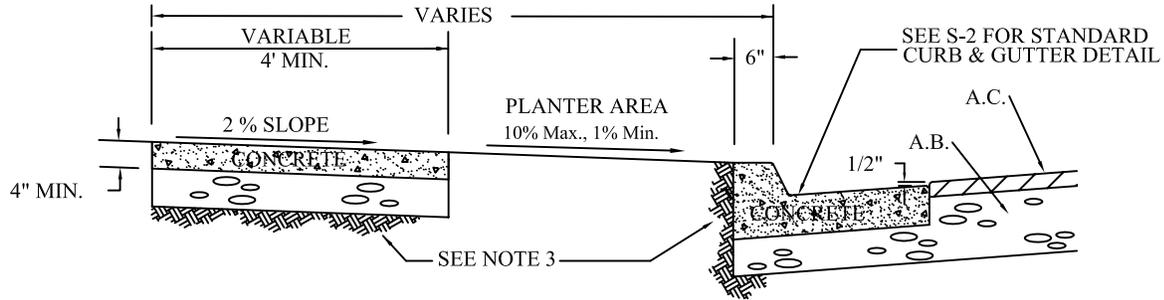
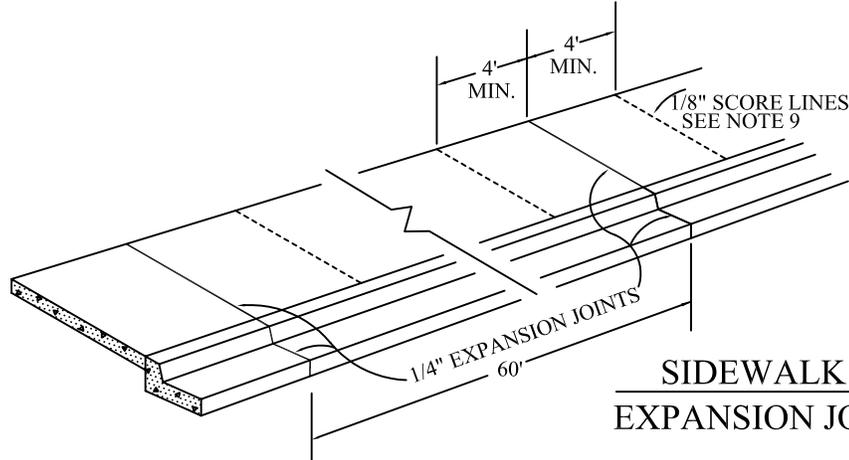


CONTIGUOUS SIDEWALK



PARKWAY SIDEWALK



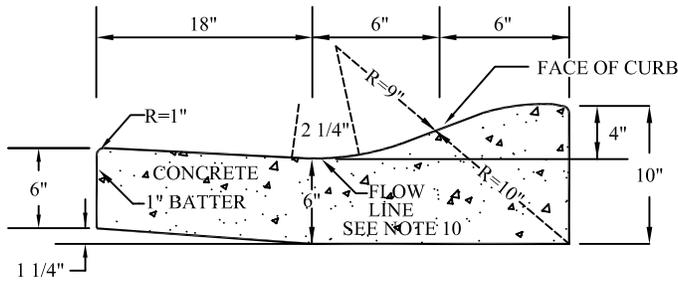
SIDEWALK SCORE & EXPANSION JOINT DETAIL

- NOTES:**
- 1.) ALL WORK TO BE DONE, AND ALL MATERIALS SUPPLIED, SHALL CONFORM TO THE STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, DATED JULY 2002.
 - 2.) ALL CONCRETE SHALL BE CLASS 3.
 - 3.) PROVIDE 4" MIN. CLASS 2 AGGREGATE BASE AT 95% RELATIVE COMPACTION OVER NATIVE SOIL PROCESSED TO 2% ABOVE OPTIMUM MOISTURE CONTENT COMPACTED TO 90% RELATIVE DENSITY.
 - 4.) 10' MIN. IN COMMERCIAL AREAS UNLESS OTHERWISE APPROVED BY CITY ENGINEER.
 - 5.) BROOM FINISH SHALL BE TRANSVERSE TO THE DIRECTION OF TRAVEL.
 - 6.) EXPANSION JOINTS IN SIDEWALK TO BE ADJACENT TO EXPANSION JOINTS IN CURB & GUTTER.
 - 7.) WHEN CONNECTING TO EXISTING CURB AND GUTTER PROVIDE 1/2" X 24" SMOOTH DOWELING AT 12" O.C. BETWEEN EXISTING AND NEW IMPROVEMENTS. STEEL REINFORCEMENT SHALL CONFORM TO SECTION 52, "REINFORCEMENT", OF THE STANDARD SPECIFICATIONS.
 - 8.) ALL NEW SIDEWALK CONSTRUCTION SHALL HAVE #4 BARS @ 24" O.C. LONGITUDINALLY.
 - 9.) 1/4" WIDE EXPANSION JOINTS AT 60-FT INTERVALS WITH 1" DEEP WEAKENED PLANE JOINTS AT 20-FT INTERVALS.
 - 10.) DISTANCE BETWEEN SCORE LINES SHALL BE 4-FT ON 4-FT WIDE SIDEWALKS AND 5-FT ON 5-FT AND WIDER SIDEWALKS. 8-FT AND WIDER SHALL ALSO BE SCORED THROUGH LENGTH OF CENTERLINE.
 - 11.) CONTIGUOUS OR PARKWAY SIDEWALKS MUST BE APPROVED BY CITY ENGINEER FOR EACH LOCATION.

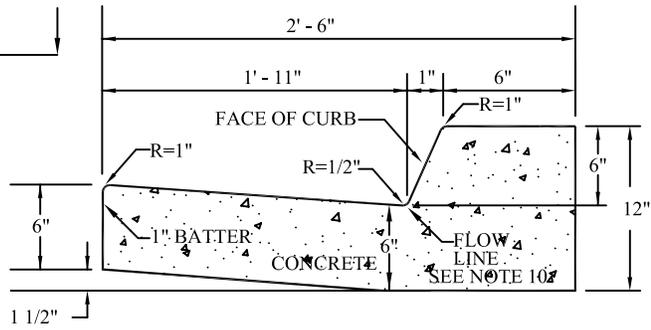
CONCRETE SIDEWALKS

DATE	REVISIONS	BY

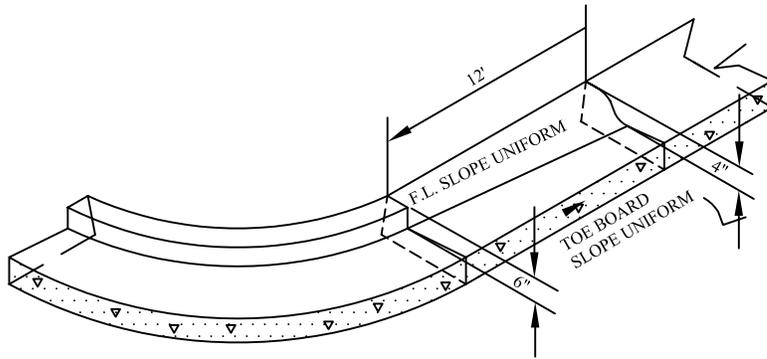
CITY OF WILLOWS	
STANDARD DETAIL	
S-1	
APPROVED BY KENT PERKES, DIRECTOR	DATE



ROLLED CURB & GUTTER



VERTICAL CURB & GUTTER



VERTICAL C & G TO ROLLED C & G TRANSITION

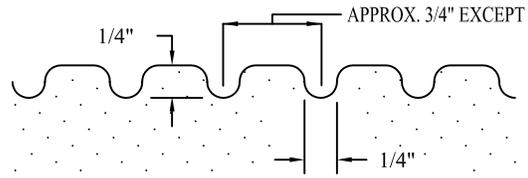
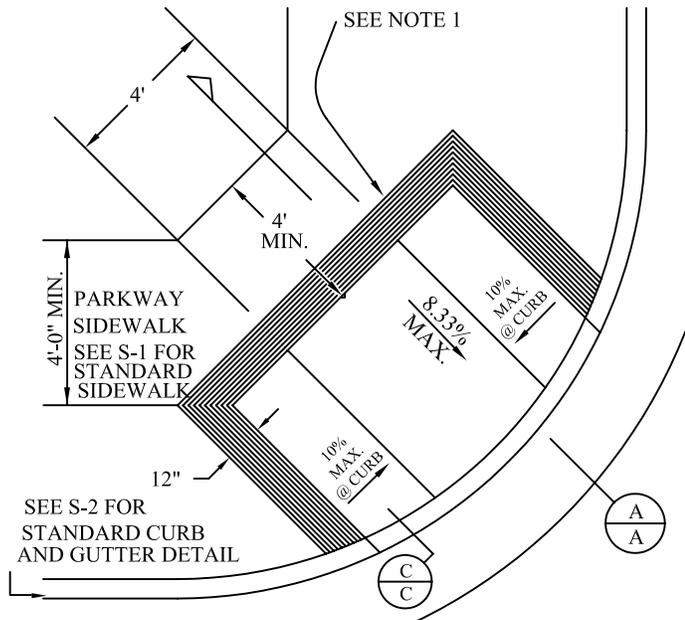
NOTES:

- 1.) PROVIDE MIN. 6" CLASS 2 AGGR. BASE AT 95% RELATIVE COMPACTION OVER NATIVE SOIL PROCESSED AND COMPACTED TO 90% RELATIVE DENSITY.
- 2.) VERTICAL CURB & GUTTER TO BE USED AT ALL CURB RETURNS.
- 3.) 1/4" EXPANSION JOINT AT BOTH ENDS OF CURB RETURN.
- 4.) 1/4" WIDE EXP. JOINT AT 60' INTERVALS WITH 1" DEEP WEAKENED PLANE JOINTS AT 20' INTERVALS.
- 5.) 1/8" SCORED CONTROL JOINTS WITH MAX. INTERVAL OF 4' WITH 4' WIDE SIDEWALK AND 5' WITH 6' WIDE SIDEWALKS.
- 6.) ALL WORK TO BE DONE, AND ALL MATERIALS SUPPLIED, SHALL CONFORM TO THE STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, DATED JULY 2002.
- 7.) ALL CONCRETE SHALL BE CLASS 3.
- 8.) BROOM FINISH SHALL BE PARALLEL TO THE DIRECTION OF FLOW.
- 9.) WHEN CONNECTING TO EXISTING CURB & GUTTER PROVIDE 1/2" X 24" SMOOTH DOWELING AT 12" O.C. BETWEEN EXISTING AND NEW IMPROVEMENTS. STEEL REQUIREMENTS SHALL CONFORM TO SECTION 52, "REINFORCEMENT", OF THE STANDARD SPECIFICATIONS.
- 10.) ALL NEW CURB & GUTTER CONSTRUCTION SHALL HAVE LONGITUDINAL #4 BARS @ 12" O.C.
- 11.) FLOWLINE ELEVATIONS MUST BE APPROVED BY CITY ENGINEER.
- 12.) VERTICAL OR ROLLED CURB MUST BE APPROVED BY CITY ENGINEER FOR EACH LOCATION.
- 13.) SEE STANDARD SPECIFICATIONS FOR SLIP-FORM REQUIREMENTS.

**CONCRETE
CURB & GUTTER**

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-2	
APPROVED BY KENT PERKES, DIRECTOR	DATE



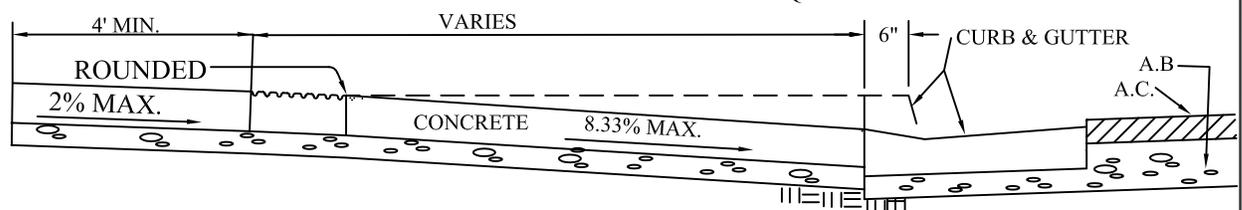
GROOVE DETAIL

N.T.S.

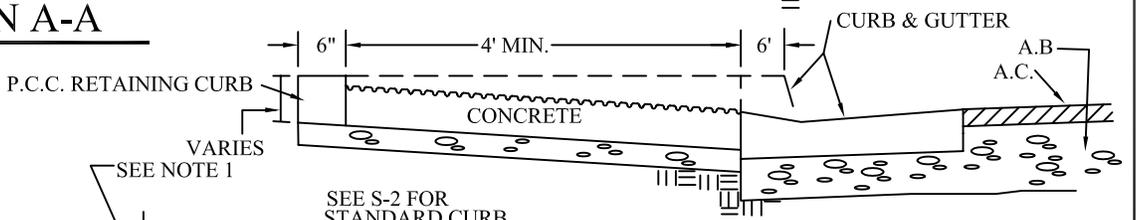
- NOTES:
1. THE RAMP SHALL HAVE A 12" WIDE BORDER WITH 1/4" GROOVES APPROX. 3/4" O.C. SEE GROVE DETAIL.
 2. THE SURFACE OF RAMP SHALL HAVE A TRANSVERSE BROOMED SURFACE TEXTURE ROUGHER THAN THE SURROUNDING SIDEWALK.
 3. SEE CURRENT ADA STANDARDS FOR ADDITIONAL DETAILS.
 4. RETAINING CURB SHALL MAINTAIN OR TRANSITION ADJACENT SIDEWALK ELEVATIONS THROUGH RAMP AREA.
 5. CASE A OR CASE B MUST BE APPROVED BY CITY ENGINEER FOR EACH LOCATION.
 6. TRANSITIONS FROM RAMPS TO WALK, GUTTER, OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES.
 7. CURB RAMPS THAT HAVE A RAMP SLOPE FLATTER THAN 6.67% SHALL HAVE A DETECTABLE WARNING SURFACE THAT EXTENDS THE FULL WIDTH OF THE RAMP AND 24" MIN. LENGTH. SEE STANDARD SPECIFICATION FOR WARNING SURFACE REQUIREMENTS.
 8. SEE STANDARD SIDEWALK DETAIL S-1 FOR ADDITIONAL CONSTRUCTION REQUIREMENTS.

CONCRETE SIDEWALK/CURB RAMP

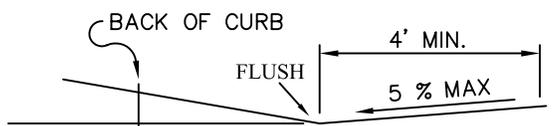
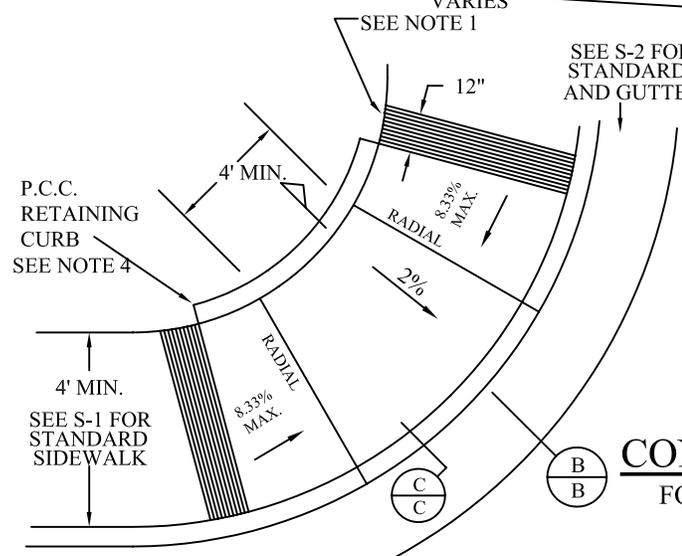
CASE A (SEE NOTE 5)



SECTION A-A



SECTION B-B



SECTION C-C

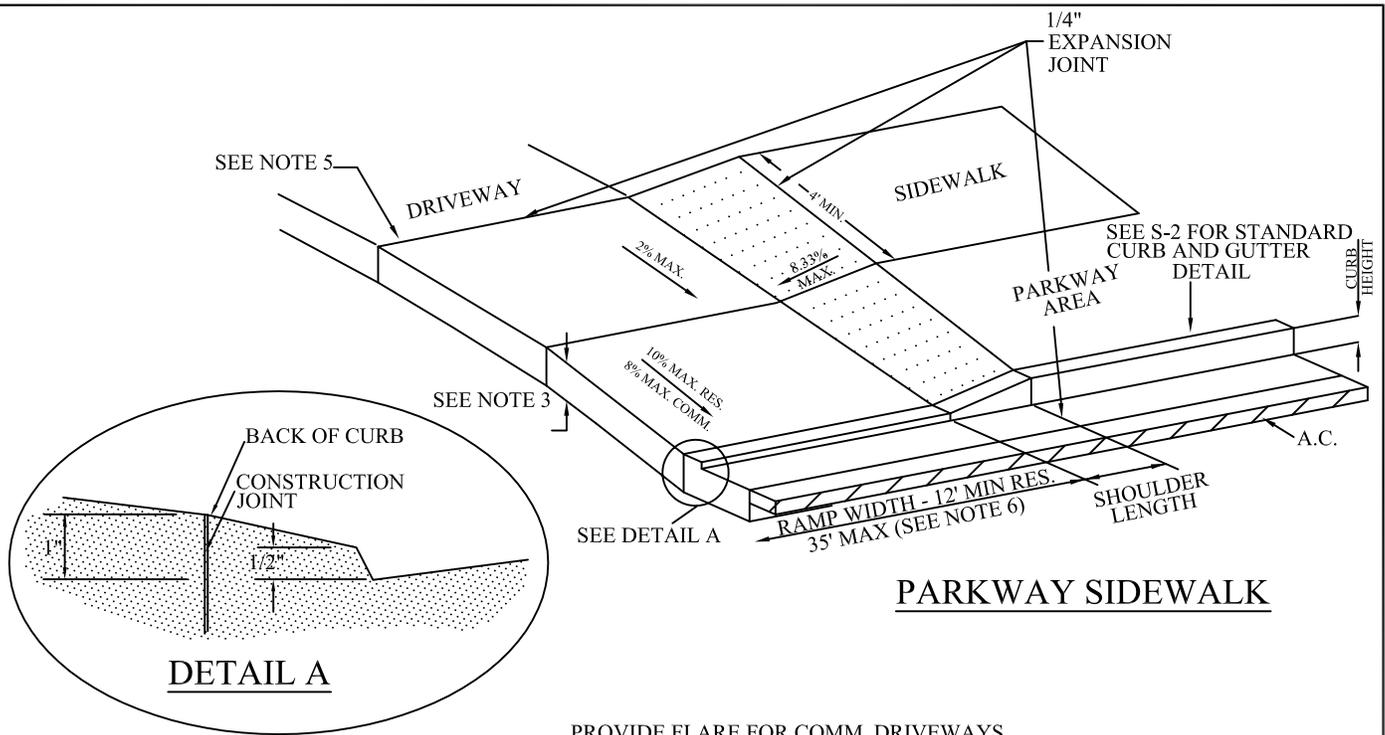
CONCRETE CURB RAMP

FOR SIDEWALKS 5' AND LESS

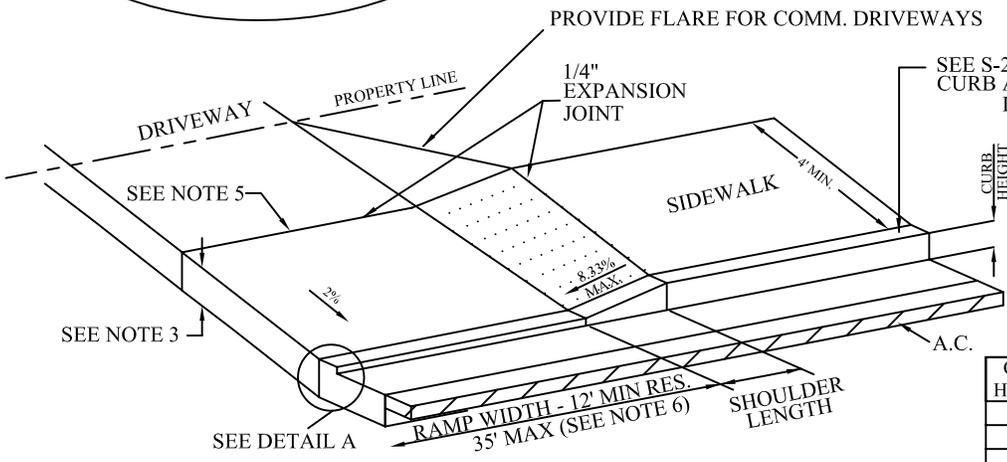
CONCRETE SIDEWALK/
CURB RAMP
CASE B (SEE NOTE 5)

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-3	
APPROVED BY KENT PERKES, DIRECTOR	DATE



PARKWAY SIDEWALK



CONTIGUOUS SIDEWALK

CURB HEIGHT	SHOULDER LENGTH	
	CONTIGUOUS	PARKWAY
4"	3'-0"	2'-0"
6"	5'-0"	3'-6"
8"	7'-0"	5'-0"
10"	9'-0"	6'-6"
12"	11'-0"	8'-0"

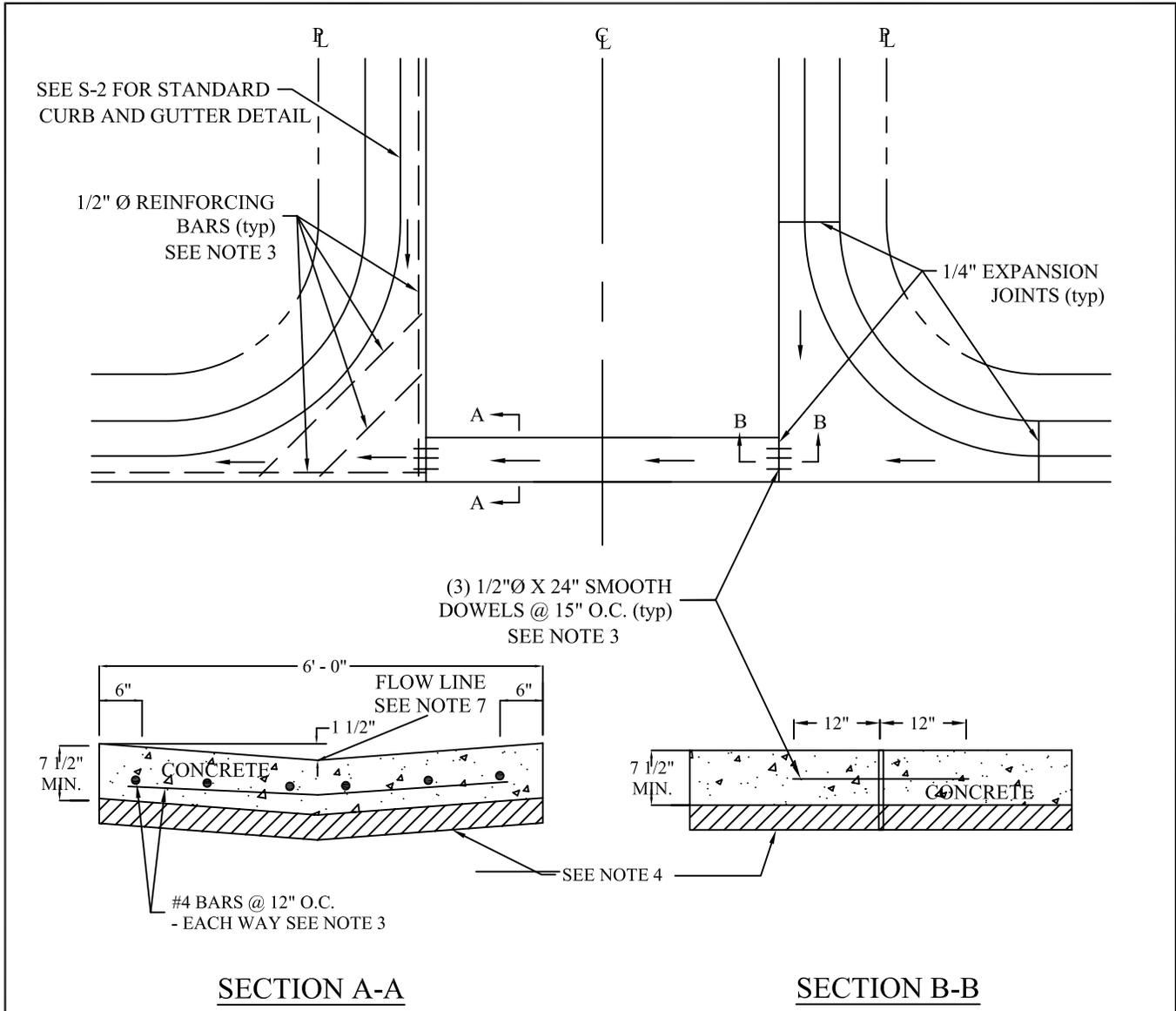
NOTES:

- 1.) ALL WORK TO BE DONE, AND ALL MATERIALS SUPPLIED, SHALL CONFORM TO THE STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, DATED JULY 2002.
- 2.) ALL CONCRETE SHALL BE CLASS 3.
- 3.) MINIMUM DRIVEWAY THICKNESS FOR SINGLE FAMILY RESIDENTIAL SHALL BE 4" WITH #4 BARS @ 24" O.C. EACH WAY. ALL OTHERS SHALL BE 6" WITH NO. 4 REINFORCEMENT BARS AT 12" ON CENTER EACH WAY. STEEL REINFORCEMENT SHALL CONFORM TO SECTION 52, "REINFORCEMENT", OF THE STANDARD SPECIFICATION.
- 4.) PROVIDE MIN. 6" CLASS 2 AGGREGATE BASE AT 95% RELATIVE COMPACTION OVER NATIVE SOIL PROCESSED AND COMPACTED TO 90% RELATIVE DENSITY.
- 5.) ON SITE GRADING MAY BE REQUIRED TO ELIMINATE EXCESSIVE GRADE CHANGE AND TO MAINTAIN SUITABLE DRAINAGE.
- 6.) MINIMUM COMMERCIAL RAMP WIDTH: ONE WAY - 14' TWO WAY - 24'
- 7.) SEE STANDARD SIDEWALK DETAIL S-1 FOR ADDITIONAL CONSTRUCTION REQUIREMENTS.

CONCRETE DRIVEWAY APPROACH

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-4	
APPROVED BY KENT PERKES, DIRECTOR	DATE



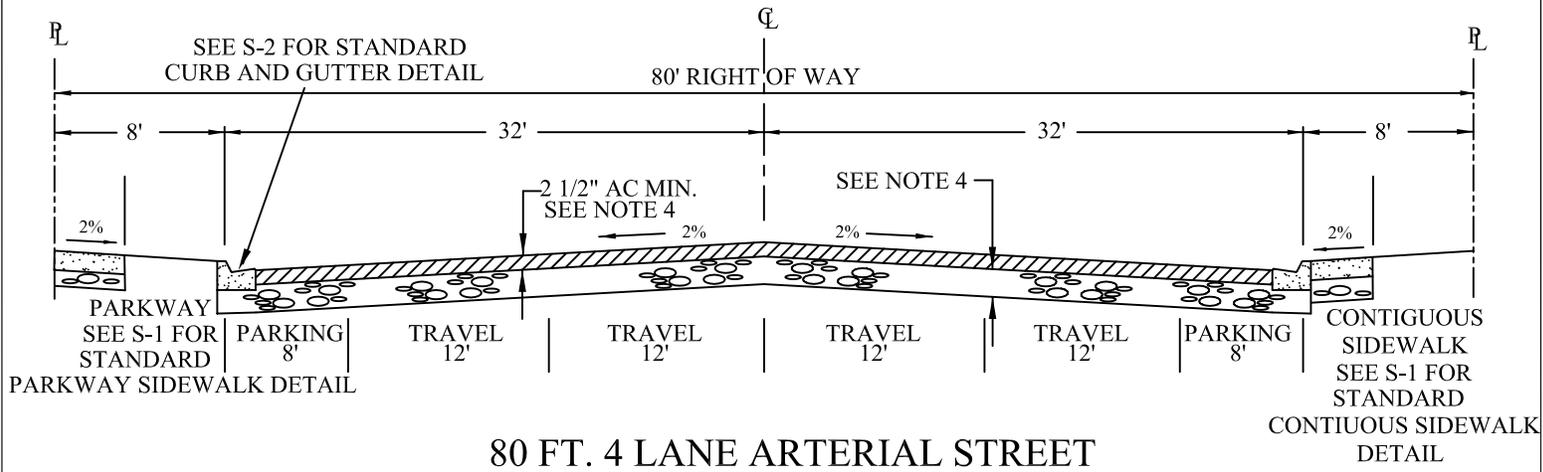
NOTES:

- 1.) ALL WORK TO BE DONE, AND ALL MATERIALS SUPPLIED, SHALL CONFORM TO THE STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, DATED JULY 2002.
- 2.) ALL CONCRETE SHALL BE CLASS 3.
- 3.) STEEL REINFORCEMENT SHALL CONFORM TO SECTION 52, "REINFORCEMENT", OF THE STANDARD SPECIFICATION.
- 4.) PROVIDE 6" MIN. CLASS 2 AGGREGATE BASE AT 95% RELATIVE COMPACTION OVER NATIVE SOIL PROCESSED AND COMPACTED TO 95% RELATIVE DENSITY.
- 5.) BROOM FINISH SHALL BE PARALLEL TO THE DIRECTION OF FLOW.
- 6.) FLOW LINE ELEVATIONS MUST BE APPROVED BY CITY ENGINEER.

