RESOLUTION NO. 1090-94

A RESOLUTION ADOPTING CONSTRUCTION STANDARDS FOR PUBLIC WORKS FACILITIES

WHEREAS, Troutdale Municipal Code Section 12.01.120 authorizes the Council to adopt, by resolution, local construction standards which clarify, modify, or expand upon the American Public Works Association "Standard Specifications for Public Works Construction"; and

WHEREAS, staff has found it beneficial to have such local standards for the information of builders and developers in Troutdale; and

WHEREAS, staff have summarized in this document those informal standards that have been in use by the City for some time.

NOW, THEREFORE, BE IT RESOLVED BY THE COMMON COUNCIL OF THE CITY OF TROUTDALE THAT:

The "City of Troutdale Construction Standards for Public Works Facilities" dated February, 1994, which are attached and made a part hereof, are adopted for use on all public works facilities in the City.

BE IT FURTHER RESOLVED THAT:

The Public Works Director may approve minor changes to these standards in unique or unusual situations provided that the resulting public facilities are of the same or greater capacity and durability as those specified in the standards.

ADOPTED BY THE COMMON COUNCIL OF THE CITY OF TROUTDALE THIS 22nd DAY OF FEBRUARY, 1994.

YEAS: 4
NAYS: 0
ABSTAINED: 0

Paul Thalhofer

Paul Thalhofer, Mayor

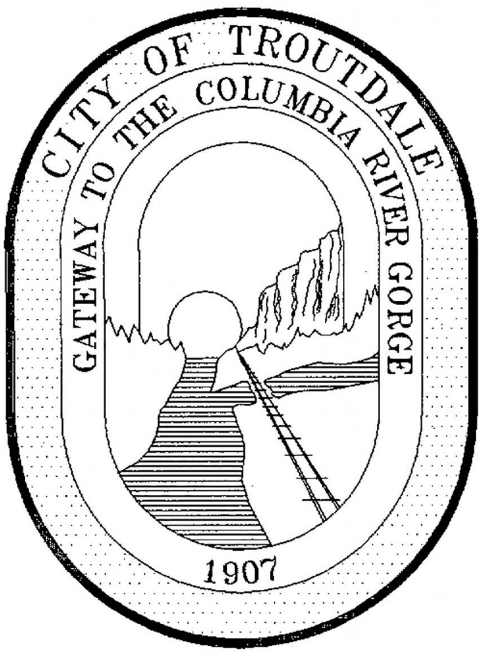
Dated: 2-24-94

ATTEST:

George Martinez

George Martinez
Deputy City Recorder

F:\



CITY OF TROUTDALE

CONSTRUCTION STANDARDS FOR PUBLIC WORKS FACILITIES

FEBRUARY 1994

FILENAME: CVR_SHT

CITY OF TROUTDALE
CONSTRUCTION DETAILS

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(Construction Details)

STREETS

(Parts I & II)

STREETS

(Part I)

*** General Requirements**
*** Standards for Pavement Overlay**

STREETS

(General Requirements)

1. The design elevation used in the construction plans must be based on the current U.S.C.G.S. datum if available in the area.

2. General design standards are contained in Chapter 7, "Troutdale Development Code" and on the attached City of Troutdale Standard Drawings/Construction Details.

3. The maximum grade on any street shall not exceed 12% without the City's approval.

4. The minimum grade on any curbed or guttered street shall not be less than 1.0%.

5. Vertical curves shall be used at all changes in grade in excess of 1.0%.

6. Cross street surface drainage will not be permitted except for cul-de-sac bubbles or steep cross slopes. All cross street slopes must be approved by the City.

7. Curb exposure will be 6 inches after the second lift of asphalt is placed.

8. Two rain drain curb outlets are required per lot, five feet in from property lines where possible. Where it is not possible, avoid placing weepholes in conflict with meter boxes, fire hydrants and light poles.

9. Barricades are required at all dead-end streets. Barricade type will be determined by the City.

10. Improvements along County and/or State roads must meet Multnomah County and/or State standards.

11. Monolithic concrete curb and gutter is required. A standard vertical curb may be used; however, it must be approved by the City.

12. All material and workmanship shall meet the requirements of the most current edition of the APWA specifications.

13. Control stakes are required for all curb lines and street centerlines during construction, and must be provided by a surveyor licensed in the State of Oregon.

14. Sub-base shall be approved before placing base rock, by conducting on-site compaction tests as deemed necessary by the City.

15. Subgrade shall be approved before placing asphalt by conducting on-site compaction tests as deemed necessary by the City. Also, a deflection test, performed with a loaded dump or water truck, will be required. This test must be witnessed by the City. No deflection is allowed.

16. Compaction tests, as requested by the City, must be in accordance with ASSHTO, Methods T-99 or T-180. Method to be used will be determined by the City depending on the project. Over excavation and/or stabilization fabric may be required by the City if the subgrade is soft or unsuitable.

17. Asphaltic concrete (AC) class "C" (ODOT classification) is required for final top lifts. A.C. Class "B" (ODOT classification) or Class "C", as determined by the City, may be used for the first lift. Pavement will be placed only on dry, clean and properly prepared surfaces, and when the air temperature meets the specifications as set forth in the most recent edition of the American Public Works Association standards for construction.

18. All joints between A.C. and concrete structures must be tacked by bitumastic.

19. All required utilities (sanitary sewer, storm sewer, water lines, power, telephone, gas, street lights, etc.) shall be in-place and their locations accurately located on "as-built" drawings. A final inspection will be required to verify condition. If deficiencies on any of them are noted, they must be corrected prior to paving.

20. Construction of "overhead" power and/or all other private utilities is not allowed. Undergrounding is required in all "new" street construction and in "significant" street reconstruction. New developments required to do "half" street improvements are considered to be "significant", and if "overhead" power is existing, it must be switched from overhead to underground as part of the development.

21. All construction activity shall be done in a safe, neat and workmanlike manner, and under supervision of City forces at all times. All safety requirements from OSHA and all other State regulating agencies must be met.

22. Prior to any street work, the contractor must submit a traffic plan to the City for review and approval. No street work affecting lanes of traffic shall begin prior to such approval.

23. Developers constructing new streets must provide a "two-year" maintenance bond to the City. This "two-year" bond shall be for ten percent of the total cost to construct the streets. An additional "two-year" bond for placement of the final 1-inch lift of asphalt is also required. The amount of this bond will be determined by the City just prior to the bond being submitted. The amount of the bond shall include all costs for preparatory work, materials and labor, plus 30 percent administrative overhead.

24. **Street name signs, speed limit signs and other sings as seen necessary by the City will be provided and installed by City forces just prior to issuance of a "certificate of substantial completion", or shortly thereafter. Costs incurred by the City for materials and labor will be forwarded to the developer for reimbursement.**

25. **All work affecting existing streets requires the issuance of a public works permit and inspection by the City. A permit fee of $50.00 will be assessed for every inspection.**

26. **All other street construction practices within the City's public right-of-way, not covered in these "general requirements" and/or in the "construction details" sections, shall comply with the rules and regulations in the most recent editions of the American Public Works Association Standard Specifications for Public Works Construction, and the State of Oregon Standard Specifications for Highway Construction.**

STANDARDS FOR PAVEMENT OVERLAY

The following standards and specifications shall apply to the work required to properly overlay streets within the City of Troutdale.

Section I -- Repair of Existing Facilities and Asphalt Surface

a. All catch basins will be adjusted, relocated or replaced if improperly built or located.

b. All manholes, gate valve boxes, clean outs, etc., shall be adjusted to final grade, and properly referenced and/or marked to avoid covering with overlay.

c. The existing asphalt-pavement surface shall be restored to true line and grade. All areas showing evidence of failure shall be removed and repaired to the satisfaction of the City. All distortions which vary from true grade by more than 1/2 inch shall be brought to grade before the final lift is placed. All utility trenches, patches, or other damage caused by construction shall be repaired.

d. All areas showing evidence of actual failure, i.e., chuck holes, alligator cracking, scaling, slipping, etc., shall be repaired using the following method:

1. Remove eight inches of the surface and base or as much as necessary to reach firm support, extending at least one foot horizontally into good pavement outside the cracked area. Make the cut square or rectangular with vertical edges. One pair of cuts should be at right angles to the direction of traffic. Cuts are to be made with a saw or broad cutting blade and air hammer.

2. If water is the cause of the failure, install proper drainage prior to overlay.

3. If the excavation is deeper than eight inches, restore grade to eight inches from surface with 1-inch base crushed rock and compact in six-inch lifts to 95% compaction, relative maximum density.

4. Apply a tack coat to the vertical edges of the area to be patched.

5. Place required depth of hot asphalt mix patch (minimum of 4", total compacted thickness) in lifts not exceeding two inches (compacted depth).

6. Check the finish patch with a straight edge or string line to ensure that it matches existing pavement.

Section II -- Cleaning of Existing Asphalt Surface

a. **General Cleaning**
All street sections to be overlayed will be thoroughly cleaned. All large accumulations of mud, rock, concrete or other construction debris shall first be removed by hand or equipment which will not cause damage to existing pavement.

b. **Brooming**
All street sections to be paved will be cleaned by mechanical brooming.

c. **Washing**
All streets, prior to paving, will be washed with high pressure hoses or water trucks with high pressure discharge.

Section III -- Asphalt Tack Coat

a. **Surface Preparation**
The surface to be tacked shall be dry and shall have been cleaned as required by Section II so it is free of dirt, dust, or other matter foreign to the surface or detrimental to the adherence of the tack coat.

b. **Material**
The liquid asphalt to be used in the tack coat shall be CRS-1, CRS-2 or CSS-1 and shall be the kind and type for the conditions under which the work is to be performed.

c. **Application**
The asphalt shall be spread by means of pressure-spray equipment which will provide uniformity of application at prescribed rates. Normally, asphalt shall be applied to the prepared surface at a rate of 0.1 to 0.2 gallons per square yard of surface, the actual rate to be as directed by the City. The tack coat shall not be applied during wet or cold weather or during darkness and shall be laid only so far in advance as is appropriate to insure a tacky, sticky condition of the asphalt at the time of placing the overlay.

Section IV -- Asphalt Pavement

a. **Surface Preparation**
Asphalt pavement shall be placed only on those surfaces prepared as per Sections I, II and III and approved by the City.

b. Control of Traffic and Access

The contractor shall notify any persons who might be affected by street closures or reduced access at least 48 hours prior to the closure or restriction. Contractors' operations shall be conducted or scheduled so as to minimize interruption of traffic.

c. Materials

Asphalt overlays shall be 1", 1-1/2" or 2" as required by the applicable plans or specifications. The only asphalt mix allowed by the City for top lifts is Class "C" mix.

d. Application

Asphalt overlays will be placed only on dry, clean and properly prepared surfaces and when the air temperature is not lower than 55° F. Placing overlays during rain or other adverse weather will NOT be permitted.

All vertical edges such as curb, catch basins, manholes, valve boxes, or edges of existing pavements shall be properly prepared and coated with a film of tack coat material; proper care must be taken to prevent coverage on concrete surface to remain exposed after paving.

The contractor shall provide adequate marks, lines, or other control method to insure proper curb exposure, depth of overlay, and street profile and overall finished grade.

Proper equipment shall be furnished suitable for the proposed work and capable of constructing a true surface.

The temperature of the mix at the time it is spread into final position shall be between 260° and 300° F. Longitudinal joints shall be made while adjacent material temperatures are high enough to ensure smooth kneading of material.

Immediately after placing, the mix shall be compacted to a density of not less than 90 percent of relative maximum density. Compaction tests will be taken as requested by the City to ensure compliance.

STREETS

(Part II)

*** Construction Details**

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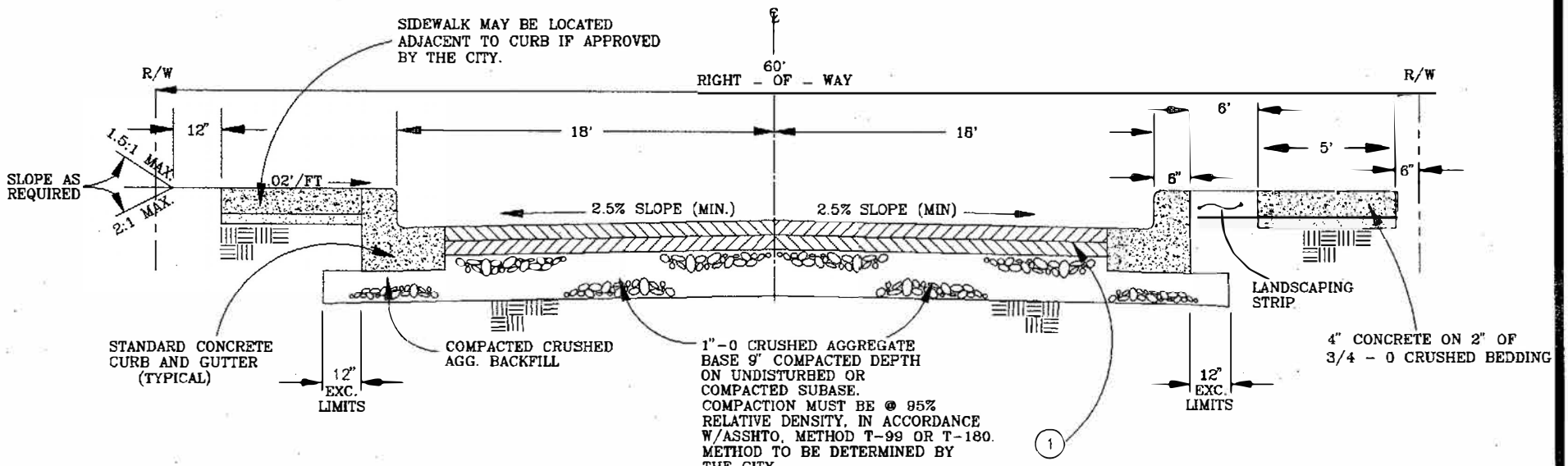


NEIGHBORHOOD COLLECTOR

NOTES:

(1) 4" OF ASPHALTIC CONCRETE CLASS "C" PLACED IN 2 EQUAL LIFTS OF 2" EACH. 1ST LIFT SHALL BE 2" COMPACTED DEPTH. FINAL 2" LIFT WILL BE PLACED AFTER 90% OF THE CERTIFICATES OF OCCUPANCY HAVE BEEN ISSUED OR 2 YEARS AFTER THE FIRST LIFT, WHICHEVER COMES FIRST.

GENERAL:

1. THESE STANDARDS ARE SHOWN AS MINIMUM ALLOWABLE. THE CITY MAY REQUIRE MODIFICATIONS DUE TO ADVERSE SOIL CONDITIONS, SPECIAL TRAFFIC CONDITIONS OR OTHER UNFORESEEN RELEVANT FACTORS.

2. ALL MATERIAL AND WORKMANSHIP SHALL MEET THE REQUIREMENTS OF THE AMERICAN PUBLIC WORKS ASSOCIATION STANDARD SPECIFICATIONS.

3. DEFLECTION/COMPACTION TESTS WILL BE REQUIRED AS DEEMED NECESSARY BY THE CITY. NO DEFLECTION IS ALLOWED.

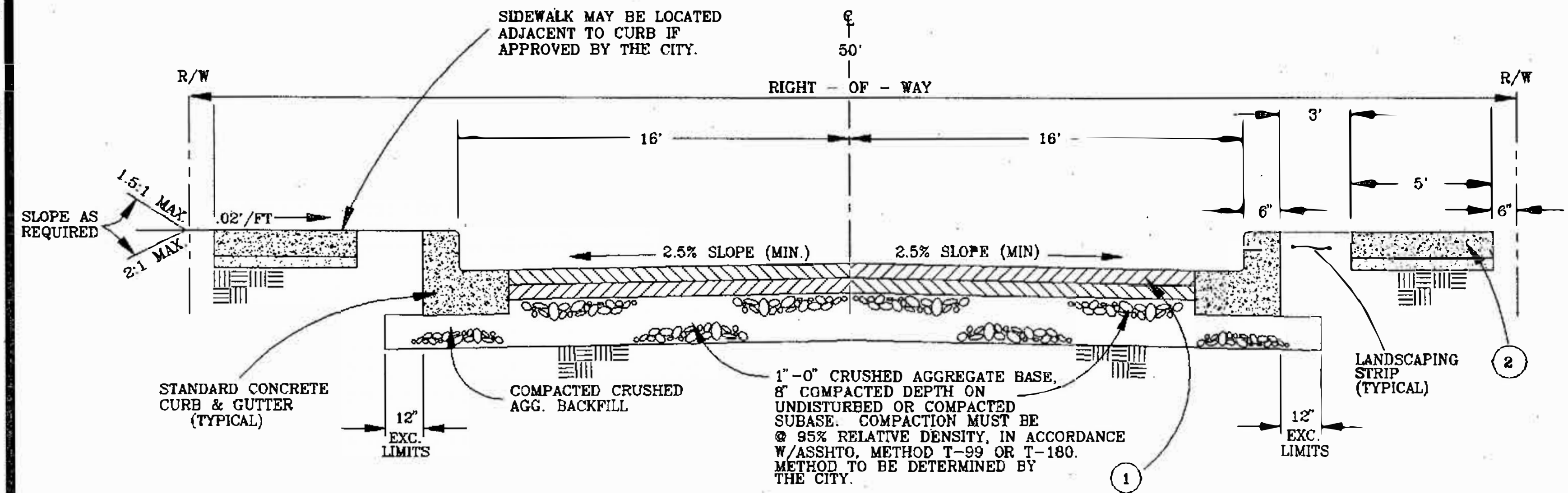
CITY OF TROUTDALE

NEIGHBORHOOD COLLECTOR (CROSS SECTION)

DATE: UPDATED 1994

DRAWING NO. II - 1

FILENAME: APWA0101.DWG



LOCAL STREET CROSS SECTION

NOTES:

(1) 3" OF ASPHALTIC CONCRETE CLASS "C" PLACED IN 2 LIFTS. 1ST LIFT SHALL BE 2" COMPACTED DEPTH. FINAL 1 INCH LIFT WILL BE PLACED AFTER 90% OF THE CERTIFICATES OF OCCUPANCY HAVE BEEN ISSUED OR 2 YEARS AFTER THE FIRST LIFT, WHICHEVER COMES FIRST.

(2) 4" THICK CONCRETE SIDEWALK ON MINIMUM OF 2" COMPACTED DEPTH OF 3/4" – 0 CRUSHED ROCK.

GENERAL:

1. THESE STANDARDS ARE SHOWN AS MINIMUM ALLOWABLE. CITY ENGINEER MAY REQUIRE MODIFICATIONS DUE TO ADVERSE SOIL CONDITIONS, TRAFFIC CONDITIONS, OR OTHER UNFORESEEN SITE CONDITIONS.

2. ALL MATERIALS AND WORKMANSHIP SHALL MEET THE REQUIREMENTS OF THE AMERICAN PUBLIC WORKS ASSOCIATION STANDARD SPECIFICATIONS.

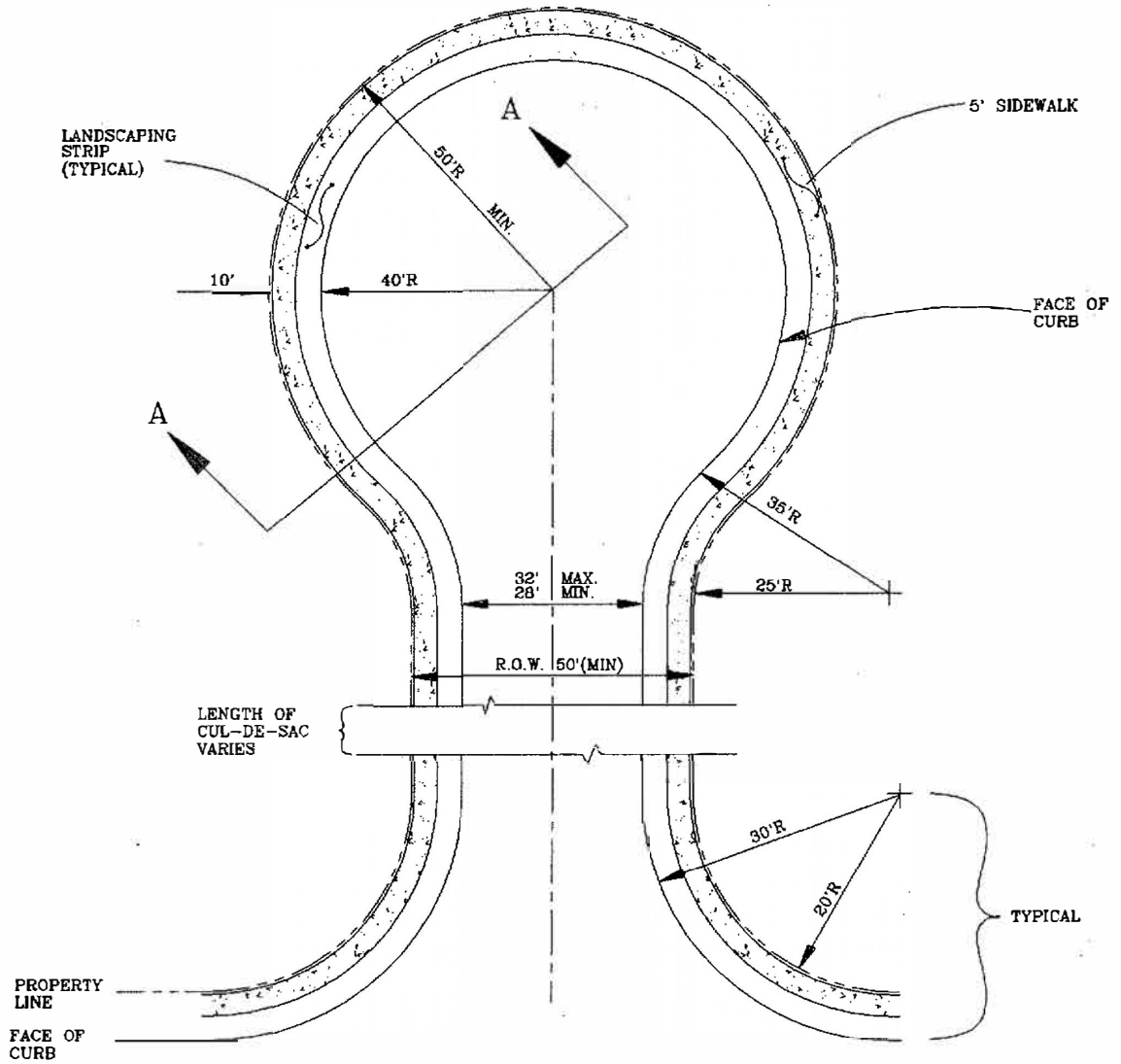
3. DEFLECTION/COMPACTION TESTS WILL BE REQUIRED AS DEEMED NECESSARY BY THE CITY. NO DEFLECTION IS ALLOWED.

