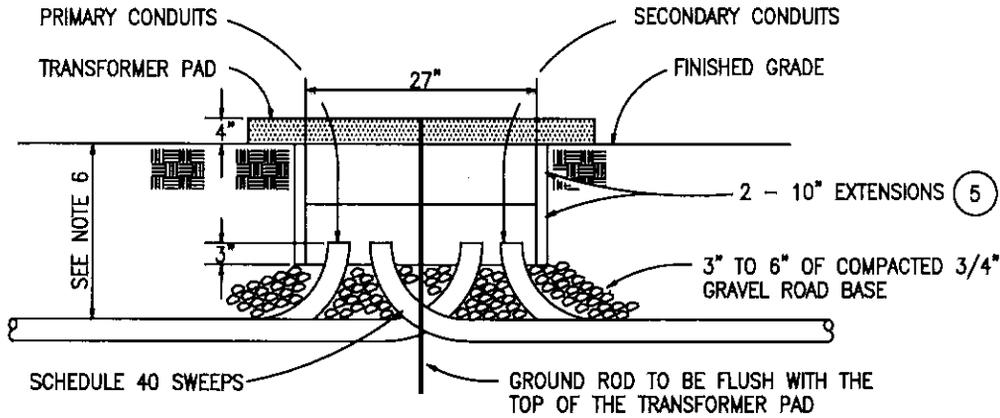
1 Phase Transformer Pad Installation 25-167 KVA
(Pad Details)

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET	1	OF	2
DRAWING NUMBER			
SR005-1			



PLAN



SECTION

NOTES

1. ALL SOIL WILL BE COMPACTED UNDER AND AROUND THE PAD BY JETTING AND/OR WACKER TO A MINIMUM OF 90% RELATIVE DENSITY.
2. SEE DRAWING SR005-1 FOR PAD DETAIL.
3. SEE DRAWINGS SR006-1 AND SR006-2 FOR PAD CLEARANCES.
4. SEE DRAWINGS SR007-1 AND SR007-2 PAD BARRIER PROTECTION.
5. "COOK" 3E BOX EXTENSION (24" X 36") OR EQUAL/APPROVED BY THE CITY OF SHASTA LAKE ELECTRIC DEPT.
6. APPROPRIATE EXCAVATION DEPTH SHALL BE PROVIDED SUCH THAT STANDARD 36" RADIUS 90° BENDS MAY BE INSTALLED AS SHOWN. CONDUIT BENDS SHALL NOT BE CUT OR OTHERWISE MODIFIED.
7. CUSTOMER INSTALLED.

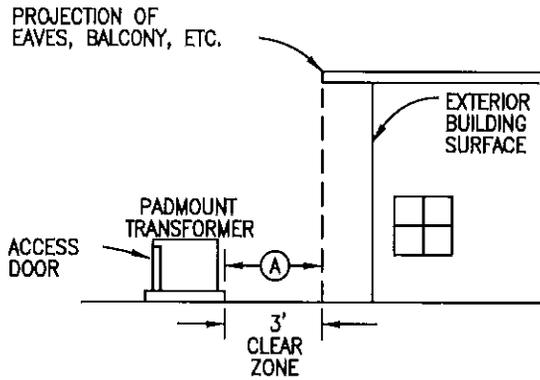
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**1 Phase Transformer Pad Installation 25-167 KVA
(Conduit Details)**

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET	2	OF	2
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SR005-2			

FIGURE 1 - CLEARANCE FROM BUILDINGS



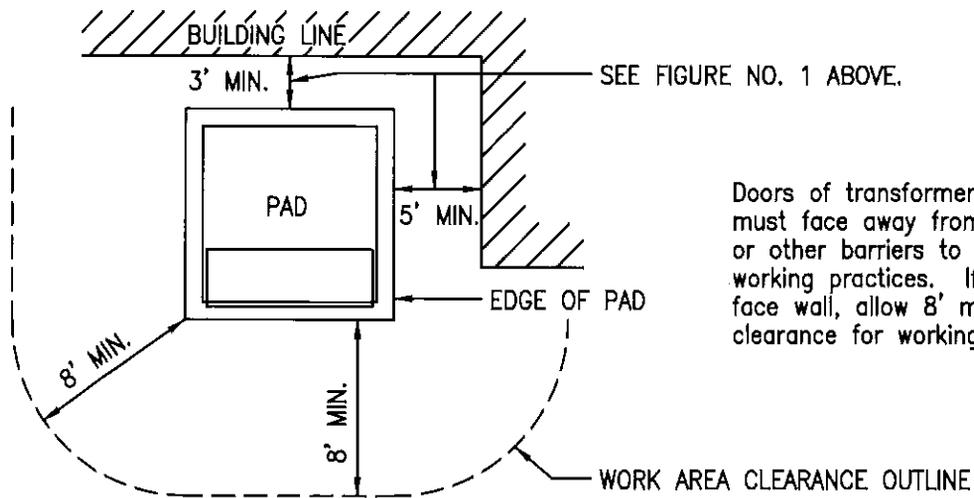
BUILDING SURFACE, EAVES, BALCONY, ETC.	CLEARANCE (NOTE 5) (A)	
NON-COMBUSTIBLE	3'	
COMBUSTIBLE	25-75KVA XFMR.	10'
	76-333KVA XFMR.	20'
	334-2500KVA XFMR.	30'

REFERENCE: ANSI 979-1984

NOTES:

1. Non-combustible material includes brick, clay, concrete, steel, and stone having a one hour fire resistive rating. Stucco is excluded.
2. Vertical space above pad and clear zone must remain unobstructed for hoisting equipment on and off pad.
3. Customer is responsible for protection of equipment by suitable barriers per SR007-1 and SR007-2. If deemed necessary by the City of Shasta Lake Electric Department.
4. Drainage of the area surrounding the transformer must be away from any building.

FIGURE 2 - WORK AREA CLEARANCE



Doors of transformers or switchgear must face away from building walls or other barriers to allow for safe working practices. If doors must face wall, allow 8' minimum clearance for working area.

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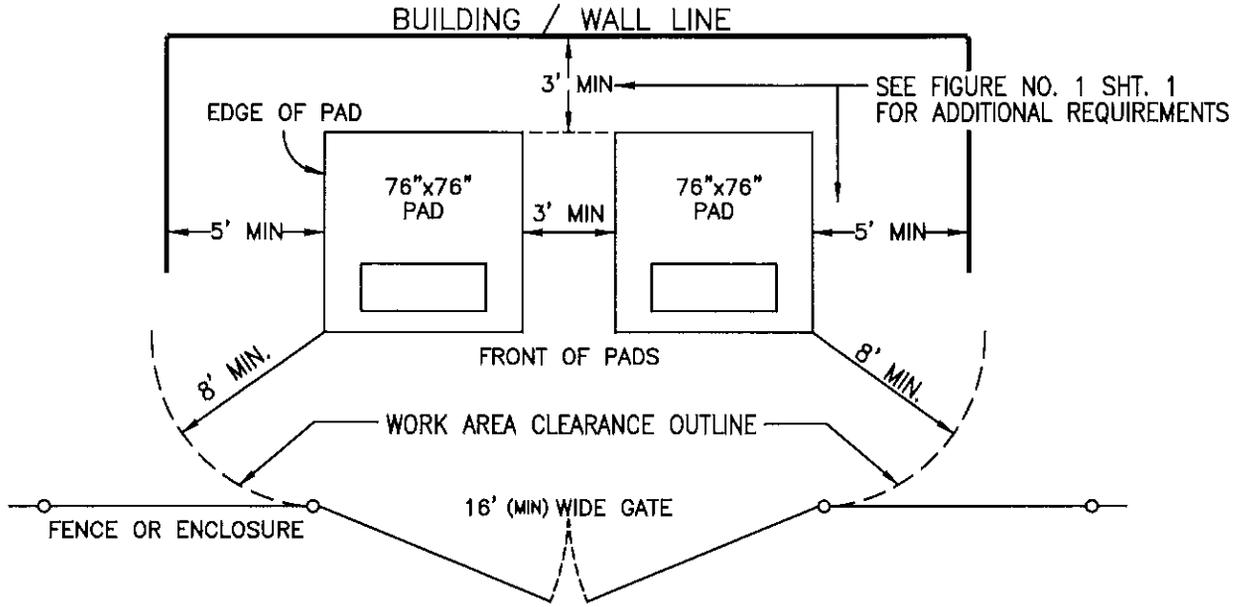
Pad Mounted Equipment Clearances

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET 1 OF 2

DRAWING NUMBER
SR006-1

FIGURE 3 - WORK AREA CLEARANCE
FOR DUAL 3# PADS



NOTES :

- 1) Doors of transformers or switchgear must face away from building walls or other barriers to allow for safe working practices. If doors must face wall, allow 8' minimum clearance for the working area.
- 2) The gate of a fence or enclosure may be within the 8' working clearance while the gates are closed (must maintain the 3' min. clearance), but while the gates are open the 8' min. working clearance must remain unobstructed.

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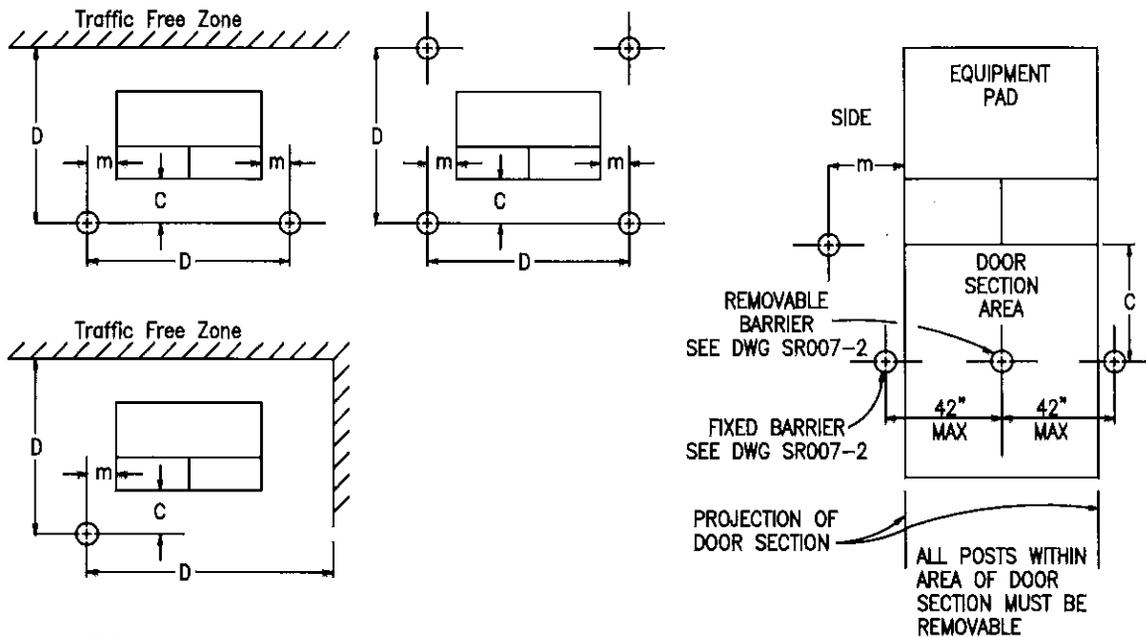
Pad Mounted Equipment Clearances
CITY OF SHASTA LAKE ELECTRIC DEPARTMENT

SHEET 2 OF 2
DRAWING NUMBER SR006-2

**BARRIER POSTS FOR PROTECTION OF PAD MOUNTED APPARATUS
(CUSTOMER INSTALLED)**

IF PAD MOUNTED APPARATUS IS TO BE LOCATED IN AN AREA SUBJECT TO VEHICULAR TRAFFIC, SUITABLE BARRIER POSTS ARE TO BE SUPPLIED BY THE CUSTOMER IN ACCORDANCE WITH THE STANDARDS APPEARING BELOW. IF THE APPARATUS IS LOCATED IN AN AREA WHICH WILL NOT ULTIMATELY BE SUBJECT TO VEHICULAR TRAFFIC, BUT IS IN THE PATH OF CONSTRUCTION EQUIPMENT, TEMPORARY BARRIERS COMPLYING WITH THESE SAME STANDARDS MUST BE PROVIDED BY THE CUSTOMER.

A. BARRIER POST LOCATIONS SHALL BE SET AT THE CORNERS OF THE PAD-MOUNTED APPARATUS IN TRAFFIC AREAS AS SHOWN BELOW.



NOTES:

1. THE DISTANCE "D" AND DISTANCE BETWEEN BARRIER POSTS SHALL NOT EXCEED 42". WHEN EXPOSED AREA EXCEEDS THIS DISTANCE, AN INTERMEDIATE POST MUST BE ADDED.
2. THE DISTANCE "m" MUST BE A MINIMUM OF 2 FEET.
3. DISTANCE "C" IS GIVEN IN THE TABLE BELOW FOR SPECIFIC TRANSFORMER SIZES.

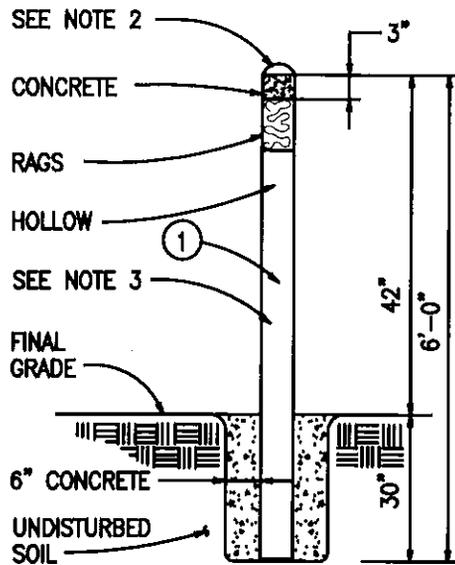
KVA	"C" - INCHES
25 - 1000	42 MIN.
1500 - 2500	47 MIN.

DRW	A.O.
CHECK'D	P.E.
DATE	SCALE
02/25/05	NTS

**Pad-Mount Equipment Barrier Protection
(Placement Details)**

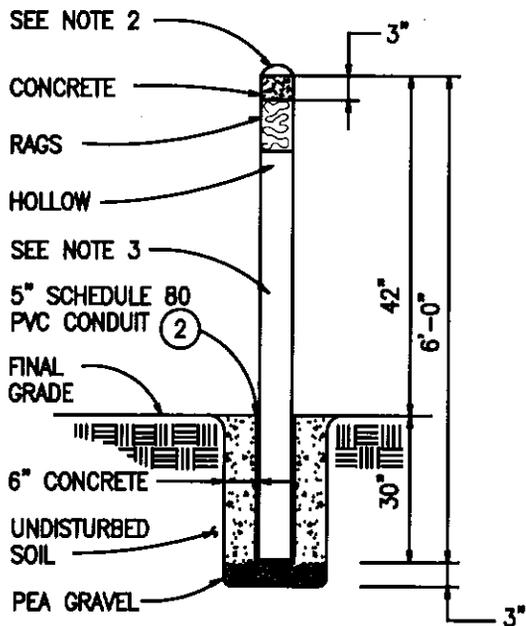
CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET	1	OF	2
DRAWING NUMBER			
SR007-1			



**NON-REMOVABLE
BARRIER POST DETAIL**

ITEM	QUANTITY	DESCRIPTION
1	1	6"x4" STEEL PIPE WITH 0.188" WALL THICKNESS
2	1	30"x5" SCHEDULE 80 PVC CONDUIT



**REMOVABLE
BARRIER POST DETAIL**

NOTES:

1. CAUTION MUST BE TAKEN WHEN INSTALLING BARRIER POSTS SO THAT THEY DO NOT MAKE CONTACT WITH ANY UNDERGROUND UTILITIES.
2. A WELDED CAP MAY BE USED IN LIEU OF CONC. CAP.
3. USE 4" STEEL PIPE, (NOT GALVANIZED) WITH A MINIMUM WALL THICKNESS OF 0.188". THE PIPE SHALL BE PRIMED AND PAINTED WHITE.
4. An 8'(FT.) MINIMUM CLEARANCE, FROM ANY ABOVE GROUND OBJECTS, IS REQUIRED ON THE SIDE THE EQUIPMENT DOOR OPENS FOR HOT STICK OPERATION.
5. ANY ADDITIONAL BARRIERS IN FRONT OF THE EQUIPMENT DOORS MUST BE REMOVABLE.

A.O./J.C.

T.D.

**Pad-Mount Equipment Barrier Protection
(Placement Details)**

SHEET 2 OF 2

DATE

SCALE

8/13/20

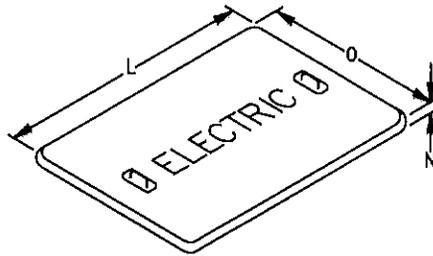
NTS

CITY OF SHASTA LAKE

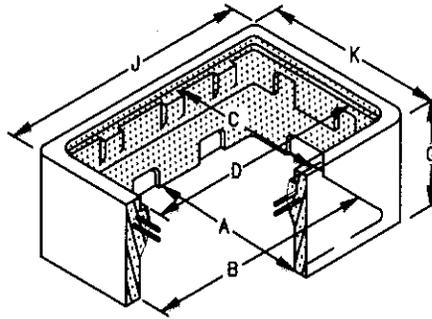
ELECTRIC DEPARTMENT

DRAWING NUMBER

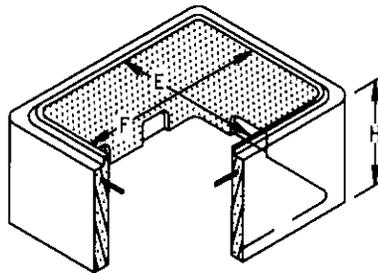
SR007-2



LID (See Notes 1 & 2)



PULL BOX



EXTENSION

NOTES:

1. ALL LIDS AND COVERS SHALL BE FURNISHED WITH HOLD-DOWN BOLTS.
2. ALL LIDS SHALL BE NON-CONCRETE AND/OR COMPOSITE. STEEL TRAFFIC LIDS WILL BE REQUIRED WHERE CURB IS NOT INSTALLED.
3. BOXES AND LIDS SHALL BE FROM SUPPLIERS WHO'S BOXES AND LIDS MEET THE NOMINAL DIMENSIONS SHOWN BELOW.
4. PRIOR TO ACCEPTANCE OF A BOX AND LID, THE CITY OF SHASTA LAKE MUST HAVE RECEIVED A REPORT FROM AN INDEPENDANT, STATE OF CALIFORNIA, LICENSED CIVIL OR STRUCTURAL ENGINEER. THE REPORT SHALL BE STAMPED BY THE ENGINEER AND SHALL CERTIFY THAT THE BOX AND LID DESIGN MEETS THE REQUIRED SPECIFICATIONS AND STANDARDS OR TEST REPORTS SHOWING TEST RESULTS MEET OR EXCEED THE REQUIREMENTS OF NOTE 5.
5. BOXES AND LIDS SHALL MEET OR EXCEED THE DESIGN STRENGTH FOR VERTICAL LOADING OF ASTM C 857 DESIGNATION A-8 (AASHTO DESIGNATION H10-44) BASED ON 8,000 LBS. PER WHEEL, 10"x10" WHEEL LOAD AREA, AND INCREASED 30% FOR AN IMPACT FACTOR.

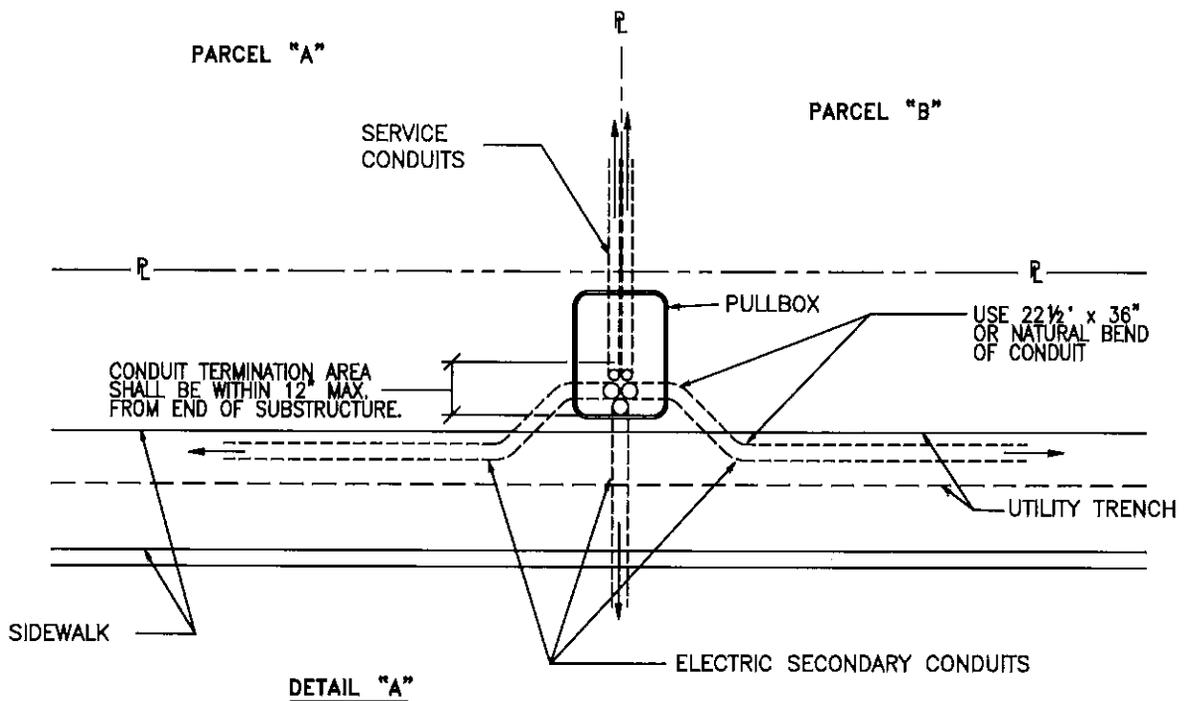
BOX NO.	DIMENSIONS (IN INCHES)														
	A	B	C	D	E	F	G	H	J	K	L	M	N	O	
3E	24	36	21	32.5	24	36	14	10	40	28.5	35	--	3	24	

DRN.	A.O.
CHECK'D	P.E.
DATE	SCALE
02/25/05	NTS

Concrete Electric Pull Box, Lid, and Extension

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET	1	OF	1
DRAWING NUMBER			
SR008-1			



NOTES:

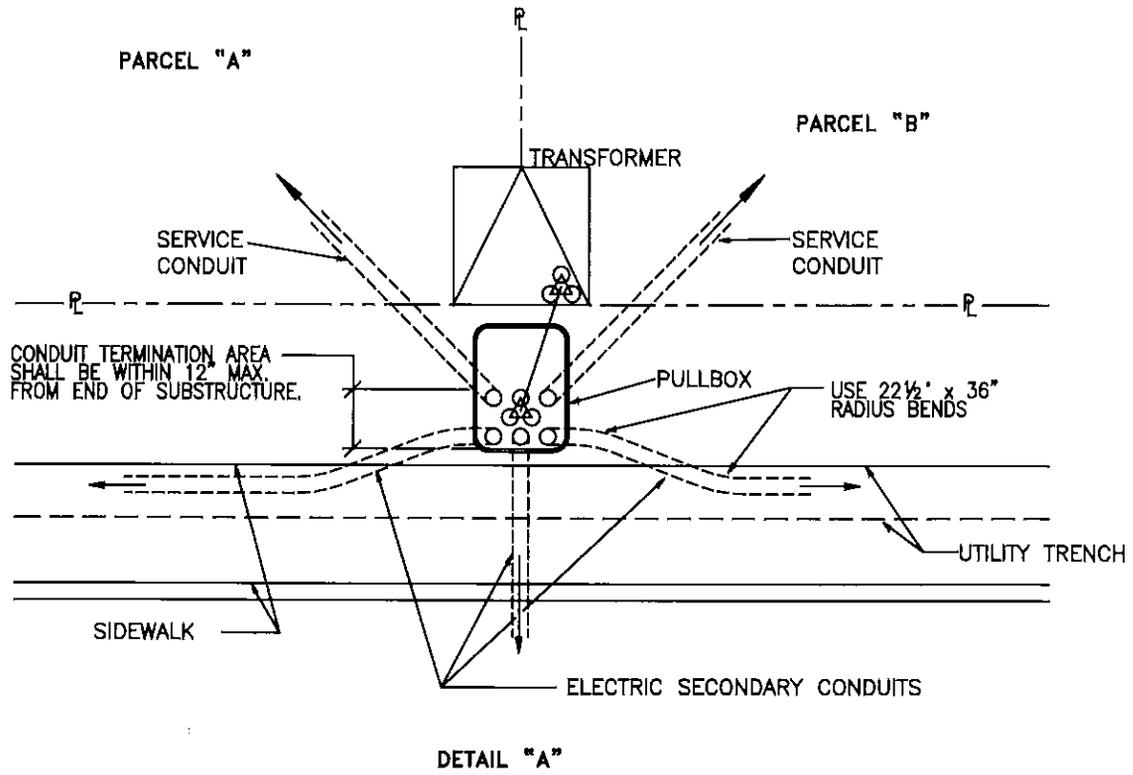
1. All conduit must be grouped within 12" of the street side of the secondary box. (See Detail "A")
2. Service conduit stubs shall be installed by the developer and shall extend three feet past the property line. The builder shall complete the service conduit run from the conduit stub to the service panel.
3. Prior to the date of this construction standard, service conduits were not stubbed to parcels as a practice, therefore stubs may not always be present on all existing parcels. Where stubs are not present the builder shall complete the service conduit run from the secondary box to the service panel.
4. For conduit sizes see plans, specifications, or other applicable construction standards.
5. All conduits shall be extended a minimum of 3" and a maximum of 5" above the bottom of the box.
6. Service conduits installed by the owner/builder shall rise in the secondary box immediately adjacent to secondary conduits as shown.
7. Conduit sweeps shall not be cut or otherwise modified.

DRN.	A.O.
CHECK'D	P.E.
DATE	SCALE
02/25/05	NTS

Conduit Placement - Secondary Box at Property Line

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET	1	OF	3
DRAWING NUMBER			
SR009-1			

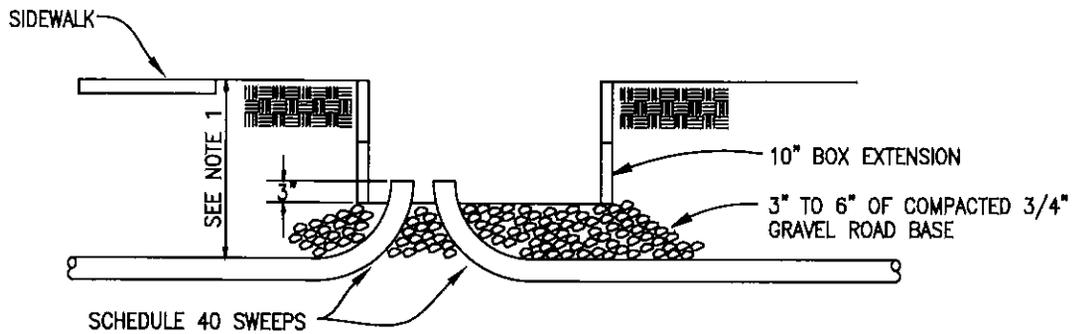


NOTES:

1. All conduit must be grouped within 12" of the street side of the secondary box. (See Detail "A")
2. Service conduit shall clear transformer pad by at least two feet, and shall extend at least three feet into parcel being served.
3. Prior to the date of this construction standard, service conduits were not stubbed to parcels as a practice, therefore stubs may not always be present on all existing parcels. Where stubs are not present the builder shall complete the service conduit run from the secondary box to the service panel.
4. For conduit sizes see plans, specifications, or other applicable construction standards.
5. All conduits shall be extended a minimum of 3" and a maximum of 5" above the bottom of the box.
6. Service conduits installed by the owner/builder shall rise in the secondary box immediately adjacent to secondary conduits as shown.
7. Conduit sweeps shall not be cut or otherwise modified.

DIM A.O.	Conduit Placement - Secondary Box at Property Line (With Transformer)	SHEET 2 OF 3
CHECKED P.E.		DRAWING NUMBER SR009-2
DATE 02/25/05	CITY OF SHASTA LAKE ELECTRIC DEPARTMENT	SCALE NTS

Secondary Box Conduit Placement - Profile View



NOTES

1. APPROPRIATE EXCAVATION DEPTH SHALL BE PROVIDED SUCH THAT STANDARD 24" RADIUS 90° BENDS MAY BE INSTALLED AS SHOWN. CONDUIT BENDS SHALL NOT BE CUT OR OTHERWISE MODIFIED.
2. FOR CONDUIT SIZES SEE PLANS, SPECIFICATIONS, OR OTHER APPLICABLE CONSTRUCTION STANDARDS.
3. ALL CONDUITS SHALL BE EXTENDED A MINIMUM OF 3" AND A MAXIMUM OF 5" ABOVE THE BOTTOM OF THE BOX.
4. CUSTOMER INSTALLED.

DRW./REV. A.O. / JJC

CHECKED T.D.

