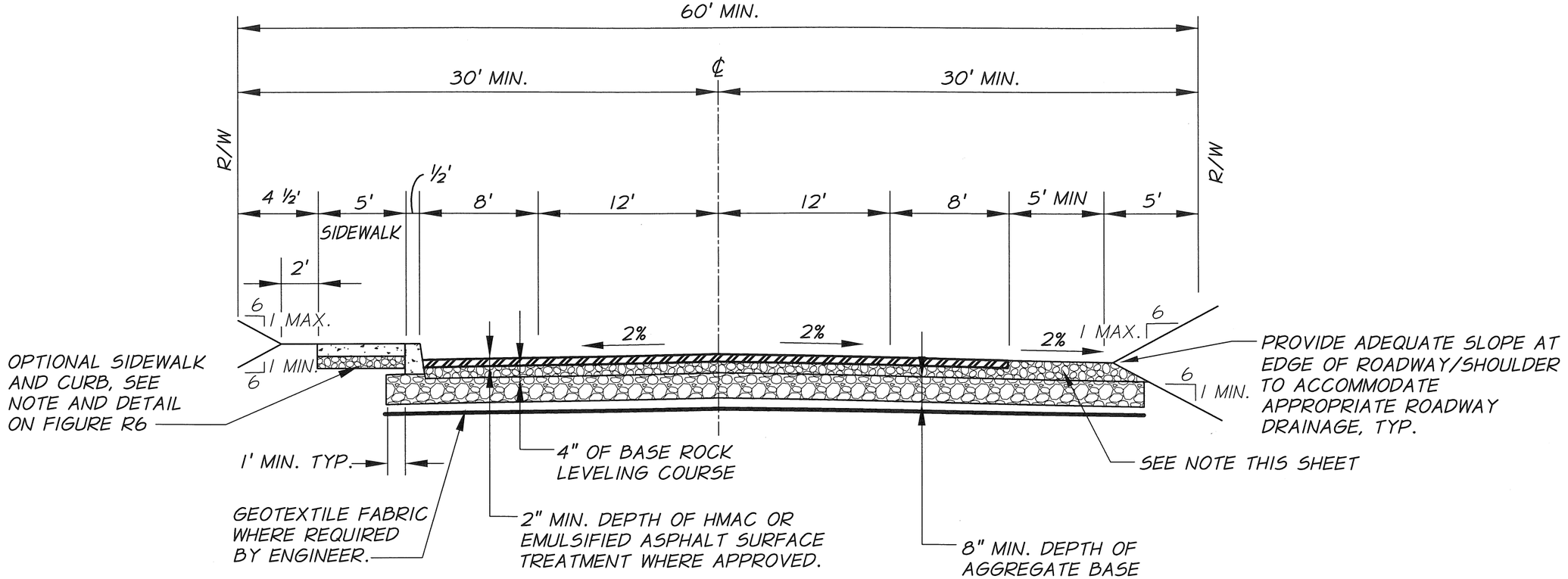


TYPICAL SECTION

LOCAL STREET

N.T.S.

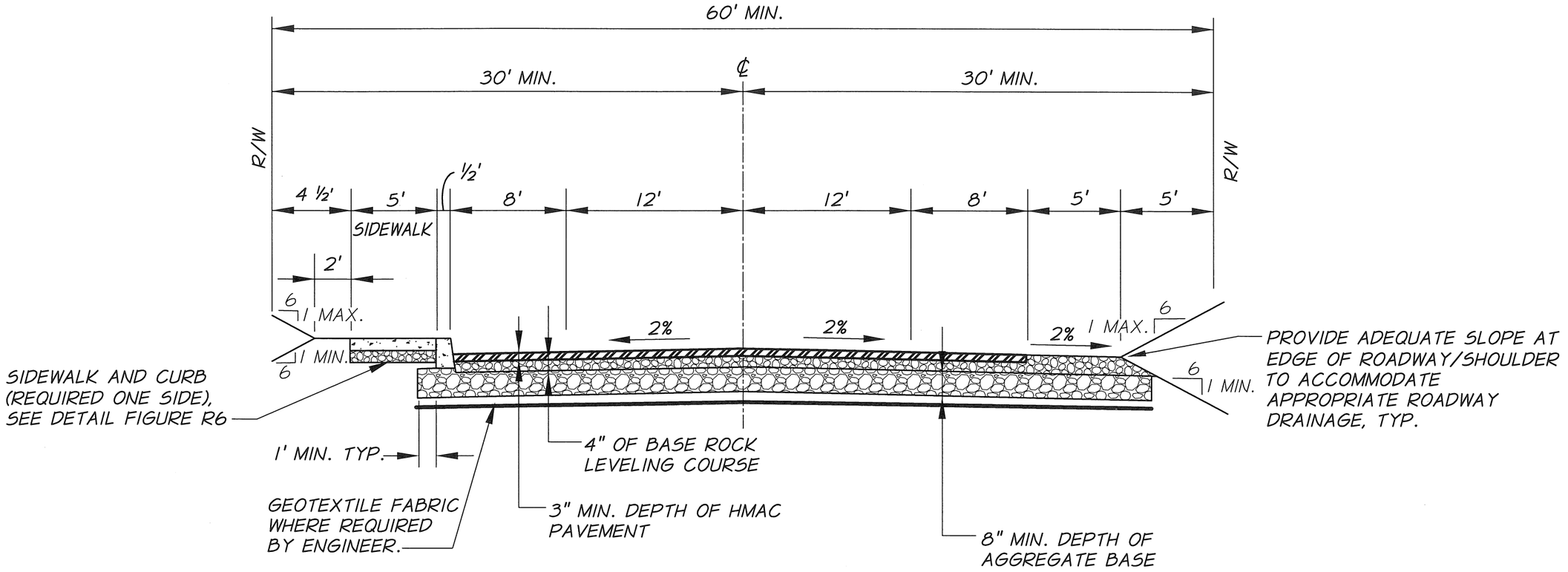
NOTE:
SIDEWALK, CURB AND GUTTER MAY BE REQUIRED TO BE INSTALLED ON ONE OR BOTH SIDE OF STREET AS A CONDITION OF CITY REVIEW OF PROPOSED DEVELOPMENT.

REVISION	DATE
GENERAL UPDATES	12/06
GENERAL UPDATES	7/13

CITY OF UNION OREGON

STANDARD STREET DETAILS
TYPICAL SECTION
LOCAL STREET

FIGURE
R1



TYPICAL SECTION

MINOR COLLECTOR STREET

N.T.S.

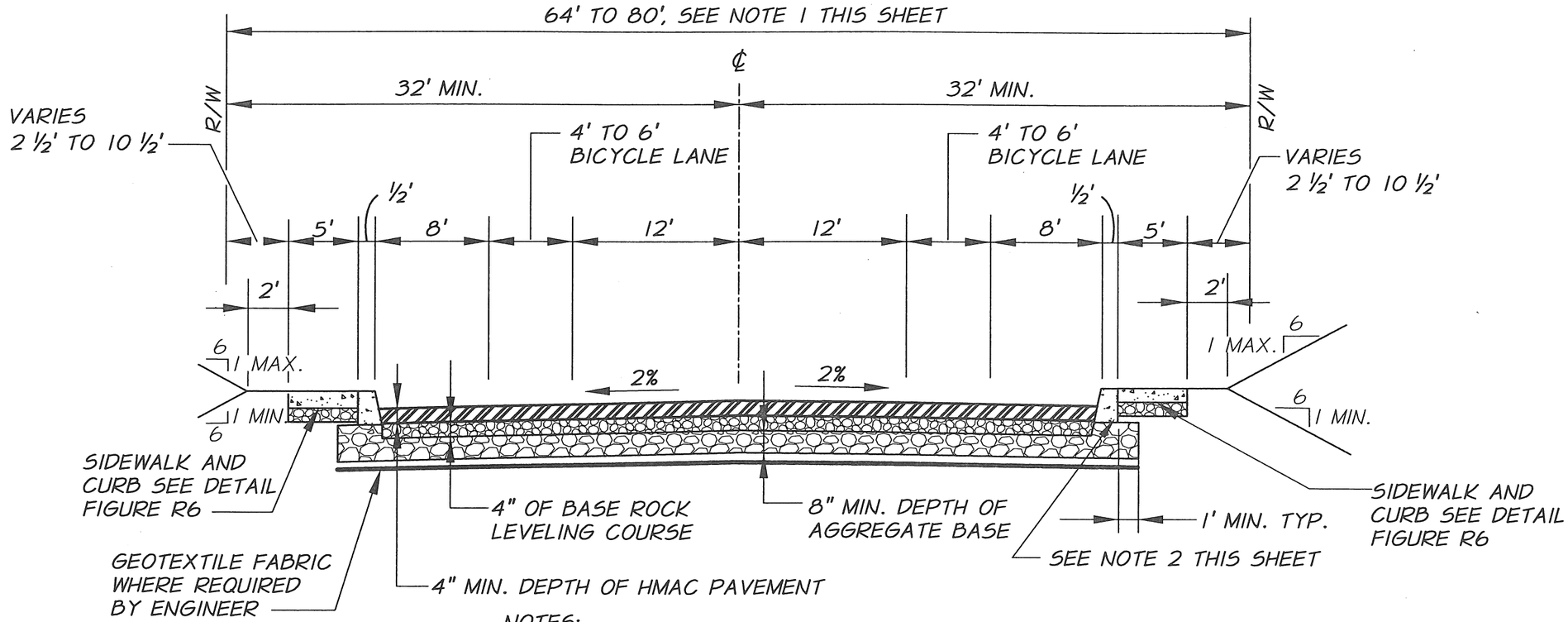
NOTE:
SIDEWALK, CURB AND GUTTER MAY BE REQUIRED TO BE INSTALLED ON BOTH SIDE OF STREET AS A CONDITION OF CITY REVIEW OF PROPOSED DEVELOPMENT.

REVISION	DATE
GENERAL UPDATES	12/06
GENERAL UPDATES	7/13

CITY OF UNION OREGON

STANDARD STREET DETAILS
TYPICAL SECTION
MINOR COLLECTOR STREET

FIGURE
R2



NOTES:

1. RIGHT OF WAY WIDTH TO BE DETERMINED AS A CONDITION OF CITY REVIEW OF PROPOSED DEVELOPMENT.

2. SIDEWALK, CURB AND GUTTER MAY BE REQUIRED TO BE INSTALLED ON ONE OR BOTH SIDE OF STREET AS A CONDITION OF CITY REVIEW OF PROPOSED DEVELOPMENT.

TYPICAL SECTION

ARTERIAL STREET

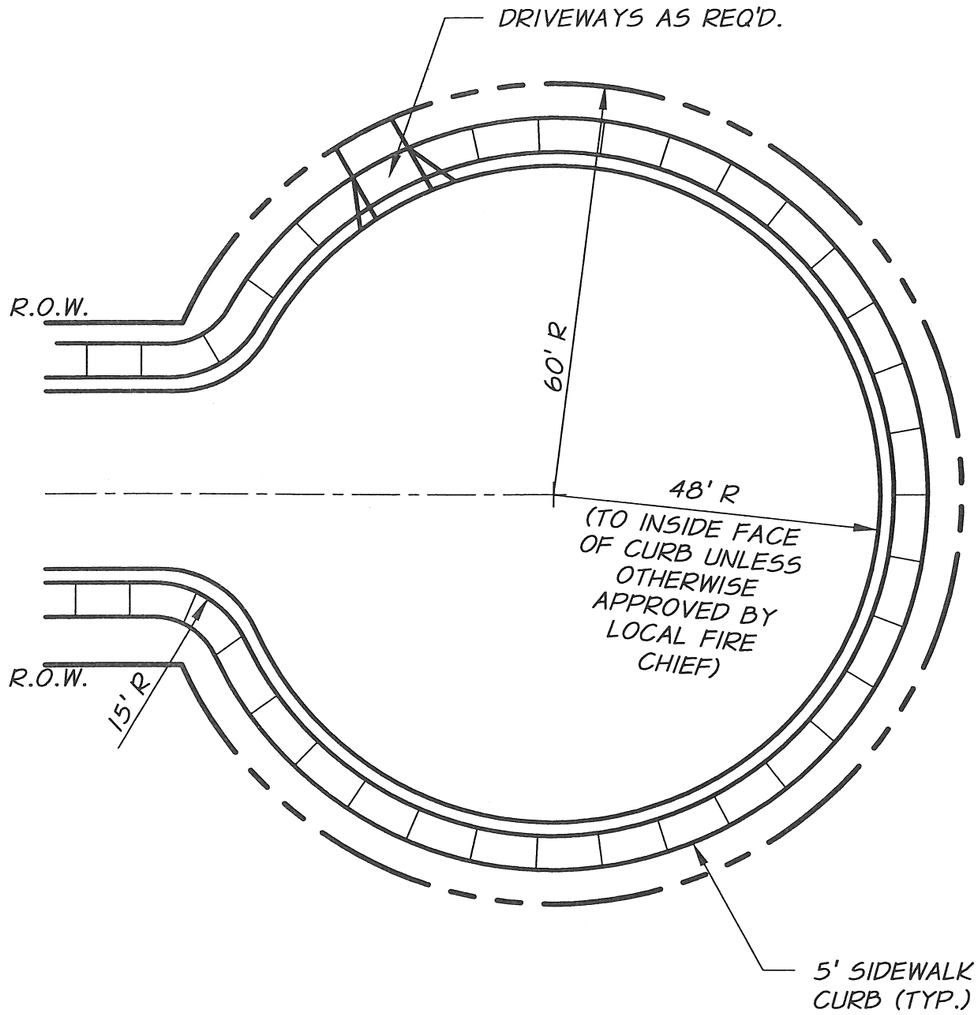
N.T.S.

REVISION	DATE
GENERAL UPDATES	12/06
GENERAL UPDATES	7/13

CITY OF UNION OREGON

STANDARD STREET DETAILS
TYPICAL SECTION
ARTERIAL STREET

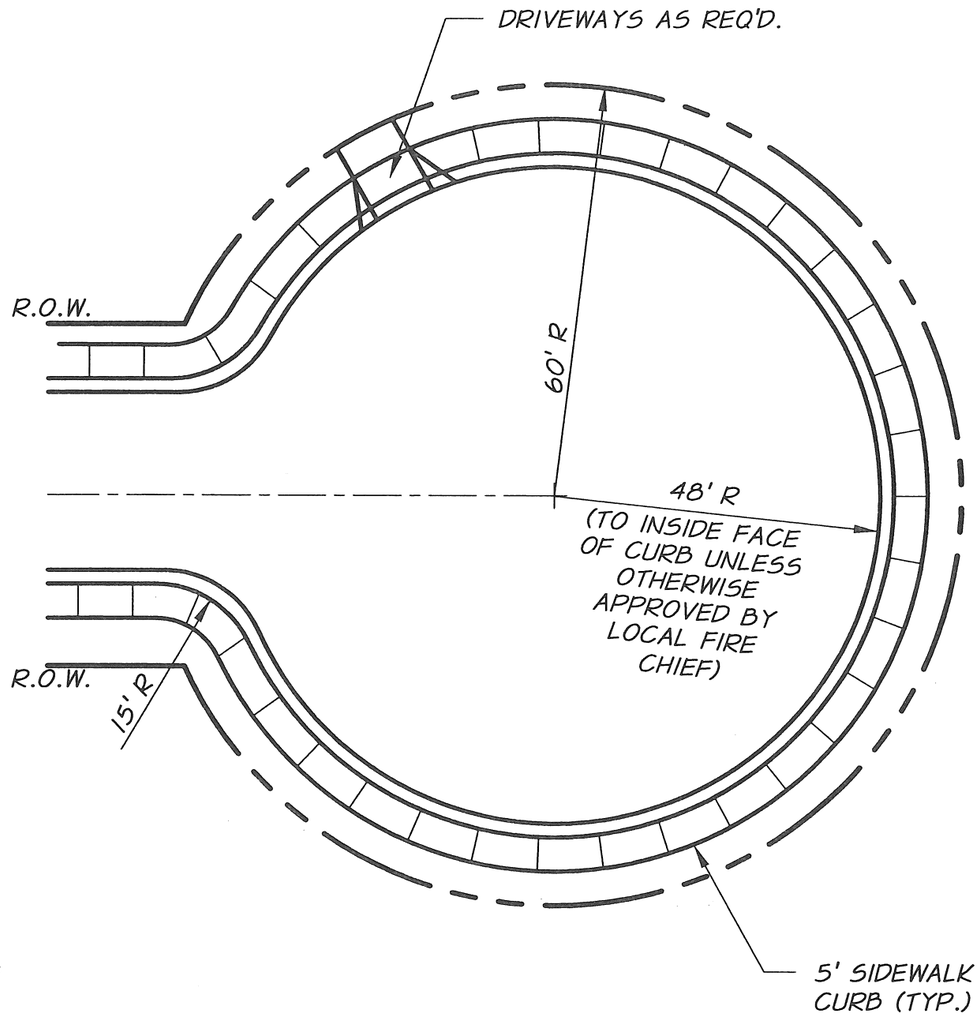
FIGURE
R3



TYPICAL CUL-DE-SAC

BUSINESS AND INDUSTRIAL

N.T.S.



TYPICAL CUL-DE-SAC

LOCAL STREET

N.T.S.

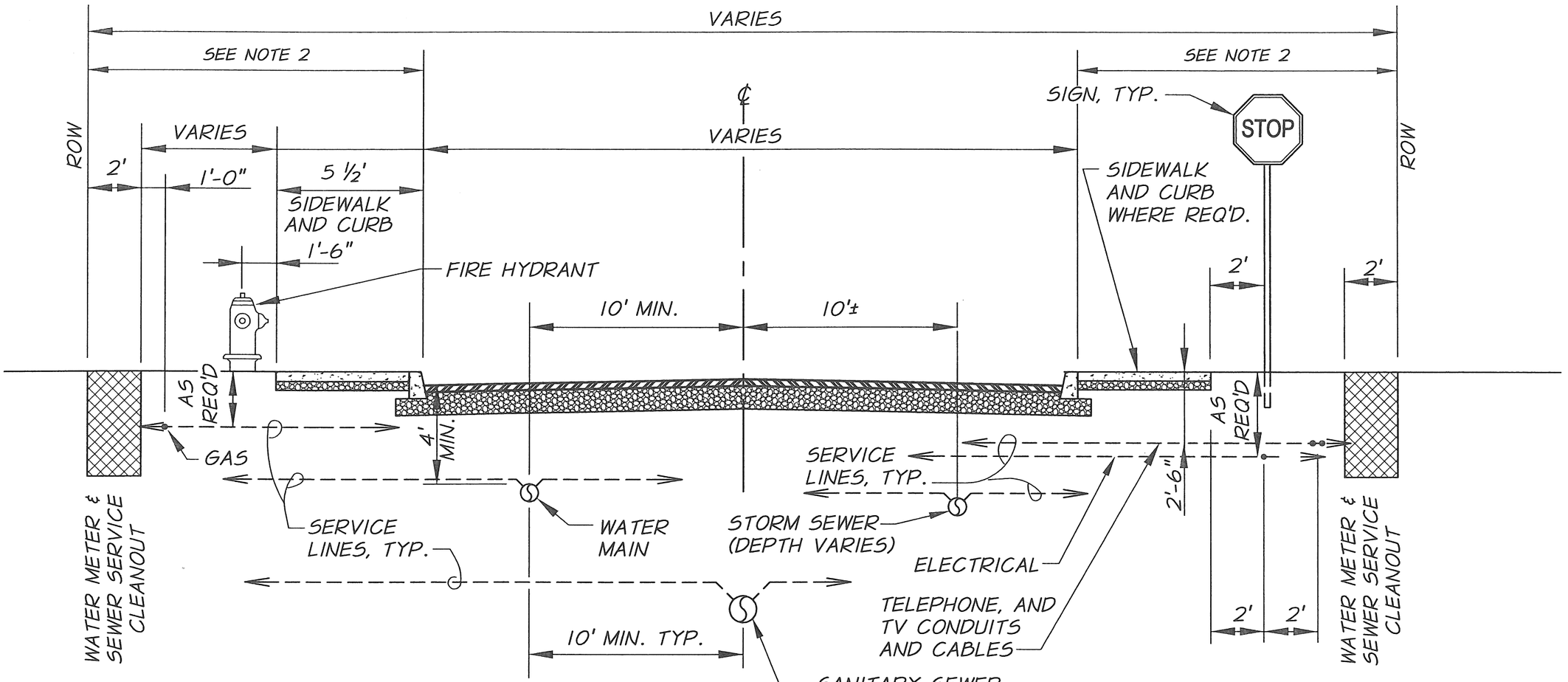
REVISION	DATE
RADIUS UPDATE	7/13

CITY OF UNION OREGON

STANDARD STREET DETAILS

TYPICAL CUL-DE-SAC

FIGURE **R4**



NOTES:

1. UTILITY AND SERVICE LINE LOCATIONS ARE SHOWN CONCEPTUALLY. FIELD CONDITIONS MAY REQUIRE MODIFICATIONS TO BOTH HORIZONTAL AND VERTICAL LOCATIONS AS APPROVED BY UTILITY COMPANIES AND CITY ENGINEER.

2. PROPERTY OWNERS SHALL COORDINATE WITH THE CITY PRIOR TO MAKING ANY MODIFICATION TO LANDS IN THE PUBLIC RIGHT OF WAY. ANY PRIVATE IMPROVEMENTS MADE IN THE PUBLIC RIGHT OF WAY ARE SUBJECT TO REMOVAL BY THE CITY.

TYPICAL SECTION

UTILITY LOCATIONS

N.T.S.

REVISION	DATE
GENERAL UPDATES	12/06
ADDED NOTE 2	8/13

CITY OF UNION OREGON

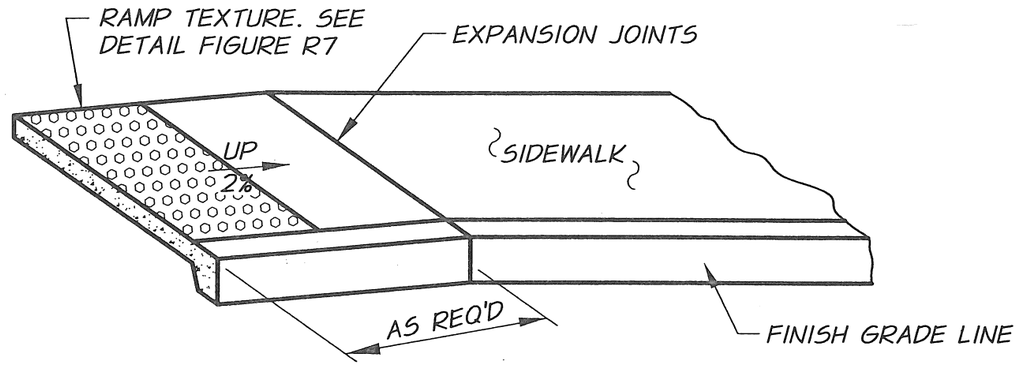
STANDARD STREET DETAILS

UTILITY LOCATIONS

FIGURE **R5**

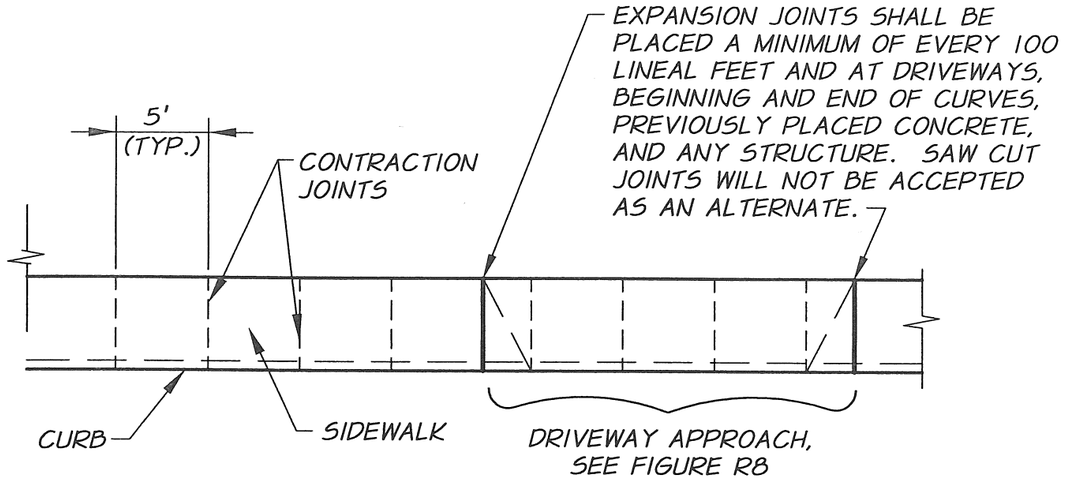
RAMP NOTES:

1. ALL SIDEWALKS EDGES SHALL HAVE 1/4" RADIUS.
2. RAMPS SHALL BE PLACED AT THE START AND END OF ALL SIDEWALKS UNLESS OTHERWISE NOTED.