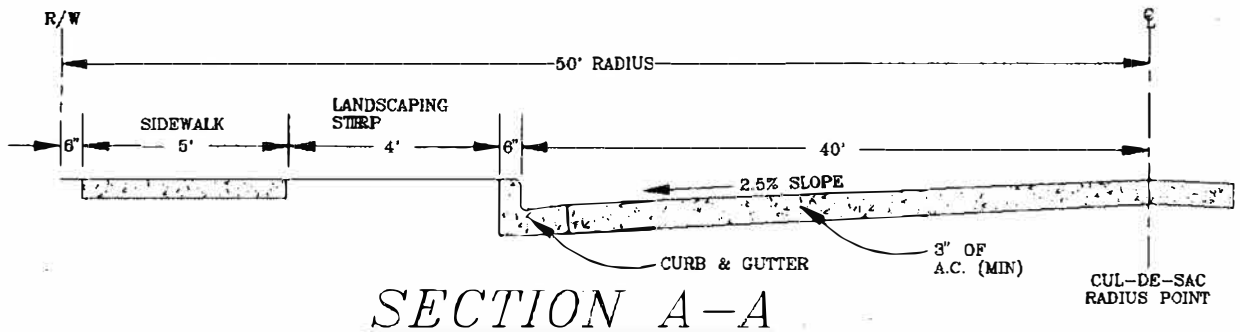
CITY OF TROUTDALE

LOCAL STREET (CROSS SECTION)

DATE: UPDATED 1994

DRAWING NO. II – 2





SECTION A–A

CITY OF TROUTDALE

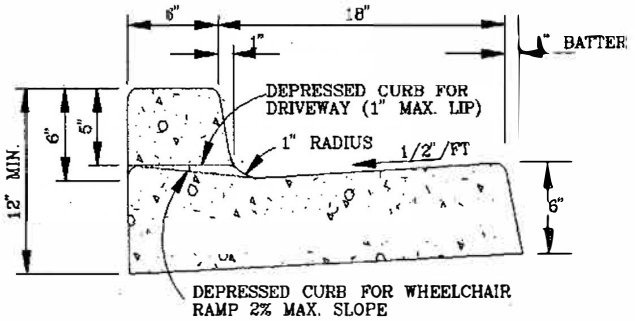
CUL-DE-SAC & INTERSECTION RADII

DATE: UPDATED 1994

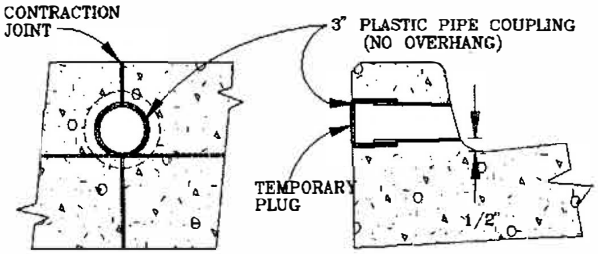
DRAWING NO. II – 3

FILENAME: APWA0106.DWG

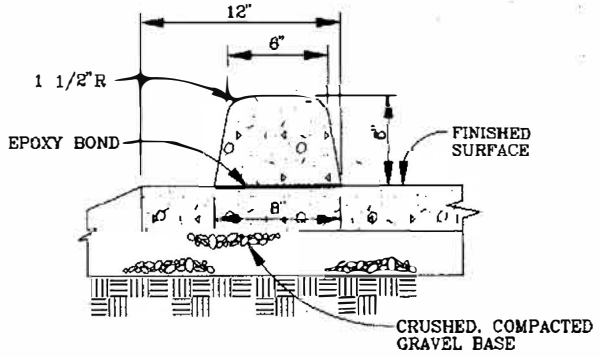
FILENAME: APWA0003.DWG



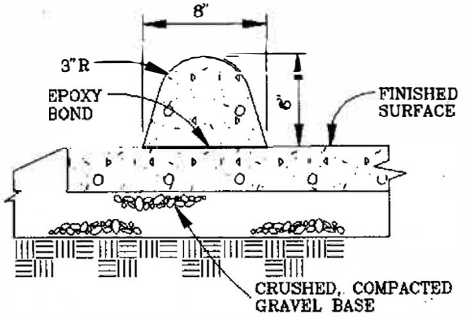
TYPICAL CURB & GUTTER



WEEP HOLE THROUGH CURB



EXTRUDED CONCRETE BONDED CURB



EXTRUDED AC BONDED CURB

GENERAL NOTES:

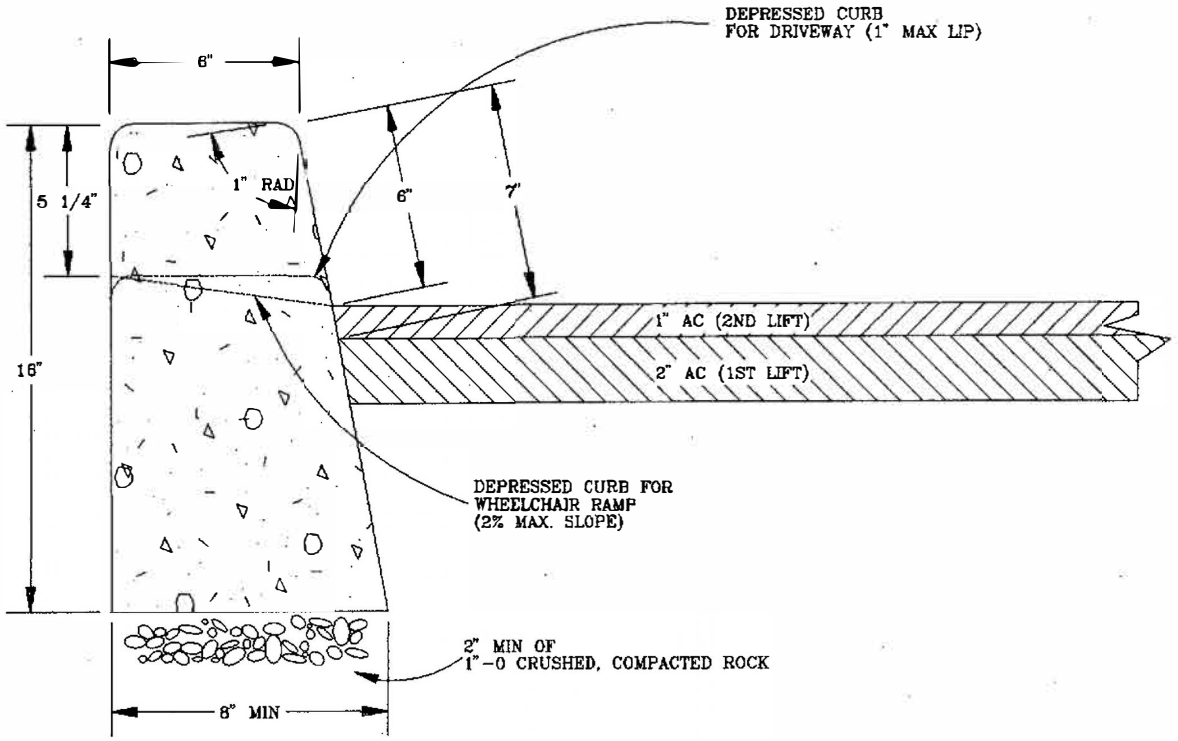
1. ALL RADII SHALL BE 3/4" EXCEPT AS OTHERWISE SHOWN.
2. CONCRETE: 3300 PSI @ 28 DAYS.
3. CONTRACTION JOINTS SHALL BE PLACED AT 15' INTERVALS AND SHALL EXTEND AT LEAST 50% THROUGH THE CURB OR CURB AND GUTTER. EXPANSION JOINTS SHALL BE @ 45' INTERVALS AND AT END OF CURB RETURNS.
4. A CONTRACTION JOINT SHALL BE PLACED ALONG AND OVER WEEP HOLE THROUGH THE CURB AND THROUGH THE SIDEWALK.
5. PRIOR TO CONSTRUCTION OF SIDEWALKS, EXTEND 4" DRAIN PIPE TO BACK OF SIDEWALK AND INSTALL COUPLING. PLUG IF CONNECTION TO RAINDRAIN/CRAWLSPACE DRAIN ISN'T BEING MADE AT THE SAME TIME.
6. THE CITY MUST GRANT APPROVAL TO CONSTRUCT STRAIGHT AND EXTRUDED CURBS.

CITY OF TROUTDALE

CURBS & WEEPHOLES

DRAWING NO. II - 4

DATE: UPDATED 1994



STRAIGHT CURB

GENERAL NOTES:

1. CONCRETE: 3300 PSI @ 28 DAYS.
2. THE CITY MUST GRANT APPROVAL TO CONSTRUCT STRAIGHT CURBS, AND EXTRUDED CURBS.
3. CONTRACTION JOINTS SHALL BE PLACED @ 15' INTERVALS AND SHALL EXTEND AT LEAST 50% THROUGH THE CURB OR CURB & GUTTER. EXPANSION JOINTS SHALL BE @ 45' INTERVALS & AT END OF CURB RETURNS.

CITY OF TROUTDALE

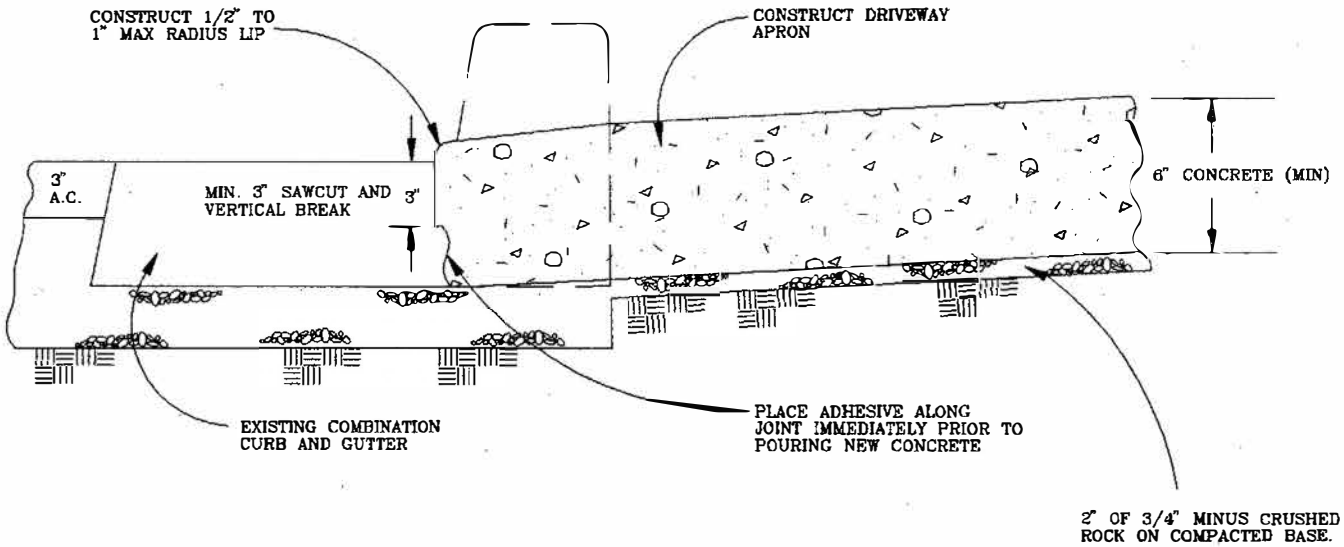
STRAIGHT CURB

DATE: UPDATED 1994

DRAWING NO. II - 5

FILENAME: APWA0110.DWG

FILENAME: APWA1001.DWG



GENERAL NOTES:

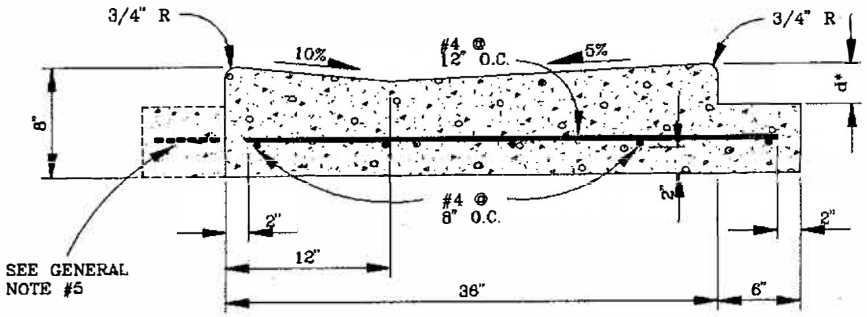
1. SAWCUT THROUGH GUTTER PLATE SHALL BE MADE AS CLOSE TO CURB FACE AS POSSIBLE.
2. COMPLETE CURB AND GUTTER SHALL NOT BE REMOVED UNLESS DIRECTED BY THE CITY.
3. DO NOT UNDERMINE EXISTING CURB AND GUTTER DURING CONSTRUCTION.

CITY OF TROUTDALE

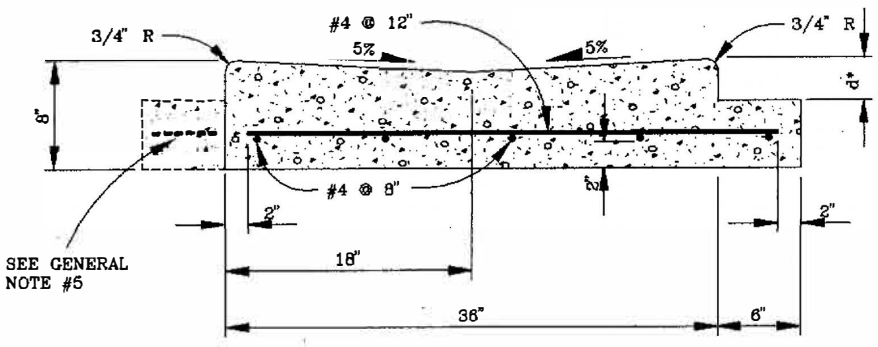
CURB KNOCKOUT FOR DRIVEWAYS

DRAWING NO. II – 6

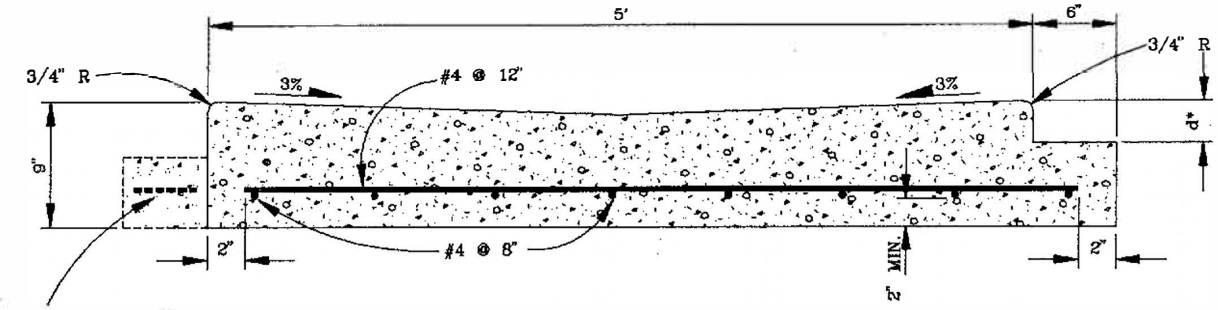
DATE: UPDATED 1994



NON-SYMMETRICAL "V" GUTTER



SYMMETRICAL "V" TYPE GUTTER



WIDE VALLEY GUTTER

GENERAL NOTES:

1. d* = THICKNESS OF ASPHALT PAVING.
2. THE CONCRETE SHALL BE CLASS 3300 PSI @ 28 DAYS.
3. CONSTRUCT 6" BENCH MONOLITHICALLY WITH VALLEY GUTTER TO EXTEND UNDER PAVEMENT FOR PAVEMENT SUPPORT.
4. PLACE PREMOLDED FILLER AGAINST VERTICAL FACE WHERE VALLEY GUTTER ABUTS CONCRETE.
5. CONSTRUCT 6" x d DEPRESSED BENCH WHERE VALLEY GUTTER ABUTS ASPHALT PAVEMENT. DO ON BOTH SIDES OF VALLEY GUTTER.
6. CONSTRUCT SYMMETRICAL "V" TYPE GUTTER UNLESS OTHERWISE DIRECTED BY THE CITY.

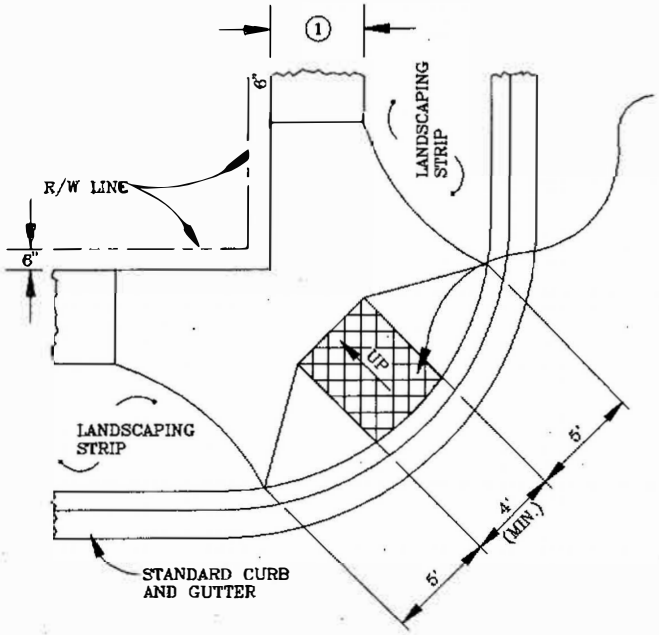
CITY OF TROUTDALE

CONCRETE CROSS GUTTERS

DATE: UPDATED 1994

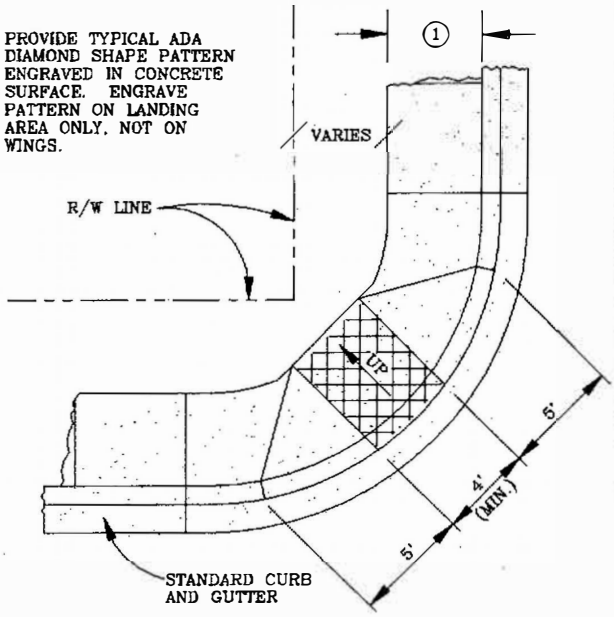
DRAWING NO. II – 7

FILENAME: APWA0004.DWG



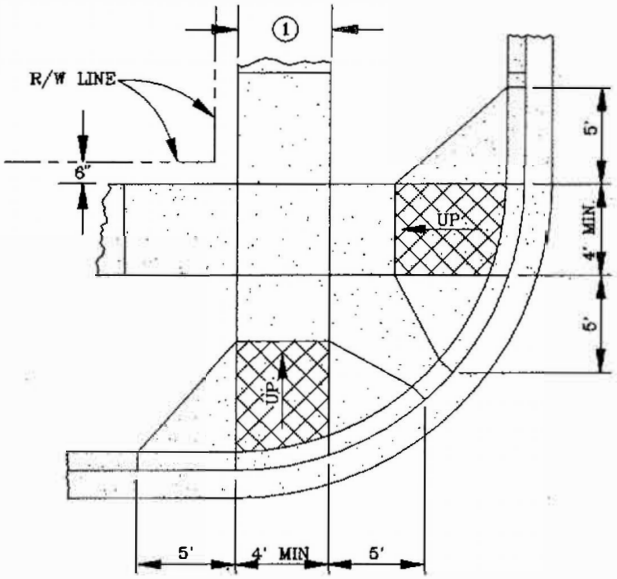
CENTER RAMP FOR PROPERTY LINE SIDEWALK

(RESIDENTIAL AREAS W/LANDSCAPING STRIP)



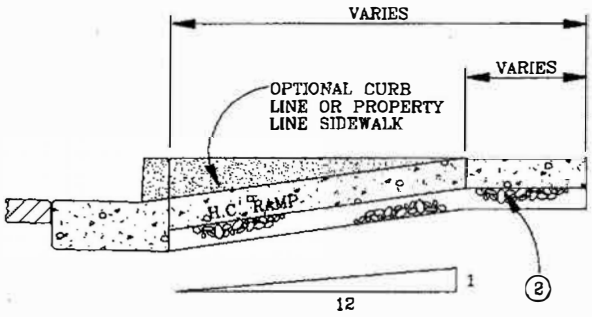
CENTER RAMP FOR CURB LINE SIDEWALK

(RESIDENTIAL AREAS WITHOUT LANDSCAPING STRIPS)



END RAMPS FOR PROPERTY LINE SIDEWALKS

(COMMERCIAL AREAS OR ARTERIAL STREETS)



SECTION THROUGH RAMP – ALL VIEWS

NOTES:

① RESIDENTIAL 5' WIDE
COMMERCIAL 6' WIDE
INDUSTRIAL 6' WIDE

② 2" COMPACTED DEPTH OF 3/4"-0 CRUSHED ROCK.