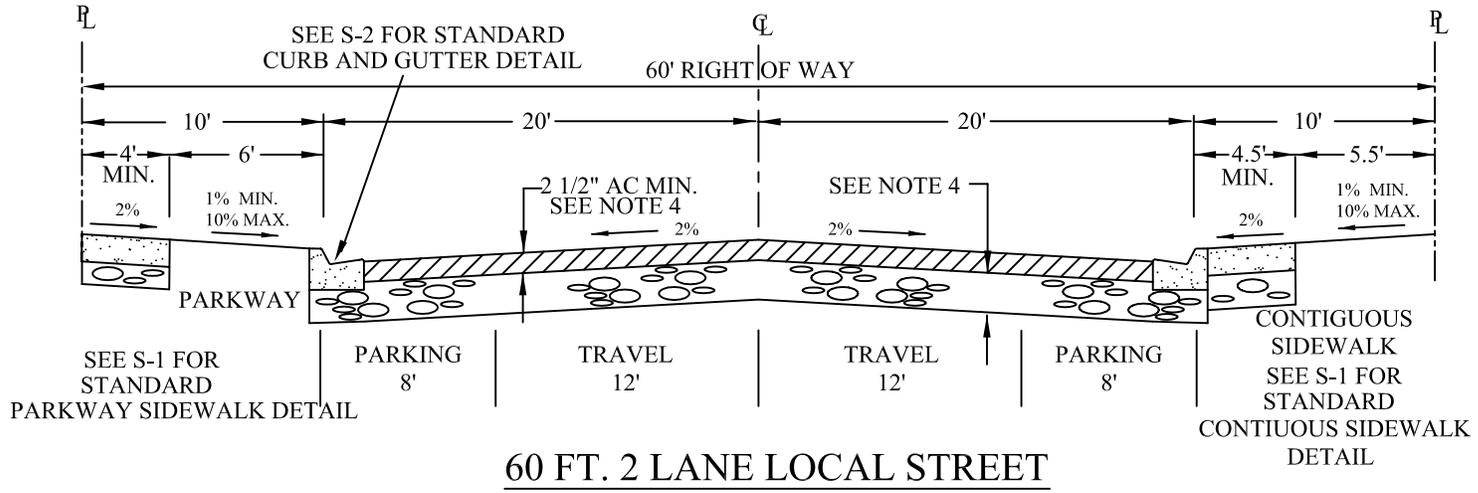
VALLEY GUTTER

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-5	
APPROVED BY KENT PERKES, DIRECTOR	DATE



80 FT. 4 LANE ARTERIAL STREET



60 FT. 2 LANE LOCAL STREET

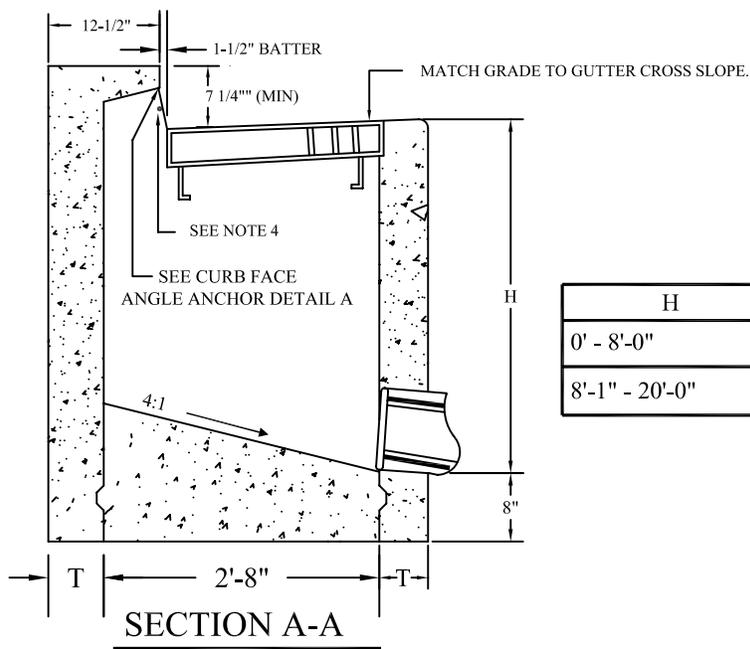
NOTES:

- 1.) ALL WORK TO BE DONE, AND ALL MATERIALS SUPPLIED, SHALL CONFORM TO THE STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, DATED JULY 2002.
- 2.) ALL ASPHALT SHALL BE TYPE B.
- 3.) STRUCTURAL SECTION DESIGN MUST BE APPROVED BY CITY ENGINEER BASED ON ACCEPTABLE GEOTECHNICAL DATA. MINIMUM SECTION MUST BE PROVIDED WITH 12" CLASS 2 AGGREGATE BASE FOR ARTERIAL STREETS, 10" FOR COLLECTORS, AND 8" FOR LOCAL ROADS BASED ON A SUBGRADE R-VALUE MINIMUM OF 20. PROVIDE APPROVED SECTION OF AGGREGATE BASE AT 95% RELATIVE COMPACTION OVER NATIVE SOIL PROCESSED AND COMPACTED TO 95% RELATIVE DENSITY.

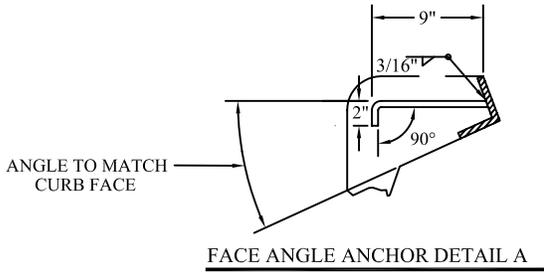
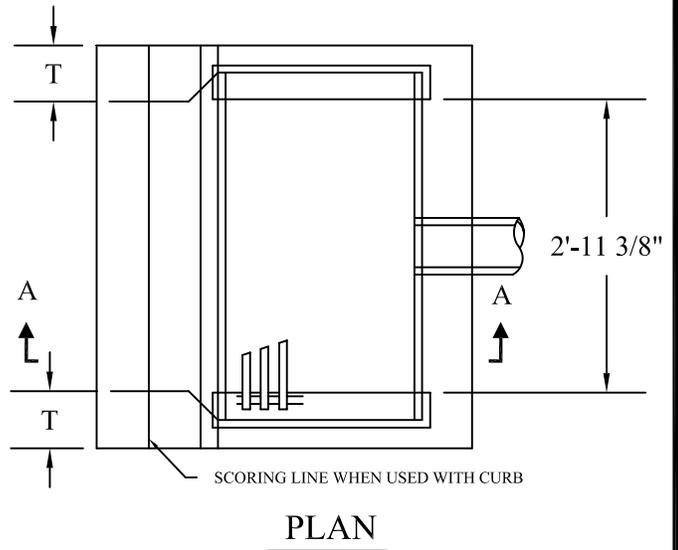
**STREET
CROSS SECTION**

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-6	
APPROVED BY KENT PERKES, DIRECTOR	DATE



H	T
0' - 8'-0"	6"
8'-1" - 20'-0"	8"



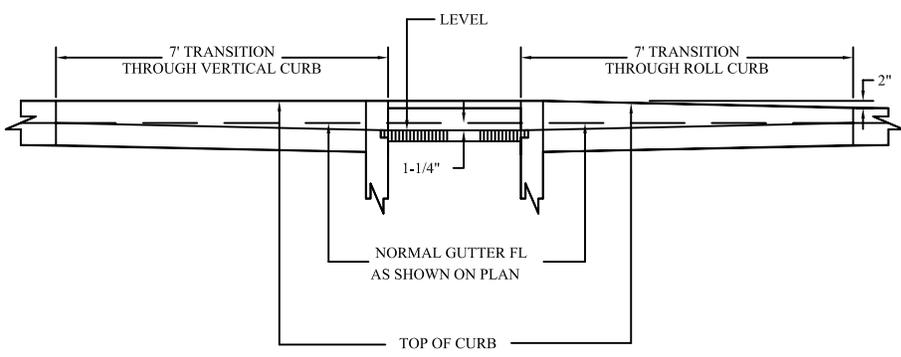
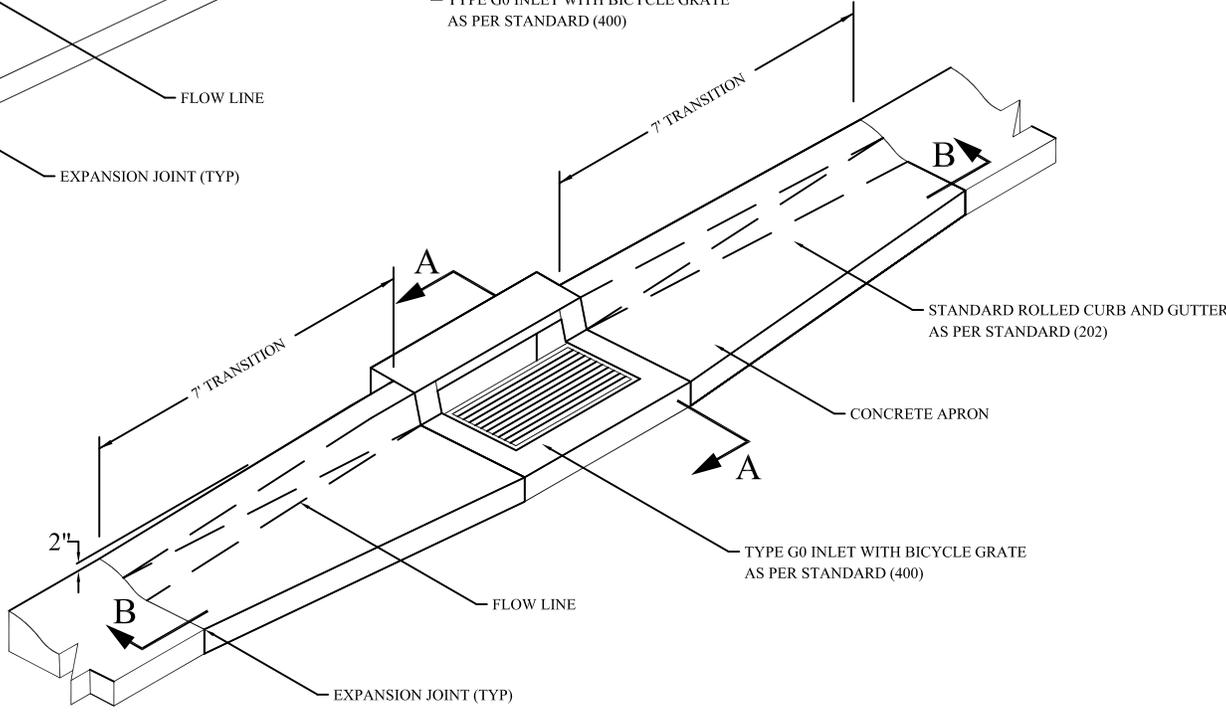
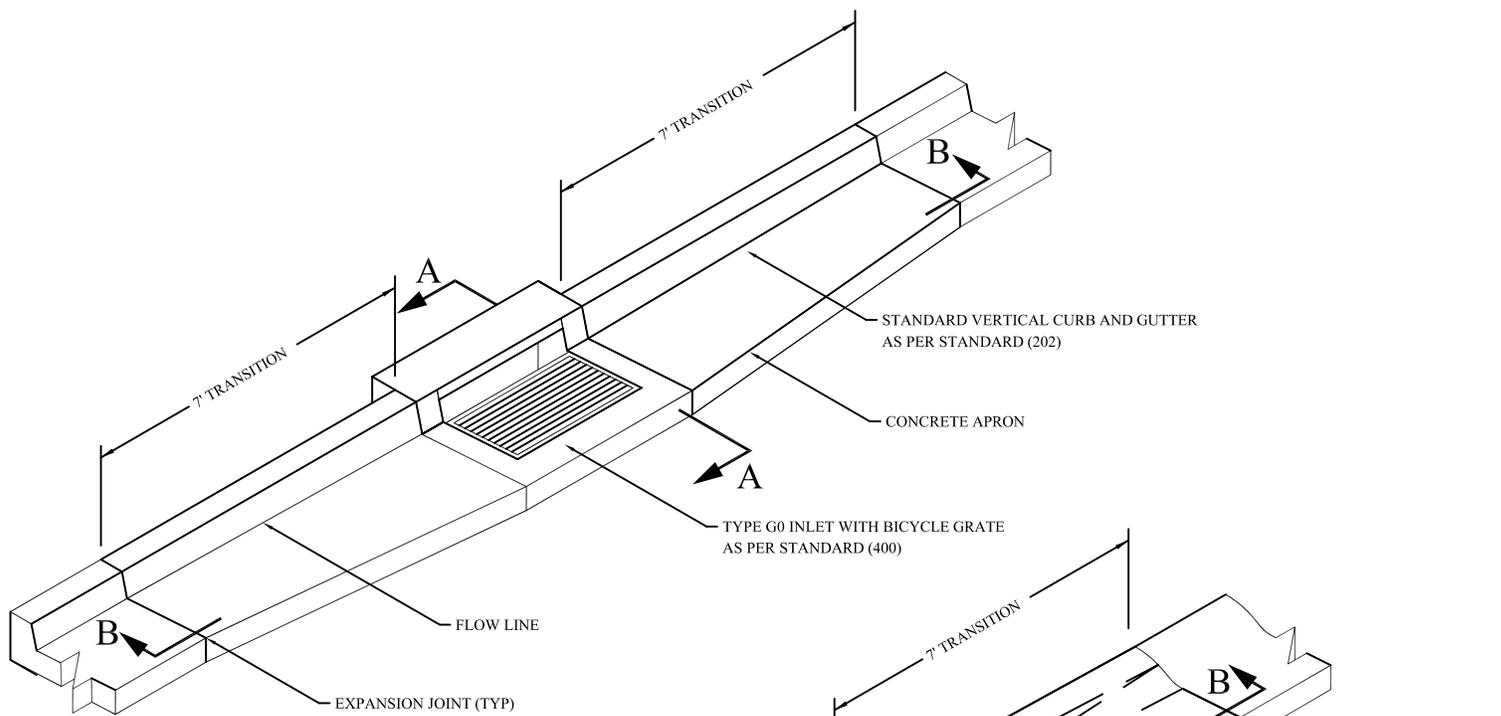
NOTES:

1. ALL WORK TO BE DONE, AND ALL MATERIALS SUPPLIED, SHALL CONFORM TO THE STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, DATED JULY 2002.
2. ALL CONCRETE SHALL BE CLASS 3.
3. "H" IS THE DIFFERENCE IN ELEVATION BETWEEN THE OUTLET PIPE FLOW LINE AND THE GUTTER FLOW LINE.
4. FOR "T" WALL THICKNESS SEE TABLE ABOVE.
5. WALL REINFORCING NOT REQUIRED WHEN H=8' OR LESS AND THE UNSUPPORTED WIDTH OR LENGTH = 7' OR LESS. WALLS EXCEEDING THESE LIMITS SHALL BE REINFORCED WITH #4 BARS @ 18" CENTERS PLACED 1-1/2" CLEAR TO INSIDE OF BOX UNLESS OTHERWISE SHOWN.
6. PLACE A #6 PROTECTION BAR HORIZONTALLY ACROSS THE CURB OPENING AND BEND BACK 4" INTO THE INLET WALL ON EACH SIDE WHENEVER OPENING EXCEEDS 4 INCHES.
7. PIPE(S) CAN BE PLACED IN ANY WALL.
8. CURB SECTION SHALL MATCH ADJACENT CURB
9. EXCEPT FOR INLETS USED FOR JUNCTION BOXES, BASIN FLOORS SHALL HAVE WOOD TROWEL FINISH AND A MINIMUM SLOPE OF 4:1 FROM ALL DIRECTIONS TOWARD OUTLET PIPE.
10. GALVANIZING- SEE STATE STANDARD SPECIFICATIONS FOR REQUIREMENTS.
11. DI GRATE SHALL BE DEPRESSED 0.11'. W=2'-11 3/8" FOR GRATE. ADD 3'-5 3/8" FOR ADDITIONAL GRATES IN TANDEM.
12. SEE CALTRANS STANDARD GRATE DETAILS D77-B FOR GRATE AND FRAME DETAILS AND WIEGHTS FOR MISC. IRON AND STEEL. ALL GRATES SHALL BE BICYCLE PROOF.
13. FULL PENETRATION BUTT WELDS MAY BE SUBSTITUTED FOR THE FILLET WELDS ON ALL ANCHORS.
14. STANDARD, SQUARE, HEXAGON, ROUNDED OR EQUIVALENT HEADED ANCHORS MAY BE SUBSTITUTED FOR THE RIGHT ANGLE HOOKS ON THE ANCHORS SHOWN ON THIS PLAN.
15. CIP OR PRECAST UNITS SHALL BE BUILT OR PLACED UPON UNDISTURBED SOIL.

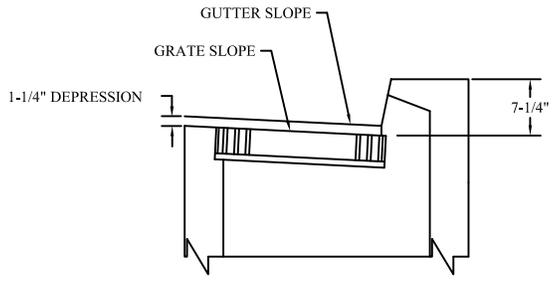
**DROP INLET
TYPE GO**

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-7	
APPROVED BY _____ DATE _____	
KENT PERKES, DIRECTOR PUBLIC WORKS DEPARTMENT	



SECTION B-B



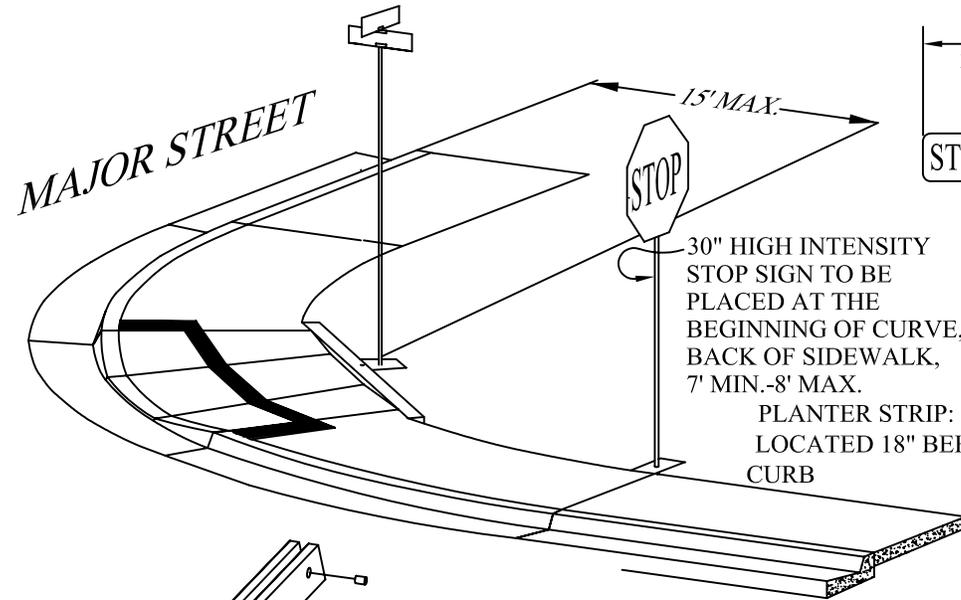
SECTION A-A

INLET TRANSITIONS

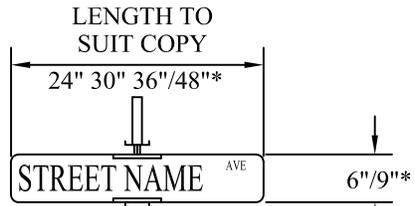
DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-8	
APPROVED BY KENT PERKES, DIRECTOR PUBLIC WORKS DEPARTMENT	DATE

MAJOR STREET



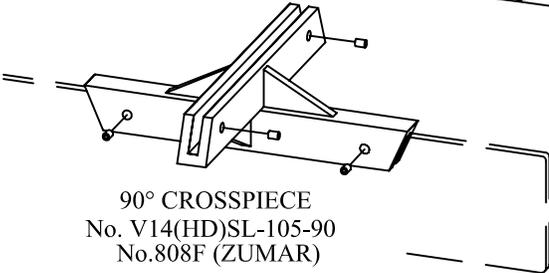
30" HIGH INTENSITY STOP SIGN TO BE PLACED AT THE BEGINNING OF CURVE, BACK OF SIDEWALK, 7' MIN.-8' MAX.
 PLANTER STRIP: SIGN LOCATED 18" BEHIND CURB



LENGTH TO SUIT COPY
 24" 30" 36"/48"*
 STREET NAME AVE

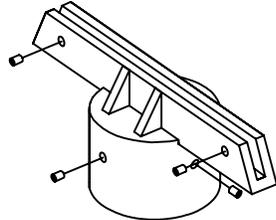
6"/9"*

8' MIN. 9' MAX.



90° CROSSPIECE
 No. V14(HD)SL-105-90
 No.808F (ZUMAR)

CAP & CROSSPIECE SET SCREWS
 5/16"-18X1/4 STEEL PLATED SOCKET HD.
 No. V14(HD)1105

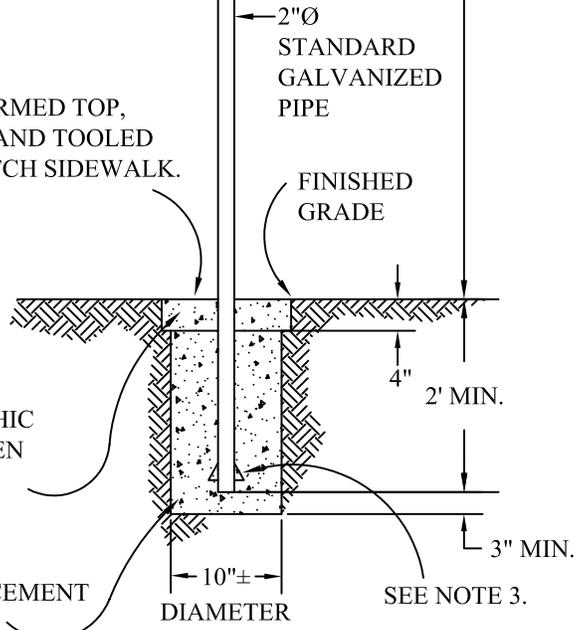


CAP FOR 2" I.D. PIPE
 No. V14(HD)SL-107.2C
 No.808F (ZUMAR)

12" SQ. FORMED TOP, TROWELED AND TOOLED FINISH TO MATCH SIDEWALK.

FORM 3 SIDES WHEN ADJACENT TO MONOLITHIC SIDEWALK, 4 SIDES WHEN IN PLANTER AREA.

PORTLAND CEMENT CONCRETE



NOTES:

1. SIGN LOCATION TO BE DETERMINED BY THE CITY ENGINEER.
2. NAME PLATES & MOUNTING ASSEMBLIES TO MEET THE REQUIREMENTS OF THE CITY ENGINEER.
3. FLARE THE BOTTOM OF PIPE TO PREVENT TURNING.
4. PLATE COLOR SHALL BE WHITE ON GREEN & SHALL BE REFLECTIVE.
5. REFLECTIVE LETTERS TO BE 4" FOR NAME, AND 3" FOR ST., CT., AVE., ETC.
6. FONT SHALL BE HIGHWAY GOTHIC "C" OR CITY APPROVED EQUAL.

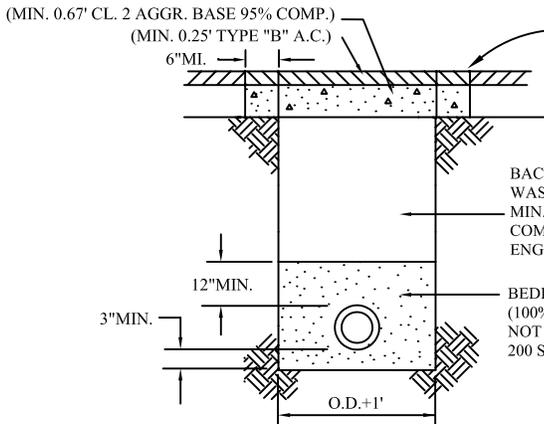
NOTE:

USE HEAVY DUTY SLOTTED HIGH TENSION ALUMINUM ALLOY DIE CASTINGS FOR CAPS & CROSS PIECES HAWKINS & HAWKINS, ZUMAR (PART NUMBERS GIVEN) OR CITY APPROVED EQUAL.