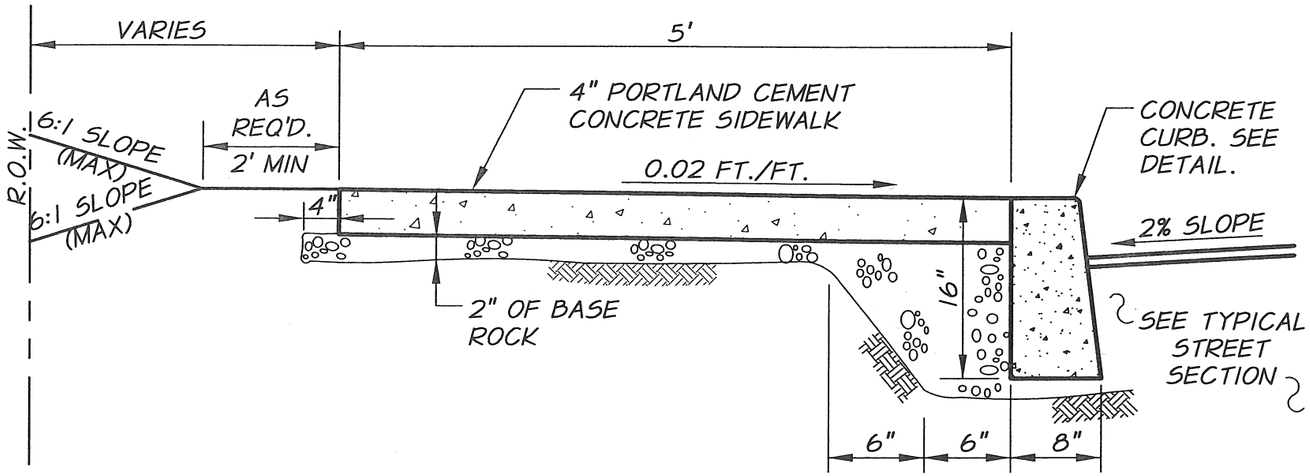
END OF SIDEWALK RAMP DETAIL

N.T.S.



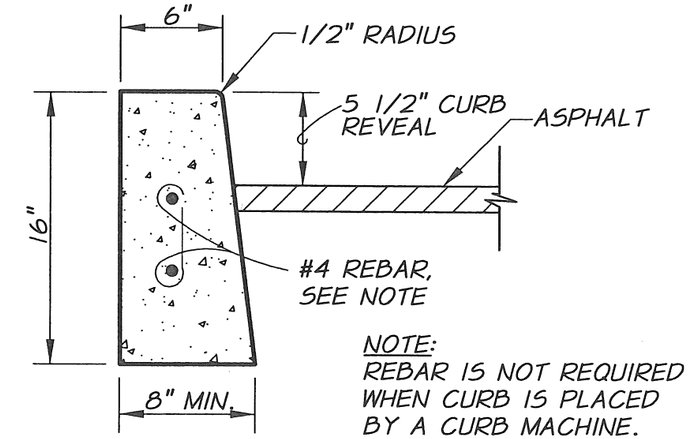
SIDEWALK JOINTING DETAIL

N.T.S.



SIDEWALK AND CURB DETAIL

N.T.S.



NOTE:
REBAR IS NOT REQUIRED WHEN CURB IS PLACED BY A CURB MACHINE.

TYPICAL CURB DETAIL

N.T.S.

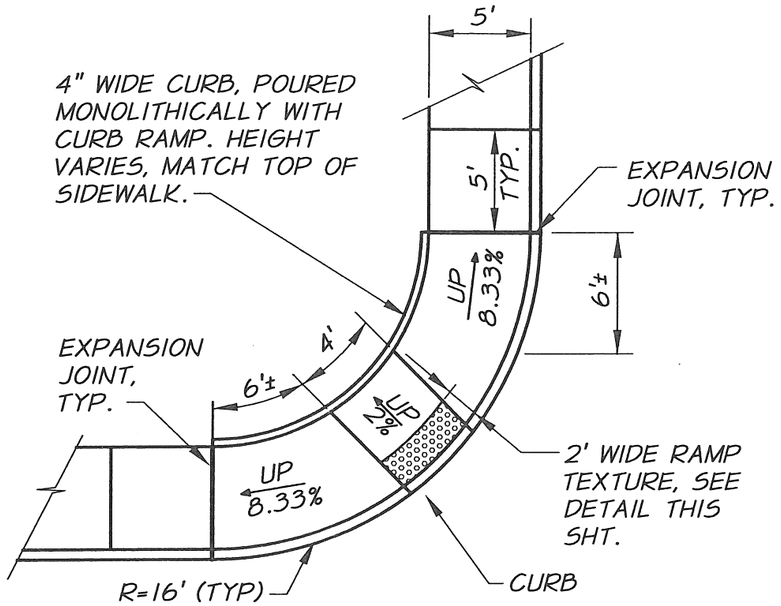
REVISION	DATE
GENERAL UPDATES	12/06
EXPANSION JOINT UPDATE	8/13

CITY OF UNION OREGON

STANDARD STREET DETAILS

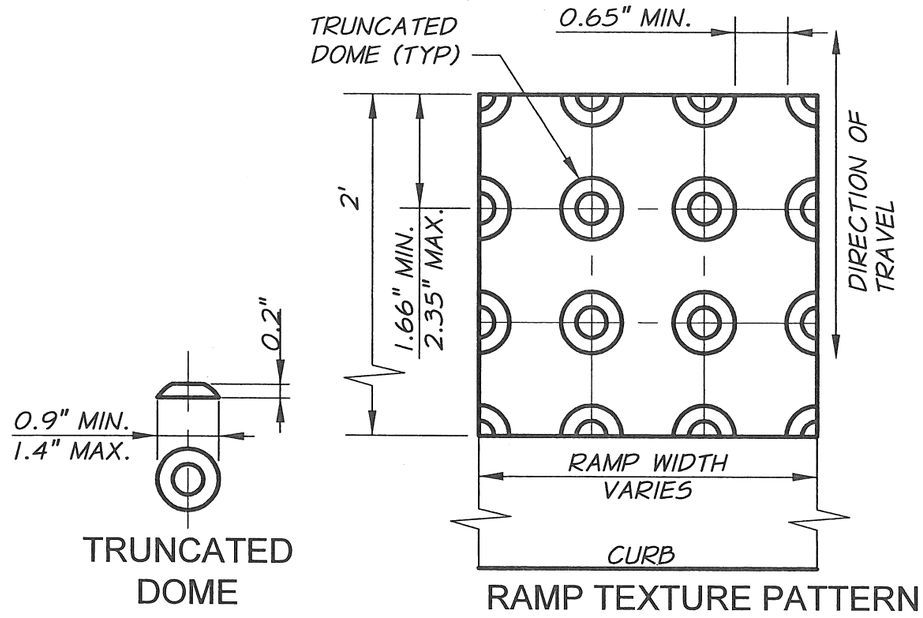
SIDEWALK AND CURB DETAILS

FIGURE **R6**



CURB RAMP PLACEMENT DETAIL

N.T.S.

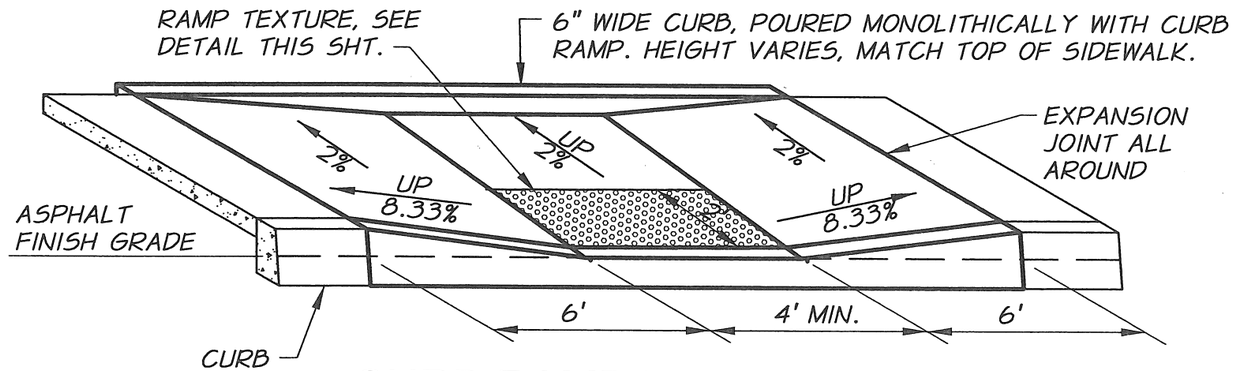


RAMP TEXTURE PATTERN DETAILS

N.T.S.

CURB RAMP NOTES:

1. THE SIDEWALK WIDTH WILL BE AS SPECIFIED ON FIGURES R1, R2, AND R3.
2. THE CURB RAMPS SHALL NOT BE PLACED INTEGRAL WITH THE SIDEWALK OR CURB AND SHALL BE ISOLATED WITH EXPANSION JOINT MATERIAL.
3. ALL SIDEWALK EDGES SHALL HAVE A 1/4" RADIUS.
4. CURB RAMP TEXTURING SHALL BE TRUNCATED DOME WARNING TEXTURE ONLY. IT SHALL ONLY BE PLACED IN THE LOWER 2' OF THROAT OF RAMP. ALIGN PATTERN RELATIVE TO TRAVEL DIRECTION ONLY AS SHOWN IN DETAIL. COLOR OF TEXTURE TO BE SAFETY YELLOW. TRUNCATED DOMES SHALL BE ARMORCAST CAST IN PLACE DETECTABLE WARNING PANELS OR APPROVED EQUAL.
5. CURB RAMPS TO BE LOCATED AND CONSTRUCTED IN ACCORDANCE WITH OREGON STANDARD DRAWINGS RD755, RD756, AND RD757, CURRENT EDITION.



CURB RAMP DETAIL

N.T.S.

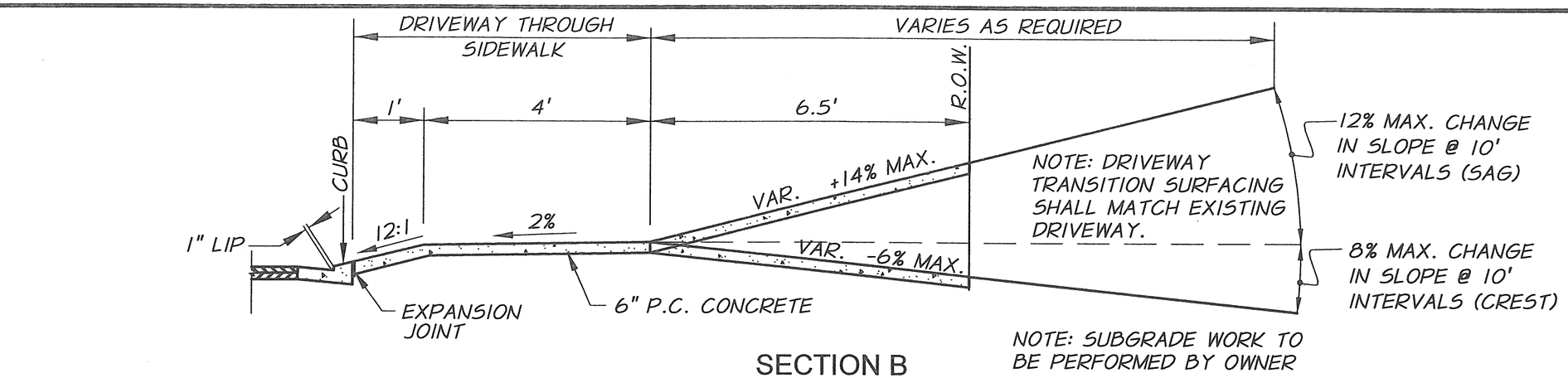
REVISION	DATE
GENERAL UPDATES	12/06
GENERAL UPDATES	7/13

CITY OF UNION OREGON

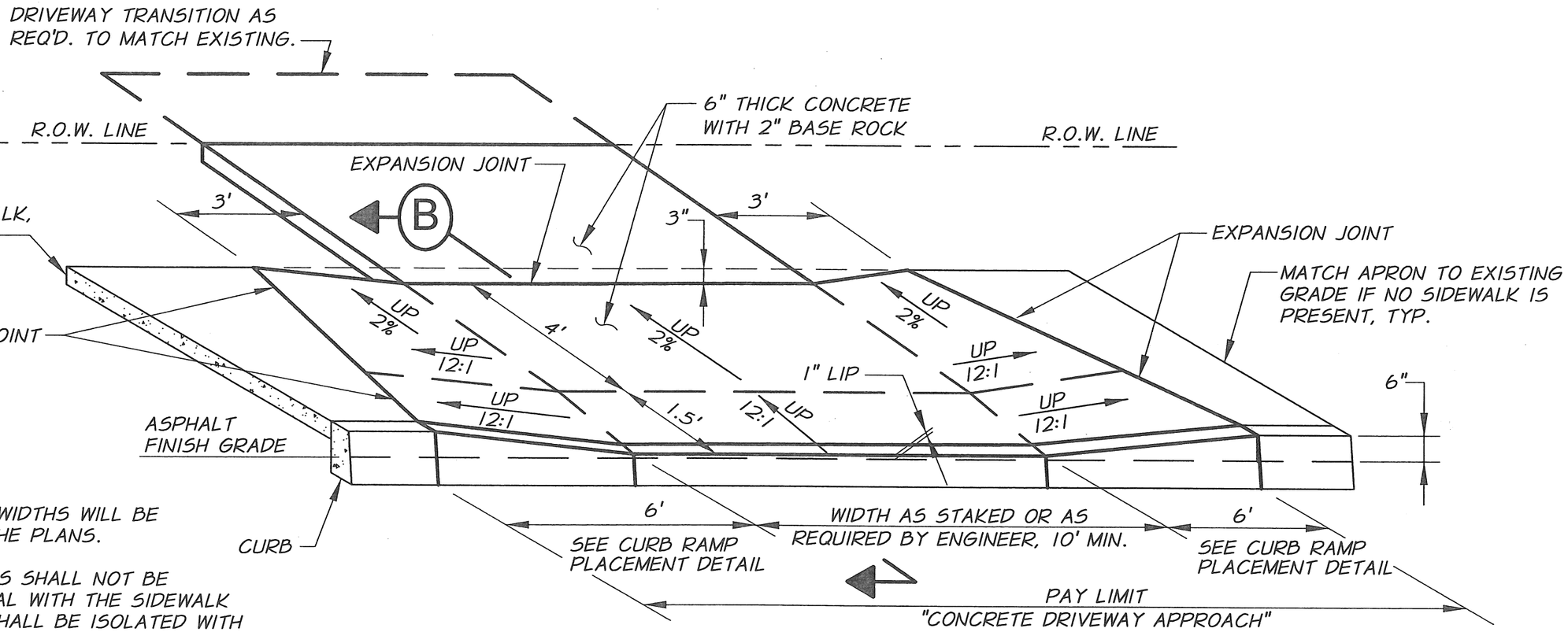
STANDARD STREET DETAILS

CURB RAMP DETAIL

FIGURE **R7**



SECTION B



TYPICAL DRIVEWAY APPROACH

N.T.S.

APPROACH NOTES:

1. THE APPROACH WIDTHS WILL BE SPECIFIED ON THE PLANS.
2. THE APPROACHES SHALL NOT BE PLACED INTEGRAL WITH THE SIDEWALK OR CURB AND SHALL BE ISOLATED WITH EXPANSION JOINT MATERIAL.
3. ALL APPROACH EDGES SHALL HAVE A 1/4" RADIUS.
4. IF SIDEWALK IS NOT PROVIDED ADJACENT TO CURB, ALTERNATIVE APPROACH CONCEPT MAY BE SUBMITTED TO THE CITY FOR APPROVAL.

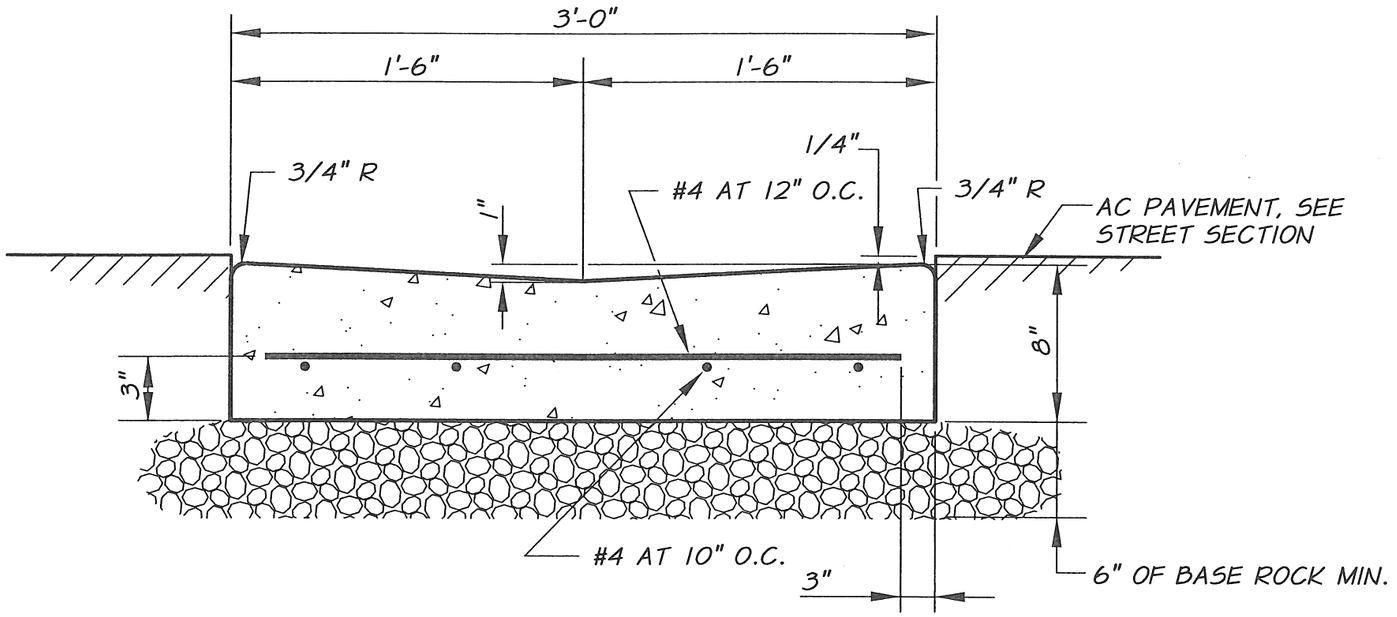
REVISION	DATE
GENERAL UPDATES	12/06
SIDEWALK NOTES	8/13

CITY OF UNION OREGON

STANDARD STREET DETAILS

DRIVEWAY APPROACH DETAIL

FIGURE R8



CONCRETE VALLEY GUTTER SECTION

N.T.S.

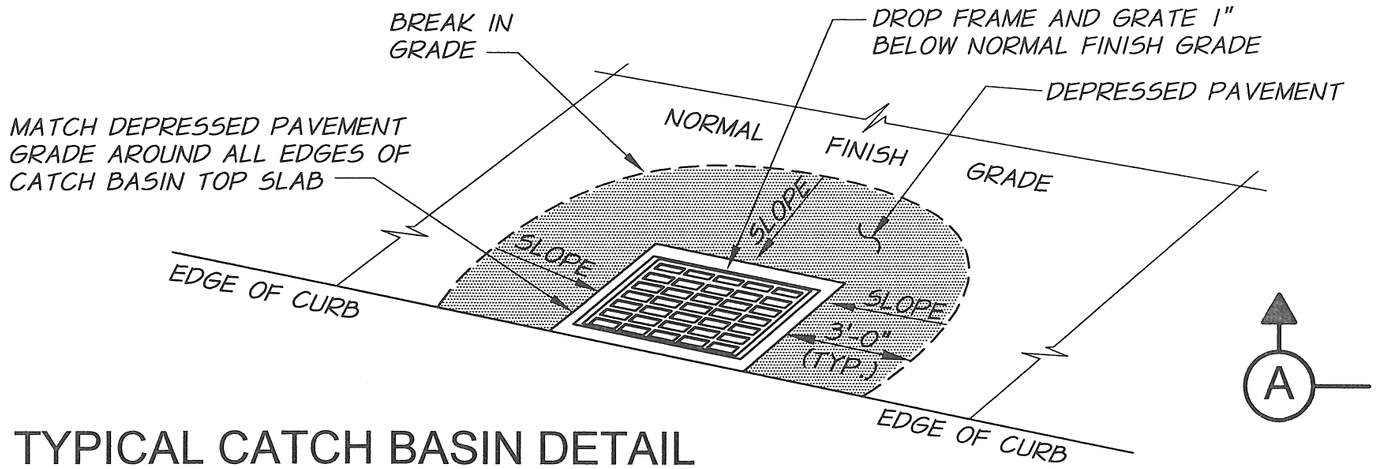
REVISION	DATE

CITY OF UNION OREGON

STANDARD STREET DETAILS

CONCRETE VALLEY GUTTER SECTION

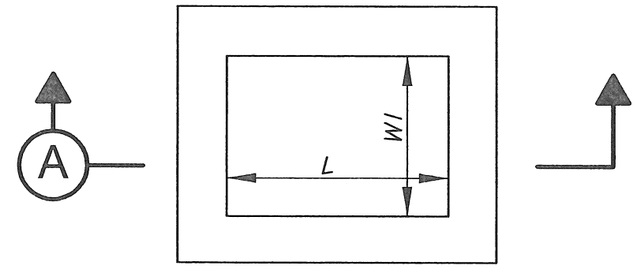
FIGURE **R9**



TYPICAL CATCH BASIN DETAIL

N.T.S.