GENERAL:

1. THE "AMERICANS WITH DISABILITIES ACT" REQUIRES THAT ACCESS RAMPS TO SIDEWALKS HAVE NO SLOPES GREATER THAN 12 HORIZONTAL TO 1 VERTICAL, AND BE TEXTURED @ THROAT OF
2. ALL H.C. RAMPS AND SIDEWALKS SHALL BE COATED WITH APPROVED CURING COMPOUND.
3. ALL SURFACES TO BE TROWELLED AND BROOMED.
4. HANDI-CAP RAMPS SHALL NOT BE IN CONFLICT WITH CATCH BASINS. LOCATE CATCH BASINS AT EITHER END OF CURB RETURNS.

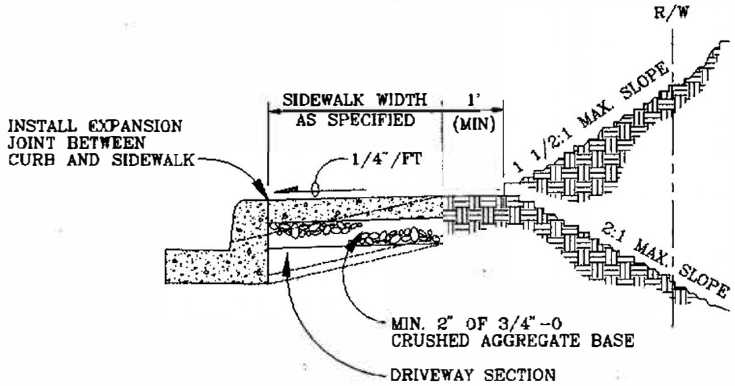
CITY OF TROUTDALE

WHEELCHAIR RAMPS

DATE: UPDATED 1994

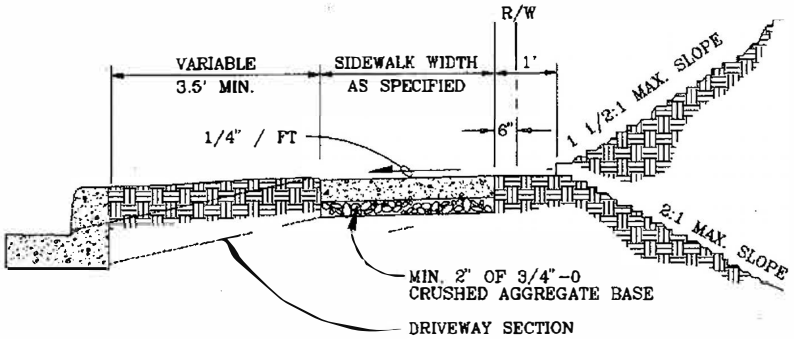
DRAWING NO. II – 8

FILENAME: APWA0006.DWG

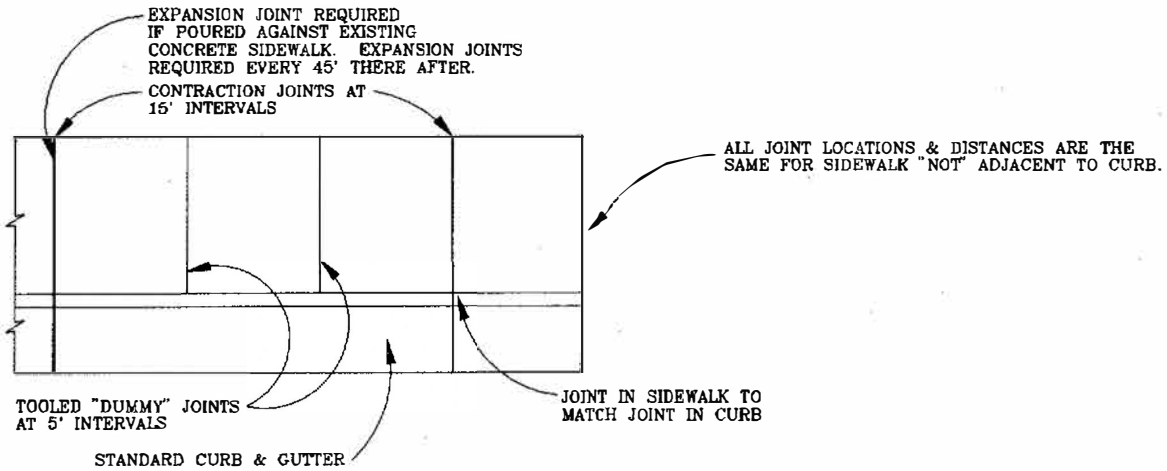


NOTE:
CONCRETE DEPTH FOR STANDARD SIDEWALKS SHALL BE NOMINAL 4" MIN.; DRIVEWAY SECTIONS INCLUDING SIDEWALKS THROUGH DRIVEWAYS SHALL BE NOMINAL 6" MIN.

SIDEWALK ADJECENT TO CURB
(CROSS SECTION)



SIDEWALK ADJECENT TO LANDSCAPING STRIP
(CROSS SECTION)



TYPICAL PLAN VIEW

GENERAL NOTES:

1. CONCRETE: 3300 PSI @ 28 DAYS. SLUMP RANGE OF 1.5" TO 3" MAX.
2. MINUMUM SIDEWALK THICKNESS SHALL BE 4".
3. SIDEWALKS SHALL BE COATED W/APPROVED CURING COMPOUND.
4. ALL SURFACES ARE TO BE TROWELLED AND BROOMED IN A WORKMAN LIKE MANNER.
5. EXPANSION JOINTS ARE REQUIRED AT SIDES OF DRIVEWAY APPROACHES AND UTILITY VAULTS. DISTANCES BETWEEN EXPANSION JOINTS SHALL BE AT 45'.
6. SIDEWALK WIDTHS SHALL BE AS FOLLOWS:
   - RESIDENTIAL 5' WIDE
   - COMMERCIAL 6' WIDE
   - INDUSTRIAL 6' WIDE

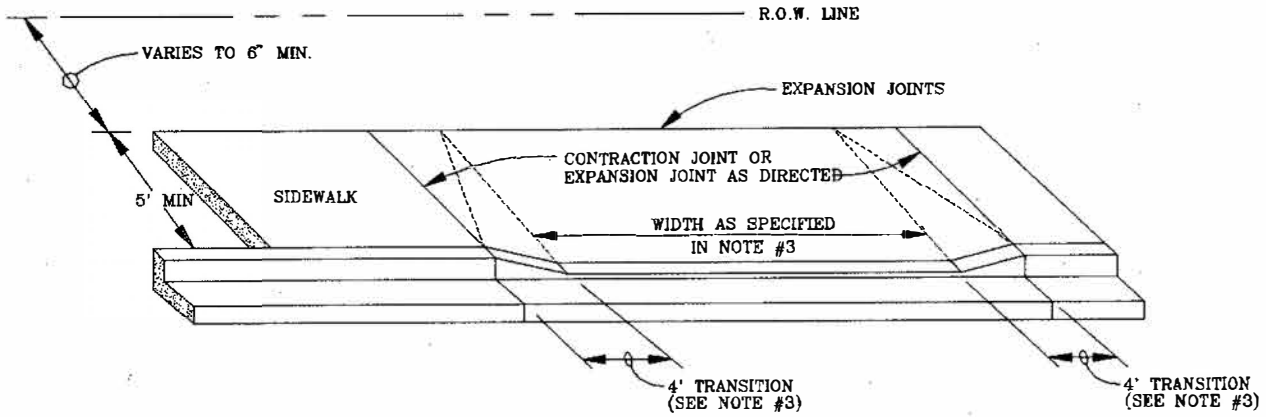
CITY OF TROUTDALE

CONCRETE SIDEWALK

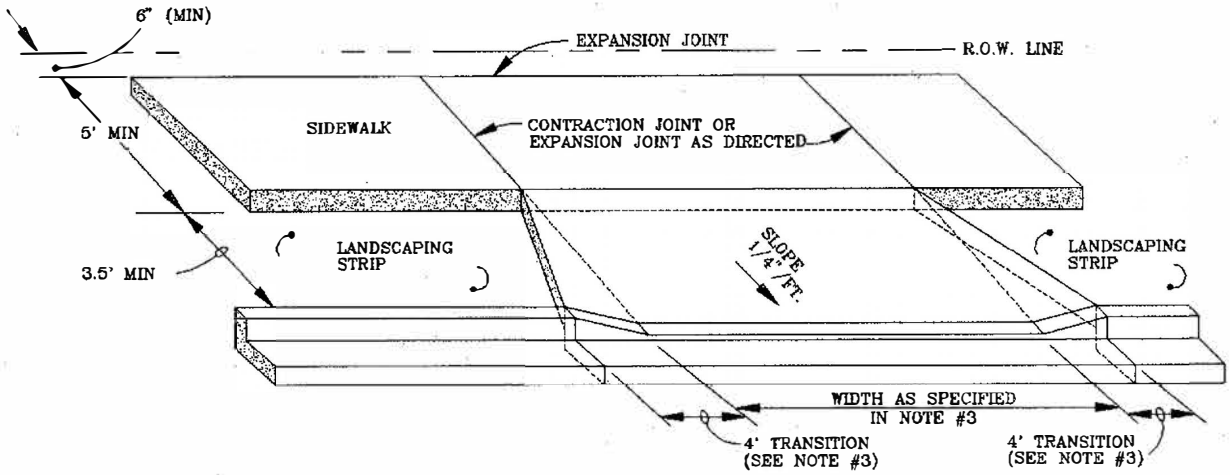
DATE: UPDATED 1994

DRAWING NO. II – 9

FILENAME: APWA0005.DWG



DRIVEWAY APPROACH FOR CURBLINE SIDEWALK



DRIVEWAY APPROACH FOR SET-BACK SIDEWALK

GENERAL NOTES:

1. RESIDENTIAL DRIVEWAYS AND SIDEWALK SECTIONS THROUGH DRIVEWAYS SHALL HAVE A NOMINAL THICKNESS OF 6" OF 3300 PSI CONCRETE @ 28 DAYS.
2. CONCRETE FOR COMMERCIAL AND INDUSTRIAL USE SHALL HAVE A NOMINAL THICKNESS OF 8" OF 3300 PSI @ 28 DAYS.
3. MAXIMUM WIDTH WILL BE 24' ON FRONTAGES EQUAL TO OR LESS THAN 50 FEET, AND 24' PLUS 1'/FT OF FRONTAGE IN EXCESS OF 50' TO A MAXIMUM DRIVEWAY WIDTH OF 36'. THIS 36' MAXIMUM WIDTH DOES NOT INCLUDE THE WIDTH OF THE TWO 4' WINGS ON BOTH SIDES OF THE APPROACH. THE START POINT OF WING SHOULD BE AT LEAST 2' IN FROM THE NEAREST PROPERTY LINE.
4. MINIMUM DRIVEWAY WIDTH ALLOWED SHALL BE 12', EXCLUDING THE TWO 4' DRIVEWAY WINGS.

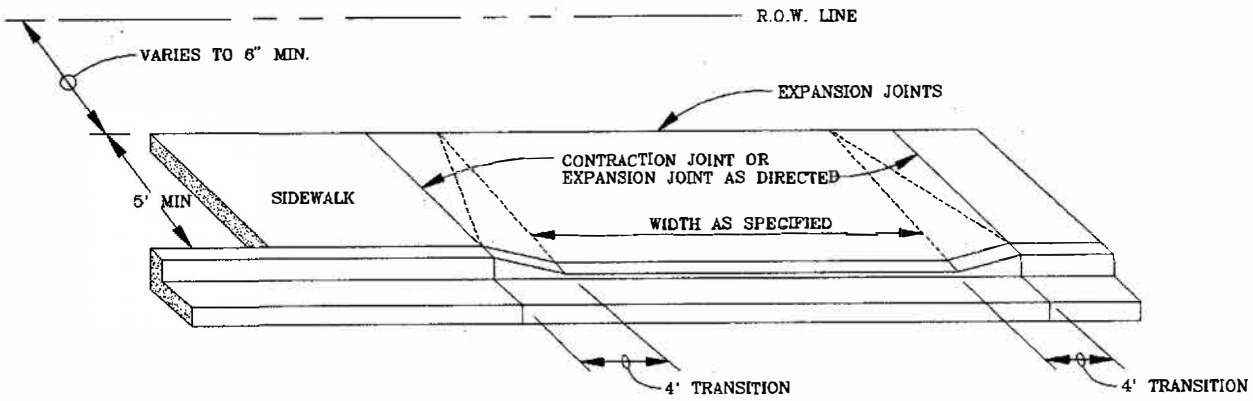
CITY OF TROUTDALE

DRIVEWAY APPROACH

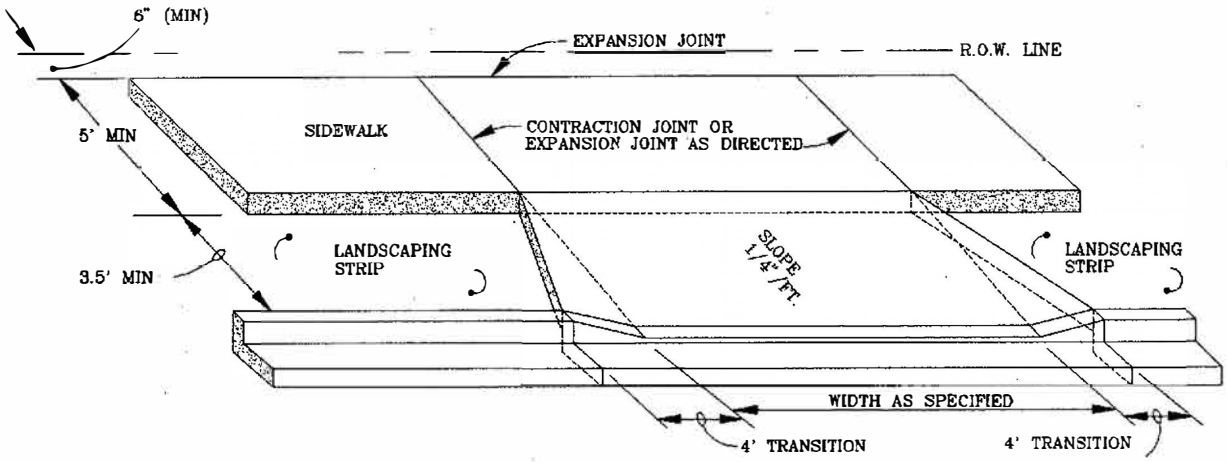
(RESIDENTIAL AREAS)

DATE:	DRAWING NO.
UPDATED 1994	II - 10

FILENAME: APWA0008.DWG



DRIVEWAY APPROACH FOR CURBLINE SIDEWALK



DRIVEWAY APPROACH FOR SET-BACK SIDEWALK

GENERAL NOTES:

1. CONCRETE FOR COMMERCIAL AND INDUSTRIAL USE SHALL HAVE A NOMINAL THICKNESS OF 8" OF 3300 PSI @ 28 DAYS.
2. MINIMUM DRIVEWAY WIDTH ALLOWED SHALL BE 15' AND MAXIMUM 44', EXCLUDING THE TWO 4' WINGS.

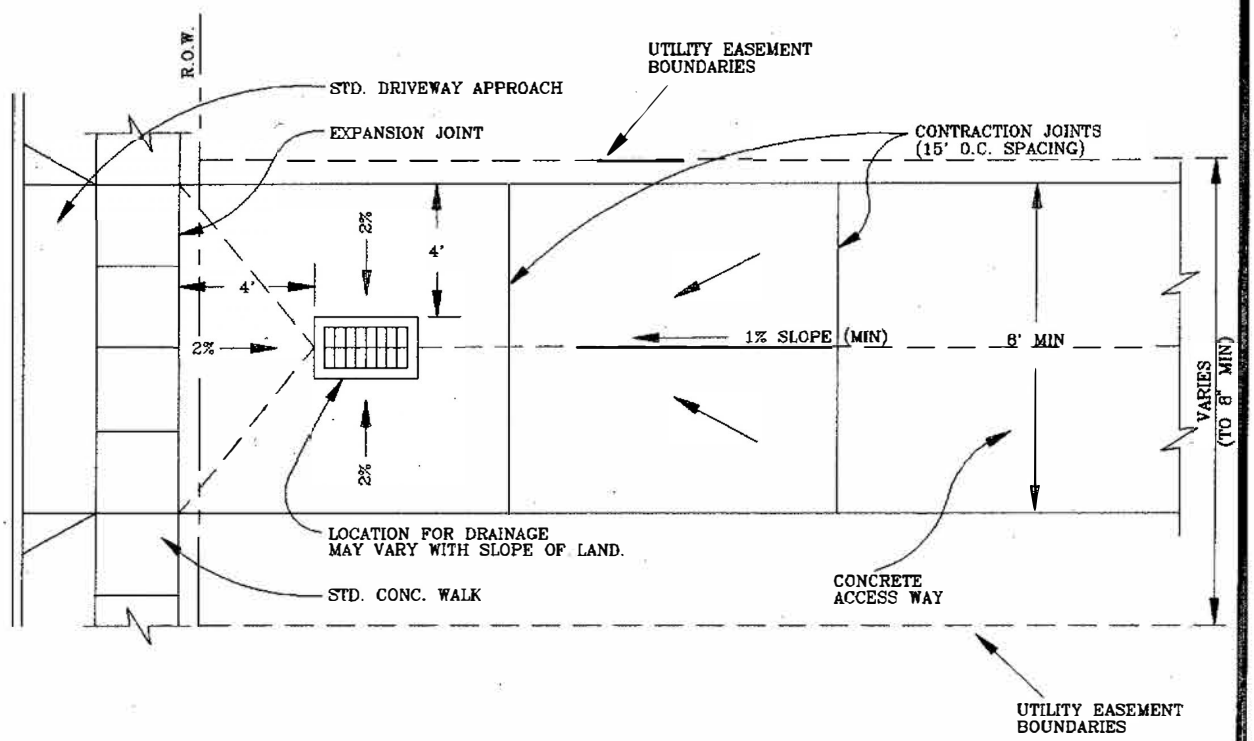
CITY OF TROUTDALE

DRIVEWAY APPROACH

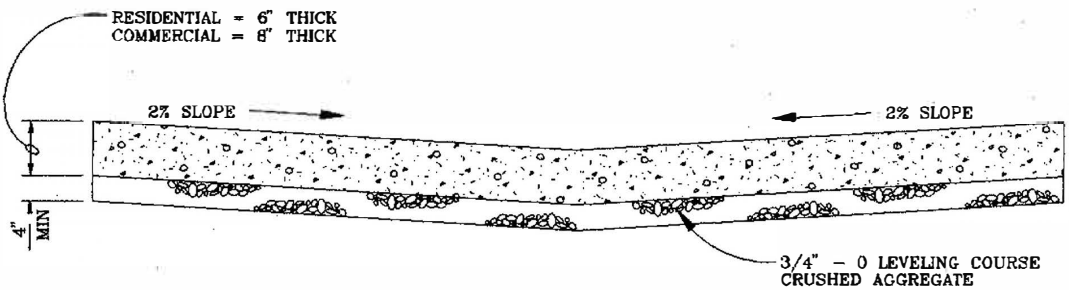
(INDUSTRIAL/COMMERCIAL AREAS)

DATE:	DRAWING NO.
UPDATED 1994	II – 11

FILENAME: APWA0129.DWG



PLAN VIEW



TYPICAL ACCESS WAY (INVERTED CROWN) SECTION

GENERAL NOTES:

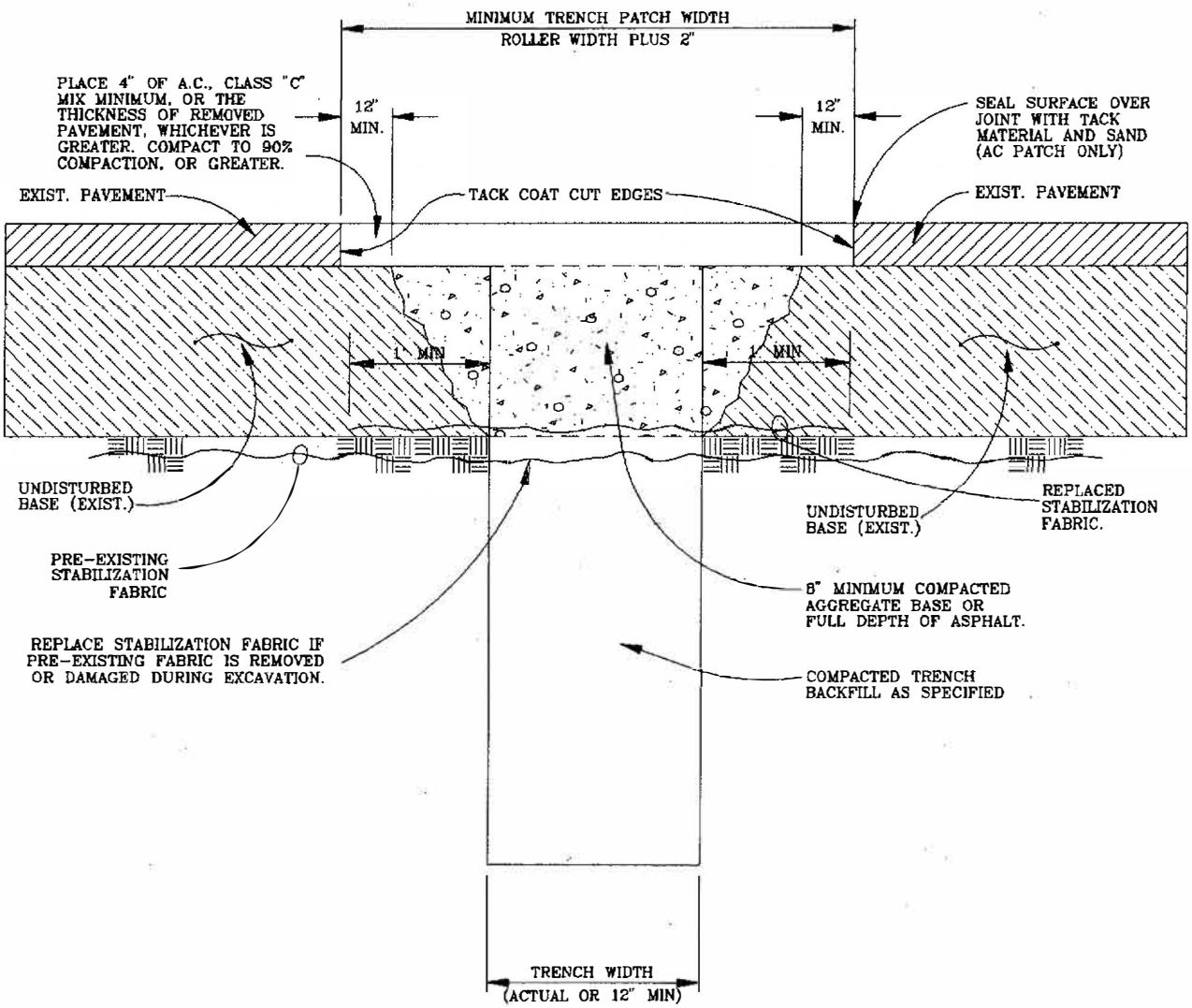
1. ALL EDGES SHALL BE TOOLED WITH 3/4" RADIUS.
2. CONCRETE TO BE 3300 PSI @ 28 DAYS.
3. EXPANSION JOINTS SHALL BE INSTALLED @ 45' INTERVALS AND CONTRACTION JOINTS @ 15' INTERVALS.
4. ACTUAL WIDTH OF EASEMENT AND CONCRETED AREA WILL BE DETERMINED BY THE CITY.