STREET SIGNS

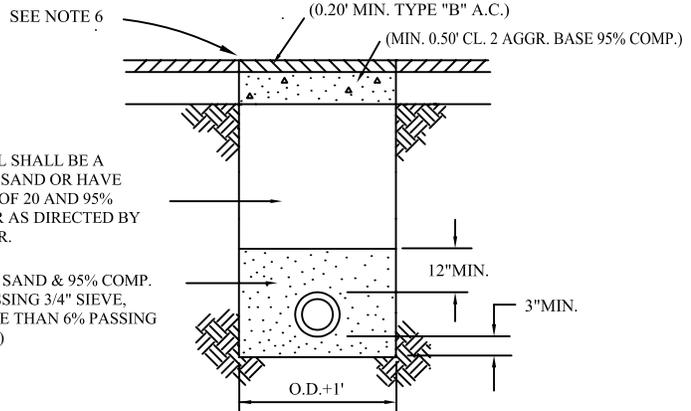
DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-10	
APPROVED BY KENT PERKES, DIRECTOR	DATE



TYPE "A"

**IMPROVED ASPHALTIC CONCRETE
OR PLANT- MIX CONCRETE**



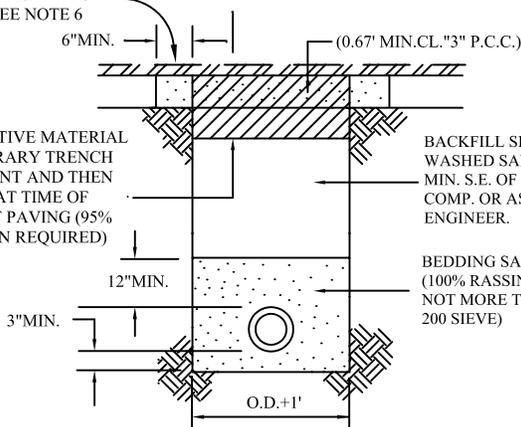
TYPE "B"

**IMPROVED ARMOR COAT
OR SEAL COAT STREETS**

TABLE 1

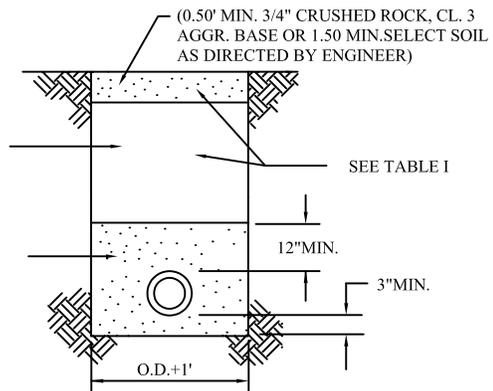
TYPE	LOCATION	BACKFILL & COMP.	RESTORATION TYPE
D-1	WITHIN 5' E.P.	STRUCTURE 95%	6" CL. 3 A.B.
D-2	GREATER THAN 5' TO E.P.	SELECT SOIL 90%	1.5' MIN. SELECT SOIL
D-(SW)	SIDEWALK AREAS	STRUCTURE 95%	4" P.C.C. OR EQUAL TO EXIST. WHICHEVER IS GREATER

(PLACE TYPE "B" A.C. IF PAVEMENT HAS AN A.C. OVERLAY) SEE NOTE 6



TYPE "C"

**PORTLAND CEMENT
CONCRETE STREETS**



TYPE "D"

**UNIMPROVED STREETS
ALLEYS, EASEMENTS, OR SIDEWALKS**

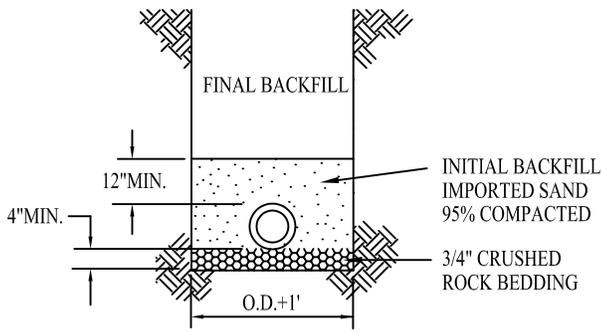
NOTES:

1. TYPE "A" & "C" TRENCHES REQUIRE (2) TWO CUTS; FIRST CUT INITIAL TRENCH WIDTH. THEN 30 DAYS AFTER WORK HAS BEEN COMPLETED IT SHALL BE SAW CUT A MINIMUM OF 6" WIDER BOTH SIDES.
2. TYPE "A" & "C" TRENCHES REQUIRE PLACEMENT AND MAINTENANCE OF TEMPORARY PAVEMENT (SC-800 COLD MIX) FOR A MINIMUM OF 30 DAYS PRIOR TO PERMANENT PAVING.
3. STRUCTURAL THICKNESS SHOWN ARE MINIMUM ALLOWABLE. OVER THICKNESS OF STRUCTURAL SECTIONS MAY BE REQUIRED BY CITY ENGINEER IF EXISTING STRUCTURAL SECTION EXCEEDS THESE MINIMUMS.
4. ALL TRENCH WORK 5' AND DEEPER SHALL HAVE APPROVED SHORING, ALL IN ACCORDANCE WITH CITY SPECIAL PROVISION SECTION 13 "TRENCHING OPERATIONS".
5. NATIVE MATERIAL MUST BE SUITABLE TO OBTAIN THE 95% COMPACTION REQUIRED.
6. PAVING SURFACE AT TRENCH JOINTS SHALL BE SEALED WITH ASPHALT EMULSION 4" EACH SIDE OF JOINT AFTER FINAL COMPACTION OF ASPHALT CONCRETE. SEALANT SHALL BE SANDED AS NECESSARY TO PREVENT TRAFFIC PICKUP.
7. BACKFILL STRUCTURE SHALL BE PLACED ON UNDISTURBED NATIVE MATERIAL. OVER EXCAVATION MAY BE REQUIRED TO PROVIDE SUITABLE SUBBASE.
8. TRENCH DEPTH LESS THAN 3.0' MAY REQUIRE CONCRETE BACKFILL.

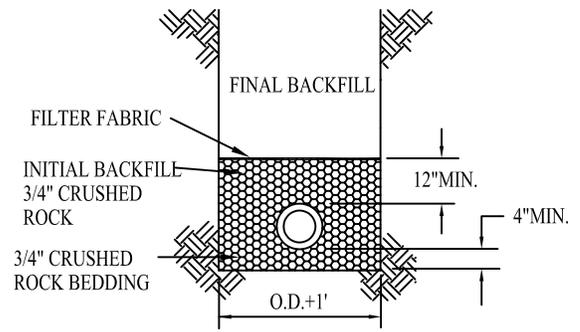
**BACKFILL & TRENCH
RESTORATION**

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-12	
APPROVED BY KENT PERKES, DIRECTOR	DATE

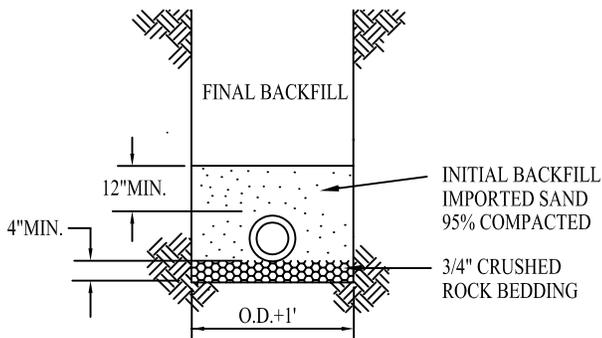


FOR PIPES LESS THAN 16" DIAMETER

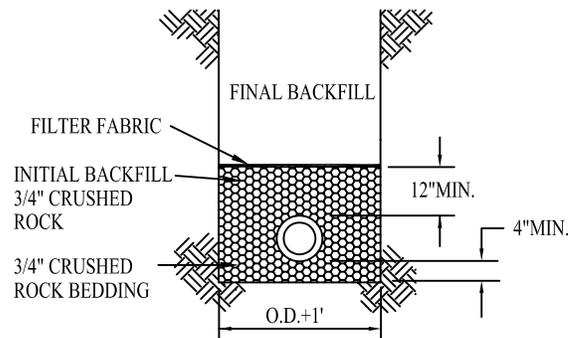


FOR PIPES 16" DIAMETER AND GREATER

WATER



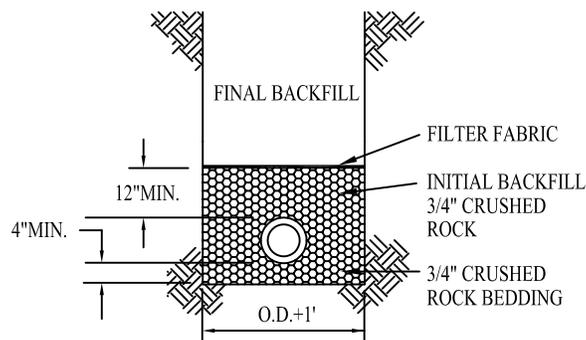
OR



STORM DRAIN

NOTES:

- 1. SEE DETAILS S-12-SAND AND S-12-NATIVE FOR FINAL BACKFILL REQUIREMENTS AND TRENCH RESTORATION REQUIREMENTS.

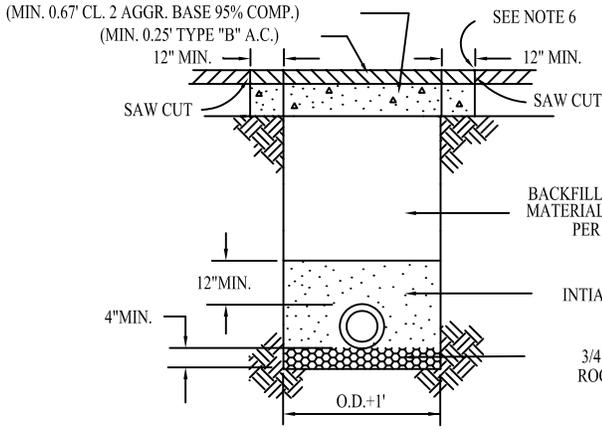


SEWER

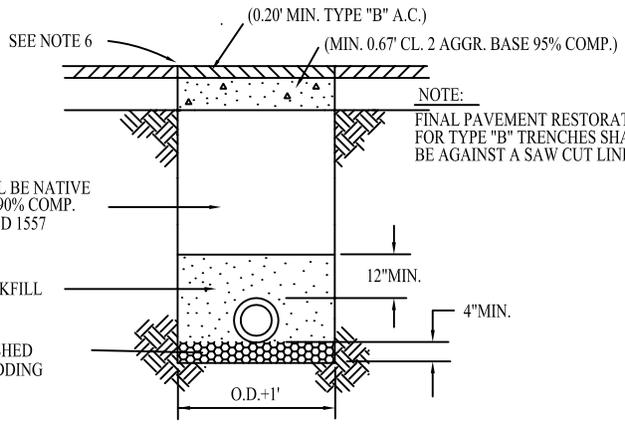
BEDDING & INITIAL BACKFILL

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-12	
APPROVED BY KENT PERKES, DIRECTOR	DATE



TYPE "A"
IMPROVED ASPHALTIC CONCRETE
OR PLANT-MIX CONCRETE



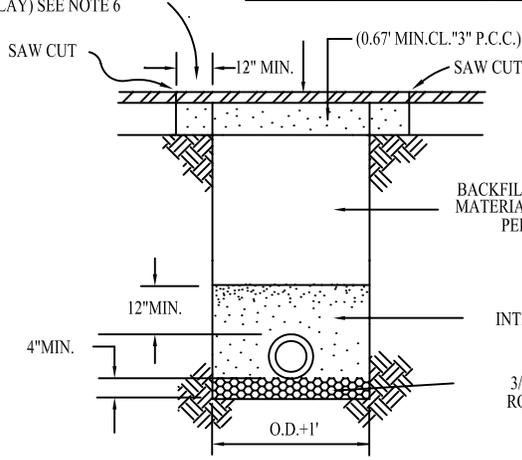
TYPE "B"
IMPROVED ARMOR COAT
OR SEAL COAT STREETS

NOTE:
FINAL PAVEMENT RESTORATION
FOR TYPE "B" TRENCHES SHALL
BE AGAINST A SAW CUT LINE.

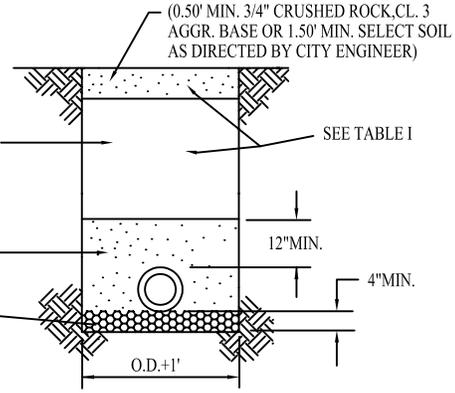
TABLE 1

TYPE	LOCATION	BACKFILL & COMP.	RESTORATION TYPE
D-1	WITHIN 3' E.P.	STRUCTURE 95%	6" CL. 3 A.B.
D-2	GREATER THAN 3' TO E.P.	SELECT SOIL 90%	1.5' MIN. SELECT SOIL
D-(SW)	SIDEWALK AREAS	STRUCTURE 95%	4" P.C.C. OR EQUAL TO EXIST. WHICHEVER IS GREATER

(PLACE TYPE "B" A.C. IF PAVEMENT HAS AN A.C. OVERLAY) SEE NOTE 6



TYPE "C"
PORTLAND CEMENT
CONCRETE STREETS



TYPE "D"
UNIMPROVED STREETS
ALLEYS OR EASEMENTS

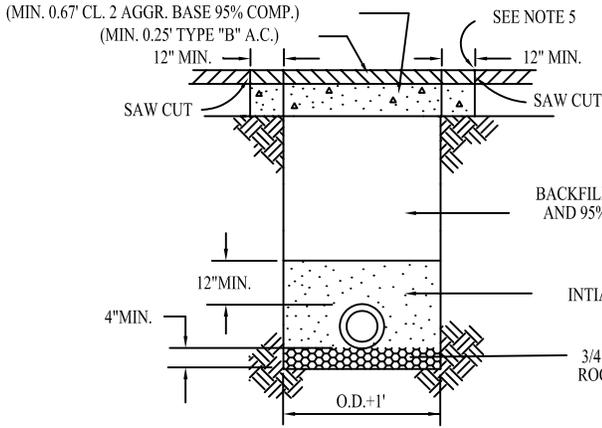
NOTES:

1. TYPE "A" & "C" TRENCHES REQUIRE (2) TWO CUTS: FIRST CUT INITIAL TRENCH WIDTH. THEN 30 DAYS AFTER WORK HAS BEEN COMPLETED IT SHALL BE SAW CUT A MINIMUM OF 12" WIDER BOTH SIDES.
2. TYPE "A" & "C" TRENCHES REQUIRE PLACEMENT AND MAINTENANCE OF TEMPORARY PAVEMENT (SC-800 COLD MIX), COMPACTED IN PLACE USING A VIBRATING ROLLER OR VIBROPLATE, FOR A MINIMUM OF 30 DAYS PRIOR TO PERMANENT PAVING.
3. STRUCTURAL THICKNESS SHOWN ARE MINIMUM ALLOWABLE. OVER THICKNESS OF STRUCTURAL SECTIONS MAY BE REQUIRED BY CITY ENGINEER IF EXISTING STRUCTURAL SECTION EXCEEDS THESE MINIMUMS.
4. ALL TRENCH WORK 5' AND DEEPER SHALL HAVE APPROVED SHORING.
5. NATIVE MATERIAL MUST BE SUITABLE TO OBTAIN THE 90% COMPACTION REQUIRED.
6. PAVING SURFACE AT TRENCH JOINTS SHALL BE SEALED WITH ASPHALT EMULSION 4" EACH SIDE OF JOINT AFTER FINAL COMPACTION OF ASPHALT CONCRETE. SEALANT SHALL BE SANDED AS NECESSARY TO PREVENT TRAFFIC PICKUP.
7. IF S.E. >= 20, NATIVE MATERIAL MAY BE JETTED. IF S.E. < 20, NATIVE MATERIAL SHALL BE INSTALLED USING A MECHANICAL METHOD OF COMPACTION AND A GEOTECHNICAL FIRM, APPROVED BY THE ENGINEER, SHALL SUPERVISE THE INSTALLATION AND PERFORM ALL REQUIRED TESTING. SEE SPECIFICATIONS FOR FREQUENCY OF ASTM D 1557 TEST AND SPECIAL TRENCH WARRANTY REQUIREMENTS.
8. SEE DETAIL S-12 FOR INITIAL BACKFILL AND BEDDING REQUIREMENTS.

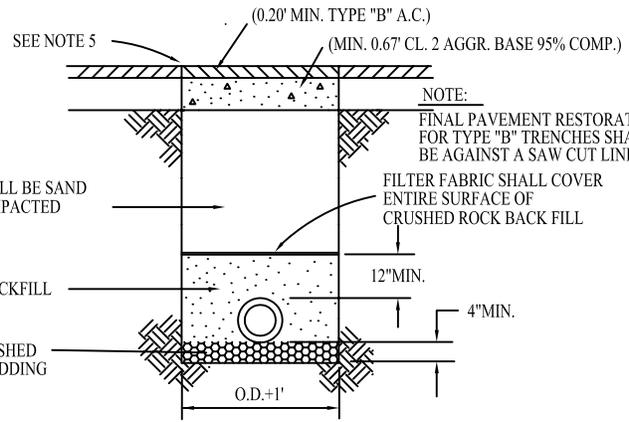
FINAL BACKFILL & TRENCH RESTORATION

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-12-NATIVE	
APPROVED BY KENT PERKES, DIRECTOR	DATE



TYPE "A"
IMPROVED ASPHALTIC CONCRETE
OR PLANT-MIX CONCRETE

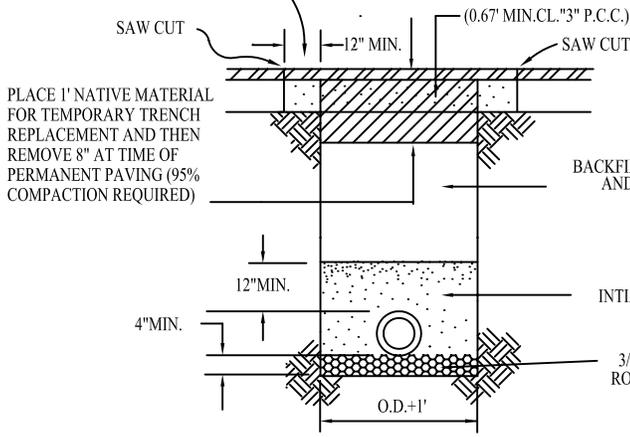


TYPE "B"
IMPROVED ARMOR COAT
OR SEAL COAT STREETS

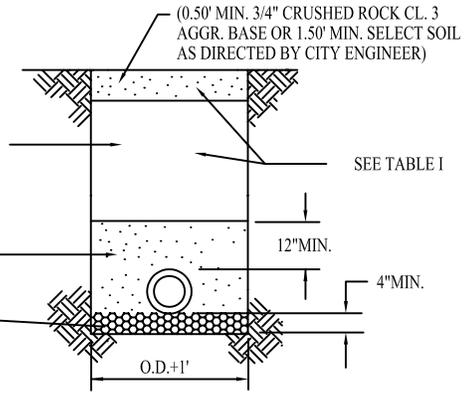
TABLE 1

TYPE	LOCATION	BACKFILL & COMP.	RESTORATION TYPE
D-1	WITHIN 3' E.P.	STRUCTURE 95%	6" CL. 3 A.B.
D-2	GREATER THAN 3' TO E.P.	SELECT SOIL 90%	1.5' MIN. SELECT SOIL
D-(SW)	SIDEWALK AREAS	STRUCTURE 95%	4" P.C.C. OR EQUAL TO EXIST. WHICHEVER IS GREATER

(PLACE TYPE "B" A.C. IF PAVEMENT HAS AN A.C. OVERLAY) SEE NOTE 5



TYPE "C"
PORTLAND CEMENT
CONCRETE STREETS



TYPE "D"
UNIMPROVED STREETS
ALLEYS OR EASEMENTS

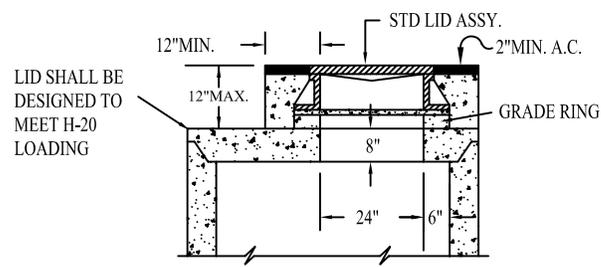
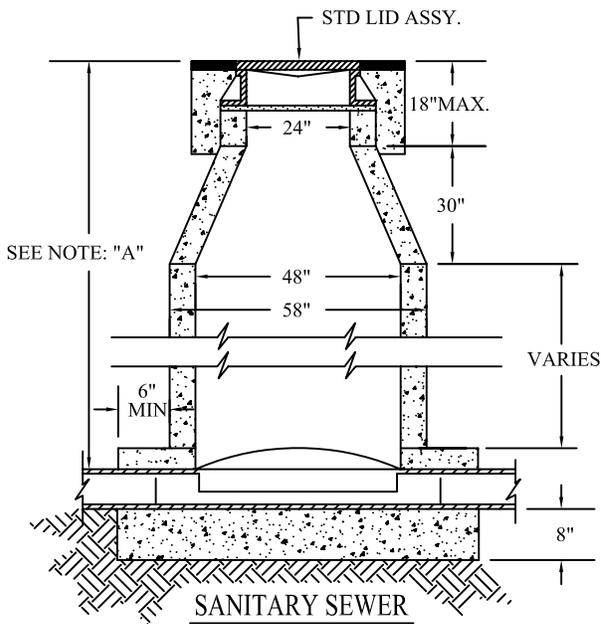
NOTES:

- TYPE "A" & "C" TRENCHES REQUIRE (2) TWO CUTS; FIRST CUT INITIAL TRENCH WIDTH. THEN 30 DAYS AFTER WORK HAS BEEN COMPLETED IT SHALL BE SAW CUT A MINIMUM OF 12" WIDER BOTH SIDES.
- TYPE "A" & "C" TRENCHES REQUIRE PLACEMENT AND MAINTENANCE OF TEMPORARY PAVEMENT (SC-800 COLD MIX), COMPACTED IN PLACE USING A VIBRATING ROLLER OR VIBROPLATE, FOR A MINIMUM OF 30 DAYS PRIOR TO PERMANENT PAVING.
- STRUCTURAL THICKNESS SHOWN ARE MINIMUM ALLOWABLE. OVER THICKNESS OF STRUCTURAL SECTIONS MAY BE REQUIRED BY CITY ENGINEER IF EXISTING STRUCTURAL SECTION EXCEEDS THESE MINIMUMS.
- ALL TRENCH WORK 5' AND DEEPER SHALL HAVE APPROVED SHORING, ALL IN ACCORDANCE WITH CITY SPECIAL PROVISION SECTION 13 "TRENCHING OPERATIONS".
- PAVING SURFACE AT TRENCH JOINTS SHALL BE SEALED WITH ASPHALT EMULSION 4" EACH SIDE OF JOINT AFTER FINAL COMPACTION OF ASPHALT CONCRETE. SEALANT SHALL BE SANDED AS NECESSARY TO PREVENT TRAFFIC PICKUP.
- SEE STANDARD DETAIL S-12 FOR INITIAL BACKFILL AND BEDDING REQUIREMENTS.

FINAL BACKFILL & TRENCH RESTORATION

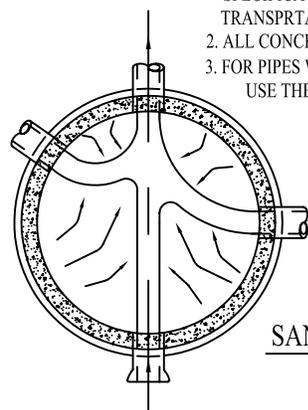
DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-12-SAND	
APPROVED BY KENT PERKES, DIRECTOR	DATE

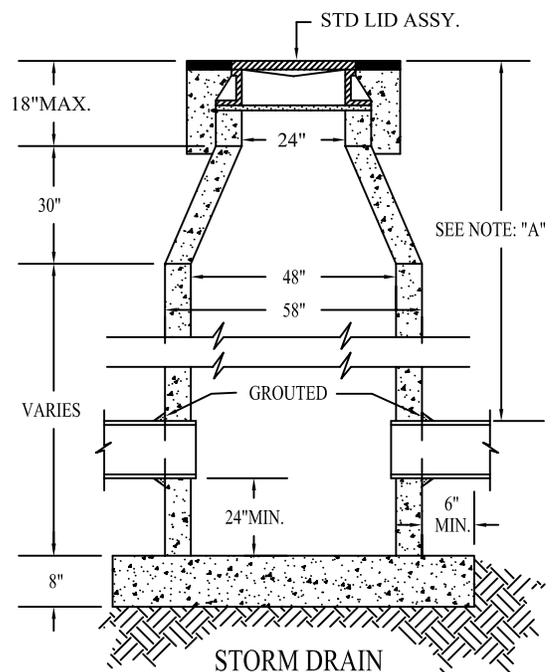
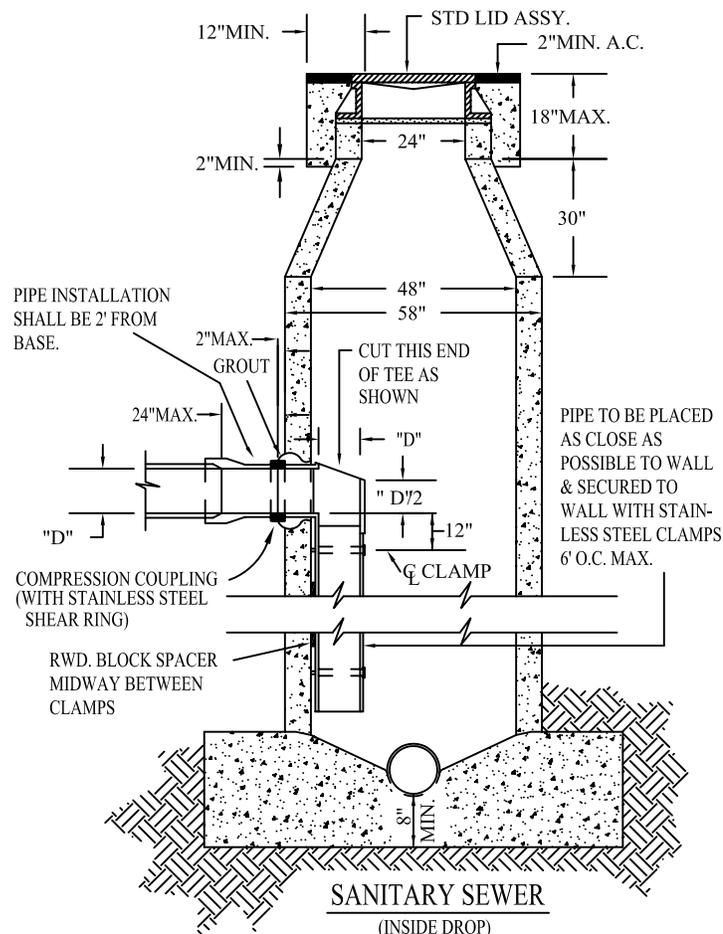


SHALLOW MANHOLE DETAIL
(FOR PIPES WITH LESS THAN 4' COVER)

- NOTES:**
1. ALL WORK TO BE DONE, AND ALL MATERIALS SUPPLIED, SHALL CONFORM TO THE STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPT. OF TRANSPORTATION, DATED JULY 2002.
 2. ALL CONCRETE SHALL BE CLASS 3.
 3. FOR PIPES WITH LESS THAN 4' COVER USE THE SHALLOW MANHOLE DETAIL



CHANNELIZATION FOR SANITARY SEWER MANHOLES



STORM DRAIN
(FOR PIPE LESS THAN 30" DIA.)

SANITARY SEWER & STORM DRAIN MANHOLE

DATE	REVISIONS	BY

CITY OF WILLOWS

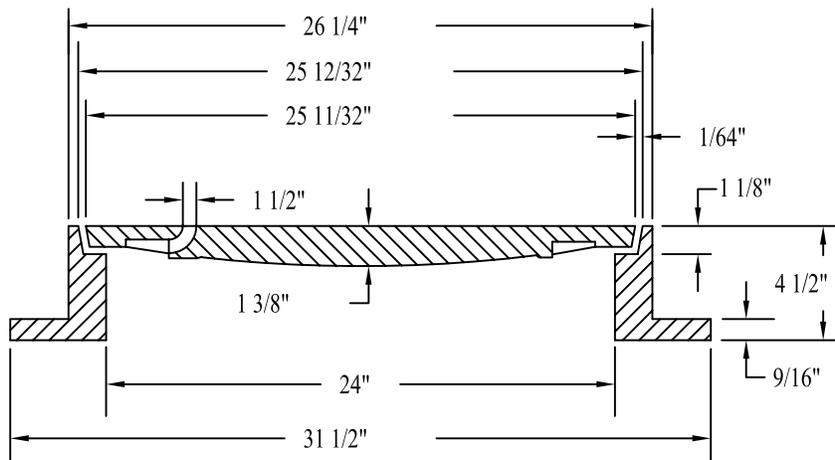
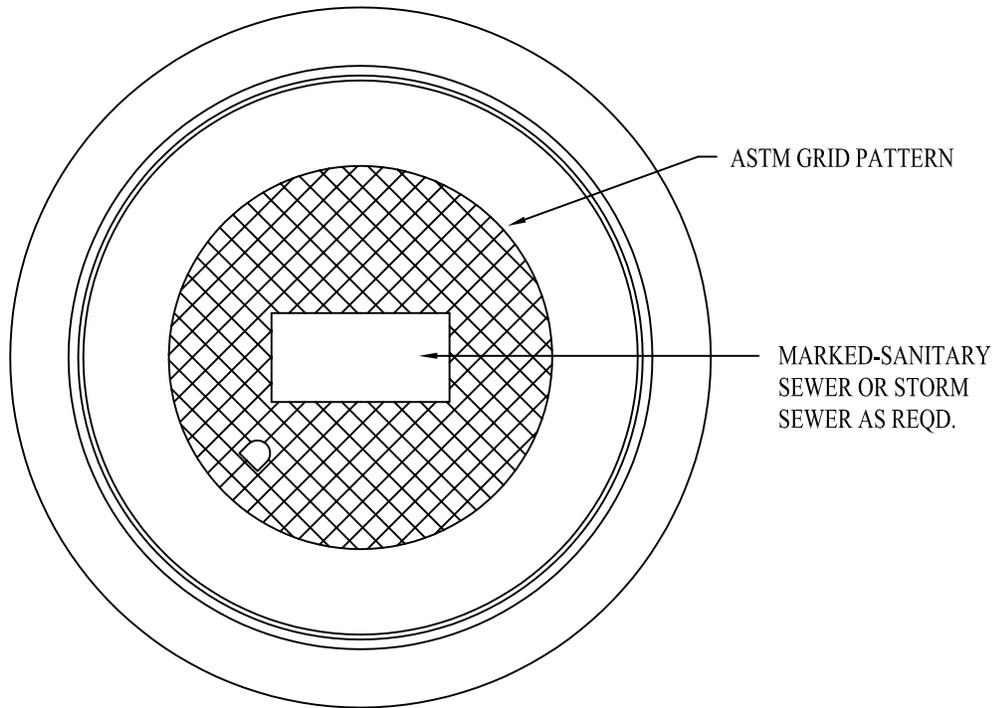
STANDARD DETAIL

S-13

APPROVED BY _____ DATE _____
KENT PERKS, DIRECTOR

NOTES:

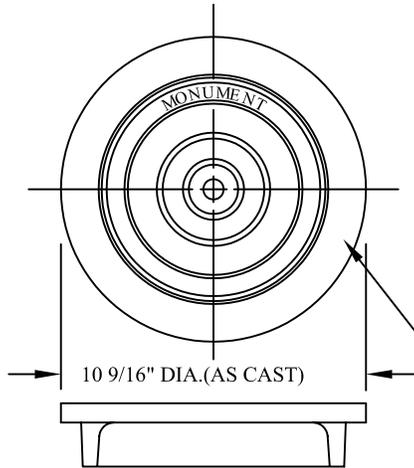
1. MANHOLE FRAME & COVER TEICHERT NO. PTB019 FOR FRAME, PTB215 FOR SS COVER, PTB216 FOR SD COVER D & L SUPPLY NO. A-1024, SOUTH BAY FOUNDRY NO. SBF 1900 SAC OR CITY APPROVED EQUAL.