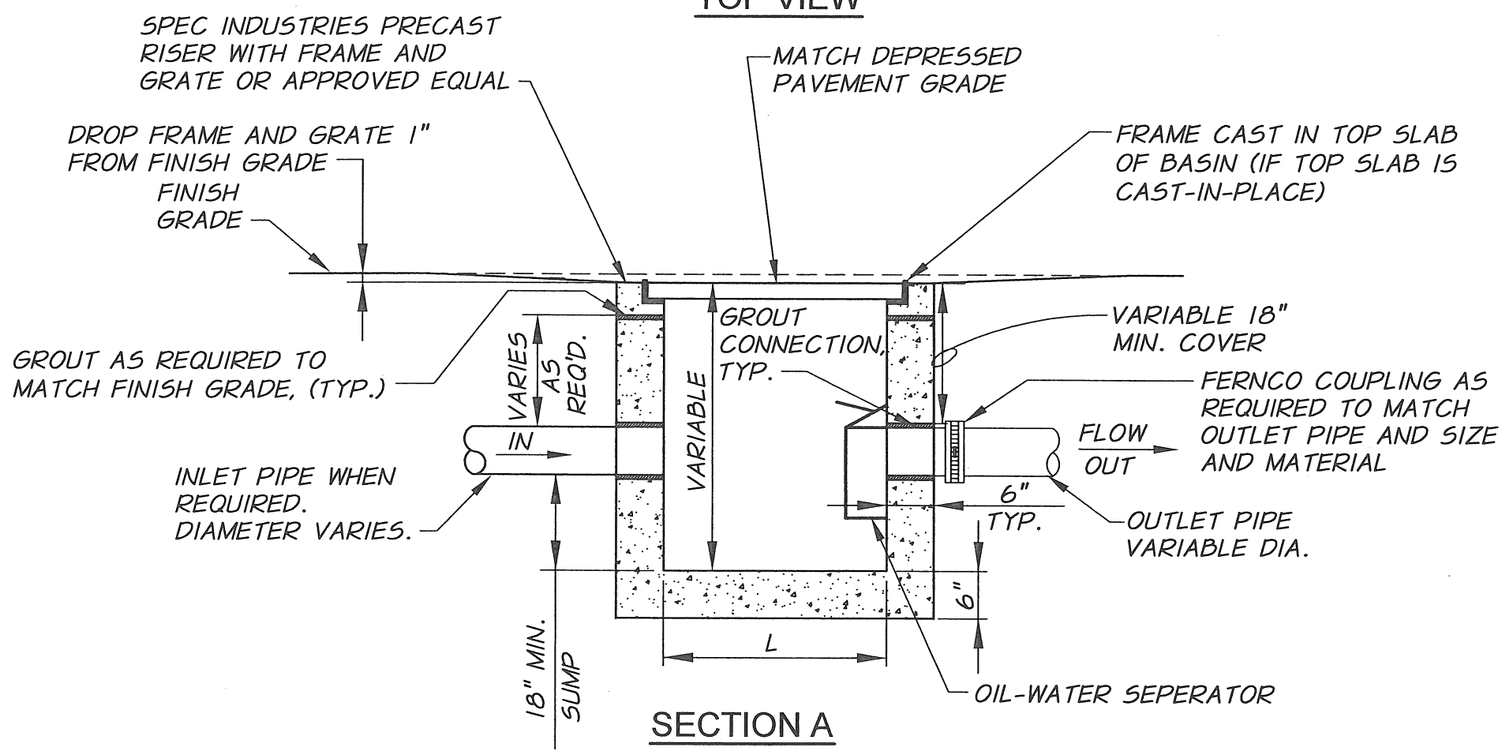
INLET TYPE	L	W 1
G-1	2'-4-1/4"	1'-8-7/8"
G-2	2'-4-1/4"	2'-3-3/8"



TOP VIEW

NOTES:

1. CATCH BASIN TO BE CONSTRUCTED IN ACCORDANCE WITH ASTM C-139 AND C-913 (PRE-CAST).
2. CONCRETE STRENGTH SHALL BE 3000 PSI.
3. 6" OF 3/4" COMPACTED BASE MATERIAL TO BE PLACED AROUND STRUCTURE.
4. REINFORCEMENT IN PRE-CAST CATCH BASIN TO BE REBAR MEETING ASTM A615 GRADE 60 OR WELDED WIRE MEETING ASTM A497.
5. PRE-CAST CATCH BASINS SHALL BE PER OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION, TYPE G-1 OR G-2, AS APPROVED BY THE CITY,
6. FRAMES AND GRATES PER OREGON STANDARD SPECIFICATIONS FOR CONSTRUCTION, AS APPROVED BY THE CITY.
7. FIELD SET CATCH BASIN TO OBTAIN PROPER GRATE SLOPE TO MATCH FINISH GRADE.
8. "FLOW THROUGH CATCH BASINS" SHALL NOT HAVE OIL-WATER SEPERATOR BUT SHALL RETAIN ALL OTHER PROVISIONS OF THIS DETAIL.
9. REINFORCEMENT SHALL NOT BE REQUIRED FOR CAST-IN-PLACE CATCH BASINS.



SECTION A

REVISION	DATE
GENERAL UPDATES	12/06
GENERAL UPDATES	8/13

CITY OF UNION OREGON

STANDARD STREET DETAILS

TYPICAL CATCH BASIN DETAIL

FIGURE **R10**

ARROWS ON SIGN AS REQ'D. FOR SIGN LOCATION

6" X VARIABLE

TRAFFIC SIGN INSTALLATION NOTES

1. ALL SIGNS SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, CURRENT ADDITION AND CURRENT MODIFICATIONS. STREET SIGNS SHALL BE THE MANUFACTURER AND STYLE AS DESIGNATED BY THE CITY.

2. SIGNS SHALL BE MOUNTED WITH 2 - 5/16" DIA. GALV. BOLTS, NUTS & LOCK WASHERS, TO A U-CHANNEL OR SQUARE TUBE POST.

3. THE POST SHALL BE A 12' LONG METAL U-CHANNEL WEIGHING A MINIMUM 3 LBS/FT. OR A 12' LONG, 2" X 2" METAL SQUARE TUBE WITH 0.105 INCH WALL THICKNESS WITH A GREEN BAKED ENAMEL FINISH OR HOT-DIPPED GALVANIZED.

4. BREAKAWAY STYLE POSTS ARE REQUIRED ON THE STATE HIGHWAY SYSTEM OR WHEN SIGNS ARE TO BE PLACED WITHIN 7' OF A ROAD TRAVEL LANE AND NO CURB IS PRESENT. BREAKAWAY ANCHOR AND V-LOCK SOCKET ASSEMBLIES SHALL BE SUBMITTED FOR APPROVAL BY THE CITY ENGINEER.

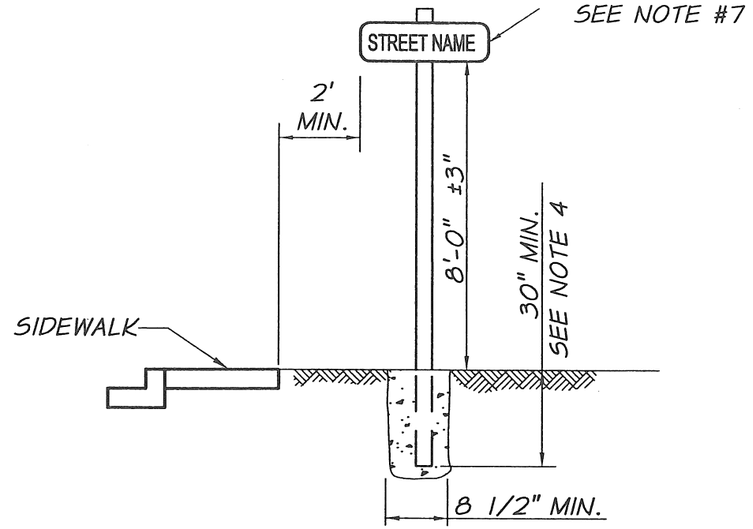
5. FOR STANDARD POSTS WITH 30" TO 36" OF BURY DEPTH, BACKFILL WITH 3000 P.S.I. CONCRETE. NATIVE MATERIAL COMPACTED TO A MINIMUM OF 90% OF TEST METHOD 609 SHALL BE USED FOR DEPTHS OVER 36". BREAKAWAY ANCHOR AND V-LOCK SOCKET ASSEMBLIES SHALL BE SUBMITTED FOR APPROVAL BY THE CITY ENGINEER.

6. SIGNS AND POST SHALL BE INSTALLED SO THEY ARE PLUMB, RESIST SWAYING IN THE WIND AND DISPLACEMENT BY VANDALISM.

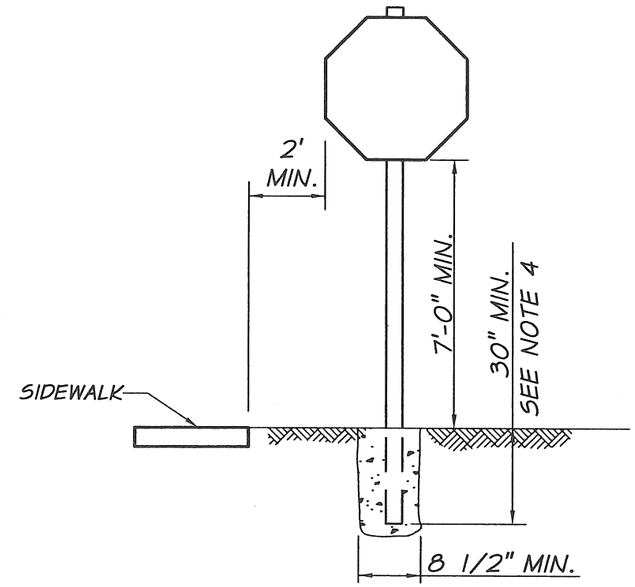
7. SIGN POSTS SHALL BE SET AT THE LOCATIONS CALLED OUT ON THE PLANS, UNLESS OTHERWISE REQUIRED. IF SIDEWALK IS NOT PRESENT, POSTS SHALL GENERALLY BE 2'-6" FROM BACK OF CURB OR EDGE OF PAVEMENT, UNLESS OTHERWISE REQUIRED.

8. ORIENT STREET SIGNS TO PROPERLY DISPLAY STREET NAMES AND ADJUST TO FIELD CONDITIONS.

9. "NO PARKING" SIGNS SHALL BE SET AT AN ANGLE NOT LESS THAN 30° NOR MORE THAN 45° WITH THE LINE OF TRAFFIC FLOW TO BE VISIBLE TO APPROACHING TRAFFIC.



STREET SIGN DETAIL



TRAFFIC SIGN DETAIL

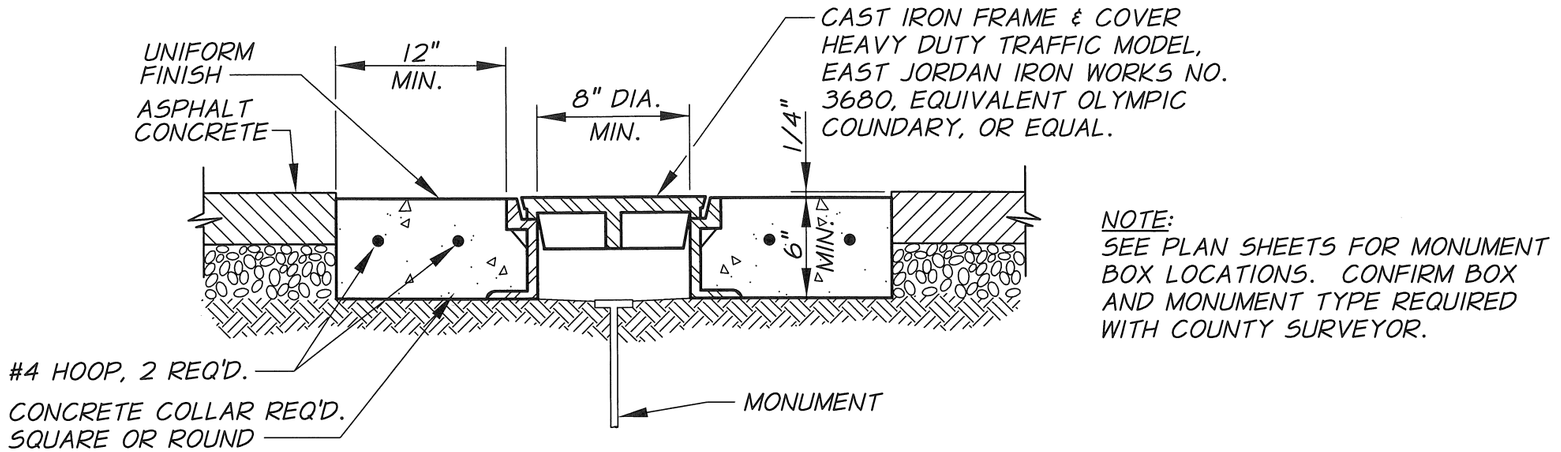
REVISION	DATE
BREAKAWAY POST NOTES	8/13

CITY OF UNION OREGON

STANDARD STREET DETAILS

SIGN DETAILS

FIGURE
R11



NOTE:
SEE PLAN SHEETS FOR MONUMENT BOX LOCATIONS. CONFIRM BOX AND MONUMENT TYPE REQUIRED WITH COUNTY SURVEYOR.

REQUIREMENTS FOR CONCRETE COLLARS:

1. CONCRETE: 3/4", 7 SACK, 4000 PSI AT 28 DAYS, 2" TO 4" SLUMP, 4-7% AIR.
2. COLLAR TO BE FORMED AND UNIFORMLY ROUND OR SQUARE.
3. SMOOTH BROOMED FINISH REQUIRED.
4. APPLY CONCRETE CURING COMPOUND.
5. PROTECT FROM TRAFFIC FOR 4 DAYS MIN.

MONUMENT BOX DETAIL

N.T.S.

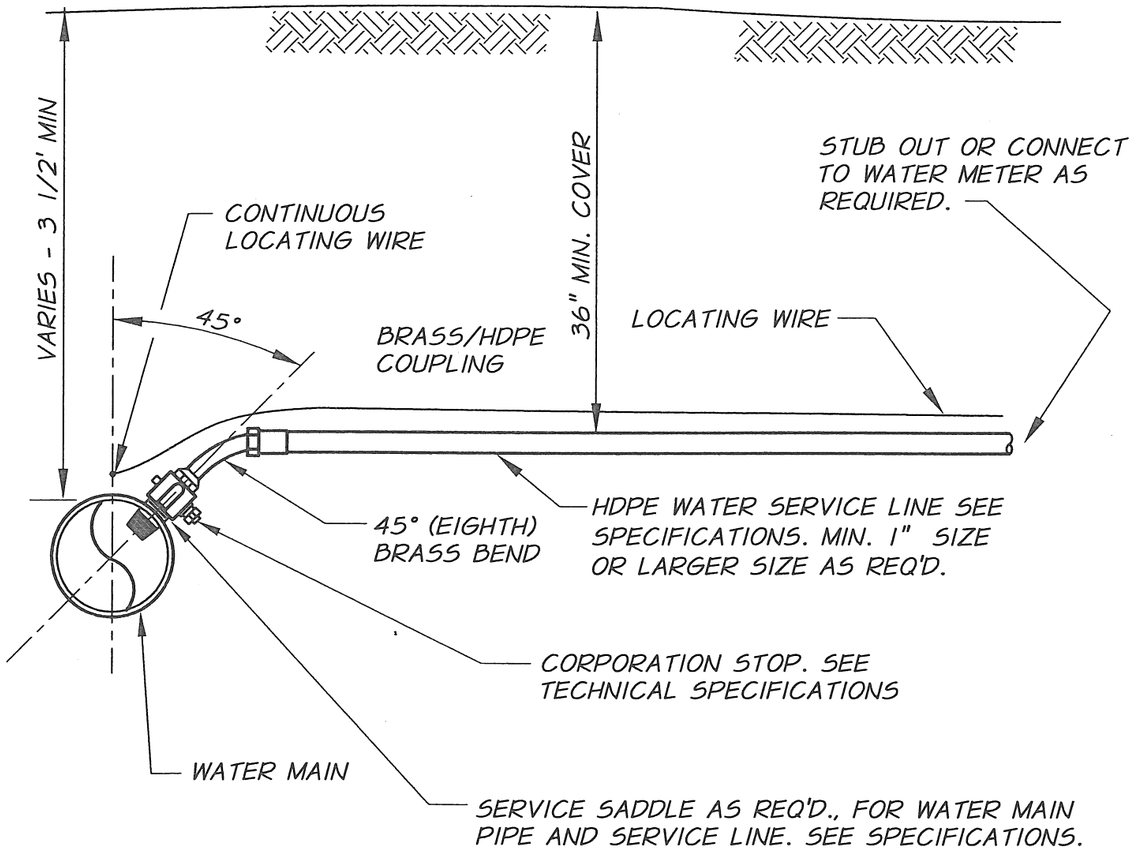
REVISION	DATE
GENERAL UPDATES	8/13

CITY OF UNION OREGON

STANDARD STREET DETAILS

MONUMENT BOX DETAIL

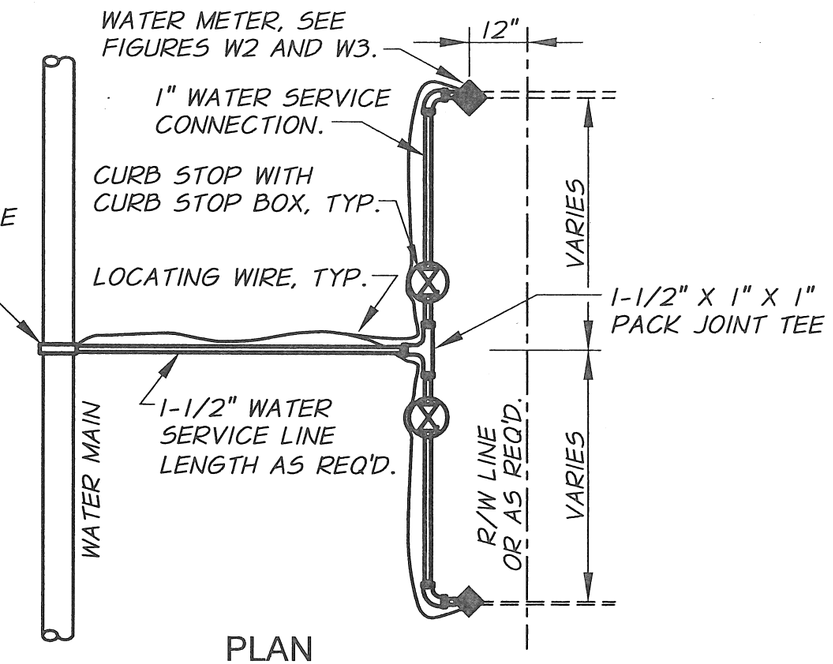
FIGURE
R12



SECTION

TYPICAL WATER SERVICE LINE

N.T.S.

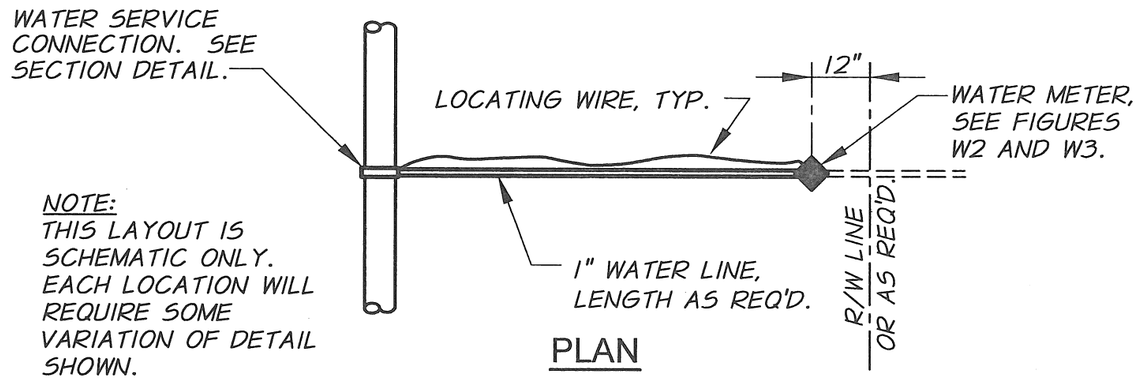


NOTE:
THIS LAYOUT IS SCHEMATIC ONLY. EACH LOCATION WILL REQUIRE SOME VARIATION OF DETAIL SHOWN.

PLAN

MULTIPLE WATER SERVICES

N.T.S.



NOTE:
THIS LAYOUT IS SCHEMATIC ONLY. EACH LOCATION WILL REQUIRE SOME VARIATION OF DETAIL SHOWN.

PLAN

SINGLE WATER SERVICE LINE

N.T.S.