CITY OF TROUTDALE

UTILITY EASEMENT ACCESS WAY

DATE:	DRAWING NO.
UPDATED 1994	II – 12

FILENAME: APWA0009.DWG



GENERAL NOTES:

1. ALL EXISTING AC OR PCC PAVEMENT SHALL BE SAWCUT PRIOR TO REPAVING, AND CUT EDGES TACKED TO PROVIDE STRONG BONDING.
2. IF STREET CUT/EXCAVATION TORE PRE-EXISTING STABILIZATION FABRIC, THE CITY MUST DETERMINE WHAT FABRIC TYPE WILL BE USED AS A SUBSTITUTE. SUBSTITUTE MUST OVERLAP ONTO EXISTING FABRIC AT LEAST 1' ON BOTH SIDES, AS SHOWN.

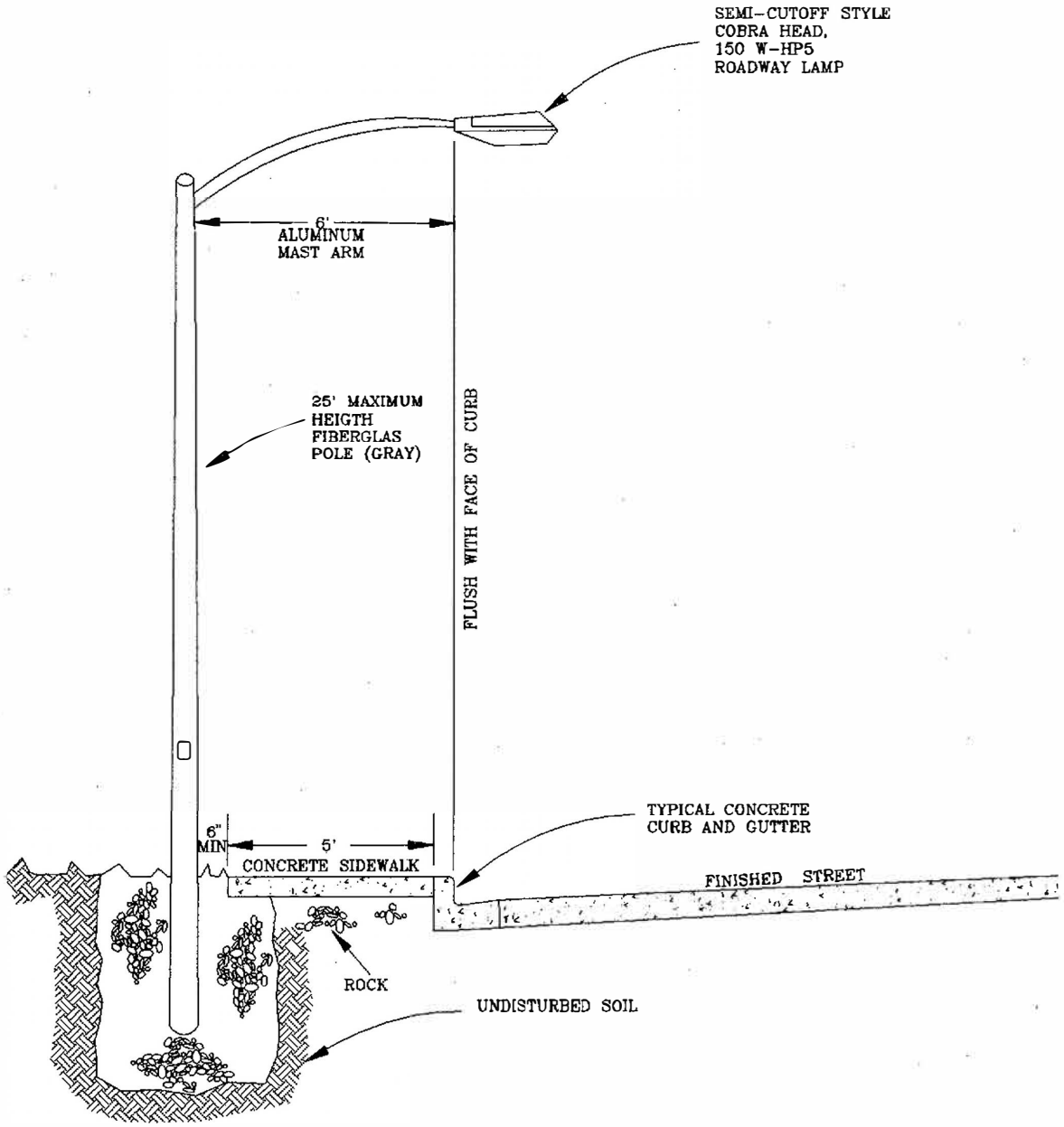
CITY OF TROUTDALE

STREET CUT & REPAIRS

DATE: UPDATED 1994

DRAWING NO. II – 13

FILENAME: APWA0012.DWG



GENERAL NOTES

1. COMPACTED, CRUSHED ROCK BACKFILL IS REQUIRED IN ALL SOIL CONDITIONS TO MAINTAIN PROPER POLE VERTICAL ALIGNMENT.
2. USE BELT SLINGS OR NYLON ROPE WHEN LIFTING POLE IN PLACE TO PREVENT SCARRING.
3. LOCATION OF LIGHT POLE CAN NOT BE CLOSER THAN 5' FROM A WATER SERVICE METER BOX, FIRE HYDRANT, OR WATER SAMPLING STATION. NO EXCEPTIONS ALLOWED.
4. INSTALLATION OF STREET LIGHT POLE SHOULD OCCUR BEFORE SIDEWALK, OTHERWISE, A 5' X 5' SECTION OF SIDEWALK MUST BE REMOVED AND REPLACED AFTER STREET LIGHT POLE IS INSTALLED.
5. THIS DETAIL IS PROVIDED TO SHOW "LOCATION" OF POLE WITHIN PUBLIC RIGHT-OF-WAY ONLY. EXACT SPECIFICATIONS FOR INSTALLATION AND ELECTRICAL COMPONENTS MUST BE OBTAINED FROM PORTLAND GENERAL ELECTRIC.
6. COBRA HEAD STYLE USED WHEN POLE IS INSTALLED BEHIND SIDEWALK. USE SHOE BOX STYLE WHEN LOCATED ADJACENT TO CURB. SEE DRAWING # II - 15.

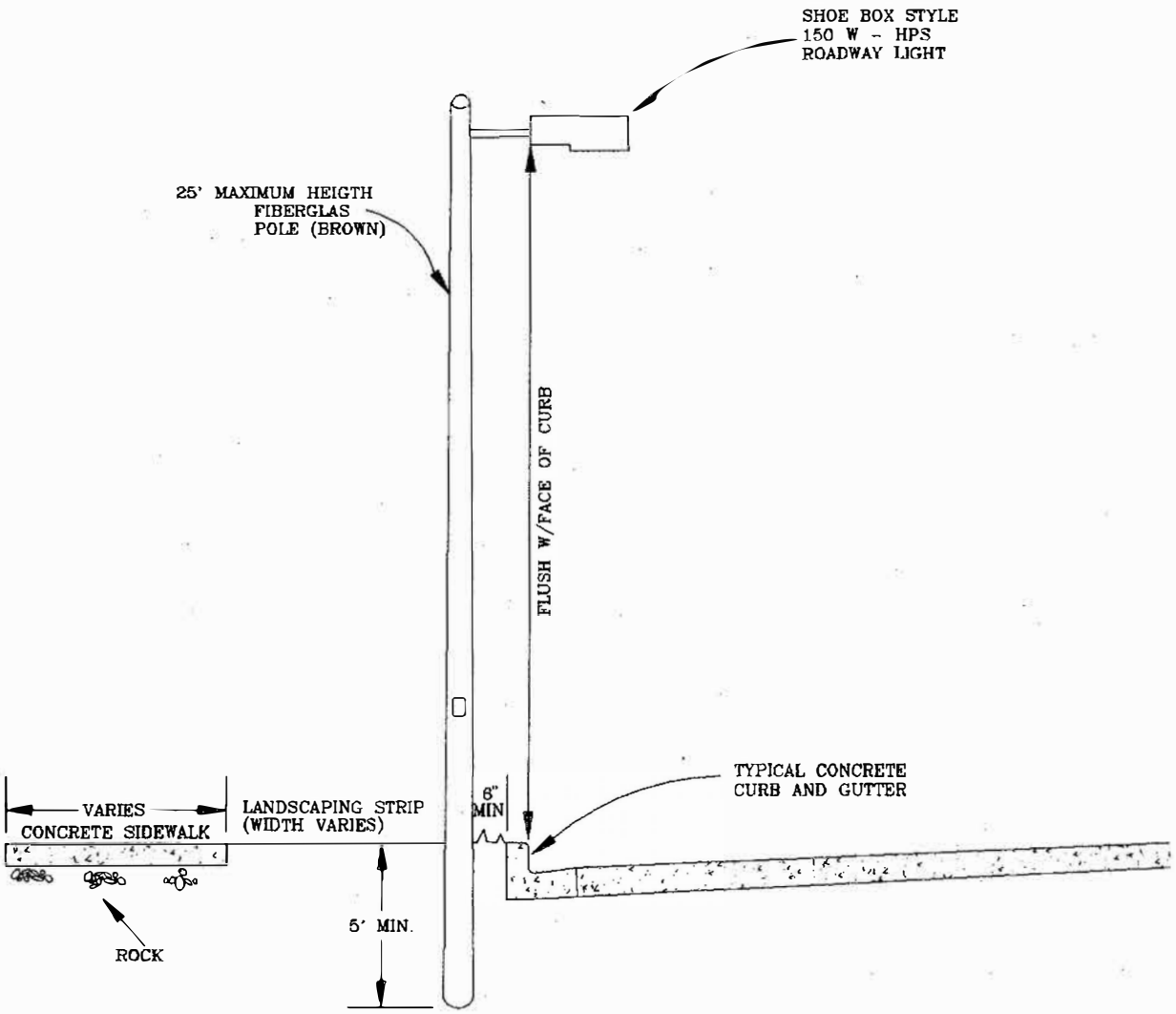
CITY OF TROUTDALE

STREET LIGHT POLE LOCATION

(BACK OF WALK)

DATE:	DRAWING NO.
UPDATED 1994	II - 14

FILENAME: APWA0107.DWG



GENERAL NOTES:

1. DURING EXCAVATION, DO NOT UNDERMINE EXISTING CURB AND GUTTER.
2. COMPACTED, CRUSHED ROCK BACKFILL IS REQUIRED IN ALL SOIL CONDITIONS TO MAINTAIN PROPER POLE VERTICAL ALIGNMENT.
3. USE BELT SLINGS OR NYLON ROPE WHEN LIFTING POLE IN PLACE TO PREVENT SCARRING.
4. LOCATION OF LIGHT POLE CAN NOT BE CLOSER THAN 5' FROM A WATER SERVICE METER BOX, FIRE HYDRANT, OR WATER SAMPLING STATION. NO EXCEPTION ALLOWED.
5. THIS DETAIL IS PROVIDED TO SHOW "LOCATION" OF POLE WITHIN PUBLIC RIGHT-OF-WAY ONLY. EXACT SPECIFICATIONS FOR INSTALLATION AND ELECTRICAL COMPONENTS MUST BE OBTAINED FROM PORTLAND GENERAL ELECTRIC.
6. "SHOE BOX" STYLE IS USED WHEN POLE IS PLACED IN LANDSCAPING STRIP. USE COBRA HEAD STYLE WHEN LOCATED BEHIND SIDEWALK. SEE DRAWING # II - 14.

CITY OF TROUTDALE

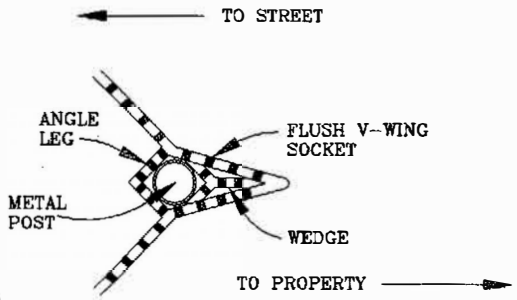
STREET LIGHT POLE LOCATION

(IN LANDSCAPING STRIP)

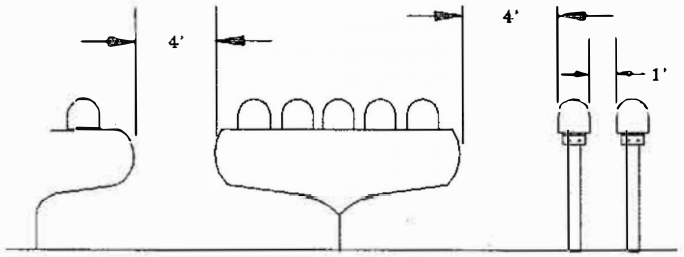
DATE:	DRAWING NO.
UPDATED 1994	II - 15

FILENAME: APWA0117.DWG

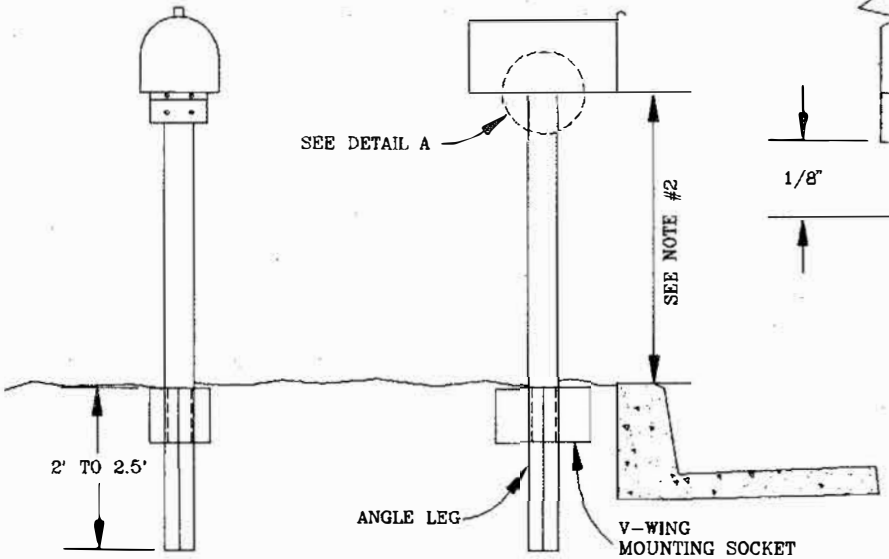
FILENAME: APWA0116.DWG



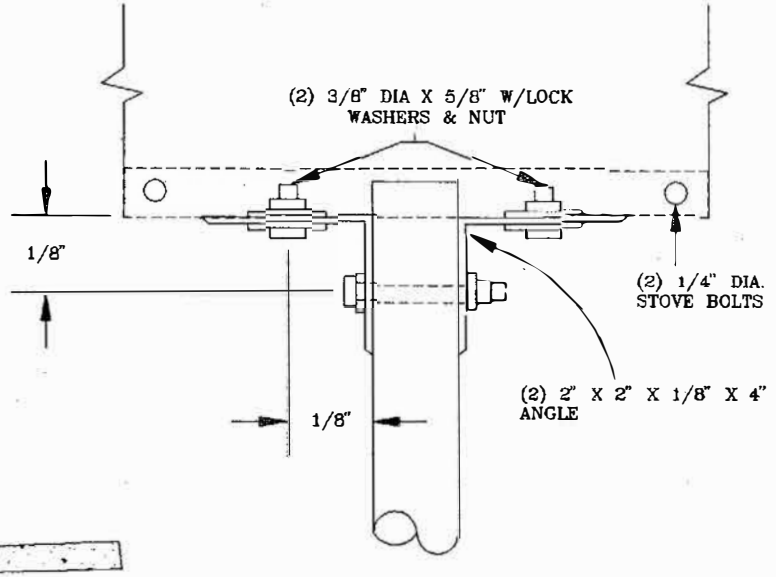
POST MOUNTING SOCKET



SPACING



FRONT SIDE



DETAIL A

GENERAL NOTES:

1. TOP OF V-LOC SOCKET MUST BE FLUSH WITH FINISH GRADE. IF MAILBOX IS BEING INSTALLED IN SIDEWALK AREA, IT MUST BE INSTALLED DURING PREP WORK OF SIDEWALK BEDDING, AND PRIOR TO POURING CONCRETE.
2. MAIL BOX HEIGHT AND SET BACKS WILL BE SPECIFIED BY POSTAL AUTHORITIES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO OBTAIN THE MOST RECENT SPECIFICATIONS FROM THE POSTAL AUTHORITIES

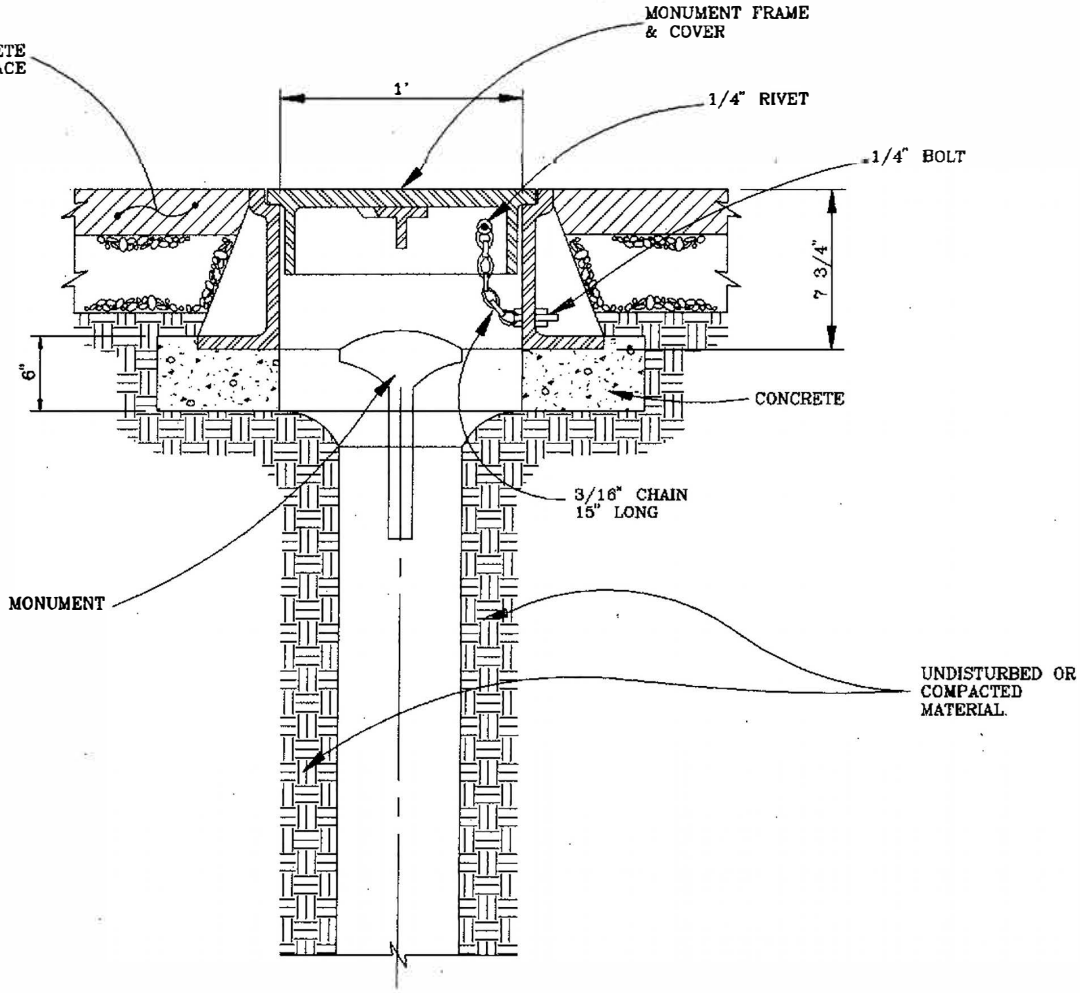
SINGLE BOX

CITY OF TROUTDALE

MAIL BOX INSTALLATIONS (CLUSTER & SINGLE)

DATE: UPDATED 1994

DRAWING NO. II – 16



ELEVATION

GENERAL NOTES:

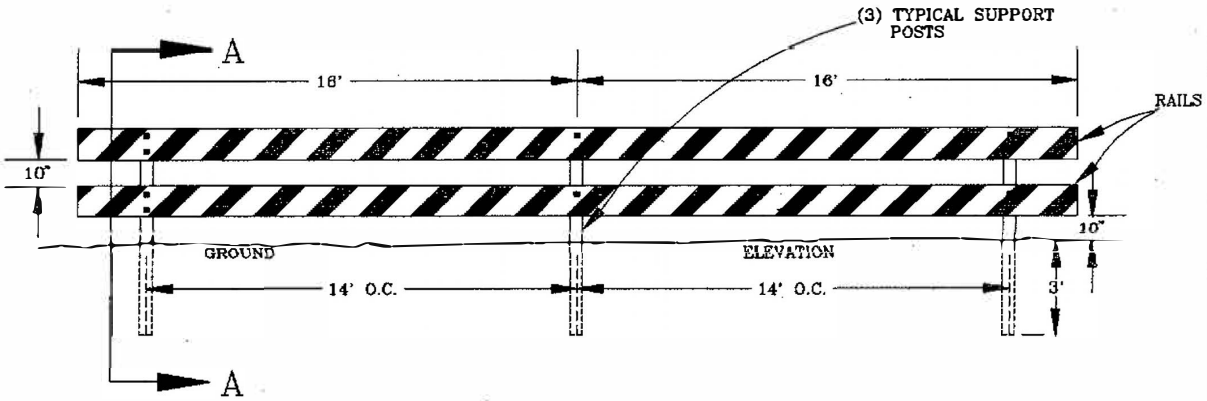
1. CONCRETE SHALL BE 3000 PSI @ 28 DAYS.
2. FRAME AND COVER SHALL BE CAST IRON.
3. COVER SHALL HAVE "MONUMENT DO NOT DISTURB" CAST INTO TOP.
4. MONUMENT TO BE 2" DIAMETER BRASS CAP MARKER OR AS APPROVED BY THE CITY, AND/OR THE COUNTY SURVEYOR.