**MANHOLE FRAME
& COVER**

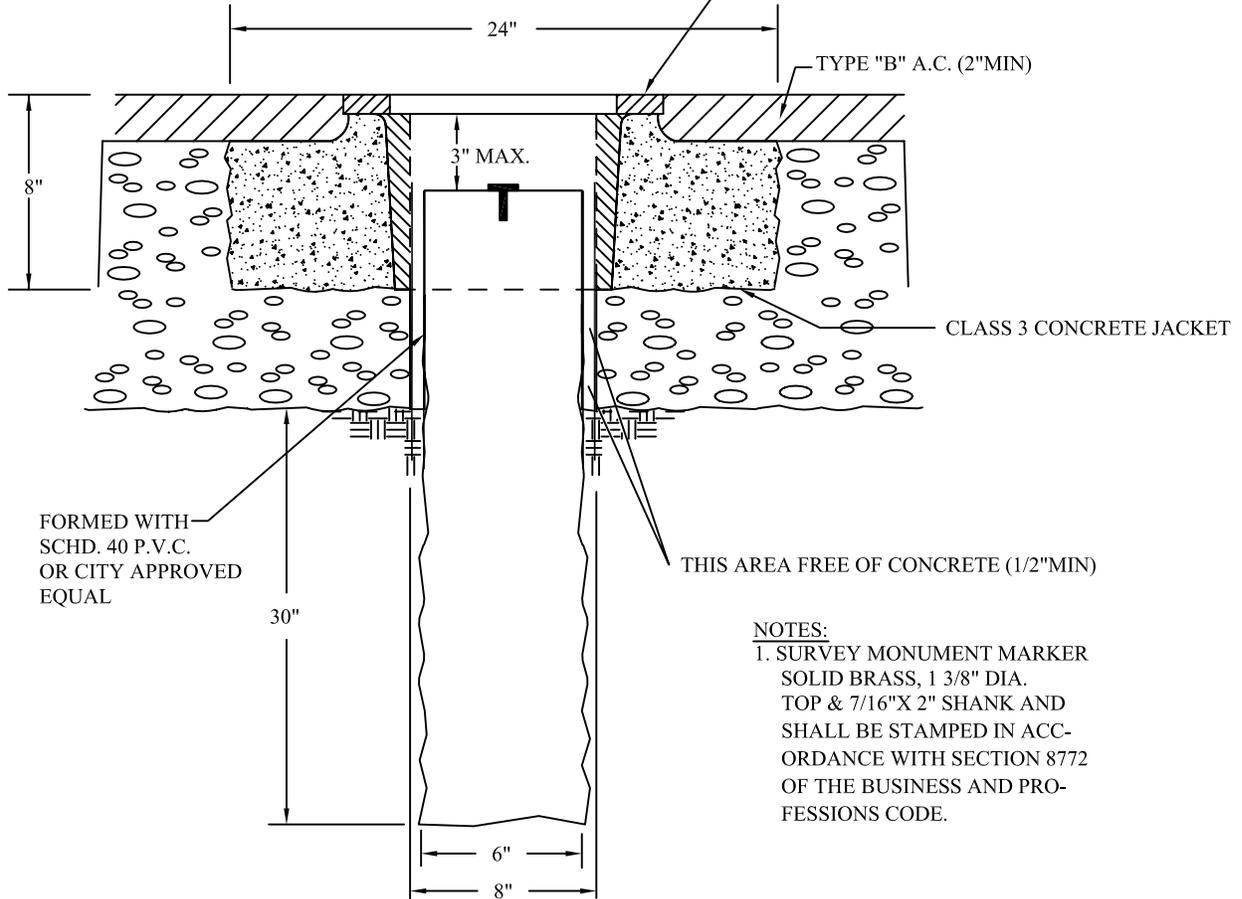
DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-14	
APPROVED BY KENT PERKES, DIRECTOR	DATE



COVER DETAIL

D AND L SUPPLY 9 1/2"
TRAFFIC VALVE BOX TYPE
PART NO. K-6016 OR APPROVED
EQUAL MARKED "MONUMENT"



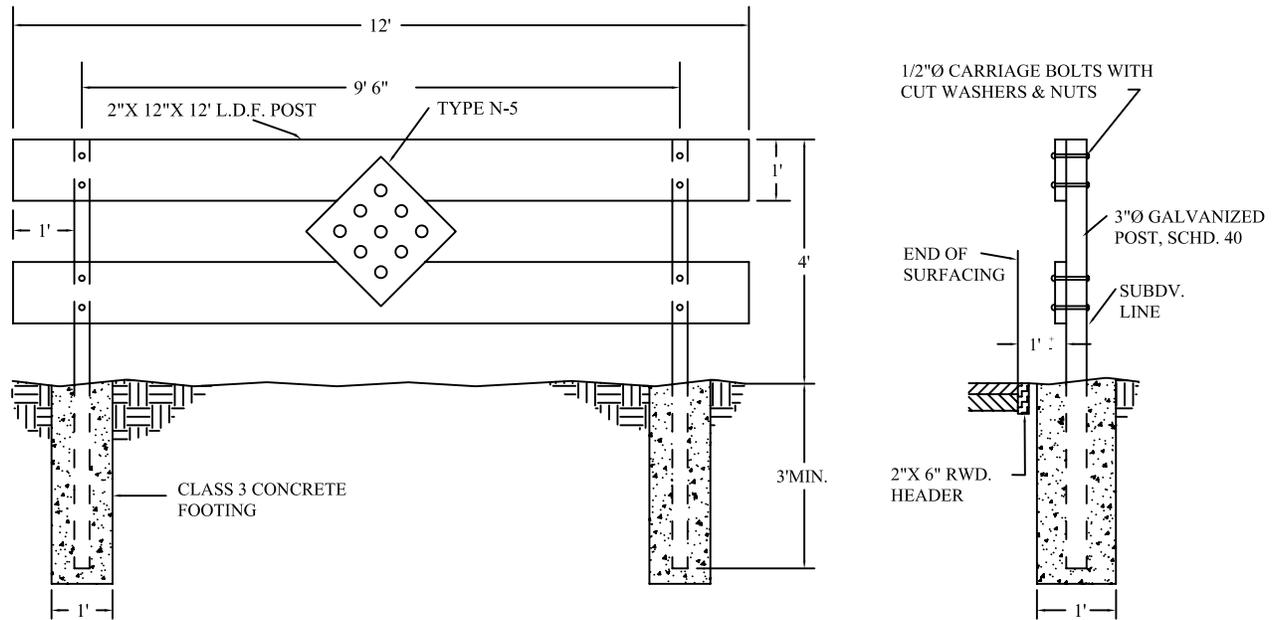
NOTES:

1. SURVEY MONUMENT MARKER
SOLID BRASS, 1 3/8" DIA.
TOP & 7/16" X 2" SHANK AND
SHALL BE STAMPED IN ACC-
ORDANCE WITH SECTION 8772
OF THE BUSINESS AND PRO-
FESSIONS CODE.

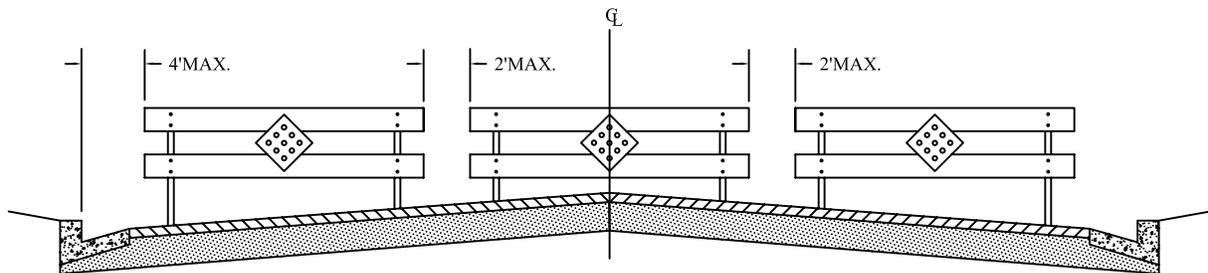
MONUMENT WELL

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-15	
APPROVED BY KENT PERKES, DIRECTOR	DATE



- NOTES:**
1. ALL EXPOSED SURFACES TO BE PAINTED WITH 2 (TWO) COATS OF 1145 SAFETY YELLOW PAINT (OR CITY APPROVED EQUAL).
 2. IF BARRICADE PLACEMENT IS AT END OF CURB, GUTTER, AND SIDEWALK, EXTEND BARRICADES TO BACK OF SIDEWALK.

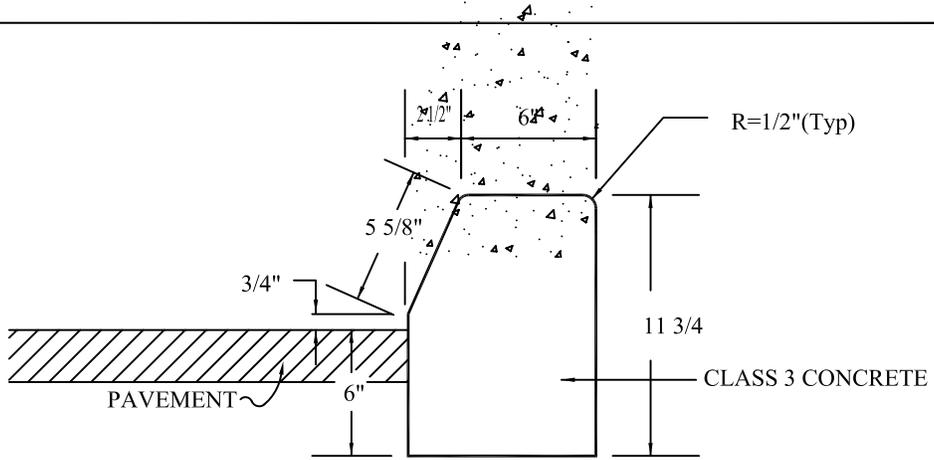


ST. WIDTH	NO. BARRICADES
64'	4 BARRICADES
40'	3 BARRICADES
30'	2 BARRICADES

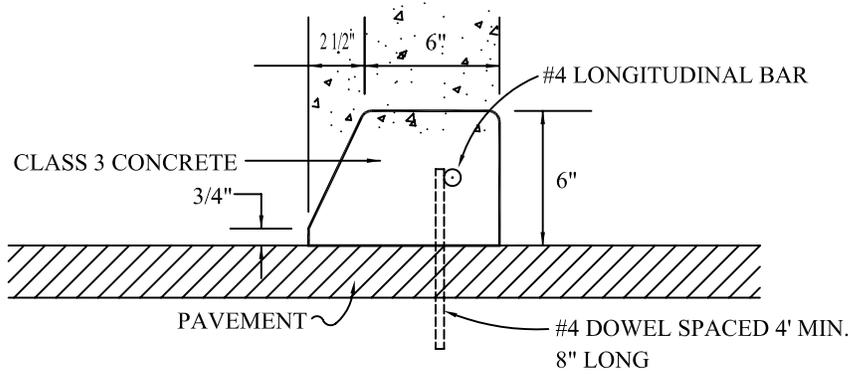
BARRICADE

DATE	REVISIONS	BY

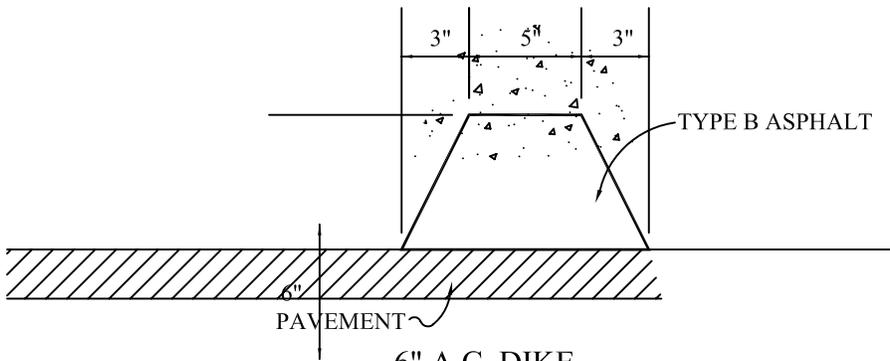
CITY OF WILLOWS	
STANDARD DETAIL	
S-16	
APPROVED BY KENT PERKES, DIRECTOR	DATE



6" P.P.C. CURB (TYPE A)



6" P.C.C. CURB (TYPE B)



6" A.C. DIKE

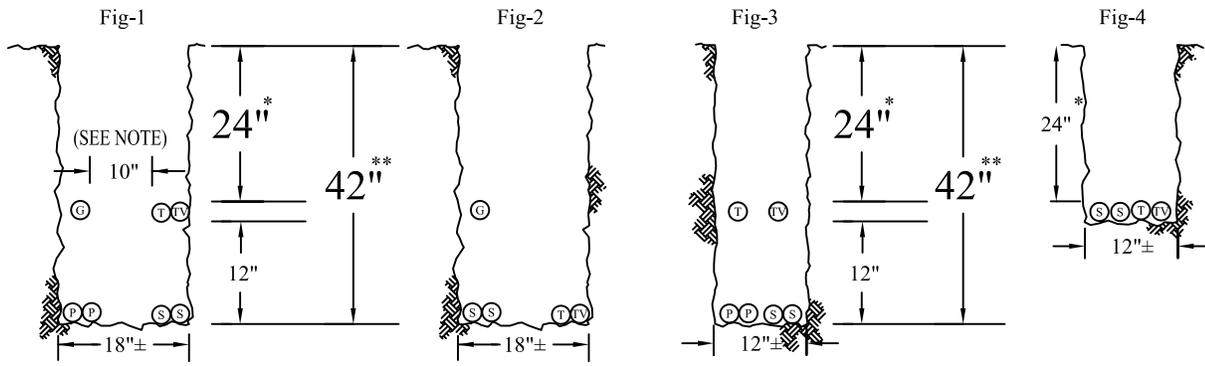
NOTES:

1. ALL WORK TO BE DONE, AND ALL MATERIALS SUPPLIED, SHALL CONFORM TO THE STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, DATED JULY 2002.
2. ALL CONCRETE SHALL BE CLASS 3.

6" CURB & 6" DIKE

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-17	
APPROVED BY KENT PERKES, DIRECTOR	DATE



LEGEND

- (G) — GAS
- (P) — ELECT. PRIMARIES
- (S) — ELECT. SECONDARIES
- (T) — TELEPHONE
- (TV) — TELEVISION

* - INCREASE TO 30" IN STREET AREA
 ** INCREASE TO 48" IN STREET AREA

NOTE:
 1. SEPARATION MAY BE REDUCED TO NOT LESS THAN 6" WHEN NECESSARY, INSTEAD OF INCREASING TRENCH WIDTH.

TYPICAL SIDEWALK & STREET JOINT TRENCH CONFIGURATIONS

JOINT TRENCH OCCUPANCY GUIDE

Sect.	(G)	(P)	(S)	(T)	(TV)	Fig.
A	X	X	12" Trench Width			1
B	X	X	X	12" Trench Width		1
C	X	X	X	X		1
D	X	X		X		1
E	X		X	12" Trench Width		1
F	X		X	X		2
G	X	X			X	1
H	X		X		X	2
I	X			X		1

Sect.	(G)	(P)	(S)	(T)	(TV)	Fig.
J	X			X	X	1
K	X				X	1
L		X	X	36" Min. Cover		3
M		X	X	X		3
N		X		X		3
P		X		X	X	3
Q		X	X		X	3
R		X			X	3
S			X	X		4

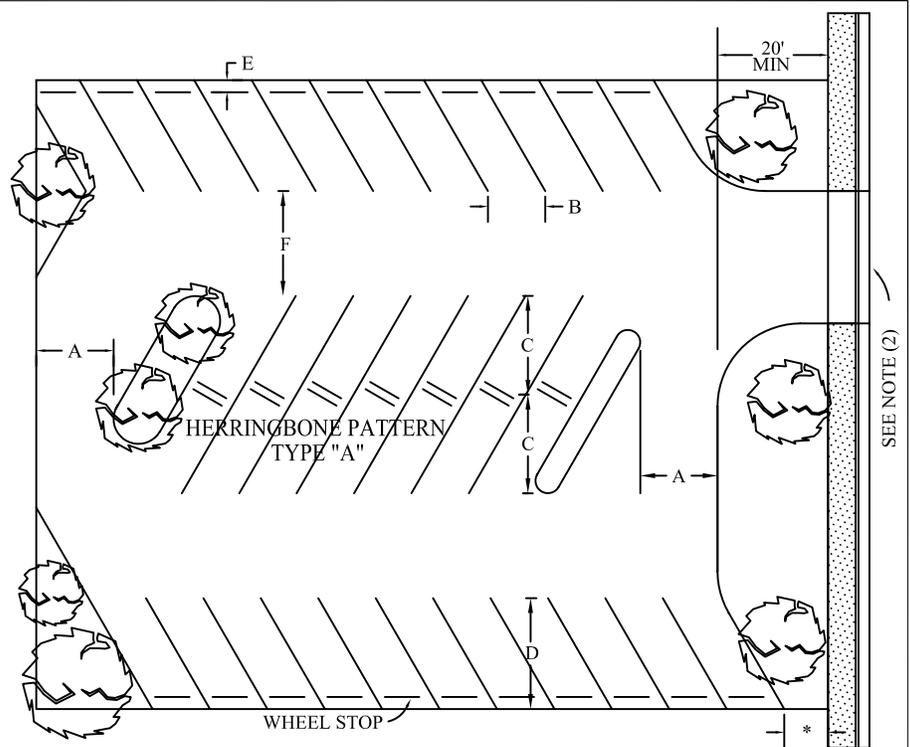
Sect.	(G)	(P)	(S)	(T)	(TV)	Fig.
T			X		X	4
U				X	X	4
V	X	X	X	X	X	1
W	X		X	X	X	2
X		X	X	X	X	3
Y			X	X	X	4

JOINT TRENCH CONFIGURATIONS FOR UTILITY COMPANIES

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-18	
APPROVED BY KENT PERKES, DIRECTOR	DATE

MINIMUM PARKING LOT STANDARDS						
PARKING ANGLE	A	B	C	D	E	F
PARALLEL PARKING						12
30°		18'	12.9'	16.8'	1.3'	13'
45°	17'	12.7'	15.9'	19.1'	1.7'	15'
60°	14'	10.4'	17.9'	20.1'	2.2'	19'
90°	14'	9'	18'	18'	2.5'	27'



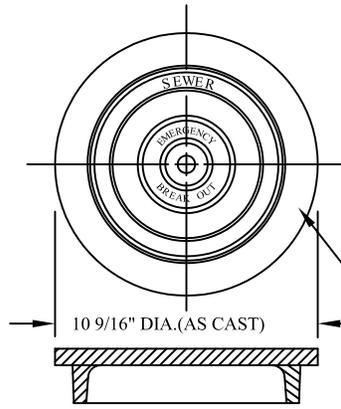
NOTES:

1. A MINIMUM NUMBER OF PARKING SPACES REQUIRED IS ESTABLISHED BY THE CITY OF WILLOWS ZONING ORDINANCE.
2. ALL PARKING STALLS SHALL BE MARKED IN AN ACCEPTED MANNER.
3. LOTS DESIGNED FOR MORE THAN TWO CARS MUST HAVE TWO-WAY ACCESS.
4. WHERE TWO PARKING ANGLES ARE TO BE USED IN A SINGLE LOT, THEY SHALL BE LOCATED IN SEPARATE AREAS OF THE LOT (EXCEPT AS SHOWN IN THE LAYOUT).
5. ANY PARKING LAYOUT NECESSITATING A CUL-DE-SAC OR SIMILAR TYPE OF TURNING FACILITY FOR REVERSING DIRECTION OF TRAVEL IN ORDER TO EXIT FROM THE AREA OR ANY PARKING SPACES WILL GENERALLY BE DISCOURAGED, AND IT SHOULD BE APPROVED BY THE CITY STAFF PRIOR TO THE INCORPORATION INTO THE PLAN.
6. RESIDENTIAL PARKING FOR MORE THAN FOUR CARS AND PARKING IN COMMERCIAL AND INDUSTRIAL AREAS SHALL NOT BE DESIGNED TO REQUIRE BACKING OUT ONTO ANY PUBLIC STREET RIGHT-A-WAY.
7. TWO-WAY PARKING AISLES SHALL BE A MINIMUM OF 24 FEET WIDE.
8. PARKING OR BACKING AREA WITHIN PARKING LOT SHALL NOT EXTEND INTO THE PUBLIC RIGHT-OF-WAY.
9. WHEN A LONG DRIVEWAY HAVING ONLY A SINGLE INGRESS IS NECESSARY WITHIN A DEVELOPMENT, PROVISIONS SHOULD BE MADE FOR THE MANEUVERING OF EMERGENCY VEHICLES AND THE ARRANGEMENT APPROVED BY CITY STAFF PRIOR TO ITS INCORPORATION INTO THE PLAN.
10. ALL PRACTICAL LOTS SHALL HAVE ADEQUATE STRUCTURAL SECTION AND SHALL BE PAVED WITH A MINIMUM OF TWO INCHES OF ASPHALT CONCRETE.
11. ALL UNUSABLE AREAS SHALL BE LANDSCAPED WHERE PACTICAL.
12. LANDSCAPED AREAS WITHIN OR ADJACENT TO THE PARKING AREA SHALL PROVIDE FOR A MINIMUM OF ONE SHADE TREE FOR EVERY FOUR PARKING STALLS. DEPENDING ON TYPE AND SIZE OF SHADE TREE, REQUIREMENTS MAY BE MODIFIED BY THE CITY SITE PLANS.
13. SIX-INCH HIGH CONCRETE CURBS SHALL SEPARATE ALL PAVED AND LANDSCAPED AREAS.
14. HE CONCRETE CURBING SHALL BE USED AS WHEEL STOPS WHERE POSSIBLE. THE USE OF BUMPER BLOCKS IS DISCOURAGED.
15. LANDSCAPED AREAS SHALL BE PROVIDED BETWEEN ASPHALT AREAS AND ALL BUILDING STRUCTURES AND FENCES AND PROPERTY LINES. HARDSCAPING SHALL BE USED WHERE PEDESTRIAN ACCESS IS A NECESSITY AS DETERMINED BY THE CITY SITE PLAN.
16. LANDSCAPING SHALL CONFORM TO THE CITY OF WILLOWS DESIGN REVIEW STANDARDS.
17. END STALLS SHOULD BE PROTECTED FROM THE TURNING MOVEMENT OF OTHER VEHICLES.
18. HANDICAPPED STALLS SHALL BE A MINIMUM OF NINE FEET WIDE PLUS AN ADJACENT FIVE FOOT MINIMUM ACCESS ZONE, PER TITLE 24, CHAPTER 2-7102, CALIFORNIA ADMINISTRATIVE CODE.
19. END STALLS AND STALLS ADJACENT TO CURBINGS SHALL BE A MINIMUM OF TEN FEET WIDE.
20. DEAD END 90° PARKING SHALL BE PROVIDED WITH ADEQUATE TURNING ROOM.
21. PARKING REQUIREMENTS FOR THE INTERIOR OF PARKING LOTS ON INDUSTRIAL LOTS SURROUNDED SOLELY BY HEAVY INDUSTRIALLY ZONED PROPERTIES MAY BE MODIFIED BY THE SITE PLAN.

OFF STREET PARKING LAYOUT

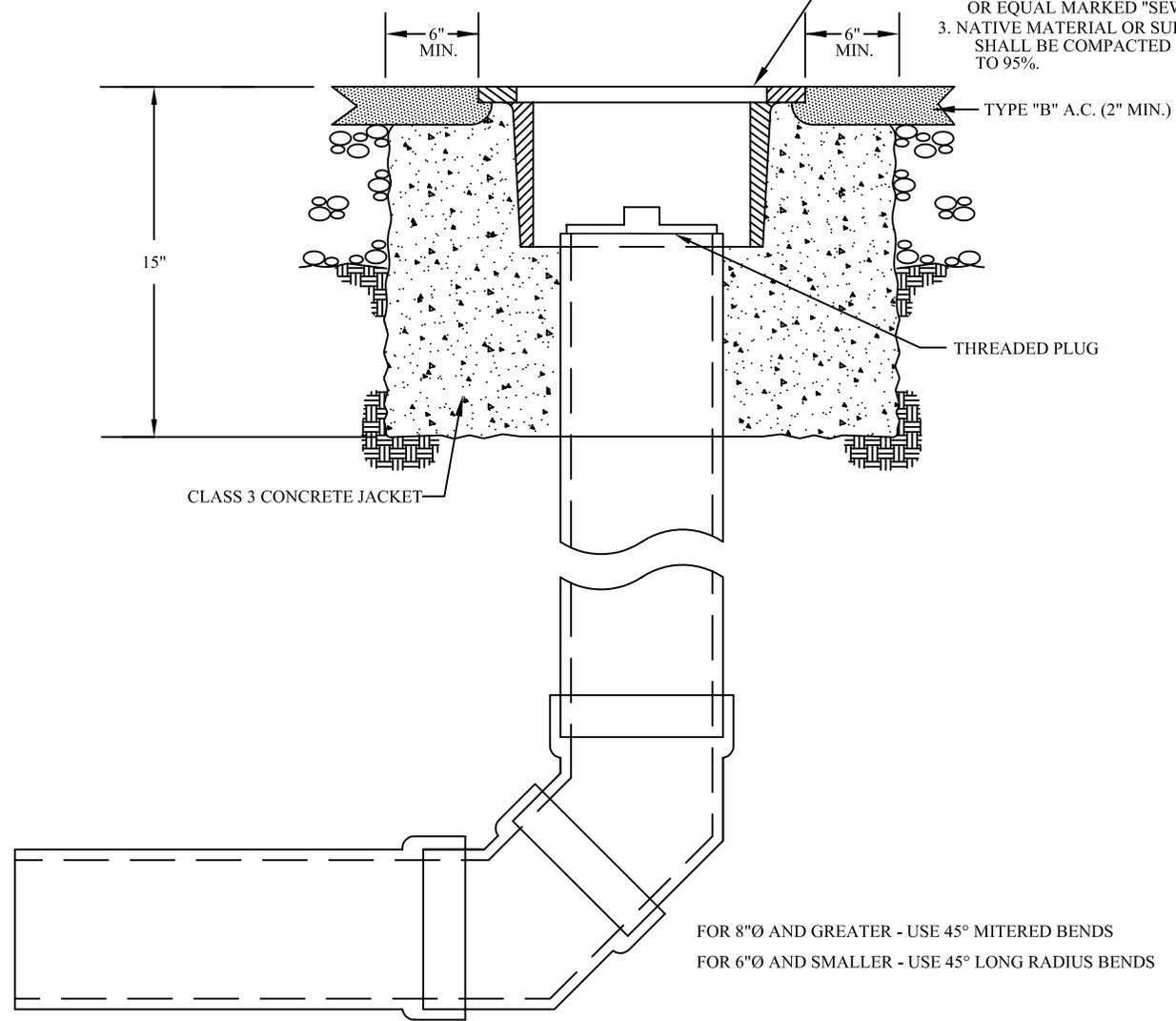
NOTE: Not more than 35% of all required parking spaces may be reduced to 7'-6" in width and 16' in length, and such spaces shall be dispersed throughout the parking lot and marked as compact car parking only, and the resultant area saved is encouraged to be used for landscaping.