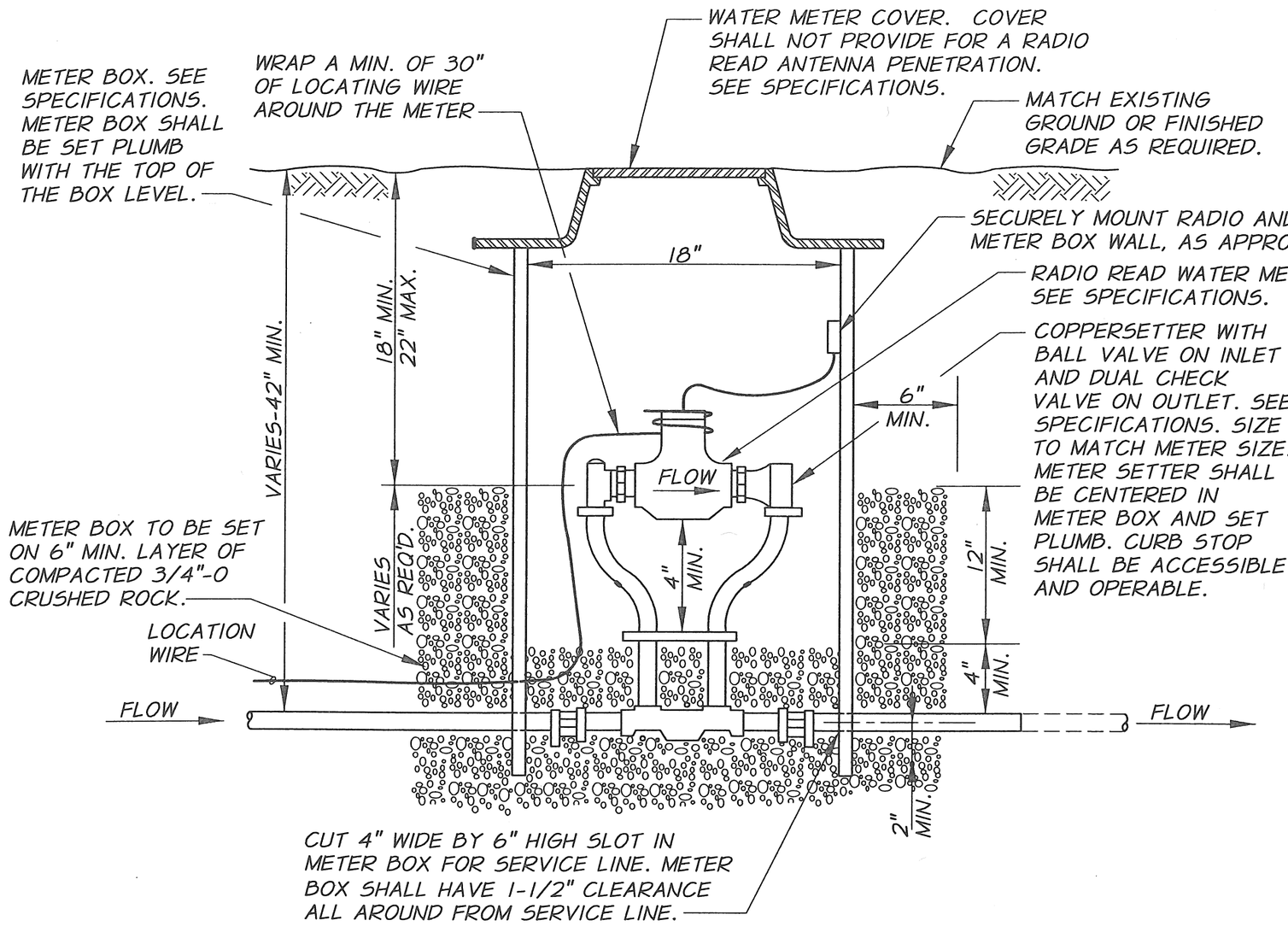
REVISION	DATE
GENERAL UPDATES	12/06
CURB STOP BOX	8/13

CITY OF UNION OREGON

STANDARD WATER DETAILS

WATER SERVICE LINE SECTION AND PLAN DETAILS

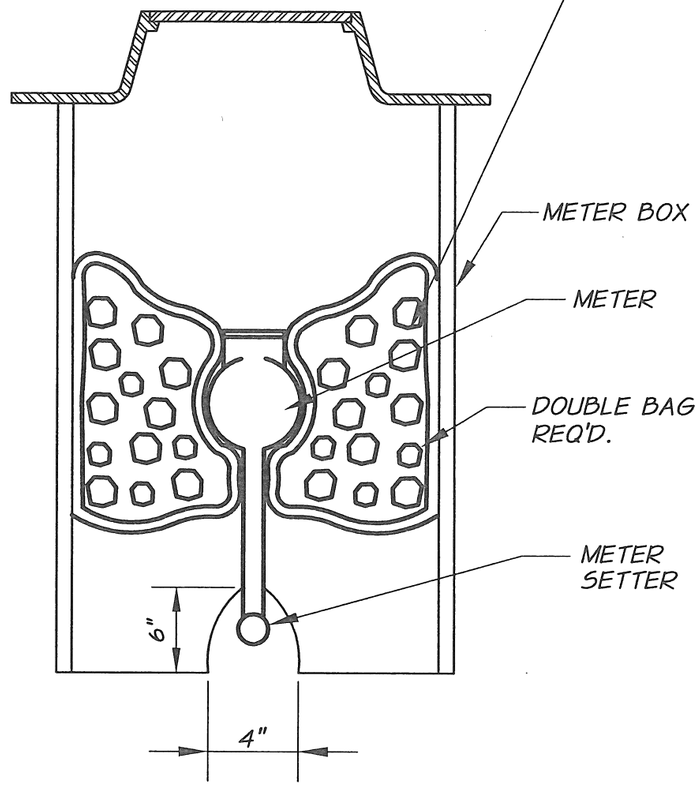
FIGURE **W1**



TYPICAL 1" OR SMALLER WATER METER INSTALLATION

N.T.S.

INSTALL THREE BAGS MIN., OR MORE IF REQ'D. BAGS SHALL BE FILLED WITH POLYURETHANE FOAM "PEANUTS". SECURELY HEAT SEAL OR TAPE EACH END OF EACH BAG. DOUBLE BAG EACH BAG UNIT. PLACE BAGS AROUND THE METER SO METER CAN BE READ. PROVIDE PROTOTYPE OF INSULATING BAG FOR APPROVAL BY ENGINEER BEFORE PROVIDING BAGS FOR PROJECT. CONSOLIDATED PLASTIC CO. INC. (1-800-362-1000) #92164 4-MIL. 20" X 24" POLY BAGS OR APPROVED EQUAL.



METER BOX INSULATION DETAIL

(REQUIRED FOR ALL METER INSTALLATIONS)

N.T.S.

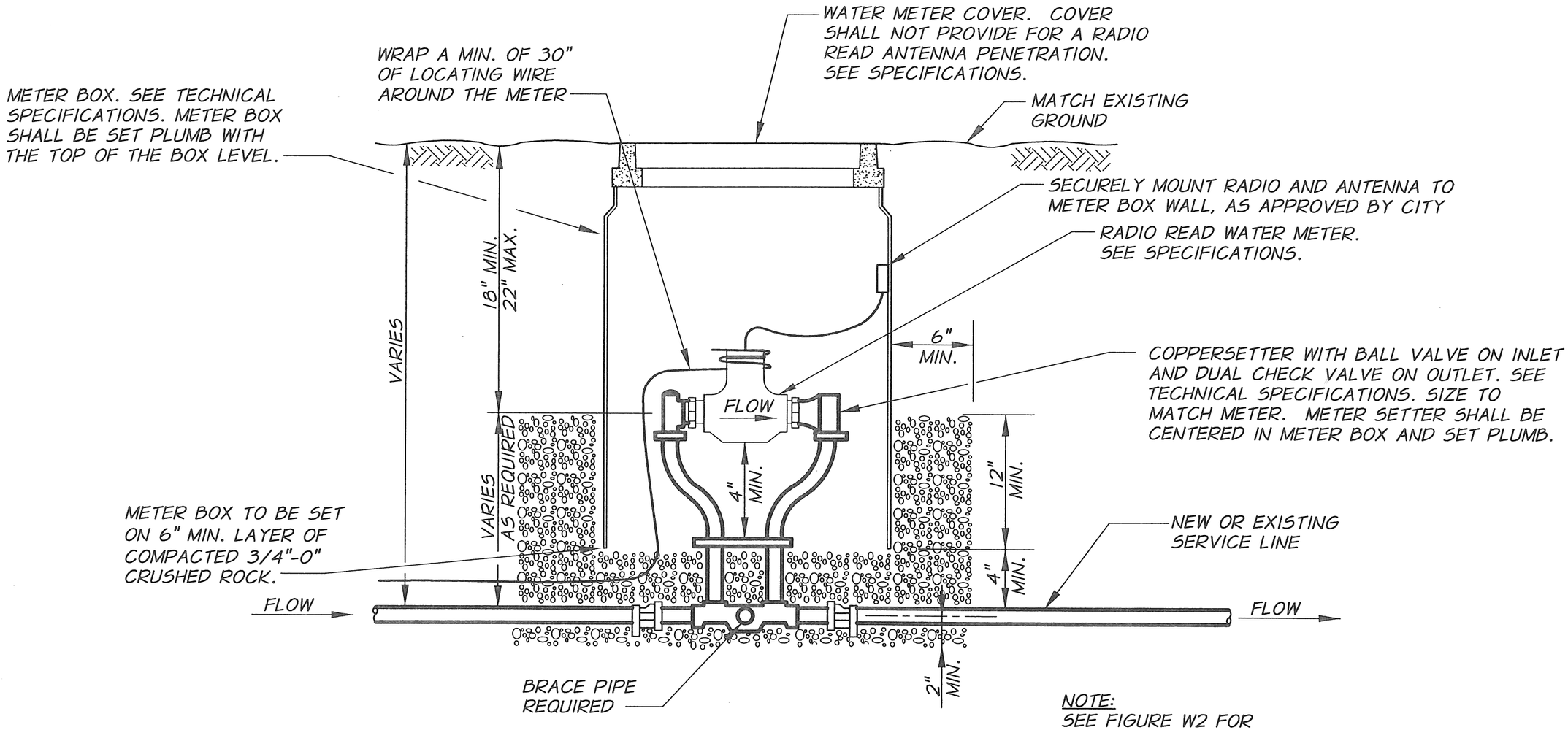
REVISION	DATE
GENERAL UPDATES	12/06
RADIO READ & POLY BAGS	7/13

CITY OF UNION OREGON

STANDARD WATER DETAILS

WATER METER DETAILS

FIGURE W2



NOTE:
SEE FIGURE W2 FOR METER BOX INSULATION DETAILS

TYPICAL 1" OR 1-1/2" WATER METER INSTALLATION

N.T.S.

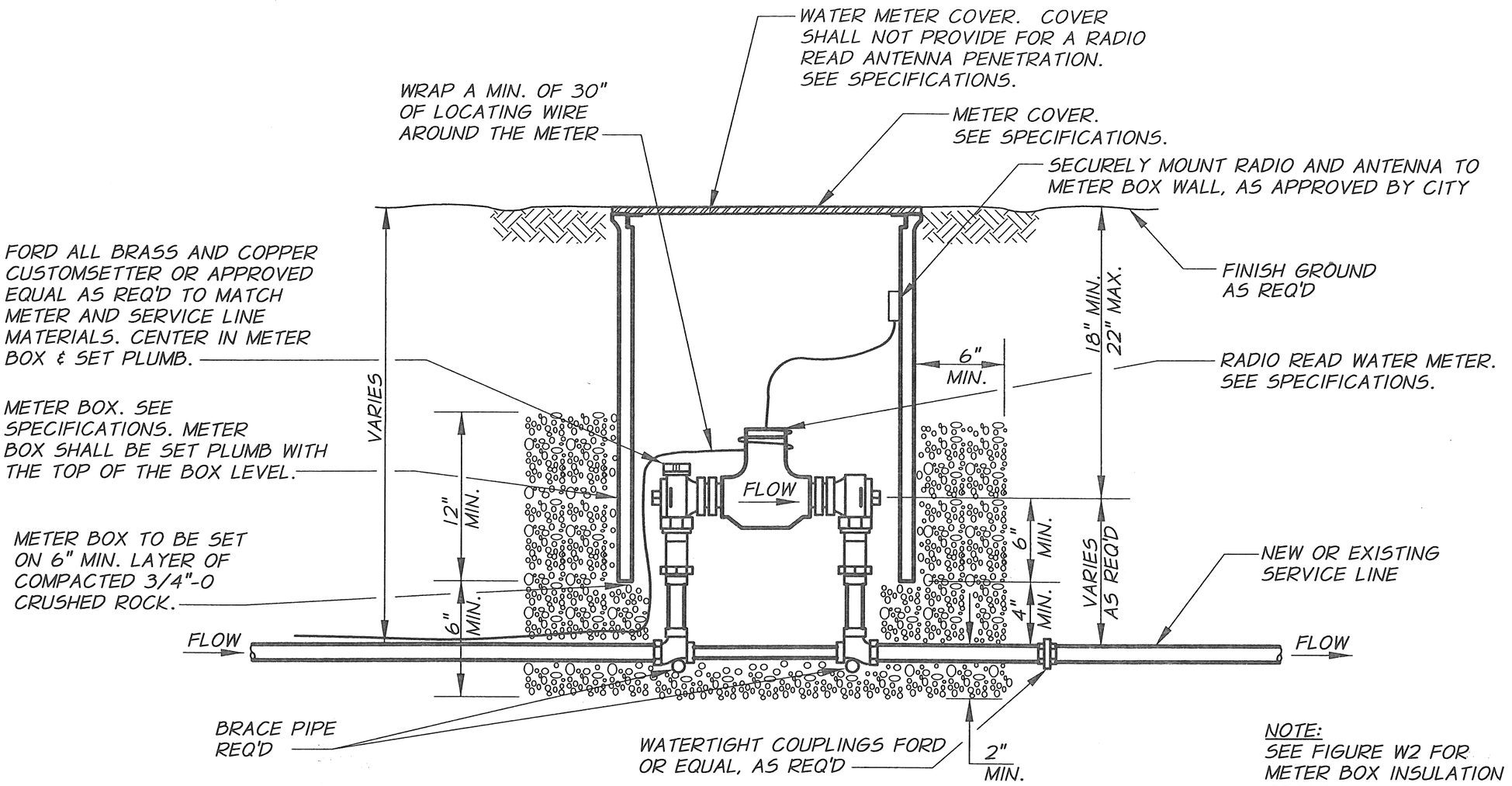
REVISION	DATE
GENERAL UPDATES	12/06
RADIO READ	7/13

CITY OF UNION OREGON

STANDARD WATER DETAILS

WATER METER DETAILS

FIGURE **W3**



NOTE:
SEE FIGURE W2 FOR METER BOX INSULATION DETAILS.

TYPICAL 1 1/2" OR 2" WATER METER INSTALLATION

(USING COPPER CUSTOMSETTER)

N.T.S.

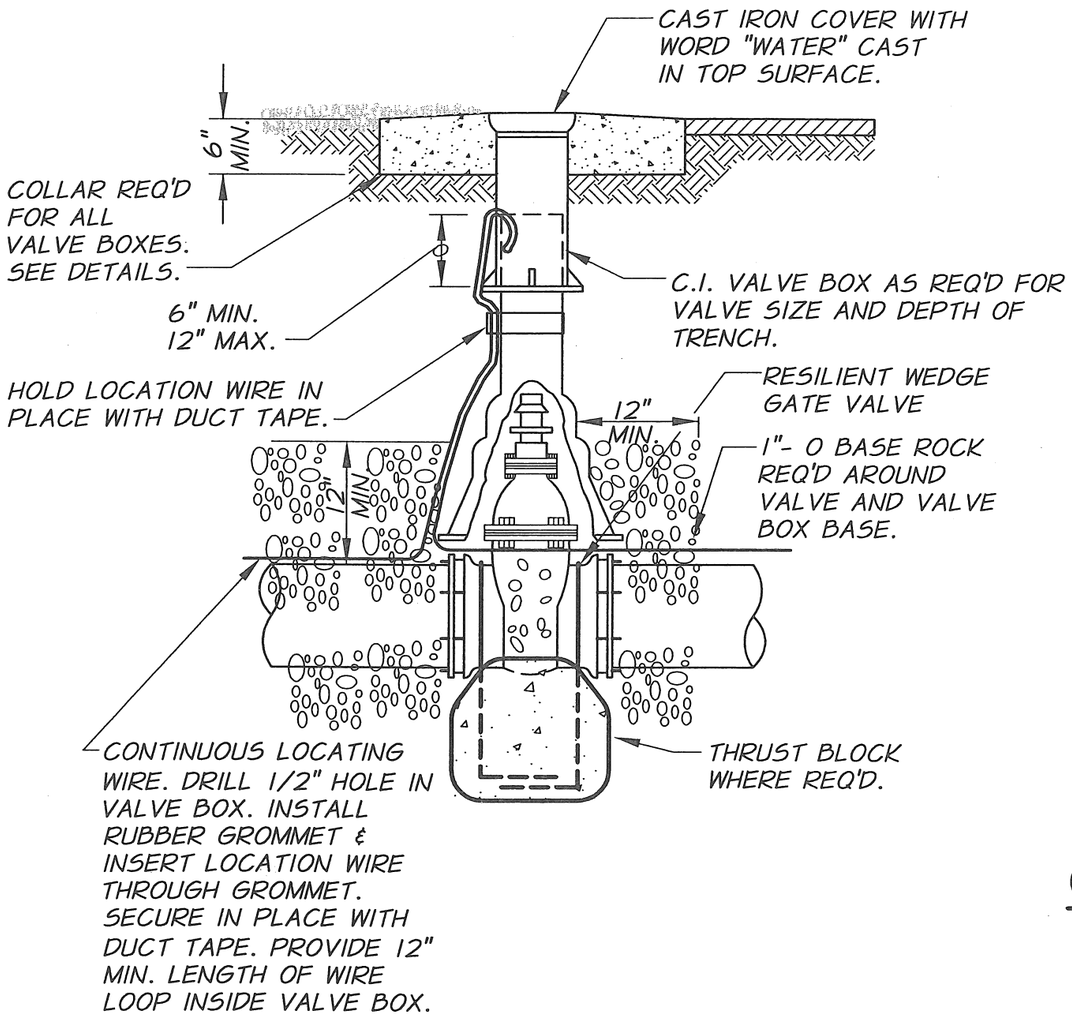
REVISION	DATE
GENERAL UPDATES	12/06
GENERAL UPDATES	7/13

CITY OF UNION OREGON

STANDARD WATER DETAILS

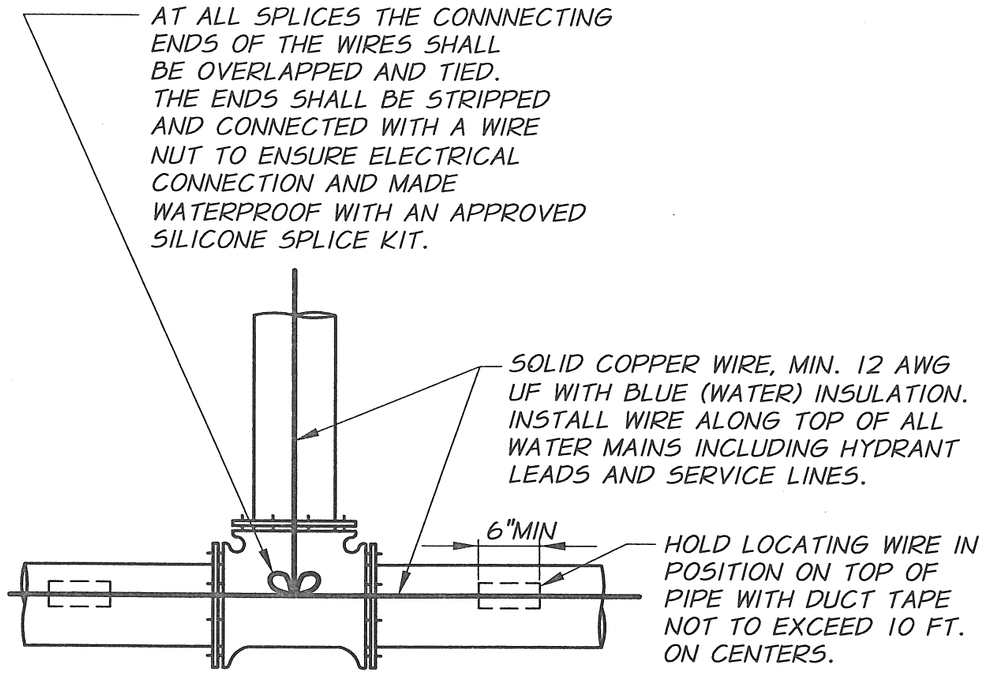
WATER METER DETAILS

FIGURE W4



VALVE BOX DETAIL

N.T.S.



CONTINUOUS LOCATING WIRE DETAIL

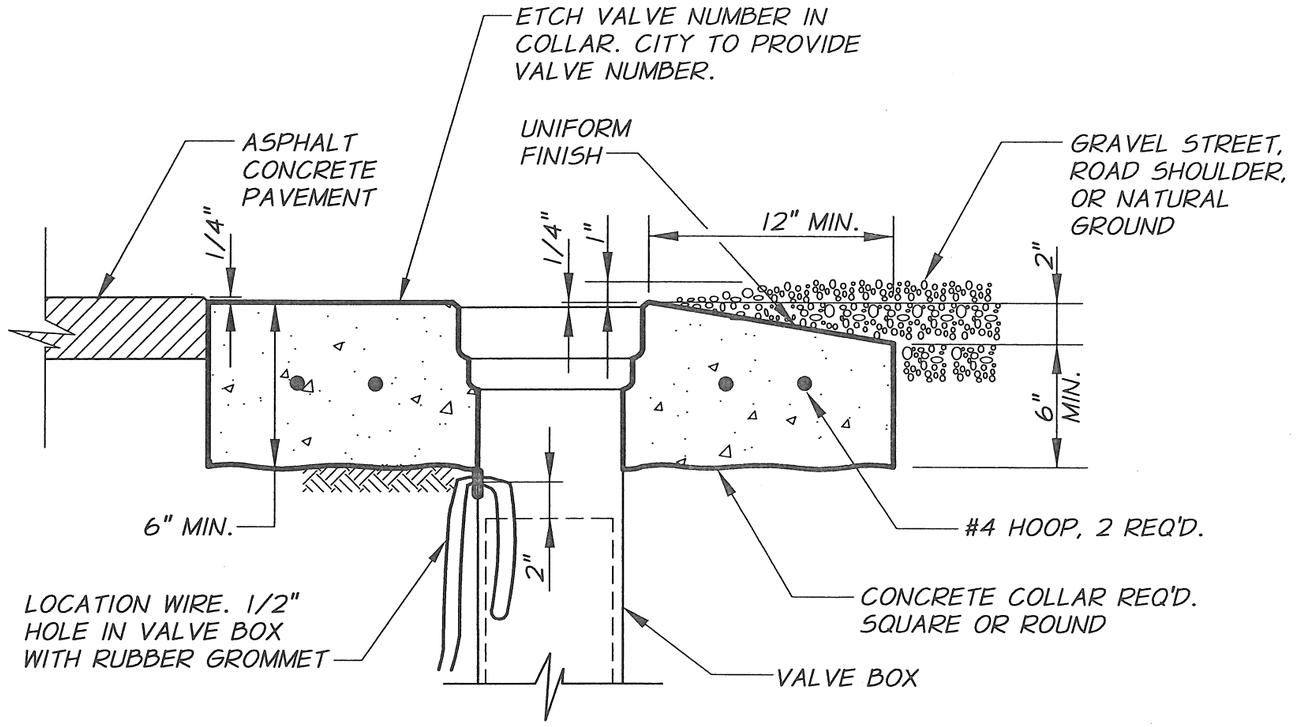
N.T.S.

REVISION	DATE
GENERAL UPDATES	12/06

CITY OF UNION OREGON

STANDARD WATER DETAILS
VALVE BOX AND CONTINUOUS LOCATING WIRE DETAIL

FIGURE
W5



REQUIREMENTS FOR CONCRETE COLLARS:
1. CONCRETE : 3/4", 7 SACK, 4000 PSI@ 28 DAYS, 2" TO 4" SLUMP, 4-7% AIR.
2. COLLAR TO BE FORMED AND UNIFORMLY ROUND.
3. SMOOTH BROOMED FINISH REQ'D.
4. APPLY CONCRETE CURING COMPOUND.
5. PROTECT FROM TRAFFIC FOR 4 DAYS MIN.

VALVE CONCRETE COLLAR DETAIL

IN ASPHALT STREETS, GRAVEL STREETS, OR NATURAL GROUND

N.T.S.