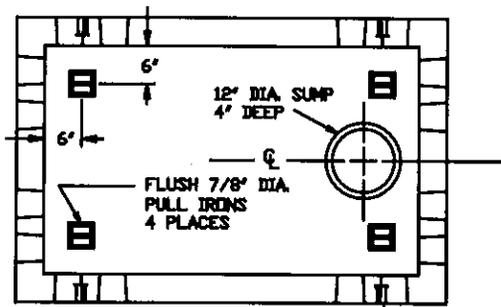
DATE 08/14/18 SCALE NTS

Conduit Placement - Secondary Box (Profile View)

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

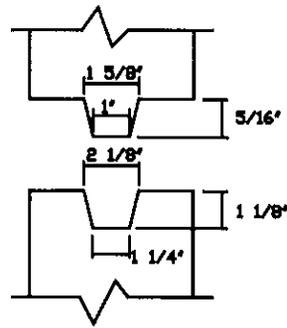
SHEET 3 OF 3

DRAWING NUMBER
SR009-3

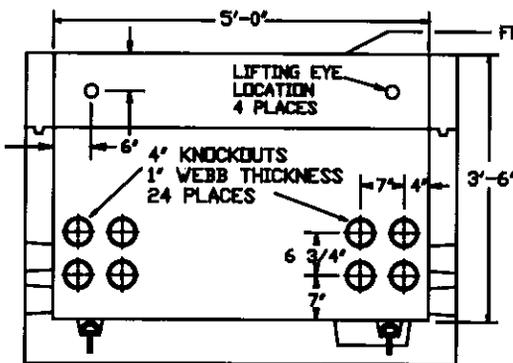


TOP

LIFTING EYE LOCATION
4 PLACES



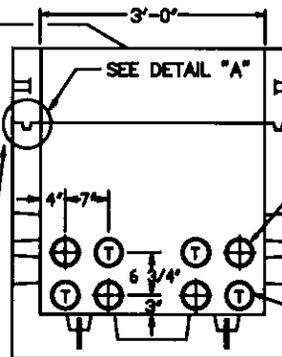
DETAIL "A"
TONGUE & GROOVE



SIDE

INSTALL PLASTIC MASTIC SEALANT INCL. WITH ENCLOSURE ASSEMBLY FOR ALL JOINTS

SEE DWG. SR010-2 FOR FRAME & COVER DETAILS



END

4" KNOCKOUTS
1" WEBB THICKNESS
24 PLACES

4" CONDUIT TERMINATORS
CAST IN VAULT
IN 8 PLACES AS
INDICATED BY "T"

NOTES :

1. THE SPLICE BOX SHALL BE POURED IN PLACE OR PRECAST WITH DIMENSIONS AS SHOWN. DESIGN STRENGTH SHALL MEET OR EXCEED THE LATEST EDITION OF ASTM C 857 DESIGNATION A-16 (AASHTO DESIGNATION HS 20-44) BASED ON 16000 LBS PER WHEEL, 10'X20' WHEEL LOAD AREA, AND INCREASED 30% FOR AN IMPACT FACTOR. PROOF OF SPECIFICATION COMPLIANCE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND/OR VENDOR.
2. ONE 5/8" GROUND RODS SHALL BE PROVIDED IN THE SPLICE BOX.
3. THE EXCAVATION SHALL ALLOW FOR THE OVERALL ASSEMBLED HEIGHT OF SPLICE BOX PLUS ADDED HEIGHT OF RISERS, MANHOLE CASTINGS, FRAMES AND COVERS, ETC. AND BEDDING MATERIALS. A MINIMUM CLEARANCE OF 6" AROUND THE SIDE WALLS OF THE SPLICE BOX IS REQUIRED FOR EASE OF INSTALLATION. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO VERIFY EXCAVATION REQUIREMENTS WITH THE VENDOR SUPPLYING THE VAULT FOR EACH SPECIFIC LOCATION.
4. THE BEDDING MATERIALS SHALL CONSIST OF 3" TO 6" OF COMPACTED 3/4" GRAVEL, GRADED LEVEL.
5. THE PRECAST SPLICE BOX SHALL BE ASSEMBLED BY LOWERING EACH SECTION INTO THE EXCAVATION. THE BASE SECTION IS LOWERED FIRST, SET LEVEL, FIRMLY POSITIONED AND MASTIC SEALANT INSTALLED BEFORE PLACING INTERMEDIATE AND TOP SECTIONS. CARE SHOULD BE TAKEN TO INSURE THAT THE SEAL SURFACES ARE CLEAN AND THAT THE GASKET MATERIAL IS IN PLACE PROPERLY.
6. BACKFILL AROUND THE SPLICE BOX SHALL CONSIST OF GOOD COMPACTABLE MATERIAL SUCH AS PEA GRAVEL, SAND, OR CLEAN EARTH FILL, SO THAT NO VOIDS REMAIN BETWEEN THE SPLICE BOX WALLS AND NATIVE SOIL AROUND EXCAVATION. BACKFILLING SHALL NOT BE COMPLETED UNTIL SPLICE BOX IS COMPLETELY ASSEMBLED, MAKING CERTAIN TO COMPACT THE BACKFILLING PROGRESSING FROM THE BOTTOM TO THE TOP SURFACE TO ATTAIN 90% RELATIVE COMPACTION. ALL BACKFILLING IS THE RESPONSIBILITY OF THE CUSTOMER AND/OR CONTRACTOR.
7. ALL GROUTING OF RISERS, COVERS, CONDUITS OR SPECIFIED SECTIONS OF SPLICE BOXES SHALL BE THE RESPONSIBILITY OF THE CUSTOMER AND/OR CONTRACTOR.
8. PULLING IRONS:
 - (a) PULLING IRONS SHALL BE DESIGNED FOR 20,000 LBS. ULTIMATE, WITH A SAFETY FACTOR OF TWO (40,000 LBS.)
9. LIFTING:
 - (a) ALL EXTENSIONS SHALL BE PROVIDED WITH FOUR LIFTING EYE'S OR OTHER APPROVED LIFTING MEANS. EACH LIFTING ATTACHMENT POINT WILL BE CAPABLE OF LIFTING THE TOTAL EXTENSION WEIGHT PLUS 150%.
10. ALL SECTIONS OF A SPLICE BOX MUST BE PERMANENTLY MARKED WITH THE DELIVERY DATE.

A.O. / JJC	
T.D.	
DATE	SCALE
08/14/18	NTS

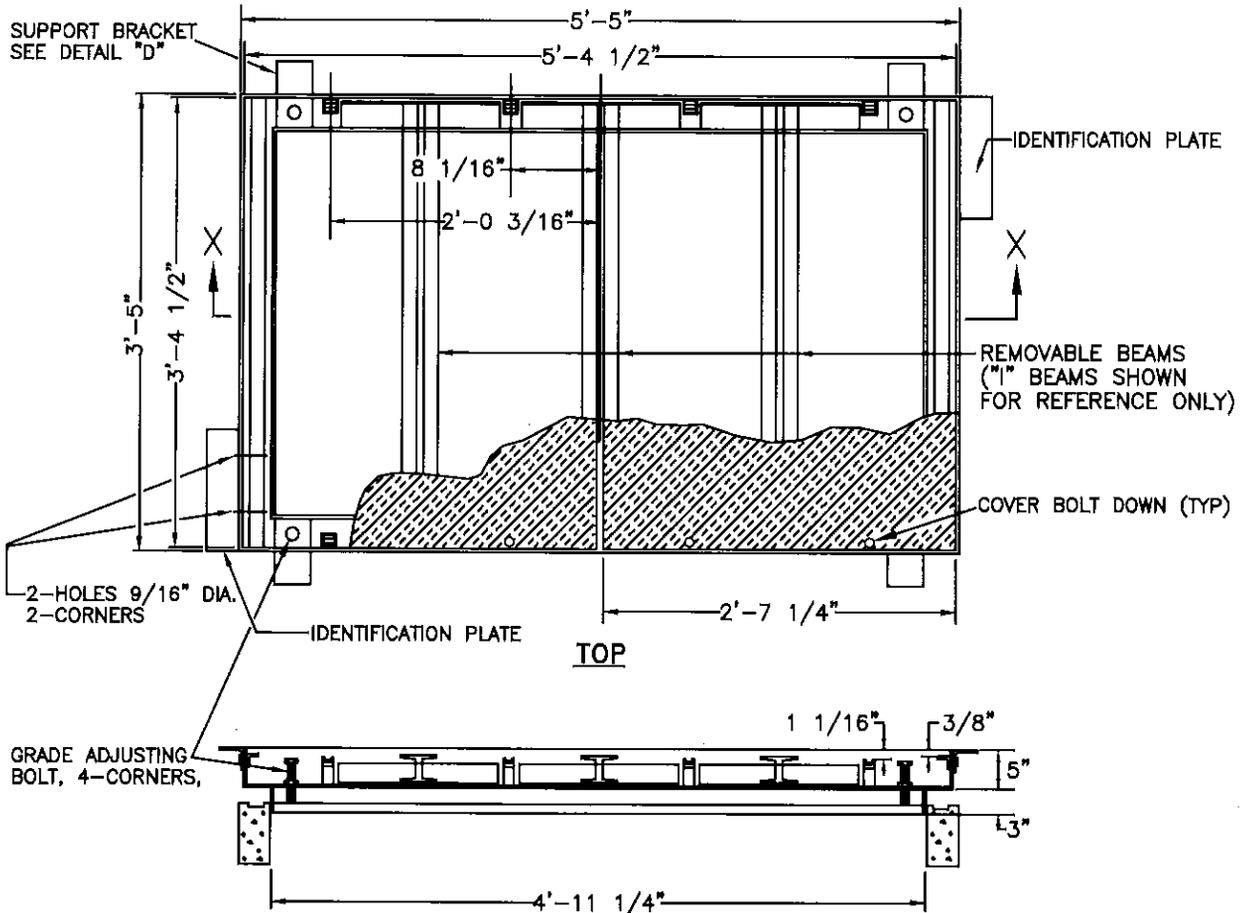
3'-0" X 5'-0" Primary Splice Box 200amp

SHEET 1 OF 2

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

DRAWING NUMBER

SR010-1



**SECTION X-X
FRAME ASSEMBLY**

NOTES:

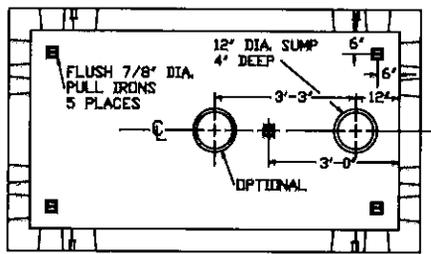
1. THE FRAME AND COVER ASSEMBLY SHALL MEET DIMENSION REQUIREMENTS AS SHOWN AND DESIGN STRENGTH SHALL MEET OR EXCEED THE LATEST EDITION OF ASTM C 857 DESIGNATION A-16 (AASHTO DESIGNATION HS 20-40) BASED ON 16000 LBS. PER WHEEL, 10"x20" WHEEL LOAD AREA AND INCREASED 30% FOR AN IMPACT FACTOR. PROOF OF SPECIFICATION COMPLIANCE SHALL BE RESPONSIBILITY OF THE CONTRACTOR AND/OR VENDOR.
2. COVERS SHALL BE INSTALLED WITHIN AN ADJUSTABLE FRAME WHICH SHALL HAVE A MINIMUM OF THREE INCHES OF ADJUSTMENT. ALL STEEL SHALL BE GALVANIZED AS PER THE LATEST REVISION OF ASTM SPEC. A-123, OR SHALL BE AN EPOXY NON-SKID SAND FINISH.
3. IDENTIFICATION PLATE (ONE) SHALL BE SUPPLIED AND STATE "HIGH VOLTAGE" .
4. ALL GROUTING OF RISERS, COVERS, CONDUITS OR SPECIFIC SECTIONS OF SPLICE BOX SHALL BE THE RESPONSIBILITY OF THE CUSTOMER AND/OR CONTRACTOR. GROUT USED BETWEEN FRAME AND SPLICE BOX SHALL BE SUITABLE FOR FULL TRAFFIC LOADS AND CONSISTENT WITH ASTM C 857 DESIGNATION A-16 LOADING AND SHALL BE ALLOWED TO CURE 24 HOURS BEFORE ANY LOAD IS APPLIED. SEE DRAWING SR010-1 FOR 3X5 SPLICE BOX.
5. ALL SECTIONS OF A SPLICE BOX MUST BE PERMANENTLY MARKED WITH THE DELIVERY DATE.

DRWN	A.O.
CHK'D	P.E.
DATE	SCALE
02/25/05	NTS

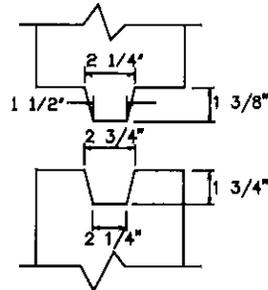
3'-0" X 5'-0" Primary Splice Box
(Frame and Cover Assembly)

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

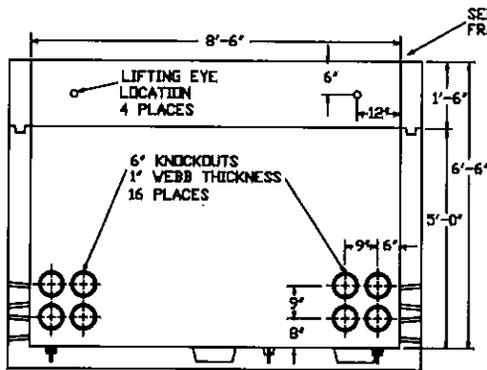
SHEET	2	OF	2
DRAWING NUMBER			
SR010-2			



TOP

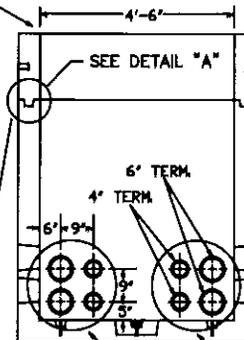


DETAIL "A"
TONGUE & GROOVE



SIDE

SEE DWG. SR011-2 FOR
FRAME & COVER DETAILS



END

INSTALL PLASTIC MASTIC
SEALANT INCL. WITH
ENCLOSURE ASSEMBLY
FOR ALL JOINTS

CONDUIT TERMINATORS
CAST IN VAULT ON BOTH
ENDS AS SHOWN.
8-4" & 8-6" TOTAL QTY.

NOTES :

1. THE SPLICE BOX SHALL BE POURED IN PLACE OR PRECAST WITH DIMENSIONS AS SHOWN. DESIGN STRENGTH SHALL MEET OR EXCEED THE LATEST EDITION OF ASTM C 857 DESIGNATION A-18 (AASHTO DESIGNATION HS 20-44) BASED ON 18000 LBS PER WHEEL, 10"x20" WHEEL LOAD AREA, AND INCREASED 30% FOR AN IMPACT FACTOR. PROOF OF SPECIFICATION COMPLIANCE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND/OR VENDOR.
2. ONE 5/8" GROUND RODS SHALL BE PROVIDED IN THE SPLICE BOX.
3. THE EXCAVATION SHALL ALLOW FOR THE OVERALL ASSEMBLED HEIGHT OF SPLICE BOX PLUS ADDED HEIGHT OF RISERS, MANHOLE CASTINGS, FRAMES AND COVERS, ETC. AND BEDDING MATERIALS. A MINIMUM CLEARANCE OF 6" AROUND THE SIDE WALLS OF THE SPLICE BOX IS REQUIRED FOR EASE OF INSTALLATION. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO VERIFY EXCAVATION REQUIREMENTS WITH THE VENDOR SUPPLYING THE VAULT FOR EACH SPECIFIC LOCATION.
4. THE BEDDING MATERIALS SHALL CONSIST OF 3" TO 6" OF COMPACTED 3/4" GRAVEL, GRADED LEVEL.
5. THE PRECAST SPLICE BOX SHALL BE ASSEMBLED BY LOWERING EACH SECTION INTO THE EXCAVATION. THE BASE SECTION IS LOWERED FIRST, SET LEVEL, FIRMLY POSITIONED AND MASTIC SEALANT INSTALLED BEFORE PLACING INTERMEDIATE AND TOP SECTIONS. CARE SHOULD BE TAKEN TO INSURE THAT THE SEAL SURFACES ARE CLEAN AND THAT THE GASKET MATERIAL IS IN PLACE PROPERLY.
6. BACKFILL AROUND THE SPLICE BOX SHALL CONSIST OF GOOD COMPACTIBLE MATERIAL SUCH AS PEA GRAVEL, SAND, OR CLEAN EARTH FILL, SO THAT NO VOIDS REMAIN BETWEEN THE SPLICE BOX WALLS AND NATIVE SOIL AROUND EXCAVATION. BACKFILLING SHALL NOT BE COMPLETED UNTIL SPLICE BOX IS COMPLETELY ASSEMBLED, MAKING CERTAIN TO COMPACT THE BACKFILLING PROGRESSING FROM THE BOTTOM TO THE TOP SURFACE TO ATTAIN 90% RELATIVE COMPACTION. ALL BACKFILLING IS THE RESPONSIBILITY OF THE CUSTOMER AND/OR CONTRACTOR.
7. ALL GROUTING OF RISERS, COVERS, CONDUITS OR SPECIFIED SECTIONS OF SPLICE BOXES SHALL BE THE RESPONSIBILITY OF THE CUSTOMER AND/OR CONTRACTOR.
8. PULLING IRONS
9. LIFTING
 - (a) PULLING IRONS SHALL BE DESIGNED FOR 20,000 LBS. ULTIMATE, WITH A SAFETY FACTOR OF TWO. (40,000 LBS.)
 - (a) ALL EXTENSIONS SHALL BE PROVIDE WITH FOUR LIFTING EYE'S OR OTHER APPROVED LIFTING MEANS. EACH LIFTING ATTACHMENT POINT WILL BE CAPABLE OF LIFTING THE TOTAL EXTENSION WEIGHT PLUS 150%.
10. ALL SECTIONS OF A SPLICE BOX MUST BE PERMANENTLY MARKED WITH THE DELIVERY DATE.

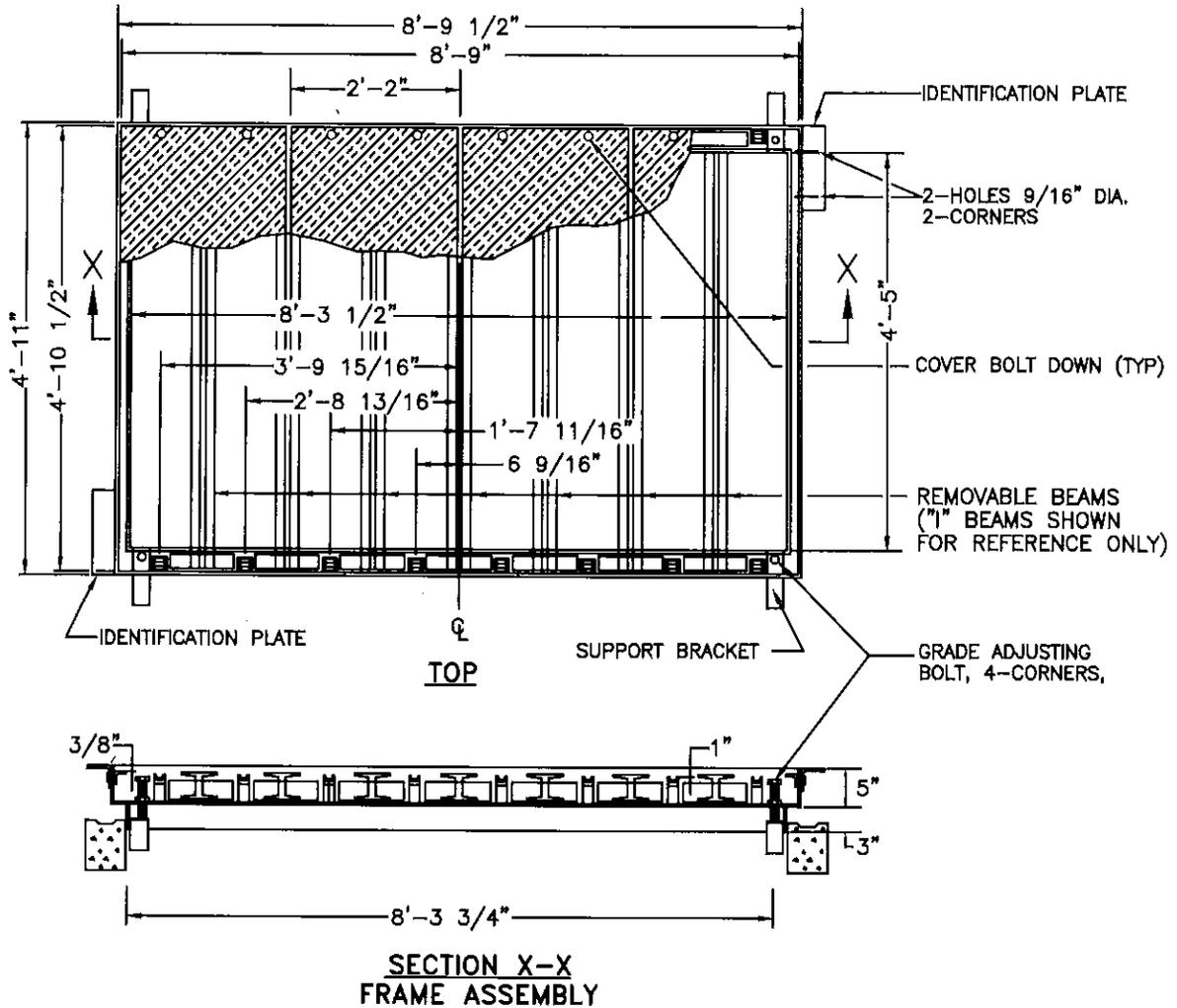
DRW	A.O.
CHKD	P.E.
DATE	SCALE
02/25/05	NTS

4'-6" X 8'-6" Primary Electrical Vault

SHEET 1 OF 2

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

DRAWING NUMBER
SR011-1



NOTES:

1. THE FRAME AND COVER ASSEMBLY SHALL MEET DIMENSION REQUIREMENTS AS SHOWN AND DESIGN STRENGTH SHALL MEET OR EXCEED THE LATEST EDITION OF ASTM C 857 DESIGNATION A-16 (AASHTO DESIGNATION HS 20-40) BASED ON 16000 LBS. PER WHEEL, 10"x20" WHEEL LOAD AREA AND INCREASED 30% FOR AN IMPACT FACTOR. PROOF OF SPECIFICATION COMPLIANCE SHALL BE RESPONSIBILITY OF THE CONTRACTOR AND/OR VENDOR.
2. COVERS SHALL BE INSTALLED WITHIN AN ADJUSTABLE FRAME WHICH SHALL HAVE A MINIMUM OF THREE INCHES OF ADJUSTMENT. ALL STEEL SHALL BE GALVANIZED AS PER THE LATEST REVISION OF ASTM SPEC. A-123, OR SHALL BE AN EPOXY NON-SKID SAND FINISH.
3. IDENTIFICATION PLATE (ONE) SHALL BE SUPPLIED AND STATE "HIGH VOLTAGE".
4. ALL GROUTING OF RISERS, COVERS, CONDUITS OR SPECIFIC SECTIONS OF SPLICE BOX SHALL BE THE RESPONSIBILITY OF THE CUSTOMER AND/OR CONTRACTOR. GROUT USED BETWEEN FRAME AND SPLICE BOX SHALL BE SUITABLE FOR FULL TRAFFIC LOADS AND CONSISTENT WITH ASTM C 857 DESIGNATION A-16 LOADING AND SHALL BE ALLOWED TO CURE 24 HOURS BEFORE ANY LOAD IS APPLIED. SEE DRAWING SR011-1 FOR 4.5X8.5 SPLICE BOX.
5. ALL SECTIONS OF A SPLICE BOX MUST BE PERMANENTLY MARKED WITH THE DELIVERY DATE.

DRW.	A.O.
CHECKD	P.E.
DATE	SCALE
02/25/05	NTS

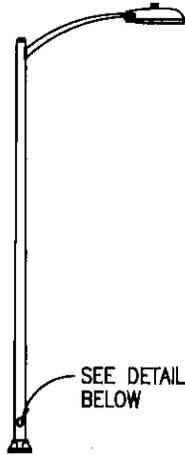
**4'-6" X 8'-6" Primary Electrical Vault
(Frame and Cover Assembly)**

SHEET 2 OF 2

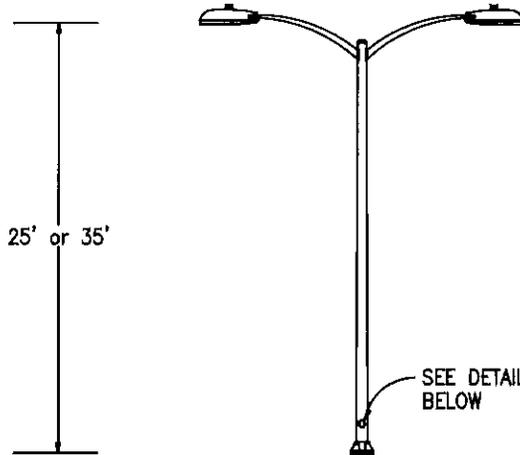
DRAWING NUMBER

SR011-2

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT



SINGLE ARM POLE



DOUBLE ARM POLE

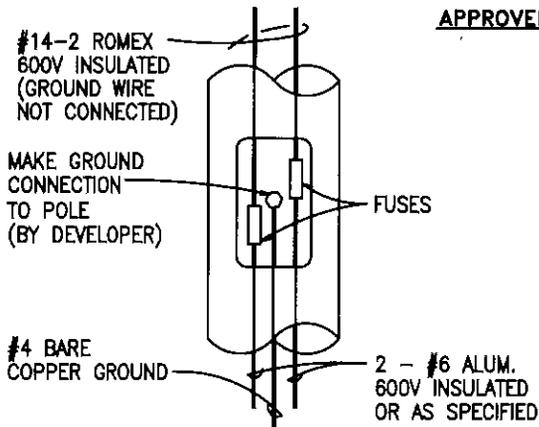
LIGHT STANDARD

TAPERED ALUMINUM STANDARD TO WITHSTAND 90 M.P.H. CONSTANT WIND LOADING (1.3 GUST FACTOR - GUST TO 117 M.P.H.). ANCHOR BASE MOUNTING, SLOTTED ANCHOR BOLT CIRCLE SHALL BE 10" TO 11" FOR 25' POLES AND 11" TO 12" FOR 35' POLES 2" TUBULAR SUPPORT ARM WITH 6' REACH, 25' OR 35' MOUNTING HEIGHT, ANCHOR BOLT COVERS AND SHAFT CAP, 4 - 1" X 36" GALVANIZED, J-BOLTS WITH 12" MINIMUM THREAD LENGTH, GALVANIZED HEX-NUTS AND WASHERS FOR J-BOLTS, 4" X 6.5" SPLICE HAND HOLE WITH FLUSH MOUNT COVER LOCATED 90° FROM ARM CENTERLINE. (SEE SKETCH).

POLE HT.	DESCRIPTION	HAPCO	LEXINGTON (SEE NOTE 6)	HUBBELL	UNION METAL
25'	SINGLE ARM POLE (25')	21-295	2208 - 40705T4 W/1MA0632B40 ARMS 2208 - 45805T4 W/1MA0632B45 ARMS	RTA04-100	
25'	DOUBLE ARM POLE (25')	22-295	2208 - 45805T4 W/2MA0632B45 ARMS	RTA16-100	150-Y25
35'	SINGLE ARM POLE (35')	21-865	3208 - 45805T4 W/1MA0632B45 ARMS	RTA10-100	150-Y22
35'	DOUBLE ARM POLE (35')	22-885	3208 - 45805T4 W/2MA0632B45 ARMS	RTA22-100	150-Y27

NOTE: ASSOCIATED MATERIAL I.E., ARM, BOLT COVERS, J-BOLTS, ETC., MAY NEED TO BE SPECIFIED SEPERATELY.

APPROVED FOR PURCHASE



LOOKING INTO HANDHOLE

NOTES

1. WIRE FROM LUMINAIRE TO BASE WILL BE NONMETALLIC-SHEATHED CABLE (ROMEX) TYPE NM OR NMC, NUMBER 14-2 COPPER 600 VOLT INSULATED.
2. WIRE FROM BASE TO POINT OF SERVICE WILL BE 2 - #6 ALUMINUM 600 VOLT INSULATED, OR AS SPECIFIED.
3. ALL WIRE WITHIN NONMETALLIC - SHEATH (ROMEX) SHALL BE 600 VOLT THW, THHN OR EQUAL.
4. ALL WIRE WITHIN DUCT SYSTEM SHALL BE XLP INSULATED NEC TYPE USE.
5. CITY OF SHASTA LAKE WILL MAKE CONNECTIONS AT BASE OF HAND HOLE AND ANY APPLICABLE SOURCE SIDE SPLICING LOCATIONS.
6. MUST STATE SINGLE OR DOUBLE ARMS ON ORDER.