CITY OF WILLOWS	
STANDARD DETAIL	
S-19	
APPROVED BY KENT PERKES, DIRECTOR	DATE



COVER DETAIL

- NOTES:
1. FOR 6" SEWER MAIN USE D AND L SUPPLY 9 1/2" TRAFFIC VALVE BOX TYPE K 6016 OR APPROVED EQUAL MARKED "SEWER"
 2. FOR 8" 10" AND 12" SEWER MAINS USE TEICHERT CLEAN-OUT ASSEMBLY H-8026-R1 & H-8026-01 OR EQUAL MARKED "SEWER"
 3. NATIVE MATERIAL OR SUBBASE SHALL BE COMPACTED TO 95%.

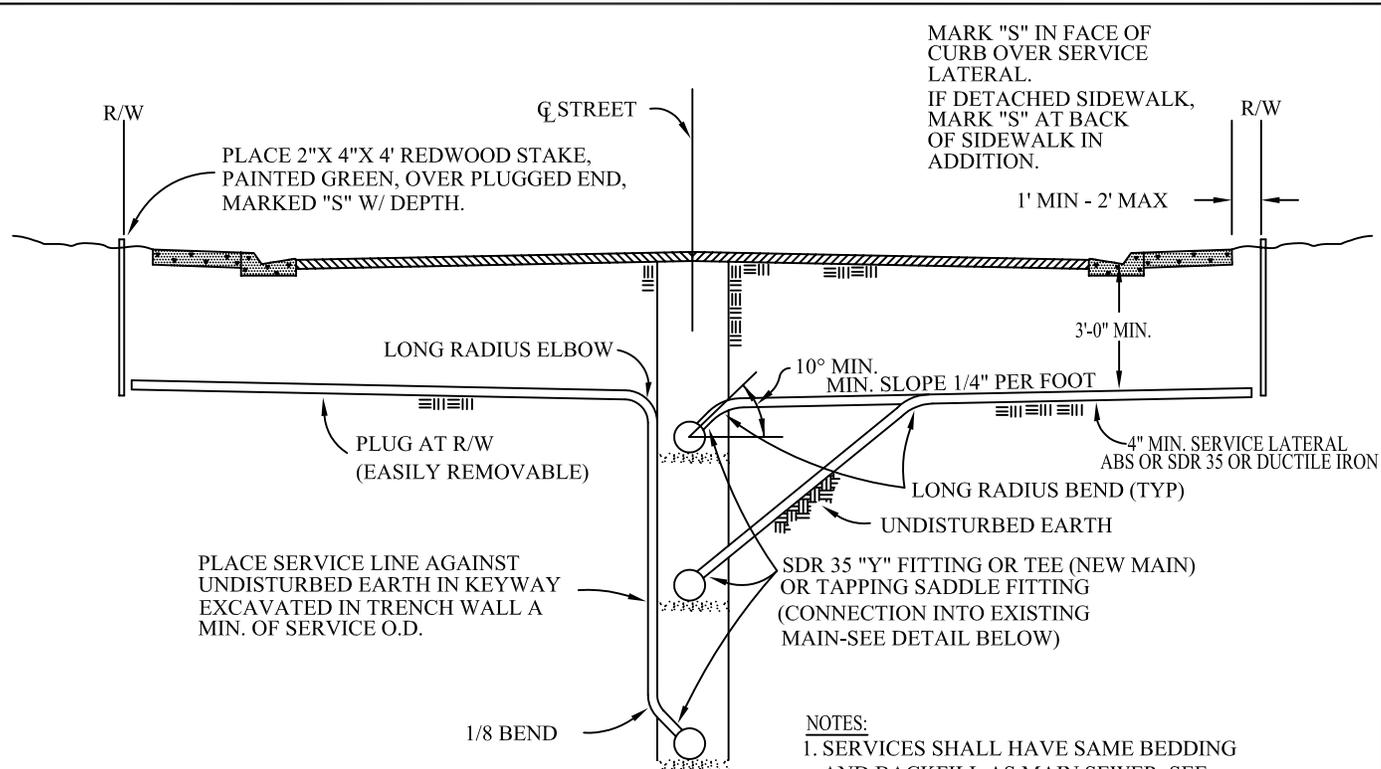


FOR 8"Ø AND GREATER - USE 45° MITERED BENDS
 FOR 6"Ø AND SMALLER - USE 45° LONG RADIUS BENDS

SANITARY SEWER
 CLEANOUT

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-20	
APPROVED BY	DATE
KENT PERKS, DIRECTOR	



MARK "S" IN FACE OF CURB OVER SERVICE LATERAL. IF DETACHED SIDEWALK, MARK "S" AT BACK OF SIDEWALK IN ADDITION.

PLACE 2"X 4"X 4' REDWOOD STAKE, PAINTED GREEN, OVER PLUGGED END, MARKED "S" W/ DEPTH.

1' MIN - 2' MAX

LONG RADIUS ELBOW

PLUG AT R/W (EASILY REMOVABLE)

PLACE SERVICE LINE AGAINST UNDISTURBED EARTH IN KEYWAY EXCAVATED IN TRENCH WALL A MIN. OF SERVICE O.D.

1/8 BEND

10° MIN. MIN. SLOPE 1/4" PER FOOT

3'-0" MIN.

4" MIN. SERVICE LATERAL ABS OR SDR 35 OR DUCTILE IRON

LONG RADIUS BEND (TYP)

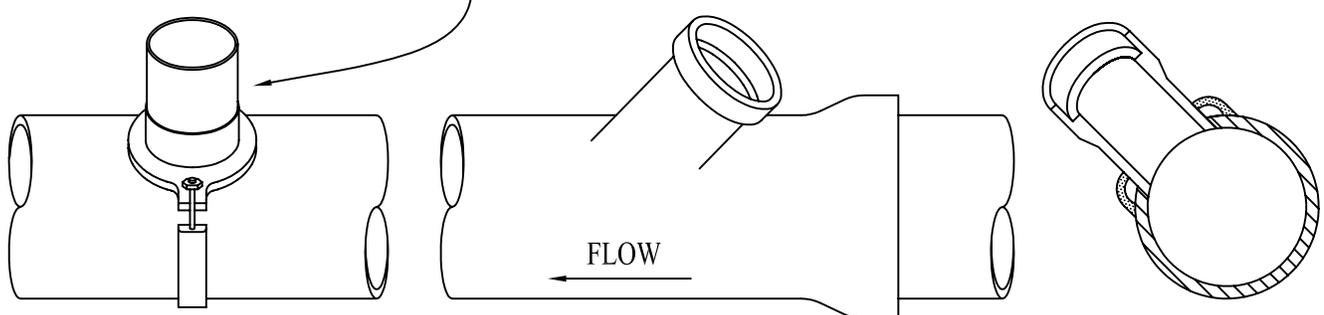
UNDISTURBED EARTH

SDR 35 "Y" FITTING OR TEE (NEW MAIN) OR TAPPING SADDLE FITTING (CONNECTION INTO EXISTING MAIN-SEE DETAIL BELOW)

NOTES:

1. SERVICES SHALL HAVE SAME BEDDING AND BACKFILL AS MAIN SEWER. SEE STANDARD DETAIL S-12.
2. ANY REPAIRS DONE TO SERVICES OR MAINS SHALL HAVE COMPRESSION COUPLINGS WITH STAINLESS STEEL SHEAR RINGS
3. PIPE FOR MAIN AND SERVICES SHALL BE FUSION BONDED EPOXY DUCTILE IRON PIPE WHEN COVER IS LESS THAN 3'.

TAPPING SADDLE (CONNECTED TO PIPE W/STAINLESS STEEL STRAP) SEALTITE OR CITY APPROVED EQUAL.

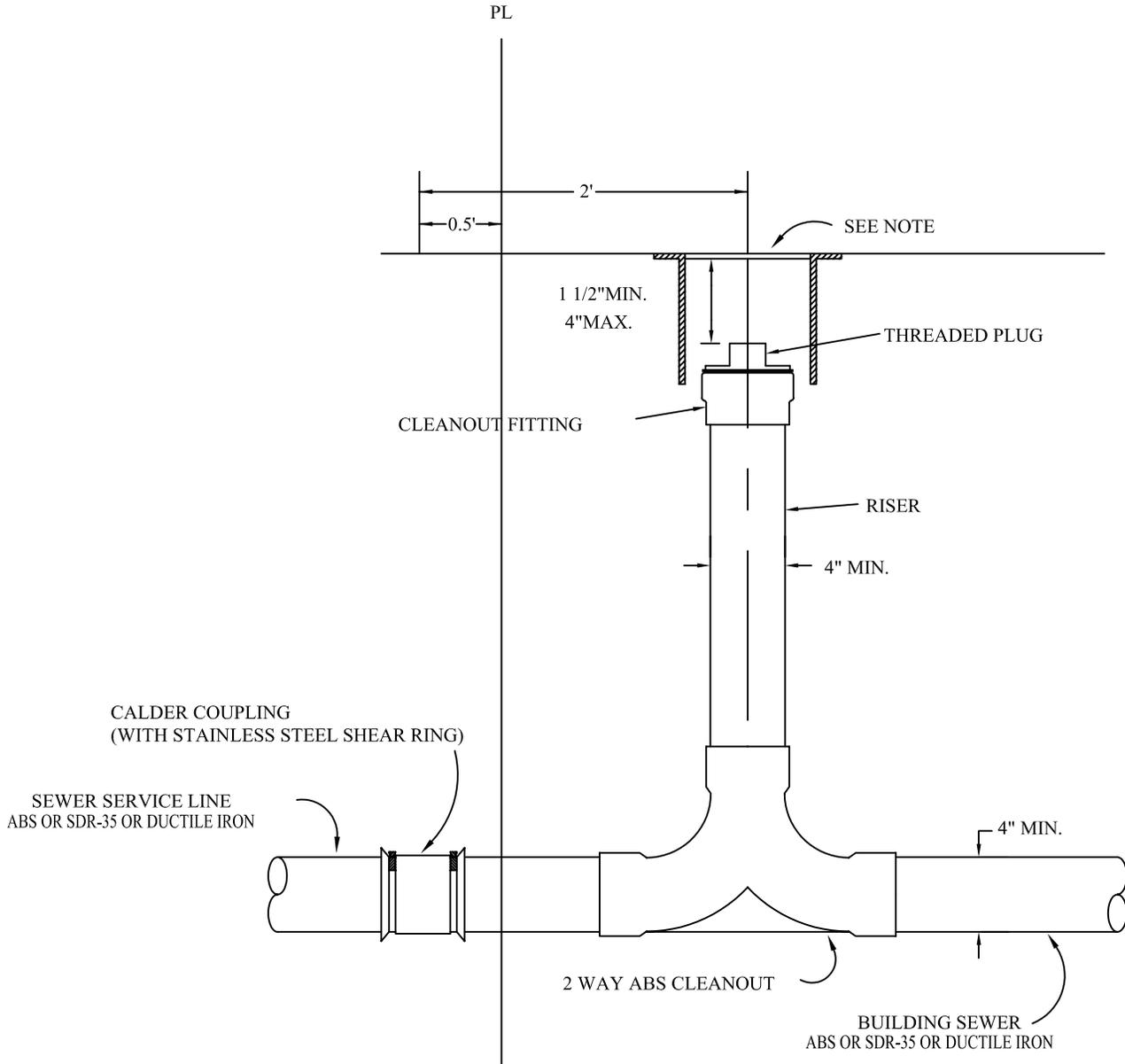


PRE FABRICATED WYE SDR 35

SANITARY SEWER SERVICE & CONNECTION

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-21	
APPROVED BY KENT PERKS, DIRECTOR	DATE



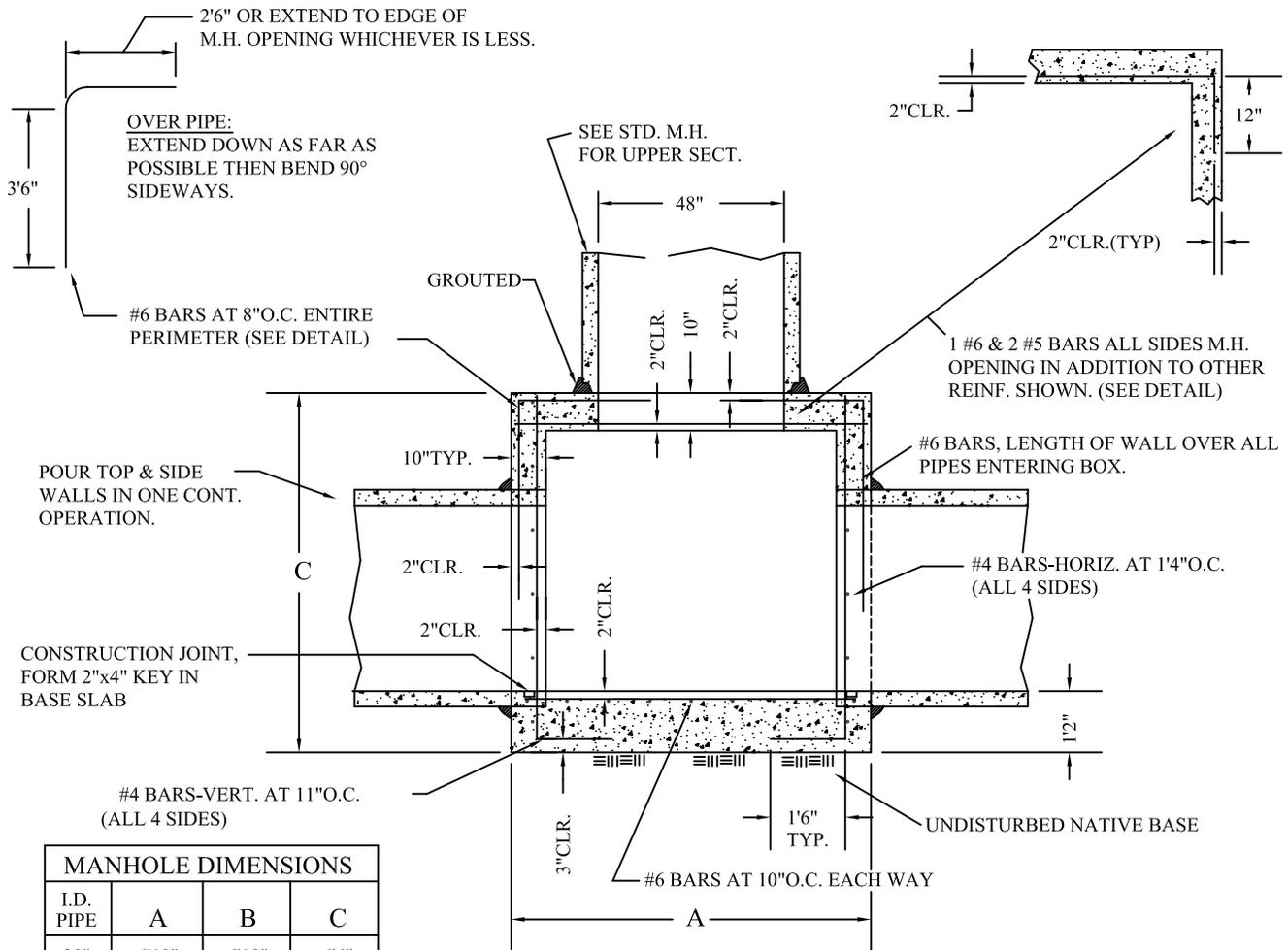
NOTES:

1. WHEN INSTALLED IN DRIVEWAY USE D AND L SUPPLY 9 1/2" TRAFFIC VALVE BOX TYPE K 6016 OR APPROVED EQUAL MARKED SEWER - WHEN INSTALLED IN LAWN OR PLANTER AREA, PLACE AN 18" SQUARE CONCRETE PAD AROUND VALVE BOX.

**SANITARY SEWER
SERVICE CLEANOUT**

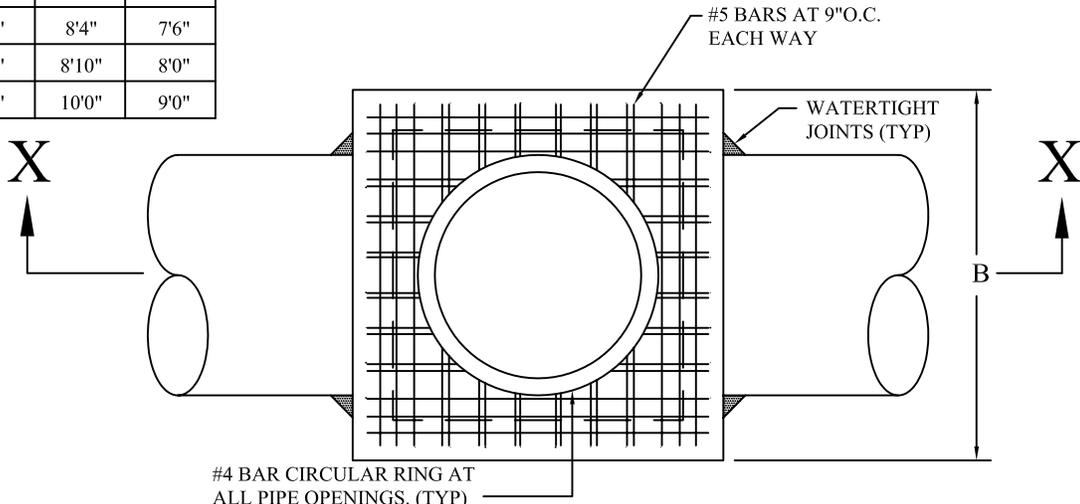
DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-22	
APPROVED BY KENT PERKES, DIRECTOR	DATE



SECTION X-X

MANHOLE DIMENSIONS			
I.D. PIPE	A	B	C
30"	6'10"	6'10"	6'4"
36"	6'10"	6'10"	6'4"
42"	6'10"	6'10"	6'4"
48"	7'4"	7'4"	7'0"
54"	8'2"	8'4"	7'6"
60"	8'4"	8'10"	8'0"
72"	9'4"	10'0"	9'0"



NOTES:

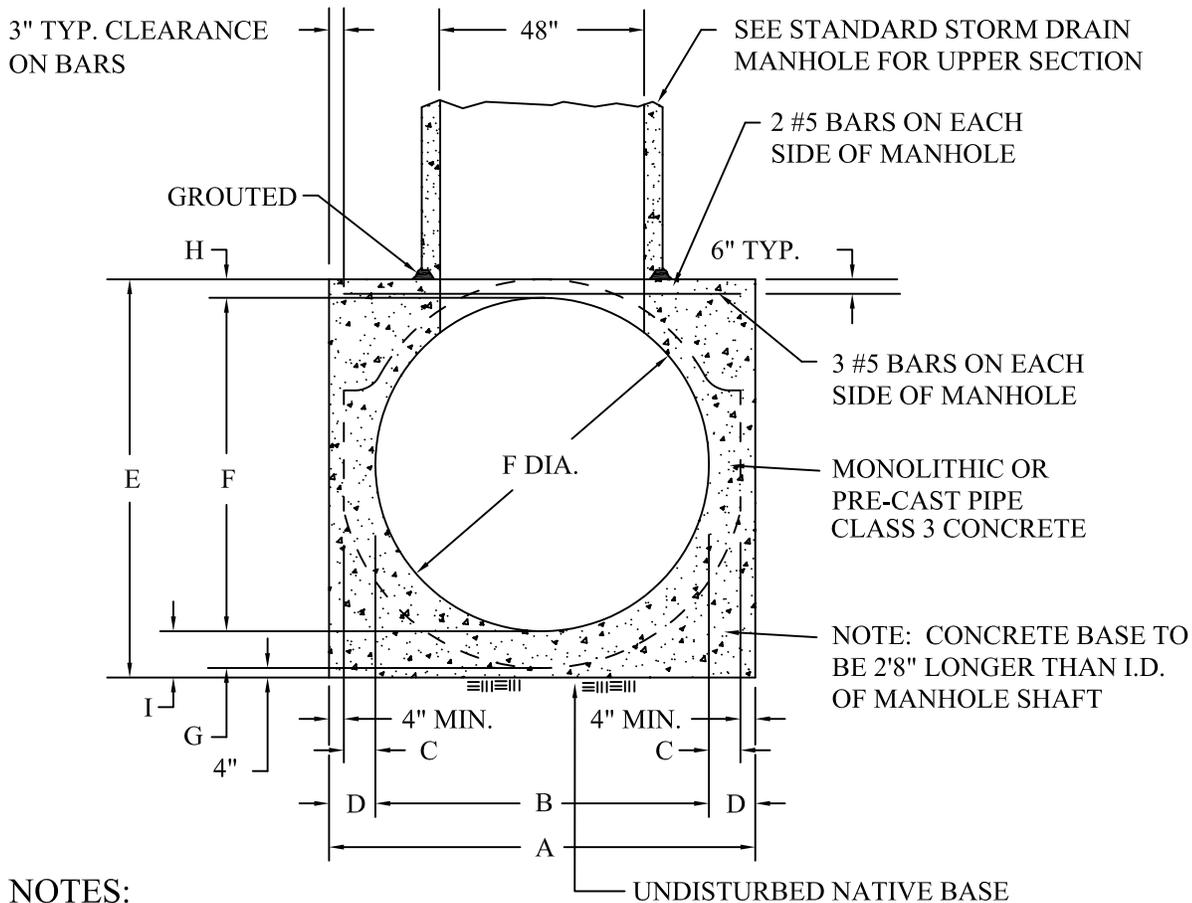
1. ALL WORK TO BE DONE, AND ALL MATERIALS SUPPLIED, SHALL CONFORM TO THE STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, DATED JULY 2002.
2. BROOM FINISH SHALL BE PARALLEL TO DIRECTION OF FLOW.
3. ALL CONCRETE SHALL BE CLASS 3.

**JUNCTION BOX FOR PIPES
30" DIAMETER OR GREATER**

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-23	
APPROVED BY KENT PERKES, DIRECTOR	DATE

MANHOLE DIMENSIONS									
I.D. PIPE	A	B	C	D	E	F	G	H	I
30"	5'0"	2'6"	5"	1'3"	3'9"	2'6"	3"	8"	7"
36"	5'0"	3'0"	4-1/2"	1'0"	4' 3-1/2"	3'0"	3-1/2"	8"	7-1/2"
42"	5'0"	3'6"	5"	9"	4'10"	3'6"	4"	8"	8"
48"	5'8"	4'0"	6"	10"	5'5"	4'0"	5"	8"	9"
54"	6'3"	4'6"	6-1/2"	10-1/2"	5' 11-1/2"	4'6"	5-1/2"	8"	9-1/2"
84"	9'0"	7'0"	8"	1'0"	8'7"	7'0"	7"	8"	11"
96"	10'2"	8'0"	9"	1'1"	9'9"	8'0"	7"	8"	1'1"



NOTES:

1. ALL WORK TO BE DONE, AND ALL MATERIALS SUPPLIED, SHALL CONFORM TO THE STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, DATED JULY 2002.
2. ALL CONCRETE SHALL BE CLASS 3.
3. BROOM FINISH SHALL BE PARALLEL TO THE DIRECTION OF FLOW.

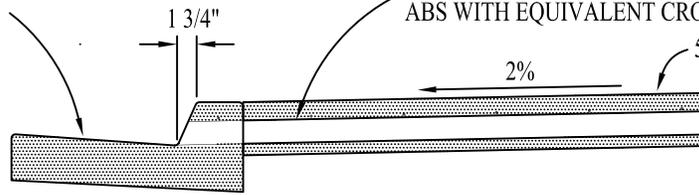
**MANHOLE FOR PIPE
30" DIA. OR GREATER**

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-24	
APPROVED BY KENT PERKES, DIRECTOR	DATE

STD. CITY CURB & GUTTER

5"x3"x3/16" GALV. STRUC. TUBING OR RECTANGULAR ABS WITH EQUIVALENT CROSS-SECTIONAL AREA

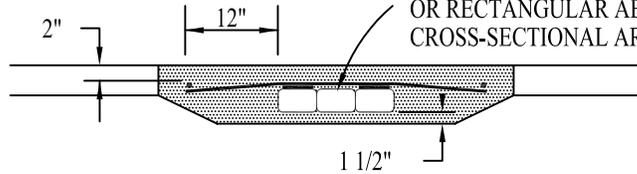


STRUCT. TUBING OR ABS TO BE CUT TO FIT CURB ANGLE.
COAT ENDS OF TUBING WITH MIN. 2 COATS SHERWIN WILLIAMS "GALVITE" OR EQUAL.

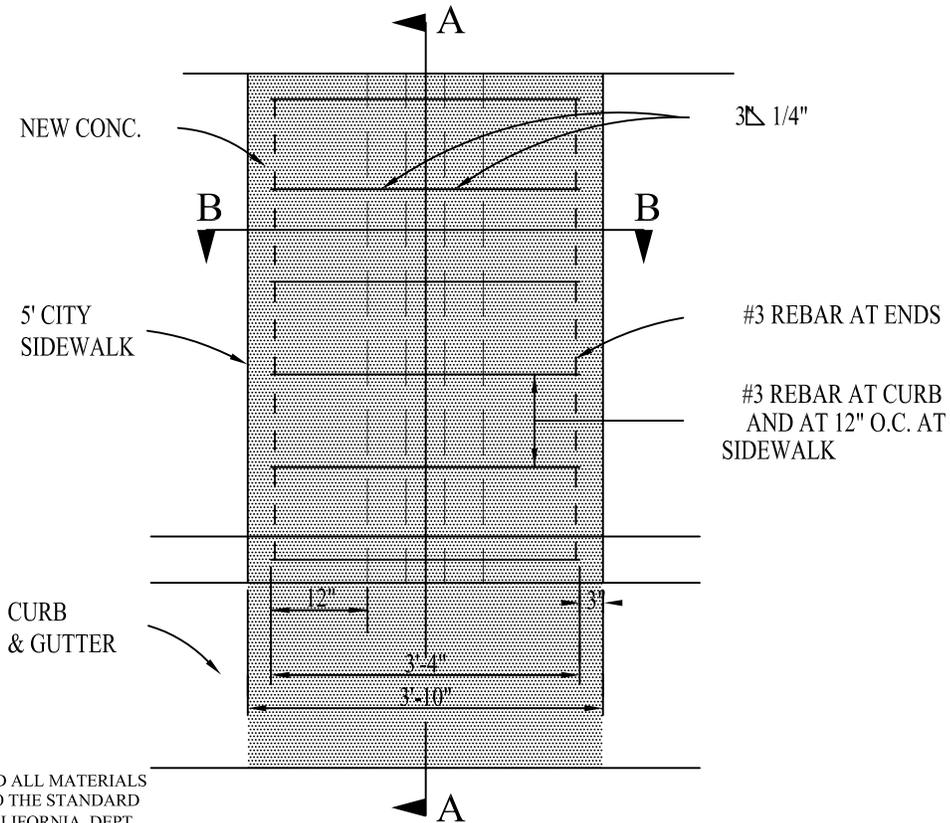
NOTE: DRAIN ASSEMBLY SHALL BE FABRICATED AND HOT DIP GALVANIZED.