CITY OF TROUTDALE

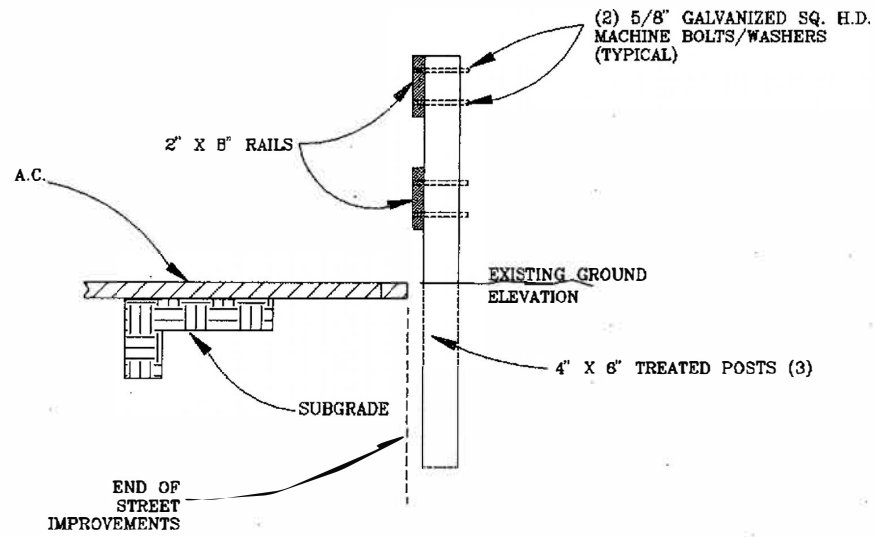
SURVEY MONUMENT & BOX

DATE:	DRAWING NO.
UPDATED 1994	II – 17

FILENAME: AFWA0014.DWG



FRONT VIEW



SIDE VIEW

GENERAL NOTES:

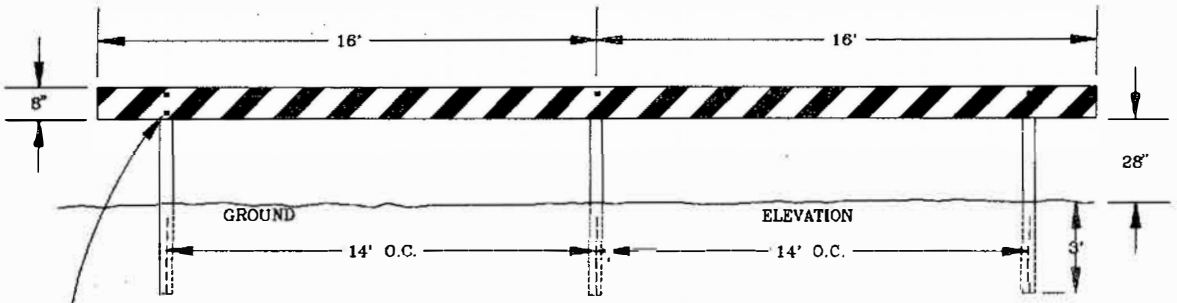
1. STRIPES SHALL BE REFLECTORIZED, RED AND WHITE IN COLOR.
2. SUPPORT POSTS SHALL BE 4"X6", TREATED. PAINTED WHITE.
3. BARRICADE BOARD RAILS SHALL BE 2"X8" X REQUIRED LENGTH, TREATED.
4. WHEN BARRICADE REMOVAL IS REQUIRED TO EXTEND STEET, CITY FORCES WILL PICK UP BARRICADE UPON REMOVAL BY CONTRACTOR.
5. CONSTRUCT BARRICADE TYPE II, AS SHOWN, UNLESS OTHERWISE DIRECTED BY THE CITY.

CITY OF TROUTDALE

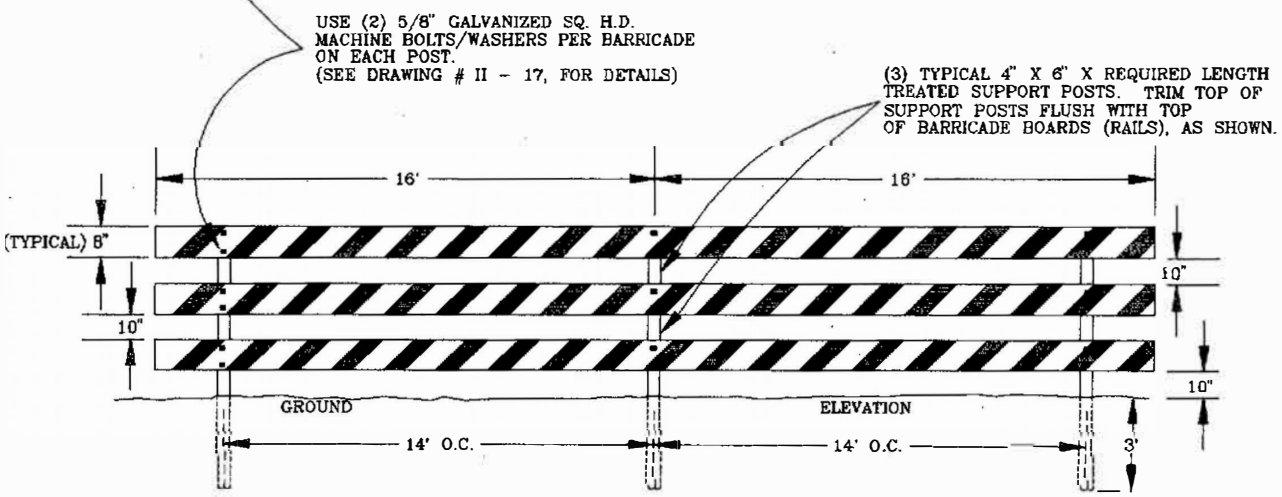
STREET BARRICADE (TYPE II)

DATE:	DRAWING NO.
UPDATED 1994	II – 18

FILENAME: APWA0104.DWG



BARRICADE TYPE I



BARRICADE TYPE III

GENERAL NOTES:

1. STRIPES SHALL BE REFLECTURIZED, RED AND WHITE IN COLOR.
2. POSTS SHALL BE 4" X 6" X REQUIRED LENGTH, TREATED, PAINTED WHITE.
3. BARRICADE BOARDS, (RAILS), SHALL BE 2"X8" X REQUIRED LENGTH, TREATED.
4. USE TYPE II, DRAWING # II-16, UNLESS OTHERWISE REQUIRED BY THE CITY.

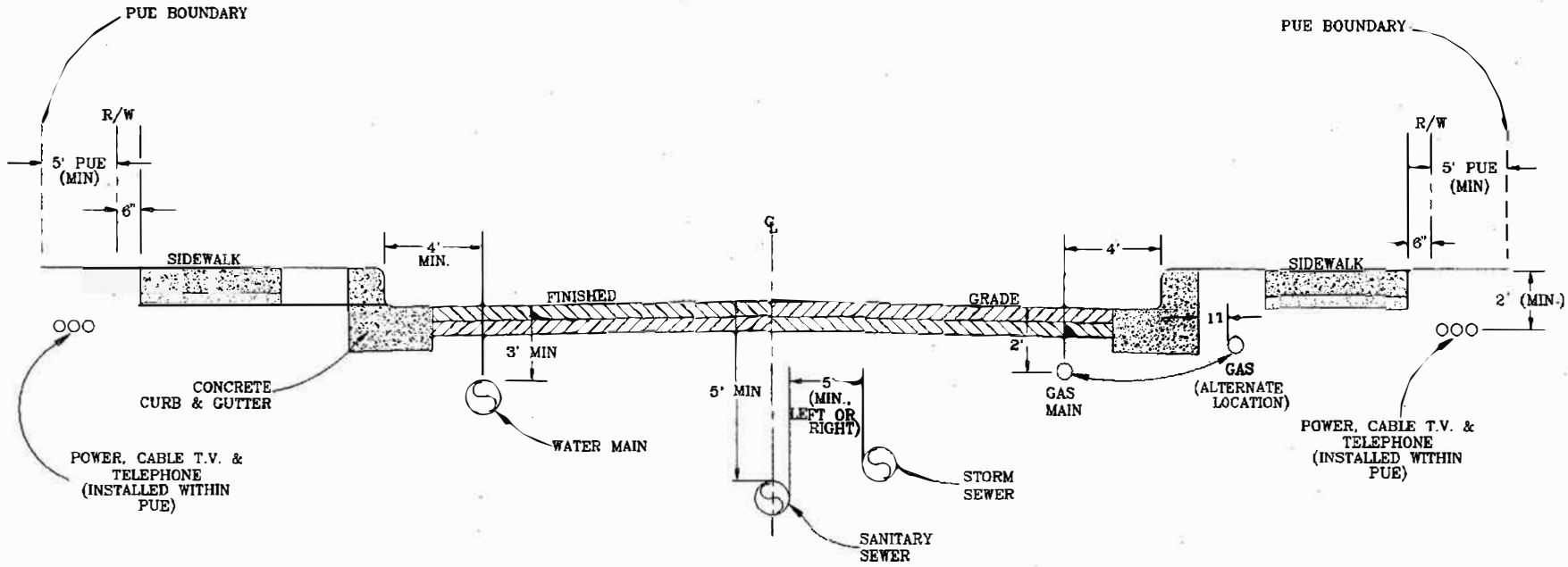
CITY OF TROUTDALE

STREET BARRICADE (TYPE I & III)

DATE:	DRAWING NO.
UPDATED 1994	II - 19

FILENAME: APWA0105.DWG

FILENAME: APWA0103.DWG



GENERAL NOTES:

1. VERTICAL AND HORIZONTAL SEPARATION DISTANCES ARE GOVERNED BY THE CITY, THE DEPARTMENT OF ENVIROMENTAL QUALITY, AND STATE HEALTH DIVISION.
2. PUE: PRIVATE UTILITY EASEMENT

CITY OF TROUTDALE

PUBLIC/PRIVATE UTILITY LOCATIONS

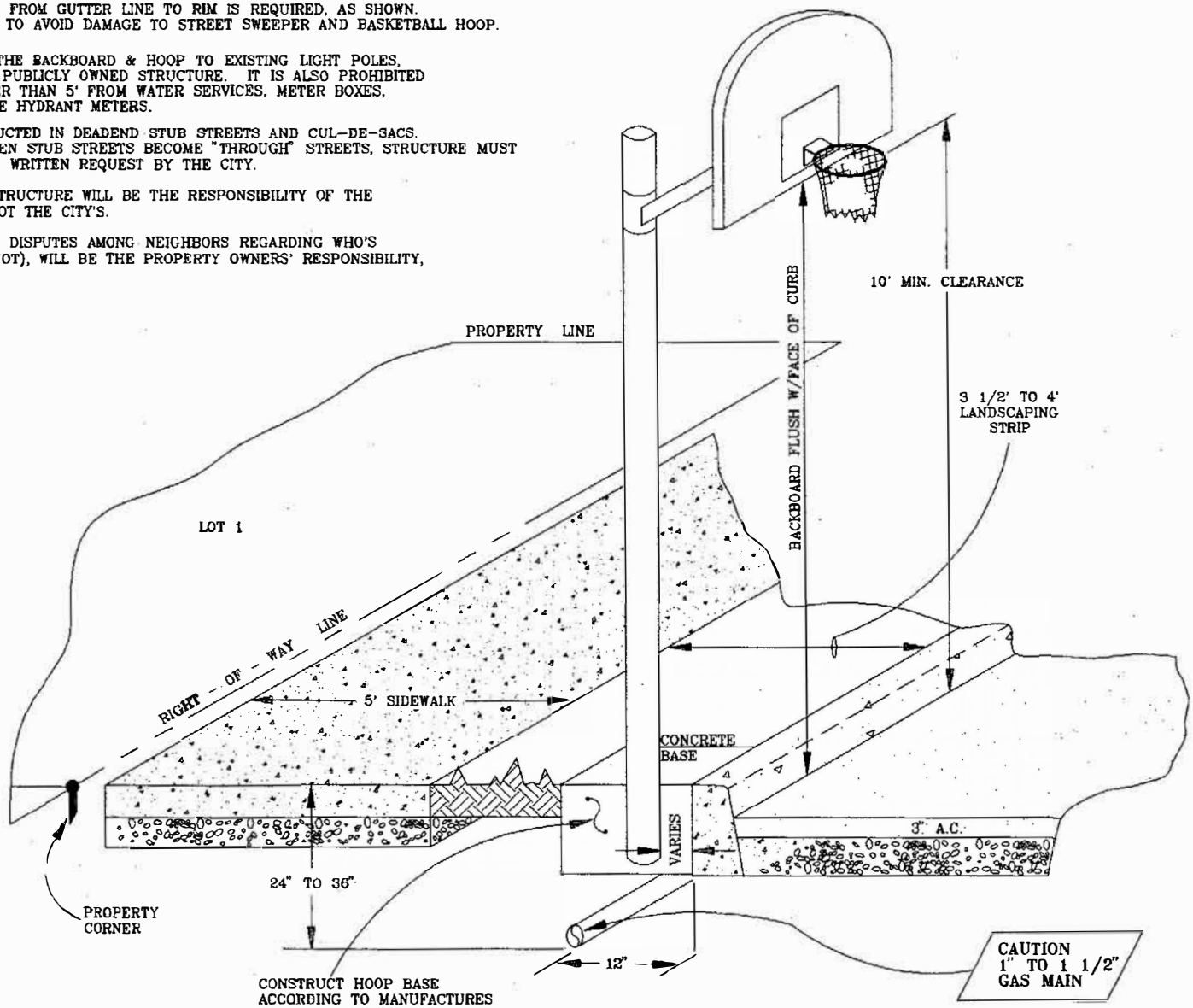
DRAWING NO. II - 20

DATE: UPDATED 1994

FILENAME: APWA0114.DWG

GENERAL NOTES:

1. CAUTION ! ! ! PRIOR TO ANY EXCAVATION, YOU MUST CONTACT THE LOCATE SERVICE @ 246-6699 TO LOCATE ALL "PRIVATE" UTILITIES, AND THE CITY @ 665-5175 TO LOCATE "PUBLIC" UTILITIES BEFORE DIGGING.
2. A MINIMUM CLEARANCE OF 10' FROM GUTTER LINE TO RIM IS REQUIRED, AS SHOWN. THIS CLEARANCE IS REQUIRED TO AVOID DAMAGE TO STREET SWEEPER AND BASKETBALL HOOP.
3. IT IS PROHIBITED TO MOUNT THE BACKBOARD & HOOP TO EXISTING LIGHT POLES, SIGN POSTS, AND ANY OTHER PUBLICLY OWNED STRUCTURE. IT IS ALSO PROHIBITED TO CONSTRUCT A HOOP CLOSER THAN 5' FROM WATER SERVICES, METER BOXES, STREET LIGHT POLES AND FIRE HYDRANT METERS.
4. HOOPS CAN ONLY BE CONSTRUCTED IN DEADEND STUB STREETS AND CUL-DE-SACS. SEE DRAWING # II - 22. WHEN STUB STREETS BECOME "THROUGH" STREETS, STRUCTURE MUST BE REMOVED BY OWNER UPON WRITTEN REQUEST BY THE CITY.
5. ON GOING MAINTENANCE OF STRUCTURE WILL BE THE RESPONSIBILITY OF THE PERSON WHO INSTALLED IT, NOT THE CITY'S.
6. ONCE THE HOOP IS IN PLACE, DISPUTES AMONG NEIGHBORS REGARDING WHO'S AUTHORIZED TO USE IT (OR NOT), WILL BE THE PROPERTY OWNERS' RESPONSIBILITY, NOT THE CITY'S.