DRW	A.O.
CHECKD	P.E.
DATE	SCALE
02/25/05	NTS

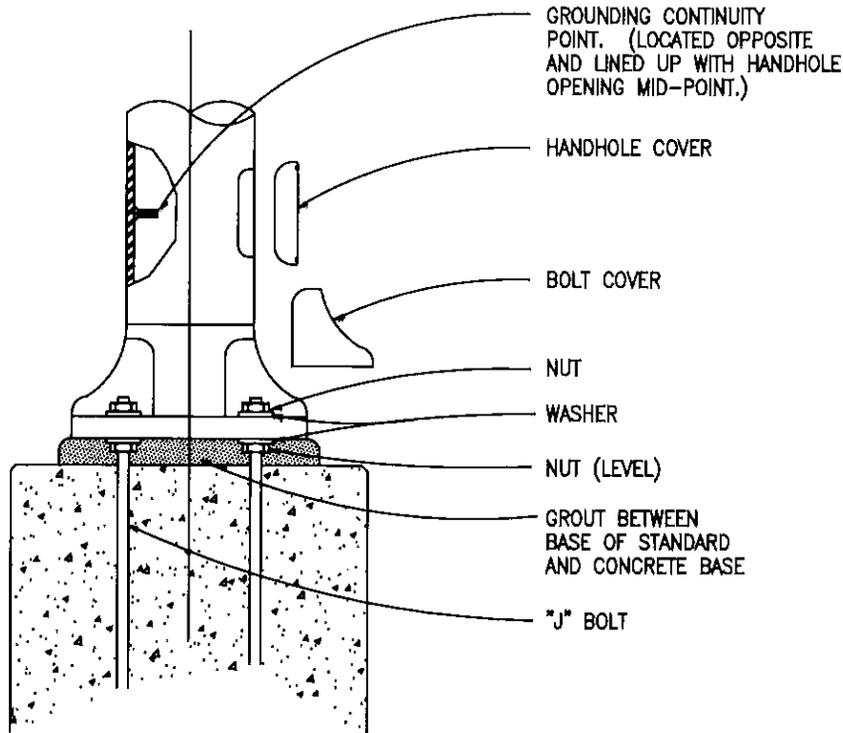
**Aluminum Street Light Standard
(Pole and Arm Details)**

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

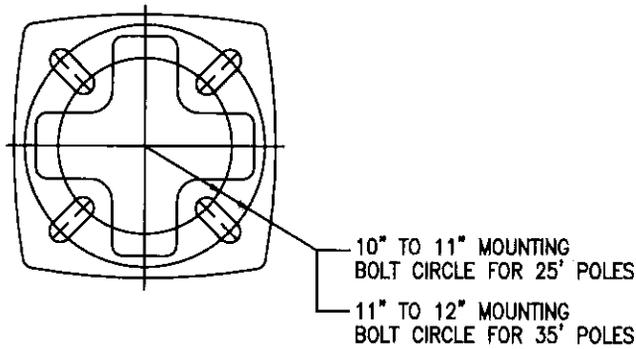
SHEET 1 OF 3

DRAWING NUMBER

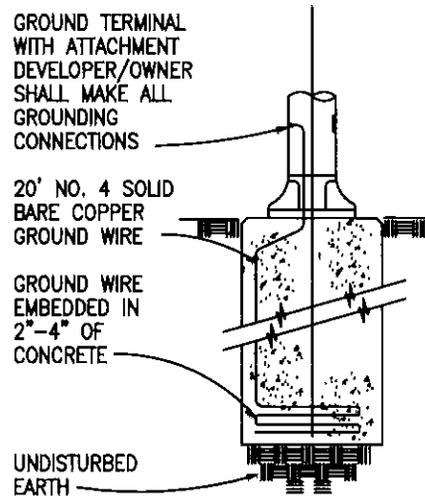
SR012-1



BASE ASSEMBLY



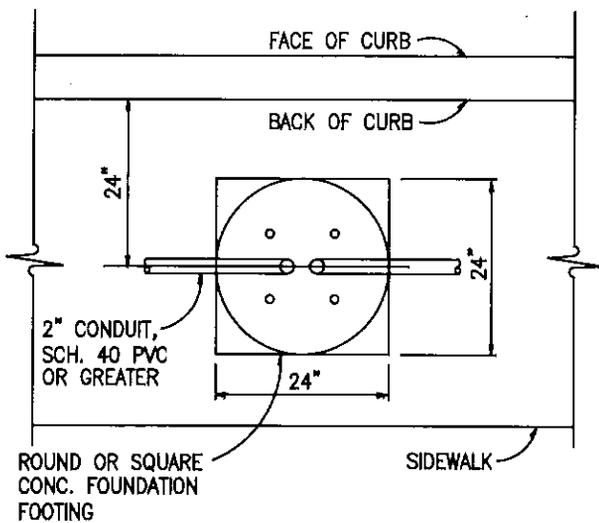
BASE PLATE



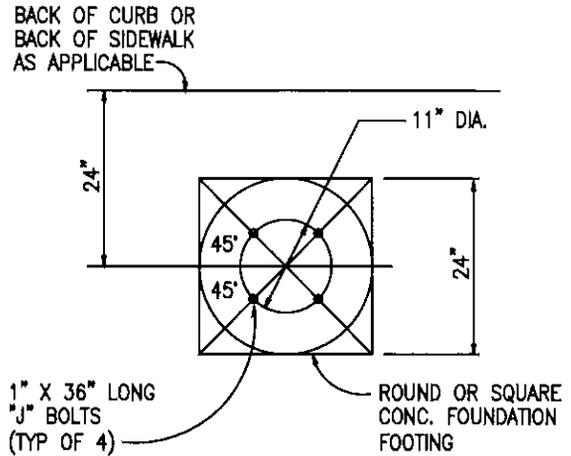
TYPICAL DETAIL OF GROUND WIRE INSTALLATION

NOTE:
SEE DWG. SR012-3 FOR BASE DETAILS

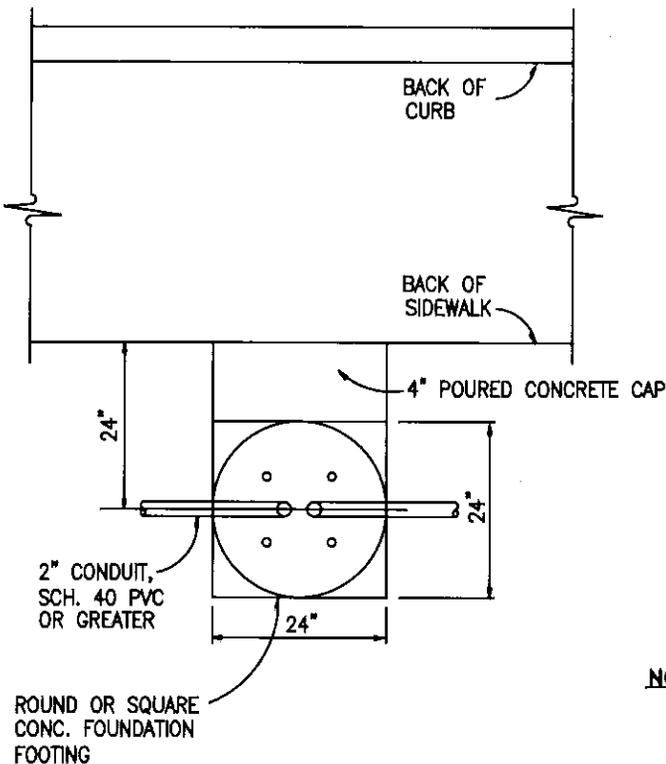
DESIGNED A.O.		Aluminum Street Light Standard (Base and Grounding Details)	SHEET 2 OF 3	
CHECKED P.E.			DRAWING NUMBER SR012-2	
DATE 02/25/05	SCALE NTS	CITY OF SHASTA LAKE <small>ELECTRIC DEPARTMENT</small>		



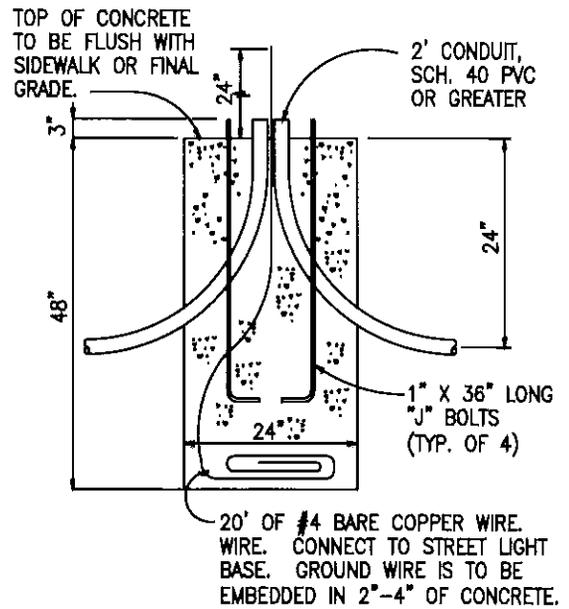
6 FOOT AND WIDER SIDEWALKS
UNLESS OTHERWISE NOTED NTS



BOLT PATTERN
NTS



SIDEWALKS LESS THAN 6' WIDE
UNLESS OTHERWISE NOTED NTS



FOUNDATION SECTION
NTS

NOTES:

1. CITY OF SHASTA LAKE SHALL LOCATE ALL STREET LIGHT BASES.
2. DEVELOPER / CUSTOMER SHALL FURNISH AND INSTALL J-BOLTS, CONDUIT, GROUNDING AND BASES AS SHOWN.

DRN	A.O.
CHK'D	P.E.
DATE	SCALE
02/25/05	NTS

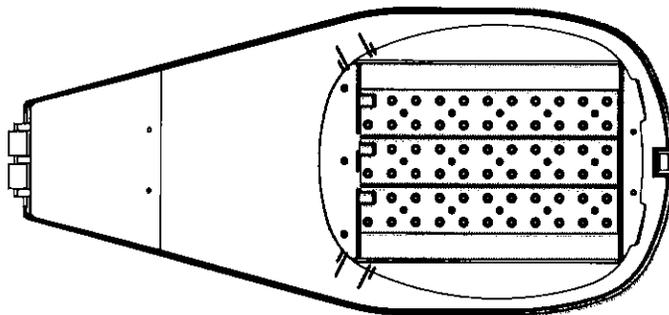
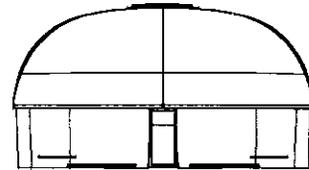
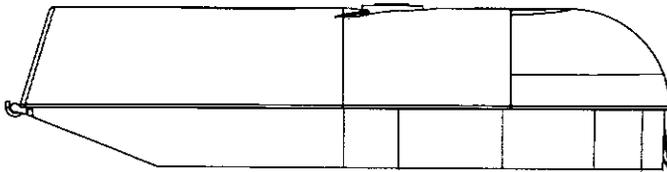
Aluminum Street Light Standard
(Base Details)

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET 3 OF 3

DRAWING NUMBER

SR012-3



EATON Lighting:

OVH=FULL CUTOFF LUMINAIRE

E03=(3) 21 LED LIGHTBARS

LED=SOLID STATE LIGHT EMITTING DIODES

E=ELECTRONIC

U=UNIVERSAL (120-277V)

SL2=TYPE 2 WITH SPILL CONTROL

AP=GREY

4=NEMA TWISTLOCK PHOTOCONTROL RECEPTACLE

Photocell:

ELL=EXTRA LONG LIFE PHOTOCONTROL

124=(105-305V)

Part	Manufacturer	Catalog #	Power
Luminaire	EATON Lighting	OVH-E03-LED-E-U-SL2-AP-4	75 Watts
Photocell	FP Outdoor Lighting Controls	ELL-124	<0.5 Watts

DESIGNED BY A.O./J.C.

CHECKED BY T.D.

DATE 08/14/20

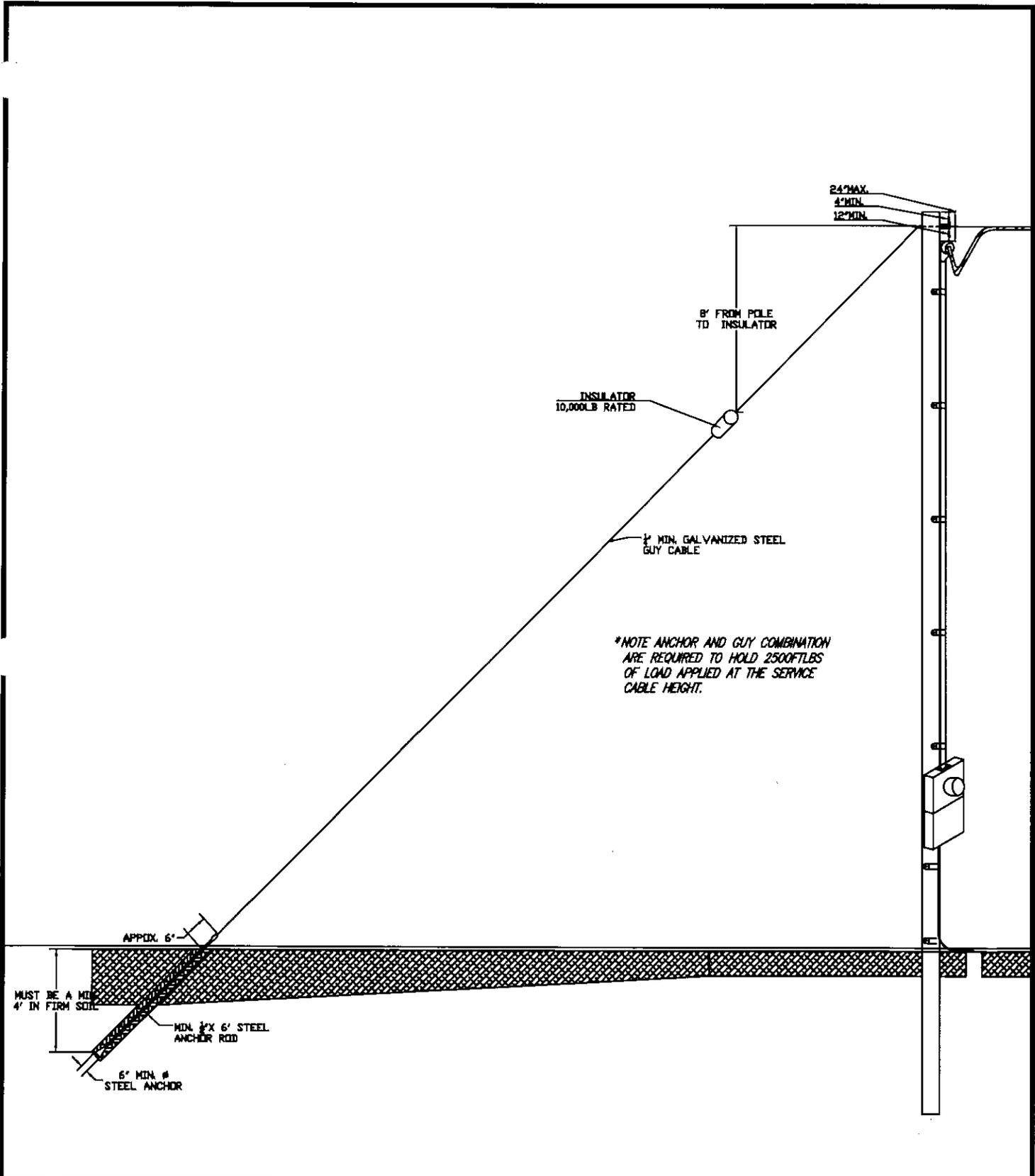
SCALE NTS

Street Light Head and Photocell

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET 1 OF 1

DRAWING NUMBER
SR013-1



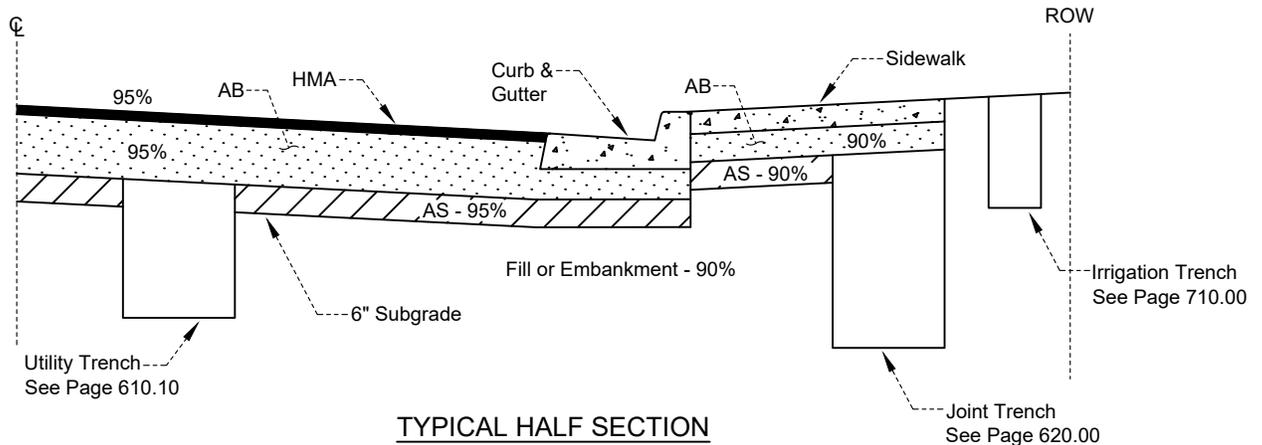
**NOTE ANCHOR AND GUY COMBINATION ARE REQUIRED TO HOLD 2500FTLBS OF LOAD APPLIED AT THE SERVICE CABLE HEIGHT.*

DRN.	JJC
CHECKED	T.D.
DATE	SCALE
08/14/18	NTS

Anchor and Guy Requirements Service Pole

CITY OF SHASTA LAKE
ELECTRIC DEPARTMENT

SHEET	3	OF	3
DRAWING NUMBER			
SP001-3			



Density References:

The following criteria shall apply to the compaction of materials:

<u>Material</u>	<u>Compaction</u>	<u>Reference</u>
HMA - Hot-Mixed Asphalt	95%	Page 100.00
AB - Aggregate Base (structural section)	95%	Page 100.00
AB - Aggregate Base (under sidewalk)	90%	Page 100.00
AS - Aggregate Subbase / Subgrade	90%-95%	Page 100.00
Fills/Embankments	90%	Page 700.00
Utility Trench Bedding	95%	Page 610.10
Utility Trench Backfill (AB)	90%	Page 610.10
Joint Trench	90%-95%	Page 620.00
Irrigation Trench Backfill (Native)	90%	Page 710.00

Compaction testing shall be performed by a certified materials testing laboratory. All testing methods shall conform to Caltrans California Test (CT) methods or approved nationally recognized standards (i.e. AASHTO, ASTM, etc.).

Jetting is not permitted.

Minimum Testing Frequency

Unless otherwise approved by the City Engineer, testing shall be performed by a certified materials testing laboratory and shall be reported to the City prior to any subsequent layer of material being placed.

Utility and Joint Trenches - One (1) test for every 500 feet of trench length and for every three (3) foot of trench depth with a minimum of three (3) tests per project.

Subgrade & Aggregate Base - One (1) test for every 300 feet of street length with a minimum of three (3) tests per project.

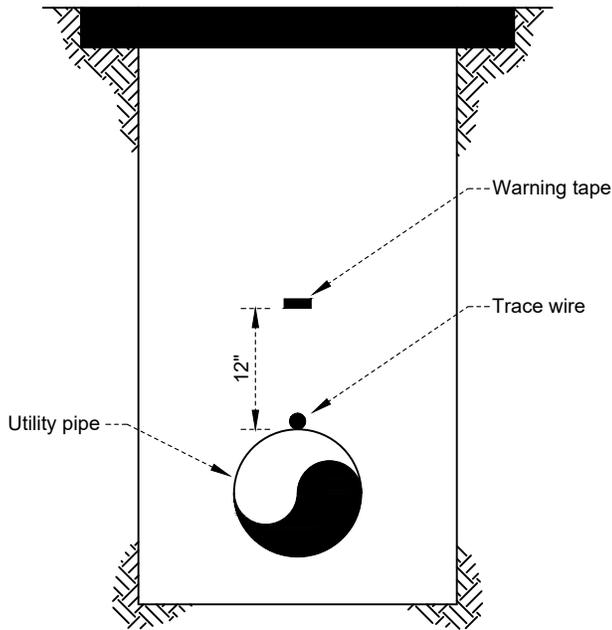
HMA Paving - One (1) test for every 200 feet of pavement with a minimum of ten (10) tests per project.

Retesting - Any tested area failing to meet the specified compaction requirement shall be reworked and/or re-compacted until a minimum of two (2) passing tests are achieved.

The above testing frequencies may be altered upon the recommendation of the project Geotechnical Engineer with the approval of the City Engineer.

The requirements for maximum density-optimum moisture relationships for all other fills (as specified in the Municipal Code) shall apply to those fills placed on private properties outside of street rights-of-way.

		CITY OF SHASTA LAKE	
		Public Works Department	Approved: 09-30-2023
		STANDARD DRAWING	City Engineer _____ Date _____
		DENSITY REFERENCE GUIDELINE	Date: 09/2023 Dwg No.: _____
REVISION	BY	APPROVED	DATE
			Scale: None 601.00



UTILITY TRENCH



WIRE SPLICE DETAIL

NOTES:

1. Locating trace wire shall be installed with all buried utility pipelines and appurtenances. Warning tape shall be installed with all buried utility pipelines.
2. Wire shall be blue coated (water) or green coated (wastewater / storm drain) #10 awg solid copper.
3. Wire shall be placed on top of pipe and attached to the pipe with duct tape @ 10' o.c.
4. Wire shall be continuous between structures, except where water valve boxes are within ten (10) feet of a pipe intersection.
5. Raw wire shall not touch metallic structures, valves, or fittings (maintain 3" clear distance).
6. Wire shall terminate within 6"-12" of the top of structures and with sufficient excess wire to allow for above ground connection to locating equipment.
7. All valves shall have locating wires.
8. All splice installations shall be within a structure.
9. Warning tape shall be 2" wide detectable metallic warning tape, and shall be color-coded and imprinted appropriate to utility (i.e. "CAUTION - BURIED WATER LINE BELOW", "CAUTION - BURIED SEWER LINE BELOW").
10. Warning tape shall be placed as shown above, and shall be unbroken for the entire run of the pipe.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**LOCATING TRACE WIRE AND
WARNING TAPE INSTALLATION**

Approved:

09-30-2023

City Engineer

Date

Date: 09/2023

Dwg No.:

Scale: None

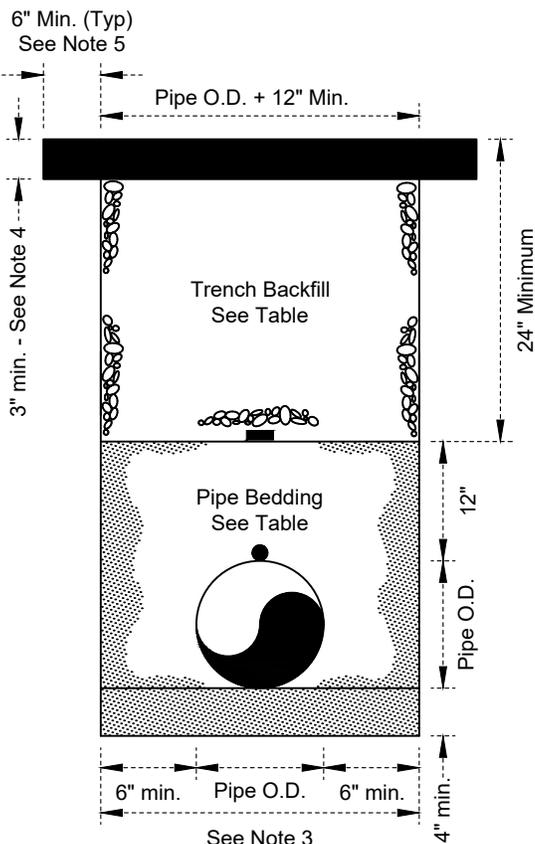
608.00

Property	Test Method	Specification Requirement	
Organic Impurities	ASTM C-40	Supernatant shall not be darker than plate 3 when compared to standard gardinar color series	
Sand Equivalent	ASTM D-2419	Equal to or greater than 20	
Compaction Characteristics	ASTM D-1557	Relative compaction of 95% or greater	
Gradation	ASTM C-136 & ASTM C-117	Sieve	Percent Passing (By weight)
REU		No. 4 (4.75mm)	100
		No. 8 (2.36mm)	90-100
		No. 16 (1.18mm)	80-100
		No. 30 (600um)	65-100
		No. 50 (300um)	40-70
		No. 100 (150um)	0-30
PG&E		1/2"	100
		No. 4	75-100
		No. 50	0-70
		No. 100	0-30
		No. 200	0-15

Notes:

1. Bedding sand shall be free from clay or organic material, suitable for the purpose intended, and shall conform to the physical properties listed in the table below. Either gradation is acceptable (REU OR PG&E).

				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
				BEDDING SAND	Date: 09/2023 Dwg No.:
REVISION	BY	APPROVED	DATE		Scale: None 609.00



Utility	Pipe Bedding	Trench Backfill
Water	Sand	Class 2 Agg. Base*
Wastewater	Class 2 Agg. Base	Class 2 Agg. Base*
Storm Drain	Class 2 Agg. Base	Class 2 Agg. Base*

* In non-street sections, trench backfill may be native material compacted to 90% relative

NOTES:

1. Joint utility trenching shall conform to Page 620.00.
2. All materials except bedding sand shall conform to Page 100.00. Bedding sand shall conform to Page 609.00. Material compaction shall conform to Page 601.00. Jetting is not permitted.
3. Trench width on each side of the pipe shall be a minimum of either six (6) inches or wider as required to allow for hand compaction of bedding material in the haunch zone of the pipe as directed by the City Engineer.
4. Trench surfacing shall be the greater of three (3) inches or the existing pavement thickness. In street sections, surfacing shall be Type 'A' Hot-Mixed Asphalt (HMA), 1/2" max. medium. In non-street sections, surfacing shall be native material graded to match the surrounding surface.
5. T-section of trench (six (6) inches minimum, typical) shall be required in all streets and paved areas, and shall be sawcut just prior to final paving. If the initial trench is cut with a grinder that leaves a clean edge that is maintained, the T-section may be omitted upon approval by the City Engineer. T-section is not required in non-paved areas.
6. All trench excavations requiring shoring shall conform to the requirements of the California Occupational Safety and Health Act (CAL-OSHA). The Contractor shall furnish and install all shoring and bracing required to support the trench walls for the protection of all personnel working in the excavation. Shoring and bracing shall be removed in a manner that protects workers and prevents sloughing of trench walls.
7. The Contractor is solely responsible for the safety of all workers, the general public, and private and public property within the project site for the duration of the project. This responsibility shall be in effect at all times.
8. Where the minimum depth of trench backfill cannot be attained, the City Engineer may approve lower cover conditions with the use of one-sack slurry cement for trench backfill. Slurry cement backfill shall conform to Page 610.30.
9. The Contractor shall dewater all excavations as required, and shall keep ground water out of the excavation. Water, wastewater, and storm water shall not be allowed in excavations during material placement or compaction operations.
10. Where pipeline excavation depth requires the use of a trench shield, and with the approval of the City Engineer, the Contractor may replace the bedding and backfill material with permeable material (3/4" crushed rock). Where permeable material is used, the Contractor shall construct one-sack slurry cement waterstops every one hundred (100) linear feet to contain the flow of groundwater along the pipeline. The waterstops shall extend from the bottom of the trench (under the pipeline) to the bottom of the final surfacing material.
11. Pipe shall be laid on an unyielding bed true to line and grade with compacted bedding material under the full length of the pipe. Bedding material shall be placed into the trench prior to pipe placement and compacted in conformance with Page 601.00. Bedding material under the coupling bells shall be hand-excavated so that there is a minimum clearance under the bell of 1 inch.
12. Pipe bedding in the pipe haunch zone between the bottom of the pipe and the springline of the pipe shall be placed underneath the pipe overhang and compacted in conformance with Page 601.00.
13. Trench backfill shall be placed in lifts. The maximum lift thickness will be determined by the City Engineer based upon the compaction method being employed; however, the maximum lift thickness when hand-operated compaction devices are used shall not exceed one (1) foot, and no lift shall exceed three (3) feet.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

WET UTILITY TRENCH

Approved:

09-30-2023

City Engineer

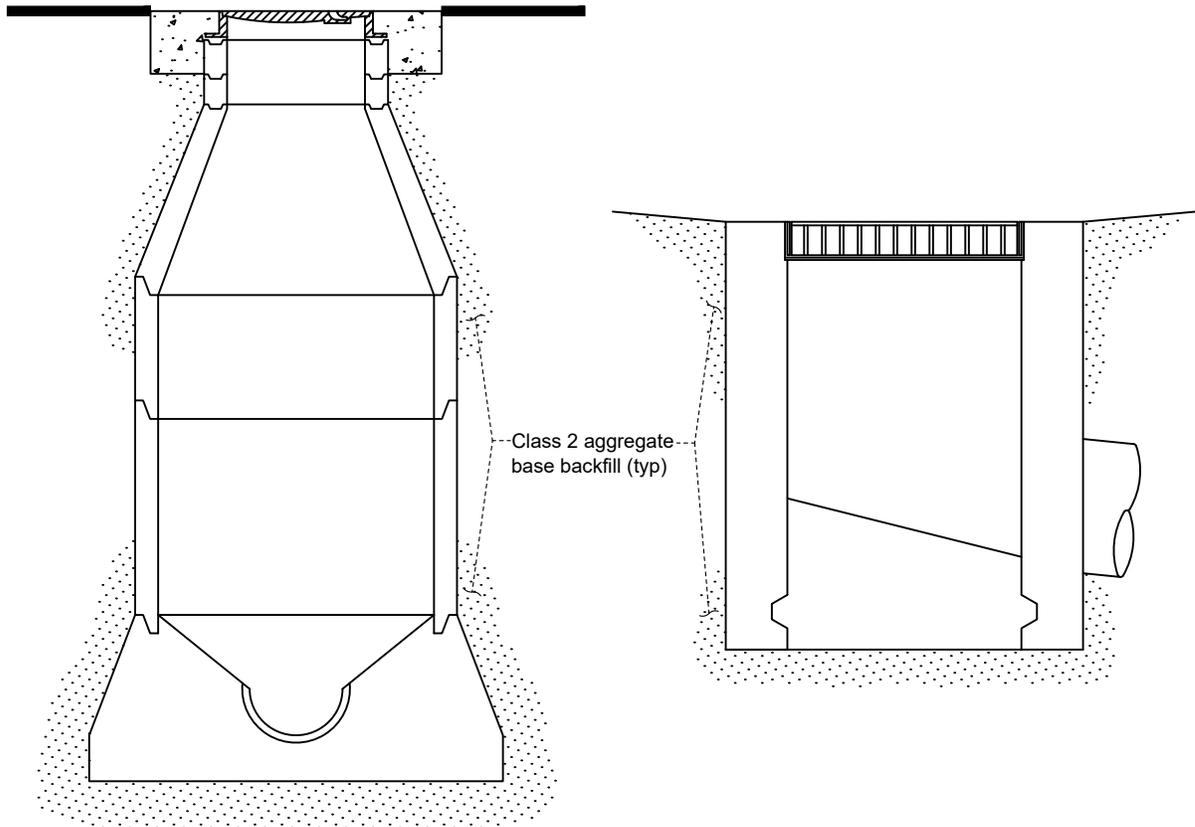
Date

Date: 09/2023

Dwg No.:

Scale: None

610.10



Structure Backfill (typ)

NOTES:

1. Material compaction shall conform to Page 601.00. Jetting is not permitted.
2. Sanitary sewer manhole and storm drain drainage inlet shown for reference. Structure backfill requirements apply to all utility structures.
3. The Contractor is solely responsible for the safety of all workers, the general public, and private and public property within the project site for the duration of the project. This responsibility shall be in effect at all times.
4. The Contractor shall dewater all excavations as required, and shall keep ground water out of the excavation. Water, wastewater, and storm water shall not be allowed in excavations during material placement or compaction operations.
5. Where excavation depth requires the use of a box shield, and with the approval of the City Engineer, the Contractor may replace the backfill material with permeable material (3/4" crushed rock).
6. Structure backfill shall be placed in lifts. The maximum lift thickness will be determined by the City Engineer based upon the compaction method being employed; however, the maximum lift thickness when hand-operated compaction devices are used shall not exceed one (1) foot, and no lift shall exceed three (3) feet.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

STRUCTURE BACKFILL

Approved:

09-30-2023

City Engineer

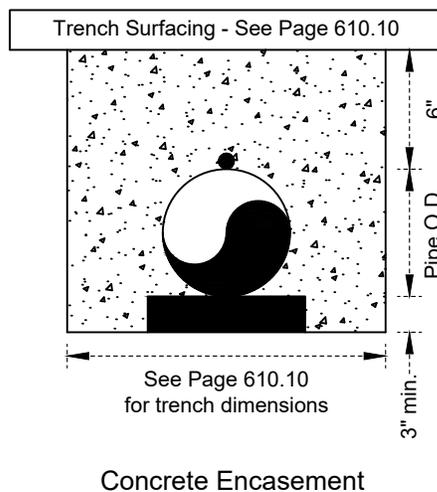
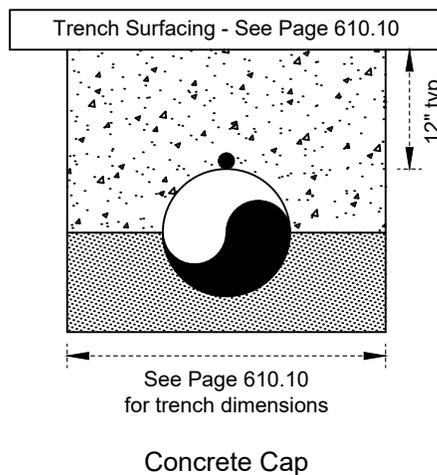
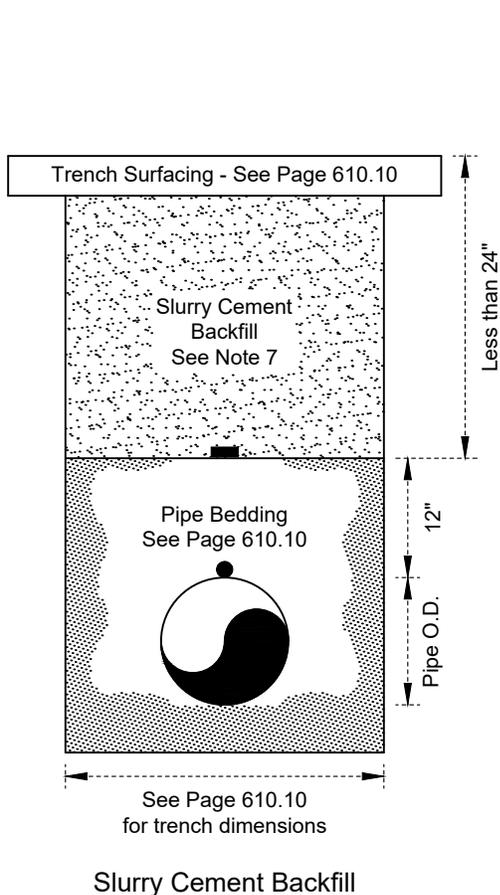
Date