SECTION A-A

THREE 5"x3"x3/16" GALV. STRUC. TUBING OR RECTANGULAR ABS WITH EQUIVALENT CROSS-SECTIONAL AREA



SECTION B-B



NOTES:

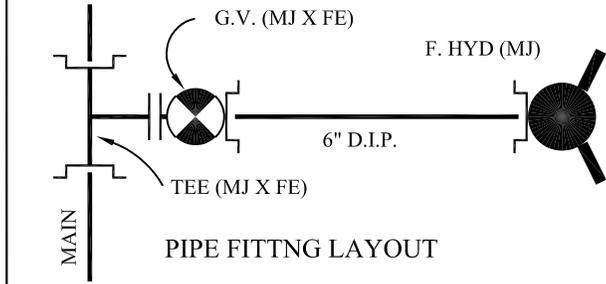
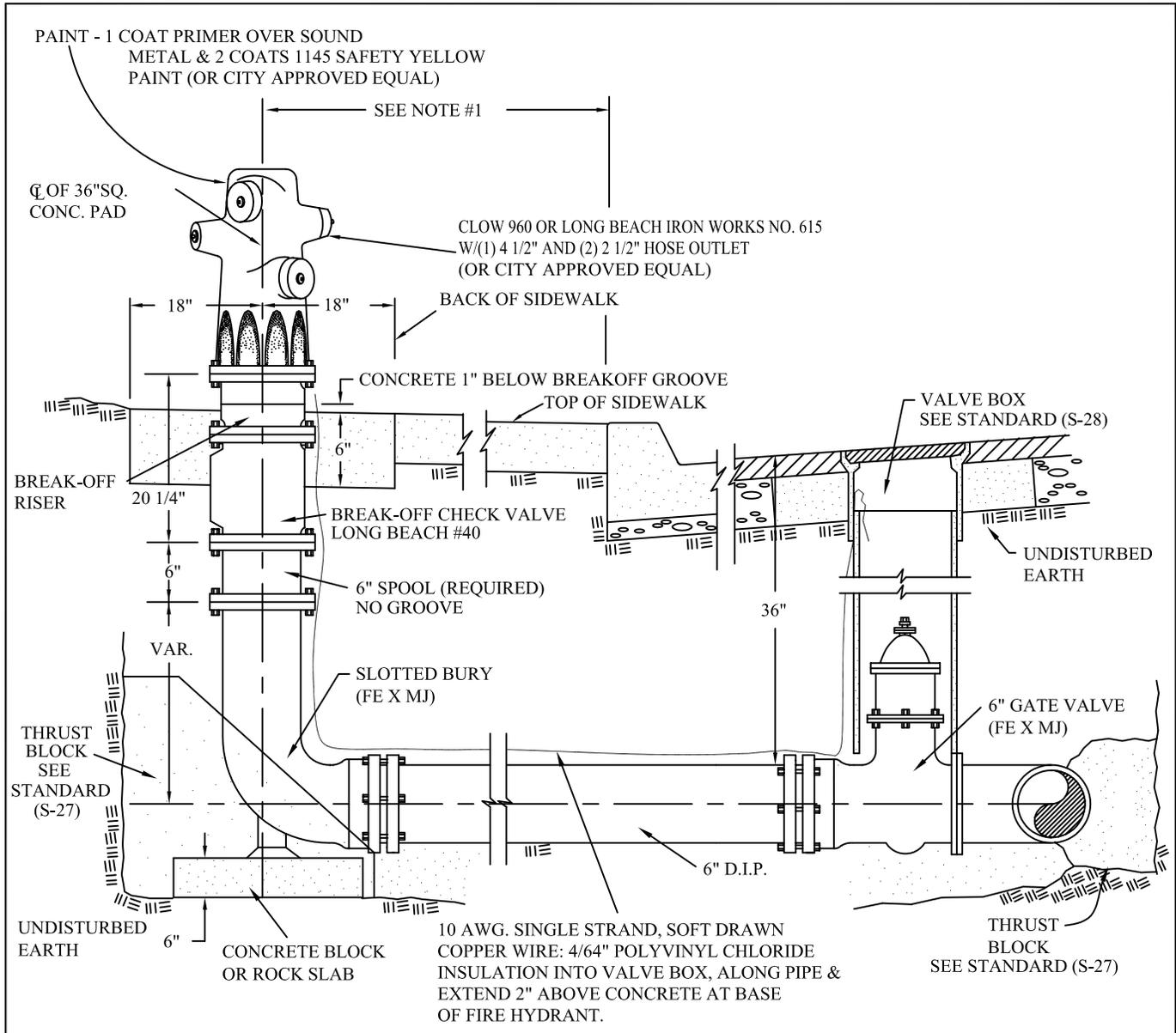
1. ALL WORK TO BE DONE, AND ALL MATERIALS SUPPLIED SHALL CONFORM TO THE STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPT. OF TRANSPORTATION, DATED JULY 2002.
2. ALL CONCRETE SHALL BE CLASS 3.

PLAN VIEW

UNDER SIDEWALK DRAIN

DATE		BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-25	
APPROVED BY KENT PERKES, DIRECTOR	DATE



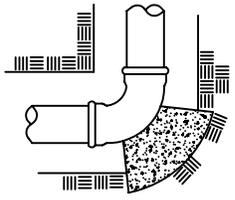
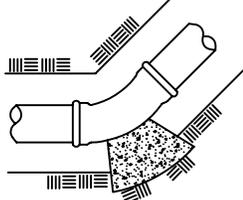
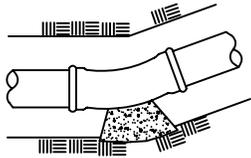
NOTES:

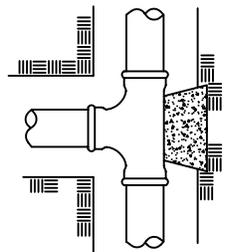
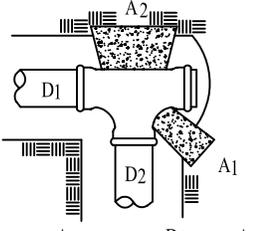
1. BLUE REFLECTIVE PAVEMENT MARKERS SHALL BE PLACED 6" FROM CENTERLINE ON SIDE NEAREST THE HYDRANT ON TWO OR MULTI-LANE STREETS. TWO MARKERS ARE REQUIRED AT INTERSECTIONS HAVING A HYDRANT. THE MARKER SHALL BE PLACED 6" FROM THE EDGE OF THE CONTINUOUS LEFT TURN LANE LINE ON SIDE NEAREST THE HYDRANT. FOUR LANE STREETS WITH TURN LANE AT INTERSECTION, THE MARKER SHALL BE PLACED 6" FROM NEAREST WHITE LINE ON THE SIDE NEAREST THE HYDRANT.
2. HYDRANT SHALL BE PLACED 24" BEHIND TOP BACK OF CURB WHEN PLACED WITHIN PLANTER STRIP. CONC. PAD SHALL EXTEND FROM TOP BACK OF CURB TO 18" BEYOND CENTERLINE OF HYDRANT.
3. ALL WORK SHALL CONFORM TO AWWA CODES.

FIRE HYDRANT

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-26	
APPROVED BY	DATE
KENT PERKS, DIRECTOR	

TYPE OF FITTING		90° BEND	45° BEND	11 1/2° OR 22 1/2° BEND
TYPICAL INSTALLATION				
SIZE OF PIPE	4"	2	1	1
	6"	4	2	1
	8"	7	4	2
	10"	12	6	3
	12"	16	10	5
	24"	60	30	16
	30"	90	45	25

TYPE OF FITTING		TEE OR DEAD END	TEE WITH PLUG			
TYPICAL INSTALLATION						
SIZE OF PIPE	4"	2	4"	2	4"	2
	6"	3	6"	4	6"	3
	8"	5	8"	6	8"	5
	10"	8	10"	10	10"	8
	12"	12	12"	14	12"	12
	24"	40	24"	55	24"	40
	30"	60	30"	80	30"	60

REQUIRED BEARING ~ TOTAL SQUARE FEET

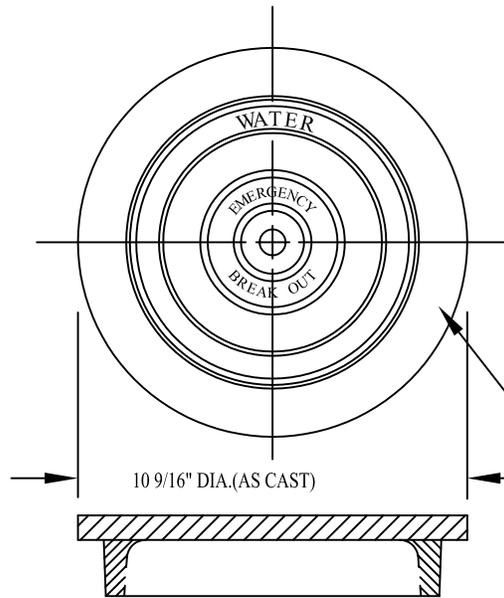
NOTES:

- THRUST BLOCKS TO BE CONSTRUCTED OF CLASS "3" CONCRETE.
- AREAS GIVEN ARE FOR CLASS 150 PIPE AT TEST PRESSURE OF 150 P.S.I. IN SOIL WITH 2,500 P.S.F. BEARING CAPACITY. INSTALLATIONS USING DIFFERENT PIPE, TEST PRESSURES, AND/OR SOIL TYPES SHOULD ADJUST AREAS ACCORDINGLY, SUBJECT TO APPROVAL BY CITY ENGINEER.
- THRUST BLOCKS TO BE POURED AGAINST UNDISTURBED SOIL.
- JOINTS TO BE KEPT CLEAR OF CONCRETE.
- THRUST BLOCKS TO BE IN PLACE 7 (SEVEN) DAYS BEFORE TESTING.
- ALL PLUGS SHALL BE SECURED WITH THRUST BLOCKS.

THRUST BLOCKS

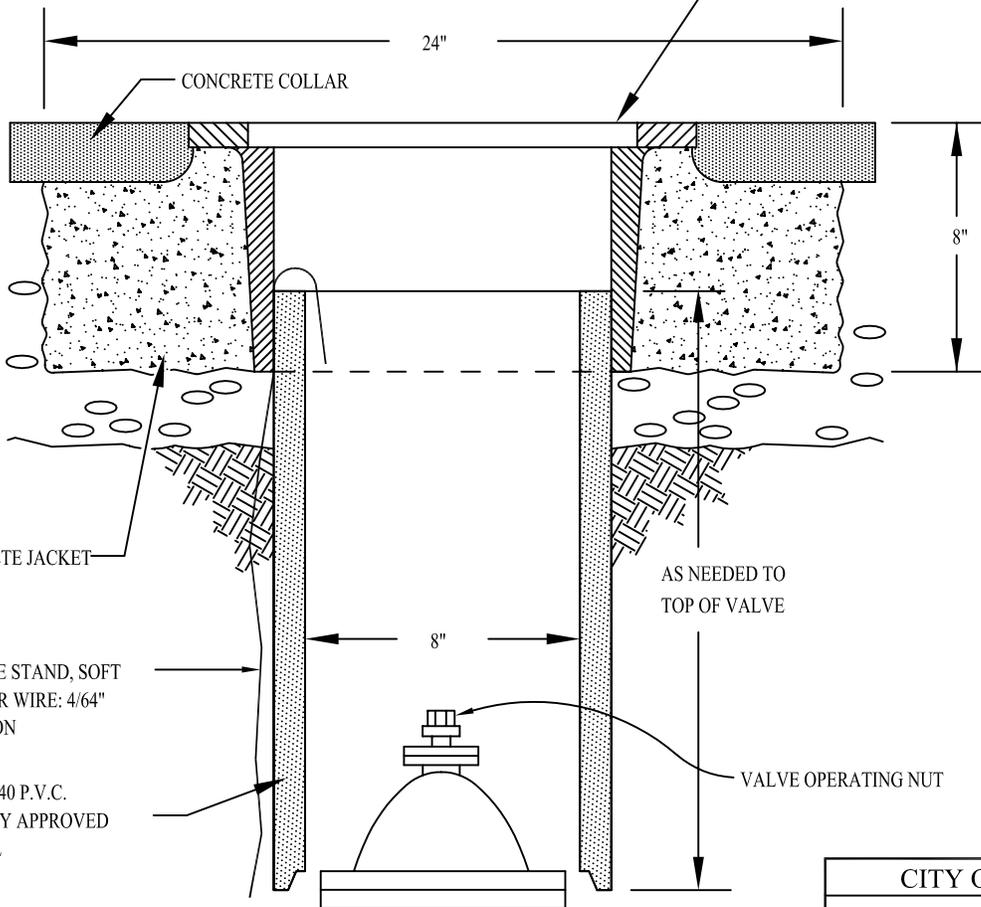
DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-27	
APPROVED BY KENT PERKES, DIRECTOR	DATE



COVER DETAIL

D AND L SUPPLY 9 1/2"
TRAFFIC VALVE BOX TYPE
K-6016 OR APPROVED
EQUAL MARKED "WATER"



CLASS 3 CONCRETE JACKET

10 AWG. SINGLE STAND, SOFT
DRAWN COPPER WIRE: 4/64"
PVC INSULATION

SCHD. 40 P.V.C.
OR CITY APPROVED
EQUAL

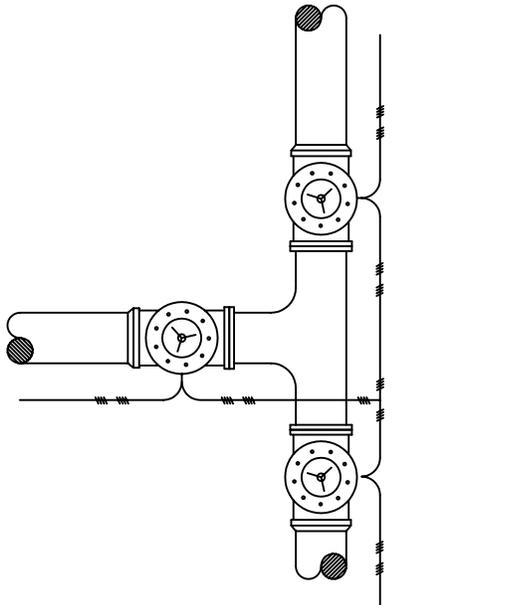
AS NEEDED TO
TOP OF VALVE

VALVE OPERATING NUT

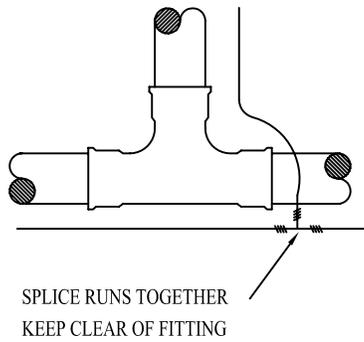
WATER VALVE BOX

DATE	REVISIONS	BY

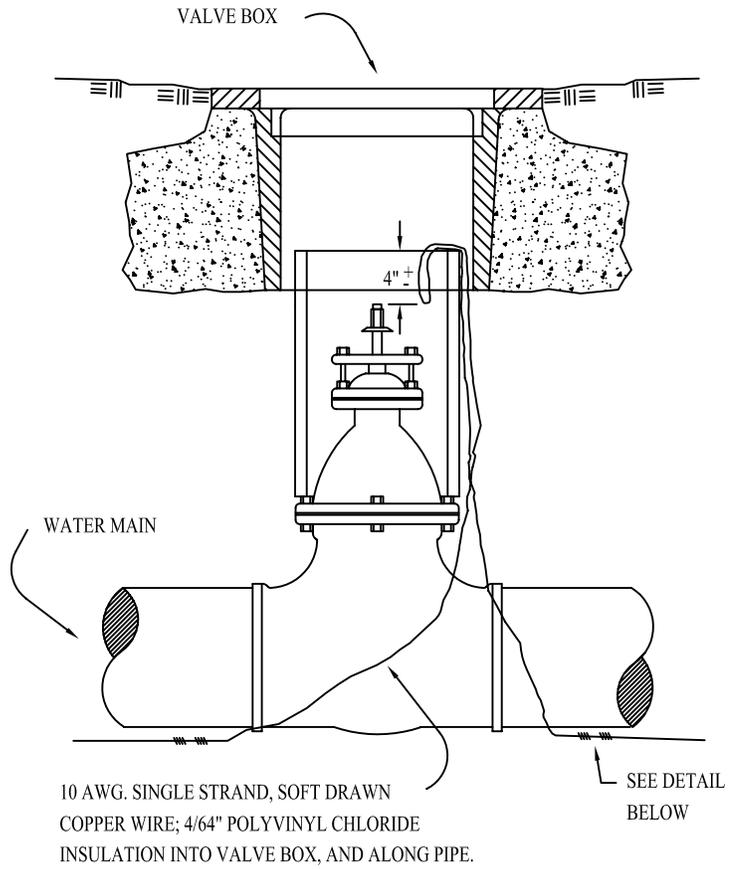
CITY OF WILLOWS	
STANDARD DETAIL	
S-28	
APPROVED BY	DATE
KENT PERKES, DIRECTOR	



TYPICAL LAYOUT

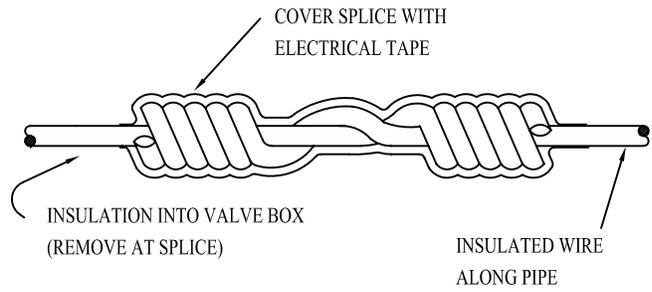


SPLICE RUNS TOGETHER
KEEP CLEAR OF FITTING



10 AWG. SINGLE STRAND, SOFT DRAWN
COPPER WIRE; 4/64" POLYVINYL CHLORIDE
INSULATION INTO VALVE BOX, AND ALONG PIPE.

SEE DETAIL
BELOW



SPLICE DETAIL

NOTES:

1. WIRE TO BE CONTINUOUS BETWEEN VALVE BOXES.
2. LOCATING WIRE TO BE LAID AT BOTTOM OF TRENCH, NEXT TO PIPE.

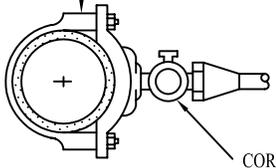
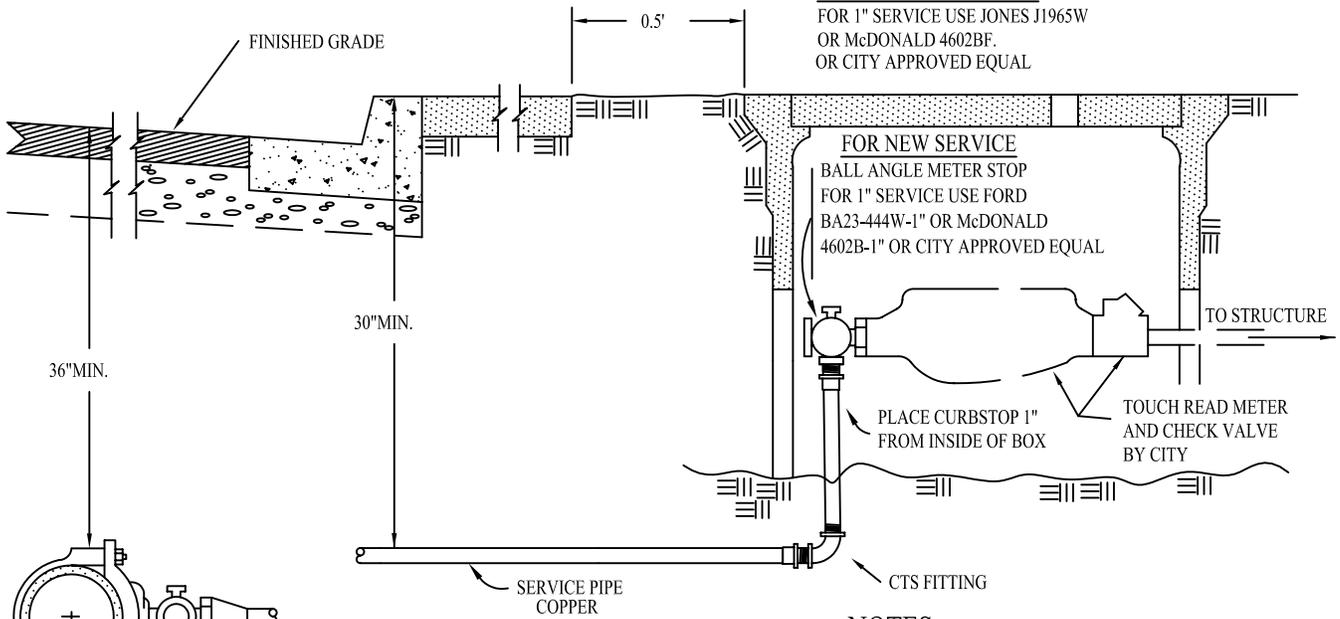
LOCATING WIRE FOR WATER
MAINS AND SERVICES

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-29	
APPROVED BY KENT PERKES, DIRECTOR	DATE

FOR EXISTING SERVICE
 FOR 1" SERVICE USE JONES J1965W
 OR McDONALD 4602BF.
 OR CITY APPROVED EQUAL

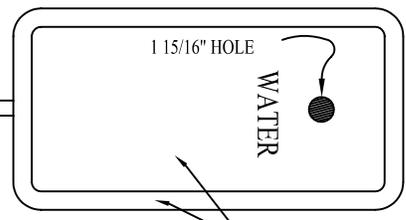
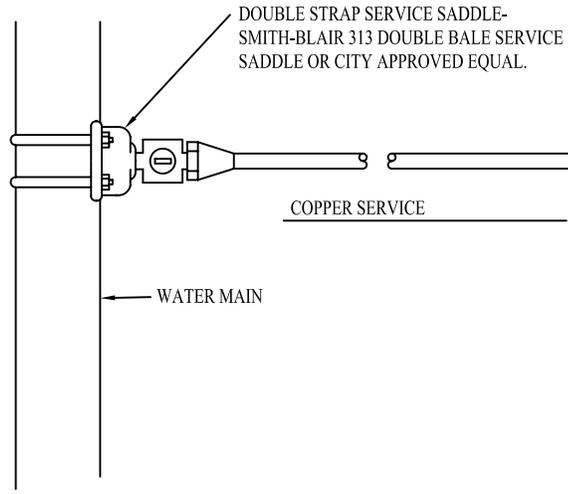
FOR NEW SERVICE
 BALL ANGLE METER STOP
 FOR 1" SERVICE USE FORD
 BA23-444W-1" OR McDONALD
 4602B-1" OR CITY APPROVED EQUAL



CORPORATION STOP-
 FORD BALLCORP FB700 OR
 CITY APPROVED EQUAL.

NOTES:

1. 1" SERVICES SHALL BE COPPER TYPE "K" SOFT.
2. SPLICES IN THE SERVICE LINE ARE TO BE AVOIDED; BUT IF ALLOWED, THEY SHALL BE MADE USING CTS GRIP-TYPE COMPRESSION COUPLINGS.
3. ALL FITTINGS ARE COPPER OR BRASS AND SHALL BE MUELLER 110 (CONDUCTIVE TYPE) COMPRESSION CONNECTIONS OR CITY APPROVED EQUAL.
4. WHEN BACKFLOW PREVENTER IS REQUIRED, SEE DETAIL (S-33).
5. ALL WORK SHALL CONFORM TO AWWA CODES.



CHRISTY METER BOX & COVER
 OR CITY APPROVED EQUAL

CHRISTY		
METER SIZE	MODEL NO.	LID TYPE *
1"	B 16	"D"

* WITH 1 3/4" HOLE / TRPL

**1" WATER SERVICE
 MAIN CONNECTION**

DATE	REVISIONS	BY

CITY OF WILLOWS

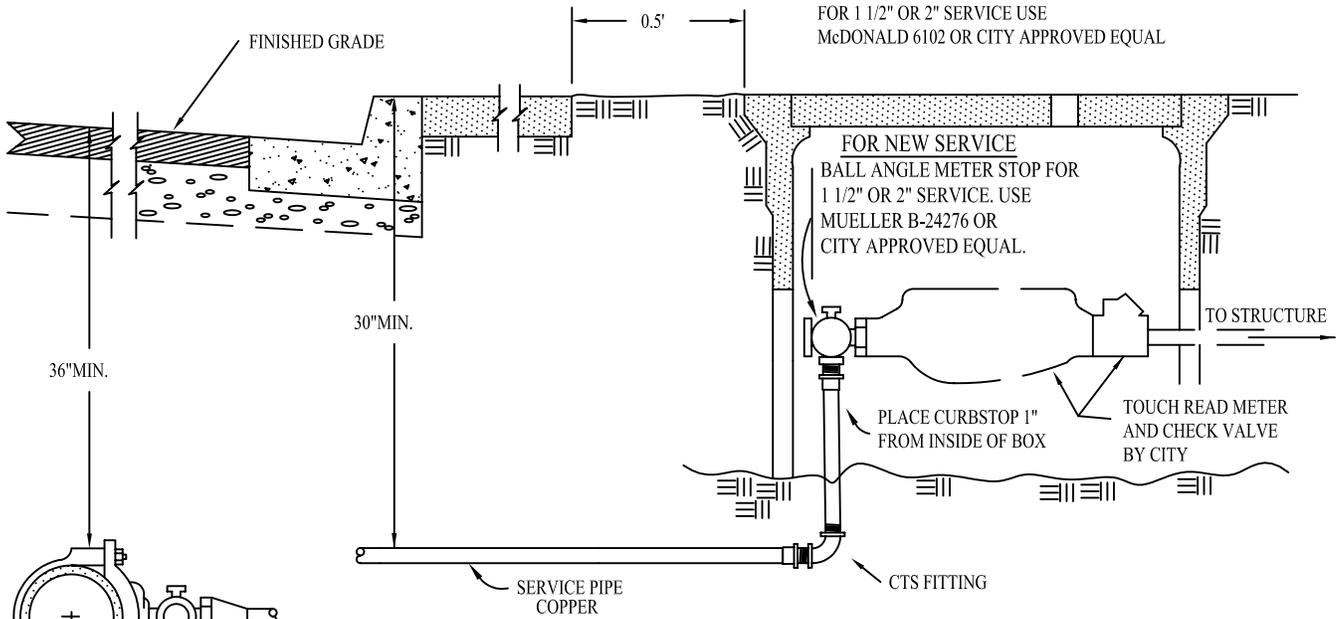
STANDARD DETAIL

S-30

APPROVED BY _____ DATE _____
 KENT PERKES, DIRECTOR

FOR EXISTING SERVICE

FOR 1 1/2" OR 2" SERVICE USE
McDONALD 6102 OR CITY APPROVED EQUAL

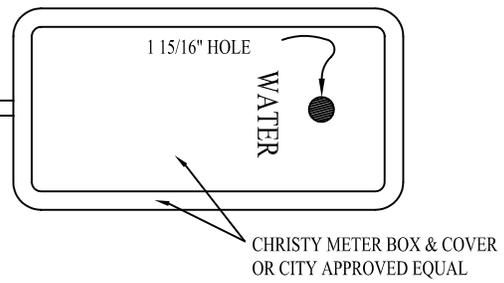
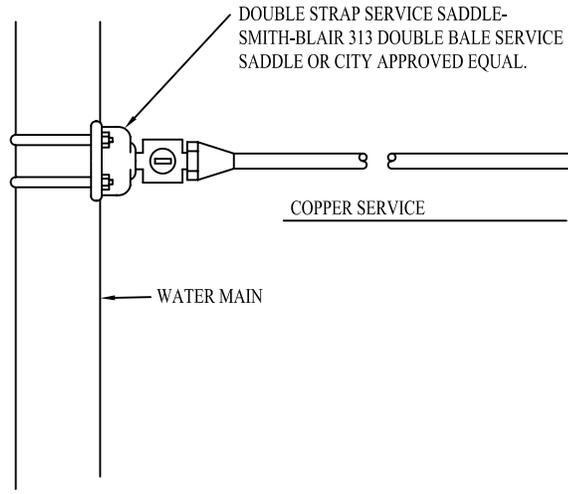


FOR NEW SERVICE
BALL ANGLE METER STOP FOR
1 1/2" OR 2" SERVICE USE
MUELLER B-24276 OR
CITY APPROVED EQUAL.

CORPORATION STOP-FORD BALLCORP FB700 OR CITY APPROVED EQUAL.

NOTES:

- 1 1/2" & 2" SERVICES SHALL BE COPPER TYPE "K" UNLESS OTHERWISE SPECIFIED.
- ALL FITTINGS ARE COPPER OR BRASS AND SHALL BE MUELLER 110 (CONDUCTIVE TYPE) COMPRESSION CONNECTIONS OR CITY APPROVED EQUAL.
- INSTALLATION SHOWN IS FOR USE WITH A NON-TURBO TYPE METER.
- WHEN BACKFLOW PREVENTER IS REQUIRED, SEE DETAIL S-33.
- ALL WORK SHALL CONFORM TO AWWA CODES.