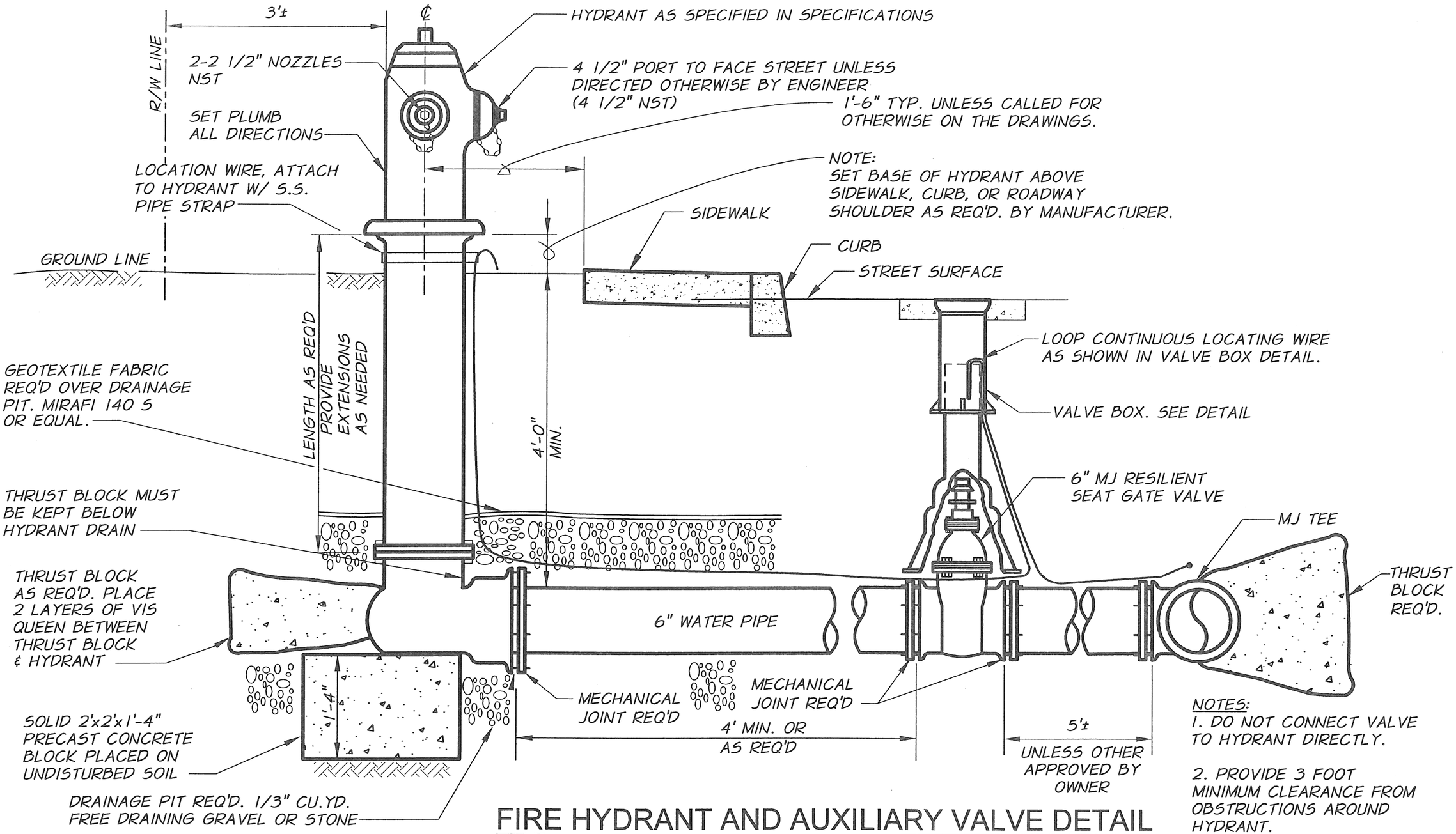
REVISION	DATE
GENERAL UPDATES	12/06

CITY OF UNION OREGON

STANDARD WATER DETAILS

VALVE CONCRETE COLLAR DETAIL

FIGURE **W6**



FIRE HYDRANT AND AUXILIARY VALVE DETAIL

N.T.S.

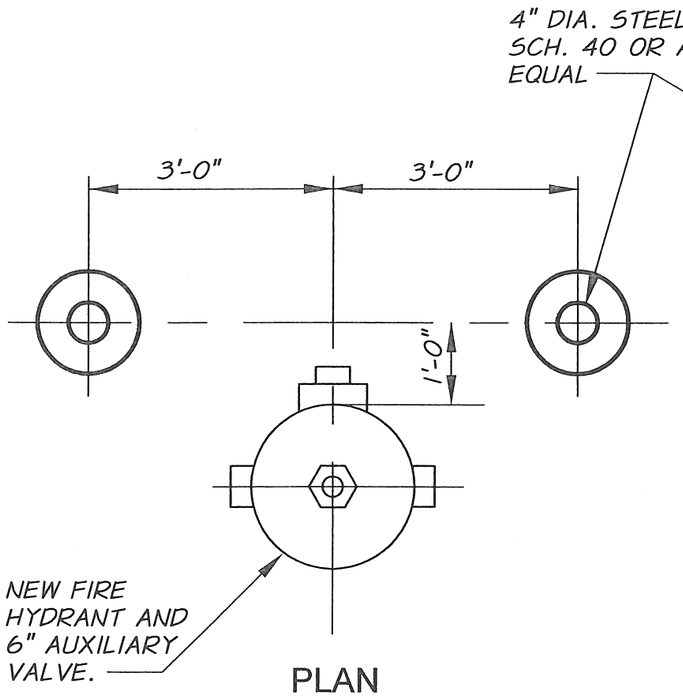
NOTES:
1. DO NOT CONNECT VALVE TO HYDRANT DIRECTLY.
2. PROVIDE 3 FOOT MINIMUM CLEARANCE FROM OBSTRUCTIONS AROUND HYDRANT.

REVISION	DATE
GENERAL UPDATES	12/06
GENERAL UPDATES	7/13

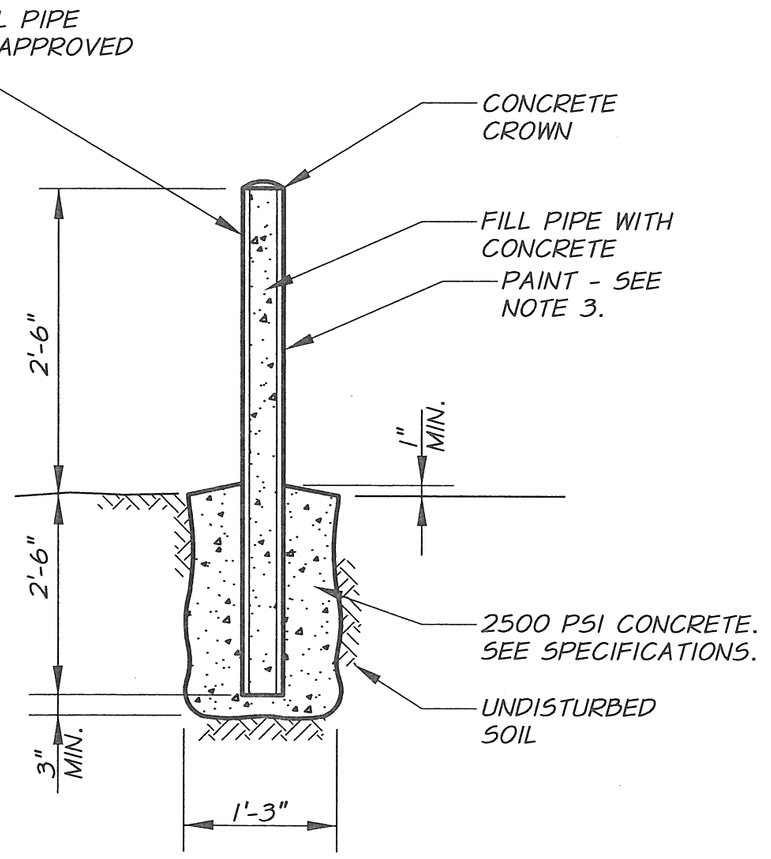
CITY OF UNION OREGON

STANDARD WATER DETAILS
FIRE HYDRANT AND AUXILIARY VALVE DETAIL

FIGURE
W7



PLAN



SECTION

NOTES:

1. 4" DIA. STEEL PIPE SHALL BE PLUMB.
2. LOCATE PIPES EQUIDISTANT FROM FIRE HYDRANT.
3. PAINTING SHALL BE DONE ONLY AFTER SURFACE IS FREE OF RUST, OIL, AND GREASE. THE METAL SHALL BE PRIMED AND TWO FINISH COATS, YELLOW IN COLOR APPLIED.

FIRE HYDRANT BARRICADE

N.T.S.

REVISION	DATE

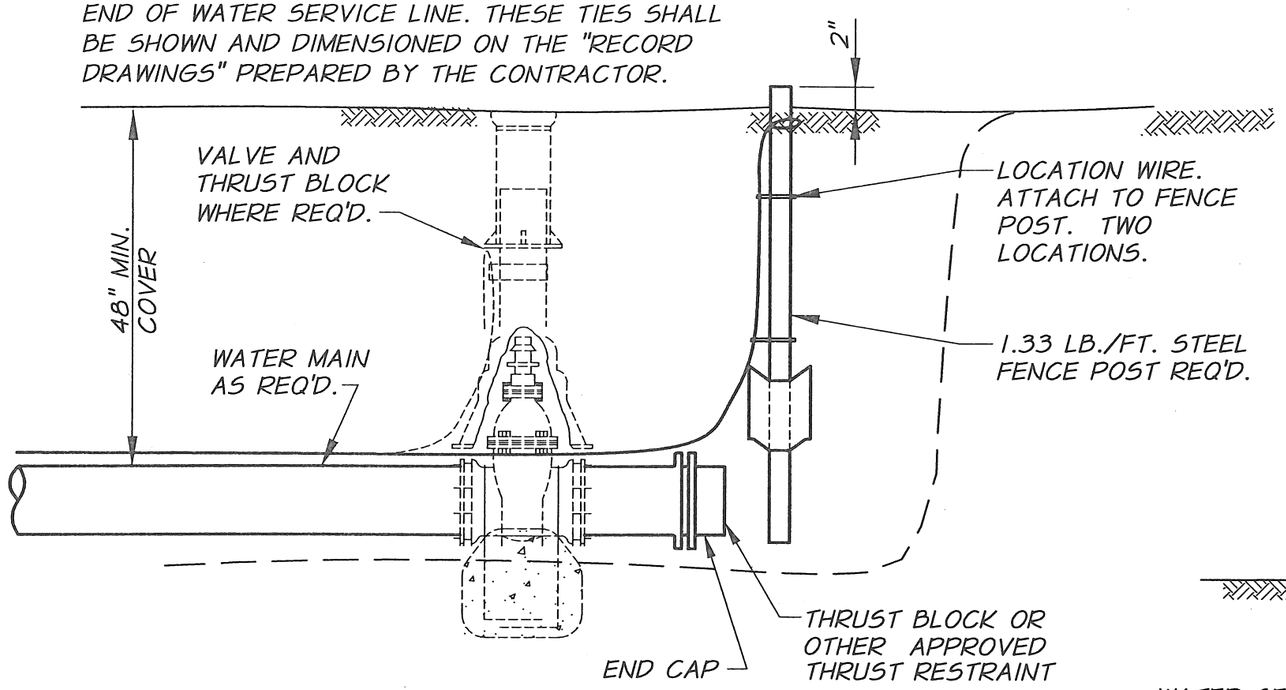
CITY OF UNION OREGON

STANDARD WATER DETAILS

FIRE HYDRANT BARRICADE

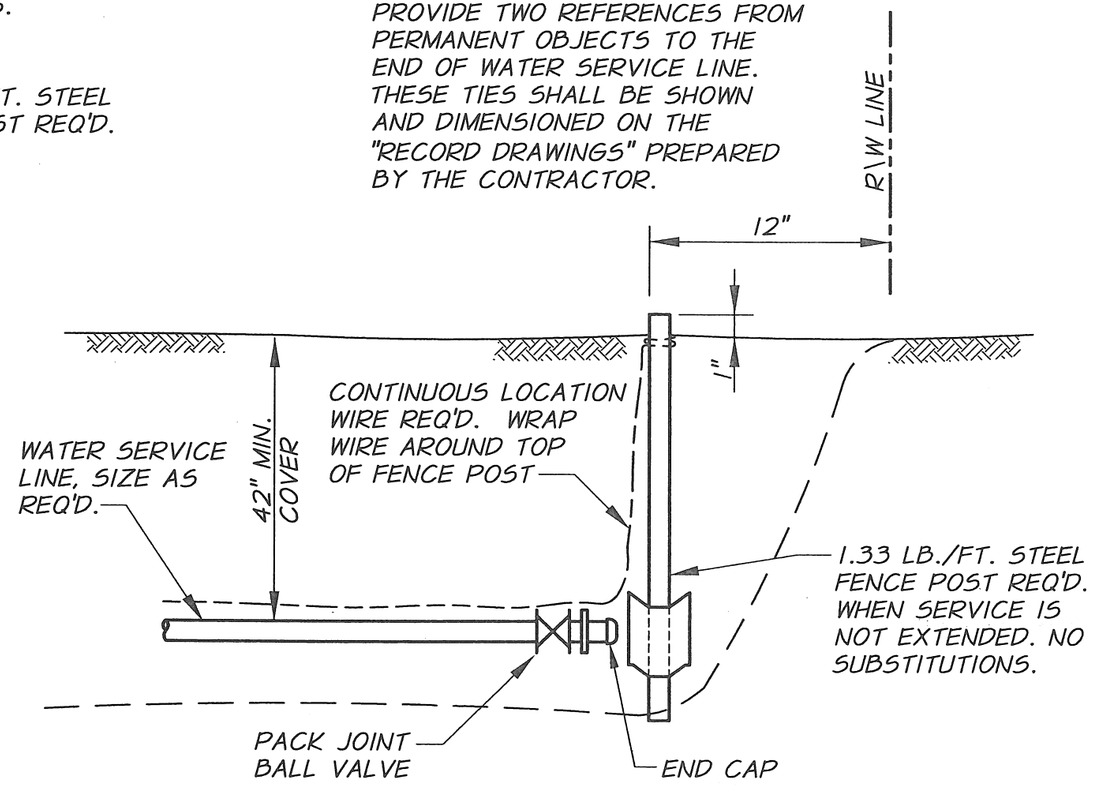
FIGURE W8

NOTE:
THE CONTRACTOR SHALL PROVIDE TWO REFERENCES FROM PERMANENT OBJECTS TO THE END OF WATER SERVICE LINE. THESE TIES SHALL BE SHOWN AND DIMENSIONED ON THE "RECORD DRAWINGS" PREPARED BY THE CONTRACTOR.



TYPICAL WATER MAIN STUB
SECTION
N.T.S.

NOTE:
THE CONTRACTOR SHALL PROVIDE TWO REFERENCES FROM PERMANENT OBJECTS TO THE END OF WATER SERVICE LINE. THESE TIES SHALL BE SHOWN AND DIMENSIONED ON THE "RECORD DRAWINGS" PREPARED BY THE CONTRACTOR.



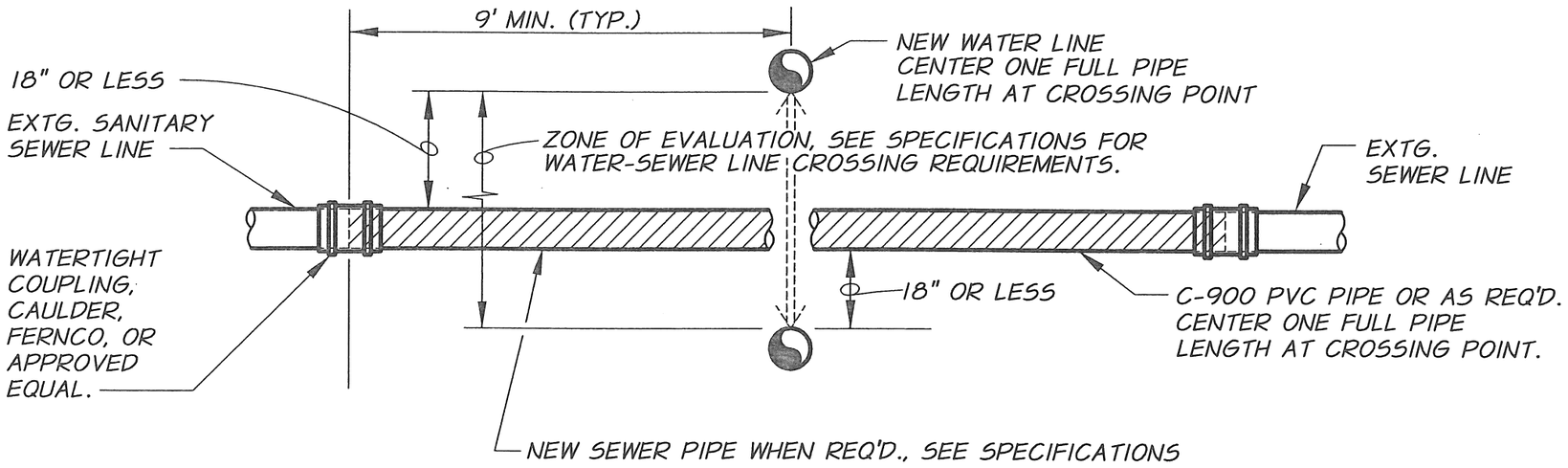
TYPICAL WATER SERVICE LINE STUB
SECTION
N.T.S.

REVISION	DATE
GENERAL UPDATES	7/13

CITY OF UNION OREGON

STANDARD WATER DETAILS
WATER MAIN AND SERVICE LINE STUB DETAILS

FIGURE
W9



NOTES:

1. SEE SUPPORT BEAM DETAIL WHEN SUPPORT BEAM IS REQUIRED.
2. ALL BACK FILL IN AREA OF WATER-SEWER CROSSING TO A DEPTH 12" ABOVE THE TOP OF THE HIGHEST PIPE SHALL BE 3/4"-0 BASE ROCK COMPACTED TO 95% OF ASTM D-698 LABORATORY DENSITY.

WATER-SEWER CROSSING

(NEW WATER LINE CONSTRUCTION)

N.T.S.

REVISION	DATE

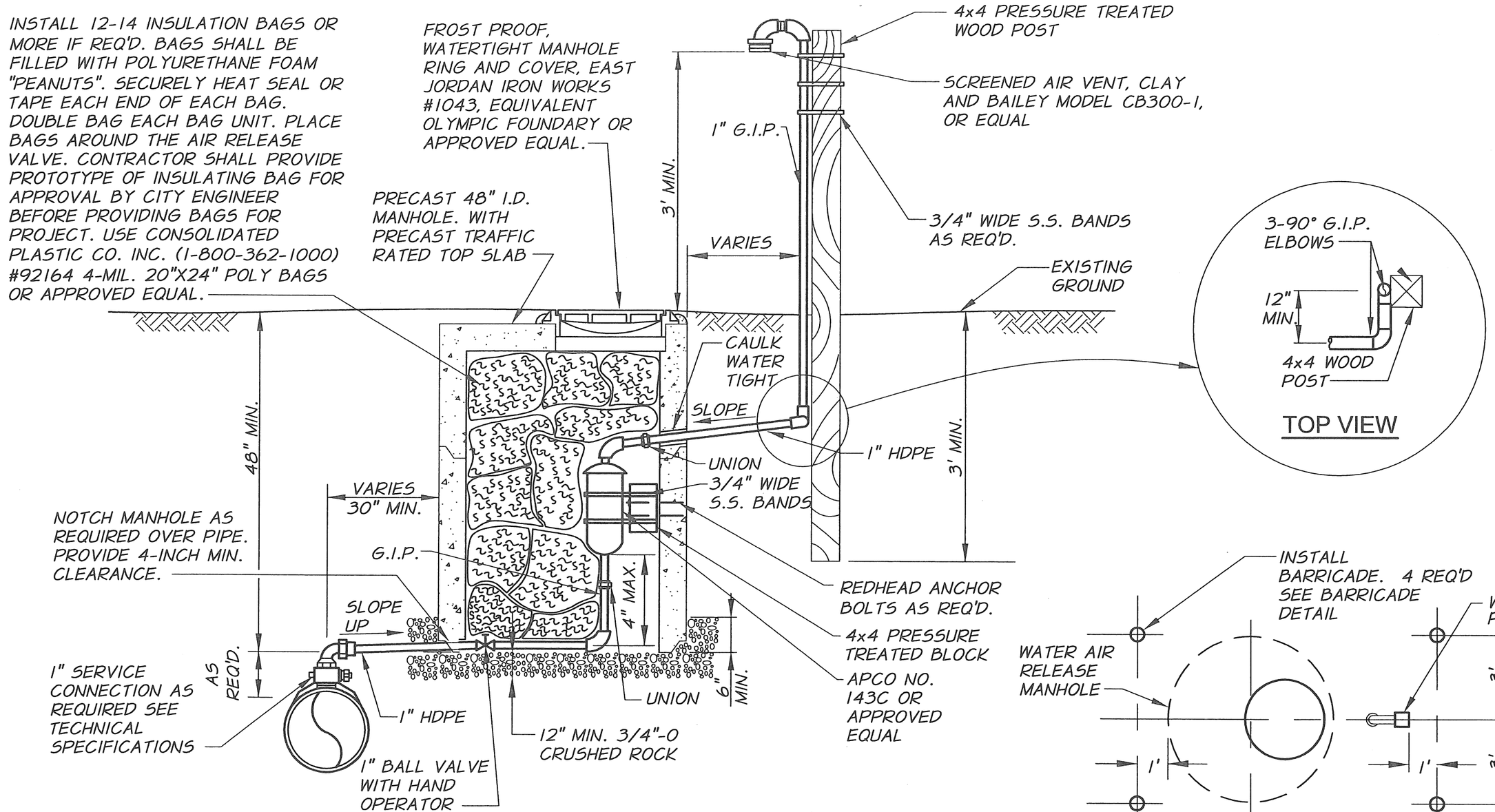
CITY OF UNION OREGON

STANDARD WATER DETAILS

WATER-SEWER CROSSING

FIGURE

W10



WATER AIR RELEASE VALVE

N.T.S.