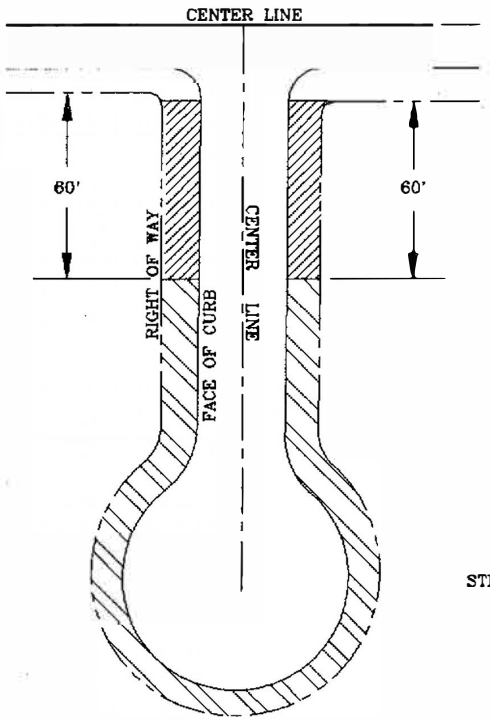
CITY OF TROUTDALE

BASKETBALL HOOP DETAIL

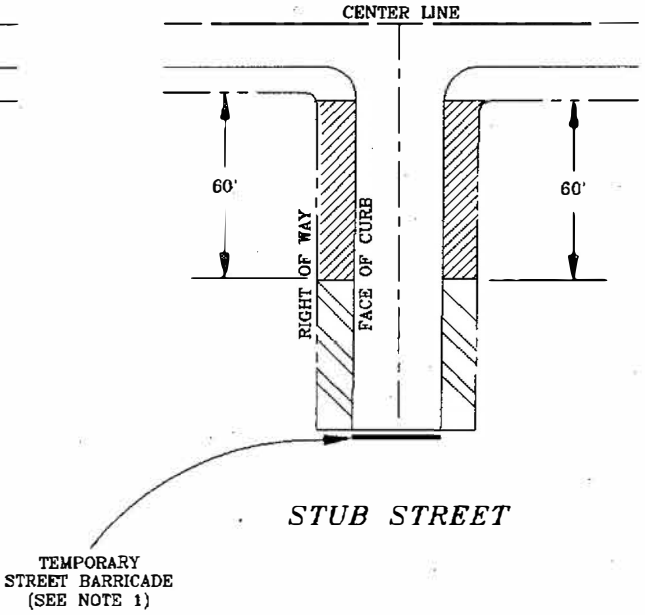
(IN PUBLIC RIGHT-OF-WAY)

DATE: UPDATED 1994

DRAWING NO. II - 21



CUL–DE–SAC



STUB STREET

LEGEND

PROHIBITED AREAS

PERMITTED AREAS

GENERAL NOTES:

1. WHEN STUB STREETS BECOME THROUGH STREETS, STRUCTURE MUST BE REMOVED BY OWNER UPON WRITTEN REQUEST FROM THE CITY.

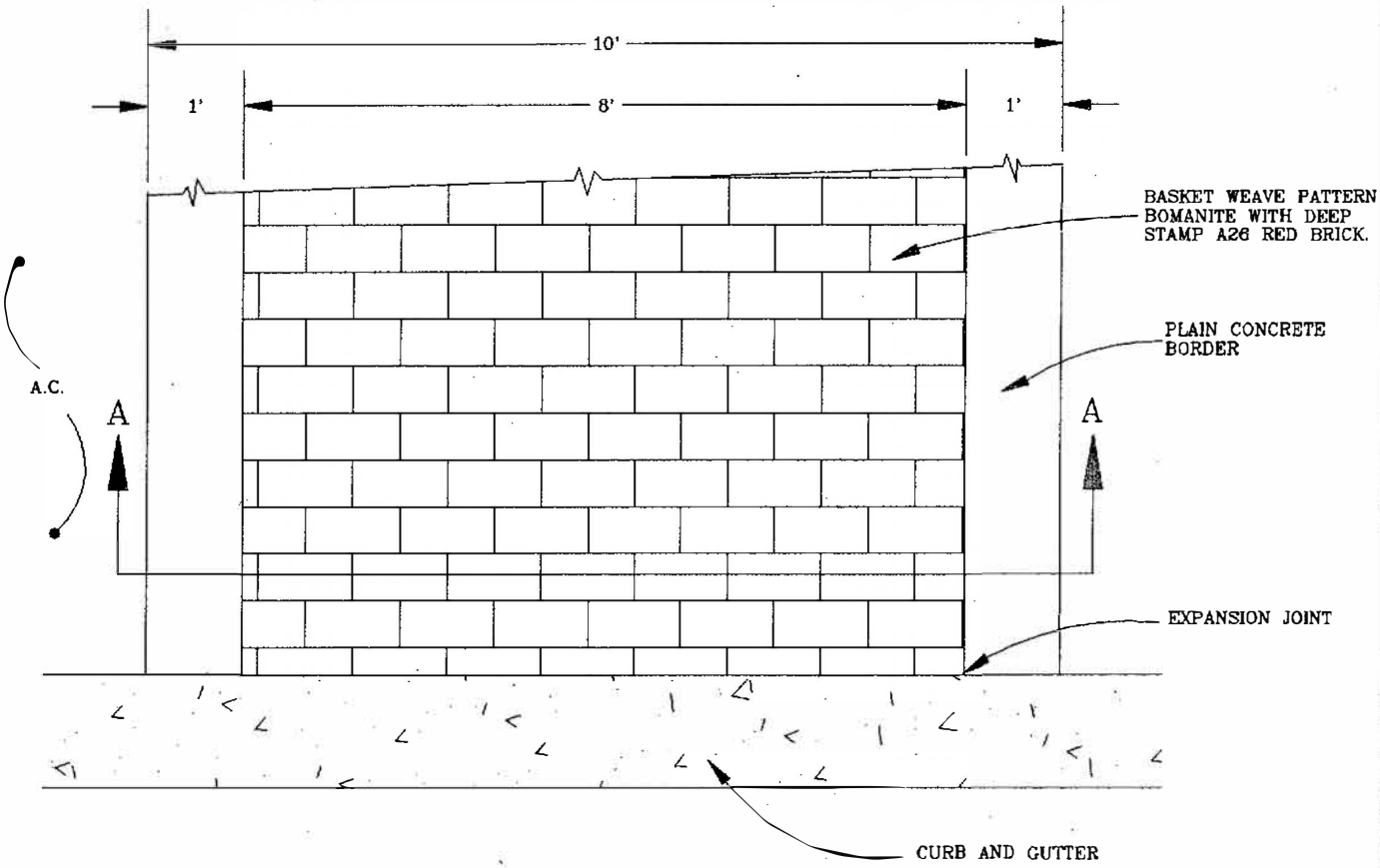
CITY OF TROUTDALE

BASKETBALL HOOP LOCATION

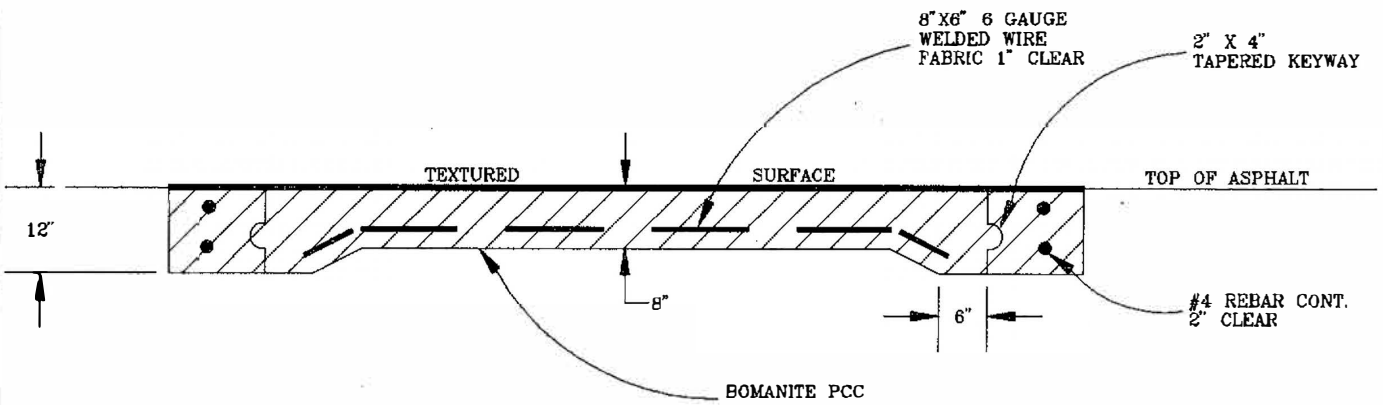
(IN PUBLIC RIGHT–OF–WAY)

DATE:	DRAWING NO.
UPDATED 1994	II – 22

FILENAME: APWA0115.DWG



PLAN VIEW



SECTION A–A

GENERAL NOTES

1. ALL CONCRETE SHALL BE 4000 PSI AT 28 DAYS. PROVIDE 1/2" EXPANSION JOINT AT CENTER OF CROSSWALK OR AT 15' O.C., WHICHEVER IS LESS.

CITY OF TROUTDALE

BOMANITE PEDESTRIAN CROSS WALK

DATE:	DRAWING NO.
UPDATED 1994	II – 23

FILENAME: APWA0118.DWG

WATER DISTRIBUTION SYSTEM

(Parts III & IV)

WATER

(Part III)

*** General Requirements**

WATER DISTRIBUTION SYSTEM

(General Requirements)

1. **Proposed water mains must be in accordance with the City of Troutdale's Public Facilities Plan. Main sizes must deliver adequate fire flows (of no less than 1000 gpm for single dwelling residential areas, and no less than 1500 gpm for commercial and industrial developments) plus normal system demand while maintaining a minimum residual pressure of 20 psi, as required by law. During normal demand periods, a minimum pressure of 45 psi is required. If this pressure is not available in the zone in which the new pipe is being placed, means to increase pressure, to no less than 45 psi, will be required. Associated expenses will be incurred by the developer.**

2. **All proposed water main additions to the City's existing water system shall be added to our current automated water model, and simulations performed of future on-site water demands for fire, peak hours, and normal domestic, industrial and commercial usage. Other demand situations may be required and run by the City. All simulations shall be done and approved by the City prior to "final" approval of construction plans. All costs associated with these water model analysis will be forwarded to the developer for reimbursement.**

3. **All construction/installation of water mains shall be done in a safe, neat and workmanlike manner, and under supervision by City forces at all times. All safety requirements from OSHA and other State regulating agencies must be met.**

4. **Water mains shall be looped wherever feasible. Water mains must be looped within cul-de-sacs if the street exceeds 350 feet in length and serves more than 12 lots.**

5. **Water main pipe material shall be Class 52 ductile iron only.**

6. **Air relief valves, pressure relief valves, pressure reducing valves, backflow prevention valves, etc., shall be used where necessary.**

7. **Hydrants shall be spaced such that all residential structures can be reached with 400 feet of hose. Hydrants shall be within 250 feet of commercial and industrial structures.**

8. **Hydrants should be located at street intersections and at cul-de-sac entrances rather than at mid-block when possible. Typical fire hydrant location is at end of curb returns and/or in direct alignment to a common property line to two lots. Do not place fire hydrant in the middle of a lot frontage. Connect fire hydrant to largest main or to main which provides looped flow. Connection of a fire hydrant to a main less than 6-inches is prohibited, and if two or more fire hydrants are required, an 8" minimum diameter pipe shall be used.**

9. A minimum 6-inch diameter main shall be installed if the line will be extended in the future.

10. Hydrant style shall be a Mueller 200 or a Waterous Pacer 6790 with two hose connections and one pumper nozzle. All fire hydrants to become public shall be painted yellow and all private hydrants red.

11. Blow-off assemblies are required on all dead-end lines. Locate blow-off assemblies four feet from face of curb, within the street.

12. An 18-inch minimum separation is required on service taps on a main line.

13. Lots may be served by a single or a double service line. Single service lines will be a minimum of 3/4 inch diameter, and double service lines a minimum of 1-inch diameter, type "K" copper pipe. Water services, meters and meter boxes must be located far enough away from fire hydrants and/or light poles to avoid conflict with curb weepholes. All "public" parcels designated as open, and for use as greenways, must be served with a water service large enough to adequately irrigate the site. Location and size of service will be determined by the City.

14. Each half of a duplex shall be served with individual service lines and individual meters.

15. Four-inch lines shall service no more than twelve lots.

16. Class 52 ductile iron may be direct tapped for 3/4 inch and 1-inch size services. Saddles shall be used on all taps greater than 1 inch.

17. All line breaks shall have thrust blocks as detailed on Standard Drawings.

18. A water sampling station(s) may be required at all new subdivisions, and as part of new commercial and industrial developments when additions to the water distribution system are included. See drawings IV-6 and IV-7. Exact location for the sampling station(s) will be determined by the City.

19. A depth of 36-inches from finish grade to top of water main is required. Placing water lines deeper or shallower than 36" inches is not allowed.

20. All new pipes must be properly flushed, chlorinated, and pressure tested, and inspected by City forces. Bacteriological samples will be taken by the City when requested by the general contractor. Operation of nearby water valves (opening and closing) by the contractor during flushing is prohibited. This will only be done by City forces, when so requested by the contractor.

21. **All backflow prevention devices (double check backflow preventors, reduced pressure backflow preventors, pressure and atmospheric vacuum breakers, etc.) must be approved by the Oregon State Health Division. All service lines greater than 1-inch shall have a double check backflow preventor as minimum protection.**

22. **The builder/developer must provide to the City any guarantee or warranty normally furnished with the purchase of any equipment or materials used in connection with the project at hand. In addition, they must furnish the City a written warranty providing satisfactory in-service operation of all work performed by affected contractor (including, but not limited to mechanical, electrical, on-site permanent concrete structures, water main, valves, fire hydrants, etc.) for a period of two (2) years following date of project acceptance.**

23. **The following is a list of acceptable/existing materials and/or equipment currently in use by the City's water distribution system:**

<u>Water meters:</u>

- **3/4" and 1" size: Sensus SRI with gallon register**
- **1 1/2" and 2" size: Sensus SRI or Neptune with gallon register**
- **Fire hydrant meter: Neptune's Trident**
- **Compound Meter: Sensus only**
- **Turbine Meter: Sensus and Neptune's Trident**
- **Fire service meter assembly: Sensus and Neptune Protectus II**

<u>Water Valves:</u>

- **4", 6" and 8" diameter: AWWA gate valves**
- **10" and 12" diameter: AWWA butterfly valves**

<u>Water Pipe:</u>

- **Large diameter (4" and greater): ductile iron, class 52**
- **Fittings: Ductile Iron Class 250**
- **1 1/2" and 2" diameter: Type K, soft or rigid copper**
- **3/4" and 1": Type K, soft copper**
- **3/4" and 1" brass fittings: McDonald MAC-PAK, Mueller C110 and Ford PAC joint**

<u>Meter Boxes:</u>

- **With 3/4" and 1" meters: Carson Brooks 1419B-15, black plastic meter box with reader lid for landscaped areas; and Brooks 36T concrete when placed in concreted areas.**

- **With 1 1/2" meters without by-pass plumbing: Brooks 38-H**

- **With 2" meters without by-pass plumbing: Brooks 65-H**

Automatic Valves:

- **Clayton**

Pilot Control Valves:

- **Clayton and Bailey 20-200 PSI**

Valve Boxes:

- **Model #910**

Backflow Devices:

- **All must be Oregon State Health approved.**

Fire Service Vaults with Fire Department Connections:

- **4", use 676-WA**
- **6", use 687-WA**
- **8", use 5106-LA**
- **10", use 5106-LA**

Fire Service Vaults without Fire Department Connections:

- **3", use 466 or 660**
- **4", use 577-WA**
- **6", use 676-WA**
- **8", use 687-WA**
- **10", use 5106-LA**

Gauges:

- **0-200 PSI, 3 1/2" face**

Meter Vaults:

- **3", use 676-WA**
- **4", use 687-WA**
- **6", use 687-WA**
- **8", use 810-LA**

Vault Doors:

- Shall be galvanized diamond plate and spring assisted model #332P. H-20 rating for traffic areas, and H-10 for landscaped areas.

The above equipment and materials are listed for information only. An "equal" substitute of materials and/or equipment can be proposed to the City for consideration and approval.

24. All new connections to existing water mains require issuance of a public works permit and inspection by the City prior to backfilling. A permit fee of $50.00 will be assessed for each connection/inspection.

25. All other construction practices (relating to water) within the City's public right-of-way, not covered in these "general requirements" and/or in the "construction details" sections, shall comply with the rules and regulations in the most recent editions of the American Public Works Association Standard Specifications for Public Works Construction, and the Standards of the American Water Works Association.

WATER

(PART IV)

* Construction Details

(HORIZONTAL) BEARING AREA OF THRUST BLOCKS IN SQUARE FEET									(VERTICAL) VOLUME OF THRUST BLOCK IN CUBIC YARDS			
FITTING SIZE	TEE, WYE, DEAD END AND HYDRANT	STRADDLE BLOCK	90° BEND PLUGGED CROSS	TEE PLUGGED ON RUN		45° BEND	22-1/2° BEND	11-1/4° BEND	90° BEND	45° BEND	22-1/2° BEND	11-1/4° BEND
				A-1	A-2							
4	1.0	1.6	1.4	1.9	1.4	1.0	---	---	---	---	---	---
6	2.1	3.7	3.0	4.3	3.0	1.8	1.0	---	1.3	---	---	---
8	3.8	6.5	5.3	7.6	5.4	2.9	1.5	1.0	2.3	1.1	---	---
10	5.9	10.2	8.4	11.8	8.4	4.6	2.4	1.2	3.7	1.8	---	---
12	8.5	14.7	12.0	17.0	12.0	6.6	3.4	1.7	5.5	2.8	1.2	---
14	11.5	---	16.3	23.0	16.3	8.9	4.6	2.3	7.6	3.9	1.7	---
16	15.0	26.1	21.3	30.0	21.3	11.6	6.0	3.0	9.9	5.1	2.3	0.9
18	19.0	---	27.0	38.0	27.0	14.6	7.6	3.8	---	---	---	---
20	23.5	40.8	33.3	47.0	33.3	18.1	9.4	4.7	---	---	---	---
24	34.0	58.8	48.0	68.0	48.0	26.2	13.6	6.8	---	---	---	---

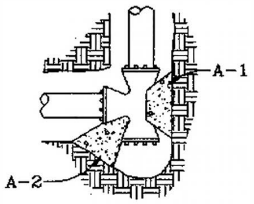
NOTES:

1. ABOVE BEARING AREAS BASED ON TEST PRESSURE OF 150 PSI AND AN ALLOWABLE SOIL BEARING STRESS OF 2000 POUNDS PER SQUARE FOOT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES AND SOIL BEARING STRESSES, USE THE FOLLOWING EQUATION:

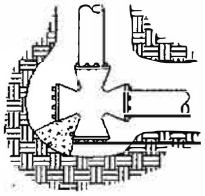
   BEARING AREA = (TEST PRESSURE / 150) x (2000 / SOIL BEARING STRESS) x (TABLE VALUE)

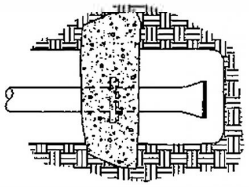
2. ABOVE VOLUMES BASED ON TEST PRESSURE OF 150 PSI AND THE WEIGHT OF CONCRETE = 4050 POUNDS PER CUBIC YARD. TO COMPUTE FOR DIFFERENT TEST PRESSURES, USE THE FOLLOWING EQUATION:

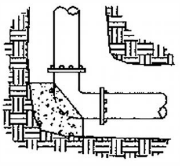
   VOLUME = (TEST PRESSURE / 150) x (TABLE VALUE)

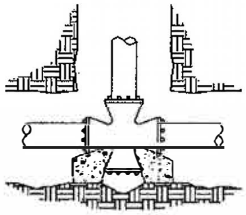


TEE


CROSS


STRADDLE BLOCK


BEND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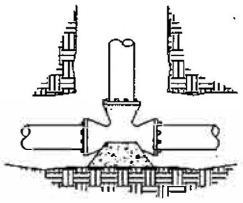
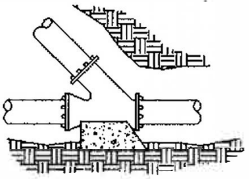
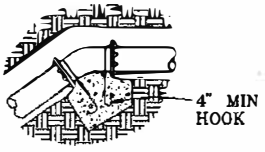

TEE


WYE



VERTICAL BEND

RODS FOR VERTICAL BENDS		
FITTING SIZE	ROD SIZE	EMBEDMENT
12" AND LESS	#6	30"
14"-16"	#8	36"

GENERAL:

1. CONCRETE BLOCKING TO BE POURED AGAINST UNDISTURBED EARTH.
2. ALL CONCRETE TO BE 2400 PSI @ 28 DAYS, MINIMUM.
3. INSTALL ISOLATION MATERIAL BETWEEN PIPE AND/OR FITTINGS BEFORE POURING CONCRETE BLOCKING.
4. CONCRETE SHALL BE KEPT CLEAR OF ALL JOINTS AND ACCESSORIES. DO NOT POUR CONCRETE DIRECTLY ON PIPE.
5. TIE RODS SHALL BE DEFORMED GALVANIZED COLD ROLLED STEEL, 40000 PSI TENSILE STRENGTH.
6. ALL THRUST BLOCKS MUST BE INSPECTED BY CITY FORCES BEFORE COVERING.

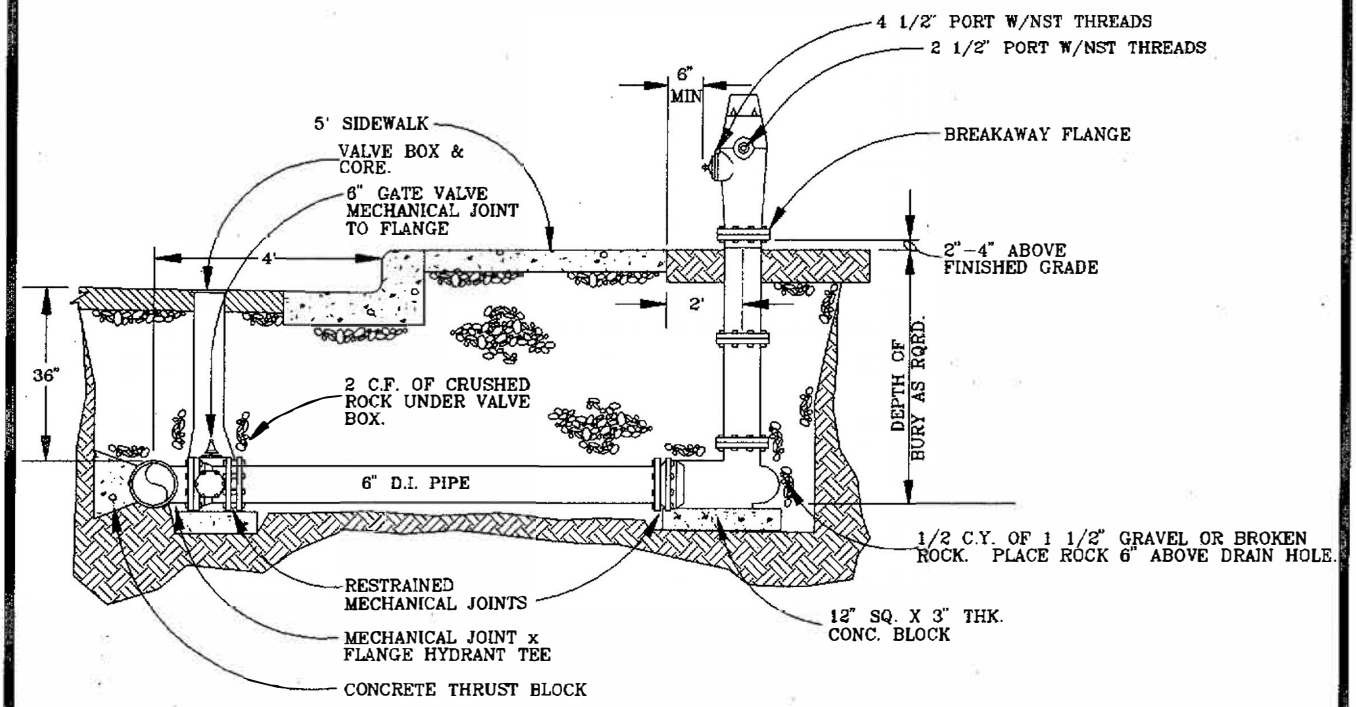
CITY OF TROUTDALE

THRUST BLOCKS

DATE: UPDATED 1994

DRAWING NO. IV - 1

FILENAME: APWA0036.DWG



BEHIND SIDEWALK INSTALLATION

GENERAL NOTES

1. WHEN PIPE IS SHORTER THAN 18', NO JOINTS ARE ALLOWED. USE MECHANICAL JOINT RETAINER GLANDS. TWO 3/4" GALVANIZED TIE RODS MAY BE USED IN LIEU OF THRUST BLOCKS FOR INSTALLATIONS LESS THAN 18' LONG. TIE RODS SHALL BE COATED WITH TWO COATS OF BITUMASTIC.
2. WHEN PIPE IS LONGER THAN 18', RESTRAINED MECHANICAL JOINTS ARE NOT REQUIRED.
3. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED AS PER THRUST BLOCK STANDARD DRAWING # IV - 1
4. HYDRANT PUMPER PORT SHALL FACE DIRECTION OF ACCESS.
5. FIRE HYDRANTS SHALL BE PLACED TO PROVIDE A MINIMUM OF 5' CLEARANCE FROM DRIVEWAYS, LIGHT POLES, METER SERVICES & BOXES AND OTHER OBSTRUCTIONS.
6. PUBLIC HYDRANTS - YELLOW; PRIVATE HYDRANTS - RED.
7. HYDRANTS ALLOWED:
   A) MUELLER 200
   B) WATEROUS PACER 6790
   C) OR EQUAL

   ALL HYDRANTS MUST HAVE 1-1/2" OPERATING NUT & NATIONAL STANDARD FIRE HOSE THREAD.
8. ENSURE THAT HYDRANT IS CONSTRUCTED HORIZONTALLY & VERTICALLY LEVELED.