CHRISTY		
METER SIZE	MODEL NO.	LID TYPE *
1 1/2"	B 36	"D"
2"	B 36	"D"

* WITH 1 3/4" HOLE / TRPL

**1 1/2" and 2"
WATER SERVICE
MAIN CONNECTION**

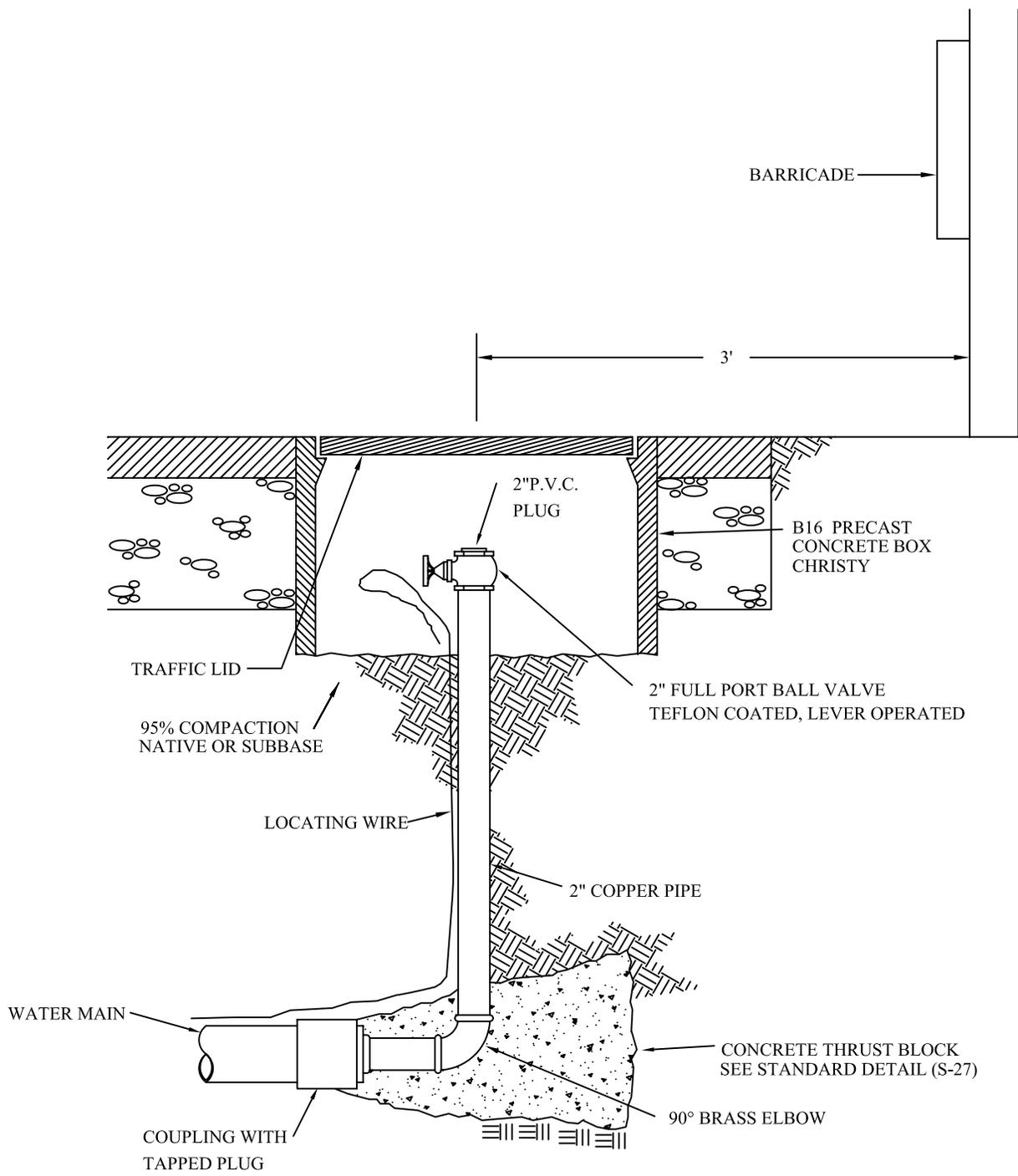
DATE	REVISIONS	BY

CITY OF WILLOWS

STANDARD DETAIL

S-31

APPROVED BY _____ DATE _____
KENT PERKES, DIRECTOR



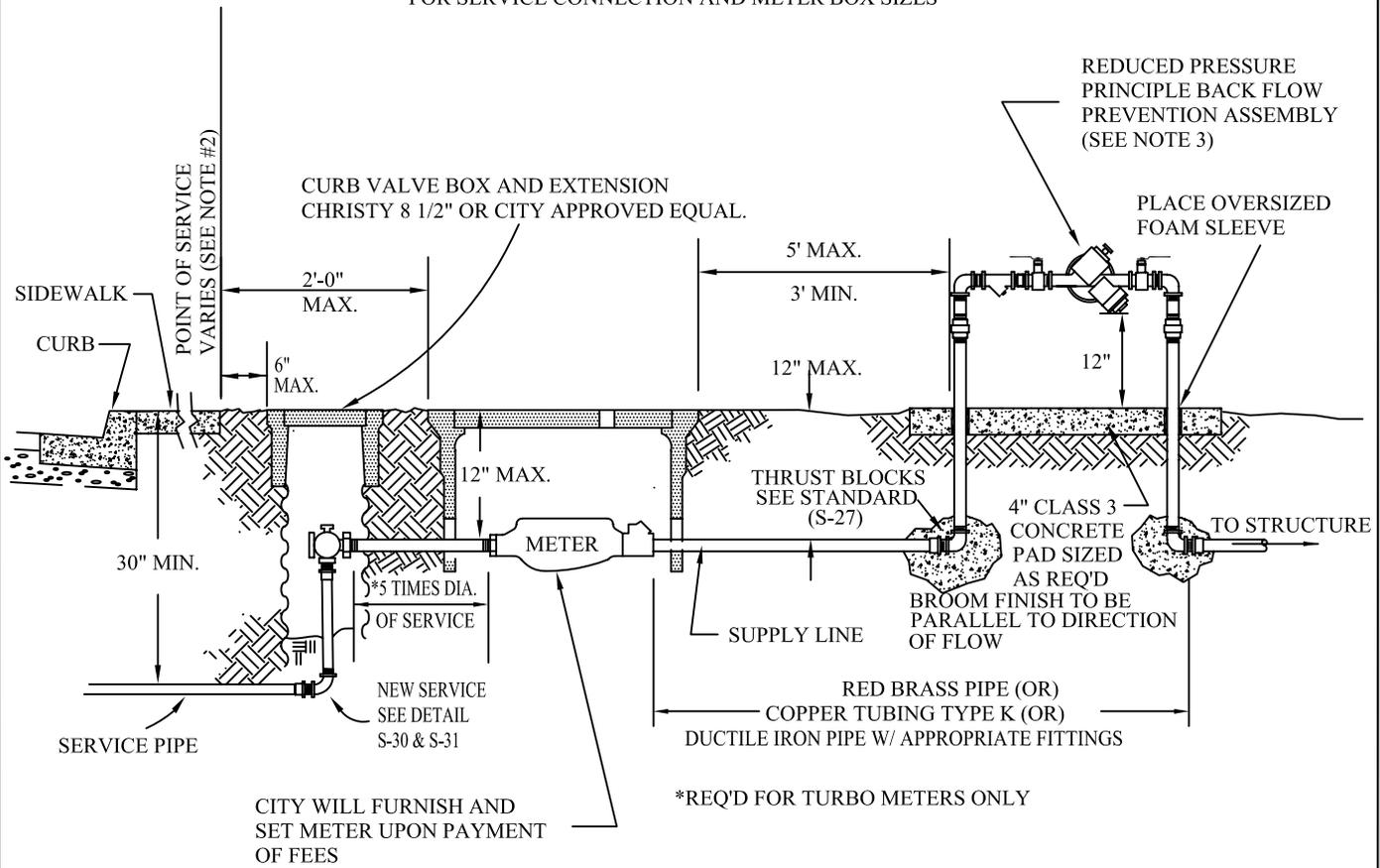
NOTES:
 1. ALL WORK SHALL CONFORM TO AWWA CODES.

DEAD-END WATER MAIN

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-32	
APPROVED BY KENT PERKES, DIRECTOR	DATE

NOTE:
SEE CITY OF WILLOWS STANDARD DETAIL S-30 & S-31
FOR SERVICE CONNECTION AND METER BOX SIZES



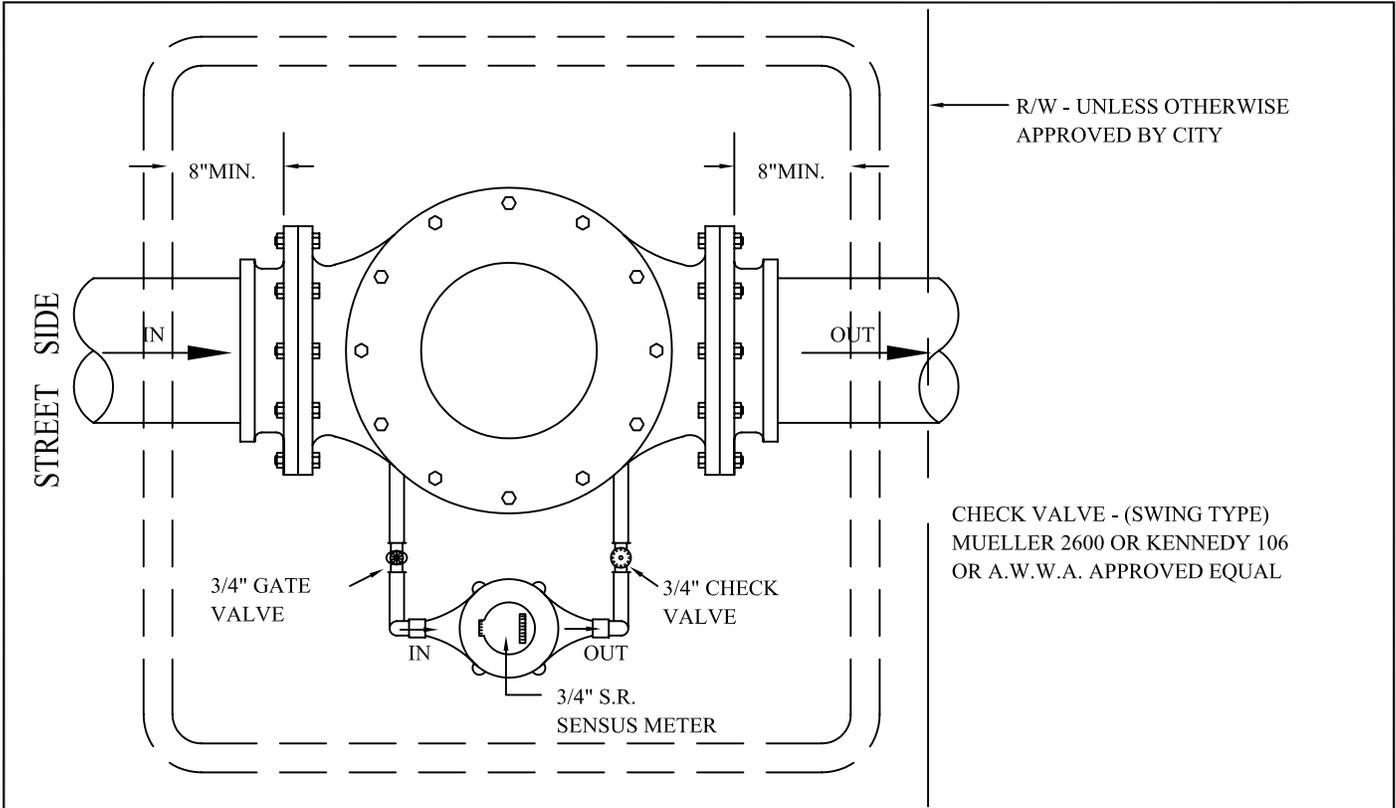
NOTES:

1. REDUCED PRESSURE BACK FLOW PREVENTION ASSM. MUST BE CONNECTED TO CITY WATER & TESTED BY CERTIFIED TESTOR WITH AN AWWA CERTIFICATION PRIOR TO BEING PLACED INTO SERVICE.
2. POINT OF SERVICE:
 - A. POINT OF SERVICE IS THE BACK OF SIDEWALK FOR STREETS WITH SIDEWALK CONTIGUOUS WITH CURB & GUTTER.
 - B. POINT OF SERVICE IS THE RIGHT OF WAY LINE ON ALL ALLEYS & UNIMPROVED STREETS.
 - C. WHERE THE POINT OF SERVICE IS UNCLEAR THE LOCATION SHALL BE DETERMINED BY THE CROSS CONNECTION CONTROL SPECIALIST OR HIS DESIGNEE.
3. LISTS OF APPROVED BACK FLOW PREVENTION ASSEMBLIES:
FEBCO, WATTS OR CITY APPROVED EQUAL.
4. THE BACK FLOW PREVENTION ASSEMBLIES SHALL BE INSTALLED ABOVE GROUND, IN A HORIZONTAL & LEVEL POSITION. THE ASSEMBLY SHALL BE LOCATED ON THE CUSTOMER'S SIDE & NO FURTHER THAN FIVE (5) FEET FROM THE POINT OF SERVICE OF THE WATER METER. CUSTOMER SHALL PROVIDE INSULATION BLANKET.
5. NO OUTLET, TAP, TEE, OR CONNECTION BETWEEN THE WATER MAIN AND THE BACK FLOW PREVENTER IS ALLOWED UNLESS APPROVED BY THE CITY ENGINEER
6. ALL WORK SHALL CONFORM TO AWWA CODES.

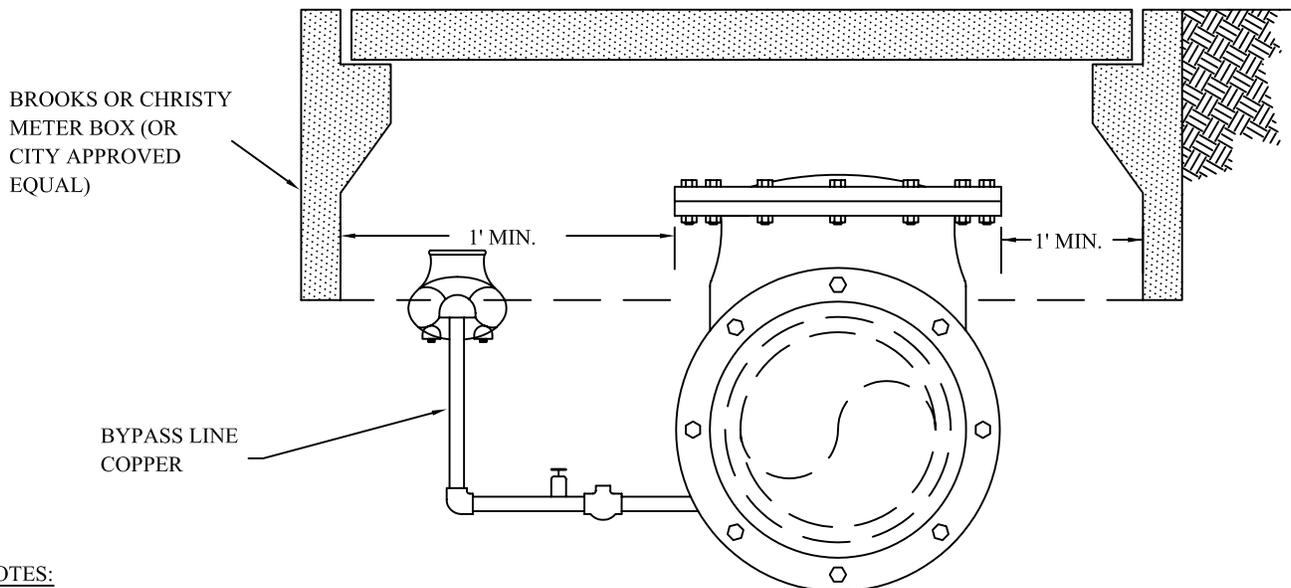
**REDUCED PRESSURE
BACK FLOW PREVENTER**

DATE		BY	

CITY OF WILLOWS	
STANDARD DETAIL	
S-33	
APPROVED BY KENT PERKES, DIRECTOR	DATE



PLAN VIEW



END VIEW

NOTES:
 1. ALL WORK SHALL CONFORM TO AWWA CODES.

TYPICAL FIRE SERVICE
 CHECK VALVE DETAIL

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-34	
APPROVED BY KENT PERKES, DIRECTOR	DATE

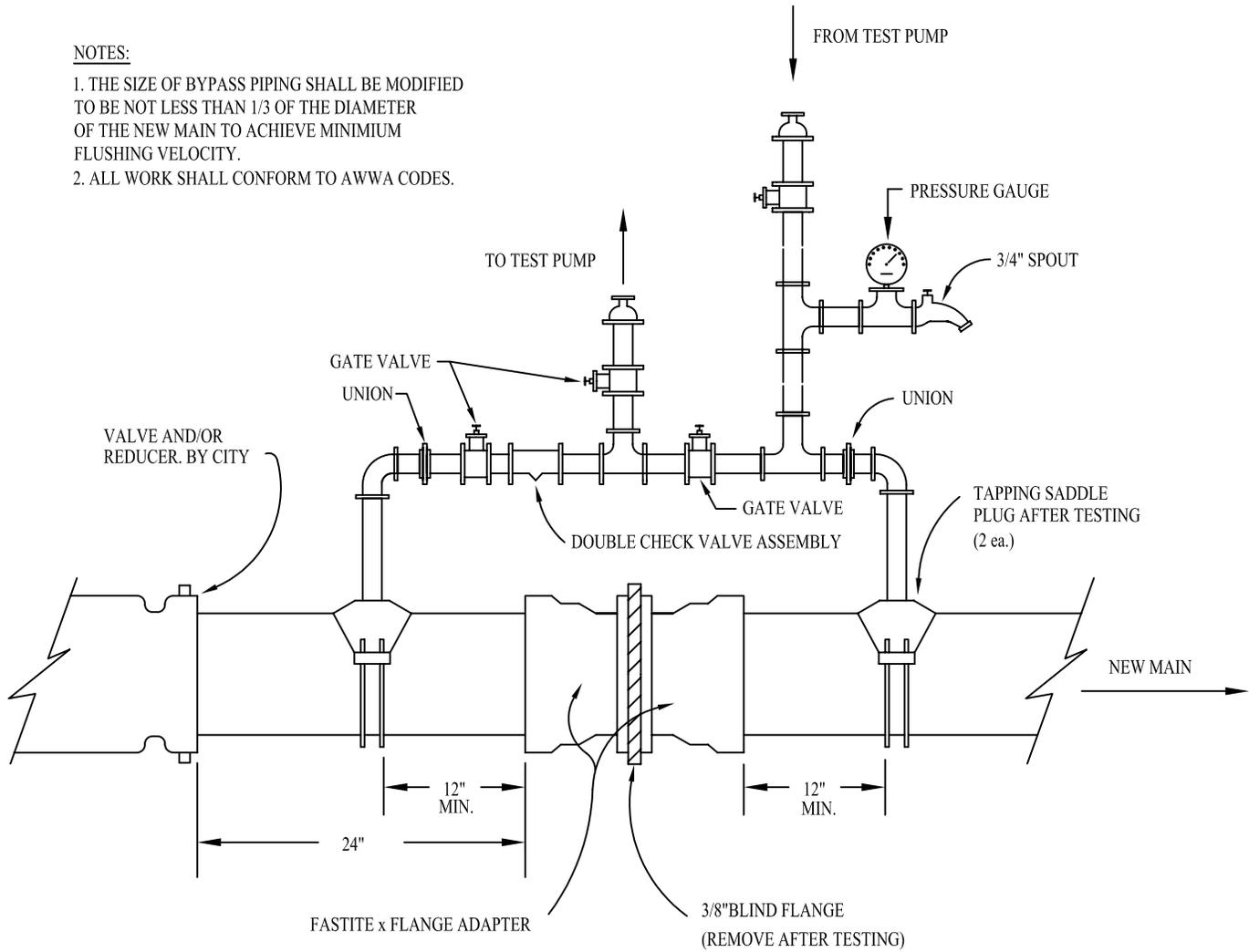
FLOW AND OUTLET OPENINGS TO FLUSH PIPE

PIPE DIAMETER IN.	FLOW REQUIRED TO PRODUCE 2.5 FT/S (APPROX) VELOCITY IN MAIN	SIZE OF TAP, IN.			NUMBER OF 2 1/2 IN. HYDRANT OUTLETS
		1"	1 1/2"	2"	
4	100	1	-	-	1
6	200	-	1	-	1
8	400	-	2	1	1
10	600	-	3	2	1
12	900	-	-	2	2
16	1600	-	-	4	2

(PER AWWA C651-92)

NOTES:

1. THE SIZE OF BYPASS PIPING SHALL BE MODIFIED TO BE NOT LESS THAN 1/3 OF THE DIAMETER OF THE NEW MAIN TO ACHIEVE MINIMUM FLUSHING VELOCITY.
2. ALL WORK SHALL CONFORM TO AWWA CODES.

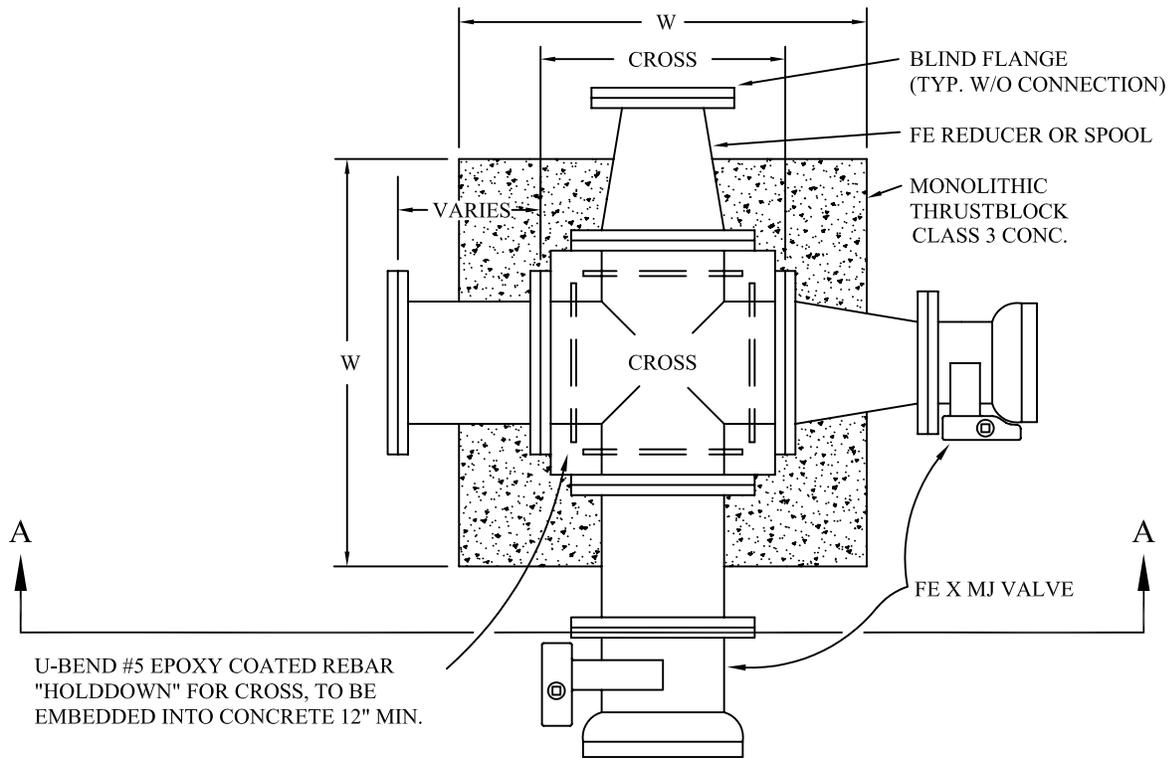


FOR NEW WATER MAIN CONSTRUCTION

**TESTING BLOCK
AND BYPASS**

DATE	REVISIONS	BY

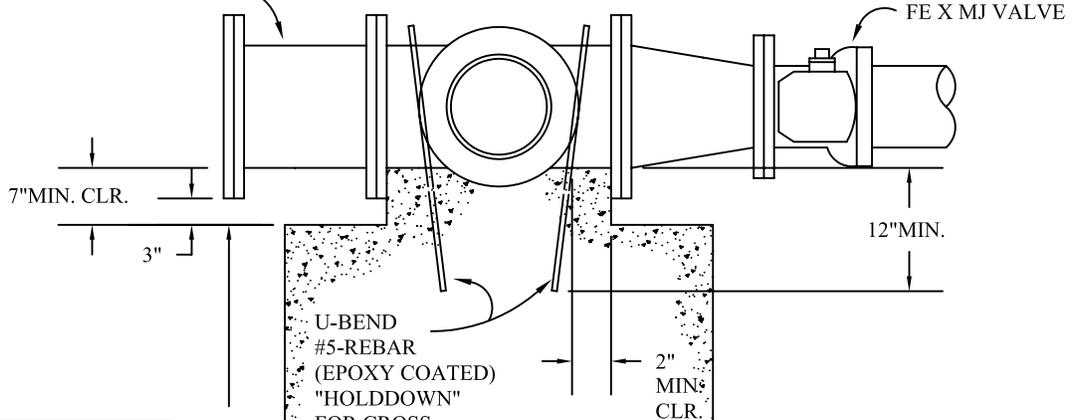
CITY OF WILLOWS	
STANDARD DETAIL	
S-35	
APPROVED BY KENT PERKES, DIRECTOR	DATE



U-BEND #5 EPOXY COATED REBAR
"HOLDDOWN" FOR CROSS, TO BE
EMBEDDED INTO CONCRETE 12" MIN.