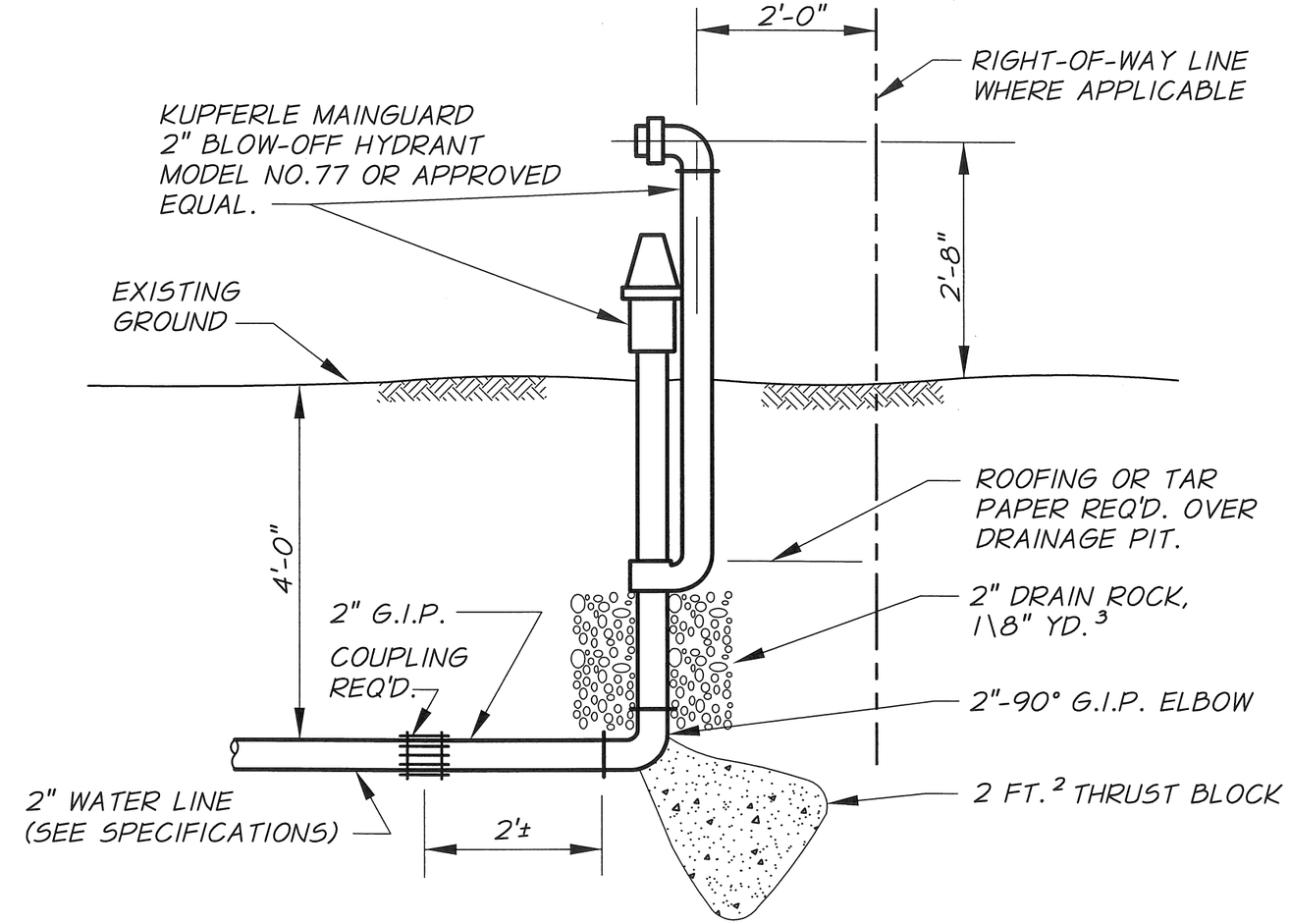
REVISION	DATE
GENERAL UPDATES	7/13

CITY OF UNION OREGON

STANDARD WATER DETAILS

WATER AIR RELEASE VALVE

FIGURE W11



2" WATER LINE BLOW-OFF DETAIL

N.T.S.

REVISION	DATE
ORIENTATION	8/13

CITY OF UNION OREGON

STANDARD WATER DETAILS

WATER LINE BLOW-OFF DETAIL

FIGURE **W12**

THURST BLOCK NOTES

1. THRUST BLOCKS SHALL BE REQUIRED AT THE FOLLOWING LOCATIONS:
   - A. ALL CHANGES IN DIRECTION.
   - B. ALL DEAD–ENDS.
   - C. ALL VALVES 10–INCH AND LARGER (SIZE FOR CLOSED CONDITION).
   - D. AT OTHER LOCATIONS REQUIRED BY THE ENGINEER.
   - E. AT TEMPORARY DEAD ENDS DURIG PIPE INSTALLATION AS REQUIRED FOR TEMPORARY PRESSURE TESTING.
   - F. AT OTHER LOCATIONS REQUIRED BY THE ENGINEER.
2. THURST BLOCKS SHALL BE SIZED AS REQUIRED BY SOIL CONDITIONS AND DESIGN PRESSURE.
3. PLACE CONCRETE AGAINST UNDISTURBED TRENCH WALL.
4. CONCRETE SHALL BE 2,500 PSI MINIMUM.
5. ALL CONCRETE SHALL BE PLACED SO THAT PIPE, FITTING JOINTS, BOLTS AND NUTS, ETC., WILL BE ACCESSIBLE FOR REPAIRS.
6. PLACE ONE LAYER OF VISQUEEN BETWEEN FITTING AND CONCRETE TO FACILITATE FUTURE REMOVAL OF THRUST BLOCK IF REQUIRED.
7. ANCHOR RODS SHALL BE 3/4" DIAMETER GALVANIZED STEEL RODS OR #6 EPOXY COATED REINFORCEMENT BAR, AASHTO M284, HAVING AN 18" MINIMUM EMBEDMENT IN CONCRETE.
8. THRUST BLOCKING SHALL BE SIZED FOR 150 PSI WATER PRESSURE
9. IF THE REQUIRED BEARING AREA IS LESS THAN 1 SQUARE FOOT, A THRUST BLOCK SHALL NOT BE REQUIRED.

DETERMINATION OF THRUST BLOCK BEARING AREA

NOTE: WHEN THRUST BLOCK BEARING AREA IS NOT SPECIFIED ON THE PLANS OR DETERMINED BY THE ENGINEER, THE FOLLOWING PROCEDURE SHALL BE USED TO DETERMINE REQUIRED BEARING AREA.

1. DETERMINE THRUST (T) FOR TYPE OF FITTING OR JOINT AND SIZE OF PIPE, FROM TABLE NO. 1 OR TABLE NO. 3.
2. DETERMINE BEARING CAPACITY (B) OF SOIL FROM TABLE NO. 2.
3. DETERMINE REQUIRED BEARING AREA (A) AS FOLLOWS:

   $A = T \times \text{PRESSURE RATIO} \div B$

EXAMPLE: DESIGN PRESSURE = 175 PSI
PIPE = 12"
FITTING = TEE
SOIL – SANDY GRAVEL

FROM TABLE NO. 1: T = 15,310 LB.
FROM TABLE NO. 2: B = 3000 LB/FT²

$$A = \frac{15{,}310 \times 1.75}{3{,}000} = 8.9 \text{ FT}^2$$

TABLE NO.1
THRUST AT FITTINGS IN POUNDS AT 100 PSI OF WATER PRESSURE

PIPE SIZE	TEES AND DEAD ENDS	90°BEND	45°BEND	22 1/2° BEND	11 1/4° BEND
4"	1,850	2,610	1,420	720	394
6"	3,800	5,370	2,910	1,470	810
8"	6,580	9,300	5,040	2,550	1,372
10"	10,750	15,200	8,240	4,170	2,216
12"	15,310	21,640	11,720	5,940	3,128
14"	20,770	29,360	15,910	8,060	4,241
16"	26,880	38,010	20,590	10,430	5,468
18"	29,865	42,235	22,858	11,653	5,855

NOTE: FOR WATER PRESSURES DIFFERENT THAN 100 PSI, MULTIPLY THRUST FOUND IN TABLE NO. 1 BY REQUIRED PROPORTION.

EXAMPLE: DESIGN PRESSURE = 175 PSI. MULTIPLY VALUE IN TABLE BY 1.75

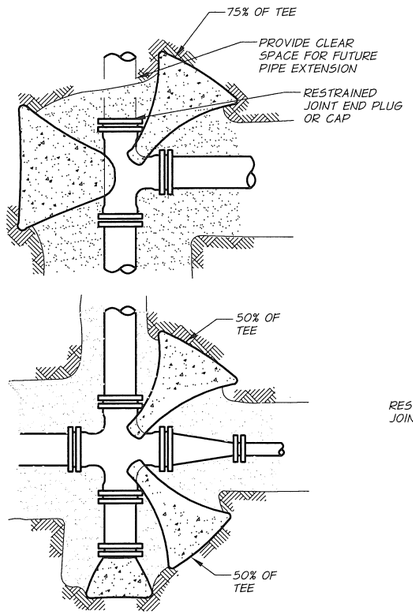
TABLE NO.2

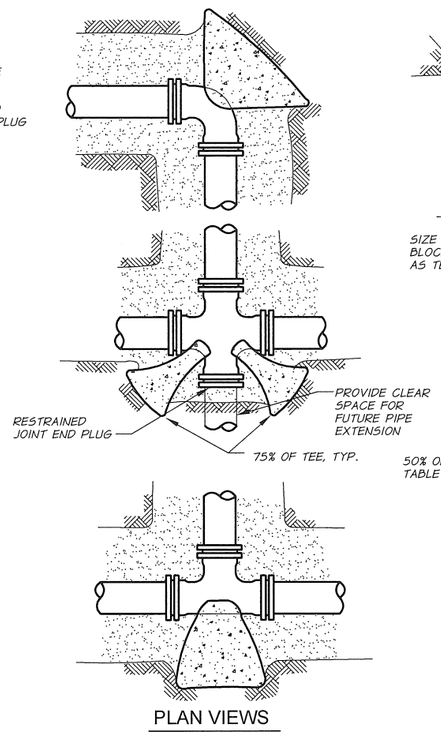
SOIL	SAFE BEARING LOAD LB/FT²
SOFT CLAY	500
SILT	1,000
SAND	2,000
SAND AND GRAVEL	3,000
SAND AND GRAVEL CEMENTED WITH CLAY	4,000
HARD CLAY	4,000

TABLE NO.3

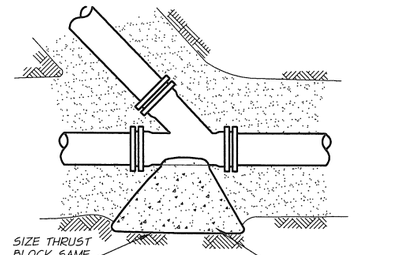
SIDE THRUST PER 100 LB./SQ.IN. PRESSURE PER DEGREE OF DEFLECTION			
PIPE SIZE	SIDE THRUST–LB	PIPE SIZE	SIDE THRUST–LB
4"	N/A	14	377
6"	N/A	16	486
8"	N/A	18	665
10"	197	20	790
12"	278	24	1,150

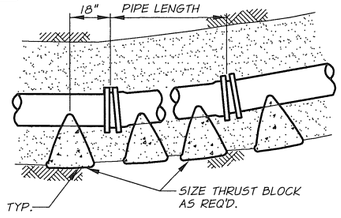
MULTIPLY THRUST BY DEGREE OF DEFLECTION TO OBTAIN TOTAL THRUST

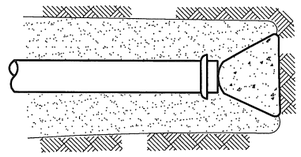


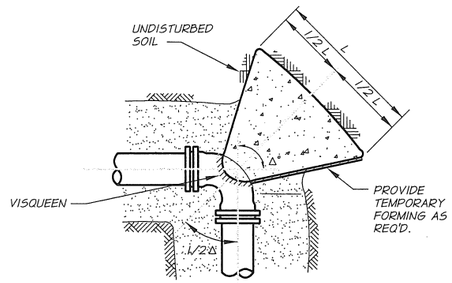


PLAN VIEWS



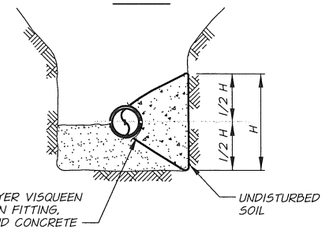






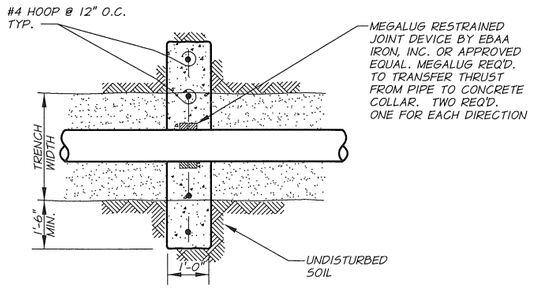
BEARING AREA (A) = HEIGHT (H) x LENGTH (L)
A = H x L

PLAN

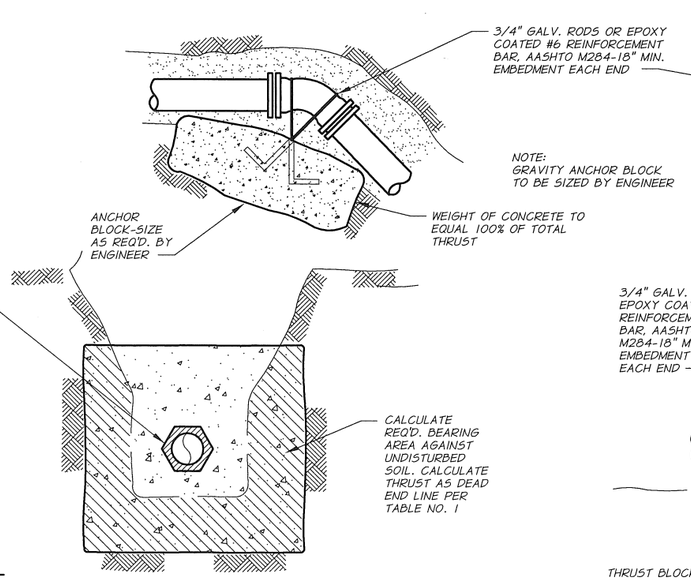


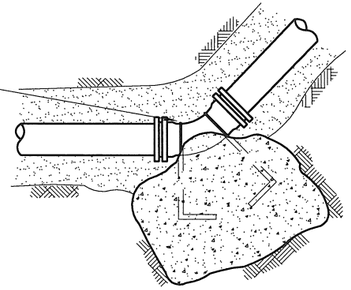
SECTION

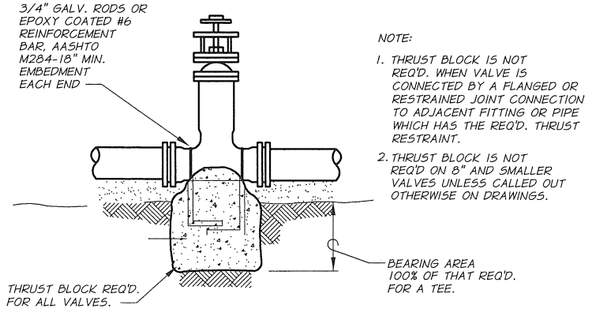
TYPICAL THRUST BLOCK DETAILS



ANCHOR COLLAR







NOTE:
1. THRUST BLOCK IS NOT REQ'D. WHEN VALVE IS CONNECTED BY A FLANGED OR RESTRAINED JOINT CONNECTION TO ADJACENT FITTING OR PIPE WHICH HAS THE REQ'D. THRUST RESTRAINT.
2. THRUST BLOCK IS NOT REQ'D ON 8" AND SMALLER VALVES UNLESS CALLED OUT OTHERWISE ON DRAWINGS.

TYPICAL THRUST BLOCK LOCATIONS

SECTION VIEWS

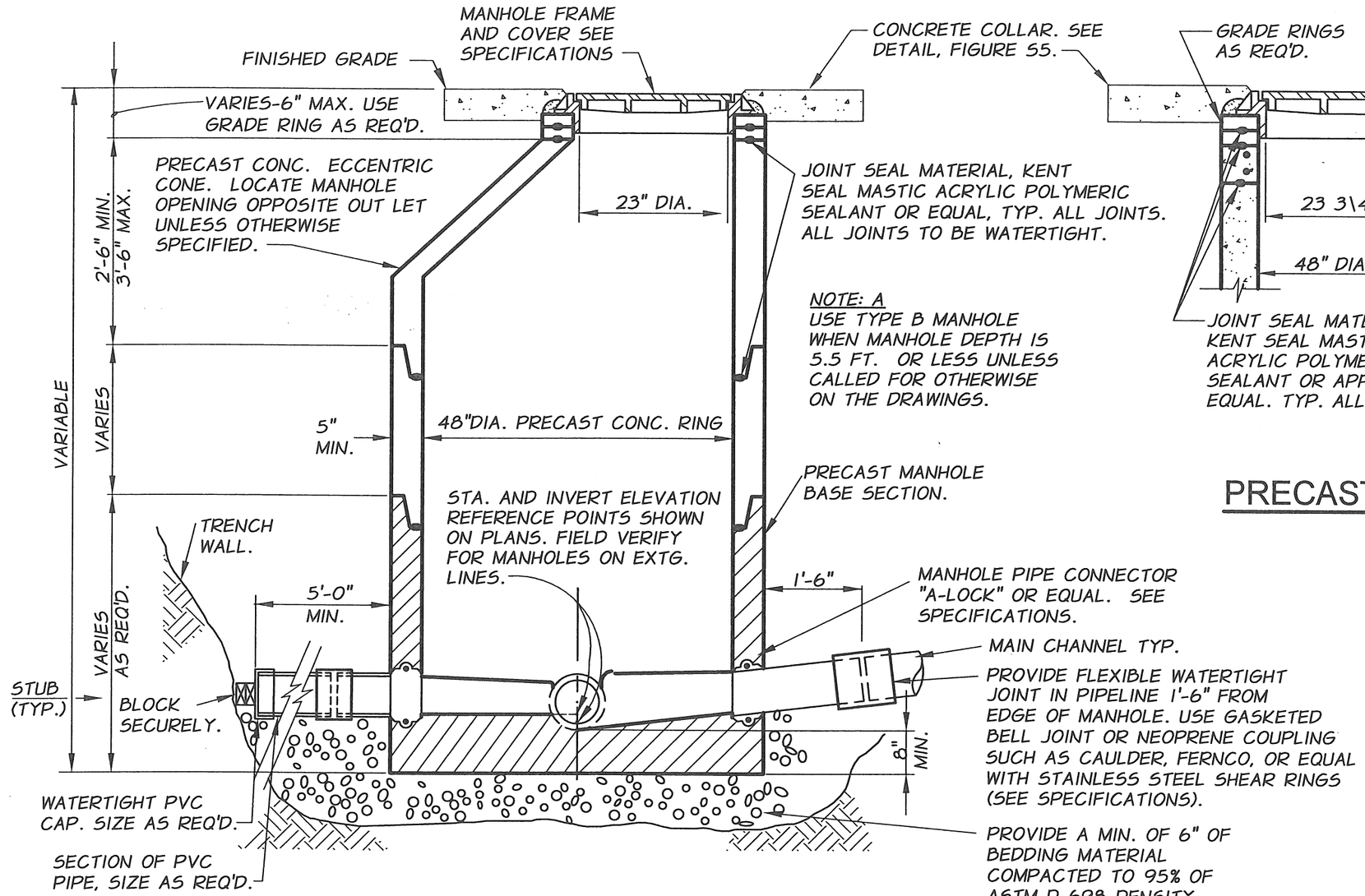
REVISION	DATE

CITY OF UNION OREGON

STANDARD WATER DETAILS

THRUST BLOCK DETAILS

FIGURE **W13**

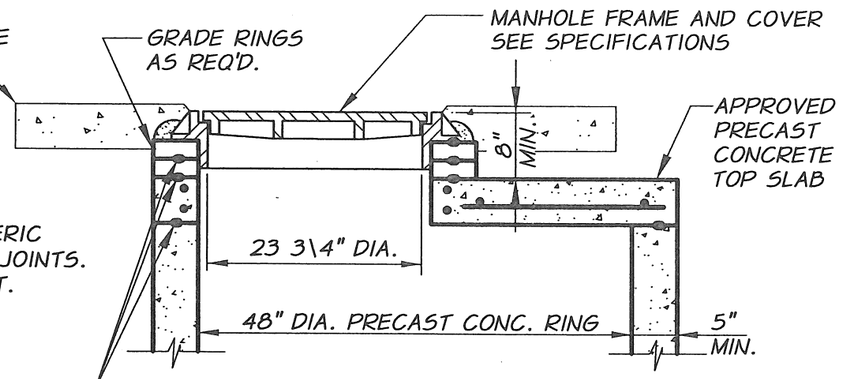


SECTION

STANDARD PRECAST BASE MANHOLE

TYPE A

N.T.S.



NOTES:
1. SEE TYPE A MANHOLE FOR BASE AND WALL DETAILS.
2. USE TYPE B MANHOLE WHEN MANHOLE DEPTH IS 5.5 FEET OR LESS UNLESS CALLED FOR OTHERWISE ON THE DRAWINGS.

PRECAST TOP SLAB MANHOLE

TYPE B

N.T.S.

REVISION	DATE
GENERAL UPDATES	12/06
MANHOLE OPENING NOTE	7/13

CITY OF UNION OREGON

STANDARD SEWER DETAILS

STANDARD PRECAST MANHOLE

FIGURE S1

MANHOLE CONSTRUCTION NOTES

1. ALL MANHOLES SHALL BE PRECAST MANHOLE UNITS UNLESS OTHERWISE APPROVED.

2. ANY GAPS, HOLES, ROUGH SPOTS, ETC., IN THE CHANNELS SHALL BE FILLED OR REPAIRED IN THE FIELD.

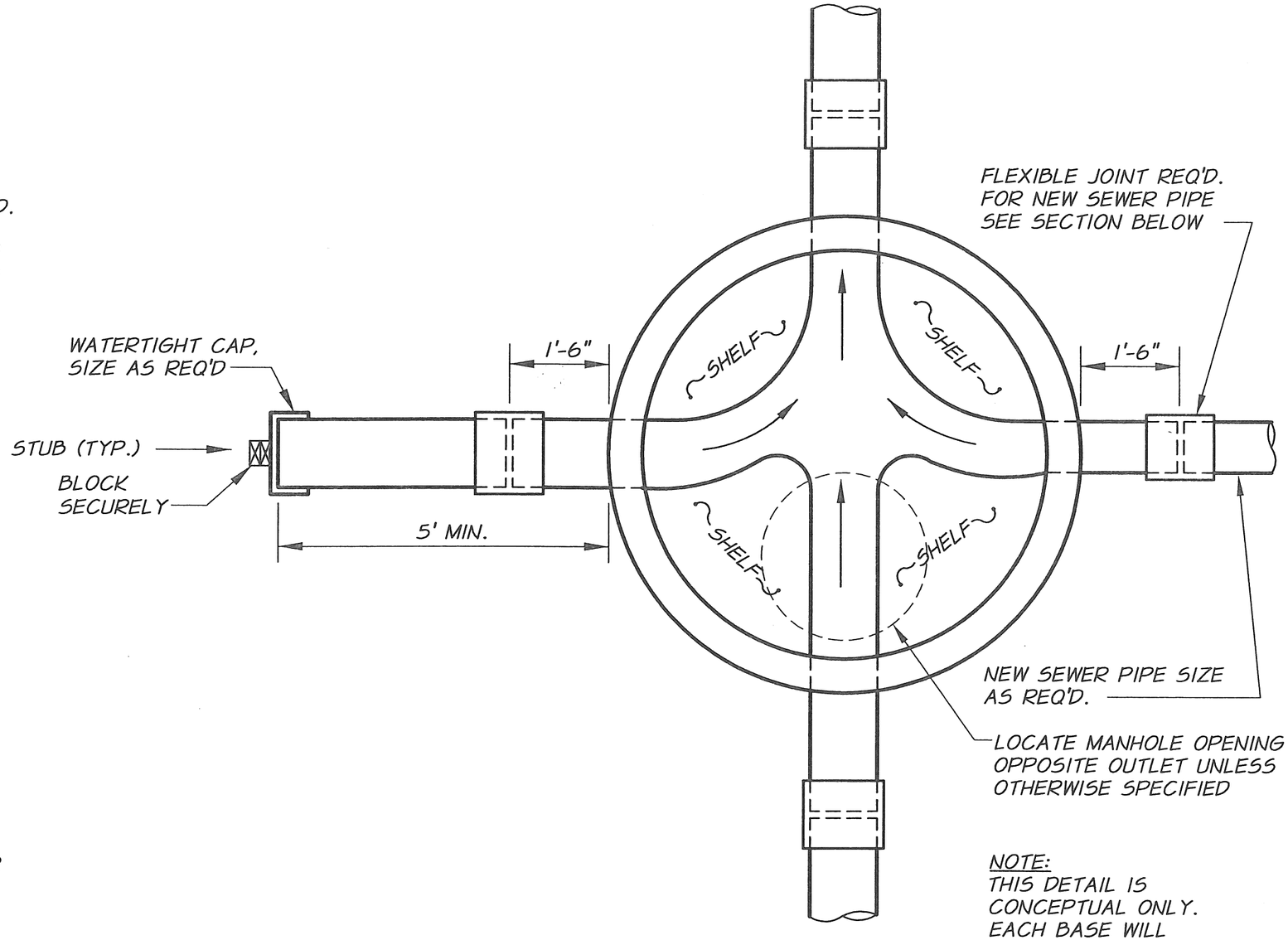
3. THE MANHOLES SHALL BE SET 0 TO 6 INCHES BELOW FINISH GRADE AND THEN ADJUSTED TO GRADE WITH GRADE RINGS AS REQUIRED.