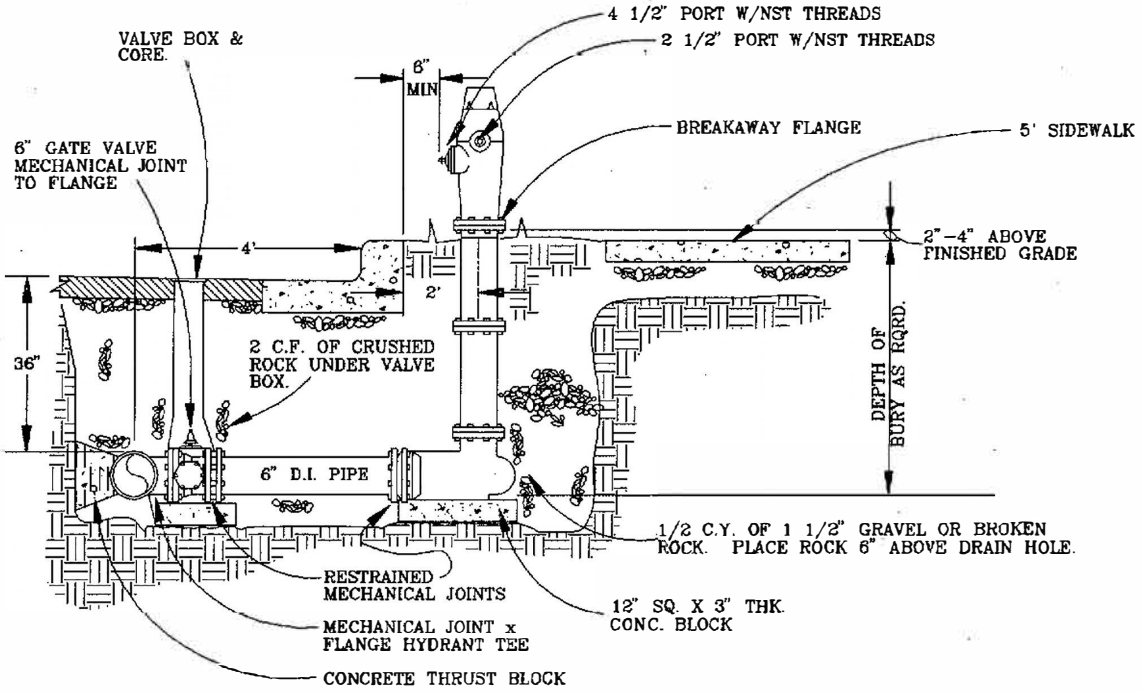
CITY OF TROUTDALE

FIRE HYDRANT ASSEMBLY

(BEHIND SIDEWALK)

DATE:	DRAWING NO.
UPDATED 1994	IV - 2

FILENAME: APWA0112.DWG



BEHIND CURB INSTALLATION

GENERAL NOTES

1. WHEN PIPE IS SHORTER THAN 18', NO JOINTS ARE ALLOWED. USE MECHANICAL JOINT RETAINER GLANDS. TWO 3/4" GALVANIZED TIE RODS MAY BE USED IN LIEU OF THRUST BLOCKS FOR INSTALLATIONS LESS THAN 18' LONG. TIE RODS SHALL BE COATED WITH TWO COATS OF BITUMASTIC.
2. WHEN PIPE IS LONGER THAN 18', RESTRAINED MECHANICAL JOINTS ARE NOT REQUIRED.
3. CONCRETE THRUST BLOCKS SHALL BE CONSTRUCTED AS PER THRUST BLOCK STANDARD DRAWING # IV – 1
4. HYDRANT PUMPER PORT SHALL FACE DIRECTION OF ACCESS.
5. FIRE HYDRANTS SHALL BE PLACED TO PROVIDE A MINIMUM OF 5' CLEARANCE FROM DRIVEWAYS, LIGHT POLES, METER SERVICES & BOXES AND OTHER OBSTRUCTIONS.
6. PUBLIC HYDRANTS – YELLOW; PRIVATE HYDRANTS – RED.
7. HYDRANTS ALLOWED:
   A) MUELLER 200
   B) WATEROUS PACER 6790
   C) OR EQUAL

   ALL HYDRANTS MUST HAVE 1-1/2" OPERATING NUT & NATIONAL STANDARD FIRE HOSE THREAD.
8. ENSURE THAT HYDRANT IS CONSTRUCTED HORIZONTALLY & VERTICALLY LEVELED.

CITY OF TROUTDALE

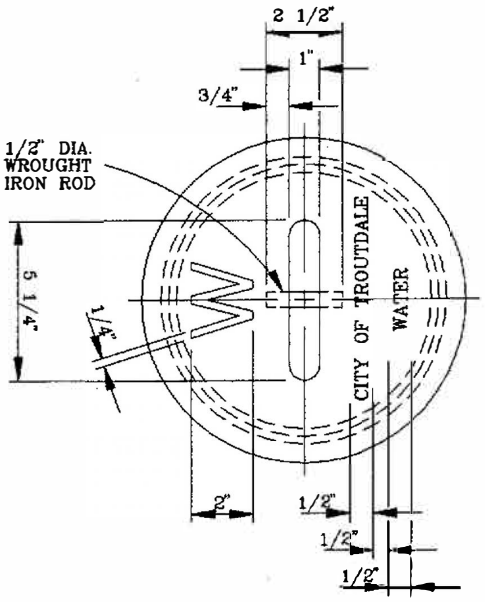
FIRE HYDRANT ASSEMBLY

(BEHIND CURB)

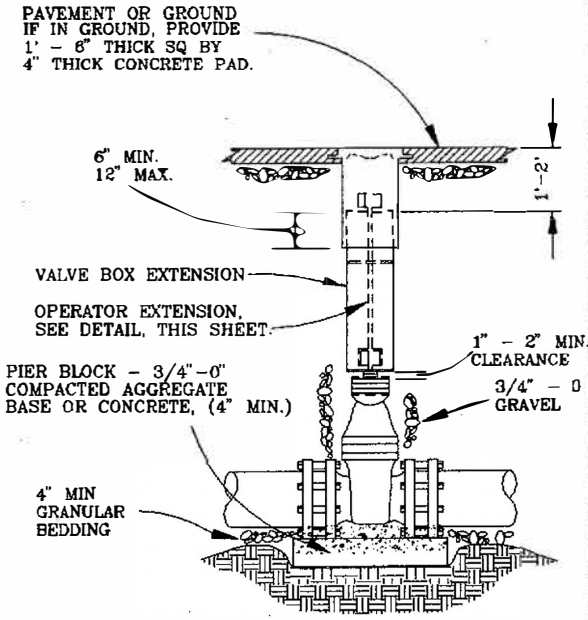
DATE: UPDATED 1994

DRAWING NO. IV – 3

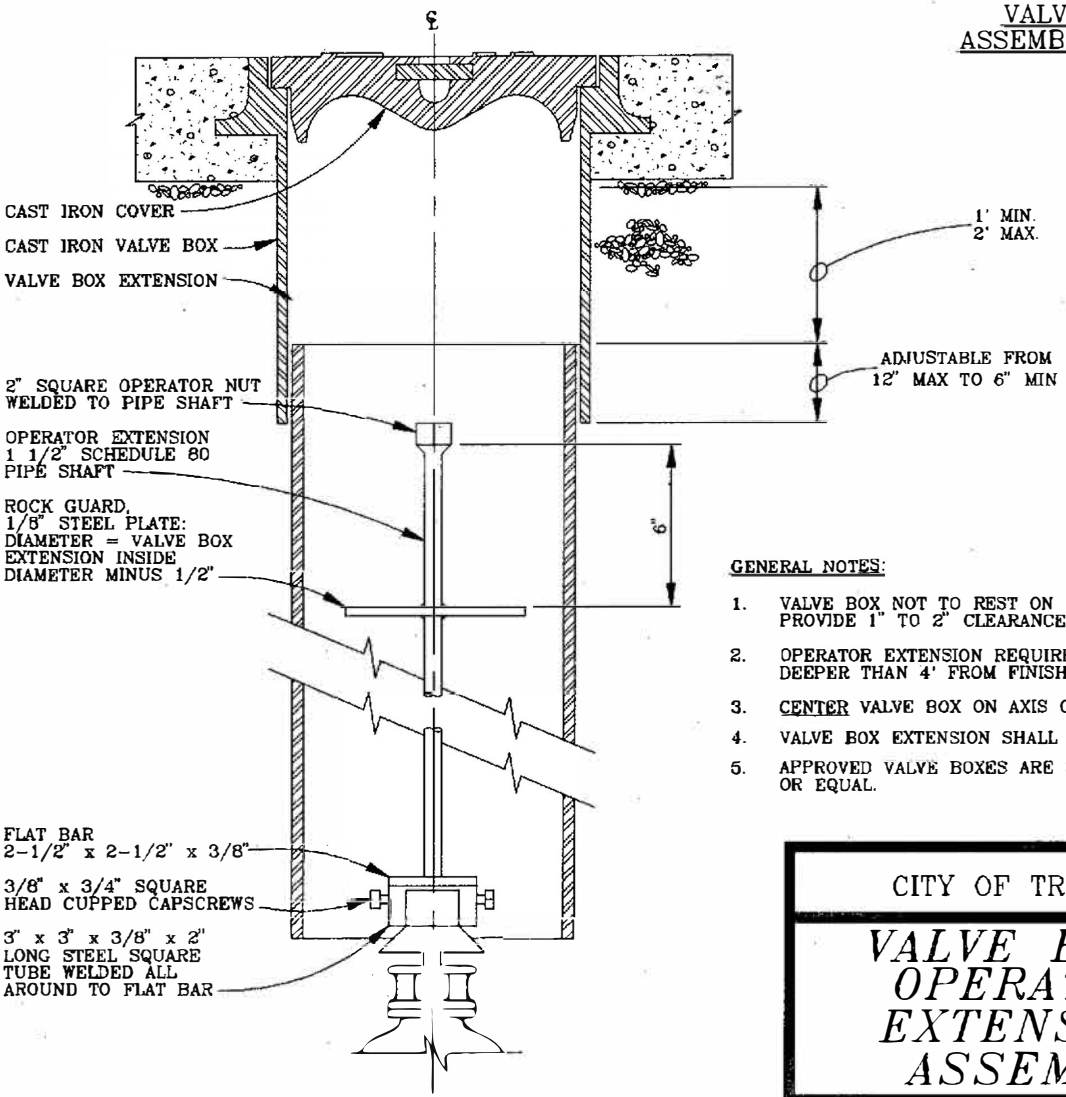
FILENAME: APWA0119.DWG



COVER PLAN



VALVE BOX
ASSEMBLY DETAIL



VALVE BOX EXTENSION SECTION

GENERAL NOTES:

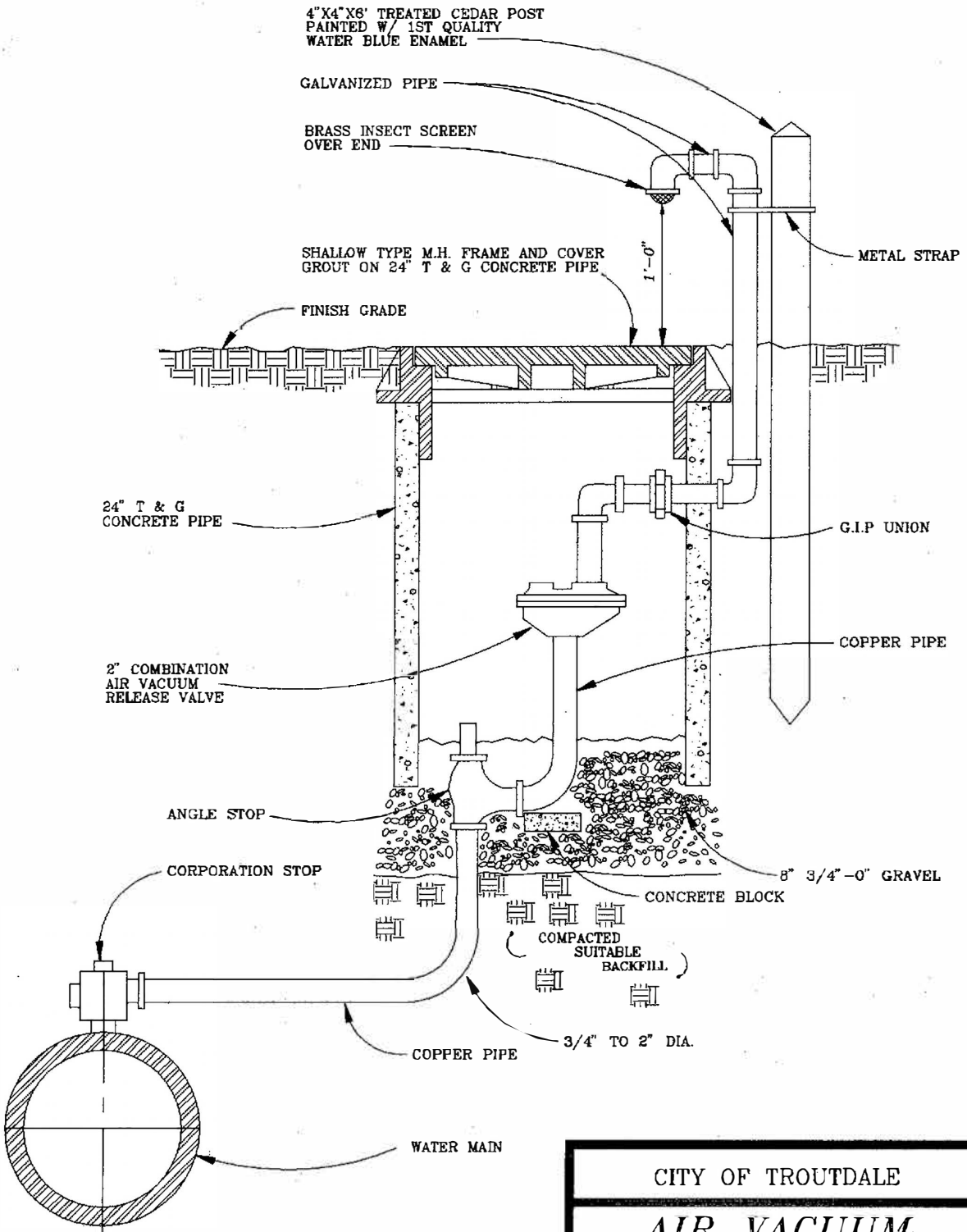
1. VALVE BOX NOT TO REST ON OPERATING ASSEMBLY. PROVIDE 1" TO 2" CLEARANCE.
2. OPERATOR EXTENSION REQUIRED WHEN VALVE NUT IS DEEPER THAN 4' FROM FINISH GRADE.
3. CENTER VALVE BOX ON AXIS OF OPERATOR NUT.
4. VALVE BOX EXTENSION SHALL BE CAST IRON.
5. APPROVED VALVE BOXES ARE STYLES 910, OR EQUAL.

CITY OF TROUTDALE

VALVE BOX & OPERATOR EXTENSION ASSEMBLY

DATE:	DRAWING NO.
UPDATED 1994	IV - 4

FILENAME: APWA0038.DWG



GENERAL NOTES:

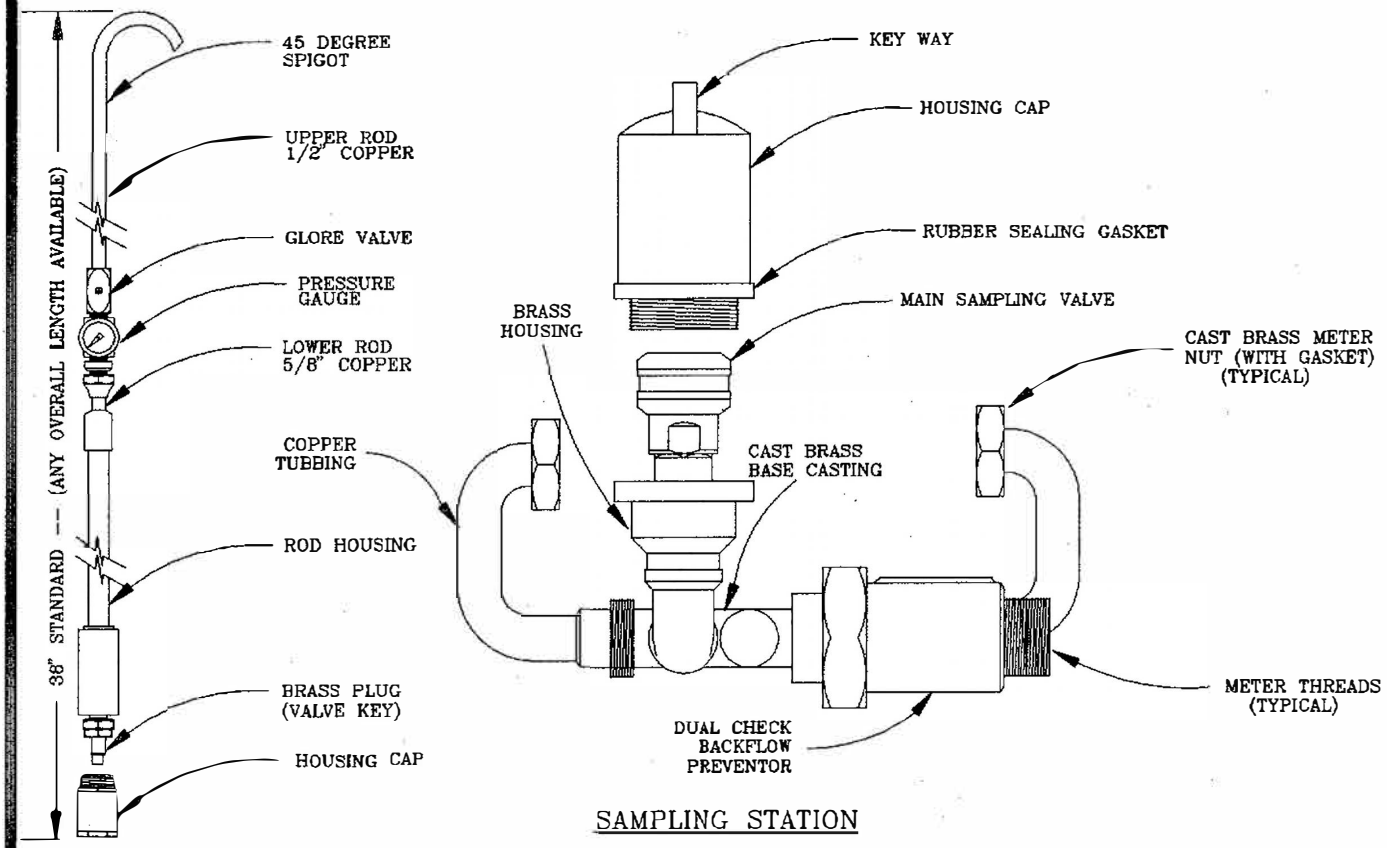
1. AIR-RELEASE AND VALVE ASSEMBLIES SHALL BE INSTALLED AT WATERMAIN HIGH POINTS. THE BREATHER TUBE SHALL EXTEND ABOVE GROUND FACING DOWNWARD. ELBOW MUST BE SCREENED AS SHOWN.
2. PIPE AND VALVE SIZES SHALL BE SPECIFIED FOR EACH PROJECT BY THE DEVELOPER'S ENGINEER AND/OR THE CITY.