SPOOL OR
FL REDUCER

PLAN



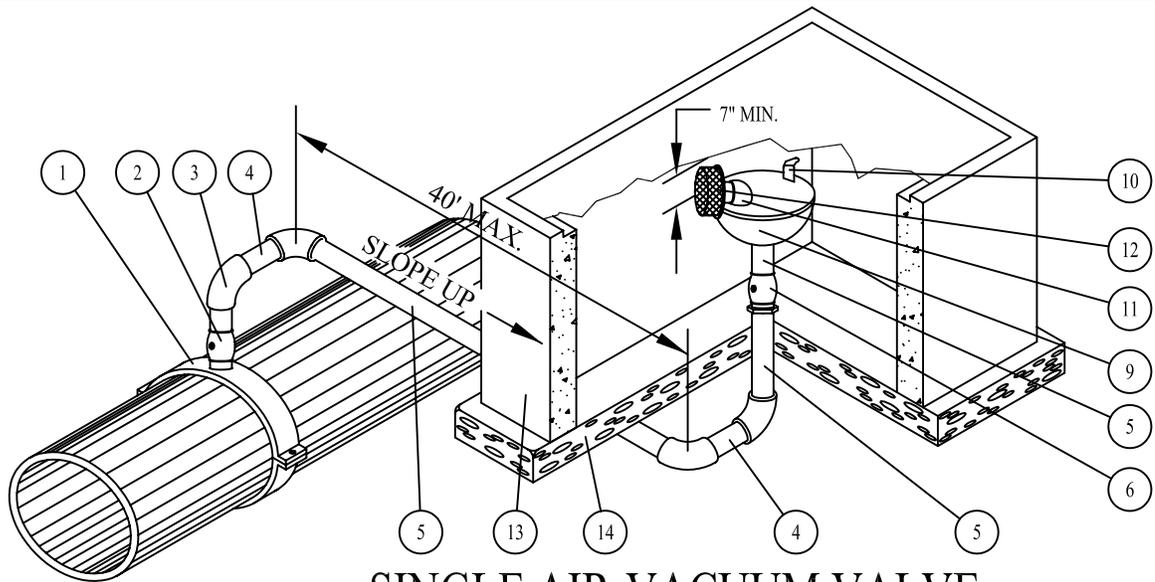
SIZE OF THRUST BLOCK		
SIZE OF CROSS	D	W
16"	4.5'	4.5'
14"	4'	4'
12"	3.5'	3.5'
10"	3'	3'
8"	2'	2.5'
6"	1.5'	2'

SECTION A-A

THRUST BLOCK FOR FLANGE CROSS

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-36	
APPROVED BY KENT PERKES, DIRECTOR	DATE



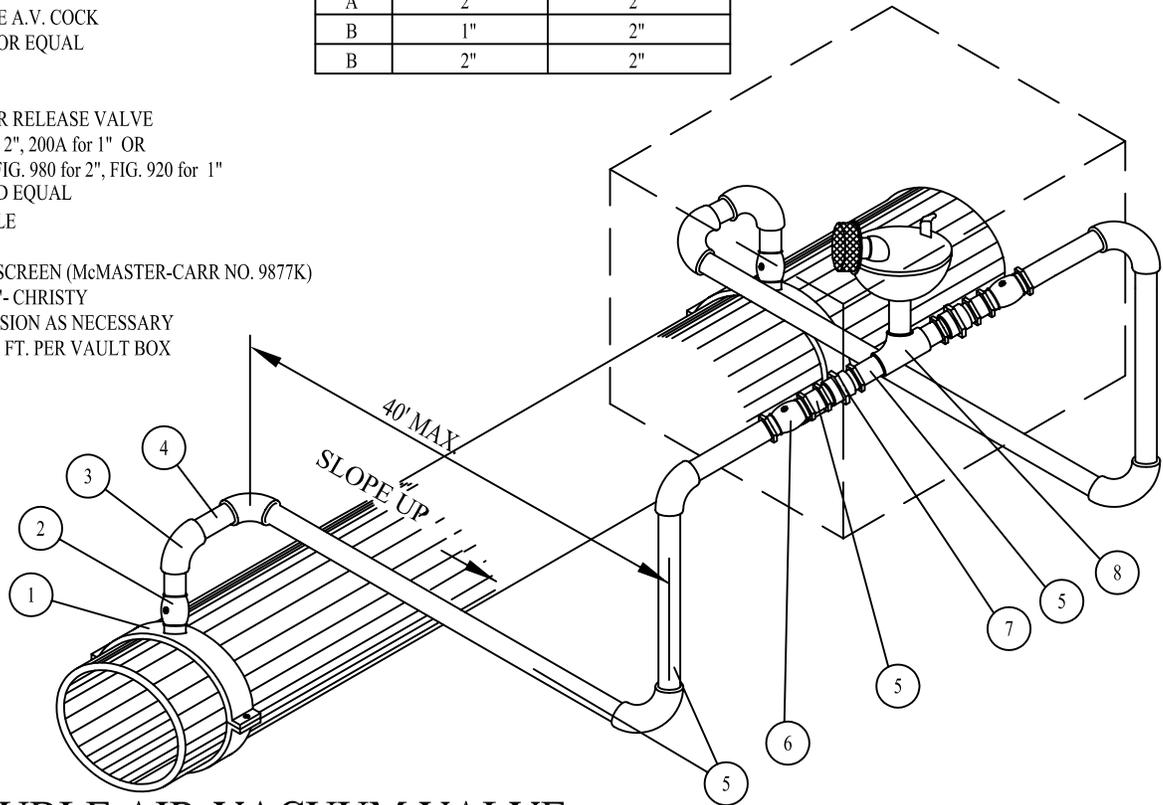
SINGLE AIR-VACUUM VALVE

TYPE "B"

NOTES:

1. ALL WORK SHALL CONFORM TO AWWA CODES.
2. SERVICE SADDLE-SMITH BLAIR # 313 OR APPR. EQUAL
3. CORP. STOP-FORD FB 1700
4. 90° BRASS ELL
5. BRASS NIPPLE
6. TYPE K COPPER PIPE
7. TEFLON BALL TYPE A.V. COCK McDONALD # 6101 OR EQUAL
8. BRASS UNION
9. BRASS TEE
10. AIR-VACUUM & AIR RELEASE VALVE APCO- SER. 1700 for 2", 200A for 1" OR G.A. INDUSTRIES- FIG. 980 for 2", FIG. 920 for 1" OR CITY APPROVED EQUAL
11. BIBB W/TEE HANDLE
12. 90° BRASS ST. ELL
13. STAINLESS STEEL SCREEN (McMASTER-CARR NO. 9877K)
14. VAULT: 17 1/4" X 30" - CHRISTY # B 36 WITH EXTENSION AS NECESSARY
15. DRAIN ROCK, 5 CU. FT. PER VAULT BOX

TYPE	AIR-VALVE SIZE	SIZE OF PIPE FITTINGS
A	1"	1"
A	2"	2"
B	1"	2"
B	2"	2"



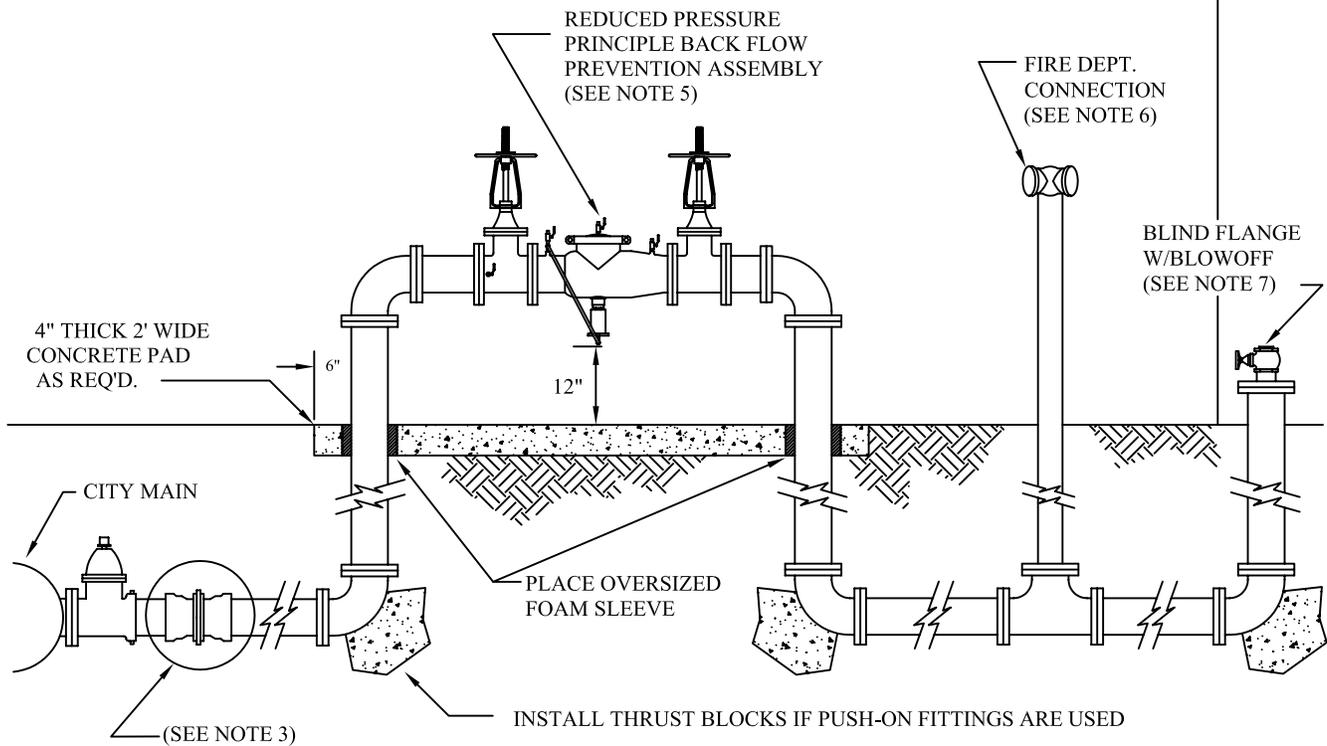
DOUBLE AIR-VACUUM VALVE

TYPE "A"

AIR-VACUUM VALVES

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-37	
APPROVED BY KENT PERKES, DIRECTOR	DATE



NOTES:

1. A CLASS 'A' CONTRACTOR'S LICENSE IS REQUIRED FOR WORK IN THE CITY RIGHT OF WAY.
2. INSTALLATION OF THE FIRE SERVICE SHALL BE IN ACCORDANCE WITH AWWA C600-87.
3. INSTALL TEST PLATE AND JUMPER ASSEMBLY IN ACCORDANCE WITH STANDARD DETAIL 410.
4. PIPES AND FITTINGS SHALL BE DUCTILE IRON CL250 MINIMUM.
5. IF POSSIBLE, PLACE REDUCED PRESSURE DEVICE 8' BEHIND BACK OF S/W.
APPROVED BACK FLOW PREVENTION ASSEMBLIES: AMES, FEBCO OR APPROVED EQUAL. CERTIFICATION BY AN AWWA LICENSED TESTER SHALL BE DELIVERED TO PUBLIC WORKS.
6. FIRE SERVICE CONNECTION SHALL BE INSTALLED 18" FROM BACK OF S/W, 30' MIN./50' MAX. FROM A FIRE HYDRANT.
7. PROVIDE TEMPORARY BLIND FLANGE W/ BLOWOFF AT BUILDING. AFTER TESTING THE FIRE SERVICE FROM THE MAIN TO THE BUILDING, REMOVE FLANGE AND MAKE CONNECTION.
8. DISINFECTING OF THE FIRE SERVICE SHALL BE IN ACCORDANCE WITH AWWA C651-99.
9. TESTING THE FIRE SERVICE FROM THE WATER MAIN TO THE BUILDING SHALL BE COORDINATED WITH PUBLIC WORKS. TESTING IN THE BUILDING SHALL BE COORDINATED WITH THE FIRE DEPARTMENT.
10. TESTING BY PUBLIC WORKS SHALL CONSIST OF A 2 HOUR PRESSURE TEST @ 200 PSI AND BACTERIA TEST AFTER THE FIRE SERVICE HAS BEEN SUFFICIENTLY FLUSHED.
11. IF THE FIRE SERVICE CONNECTION SERVES MORE THAN ONE BUILDING, A POST INDICATOR VALVE IS REQUIRED FOR EACH BUILDING.

REDUCED PRESSURE DEVICE

OUTSIDE INSTALLATION

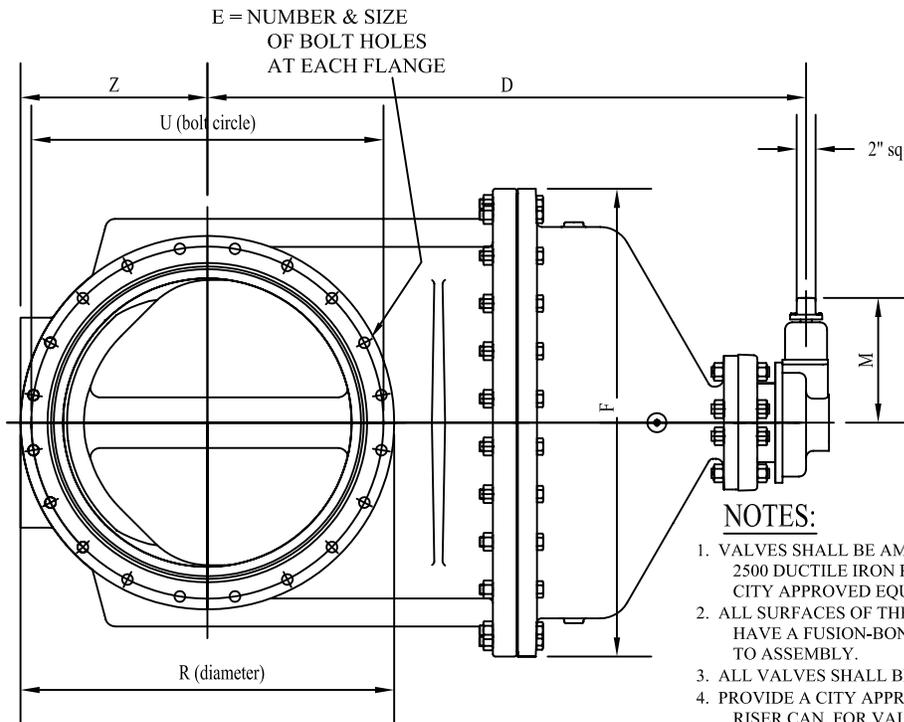
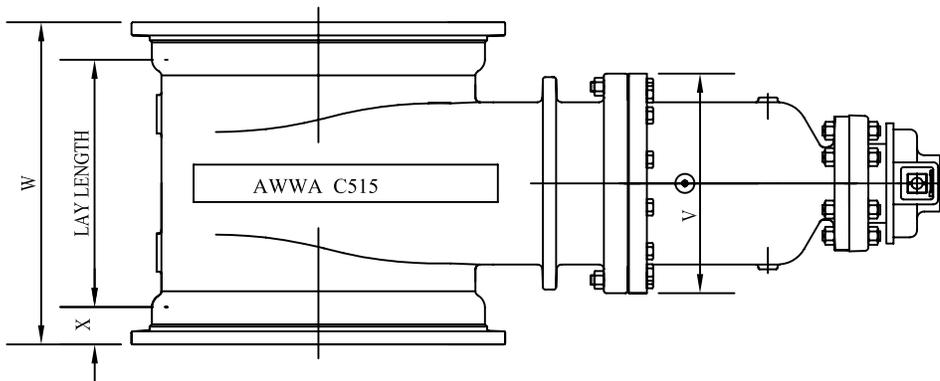
**FIRE SERVICE
CONNECTION**

DATE	REVISIONS	BY

CITY OF WILLOWS
STANDARD DETAIL
S-38
<small>APPROVED BY</small> _____ <small>DATE</small> _____ <small>KENT PERKES, DIRECTOR</small>

SIZE	LAY LENGTH	D	E	F	M	R	U	V	W	X	Z
14	13-1/4	35-3/16	10; 7/8	26	9	20-5/16	18-3/4	13-1/2	20-1/2	3-5/8	—
16	13-5/8	39-3/4	12; 7/8	28-1/4	9	22-9/16	21	15-1/18	20-7/8	3-5/8	—
18	15-3/4	43	12; 7/8	32	9	24-7/8	23-1/4	15	23	3-5/8	—
20	16-1/4	44-7/16	14; 7/8	34-1/2	9-7/8	27-1/8	25-1/2	16-1/4	23-1/2	3-5/8	—
24	18-1/4	52-1/2	16; 7/8	39	9-7/8	31-3/4	30	17-3/4	25-1/2	3-5/8	—
30	25-3/4	62-5/8	20; 1-1/8	49	13-1/16	—	36-7/8	23	33-3/4	4	19-9/16
36	29-1/2	74-3/8	24; 1-1/8	58	14-7/8	—	43-3/4	27-1/2	37-1/2	4	23

**ALL DIMENSIONS ARE IN INCHES



NOTES:

1. VALVES SHALL BE AMERICAN FLOW CONTROL'S SERIES 2500 DUCTILE IRON RESILIENT WEDGE GATE VALVE or CITY APPROVED EQUAL.
2. ALL SURFACES OF THE VALVE BODY AND BONNET SHALL HAVE A FUSION-BONDED EPOXY COATING APPLIED PRIOR TO ASSEMBLY.
3. ALL VALVES SHALL BE SIDE MOUNTED AND DIRECT BURY.
4. PROVIDE A CITY APPROVED VALVE EXTENSION, WITH A RISER CAN, FOR VALVES DEEPER THAN 6.0 FEET. HEIGHT OF EXTENSION SHALL TERMINATE AT 1.5 FEET TO 4.0 FEET BELOW GRADE.
5. A 10 AWG SINGLE STRAND, SOFT DRAWN COPPER WIRE SHALL BE INSTALLED.

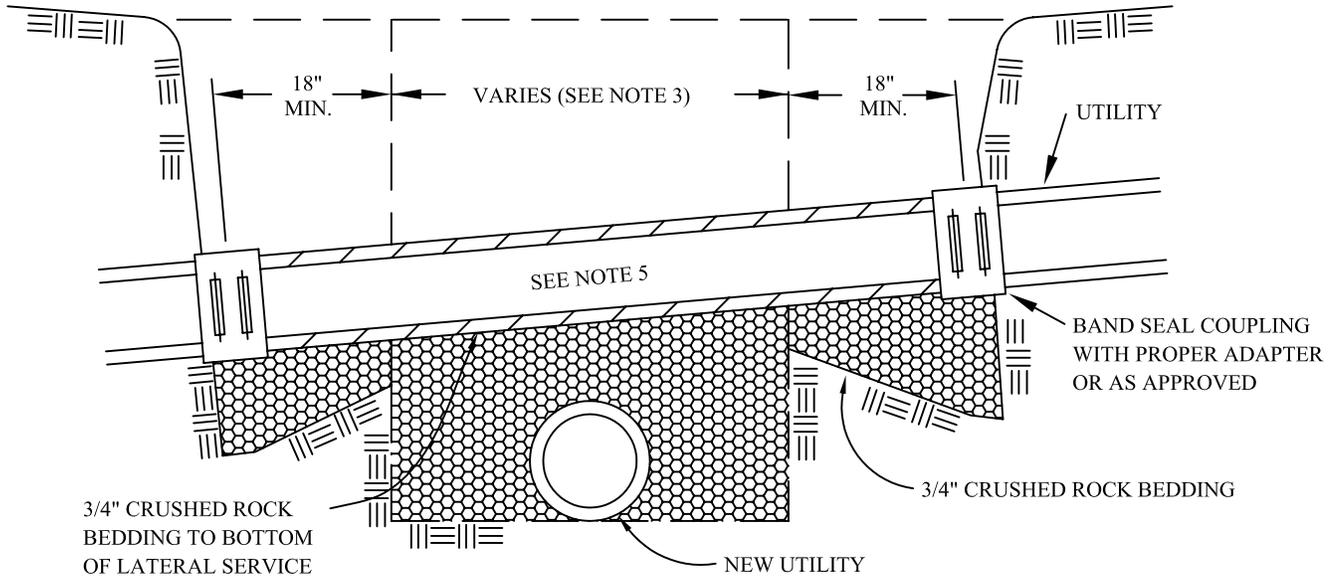
MECHANICAL JOINT ENDS AND BEVEL GEAR

SIZES ARE SHOWN FOR MECHANICAL JOINTS WITH BEVEL GEAR. DIMENSIONS WILL VARY SLIGHTLY WHEN USING OTHER TYPES OF VALVES/CONNECTIONS.

RESILIENT WEDGE GATE VALVE

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-39	
APPROVED BY	DATE
KENT PERKES, DIRECTOR	



NOTES:

1. INSIDE DIAMETER OF PIPE TO BE THE SAME AS THE PIPE TO WHICH IT CONNECTS.
2. ALTERATIONS OF SEWER GRADES WILL BE PERMITTED ONLY AFTER PERMISSION HAS BEEN RECEIVED FROM THE CITY.
3. WHENEVER THE SPAN OF THE PIPE EXCEEDS 5'-0" REPLACEMENT PROCEDURE AND MATERIAL SHALL BE AS DIRECTED BY THE CITY.
4. TRIM THE END OF THE SIDE SEWER PIPE TO A CLEAN CUT UNDAMAGED END WITH MECHANICAL PIPE CUTTER.
5. EXTRA STRENGTH VITRIFIED CLAY PIPE OR FUSION BONDED EPOXY DUCTILE IRON PIPE FOR SANITARY SEWER LINES AS DIRECTED BY CITY; FOR STORM DRAIN LINES, CONCRETE PIPE OF THE SAME TYPE REMOVED.
6. BAND SEAL COUPLING SHALL HAVE STAINLESS STEEL SHEAR RING.

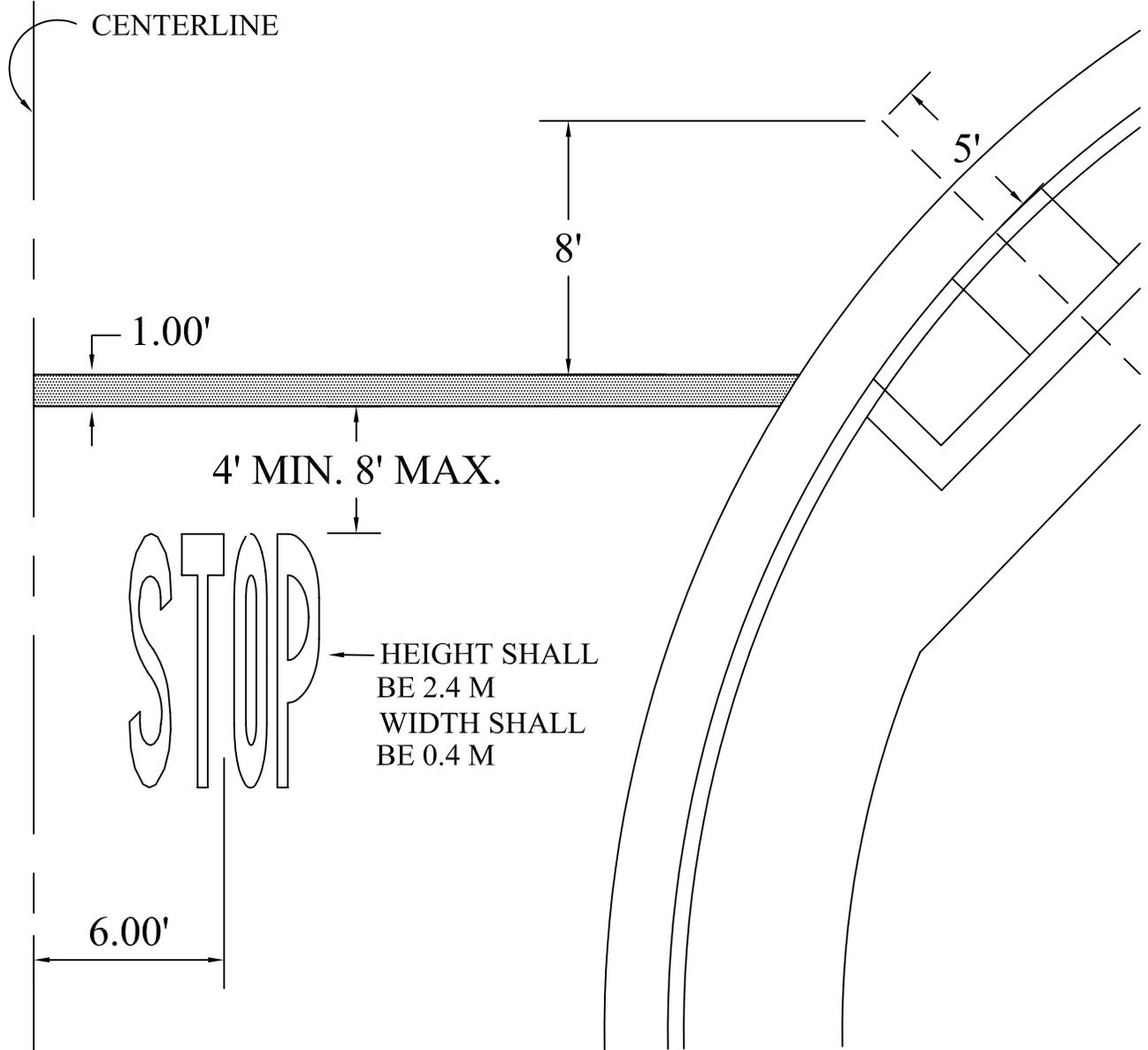
UTILITY CROSSING

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-40	
APPROVED BY KENT PERKES, DIRECTOR	DATE

NOTES:

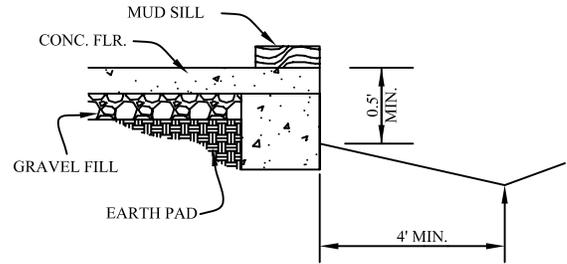
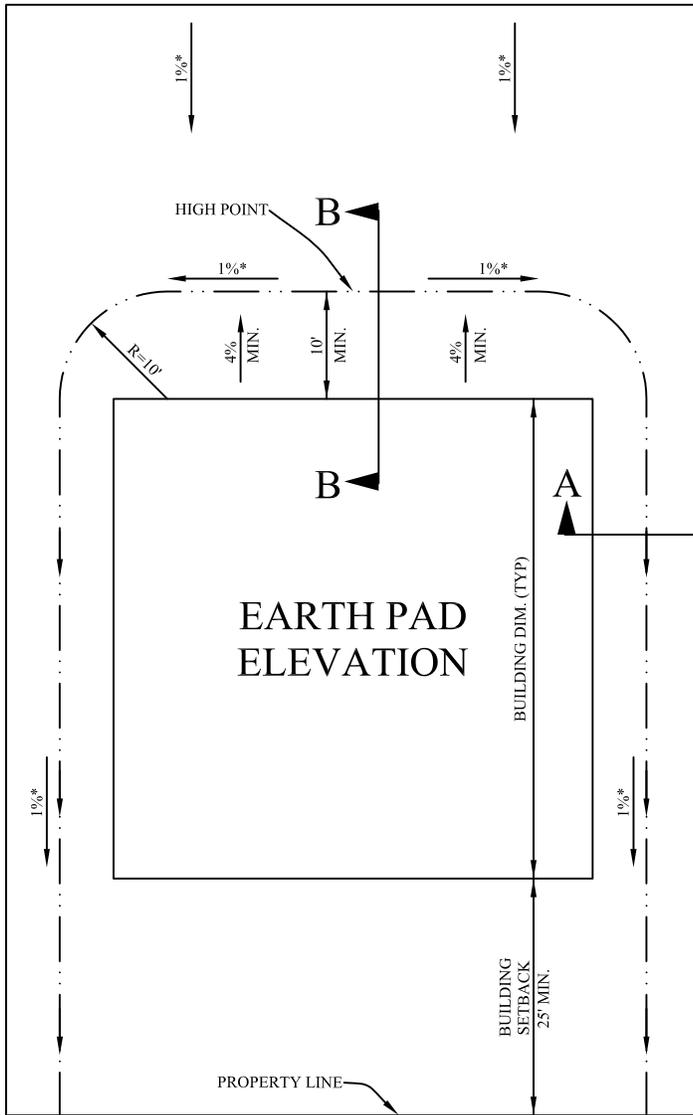
1. ALL WORK TO BE DONE, AND ALL MATERIALS SUPPLIED, SHALL CONFORM TO THE STANDARD SPECIFICATIONS, STATE OF CALIFORNIA, DEPARTMENT OF TRANSPORTATION, DATED JULY 2002.
2. UNLESS OTHERWISE NOTED ON THE PLANS, STOP BAR AND "STOP" LEGEND SHALL BE PAINTED WITH ACRYLIC EMULSION, EXTERIOR WHITE AND LIGHT AND MEDIUM TINTS ACCORDING TO CALTRANS STANDARDS.
3. ALTERNATE LOCATION OF STOP BAR TO BE DETERMINED BY CITY ENGINEER.



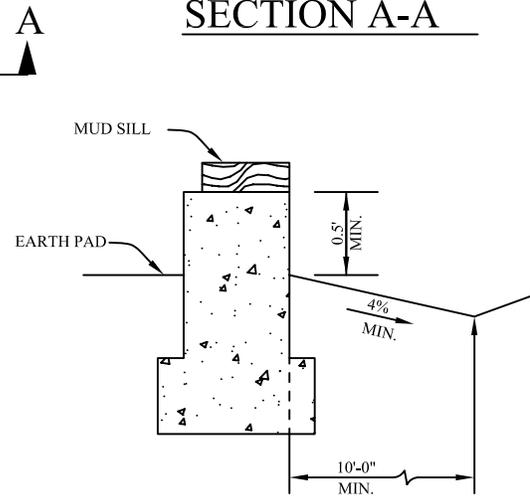
**STOP BAR
PLACEMENT**

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-41	
APPROVED BY KENT PERKES, DIRECTOR	DATE



SECTION A-A



SECTION B-B

NOTE:

- * MINIMUM LOT GRADE MAY BE REDUCED TO NOT LESS THAN 0.5% PROVIDED:
 1. PROPERTY ABUTTING THE SUBDIVISION DRAINS ONTO THE SUBDIVISION PROPERTY, AND A 1% LOT GRADE WOULD OBSTRUCT THE NATURAL DRAINAGE.
 2. THE DRAINAGE FROM THE ABUTTING PROPERTY WILL BE COLLECTED AND ROUTED THROUGH THE SUBDIVISION DRAINAGE FACILITIES.
 3. THE CITY ENGINEER CONFIRMS THAT LOT GRADES ARE NOT LESS THAN 0.5% WILL ACCOMMODATE THE COLLECTION AND ROUTING OF THE SURFACE DRAINAGE.
 4. BUILDING PADS SHALL NOT BE INUNDATED DURING A 100 YEAR FREQUENCY DESIGN STORM.
 5. INFORMATION HEREON IS ILLUSTRATIVE AND SUBJECT TO RECOMMENDATIONS OF A GEOTECHNICAL REPORT.

**MINIMUM
RESIDENTIAL
LOT GRADES**

DATE	REVISIONS	BY

CITY OF WILLOWS	
STANDARD DETAIL	
S-42	
APPROVED BY KENT PERKES, DIRECTOR	DATE