4. CONE SECTION SHALL BE ECCENTRIC.

6. SHOULD THE CITY ENGINEER DETERMINE THE NATIVE MATERIAL IS UNSUITABLE FOUNDATION, ADDITIONAL MATERIAL SHALL BE INSTALLED AS OUTLINED IN THE TECHNICAL SPECIFICATIONS.

7. IN MANUFACTURING THE MANHOLES, THE CONTRACTOR IS ADVISED TO REVIEW THE DETAILS ON THIS SHEET WHICH SHOW THE SEWER PIPE SLOPE CALCULATED TO THE CENTERLINE OF THE MANHOLE.

8. ALL MANHOLE CHANNELS SHALL BE CONSTRUCTED IN THE MANHOLE BASE U-SHAPED FORM. ALL SHELVES SHALL BE FINISHED IN A WORKMAN- LIKE MANNER AND SHALL SLOPE TO DRAIN TO CHANNEL AT 1:12 MAXIMUM SLOPE.



NOTE:
THIS DETAIL IS CONCEPTUAL ONLY. EACH BASE WILL HAVE IT'S OWN UNIQUE LAYOUT.

PLAN

MANHOLE BASE

N.T.S.

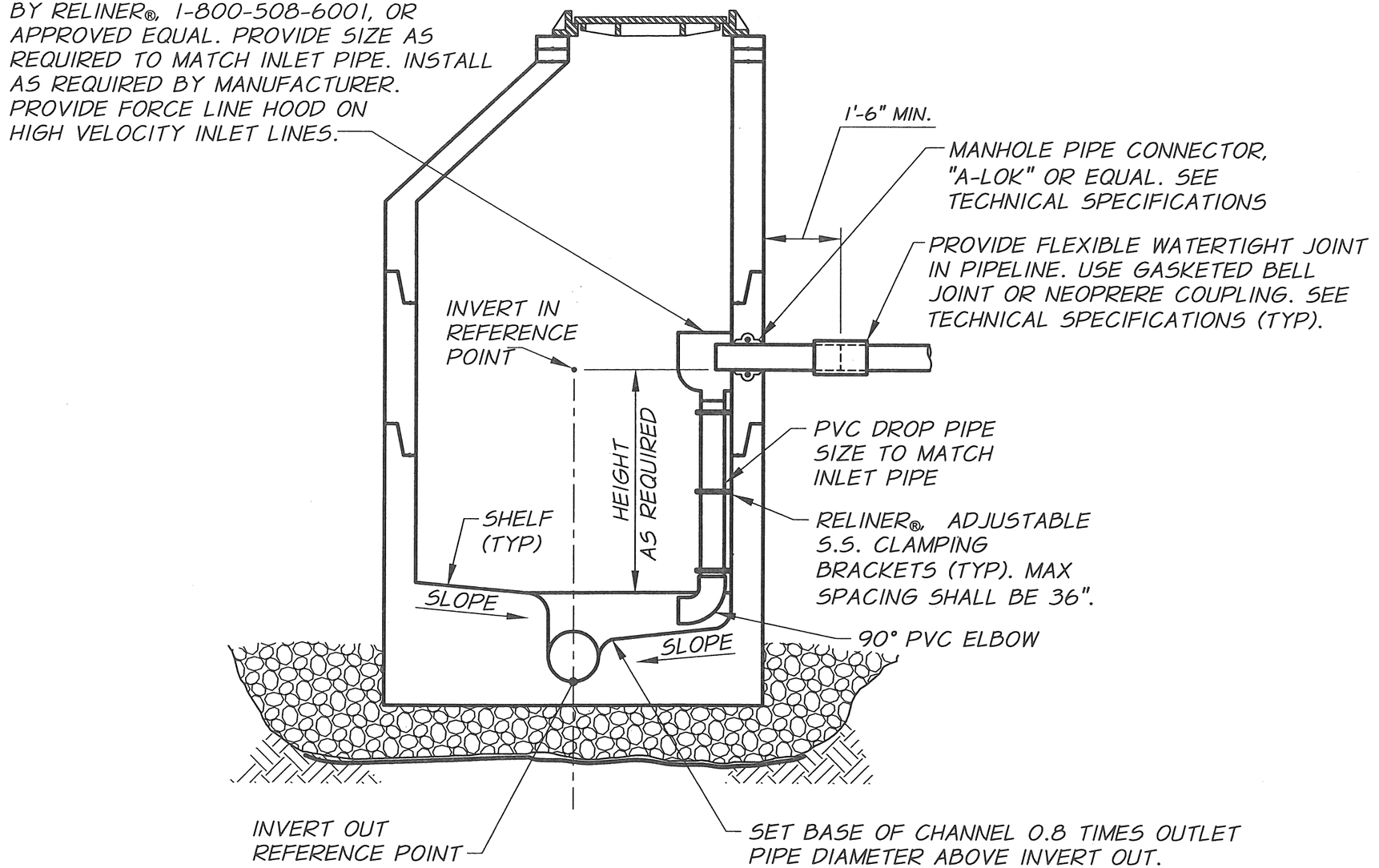
REVISION	DATE
MANHOLE OPENING NOTE	7/13

CITY OF UNION OREGON

STANDARD SEWER DETAILS
MANHOLE BASE/
CONSTRUCTION NOTES

FIGURE
S2

NOTE:
SEE FIGURES S1 AND S2 FOR OTHER MANHOLE REQUIREMENTS.



DROP PRECAST MANHOLE

N.T.S.

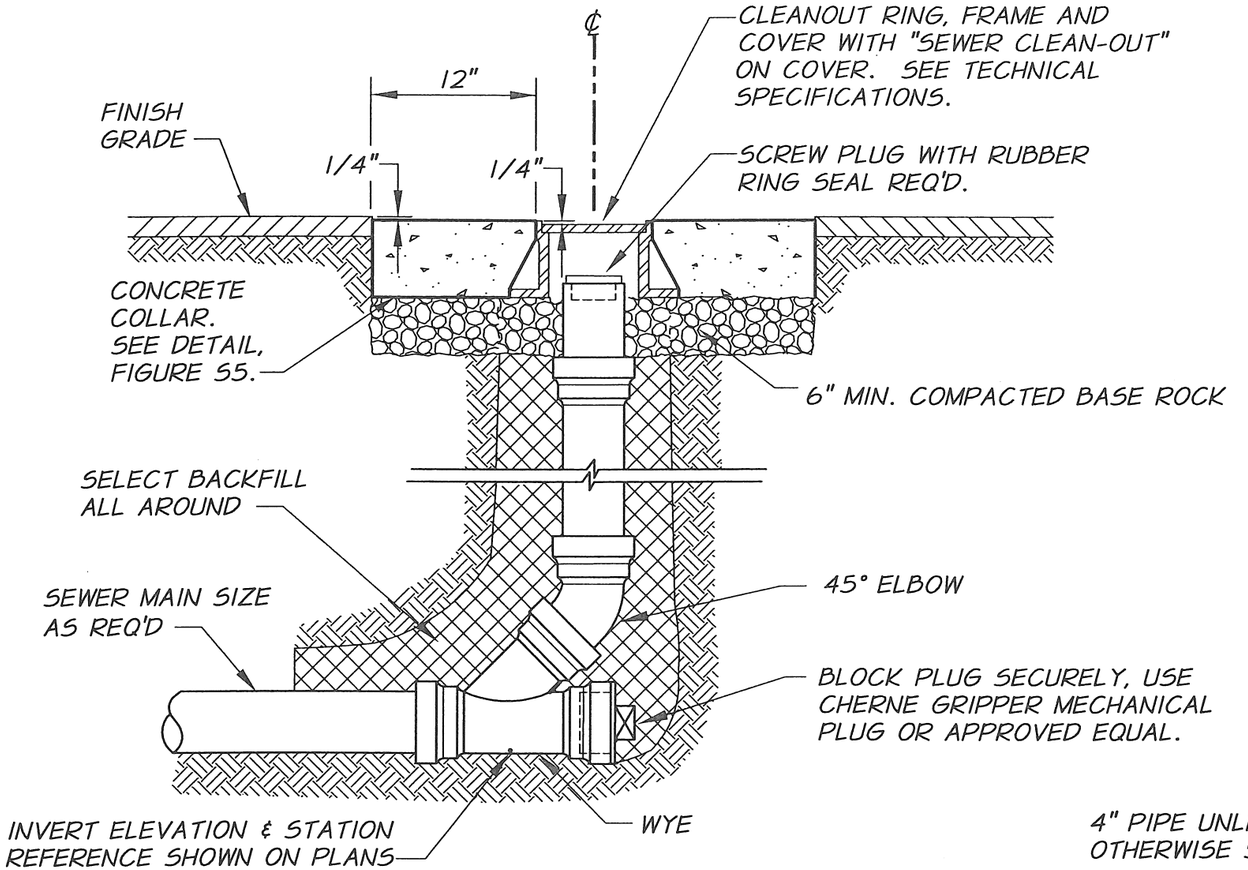
REVISION	DATE
REPLACED W/ INSIDE DROP	7/13

CITY OF UNION OREGON

STANDARD SEWER DETAILS

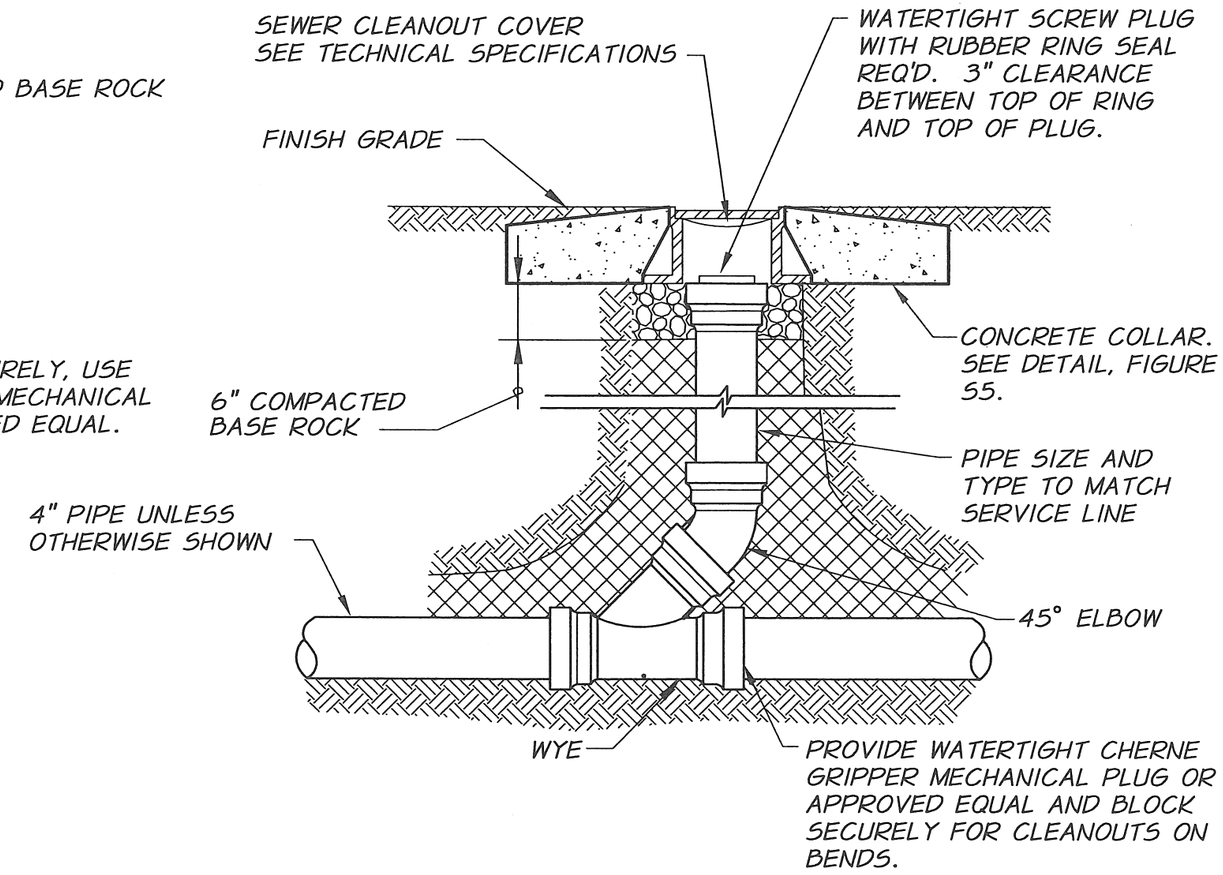
DROP PRECAST MANHOLE

FIGURE S3



GRAVITY SEWER MAIN LINE CLEANOUT

N.T.S.



SEWER SERVICE LINE CLEANOUT

N.T.S.

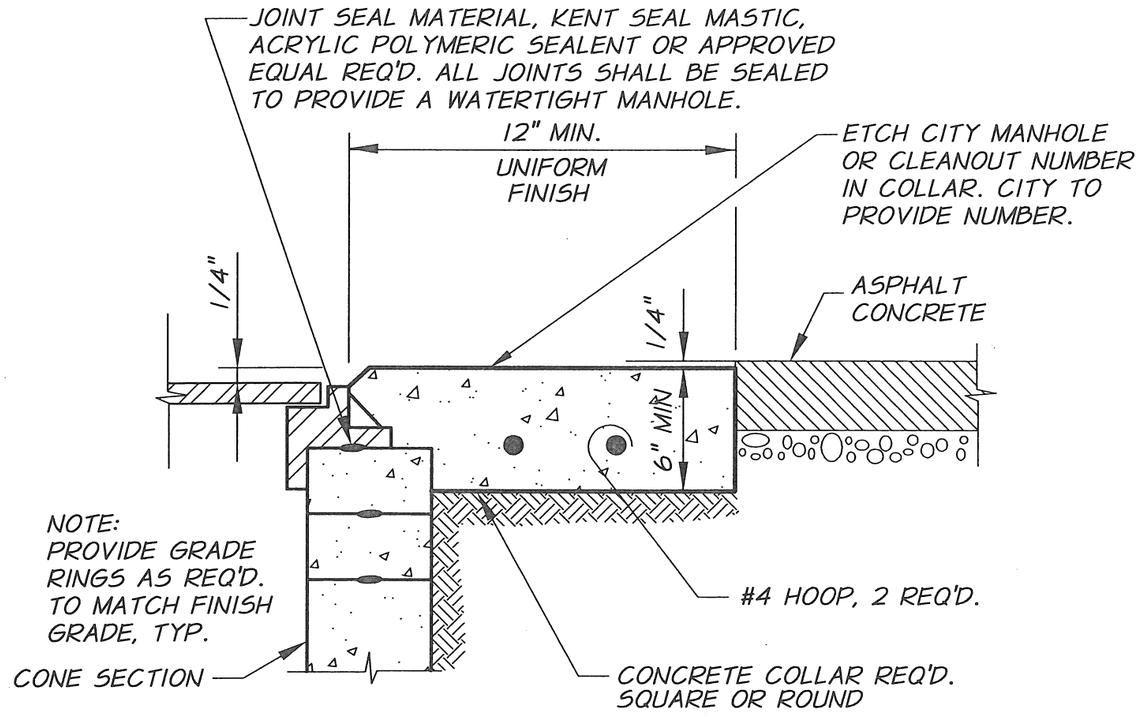
REVISION	DATE
GENERAL UPDATES	12/06

CITY OF UNION OREGON

STANDARD SEWER DETAILS

SEWER CLEANOUTS

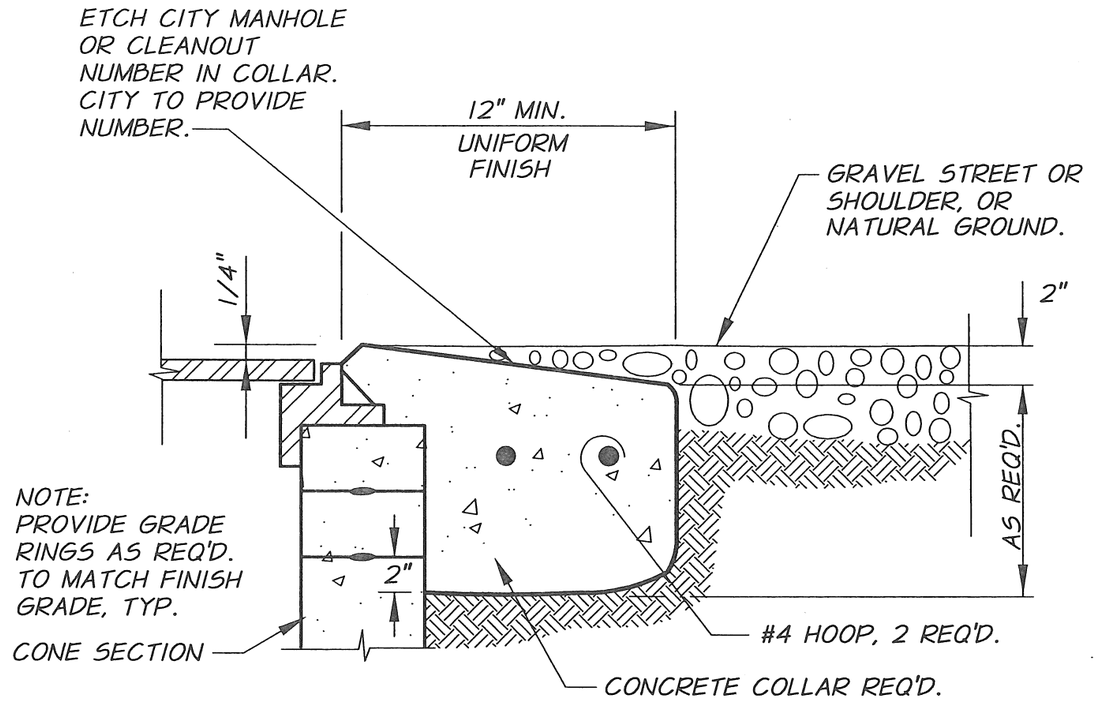
FIGURE **S4**



MANHOLE AND CLEANOUT CONCRETE COLLAR DETAIL

IN ASPHALT PAVEMENT

N.T.S.



MANHOLE AND CLEANOUT CONCRETE COLLAR DETAIL

IN GRAVEL STREETS OR NATURAL GROUND

N.T.S.

REQUIREMENTS FOR CONCRETE COLLARS:

1. CONCRETE: 3/4", 7 SACK, 4000 PSI @ 28 DAYS, 2" TO 4" SLUMP, 4-7% AIR.
2. COLLAR TO BE FORMED AND BE UNIFORMLY ROUND.
3. SMOOTH BROOMED FINISH REQ'D.
4. APPLY CONCRETE CURING COMPOUND
5. PROTECT FROM TRAFFIC FOR 4 DAYS MIN.

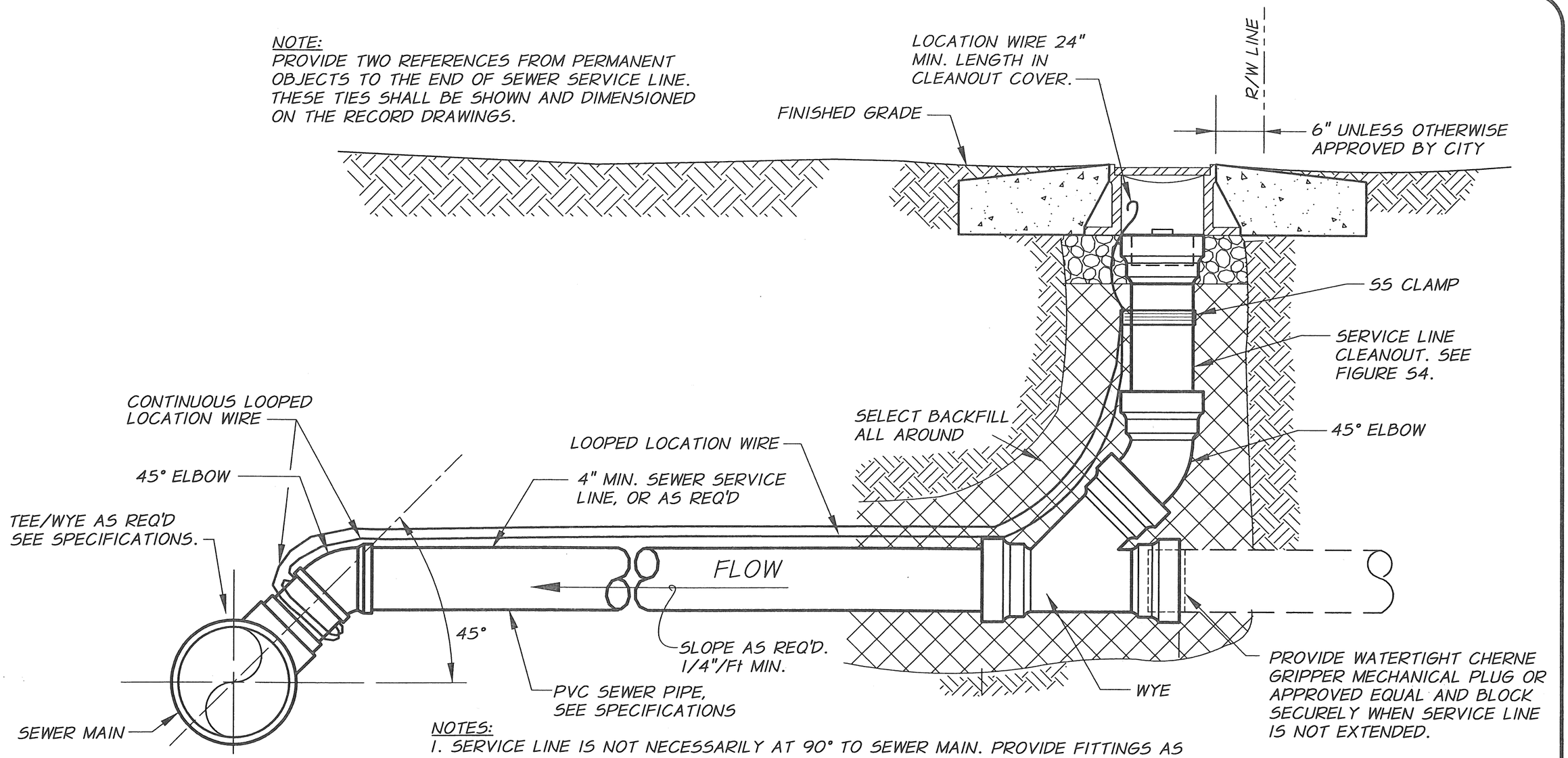
REVISION	DATE
GENERAL UPDATES	12/06

CITY OF UNION OREGON

STANDARD SEWER DETAILS
MANHOLE AND CLEANOUT CONCRETE COLLAR DETAILS

FIGURE
S5

NOTE:
PROVIDE TWO REFERENCES FROM PERMANENT OBJECTS TO THE END OF SEWER SERVICE LINE. THESE TIES SHALL BE SHOWN AND DIMENSIONED ON THE RECORD DRAWINGS.