Date: 09/2023

Dwg No.:

Scale: None

610.20



NOTES:

1. Joint utility trenching shall conform to Page 620.00.
2. Trench surfacing and dimensions shall conform to Page 610.10.
3. In all wet utility trench cases except concrete encasement, pipe bedding shall conform to Page 610.10.
4. All trench excavations requiring shoring shall conform to the requirements of the California Occupational Safety and Health Act (CAL-OSHA). The Contractor shall furnish and install all shoring and bracing required to support the trench walls for the protection of all personnel working in the excavation. Shoring and bracing shall be removed in a manner that protects workers and prevents sloughing of trench walls.
5. The Contractor is solely responsible for the safety of all workers, the general public, and private and public property within the project site for the duration of the project. This responsibility shall be in effect at all times.
6. The Contractor shall dewater all excavations as required, and shall keep ground water out of the excavation. Water, wastewater, and storm water shall not be allowed in excavations during material placement or compaction operations.
7. **Slurry Cement Backfill:** Trench backfill shall be slurry cement when the depth of cover is less than that shown on Page 610.10 but greater than the minimum specified by the manufacturer for the type of pipe being used. Slurry cement backfill shall consist of 2600 pounds of pea gravel, 800 pounds of sand, 94 pounds (1 sack) of cement, and 11 gallons of water per cubic yard. Slurry cement backfill shall be placed and compacted in lifts not exceeding 3'.
8. **Concrete Cap:** A concrete cap shall be placed over the pipe as shown when the depth of cover is less than the minimum specified by the manufacturer for the type of pipe being used. Concrete for the cap shall be 2000 psi minimum.
9. **Concrete Encasement:** Pipelines shall be concrete encased under rare circumstances when required or approved by the City Engineer. Pipe shall be supported on concrete blocks, grout pads, or other approved methods. Two supports shall be required per joint of pipe. Concrete for encasement shall be 2000 psi, and care shall be taken not to float the pipe while placing concrete.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

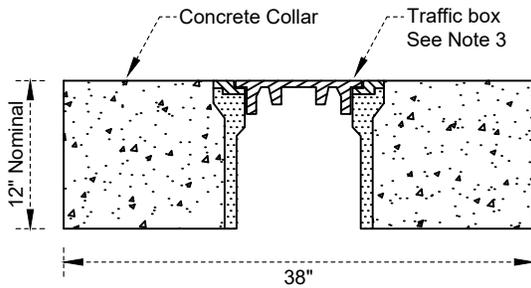
STANDARD DRAWING

**CONCRETE ENCASUREMENT, CONCRETE CAP,
AND SLURRY CEMENT BACKFILL**

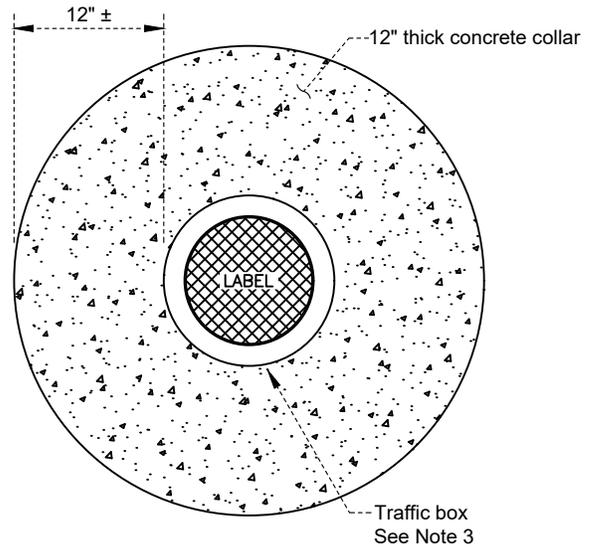
Approved:  09-30-2023
Date

City Engineer _____ Date _____

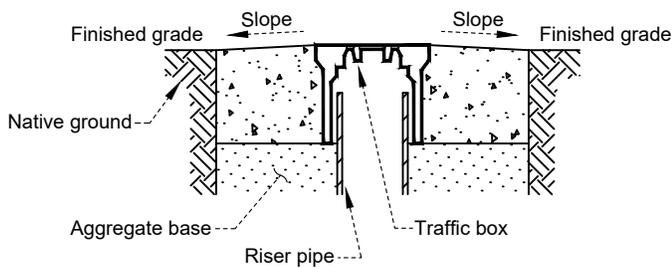
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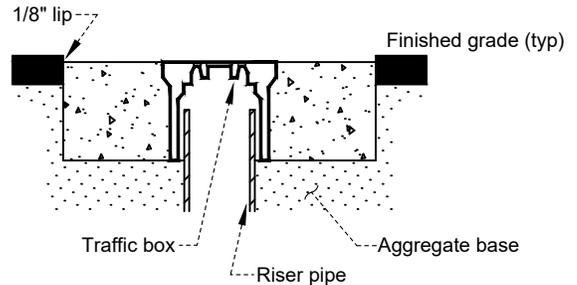
TRAFFIC BOX CONCRETE COLLAR - PROFILE



TRAFFIC BOX CONCRETE COLLAR - PLAN



TRAFFIC BOX INSTALLATION
Unpaved Locations



TRAFFIC BOX INSTALLATION
Paved Locations

NOTES:

1. All materials shall conform to Page 100.00.
2. Traffic boxes shall be concrete with cast iron lid and box trim. Traffic boxes shall be Christy G5 or approved equal.
3. Traffic box lids shall be labeled as required (i.e. "WATER", "SEWER", etc.).
4. In paved locations, existing HMA shall be jackhammered to a neat vertical edge prior to collar placement.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

STANDARD DRAWING

TRAFFIC BOX CONCRETE COLLAR
AND GRADE ADJUSTMENT

Approved:

09-30-2023

City Engineer

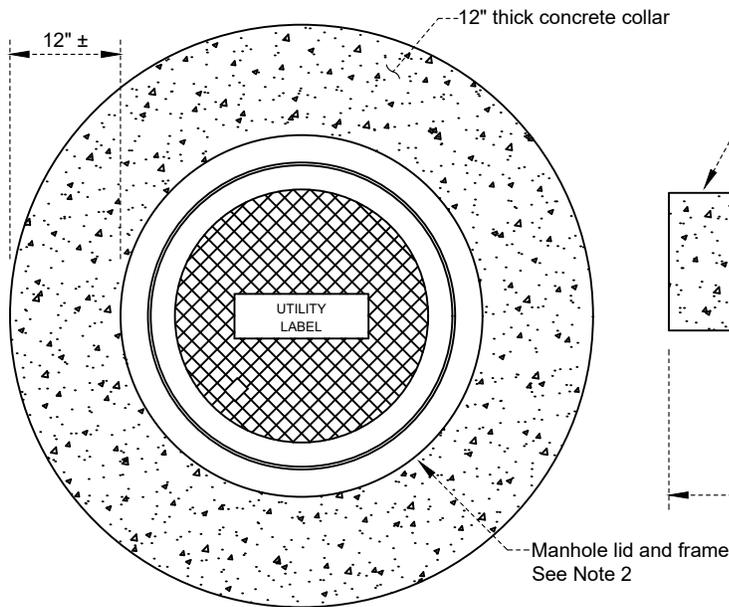
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Date: 09/2023

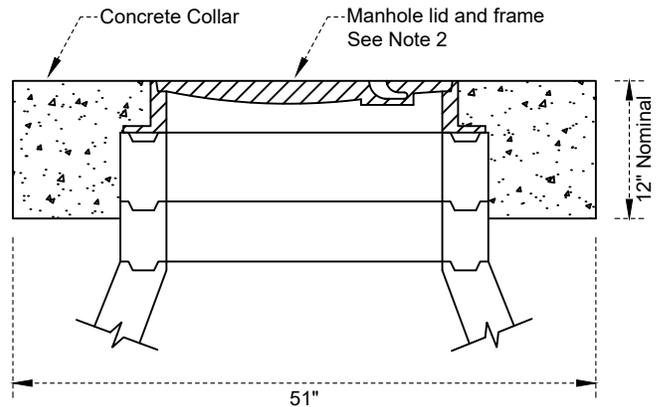
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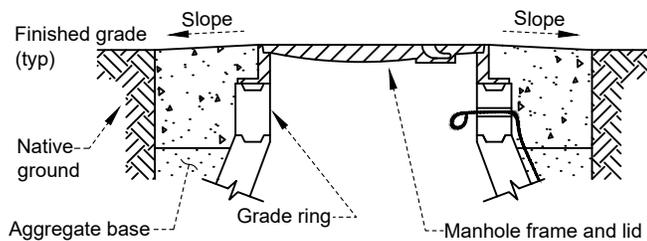
612.10



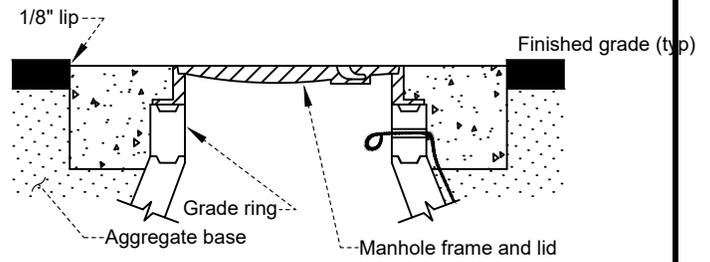
MANHOLE CONCRETE COLLAR - PLAN



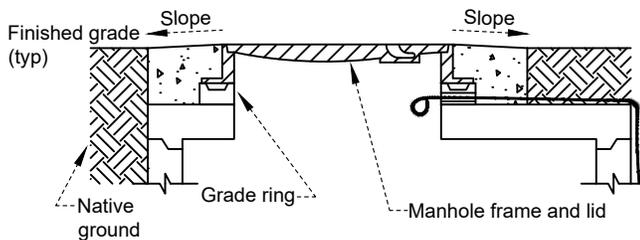
MANHOLE CONCRETE COLLAR (typ) - PROFILE



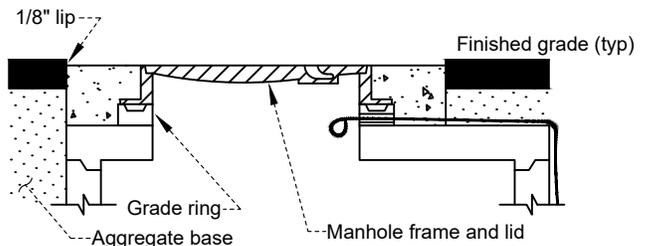
TYPE 1 MANHOLE FRAME and LID INSTALLATION
Unpaved Locations



TYPE 1 MANHOLE FRAME and LID INSTALLATION
Paved Locations



TYPE 2 MANHOLE FRAME and LID INSTALLATION
Unpaved Locations



TYPE 2 MANHOLE FRAME and LID INSTALLATION
Paved Locations

NOTES:

- All material shall conform to Page 100.00.
- Manhole frame and lid shall conform to Pages 264.10, 264.20, 364.10 or 364.20 as appropriate.
- Manhole frame and lid shall be labeled as appropriate - see Note 2.
- In paved locations, existing HMA shall be jackhammered to a neat vertical edge prior to collar placement.
- Locating wire shall conform to Page 608.00. Core 1/2" dia. hole through grade ring as needed to maintain required clearance to top of structure.
- Total grade ring adjustment shall not exceed 12".
- Frame and lid adjustments less than 2" or on a slope shall be made with non-shrink grout and spacers.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

MANHOLE CONCRETE COLLAR AND GRADE ADJUSTMENT

Approved:

09-30-2023

City Engineer

Date

Date: 09/2023

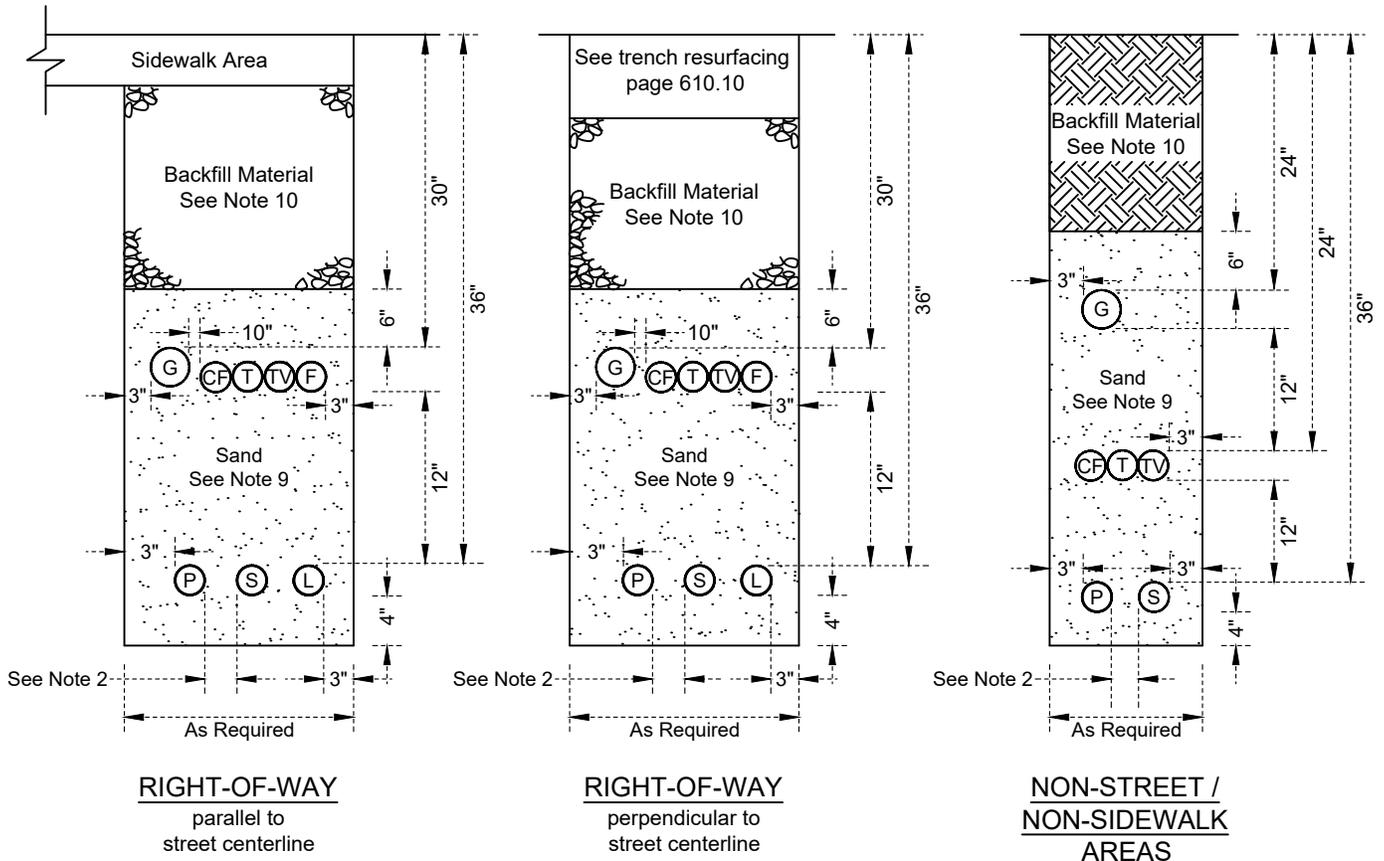
Dwg No.:

Scale: None

612.20

LEGEND

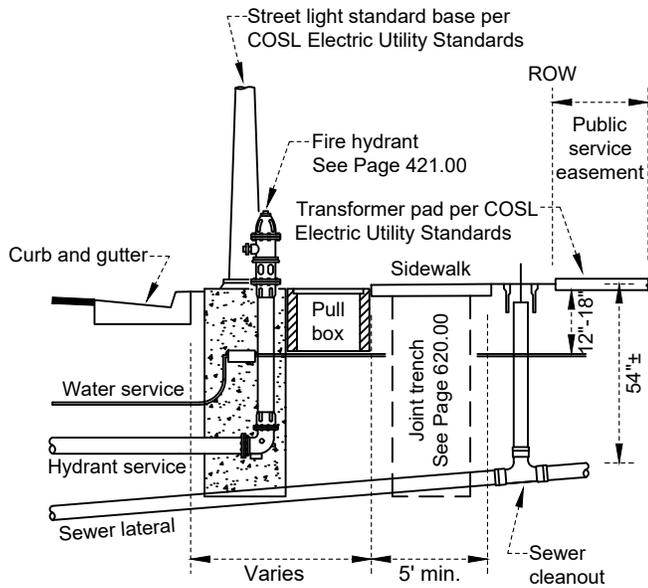
- | | |
|----------------|------------------------|
| (G) Gas (PG&E) | (P) Primary Electric |
| (T) Telephone | (S) Secondary Electric |
| (TV) Cable TV | (L) Street Light |
| (F) Fire Alarm | (CF) City Fiber |



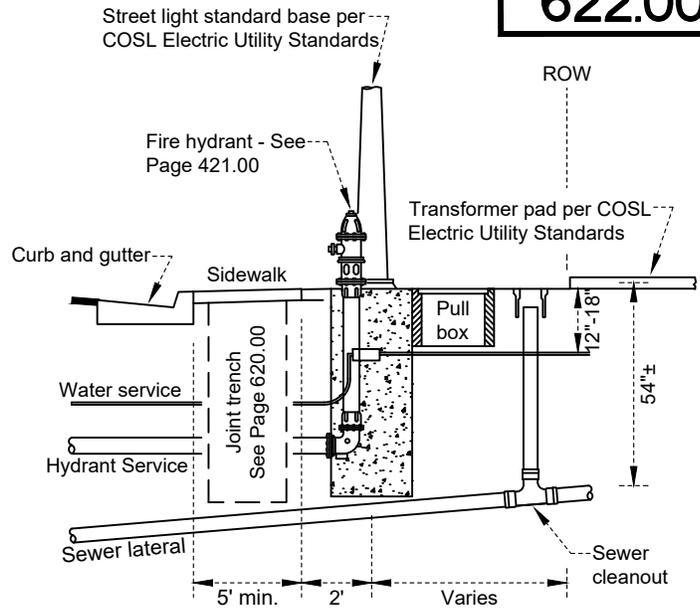
NOTES:

- Wet utility trenching shall conform to Page 610.10.
- All dimensions shown are minimum requirements. Trench depths and conduit separations will vary due to conduit size, lateral interference, and conflict with other utilities. Separation between primary and secondary electric conduits shall be per CoSL Electric Utility standards.
- Joint utility trench location shall conform to Pages 624.10 and 624.20.
- All underground cable or conductors shall be installed in plastic conduit that conforms to CoSL Electric Utility standards. No direct burial cable will be permitted.
- All conduits installed shall include mule tape or pull line per CoSL Electric Utility standards.
- At no time shall dry utilities (gas, primary or secondary electric, phone, or cable) be allowed to occupy the same trench as any wet utility (water, sanitary sewer, or storm drain).
- Gas facilities shall adhere by GO-112F:
 - Where 10" separation cannot be obtained in a 18" wide trench, separation may be reduced to not less than 6" instead of widening the trench.
 - Where primary electrical and gas are not involved, secondary electrical may occupy the position shown for gas.
- Each utility may have one or more conduits in a joint trench.
- Sand shall be used to provide bedding and backfill for the conduits, and shall conform to Page 609.00. Crushed rock or sharp-edged material of any kind is unacceptable.
- Slurry backfill shall conform with page 610.30, and shall be placed and compacted in lifts not exceeding three (3) feet. Where streets have not yet been constructed, import material (Class 2 aggregate base) may be used in lieu of slurry. In non-street / non-sidewalk areas, backfill may be native material compacted to 90% relative.
- Material compaction shall conform to page 601.00.

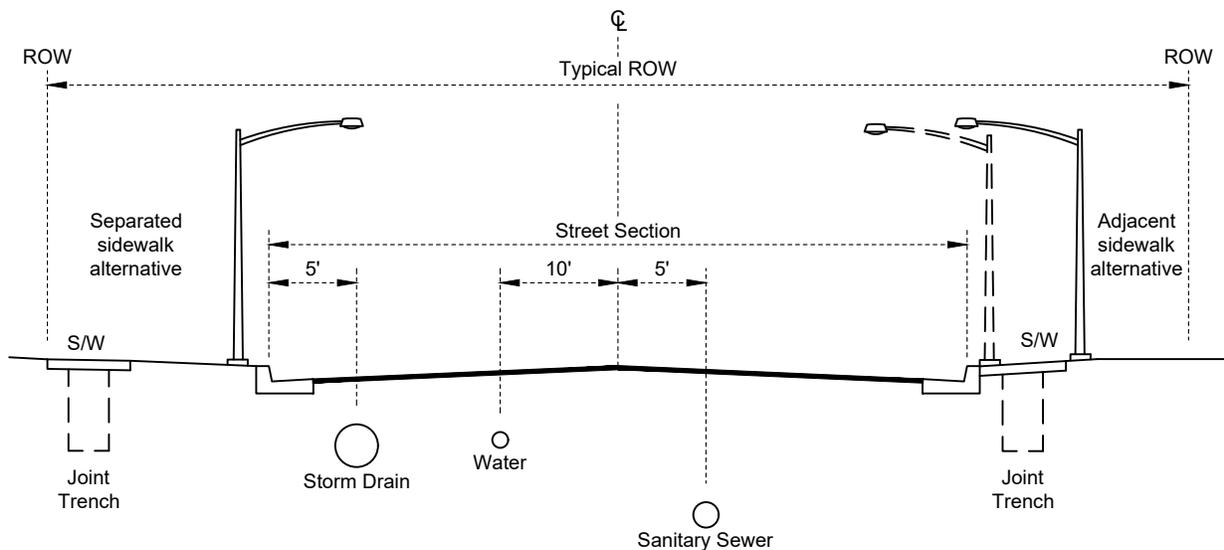
				CITY OF SHASTA LAKE		Approved:  09-30-2023 Date	
				Public Works Department			
				STANDARD DRAWING		City Engineer	
				JOINT UTILITY TRENCH		Date: 09/2023	
						Scale: None	
1	W. Bond	12/24				Dwg No.: 620.00	
REVISION	BY	APPROVED	DATE				



SEPARATED SIDEWALK DETAIL



ADJACENT SIDEWALK DETAIL



TYPICAL STREET SECTION

NOTES:

1. All dimensions shown are minimum requirements. Trench depths and conduit separations will vary due to conduit size, lateral interference, and conflict with other utilities. Refer to relevant COSLCS Pages for more information.
2. The typical location for joint utility trenches in parkways shall be under the sidewalk section.
3. All underground cable or conductors shall be installed in plastic conduit that conforms to City of Shasta Lake Electric Utility standards. No direct burial cable will be permitted.
4. At no time shall dry utilities (gas, primary or secondary electric, phone, or cable) be allowed to occupy the same trench as any wet utility (water, sanitary sewer, or storm drain).
5. For specific joint trench details, see page 620.00.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

TYPICAL UTILITY LOCATIONS

Approved:

09-30-2023

City Engineer

Date

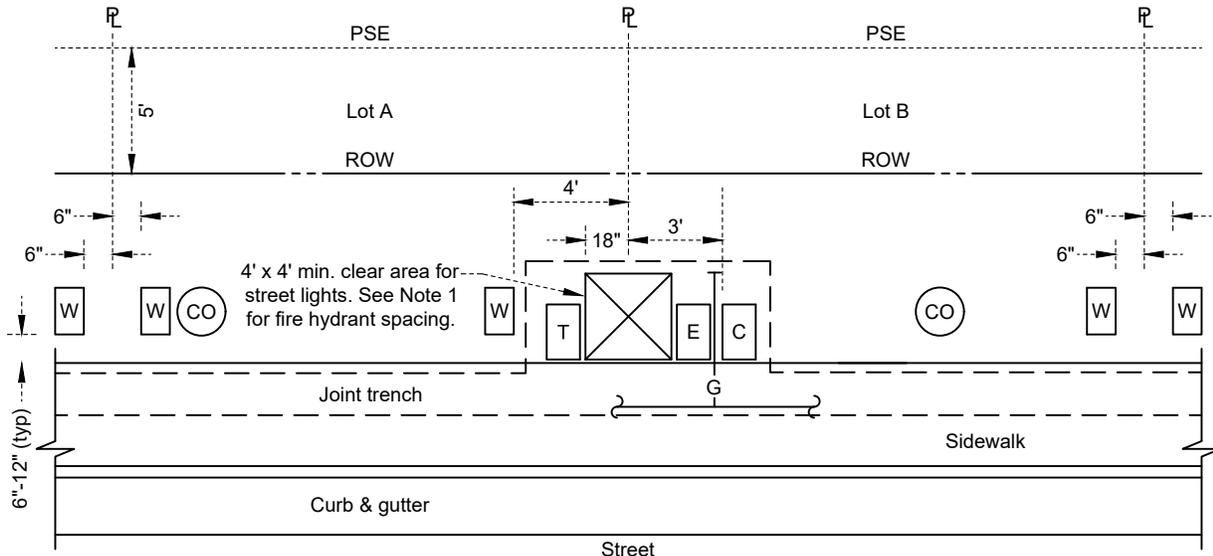
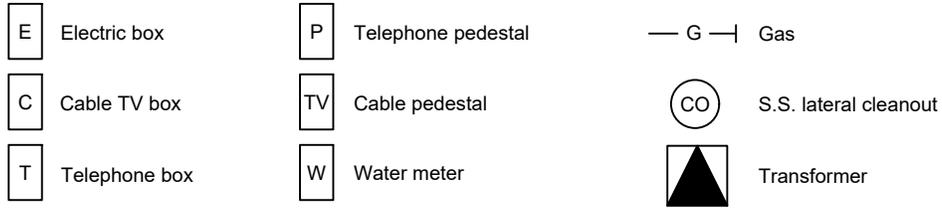
Date: 09/2023

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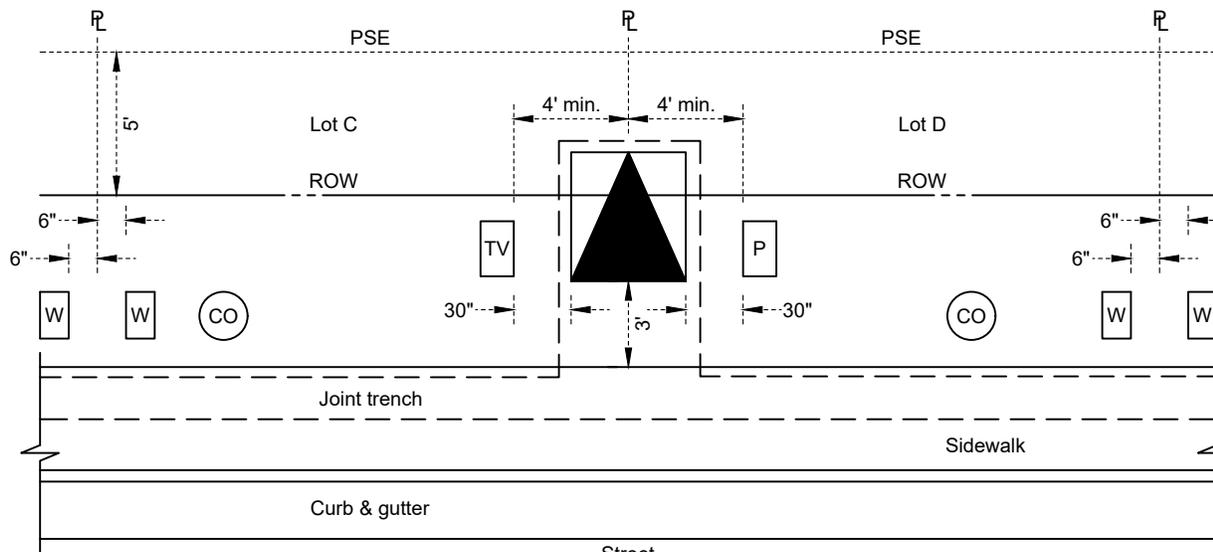
Scale: None

622.00

LEGEND



LOCATION A
(for street lights and fire hydrants)



LOCATION B
(for electric transformer)

NOTES:

- No underground utility shall be located within 4' of a fire service trench per Page 421.00.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

TYPICAL UTILITY
SERVICE BOX LOCATIONS

Approved:

09-30-2023

City Engineer

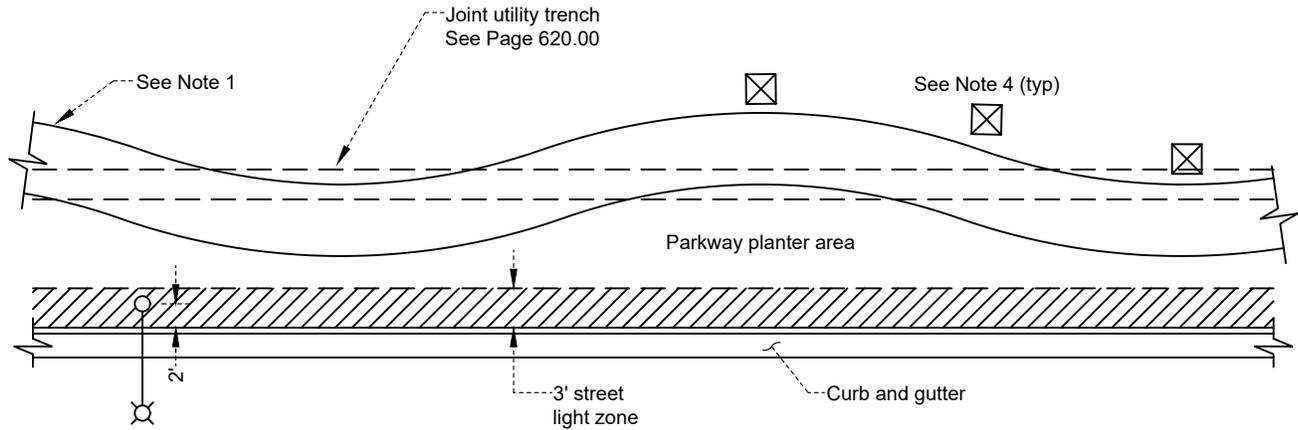
Date

Date: 09/2023

Dwg No.:

Scale: None

623.00



NOTES:

1. Meandering sidewalk layout and dimensions shall conform to Page 131.30.
2. Joint utility trench shall be centered at the maximum meander distance from curb.
3. Underground utilities located within the street light zone shall accommodate street light foundations per City of Shasta Lake Electric Utility Standards.
4. Utility splice boxes, transformers, terminations, hand holds, pedestals, etc., shall be located behind the sidewalk. See Page 623.00 for typical locations.
5. Depending on the location of the sidewalk, a PSE may be required. The easement width shall be 5' minimum and shall not exceed the building setback line.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