NOTES:
1. SERVICE LINE IS NOT NECESSARILY AT 90° TO SEWER MAIN. PROVIDE FITTINGS AS REQ'D. TO INSTALL SERVICE.

2. DEPTH OF SEWER MAIN MAY NOT ACCOMODATE TEE/WYE 45° ANGLE ORIENTATION SHOWN. CONTRACTOR SHALL HAVE ANY ALTERNATE ALIGNMENT APPROVED BY THE CITY.

SEWER SERVICE LINE

N.T.S.

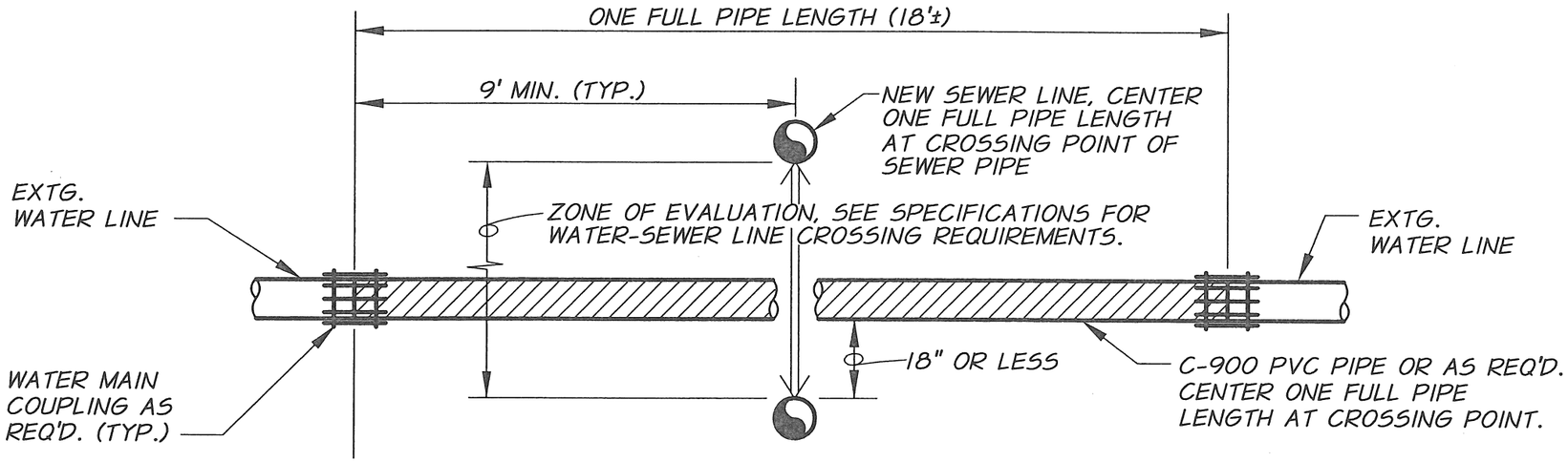
REVISION	DATE
GENERAL UPDATES	12/06
GENERAL UPDATES	7/13

CITY OF UNION OREGON

STANDARD WATER DETAILS

SEWER SERVICE LINE

FIGURE S6



NOTE:

ALL BACK FILL IN AREA OF WATER-SEWER CROSSING TO A DEPTH 12" ABOVE THE TOP OF THE HIGHEST PIPE SHALL BE 3/4"-0 BASE ROCK COMPACTED TO 95% OF ASTM D-698 LABORATORY DENSITY.

WATER-SEWER CROSSING

(NEW SEWER LINE CONSTRUCTION)

N.T.S.

REVISION	DATE

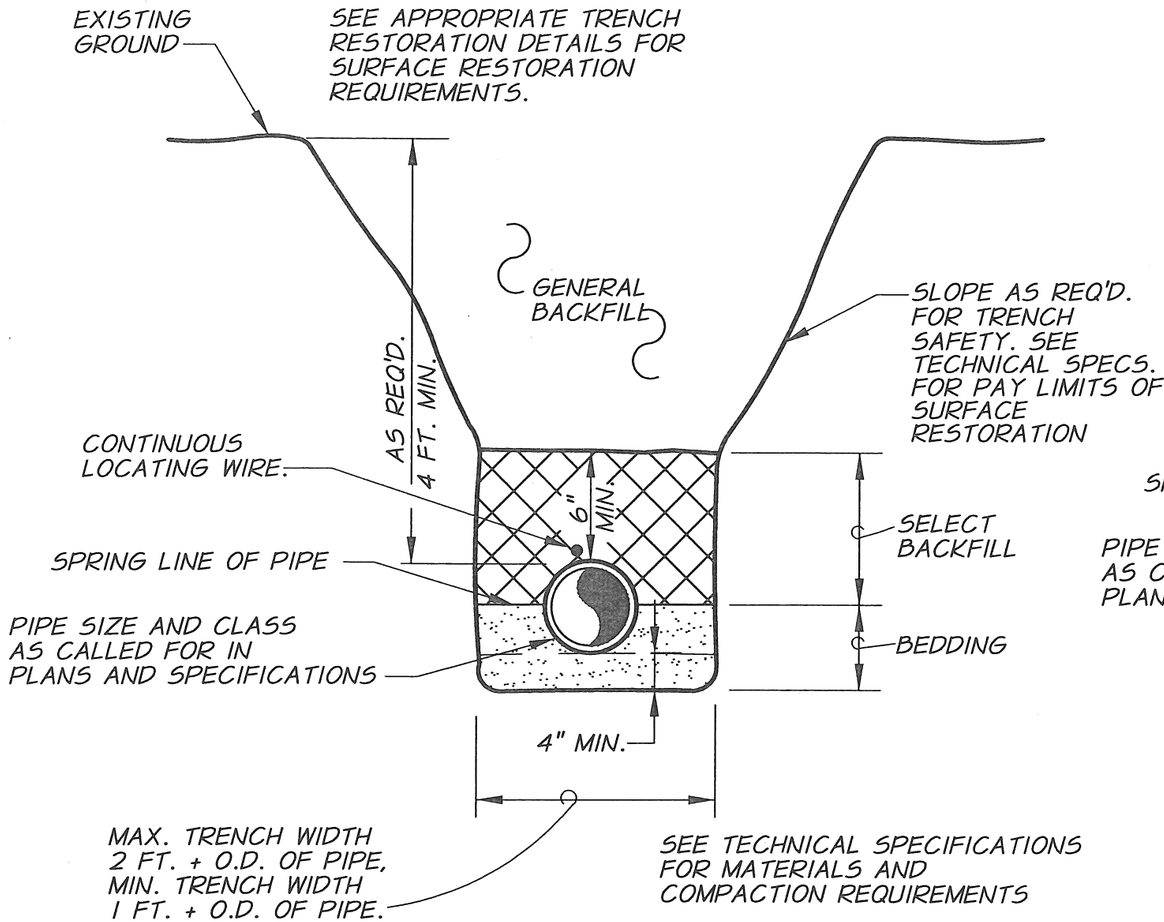
CITY OF UNION OREGON

STANDARD SEWER DETAILS

WATER/SEWER CROSSING

FIGURE

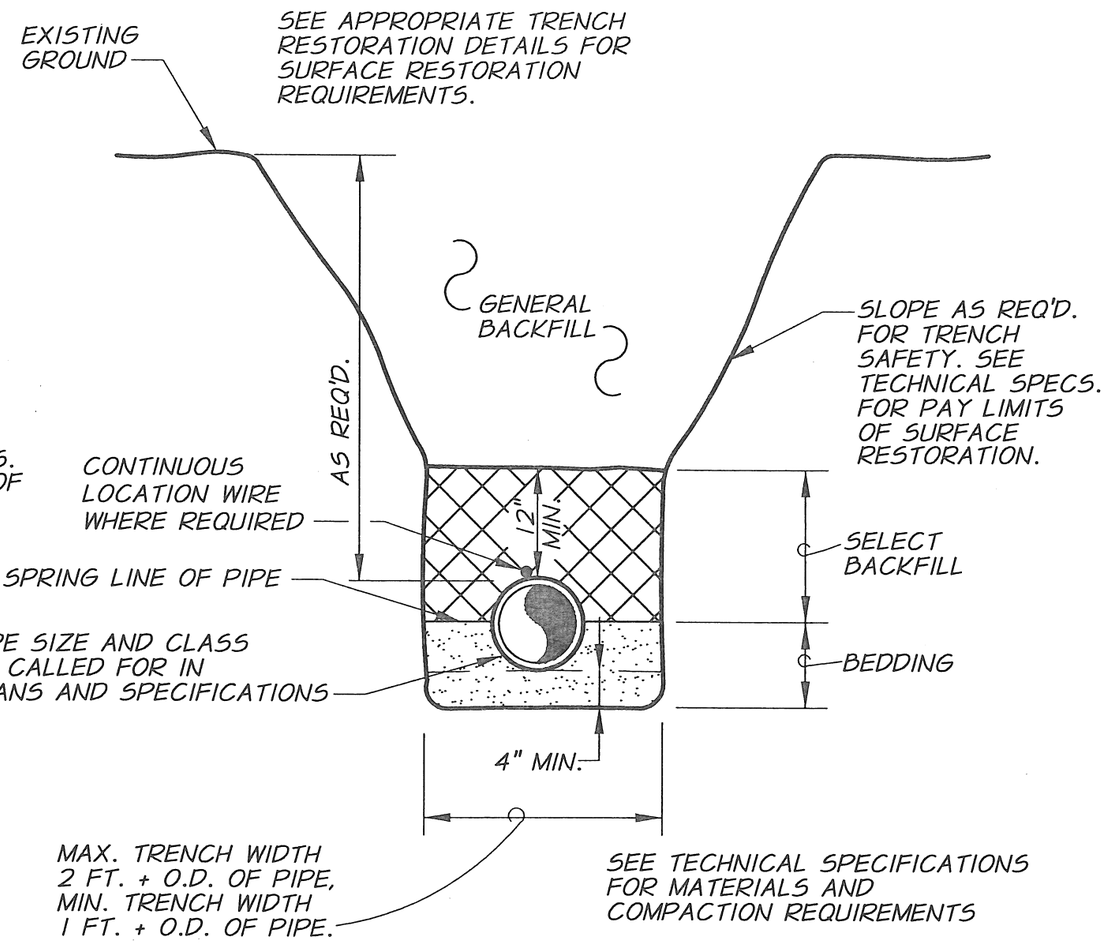
S7



TRENCH EXCAVATION AND BACKFILL

WATER LINES

N.T.S.



TRENCH EXCAVATION AND BACKFILL

SEWER & STORM SEWER LINES

N.T.S.

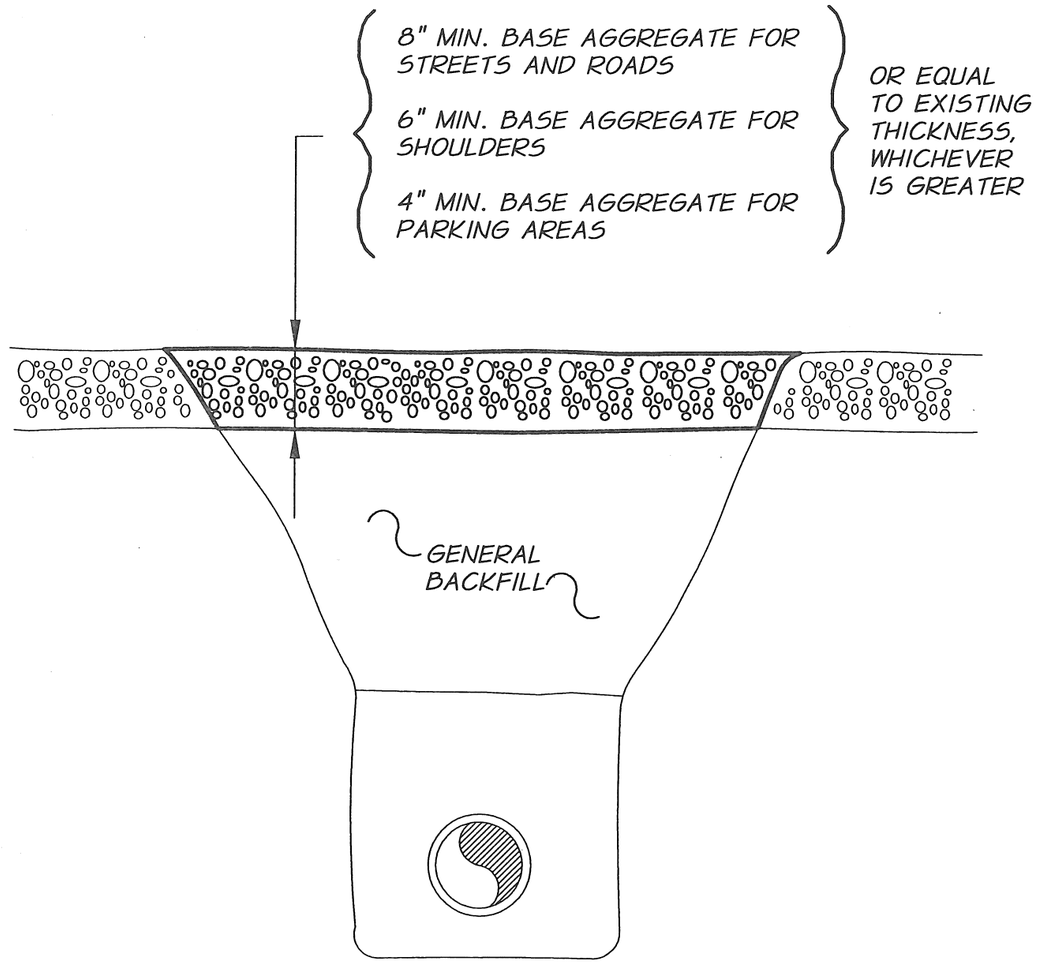
REVISION	DATE

CITY OF UNION OREGON

STANDARD TRENCH DETAILS

TRENCH EXCAVATION AND BACKFILL

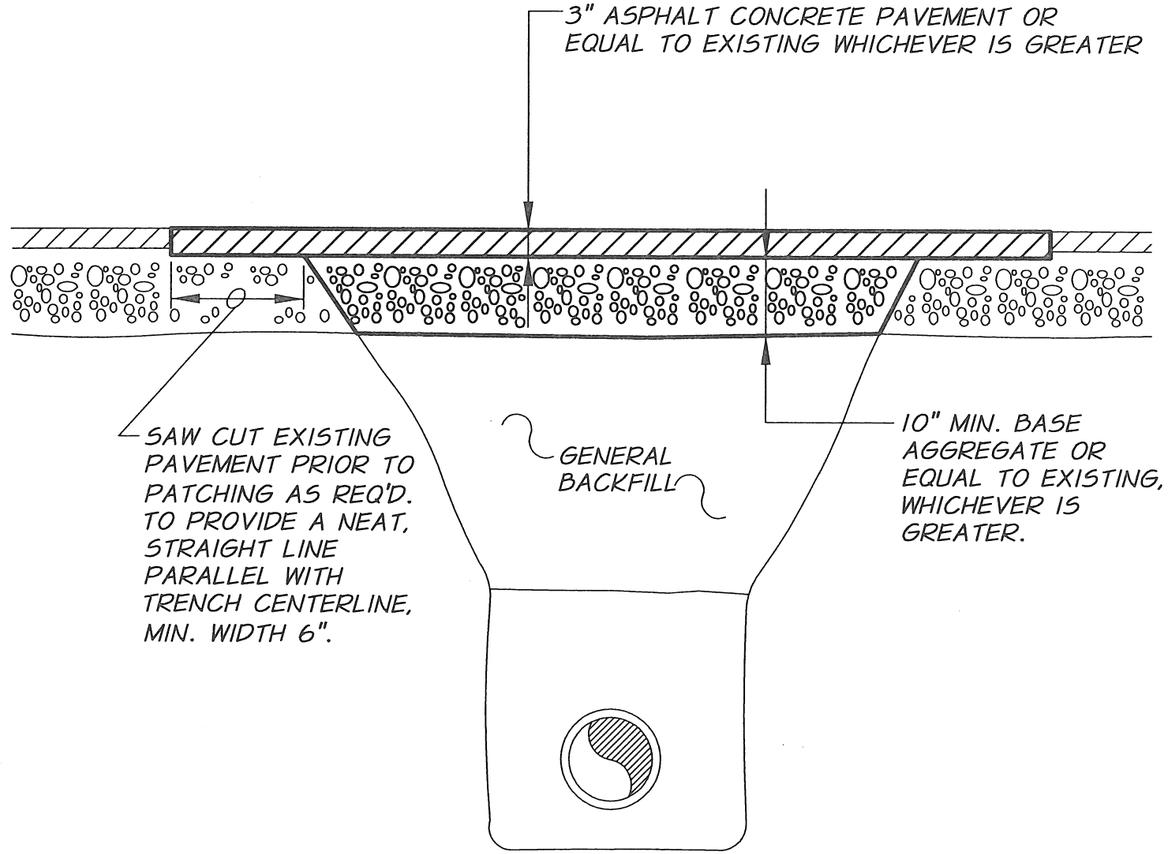
FIGURE T1



TRENCH RESTORATION

GRAVEL STREETS, ROADWAYS, SHOULDERS, AND PARKING AREAS

N.T.S.



TRENCH RESTORATION

PAVED STREETS AND ROADWAYS

N.T.S.

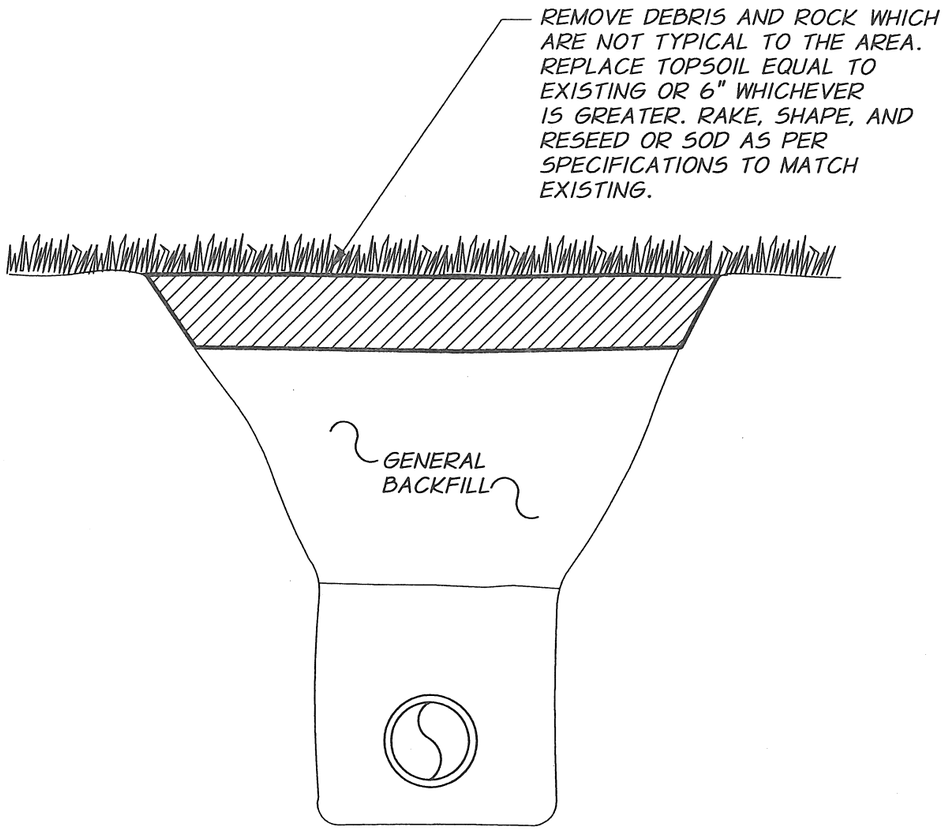
REVISION	DATE
GENERAL REVISIONS	*7/13*

CITY OF UNION OREGON

STANDARD TRENCH DETAILS

TRENCH RESTORATION
GRAVEL AND PAVEMENT AREAS

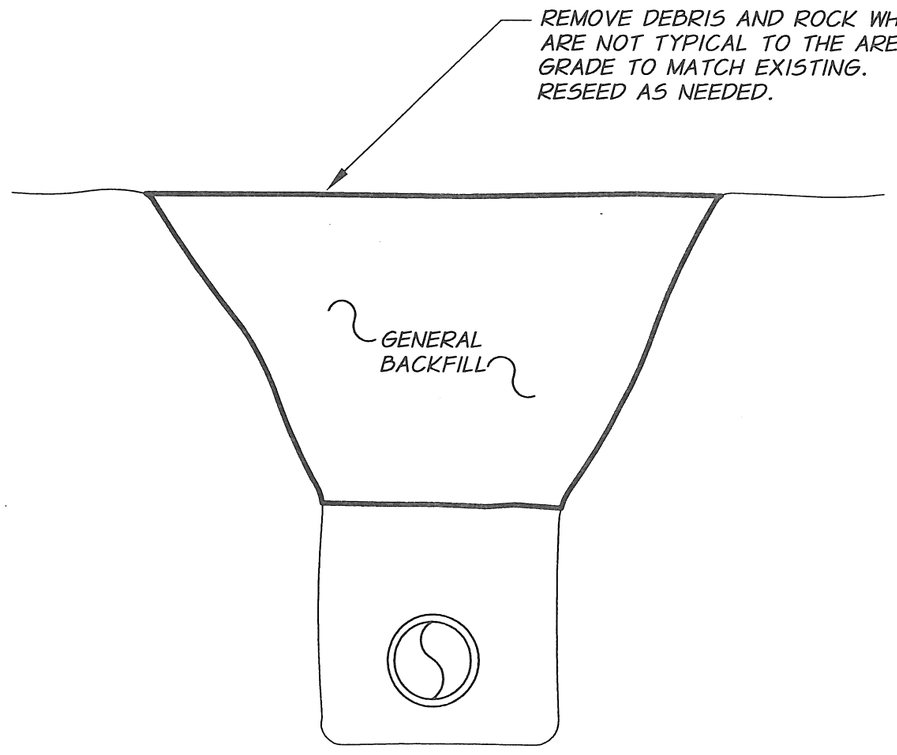
FIGURE
T2



TRENCH RESTORATION

LAWNS & LANDSCAPED AREAS

N.T.S.



TRENCH RESTORATION

NATURAL AREAS

N.T.S.

REVISION	DATE
GENERAL UPDATES	*7/13*

CITY OF UNION OREGON

STANDARD TRENCH DETAILS

TRENCH RESTORATION
LAWN AND NATURAL AREAS

FIGURE
T3

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