**JOINT TRENCH LOCATION
MEANDERING SIDEWALK**

Approved:

09-30-2023

City Engineer

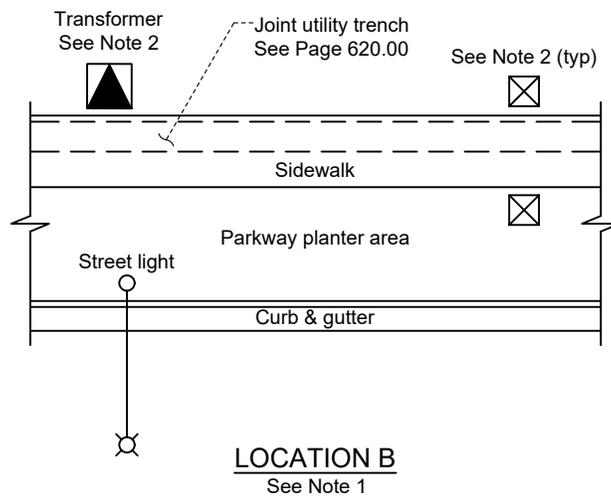
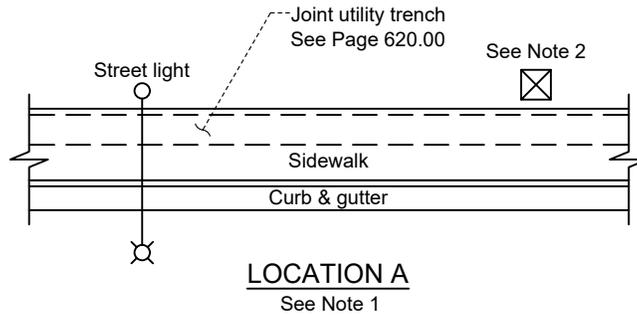
Date

Date: 09/2023

Dwg No.:

Scale: None

624.10



NOTES:

1. Joint utility trench shall be located under the sidewalk as follows:
 - A. Where the sidewalk is adjacent to the curb or where the parkway strip width is less than 5', the joint trench shall be located under the back edge of the sidewalk.
 - B. Where the parkway strip width is greater than 5', the joint trench may be located on either side of the sidewalk.
2. All above ground structures including electric transformers shall be located behind the sidewalk. Utility splice boxes, terminations, hand holds, etc. shall be located on the same side of the sidewalk as the joint trench. See Page 623.00 for typical locations.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

STANDARD DRAWING

JOINT TRENCH LOCATION
NON-MEANDERING SIDEWALK

Approved:

09-30-2023

City Engineer

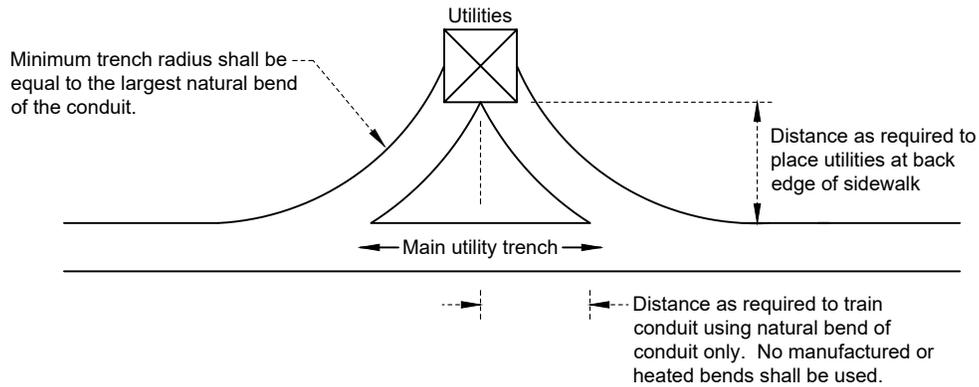
Date

Date: 09/2023

Dwg No.:

Scale: None

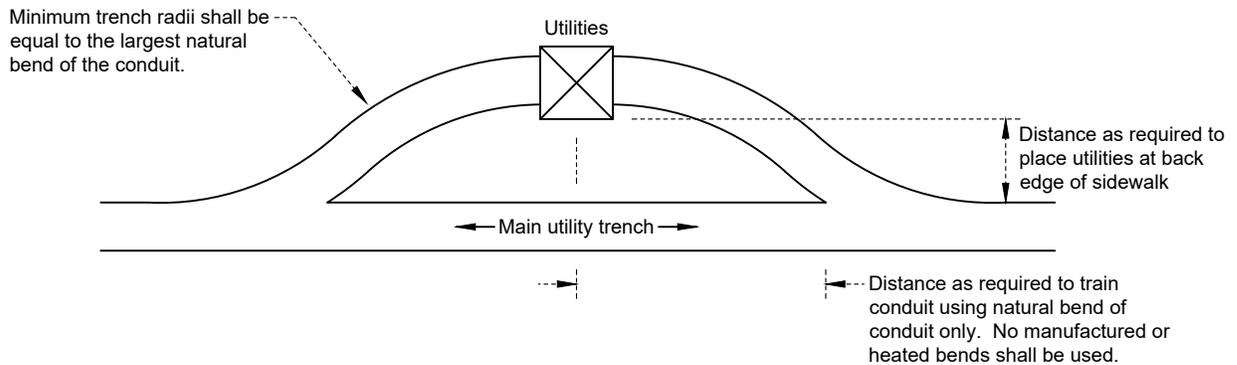
624.20



DETAIL A

NOTE:

1. Detail A shall be used where joint utility conduits enter the bottom of pull or splice boxes with 90° bends.

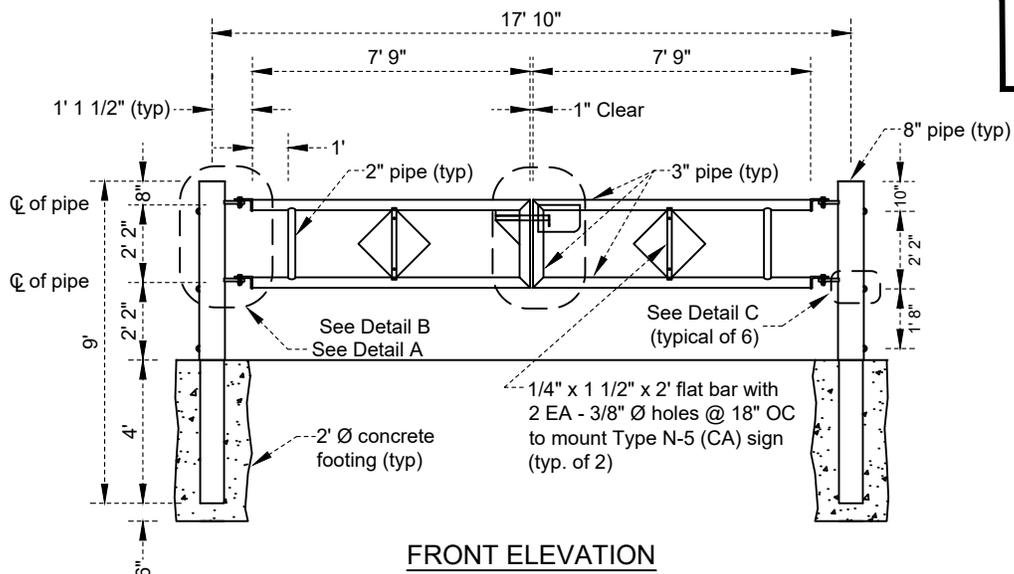


DETAIL B

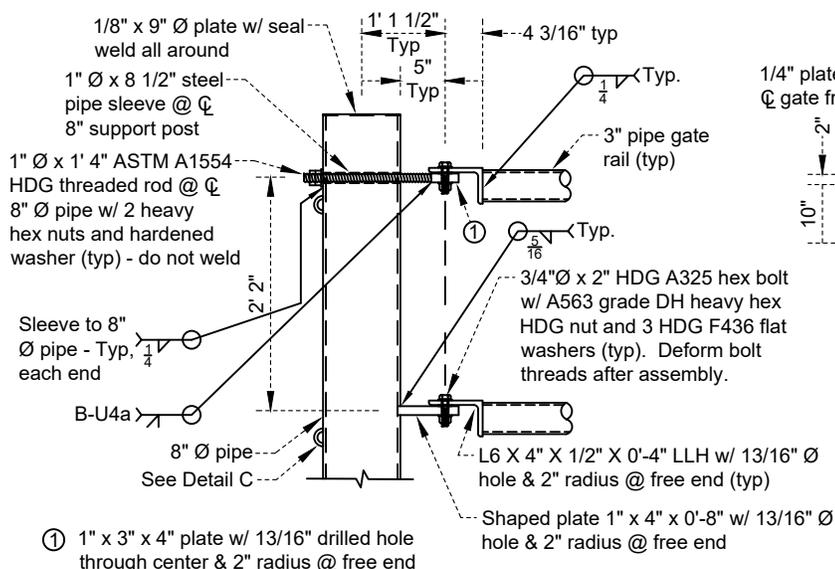
NOTE:

1. Where one or more conduits must enter a box perpendicular (90°) to the box wall or where a gas line must be tapped.

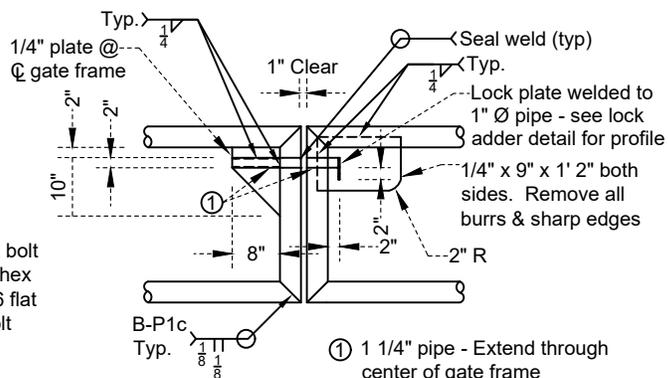
				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
				JOINT TRENCH TURNOUT	City Engineer _____ Date _____
					Date: 09/2023 Dwg No.: Scale: None 624.30
REVISION	BY	APPROVED	DATE		



FRONT ELEVATION

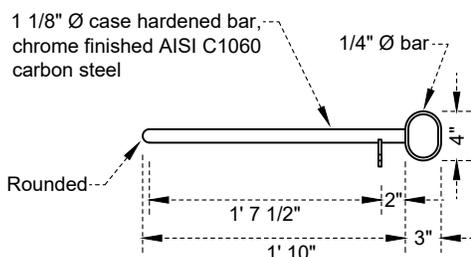


DETAIL A

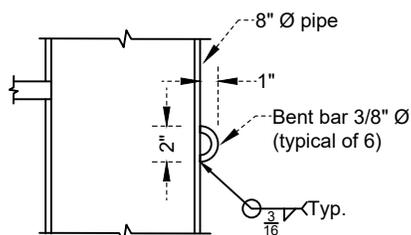


DETAIL B

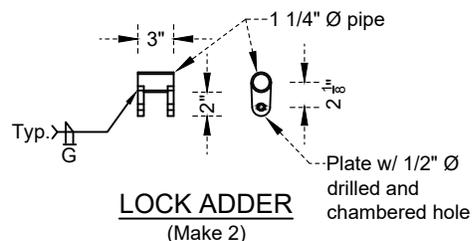
① 1" x 3" x 4" plate w/ 13/16" drilled hole through center & 2" radius @ free end



LOCKING BAR



DETAIL C



LOCK ADDER
(Make 2)

NOTES:

1. Concrete shall conform to Page 100.00.
2. All pipe shall be Schedule 40 steel.
3. Gate locks shall be provided by the City.
4. Contractor shall prepare and paint all surfaces with 2-part epoxy paint prior to installation. Color shall be as directed by the City Engineer.
5. Signage shall be Type N-5 (CA) warning signs with safety reflectors.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

ACCESS CONTROL GATE

Approved:

WST

09-30-2023

City Engineer

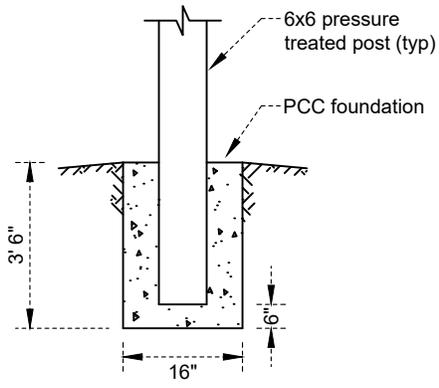
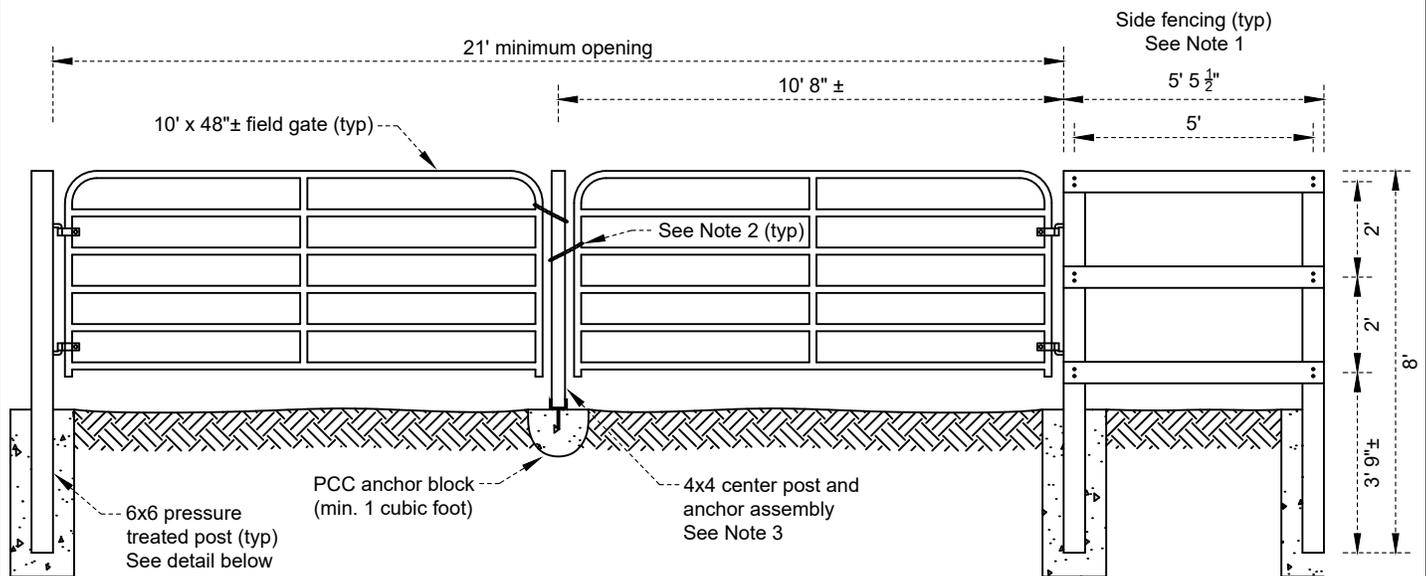
Date

Date: 09/2023

Dwg No.:

Scale: None

630.10



POST FOUNDATION DETAIL

NOTES:

1. Side fencing shall be installed where required by the City Engineer to prevent drive-around. Horizontal fencing shall be 1x6 pressure treated lumber, attachment hardware shall be 1/2" x 5" galvanized lag bolts, and entire side fencing assembly shall be painted white.
2. Chains shall connect a single gate to the center breakaway post. Chains shall not connect gates together, and shall be closed with locks provided by the City.
3. The center 4x4 post is intended to be easily knocked down in the direction of gate opening. The post shall be attached to the post base (Simpson Strong-Tie Type BC or equal) with a simple screw attachment, and the post base shall be attached to the anchor block with an anchor bolt.
4. Field gates shall be 1 1/4" Ø tubing (min.). Color shall be as determined by the City Engineer.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

EMERGENCY ACCESS
KNOCKDOWN GATE

Approved:

09-30-2023

City Engineer

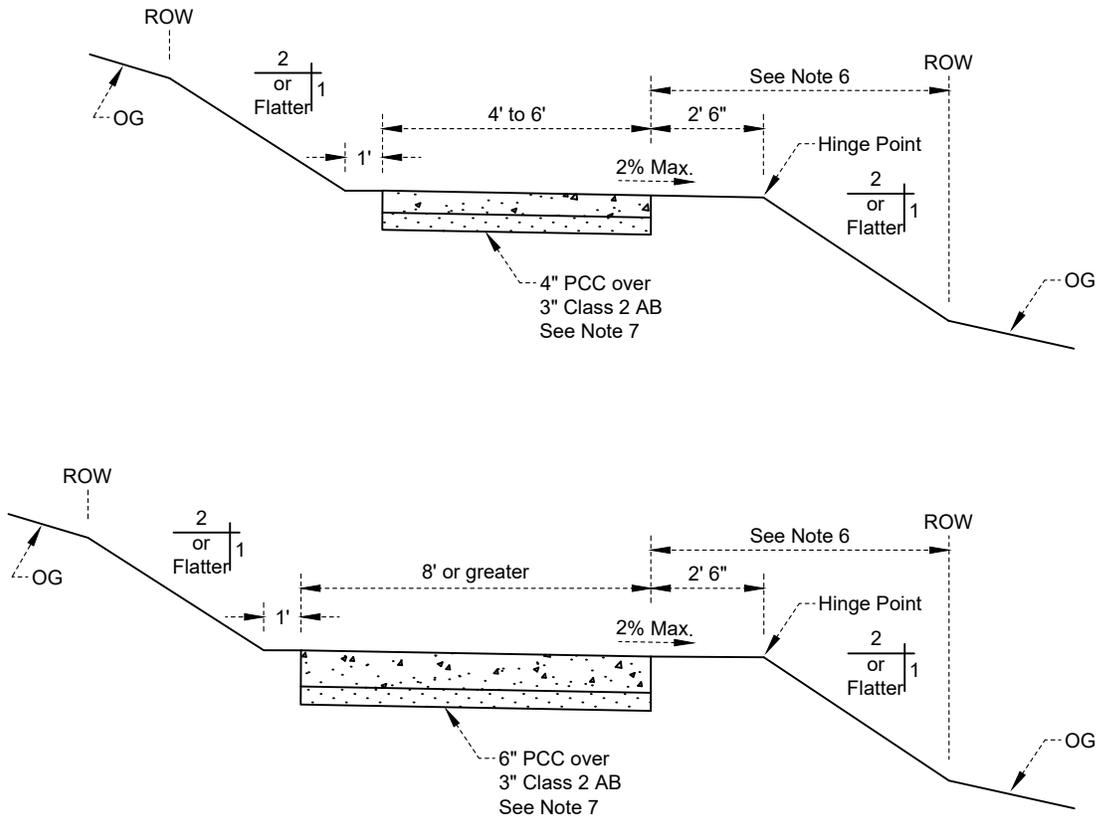
Date

Date: 09/2023

Dwg No.:

Scale: None

630.20



Profile Grade	Resting Interval Spacing
< 5%	No resting interval req'd
5% - 8.33%	200'
8.33% - 10%	30'
10% - 12.5%	10'

1. Profile grade shall not exceed 12.5%.
2. No more than 30% of the trail length may exceed a profile grade of 8.33%.

NOTES:

1. All materials shall conform to Page 100.00.
2. All brooming shall be perpendicular to the alignment.
3. Weakened plane joints shall be to a depth of 2" and at intervals not to exceed 16' on center.
4. 1/2" deep score lines shall be evenly spaced between weakened plane joints at 3' to 5' intervals.
5. Expansion joints located at curve returns shall be 1/2" wide and shall be filled with pre-molded expansion joint material.
6. A 4' high vinyl coated chain link fence shall be constructed in areas where the distance from the edge of concrete to the hinge point is less than 2' 6" and in areas where the side slope is steeper than 2:1. In areas where a fence is required, the fence shall be constructed between the edge of path and the hinge point.
7. Where approved by the City Engineer, the PCC / AB structural section may be replaced with a HMA / AB structural section. Where HMA / AB replacement occurs, the structural section shall conform to Page 111.20.
8. Passing space at least 8' wide and 8' long shall be provided at least every 1000' where the pathway is less than 5' wide.
9. Signs shall be installed at designated trail heads indicating the length of the trail segment.
10. Resting locations shall be provided along the trail per the "Resting Interval Spacing" chart above. Each resting location shall be no less than 5' in length.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

PAVED PATHWAYS AND TRAILS

Approved:

09-30-2023

City Engineer

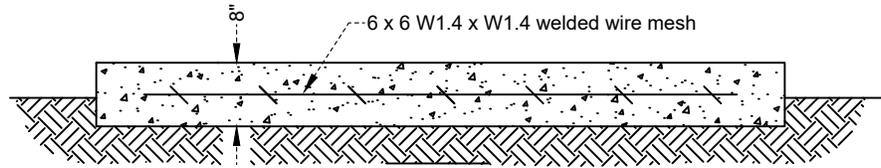
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Date: 09/2023

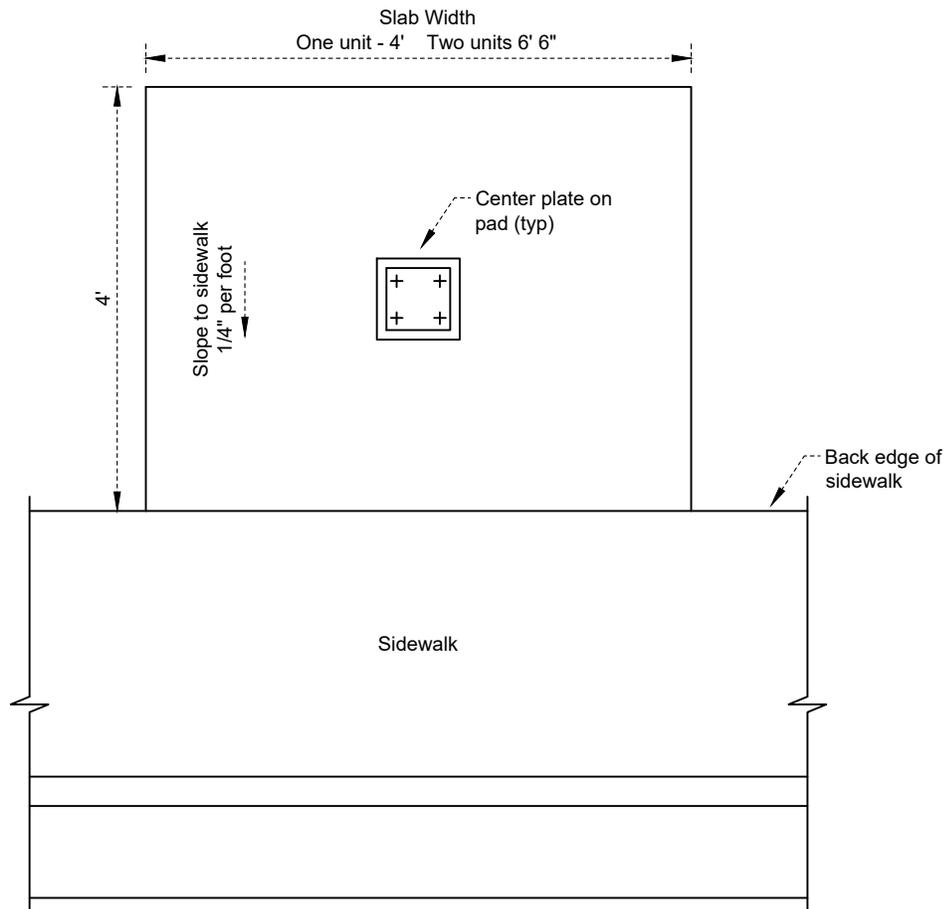
Dwg No.:

Scale: None

635.00



SECTION



PLAN VIEW

NOTES:

1. All materials shall conform to Page 100.00.
2. All brooming shall be perpendicular to the sidewalk.
3. Base plate(s) and anchor bolts (supplied by U.S. Postal Service) shall be installed per Postal Service specifications.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

POSTAL PAD - NDCBU CLUSTER BOX
(Concrete Pad without J-Bolts)

Approved:

09-30-2023

City Engineer

Date

Date: 09/2023

Dwg No.:

Scale: None

650.00

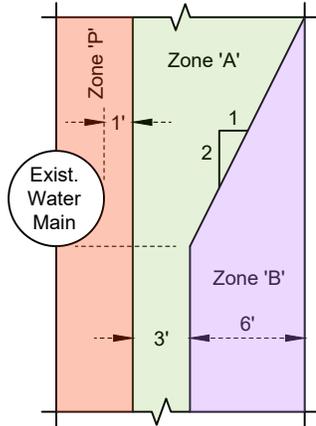
Criteria for the separation of water mains and non-potable pipelines

The construction of new pipelines lines for the conveyance of potable water and non-potable material shall conform to California Code of Regulations, Title 22, Division 4 - Environmental Health, Chapter 16 - California Waterworks Standards, Article 4 - Materials and Installation of Water Mains and Appurtenances, §64572 - Water Main Separation.

1. New water mains and new supply lines shall not be installed in the same trench as, and shall be at least 10 feet horizontally from and 1 foot vertically above, any parallel pipeline conveying untreated sewage, primary or secondary treated sewage, recycled water, and hazardous fluids such as fuels, industrial wastes, and wastewater sludge.
2. New water mains and new supply lines shall be installed at least 4 feet horizontally from, and 1 foot vertically above, any parallel pipeline conveying storm drainage and disinfected tertiary recycled water (defined in section 60301.230).
3. New supply lines conveying raw water to be treated for drinking purposes shall be installed at least 4 feet horizontally from, and 1 foot vertically below, any water main.
4. If crossing a pipeline conveying a fluid listed in Section 1 or 2 above, a new water main shall be constructed no less than 45-degrees to and at least 1 foot above that pipeline. No connection joints shall be made in the water main within 8 horizontal feet of the fluid pipeline.
5. The vertical separation specified in Sections 1, 2, and 3 above is required only when the horizontal distance between a water main and pipeline is less than 10 feet.
6. New water mains shall not be installed within 100 horizontal feet of the nearest edge of any sanitary landfill, wastewater disposal pond, or hazardous waste disposal site, or within 25 horizontal feet of the nearest edge of any cesspool, septic tank, sewage leach field, seepage pit, underground hazardous material storage tank, or groundwater recharge project site.
7. The minimum separation distances set forth in this section shall be measured from the nearest outside edge of each pipe barrel.
8. When new water mains or non-potable pipelines cannot be constructed in accordance with the above standards due to existing conditions, the appropriate alternate construction criteria described on Page 660.20 shall apply to the pipelines.

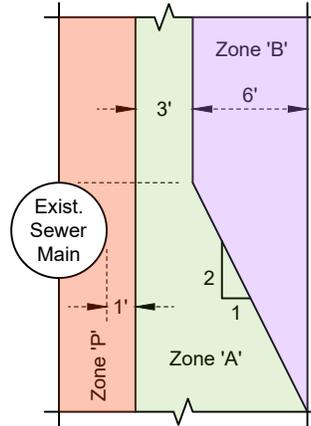
				CITY OF SHASTA LAKE Public Works Department	Approved:  09-30-2023 Date
				SEPARATION CRITERIA FOR POTABLE AND NON-POTABLE PIPELINES	City Engineer _____ Date
					Date: 09/2023 Dwg No.: Scale: None 660.10
REVISION	BY	APPROVED	DATE		

CASE 1
New Non-Potable Pipeline

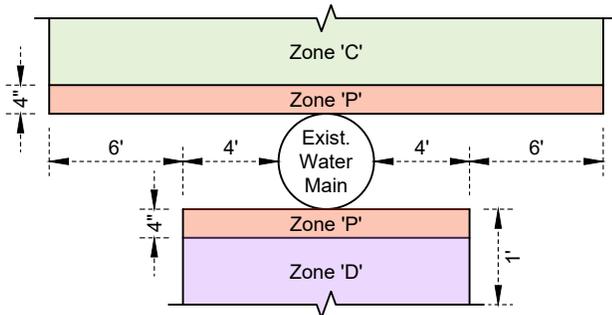


Parallel

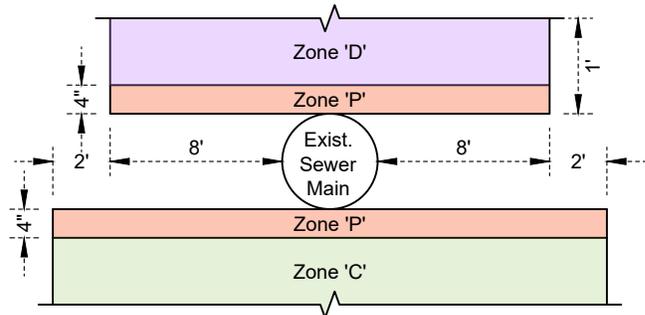
CASE 2
New Water Main



Parallel



Crossing



Crossing

Description of Special Installation Conditions by Zone		
Zone	Case 1: New Non-Potable Pipeline	Case 2: New Water Main
P	New construction is prohibited within this area	New construction is prohibited within this area
A	New construction within this area shall have prior written approval from both DDW & City of Shasta Lake Public Works	New construction within this area shall have prior written approval from both DDW & City of Shasta Lake Public Works
B	New construction within this area shall be PVC sewer main pipe with rubber ring joints (ASTM D3034)	New construction within this area shall be PC350 DIP with gasketed compression joints or DR 14 PVC C900 water main pipe with rubber ring joints (ASTM F477)
C	New construction shall be DR 14 PVC C900 water main pipe centered on the sewer main and shall have no joints within ten (10) feet from either side of the existing water main	New construction shall be PC350 DIP or DR14 PVC C900 water main pipe and shall have no joints within ten (10) feet from either side of the existing sewer main
D	New construction shall be DR14 PVC C900 water main pipe and shall have no joints within four (4) feet from either side of water main	New construction shall be PC350 DIP or DR14 PVC C900 and have no joints within four (4) feet from either side of the existing water main

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE
Public Works Department

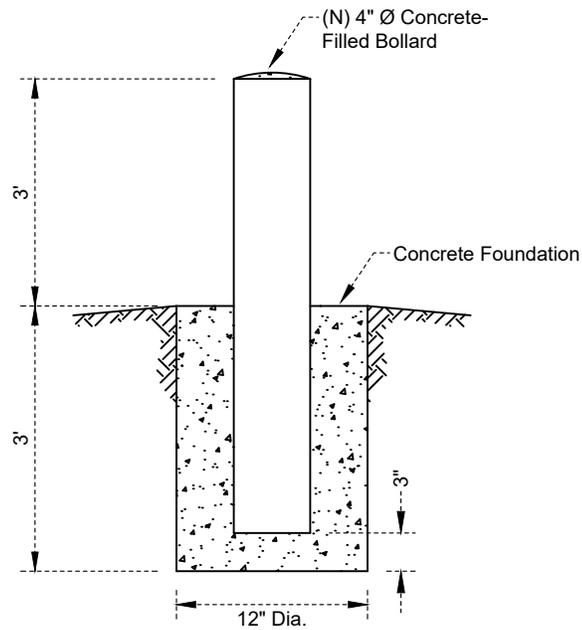
STANDARD DRAWING

**SPECIAL INSTALLATION CONDITIONS
FOR POTABLE AND NON-POTABLE PIPELINES**

Approved:  09-30-2023
Date

City Engineer _____ Date _____

Date: 09/2023 Dwg No.: 660.20
Scale: None



NOTES:

1. Concrete shall conform to Page 100.00.
2. Bollards shall be Schedule 80 steel, shall be filled with concrete, and shall be painted Safety Yellow.

				CITY OF SHASTA LAKE Public Works Department	Approved:  Date: 09-30-2023
				BOLLARD INSTALLATION	Date: 09/2023 Dwg No.: Scale: None 670.00
REVISION	BY	APPROVED	DATE		

GENERAL

1. The Contractor shall know and fully comply with applicable provisions of the federal, state, and local regulations and requirements that govern the Contractor's operations and storm water and non-storm water discharges from both the project site and areas of disturbance outside the project limits during construction.
2. The Contractor is directed to Chapter 15.08 - Grading, Erosion Control, and Hillside Development of the City of Shasta Lake Municipal Code for additional requirements.

CUTS

1. Slope: Excavations shall not be made with a cut face steeper in slope than two horizontal to one vertical (2:1). The City Engineer, or approving body, may require the excavation to be made with a cut face flatter in slope than two horizontal to one vertical if there is reason to believe that the material in which the excavation is to be made is unusually subject to erosion or if other conditions make such flatter cut necessary for stability and safety. An applicant or permittee may submit the report and recommendations of a retained Engineering Geologist or Geotechnical Engineer for a steeper slope and the City Engineer shall consider and may approve a steeper slope, but shall not necessarily be bound by such report if a determination that public safety would be endangered thereby.
2. Unstable Slopes: If the material of the slope is of such composition and character as to be unstable, considering all types of anticipated loading moisture conditions and erodibility, the project Engineering Geologist and/or Geotechnical Engineer shall, by testing and analysis, provide specific criteria for its stabilization by reduction of slope angle, buttressing, or by a combination of these or other means.
3. Rounding Slopes: All cut slopes shall be rounded into the existing terrain to produce a contoured transition from cut face to natural ground where conditions permit.
4. Location of Slopes: All cut slopes shall be within properties or parcels under one ownership wherever possible, and in no event shall cuts be divided vertically by property lines unless design criteria is submitted which, in the estimation of the City Engineer, would provide adequate protection. Tops of cut slopes shall not be nearer than one foot plus one-fifth the height of the cut to a project boundary, but need not exceed a horizontal distance of ten (10) feet from the project boundary.
5. Terraces: Terraces shall be a minimum of six and one-half feet in width. Cut slopes shall not exceed a vertical height of 60 feet unless terraces are installed at each 30 feet of vertical height. At the discretion of the City Engineer, cut slopes exceeding 30 feet and less than 100 feet in vertical height may have one (1) terrace drain placed at mid-height.

FILLS

1. Slope: No fill shall be made which creates any exposed surface steeper in slope than two horizontal to one vertical (2:1).
2. Terraces: Terraces shall be a minimum of six and one-half feet in width. Fill slopes shall not exceed a vertical height of 50 feet unless terraces are installed at each 25 feet of vertical height. At the discretion of the City Engineer, fill slopes exceeding 25 feet and less than 50 feet in vertical height may have one (1) terrace drain placed at mid-height.
3. Placement of Fill: All fills shall be placed, compacted, inspected and tested in accordance with the following provisions:
 - A. The natural ground surface shall be prepared to receive fill by removing vegetation, non-complying fill, unsuitable soil; and, where natural slopes are five horizontal to one vertical or steeper, by placing at least ten (10) foot wide keys and benches into sound bedrock or other competent material. Five (5) feet of the lowermost bench shall be exposed beyond the toe of the fill.
 - B. No organic material shall be permitted in fills. No rock or similar irreducible material with a maximum dimension greater than eight (8) inches shall be buried or placed in fills unless otherwise recommended by the Civil Engineer or Geotechnical Engineer.
 - C. The fill shall be spread in a series of layers. The maximum thickness of loose lifts shall be eight (8) inches and shall be compacted by sheepfoot roller or other approved method after each layer is spread.
 - D. The moisture content of the fill material shall be controlled at the time of spreading and compaction to obtain required relative compaction.
 - E. All fills shall be compacted to a minimum of 90% of maximum density as determined by AASHTO T180, correction for oversize material in accordance with AASHTO T224 or other approved testing method giving equivalent test results.

				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer _____ Date _____	
				GRADING DESIGN STANDARDS		Date: 09/2023 Dwg No.:	
REVISION	BY	APPROVED	DATE			Scale: None 700.01	

FILLS (continued)

3. Placement of Fill: All fills shall be placed, compacted, inspected and tested in accordance with the following provisions:
 - F. A field density test shall be taken for each two (2) feet of fill or portion thereof, measured vertically from the lowest point of the area to be filled and for each 1,000 cubic yards of fill placed. In addition, in the case of subdivisions, at least one (1) field density test shall be taken on each platted lot which receives fill. Slope face test shall be required at one (1) test per 1,000 square feet but at no greater vertical interval than ten (10) feet.
 - G. All fills shall be tested for relative compaction (density). A certificate of compliance shall be submitted to attest to compliance with these standards. In addition, any fill proposed to support any structure, either immediately or in the future, shall be certified as to compliance with these standards, the soils report, and chapters 18 & 33 of the California Building Code. All certificates of compliance shall be signed by a Civil Engineer or a Geotechnical Engineer and be approved by the City Engineer.
 - H. Fills toeing out on natural slopes which are steeper than two horizontal to one vertical (2:1) shall not be permitted unless buttress effect can be shown to safely permit an exception.
 - I. Toes of fill slopes shall not be made nearer to a project boundary line than a minimum of five (5) feet or one-fifth (1/5) the height of the fill, but need not exceed a horizontal distance of ten (10) feet. Property lines should be located 2' from top of slopes. Fill slopes shall not be divided vertically by property lines unless design criteria is submitted which, in the estimation of the city engineer, would provide adequate protection.
 - J. Combined cut and fill slopes shall meet the requirements of subsections 1 and 2 of this section insofar as steepness, height, and terracing are concerned except that where the slope exceeds 25 feet in height the required drainage terrace shall be placed at the top of the cut slope.
 - K. All fill slopes shall be rounded into the existing terrain to produce a contour or transition from the fill face to natural ground where conditions permit.
 - L. Fill slopes shall be overbuilt a minimum of one foot and cut back to design slope and tested per section f above. Brush may be cleared twelve (12) feet past the toe of fill slopes to accommodate this overbuilding and regrading.
4. Old Fills: All old fills shall be tested by either the Civil Engineer or the Geotechnical Engineer and a written declaration made as to the adequacy of the fill to support the proposed structures or the old fill shall be either removed and recompacted or removed from the site.
5. Reports and Inspections:
 - A. Periodic reports by a Civil Engineer or a Geotechnical Engineer shall be required. These reports shall include (but need not be limited to): inspection of cleared areas and benches prepared to receive fill and removal of all unsuitable soil and material, the bearing capacity of the fill to support structures, the placement and compaction of fill materials, and the inspection of buttress fills, subdrains and similar devices.
 - B. The City Engineer may require inspection(s) by an Engineering Geologist to assure that all geologic conditions have been adequately considered. Where geologic conditions justify, the City Engineer may require periodic geologic reports. These inspections and reports may be required to include (but need not be limited to): inspection of cut slopes, inspection of canyons during clean out, recommendations with respect to groundwater and earth material conditions, inspection of benches prior to placement of fill, possible spring locations and determination of subdrain placement.

DRAINAGE

1. General: All drainage design work shall conform to Section 200 of the COSLCS.
2. Terrace Drains: Paved concrete terrace drains shall be a minimum of three inches thick, shall have a minimum width of three feet and shall be installed along the terrace for all graded slopes at intervals not to exceed 25 feet in fill and 30 feet in cut measured along a vertical plane. The longitudinal slope of terrace drains shall not be less than 4%, nor more than 15%, and any change in rate of grade within these allowable slopes shall increase the grade in the direction of flow. No single run of a terrace drain shall exceed 300 feet to a downdrain.
3. Berms: Earth berms to control drainage and prevent erosion shall be constructed around the top perimeter of cut and fill slopes, except when diverter gutters are installed in the same location.

				CITY OF SHASTA LAKE Public Works Department STANDARD DRAWING	Approved:  09-30-2023 City Engineer _____ Date _____	
					GRADING DESIGN STANDARDS	
REVISION	BY	APPROVED	DATE		Date: 09/2023	Dwg No.: 700.02
					Scale: None	

DRAINAGE (continued)

4. Diverter Gutters: Concrete gutter, vertical curb and gutter, or another approved system shall be constructed as required by the City Engineer to provide drainage and protect against erosion, at the top of all cut slopes where the tributary drainage area above has a slope exceeding ten horizontal to one vertical (10:1) and a slope distance of greater than 50 feet.
5. Vee Channels: Where a slough wall is required at the toe of a slope, a vee channel shall be constructed behind the wall to carry off the slope waters.
6. Downdrain and Outlet Structures:
 - A. Open channel downdrains shall be of a size required by runoff calculations. They shall be designed by a Civil Engineer. The alignment of downdrains shall be such as to discharge water in a safe and erosion-free manner.
 - B. Outlet structures shall be of concrete. Where outletting into streets, the structure shall be of a design approved by the City Engineer. Where outletting into natural watercourses or other approved locations, the structure shall be provided with adequate velocity reducers, diversion walls, rip-rap, concrete aprons, or other similar energy dissipater. All slope drainage shall be collected and disposed of in an approved drainage device.
7. Hydrology Calculations: Hydrology calculations shall conform to Page 200.02.
8. Subdrains: All canyon fills shall have subdrains as required by the City Engineer or soils report, except when soil conditions are such that a drain is not needed.
9. Site Drainage: All finish grades shall slope a minimum of 2% from the building pad to a public street, storm drain, or an improved easement. When designed by a Civil Engineer, a flatter grade may be approved by the City Engineer. The drainage system shall conduct the water to a street, storm drain, or natural watercourse approved by the City Engineer as a safe place to deposit such waters. Under sidewalk drains shall be installed to convey site drainage to the street without overtopping sidewalks.
10. Maintenance of Drainage: Drainage in conformance with these provisions shall be maintained during and subsequent to construction by the owner.

TOPSOIL

1. Topsoil shall be placed on all areas to be planted or stabilized with erosion control including fill slopes, cut slopes 2:1 or flatter, and all disturbed areas to be seeded. Vee channels do not require placement of topsoil.
2. Topsoil shall be excavated to the lines and depths as directed by the Engineer and stockpiled.
3. Topsoil shall not be placed until all equipment, except equipment required for spreading topsoil, is through working in an area.
4. All lumps or clods shall be broken up, and rocks and debris larger than 2-1/2 inches in maximum dimensions shall be removed, before the topsoil is spread.
5. Topsoil shall be spread uniformly at the rate specified by the Engineer. The finished surface after spreading topsoil shall be approximately one (1) inch below the top of adjacent grade. Import topsoil may be required to meet this specification.
6. Topsoil shall be spread to a uniform thickness. Topsoil shall be placed a minimum of 6 inches thick on all disturbance areas to be seeded and mulched per Page 810.00, "erosion control criteria", except that topsoil shall be placed 4 inches thick on cut slopes that are 2:1. Cut slopes shall be scarified to a depth of 2 inches prior to placing topsoil to ensure sufficient contact. Other compacted areas (i.e. roadbeds, parking areas, staging or equipment storage areas, etc.) shall be uncompacted by ripping to a depth of six (6) inches prior to placement of topsoil.
7. Topsoil shall be roughened by trackwalking or rolling with a sheepsfoot roller prior to seeding and mulching. Trackwalk topsoil with tracked equipment run perpendicular to slope contours. Water may be used to assist this process but must not cause erosion.
8. Finished surfaces after topsoil placement must achieve a minimum of 85 percent compaction.

				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer _____ Date _____	
				GRADING DESIGN STANDARDS		Date: 09/2023 Dwg No.:	
REVISION	BY	APPROVED	DATE			Scale: None 700.03	

On all land development projects processed after June 1, 1983, the Developer's licensed Civil or Geotechnical Engineer shall be responsible for providing a written declaration* that embankments or unclassified fills, up to and including the finish aggregate base rock surface, on either public rights-of-way or private properties, have been placed in accordance with the plans and specifications. this will apply to projects for subdivisions, parcel maps, grading permits, encroachment permits, or any other improvements for which permits or permission of the Engineering Division are necessary.

Embankment or unclassified fill shall be considered as any area upon which the depth of fill exceeds 12 inches to the finish grading plane. Unclassified fills shall be constructed in accordance with project geotechnical report and these Construction Standards.

The City will coordinate with the Developer or Engineer for obtaining all compaction tests on the subsequent layers of material placed on the finish subgrade and for the densities of trenches within the rights-of-way.

The written declaration shall be based on sufficient visual and test observations to enable the Engineer to issue a written statement that in his/her professional opinion the fill(s) have been placed and compacted in accordance with the requirements of the plans and specifications. The declaration for the compaction of all unclassified fill within the public rights-of-way shall be received by the City Engineer prior to allowing construction to proceed to the next subsequent operation (placement of HMA, etc.). With respect to unclassified fills upon private properties, the written declaration shall be submitted to the City Engineer prior to issuance of any building permits.

* For purposes of clarification, the words certify, certification, or declaration constitute an expression of professional opinion regarding those facts or findings which are the subject of the certification, and do not constitute a warranty or guarantee, either expressed or implied.

				<p align="center">CITY OF SHASTA LAKE Public Works Department</p>	<p>Approved:  09-30-2023</p>
				<p align="center">DECLARATION REGARDING EMBANKMENTS OR UNCLASSIFIED FILLS</p>	<p>Date: 09/2023 Dwg No.:</p>
					<p>Scale: None 701.01</p>
REVISION	BY	APPROVED	DATE		

A. General

1. The following construction information shall be applicable to all City parks, landscape maintenance districts, streetscapes (right-of-way) and other City facilities that require landscape improvements.
2. All landscape work shall conform to the approved landscape plan and the following codes, adopted policies, and applicable standards:
 - A. Uniform Building Code
 - B. Uniform Plumbing Code
 - C. National Electric Code
 - D. State of California Administrative Code, Title 17
 - E. City of Shasta Lake Tree Ordinance
 - F. City of Shasta Lake Electric Utility Construction Standards
 - G. City of Shasta Lake construction standards (COSLCS)
 - H. American standard for nursery stock (ANSI Z60.1)
3. It shall be the contractor's responsibility to verify the point of connection for water and electric services prior to starting any landscape work. Prior to starting any excavation, the contract shall call underground service alert at 1-800-227-2600.
4. All landscape irrigation systems shall include a reduced pressure principle device (RPP) per Page 431.10.

B. Pre-construction Meeting

1. A pre-construction meeting is required prior to commencement of any landscape work. The meeting will be held at a mutually agreed time and place which shall be attended by the City construction inspector, parks division representative, developer, landscape contractor, sub-contractor(s), and other governmental or City agency representatives as appropriate.
2. Contractor shall bring to the pre-construction meeting the following items:
 - A. Tentative construction schedule
 - B. Shop drawing, sample, substitute or "or equal" submittal schedule
 - C. A set of the approved landscape plans and specifications.

C. Inspection Authority

1. All work shall be inspected by the City. Final authority on any and all issues shall be the City Engineer.
2. The Contractor is solely responsible for the proper execution of the work in accordance with all requirements of the approved plans and specifications.
3. All materials furnished by the contractor shall be subject to inspection.
4. The Contractor shall schedule all reviews by the City at least forty-eight (48) hours prior to the anticipated review by calling (530) 275-7400
5. The Contractor shall request a review by the inspector at the following phases in the progress of the landscape work:
 - A. Before backfilling irrigation pipe and electric conduit
 - B. Hydrostatic testing
 - C. Irrigation system coverage and performance check
 - D. Finish grade prior to placing mulch or sod
 - E. Hardscape forms prior to pouring concrete

				CITY OF SHASTA LAKE Public Works Department STANDARD DRAWING	Approved:  09-30-2023 City Engineer Date	
					Date: 09/2023 Dwg No.: Scale: None 702.01	
REVISION	BY	APPROVED	DATE	LANDSCAPE CONSTRUCTION CRITERIA		

C. Inspection Authority (continued)

6. The City will not make inspections on weekends, holidays, or outside normal work hours.

D. Final Inspection

1. The Contractor shall request an inspection when all required landscape work has been completed. The Contractor, Developer, landscape contractor, City staff, and other governmental or regulatory representatives (as required) shall attend.
2. If all work is accepted, the Contractor shall provide a minimum 90-day maintenance and plant establishment period for all required landscape work following the final inspection.
3. At the conclusion of the 90-day maintenance and plant establishment period, the Contractor shall request a final inspection. All appropriate representatives shall be present.
4. The Contractor shall provide as-built drawings, manufacturer documentation, warranty information, and specifications on installed equipment to the City.

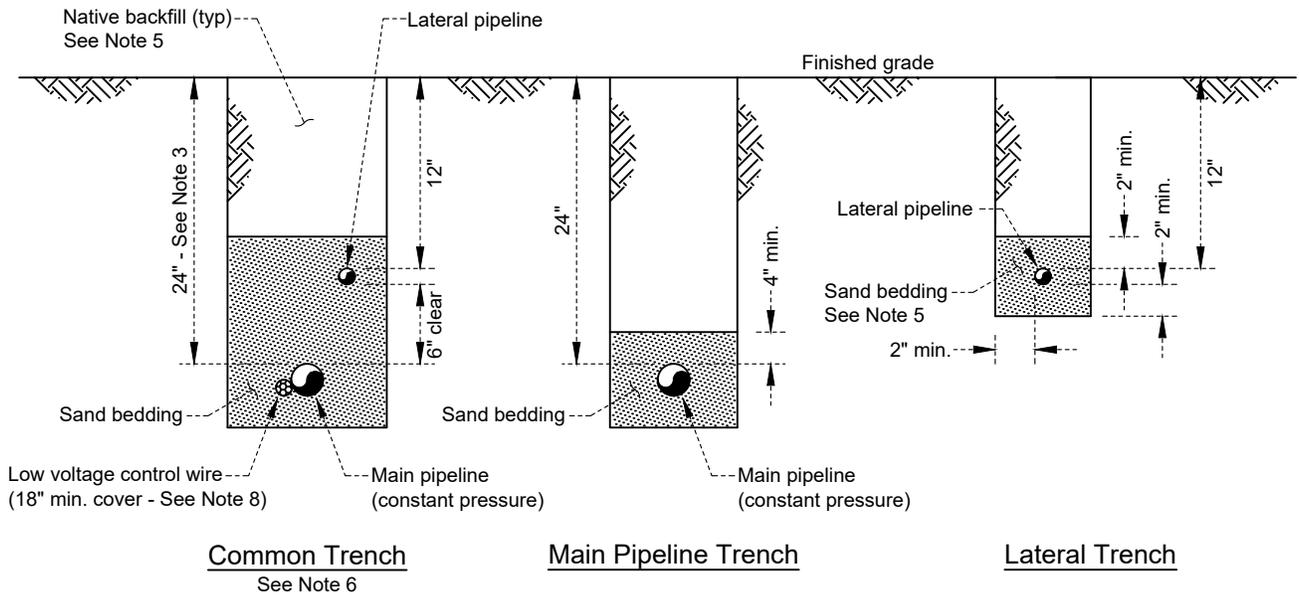
E. Warranty

1. The Contractor shall warranty all irrigation utility installation work for a period of one (1) year from the date of the final inspection. During this time period, the Contractor shall repair or replace any and all work that may prove defective in workmanship or materials, ordinary wear and tear and unusual abuse or neglect excepted, together with any other work that may be damaged or displaced during repair operations.
2. The Contractor shall provide a Maintenance Bond to the City that shall remain in effect throughout the entire warranty period. Said bond shall be in the amount of 50% of the construction cost of the work.

F. Miscellaneous Information

1. Landscape maintenance district requirements:
 - A. After completing the 90-day plant establishment and maintenance period, the Contractor shall continue maintaining the landscape improvements until assessments are levied by the Shasta County Assessor.
 - B. All landscape improvements shall conform to the city of Shasta Lake landscape maintenance district requirements and standards, current edition.

				CITY OF SHASTA LAKE Public Works Department STANDARD DRAWING	Approved:  09-30-2023 City Engineer Date	
					LANDSCAPE CONSTRUCTION CRITERIA	Date: 09/2023 Scale: None
REVISION	BY	APPROVED	DATE			



NOTES:

1. Bedding sand shall conform to Page 609.00. Material compaction shall conform to Page 601.00.
2. Irrigation piping shall not share the same trench as other public utilities.
3. Irrigation piping crossing an existing joint utility easement shall maintain 18" of cover.
4. The bottom of irrigation trenches shall be true to grade and free of protruding stones, roots, or other matter which would prevent proper bedding of pipe.
5. Irrigation trench bedding shall be 2" minimum sand above and below pipe. Trench backfill material shall consist of excavated native material that is free from debris, vegetative material, rocks over 1" in diameter, and other coarse undesirable material.
6. When two or more irrigation pipelines are installed in the same trench, they shall be separated by a minimum horizontal clear distance of 6" and a vertical clear distance of 6".
7. Pipelines shall be installed 12" behind the back of sidewalk.
8. Spare low voltage control wire shall be installed along the entire main line, with a minimum of one spare wire per controller. 36" of excess spare wire shall be looped into each controller valve box.
9. Splicing of wire shall be permitted only on runs exceeding 2,500 feet. All splices shall be located in controller valve boxes.
10. Where control wires cross under streets, parking lots, or sidewalks, they shall be located in Schedule 40 PVC sleeves.
11. Pressure testing shall be performed on all constant-pressure main pipelines before any fittings or valves are buried. The test shall be performed at a constant pressure of 125 psi for a duration of 3 hours. Lateral pipelines controlled by valves shall be pressurized, and any observed leaks shall be repaired.
12. Irrigation trenches shall be backfilled only after piping has been tested, inspected, and approved.
13. During the warranty period, trench settlement shall be brought back to original finish grade by the Contractor. All damage to turf, planting, hardscape, or paved areas caused by trench settlement shall be repaired.
14. All irrigation main and lateral pipeline shall be Schedule 40 PVC unless otherwise approved by the City Engineer.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

LANDSCAPE IRRIGATION
TRENCHING DETAILS

Approved:

09-30-2023

City Engineer

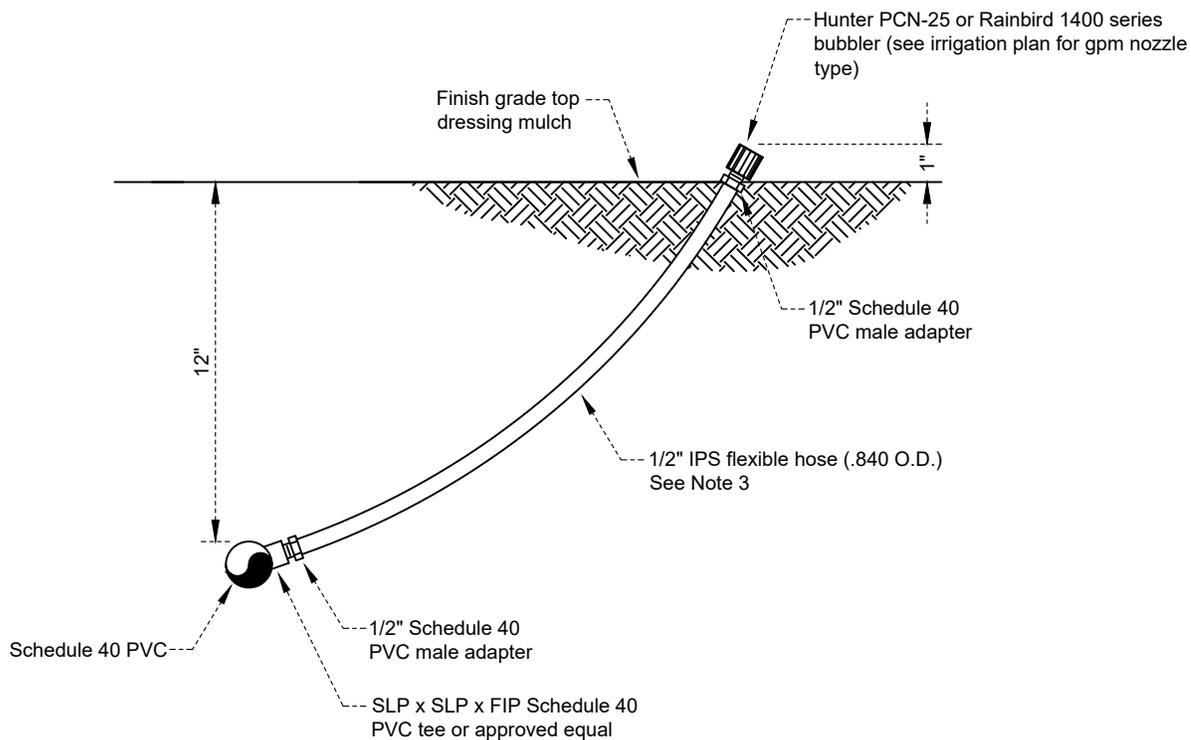
Date

Date: 09/2023

Dwg No.:

Scale: None

710.00



NOTES:

1. Bubbler shall have the following features:
 - Full circle (trickle pattern)
 - Pressure compensating between 20 & 90 psi
 - Low flow rates
 - No adjustment required
 - Inlet filter screen
 - Durable, non-corrosive plastic
2. Bubblers shall be installed 3" from the root ball on the uphill side.
3. Primer and solvent cement shall be of the correct type for the pipe being joined. Primer shall be used on all glued pipe joints.
4. All threaded joints shall have teflon tape applied.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SPRINKLER DETAIL (TYPE 1)

Approved:

09-30-2023

City Engineer

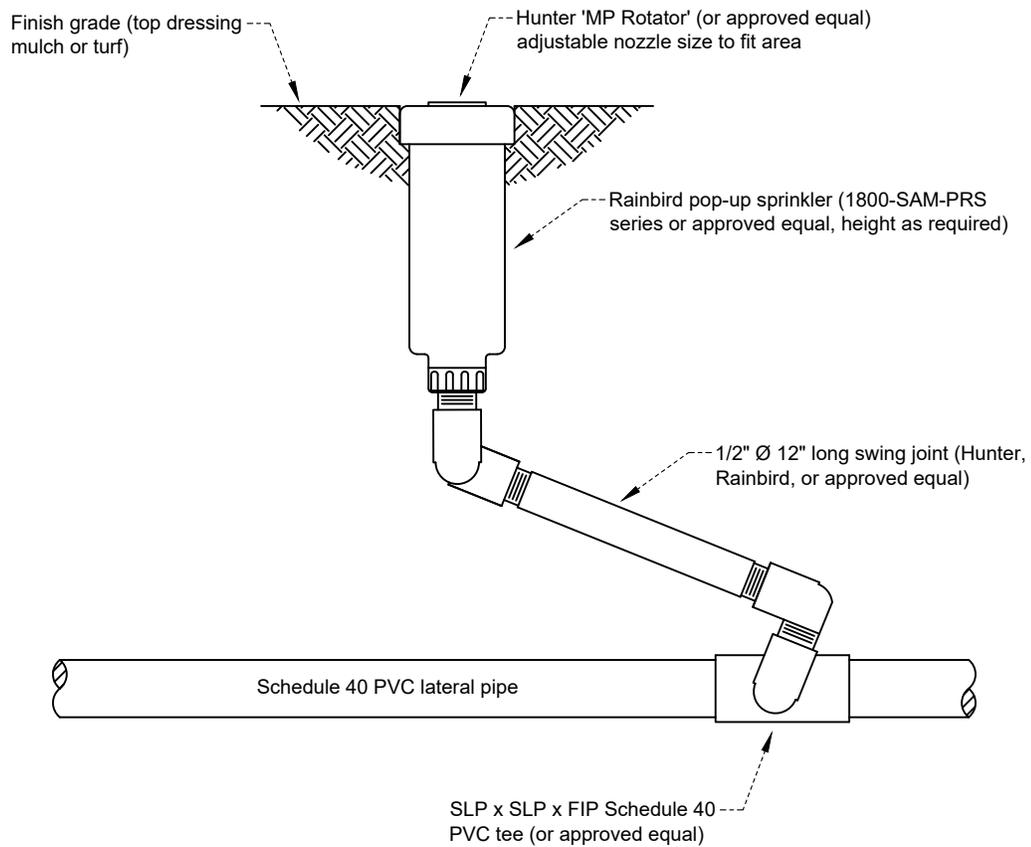
Date

Date: 09/2023

Dwg No.:

Scale: None

711.10



NOTES:

1. Pop-up sprinkler heads shall be located 1 1/2" away from walks, curbs, hardscaping, mowing strips, and header boards, and 12" away from structures & buildings.
2. Pop-up sprinkler head shall be perpendicular to grade.
3. All pop-up sprinkler heads shall have a built-in check valve to prevent low head drainage.
4. Top of the pop-up sprinkler head shall be flush with finish grade.
5. All threaded joints shall have teflon tape applied.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SPRINKLER DETAIL (TYPE 2)

Approved:

09-30-2023

City Engineer

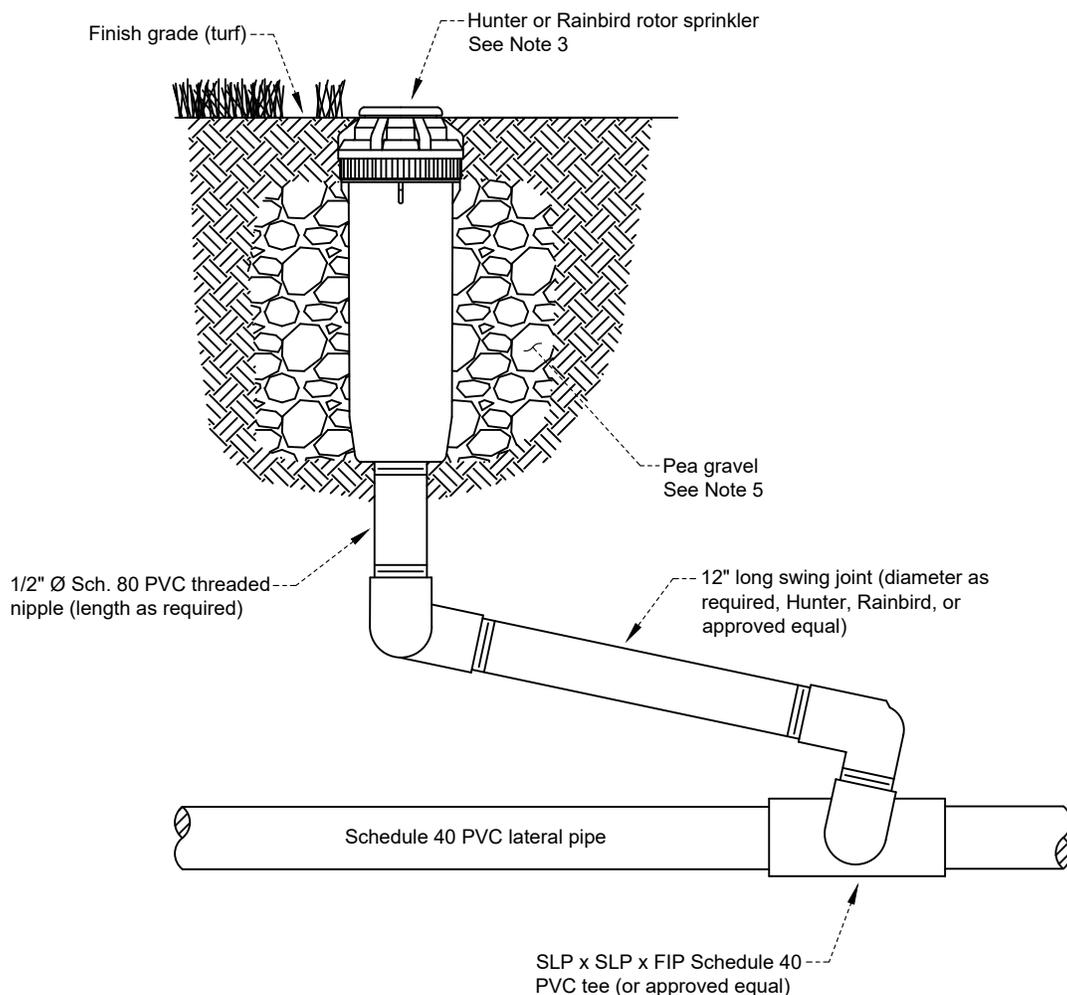
Date

Date: 09/2023

Dwg No.:

Scale: None

711.20



NOTES:

1. Rotor pop-up sprinkler heads shall be located 1 1/2" away from walks, curbs, hardscaping, mowing strips, and header boards, and 12" away from structures & buildings.
2. Rotor pop-up sprinkler head shall be perpendicular to grade.
3. All pop-up sprinkler heads shall have a built-in check valve to prevent low head drainage.
4. Top of the pop-up sprinkler head shall be flush with finish grade.
5. Install one cubic foot of pea gravel around the base of each rotor pop-up sprinkler.
6. All threaded joints shall have teflon tape applied.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SPRINKLER DETAIL (TYPE 3)

Approved:

09-30-2023

City Engineer

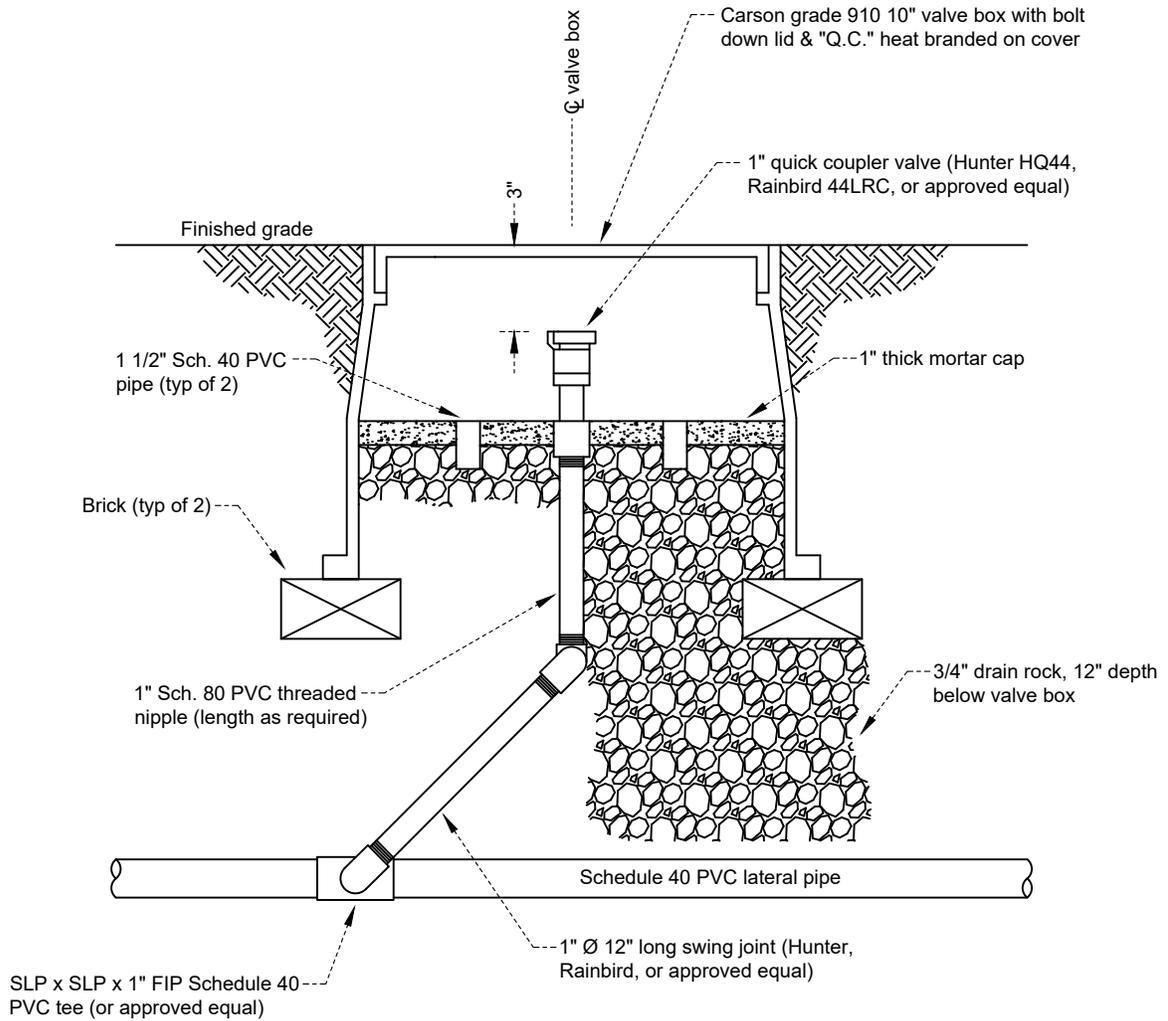
Date

Date: 09/2023

Dwg No.:

Scale: None

711.30



NOTES:

1. Valve box shall be set to finished grade. Valve box extensions shall be installed as required.
2. All threaded joints shall have teflon tape applied.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

QUICK COUPLER VALVE

Approved:

09-30-2023

City Engineer

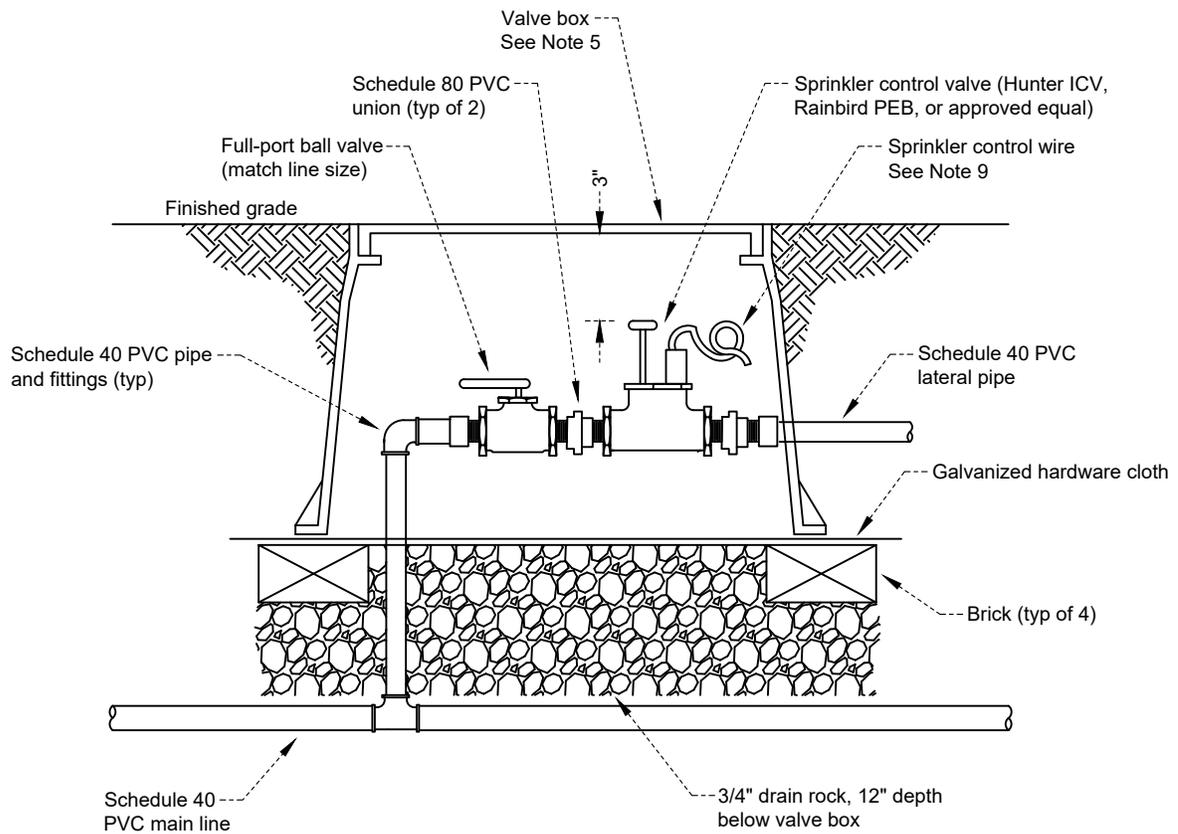
Date

Date: 09/2023

Dwg No.:

Scale: None

712.00



NOTES:

1. Control valves shall be limited to one per box and shall be located in shrub or ground cover areas whenever possible.
2. Multiple valves shall be grouped together, with a minimum of 6" separation between boxes.
3. Valve boxes shall not be installed within 12" of hardscape or structures, and shall be installed at 90° to hardscape or structures.
4. Valves shall be installed plumb in an upright position.
5. Valve box shall be green HDPE with bold down lid (Carson Model No. 1419 box with Carson Model No. 1419E lid or approved equal). Valve box extensions shall be installed as required.
6. No part of the valve box shall bear on any valve, piping, or appurtenances.
7. The valve designation (controller and station number) shall be tagged on each valve.
8. Main line shall be flushed prior to valve installation.
9. All wire splices shall be made with direct-bury splice kits (3M DBO/B-6 or approved equal). 36" of excess wire shall be looped into each controller valve box.
10. All threaded joints shall have teflon tape and teflon joint compound applied.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

IRRIGATION CONTROL VALVE

Approved:

09-30-2023

City Engineer

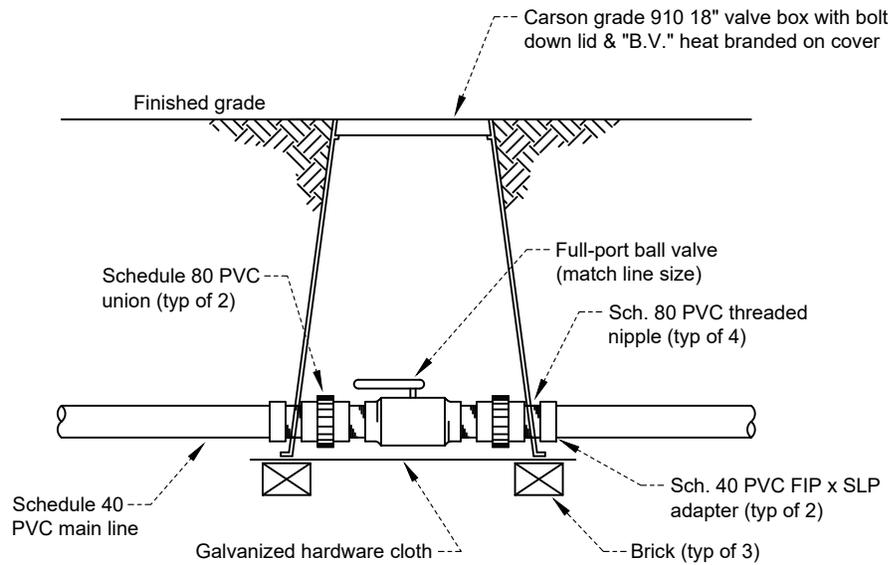
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Date: 09/2023

Dwg No.:

Scale: None

713.00



NOTES:

1. Ball valve shall be no-lead brass full-port with 1/4-turn handle. Ball may be stainless steel or chrome-plated brass.
2. All threaded joints shall have teflon tape and teflon joint compound applied.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

IRRIGATION BALL VALVE

Approved:

09-30-2023

City Engineer

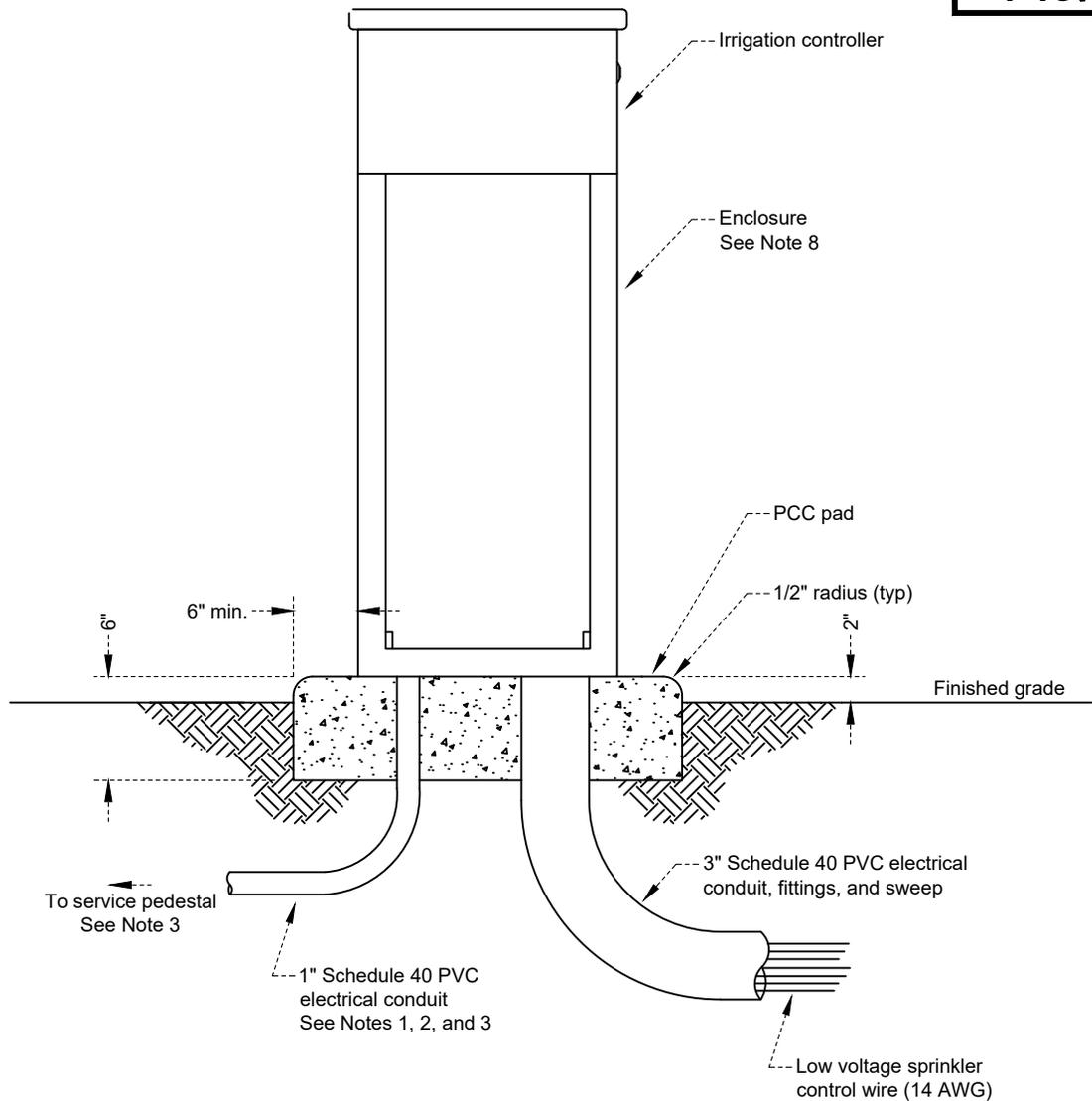
Date

Date: 09/2023

Dwg No.:

Scale: None

714.00



NOTES:

1. A permit from the City of Shasta Lake Building Department for electric service inspection shall be obtained prior to any electrical work.
2. The connection to the service pedestal shall be made by an appropriately licensed Contractor.
3. Service pedestal shall be per city of Shasta Lake Electrical Standards, Chapter 500.
4. Provide a 110V GFCI receptacle inside controller pedestal.
5. All sprinkler valve control wire(s) shall be housed in a Schedule 40 conduit sleeve under hard surfaces. Size shall be as required.
6. Extra control wire shall be bundled and taped at the bottom of the enclosure. 36" of excess wire shall be provided.
7. All splices shall be located in controller valve boxes.
8. Enclosure shall be Hunter (ICC OR ACC-SS), Rainbird (ESP-MC-SS), or approved equal. Install per manufacturer's specifications.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

IRRIGATION CONTROL ENCLOSURE

Approved:

09-30-2023

City Engineer

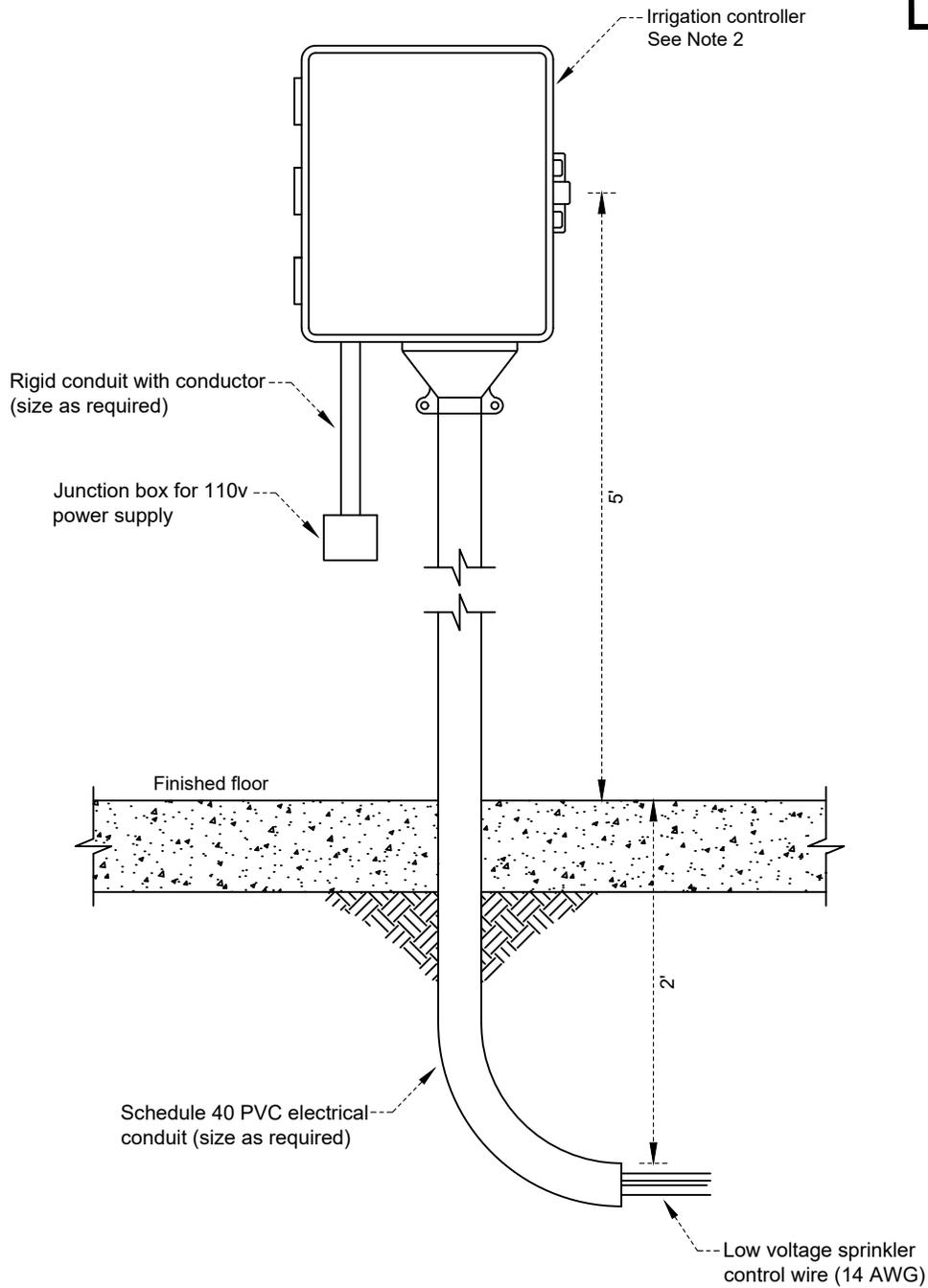
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Date: 09/2023

Dwg No.:

Scale: None

715.00



NOTES:

1. All electrical work shall conform to the Uniform Building Code.
2. Controller shall be mounted on a vertical wall in strict accordance with the manufacturer's mounting instructions and shall be on its own circuit breaker. Controller shall be Hunter ICC2, Hunter ACC2, or approved equal.
3. See irrigation plan for total number of stations required.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

INTERIOR IRRIGATION CONTROLLER

Approved:

09-30-2023

City Engineer

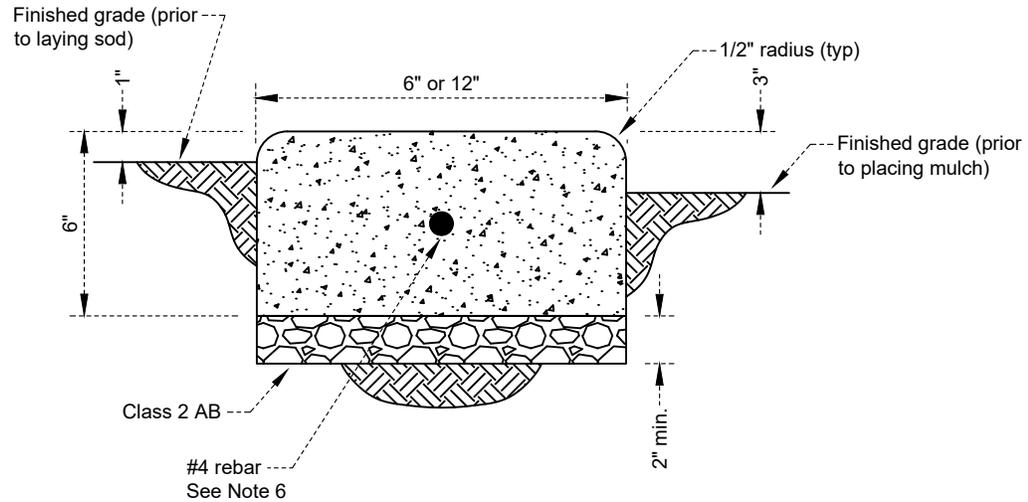
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Date: 09/2023

Dwg No.:

Scale: None

716.00



NOTES:

1. All materials shall conform to Page 100.00.
2. Subgrade shall be free of organic matter, large clay lumps, or stones larger than one inch, and shall be compacted to 95% relative density.
3. Forms shall be true to line and grade, and shall be adequately staked and braced to maintain a uniform line.
4. Install expansion joints in curb at 20' on center (maximum).
5. Install tooled scored joints at 10' on center or at changes of direction.
6. For 6" divider curb, install one continuous #4 rebar. For 12" divider curb, install two continuous #4 rebar. Lap all bars 18"
7. Broom finish shall be parallel with curb.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

CONCRETE LANDSCAPE DIVIDER CURB

Approved:

09-30-2023

City Engineer

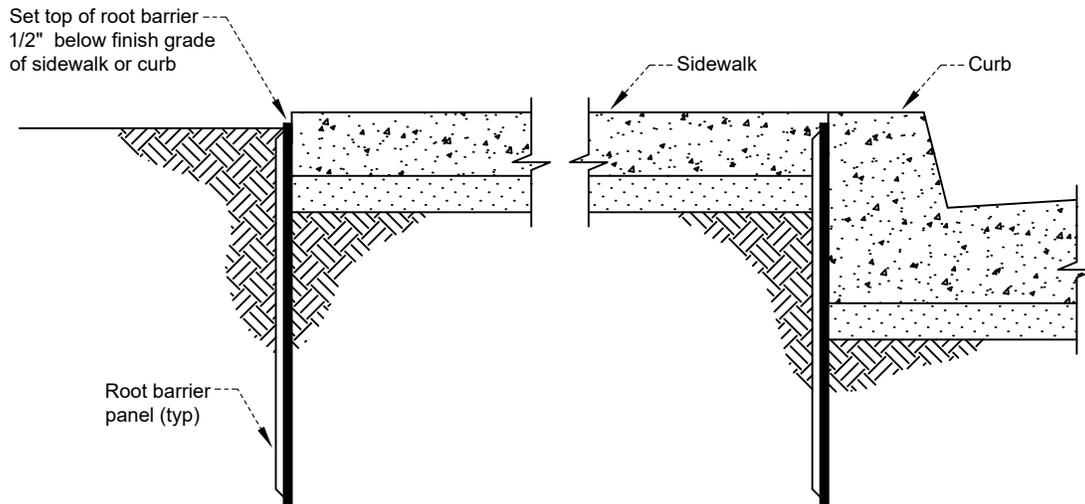
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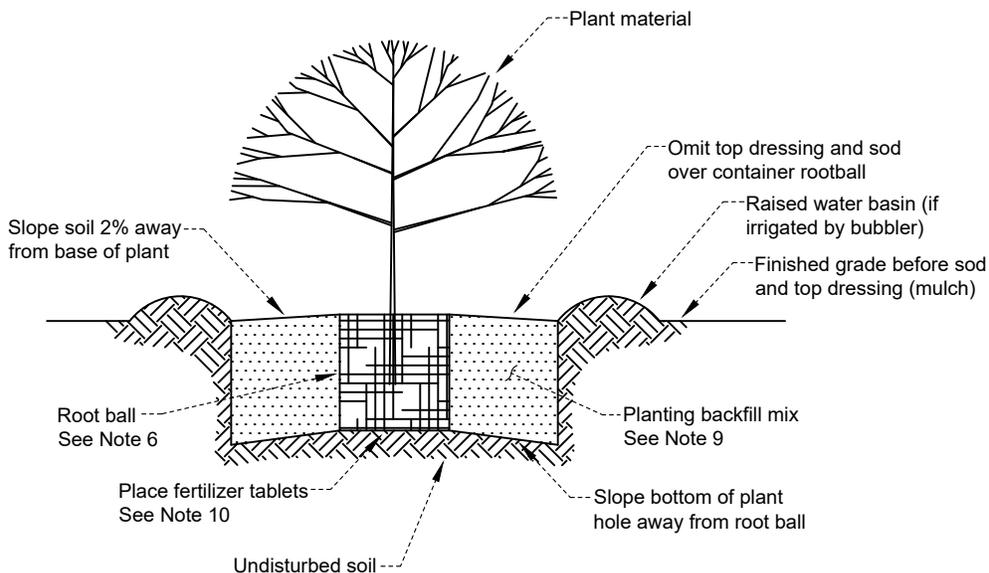
720.00



NOTES:

1. Root barriers shall be installed for all trees within four feet of any hard surface area, structures, or utility equipment
2. Install root deflecting ribs towards the tree roots.
3. Root barriers panels shall be NDS EP Series or approved equal.
4. Quantity of 18" high x 24" long panels required for linear application use:
 - 15 gal. & 24" box tree - 5 panels
 - 36"-42" box tree - 7 panels
 - 48"-72" box tree - 10 panels

				CITY OF SHASTA LAKE		Approved: 	
				Public Works Department		09-30-2023	
				STANDARD DRAWING		City Engineer _____ Date	
				TREE ROOT BARRIER		Date: 09/2023 Dwg No.:	
						Scale: None 721.00	
REVISION	BY	APPROVED	DATE				



NOTES:

1. All plant materials shall comply with all Federal, State, and County regulations requiring inspection for plant diseases and pest infestations. Inspection certificates required by law shall accompany each shipment of material.
2. Planting shall be performed only when weather and soil conditions are determined to be suitable by the Engineer.
3. Prior to planting, all planted areas shall provide positive drainage with no standing water.
4. If glazing occurs during excavation, scarify vertical sides of planting hole.
5. All plants that settle shall be raised to the correct finish grade level.
6. The top of the root ball shall be one inch above the surrounding soil to avoid water accumulation at the crown. Backfill shall be placed around the crown of the root ball to cover exposed surfaces.
7. The bottom and sides of the exposed root ball shall be loosened, and any circling roots shall be unwound.
8. Plant material shall be located and installed on the site per the planting plan. The Contractor shall provide aesthetic placement of plant materials. There shall be no plant placement tolerances.
9. Planting mix backfill shall consist of 80% native soil with 20% approved topsoil or 20% organic soil amendment. No rock over 1" diameter shall be present. Organic soil amendment shall be slowly decomposing by nature.
10. Fertilizer tablets shall have a guaranteed analysis of 20-10-5 (N-P-K), and shall be installed per the manufacturer's application rates and specifications.
11. Plant material shall be approved by the City Engineer prior to it being planted on the site.
12. Planting holes shall be circular and equal to the depth and three times the width of the plant container.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

TREE AND SHRUB PLANTING

Approved:

09-30-2023

City Engineer

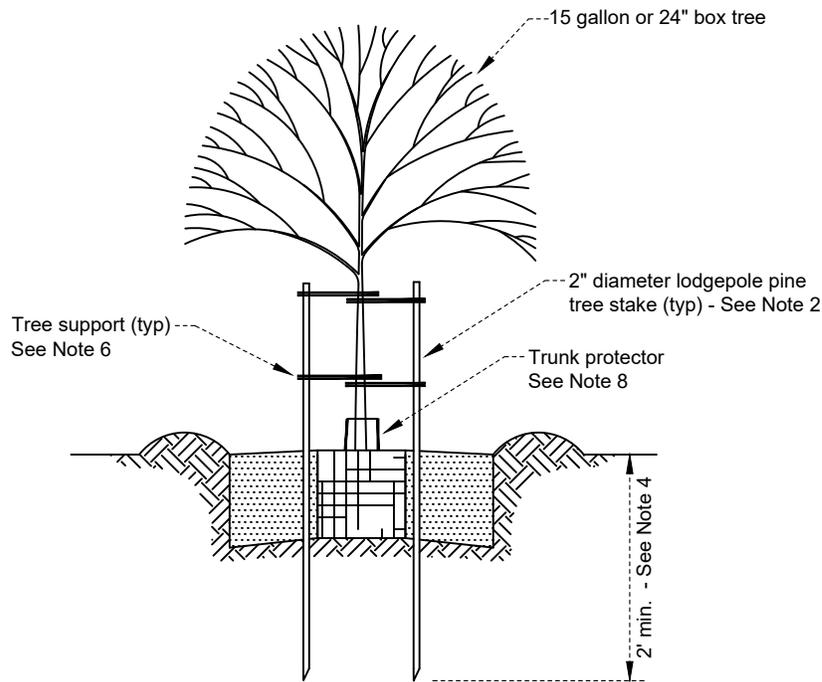
Date

Date: 09/2023

Dwg No.:

Scale: None

722.10



NOTES:

1. Tree staking shall be completed the same day as the tree planting.
2. Stakes shall be 8' in height for 15 gallon trees, or 10' in height for a 24" box trees.
3. Stakes and trees shall be aligned in an east/west direction.
4. Stakes shall be spaced evenly and vertically on the outside of the tree root ball and driven firmly into undisturbed soil. Stakes shall be driven at an angle and drawn to vertical. Stakes shall not be driven through the root ball.
5. Nursery stakes shall be removed at time of installation.
6. Trees shall be double staked and supported with four cinch-tie tree supports. Wrap supports around the tree trunk and the stake twisting to form a figure eight. Secure with a galvanized screw driven through the support and into the stake to prevent slippage.
7. Trees branching three feet or more above ground level shall have their trunks painted with light gray interior latex paint.
8. Trees in lawn areas shall have a plastic trunk guard installed at ground level.
9. Trees shall be staked to keep them in an upright position and hold them erect, while allowing the tops and trunks to flex with the wind. Tree trunks and lateral branches shall be protected from abrasion from stakes and ties.
10. Finished grade shall be sloped away from the tree trunk a minimum of 2' diameter at 3%.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

TREE STAKING

Approved:

09-30-2023

City Engineer

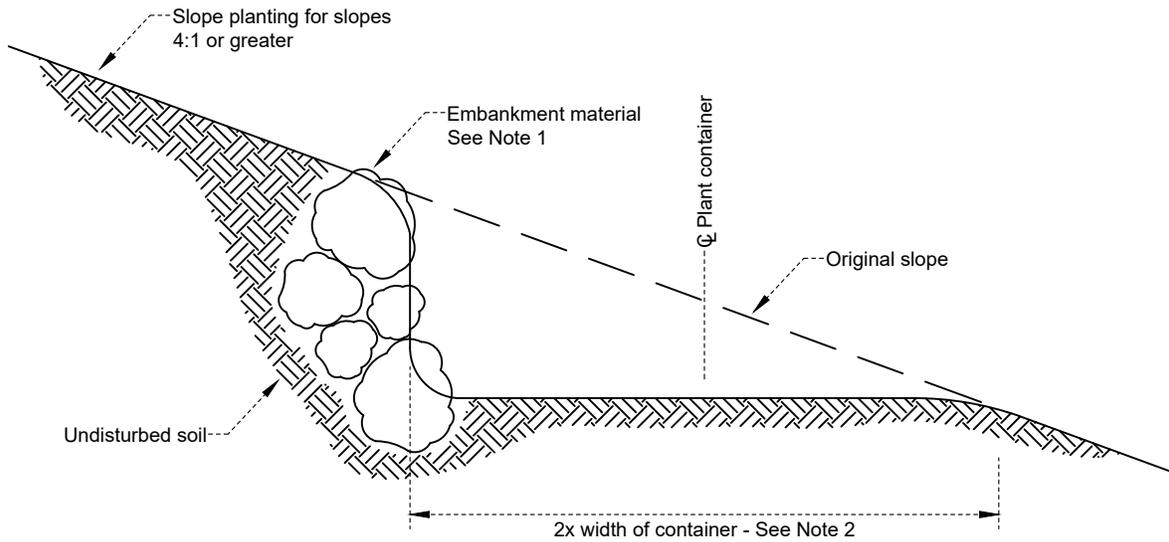
Date

Date: 09/2023

Dwg No.:

Scale: None

722.20



NOTES:

1. Acceptable embankment retaining material shall be concrete block, boulders / large rocks, or plastic recycled header.
2. Planting shall be in accordance with Pages 722.10 and 722.20, excepting Note 11 on Page 722.10 shall read, "Planting holes shall be circular and equal to the depth and two (2) times the width of the plant container."

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SLOPE PLANTING

Approved:

09-30-2023

City Engineer

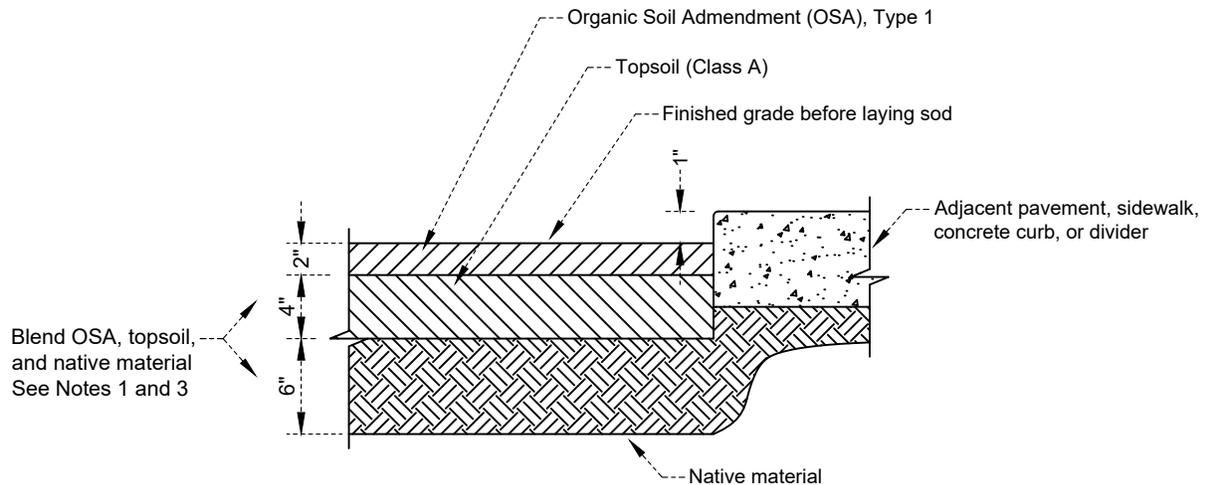
Date

Date: 09/2023

Dwg No.:

Scale: None

725.00



NOTES:

1. All rocks larger than 1" in diameter shall be removed from the top 6".
2. The Contractor shall dispose of all rocks larger than 1" and other extraneous materials generated from soil preparation operations.
3. After blending soils, all sod areas shall receive 20 pounds of 6-20-20 with 10 percent sulphur fertilizer and 10 pounds of 5-2-4 with 10% humic acid fertilizer per 1000 square foot, rototilled into the top 6 inches of the mixed soil.
4. The finished grade for sod areas shall be approved by the City Engineer prior to laying sod.
5. All sod areas shall have a minimum slope of 2%.
6. Sod shall be field-grown in the Sacramento/San Joaquin valley.
7. Sod type shall be as specified on the drawings.
8. Sod shall be strongly rooted and free of weeds, native grasses, & insect pests.
9. Sod blend shall have a 5/8" minimum thickness with a 2" minimum top growth.

REVISION	BY	APPROVED	DATE

CITY OF SHASTA LAKE

Public Works Department

STANDARD DRAWING

SOD PLANTING

Approved:

09-30-2023

City Engineer

Date

Date: 09/2023

Dwg No.:

Scale: None

726.00

WATER POLLUTION CONTROL

Water pollution control requirements vary by project size as follows:

1. Projects with less than 1 acre of ground disturbance

Prior to any construction activity, a water pollution control plan (WPCP) shall be submitted and approved by the City. The WPCP shall address both temporary and permanent erosion control Best Management Practices (BMPs) for storm water and non-storm water discharges associated with construction activities. Approval of the WPCP shall not relieve the Project Owner or the Contractor of any liability for violations of State or Federal law relating to water pollution. Copies of the WPCP shall be kept at the project site and it shall be available during construction.

The Project Owner and the Contractor shall know and fully comply with applicable provisions of all Federal, State, and local regulations and requirements that govern the Contractor's operations and storm water and non-storm water discharges from both the project site and areas of disturbance outside the project limits during construction.

The WPCP shall address storm water and non-storm water discharges from areas in the vicinity of the project site which are directly related to construction activities including, but not limited to, material borrow/stockpile areas, staging areas, storage yards and access roads. The Contractor shall implement, inspect, and maintain the required water pollution control practices.

The Project Owner shall be responsible for penalties assessed or levied on the Project Owner, Contractor, or the City of Shasta Lake as a result of the Contractor's failure to comply with the provisions in this section including, but not limited to, compliance with the applicable provisions of Federal, State, and local regulations and requirements as set forth therein.

Penalties as used in this section shall include fines, penalties, and damages, whether proposed, assessed, or levied against the City, Project Owner, or the Contractor, including those levied under the Federal Clean Water Act, State Fish and Wildlife Code, and the State Porter-Cologne Water Quality Control Act, by governmental agencies or as a result of citizen suits. Penalties shall also include payments made or costs incurred due to stop work orders, work suspension, and/or Contractor delays or in settlement for alleged violations of applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, due to agency or City-imposed mitigation or to remediate or correct violations, or damages resulting from stop work orders or work suspension.

The Contractor shall notify the City immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or the Contractor's records pertaining to water pollution control work. The Contractor and Project Owner shall provide copies of correspondence, notices of violation, enforcement actions or proposed fines by regulatory agencies to the City.

A. Water Pollution Control Plan preparation and approval

The WPCP shall address storm water run-off and run-on for all disturbed and affected areas of construction, including temporary and permanent measures. The requirements described herein are considered minimum requirements to satisfy the City of Shasta Lake erosion control standards. All BMPs shall be designed, installed, maintained, and otherwise managed pursuant to the provisions set forth in the most current versions of either the Caltrans Stormwater Quality Handbook (latest revision), Caltrans Construction Site BMP Manual (latest revision), or the California Stormwater Quality Association (CASQA), California Stormwater BMP Handbook for Construction (latest revision). The Contractor may recommend equivalent erosion control applications that provide equal or better performance for consideration and approval by the City.

The WPCP shall be prepared by a registered civil engineer experienced in erosion control, a qualified SWPPP Developer, or a Certified Professional Erosion and Sediment Control specialist, unless otherwise approved by the City. Implementation, monitoring, and maintenance of BMPs shall be by or under the supervision of same. The WPCP should be commensurate with the size, duration, timing, location, and overall scope of the project.

The WPCP shall incorporate water pollution control practices in the following categories:

1. Soil stabilization.
2. Sediment control.
3. Wind erosion control.
4. Tracking control.
5. Non-storm water management.
6. Waste management and materials pollution control.

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REVISION	BY	APPROVED	DATE			Scale: None 800.01	

WATER POLLUTION CONTROL (continued)

A. Water Pollution Control Plan preparation and approval (continued)

A water pollution control schedule shall be developed that describes the timing of grading or other work activities that could affect water pollution. The water pollution control schedule shall be updated as necessary to reflect changes in the Contractor's operations that would affect the implementation of water pollution control practices.

The Contractor shall prepare an amendment to the WPCP such as when there is a substantial change in construction activities or operations which may affect the discharge of pollutants to surface waters, ground waters, or storm drain systems; when there is a change in the schedule that affects the discharge of pollutants; or when directed by the City. Amendments shall identify additional water pollution control practices or revised operations, including those areas or operations not identified in the initially approved WPCP. Amendments to the WPCP shall be prepared and submitted for review and approval within the time approved by the City.

B. WPCP implementation

Unless otherwise specified, upon approval of the WPCP, the Project Owner shall be responsible throughout the duration of the project for installing, constructing, inspecting, maintaining, replacing, removing, and disposing of temporary water pollution control practices, and installing, constructing, inspecting, maintaining, and replacing permanent water pollution control practices specified in the WPCP and in the amendments.

If a deficiency is identified in the implementation of the approved WPCP or amendments, the deficiency shall be corrected immediately unless approved by the City in writing but shall be corrected prior to the onset of precipitation. If the identified deficiency is not corrected by the date agreed or prior to the onset of precipitation, the project shall be in nonconformance and subject to penalties.

If the project does not conform to the provisions of this section, the City may order the suspension of construction operations until the project is brought into compliance with this section.

C. Year-round implementation requirements

A year-round program shall be in place for implementing, inspecting, and maintaining water pollution control practices for soil stabilization, sediment control, wind erosion control, tracking control, non-storm water management, and waste management and materials pollution control.

The National Weather Service weather forecast (www.weather.gov) shall be monitored and used by the Contractor on a daily basis. If 50% or greater precipitation is predicted, the necessary water pollution control practices shall be deployed prior to the onset of the precipitation. If there is less than a 50% chance of precipitation, the Contractor or owner shall still be responsible for ensuring the project site does not result in a discharge of pollutants off-site. Regardless of the chances of precipitation, the Contractor shall allow adequate time to properly install all required BMPs prior to precipitation disturbed soil areas shall be considered active whenever the soil disturbing activities have occurred, continue to occur, or will occur during the ensuing 14 days. Non-active areas shall be stabilized with water pollution control practices within 14 days of cessation of soil disturbing activities or prior to the onset of precipitation, whichever occurs first.

D. Maintenance

To ensure the proper implementation and functioning of water pollution control practices, all water pollution control practices identified in the WPCP shall be inspected and maintained regularly. The construction site shall be inspected as follows:

1. Prior to a forecast storm.
2. After a precipitation event which causes site runoff.
3. At 24-hour intervals during extended precipitation events.
4. Routinely, a minimum of once every two weeks.

A storm water quality construction site inspection checklist shall be used as approved by the City. One copy of each site inspection record shall be submitted to the City within 48 hours of completing the inspection.

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WATER POLLUTION CONTROL (continued)

E. Report of discharges, notices, or orders

If a discharge from the project site occurs, regardless of source, in a manner causing, or potentially causing, a condition of pollution in surface waters or drainage systems, the Contractor shall immediately inform the City. In addition, the Contractor shall submit a written Notice of Discharge report to the City within 24 hours of the discharge event. The report shall include the following information:

1. The date, time, location, nature of the operation, and type of discharge, including the cause or nature of the notice or order.
2. The water pollution control practices deployed before the discharge event.
3. The date of deployment and type of water pollution control practices deployed after the discharge event, including additional measures installed or planned to remediate and clean-up the discharge, and/or reduce or prevent reoccurrence.
4. An implementation and maintenance schedule for affected water pollution control practices.

F. Report of first-time non-storm water discharge

The City shall be notified at least 3 days in advance of first-time non-storm water discharge events such as pipeline dewatering and shall give approval for the discharge to the Contractor prior to the discharge starting. Non-storm water discharges shall be monitored at first-time occurrences and routinely thereafter.

If a written notice, order, or other non-compliance action letter is received from a regulatory agency as a result of storm water or other discharges from the project site, the City shall be notified immediately. The Project Owner and/or Contractor shall be solely responsible for responding to and complying with the notice, order, or action letter, unless otherwise directed by the City.

2. Projects with 1 acre or more of ground disturbance

Prior to any construction activity, the project applicant shall prepare, submit, and obtain approval of a storm water pollution prevention plan (SWPPP) in accordance with the NPDES General Construction Permit (latest revision) for storm water and non-storm water discharges associated with construction activities. Prior to ground disturbance, the SWPPP shall be approved by the City and a WDID number obtained from the State. Approval does not relieve the Project Owner or Contractor of any liability for violations of state or federal law relating to water pollution.

The NPDES permit that regulates this project, as referenced above, is hereafter collectively referred to as the Permit.

The project shall conform to the Permit and modifications thereto. Copies of the Permit and the SWPPP shall be kept at the project site and shall be available at all times. The Project Owner and Contractor shall know and fully comply with applicable provisions of the Permit and all modifications thereto, and Federal, State, and local regulations and requirements that govern the Contractor's operations and storm water and non-storm water discharges from both the project site and areas of disturbance outside the project limits during construction.

The Permit shall apply to storm water and certain permitted non-storm water discharges from areas outside the project site which are directly related to construction activities including, but not limited to, material borrow/storage areas, staging areas, storage yards and access roads. The Contractor shall comply with the Permit for those areas and shall implement, inspect, and maintain the required water pollution control practices.

The Project Owner shall be responsible for penalties assessed or levied on the Project Owner, Contractor, or the City of Shasta Lake as a result of the Contractor's failure to comply with the provisions in this section including, but not limited to, compliance with the applicable provisions of the Permit, and Federal, State, and local regulations and requirements as set forth therein.

Penalties as used in this section shall include fines, penalties, and damages, whether proposed, assessed, or levied against the City of Shasta Lake, Project Owner, or the Contractor, including those levied under the Federal Clean Water Act, State Fish and Wildlife Code, and the State Porter-Cologne Water Quality Control Act, by governmental agencies or as a result of citizen suits. Penalties shall also include payments made or costs incurred due to stop work orders, work suspension, and/or Contractor delays or in settlement for alleged violations of the permit, or applicable laws, regulations, or requirements. Costs incurred could include sums spent instead of penalties, due to agency or City-imposed mitigation or to remediate or correct violations, or damages resulting from stop work orders, or work suspension.

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WATER POLLUTION CONTROL (continued)

2. Projects with 1 acre or more of ground disturbance (continued)

The Contractor shall notify the City immediately upon request from the regulatory agencies to enter, inspect, sample, monitor, or otherwise access the project site or the Contractor's records pertaining to water pollution control work. The Contractor and Project Owner shall provide copies of correspondence, notices of violation, enforcement actions or proposed fines by regulatory agencies to the City.

A. Storm water pollution prevention plan preparation, approval, and amendments

The requirements described herein are considered minimum requirements to satisfy the City of Shasta Lake erosion control standards. No ground disturbing work shall be performed until a SWPPP has been approved by the City and a waste discharge identification number (WDID) for the project has been assigned by the State. The SWPPP submittal to the City shall contain all Permit Registration Documents (PRD) as required by the Permit, including the draft Notice of Intent (NOI), risk assessment, site map, SWPPP schedule, and signed certification statements. SWPPP approval by the City shall not constitute a finding that the SWPPP complies with applicable requirements of the Permit and applicable Federal, State, and local laws, regulations, permits, and requirements, nor does approval supercede the requirements and provisions of the Permit, or any other Federal, State, or local regulations or permit in the event of a conflict.

The SWPPP shall address storm water run-off and run-on for all disturbed and affected areas of construction, including temporary and permanent measures. The SWPPP shall identify the Qualified SWPPP Practitioner (QSP) and the Qualified SWPPP Developer (QSD) as required by the Permit. The Project Owner shall be identified as the legally responsible person (LRP).

Upon approval by the City, the Project Owner shall submit the PRD electronically to the State Water Resources Control Board website, entitled Stormwater Multi-Application Reporting and Tracking System (SMARTS). The Project Owner is also responsible for submitting the appropriate fee to the State and obtaining a certified NOI WDID for the project. No ground disturbing work shall occur until the PRD has been uploaded to the SMARTS website and a WDID has been assigned to the project.

All BMPs shall be designed, installed, maintained, and otherwise managed pursuant to the provisions set forth in the Caltrans Stormwater Quality Handbook, Construction Site BMP Manual (latest revision) or the California Stormwater Quality Association (CASQA), California Stormwater BMP Handbook for Construction (latest revision). Equivalent erosion control applications that provide equal or better performance may also be proposed for consideration and approval by the City.

The SWPPP shall incorporate water pollution control practices in the following categories:

1. Soil stabilization.
2. Sediment control.
3. Wind erosion control.
4. Tracking control.
5. Non-storm water management.
6. Waste management and materials pollution control.

A water pollution control schedule shall be developed that describes the timing of grading or other work activities that could affect water pollution. The water pollution control schedule shall be updated, as necessary, to reflect changes in the Contractor's operations that would affect implementation of water pollution control practices. Copies of all updates shall be kept with the SWPPP at the project site.

An amendment to the SWPPP shall be prepared, as required by the Permit, such as when there is a substantial change in construction activities or operations which may affect the discharge of pollutants to surface waters, ground waters, storm drain systems; when the Contractor's activities or operations violate a condition of the permit; when there is a change in the schedule that affects the discharge of pollutants; when there is a change in the schedule that affects the risk level required by the permit; or when directed by the City. Amendments shall identify additional water pollution control practices or revised operations, including those areas or operations not identified in the initially approved SWPPP. Amendments to the SWPPP shall be prepared and submitted for review and approval by the City within the time required by the Permit.

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					Scale: None
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WATER POLLUTION CONTROL (continued)

2. Projects with 1 acre or more of ground disturbance (continued)

B. SWPPP implementation

Unless otherwise specified, upon approval of the SWPPP, the Project Owner will be responsible throughout the duration of the project for installing, constructing, inspecting, maintaining, replacing, removing, and disposing of temporary water pollution control practices, and installing, constructing, inspecting, maintaining, and replacing permanent water pollution control practices specified in the SWPPP and in the amendments. All documentation, inspections, and reports, including the annual report, shall be the responsibility of the Project Owner.

If a deficiency is identified in the implementation of the approved SWPPP or amendments, the deficiency shall be corrected immediately unless requested by the Contractor and approved by the City in writing but shall be corrected prior to the onset of precipitation. If the identified deficiency is not corrected by the date agreed or prior to the onset of precipitation, the project shall be in nonconformance with this section and subject to penalties.

If the project does not conform to the provisions of this section, the City may order the suspension of construction operations until the project is brought into compliance with this section.

C. Year-round implementation requirements

A year-round program shall be in place for implementing, inspecting and maintaining water pollution control practices for soil stabilization, sediment control, wind erosion control, tracking control, non-storm water management, and waste management and materials pollution control.

The National Weather Service weather forecast (www.weather.gov) shall be monitored and used by the Contractor on a daily basis. These standards require that if 50% or greater precipitation is predicted, the necessary water pollution control practices shall be deployed prior to the onset of the precipitation. If there is less than a 50% chance of precipitation, the Contractor or owner shall still be responsible for ensuring the project site does not result in a discharge of pollutants off-site. Regardless of the chances of precipitation, the Contractor shall allow adequate time to properly install all required BMPs prior to precipitation.

Disturbed soil areas shall be considered active whenever the soil disturbing activities have occurred, continue to occur, or will occur during the ensuing 14 days. Non-active areas shall be stabilized with water pollution control practices within 14 days of cessation of soil disturbing activities or prior to the onset of precipitation, whichever occurs first.

D. Maintenance

To ensure the proper implementation and function of water pollution control practices, all BMPs shall be inspected and maintained regularly. The construction site shall be inspected as follows:

1. Prior to a forecast storm.
2. After a precipitation event which causes site runoff.
3. At 24 hour intervals during extended precipitation events.
4. Routinely, a minimum of once every week.
5. Quarterly, as required by the permit.

A storm water quality construction site inspection checklist shall be used as approved by the City. One copy of each site inspection record shall be submitted to the City within 48 hours of completing the inspection.

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WATER POLLUTION CONTROL (continued)

2. Projects with 1 acre or more of ground disturbance (continued)

E. Report of discharges, notices, or orders

If discharges from the project site are identified, regardless of source, in a manner causing, or potentially causing, a condition of pollution in surface waters or drainage systems, the Contractor shall immediately inform the City. In addition, the Contractor shall submit a written notice of discharge report to the City within 24 hours of the discharge event. The report shall include the following information:

1. The date, time, location, nature of the operation, and type of discharge, including the cause or nature of the notice or order.
2. The water pollution control practices deployed before the discharge event.
3. The date of deployment and type of water pollution control practices deployed after the discharge event, including additional measures installed or planned to remediate and clean-up the discharge, and/or reduce or prevent reoccurrence.
4. An implementation and maintenance schedule for affected water pollution control practices.

F. Report of first -time non-storm water discharge

The City shall be notified at least 3 days in advance of first-time non-storm water discharge events such as pipeline dewatering and shall give approval for the discharge to the Contractor prior to the discharge starting. Non-storm water discharges shall be monitored at first-time occurrences and routinely thereafter.

If a written notice, order, or other non-compliance action letter from a regulatory agency is received as a result of storm water or other discharges from the project site, the City shall be notified immediately. The Project Owner and/or Contractor shall be solely responsible for responding to and complying with the notice, order, or action letter, unless otherwise directed by the City.

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EROSION CONTROL

Erosion control consists of applying erosion control materials to the areas shown on the Plans, embankment, excavation slopes and other areas disturbed by construction activities, and as shown on the Water Pollution Control Plan or the SWPPP.

Erosion control shall be placed between September 1 and March 15. Areas completed and ready for application of erosion control outside of these dates shall be temporarily stabilized until the acceptable window begins, or as directed by the City. Areas may be temporarily stabilized using soil binders, temporary seed and straw, or just straw, or as approved by the City. Prior to application of permanent seed, areas temporarily stabilized using soil binders shall be scarified by track walking or other means to break up crusted soils. If areas were temporarily stabilized using seed and/or straw, any thick vegetation and straw shall be removed or incorporated into the soil as necessary to allow proper and effective application of permanent seed and mulch.

Erosion control materials shall consist of seed, fertilizer, straw, fiber, and stabilizing emulsion.

1. Seed

Seed for erosion control work shall consist of the following:

A. Temporary - Seed for temporary erosion control work shall consist of the following mix:

<u>Species</u>	<u>Lbs. PLS per Acre</u>
Hordeum Vulgare	250

B. Permanent - Seed for permanent erosion control work shall consist of the following mix:

<u>Species</u>	<u>Lbs. PLS per Acre</u>
Achillea Millefolium	2
Bromus Carinatus	15
Eschscholzia Californica	3
Trifolium Willdenovii	5
Vuplia Microstachys	5
<u>Hordeum Vulgare</u>	<u>100</u>
Total	130

Seed is required to be labeled under the California Food and Agricultural Code and shall be labeled by the vendors supplying the seed. Seed shall have been tested for purity and germination not more than 12 months prior to the application of the seed. Seed labels furnished by the vendors shall indicate the purity, germination, and pure live seed (PLS) as determined by testing. Results from testing the seed for purity and germination shall be furnished to the City prior to applying seed. Seed shall be delivered to the job site in unopened separate containers with the seed tag attached. Containers without a seed tag will not be accepted.

2. Fertilizer

Fertilizer shall consist of a natural based product with a slow release formulation of 7-2-3 (N-P-K), 10 percent sulfur is optional, or as approved by the City. Fertilizer for erosion control work shall conform to the requirements of the California Food and Agricultural Code, shall be in pelleted or granular form for hydroseeding, and shall have a minimum guaranteed chemical analysis of 7 percent nitrogen, 2 percent phosphoric acid, 3 percent water soluble potash, and 10 percent sulfur. Fertilizer shall be a formulation suitable for hydroseeding purposes and soluble in water.

3. Straw

Straw for erosion control work shall be sterile upland straw, dry oat, wheat, or rice straw, free from weeds and foreign matter detrimental to plant life. Evidence shall be furnished that clearance has been obtained from the Shasta County Agricultural Commissioner, as required by law, before straw obtained from outside Shasta County is delivered to the worksite. Straw that has been used for stable bedding shall not be

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EROSION CONTROL (continued)

4. Fiber

Fiber shall be wood fiber, cellulose fiber, alternate fiber, or a combination of these fibers. Wood fiber shall be a long strand, whole wood fiber thermomechanically processed from clean whole wood chips. Cellulose fiber shall be made from natural or recycled pulp fiber, such as wood chips, sawdust, newsprint, chipboard, corrugated cardboard, or a combination of these materials. Alternate fiber must be a long strand, whole natural fiber made from clean straw, cotton, corn, or other natural feed stock.

Fiber shall :

- A. Disperse into a uniform slurry when mixed with water.
- B. Contain 3/8" fiber strands for at least 25% by total volume.
- C. Have at least 40 percent retained when passed through a No. 25 sieve.
- D. Have an initial moisture content of no more than 15% of its dry weight when tested under CA Test 226. The moisture content must be marked on the packaging.
- E. Have a water holding capacity, by weight, of at least 1,200% when tested under ASTM D7367.
- F. Be nontoxic to plants and animal life.
- G. Be free of synthetic or plastic materials, lead paint, printing ink, varnish, petroleum products, seed germination inhibitors, and chlorine bleach.
- H. Contain less than 250 ppm of boron.
- I. Be colored to contrast with the area on which the fiber is to be applied. The coloring agent shall be biodegradable, nontoxic, and free from copper, mercury, and arsenic and must not stain concrete or painted surfaces.

Fiber for temporary hydraulic mulch must be at least 50 percent wood fiber. The remaining percentage must be cellulose fiber, alternate fiber, or a combination.

5. Tackifier

Tackifier shall be free from growth or germination inhibiting factors, nonflammable, nontoxic to aquatic organisms, and functional for a minimum of 180 days.

General purpose tackifier may be either a plant-based product or a polymeric emulsion blend as follows:

- A. Plant based tackifier must be a natural high molecular weight polysaccharide, a high viscosity hydrocolloid that is miscible in water, and labeled as either guar, psyllium, or starch, as follows:
 - 1. Guar gum based product must be derived from the ground endosperm of the guar plant, cyanmopsis tetragonolobus. It must be treated with dispersing agents for easy mixing. It must be able to be diluted at the rate of 1 to 5 pounds per 100 gallons of water.
 - 2. Psyllium based product must be manufactured from the finely ground, muciloid coating of plantago ovata or plantago ispaghula seeds and able to dry and form a firm but rewettable membrane.
 - 3. Starch based product must be a nonionic, water-soluble, granular material derived from corn, potato, or other plant -based source.
- B. Polymeric emulsion blend tackifier must be a prepackaged liquid or dry powder, anionic formulation with a residual monomer content not exceeding 0.05 percent by weight. The tackifier must contain and be labeled with one of the following as the primary active ingredients:
 - 1. Acrylic copolymers and polymers.
 - 2. Polymers of methacrylates and acrylates.
 - 3. Copolymers of sodium acrylates and acrylamides.
 - 4. Polyacrylamide and copolymer of acrylamide.
 - 5. Hydrocolloid polymers.

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SEQUENCE OF APPLICATION

Erosion control materials shall be applied in separate applications in the following sequence:

1. The following seed and fertilizer mixture shall be applied with hydro-seeding equipment within 30 minutes after the seed has been added to the mixture:

<u>Material</u>	<u>Temp. Lbs.per Acre (Min.)</u>	<u>Perm Lbs. per Acre (Min.)</u>
Seed	250	130
Commercial Fertilizer	600	600
Fiber	200	200

2. Straw shall be applied at the rate of 2 tons per acre, or 2.5 tons per acre for slopes greater than or equal to 4% slope. Straw shall be distributed evenly without clumping or piling. When weather conditions are suitable straw may be pneumatically spread.

3. The following mixture in the rates indicated shall be applied with hydro-seeding equipment:

<u>Material</u>	<u>Temp. Lbs.per Acre (Min.)</u>	<u>Perm Lbs. per Acre (Min.)</u>
Fiber	500	500
Tackifier	150	150

The ratio of total water to total tackifier in the mixture shall be as recommended by the manufacturer.

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