CITY OF TROUTDALE

AIR VACUUM RELEASE VALVE ASSEMBLY

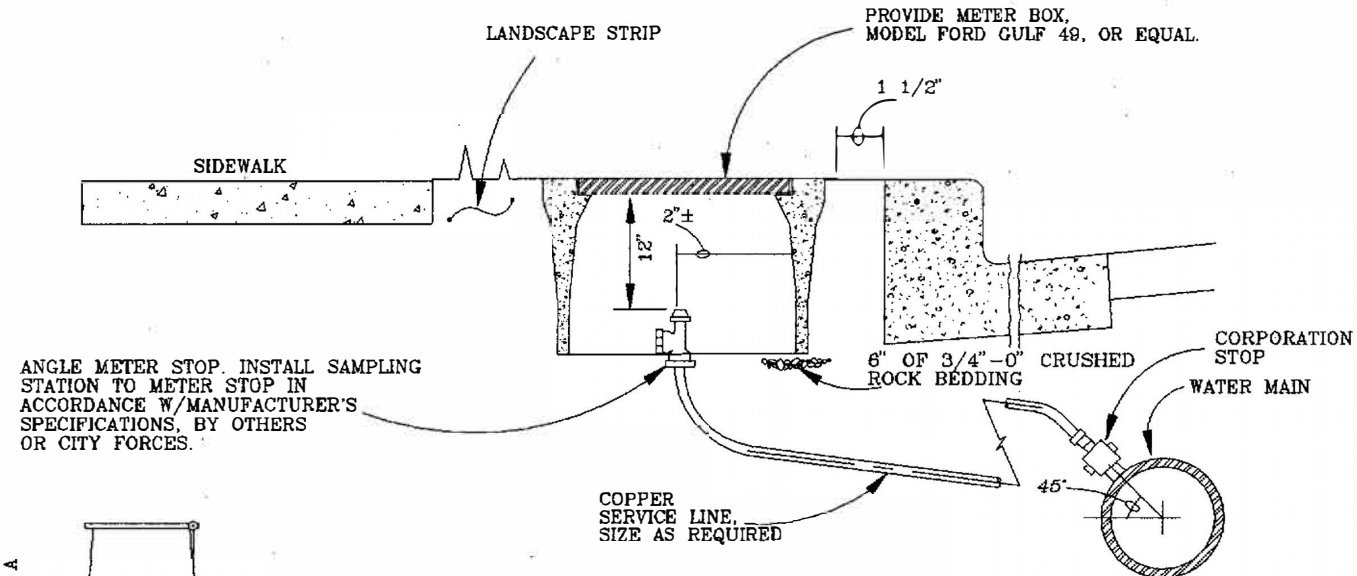
DATE:	DRAWING NO.
UPDATED 1994	IV – 5

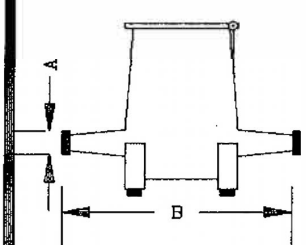
FILENAME: APWA0042.DWG



SAMPLING STATION

PROBE ROD





METER DIMENSIONS			
METER ZISE	5/8"	5/8" X 3/4"	3/4"
(A) THREADS	3/4"	1"	1"
(B) LAYING LENGTH	7 1/2"	7 1/2"	9"

GENERAL NOTES:

1. USE SAMPLING STATION MODEL # 1500. OR EQUAL.
2. USE PROBE ROD, MODEL # 150G. OR EQUAL.
3. USE THIS SAMPLE STATION CONFIGURATION UNLESS OTHERWISE DIRECTED BY THE CITY.

CITY OF TROUTDALE

WATER SAMPLING STATION

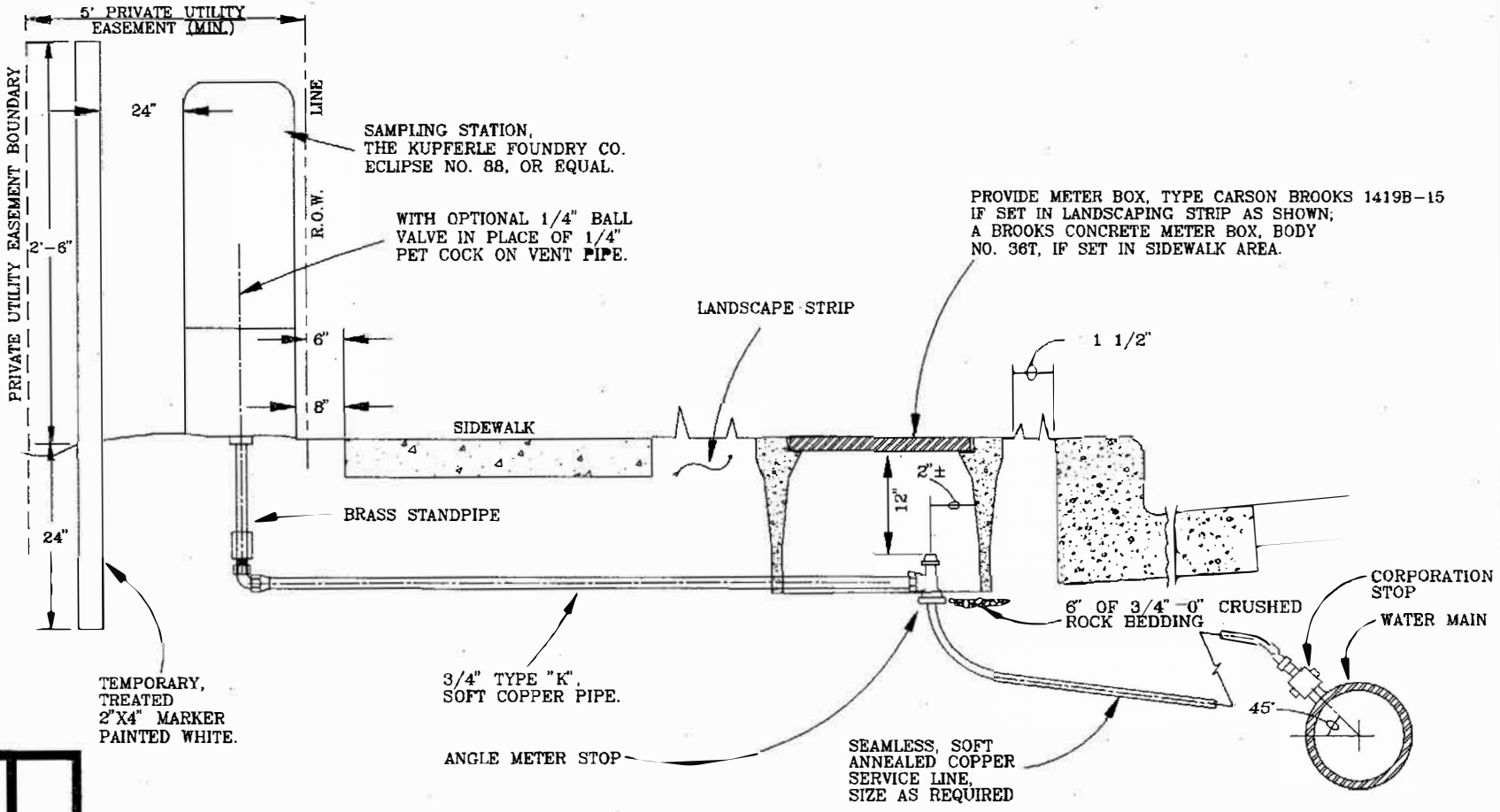
(OPTION 1)

DATE: UPDATED 1994

DRAWING NO. IV - 6

FILENAME: APWA0124.DWG

FILENAME: APWA0047.DWG



GENERAL NOTES:

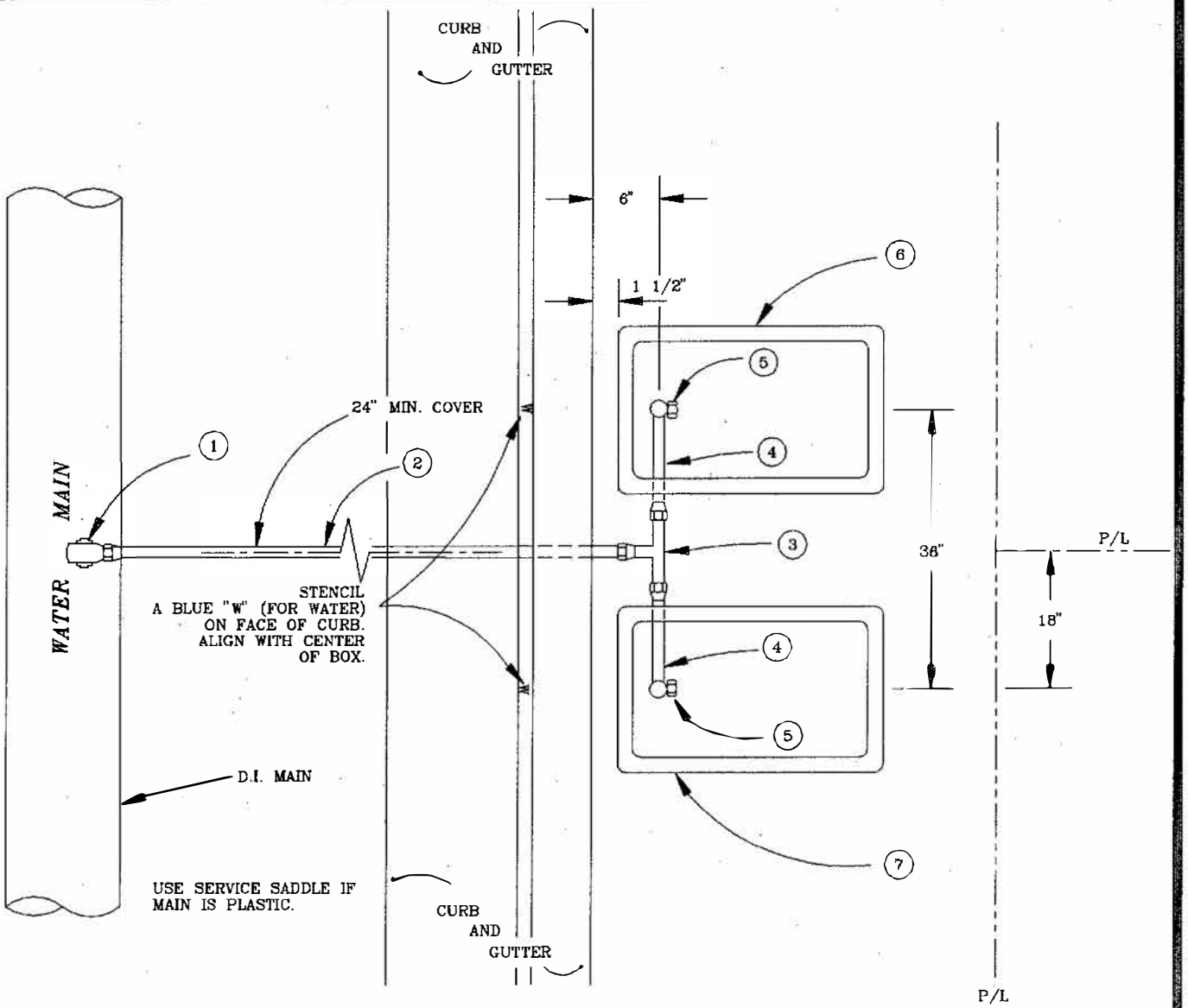
1. SAMPLING STATION MUST BE LOCATED 6" FROM BACK OF SIDEWALK, AS SHOWN.
2. A TEMPORARY TREATED 2"X4" MARKER IS REQUIRED, PAINTED WHITE. MARKER TO BE REMOVED BY HOME BUILDER WHEN READY TO LANDSCAPE.
3. CAUTION SHOULD BE EXCERCISED TO NOT DAMAGE STATION BOX DURING INSTALLATION OF PRIVATE UTILITIES. (I.E. PGE, GTE, GAS, CABLE).
4. USE OPTION 1, DRAWING # IV – 6, UNLESS OTHERWISE DIRECTED BY THE CITY.

CITY OF TROUTDALE

WATER SAMPLING STATION (OPTION 2)

DATE: UPDATED 1994

DRAWING NO. IV – 7



NOTES:

1. CORPORATION STOP SET AT 45° ANGLE, AS SHOWN ON DRAWING # IV – 9.
2. 1" SOFT TEMPER TYPE 'K' COPPER TUBING COMPLYING W/ASTM B-88.
3. 3/4" X 3/4" X 1" "BULLHEAD" TEE ALL COPPER FLARE.
4. 3/4" SOFT TEMPER TYPE 'K' COPPER TUBING COMPLYING W/ASTM B-88.
5. 3/4" ANGLE METER STOP.
6. BROOKS CONCRETE METER BOX, BODY NO. 36T WHEN SET IN CONCRETE.
7. CARSON BROOKS 1419B-15 WHEN SET IN LANDSCAPING STRIP.

GENERAL:

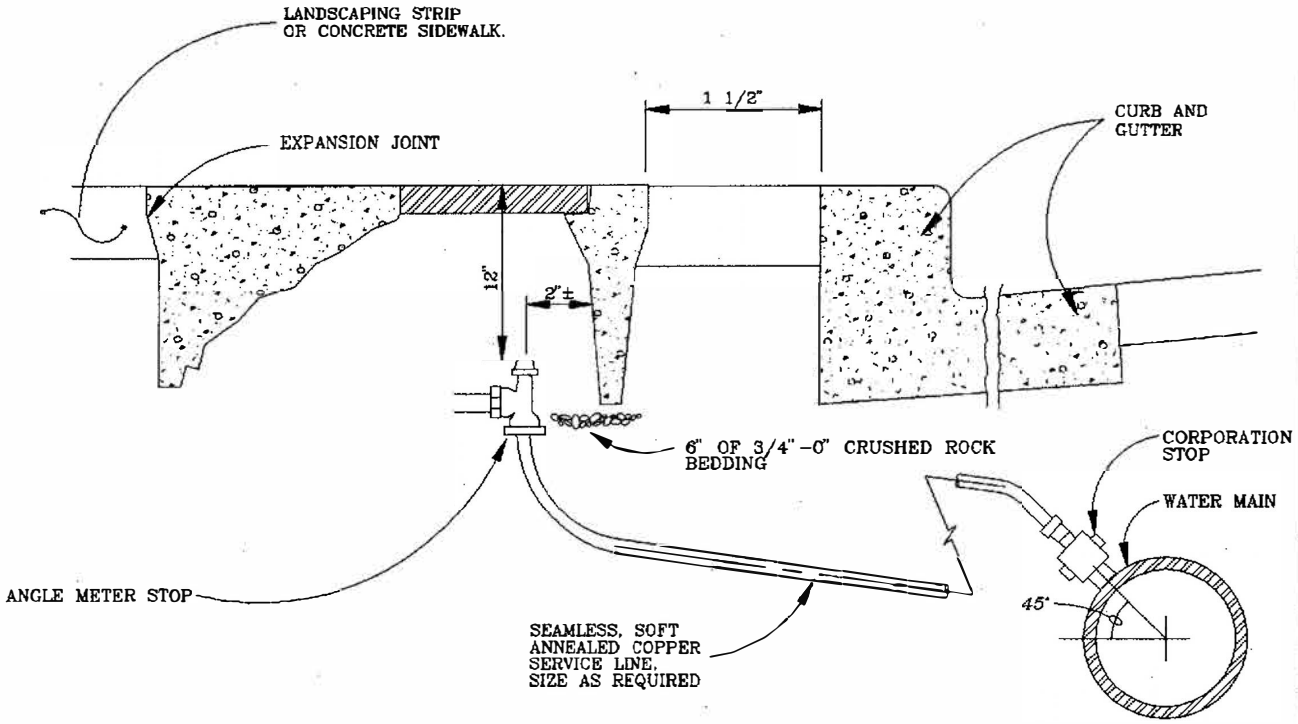
1. "EQUAL" SUBSTITUTES FOR ANY MATERIALS SHOWN SHALL BE APPROVED BY THE CITY.
2. ALL PIPE AND STRUCTURE ZONES SHALL BE BACKFILLED USING GRANULAR SOILS COMPACTED TO 95%, MAXIMUM RELATIVE DENSITY.
3. SET CENTERLINE METER NUT OF ANGLE METER STOP 12" BELOW TOP OF CURB, AS SHOWN ON DRAWING # IV – 9.
4. TOP OF METER BOX FLUSHED WITH TOP OF CURB, MUST BE AS SHOWN ON DRAWING # IV – 9.
5. METER BOX SHALL BE CENTERD OVER THE COMPLETED METER ASSEMBLY.
6. ACCEPTABLE BRASS FITTINGS: MUELLER C110, FORD PAC JOINT OR MCDONALD MAC PAC, OR EQUAL.

CITY OF TROUTDALE

1" DOUBLE WATER SERVICE

DATE:	DRAWING NO.
UPDATED 1994	IV – 8

FILENAME: APWAG120.DWG



GENERAL NOTES:

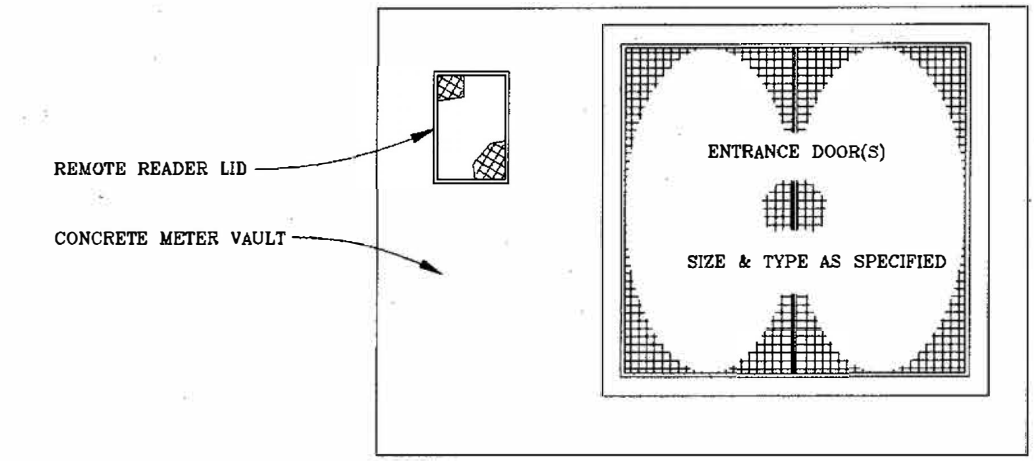
1. REFER TO DRAWING # IV – 8, FOR DETAILS ON INSTALLATION OF A 1" DOUBLE WATER SERVICE, AND FOR ADDITIONAL HORIZONTAL LOCATION INFORMATION.
2. ANGEL METER STOP SHALL BE SET TO A TOLERANCE OF +/– 1".
3. STENCIL A BLUE "W" ON FACE OF CURB WHERE SERVICE LINE CROSSES THE CURB, AS SHOWN ON DRAWING # IV – 6.
4. CORPORATION STOPS MUST BE AT LEAST 18" APART.
5. METER BOX SHALL BE INSTALLED FLUSHED WITH TOP OF CURB.
6. 3/4" & 1" BRASS FITTINGS SHALL BE EITHER MUELLER C110, FORD PAC JOINT, MCDONALD MAC PAK, OR EQUAL.
7. NO VARIENCES FROM THE ABOVE ARE ALLOWED.

CITY OF TROUTDALE

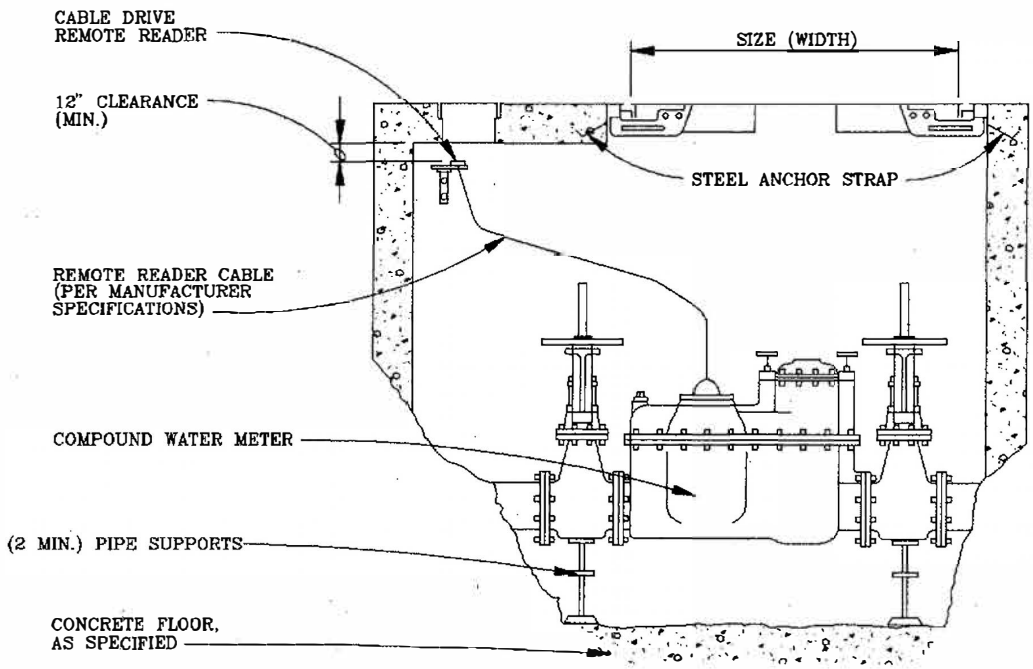
3/4" TO 2" SINGLE WATER SERVICE

DATE:	DRAWING NO.
UPDATED 1994	IV – 9

FILENAME: APWA0043.DWG



PLAN VIEW



ELEVATION VIEW

GENERAL NOTES:

1. TYPE OF VAULT REQUIRED WILL BE DETERMINED AS FOLLOWS:

D.D.C. SIZE	VAULT (OR EQUAL)
3"	676-WA
4"	687-WA
6"	687-WA
8"	810-LA

2. ALL VAULTS SHALL DRAIN TO STORM SYSTEM WHEN POSSIBLE. WHEN NOT, A FRENCH DRAIN FACILITY NEAR THE VAULT MUST BE PROVIDED.
3. THE INSTALLATION/REMOVAL OF EQUIPMENT IN THE VAULT WILL DETERMINE THE NUMBER OF DOORS REQUIRED.

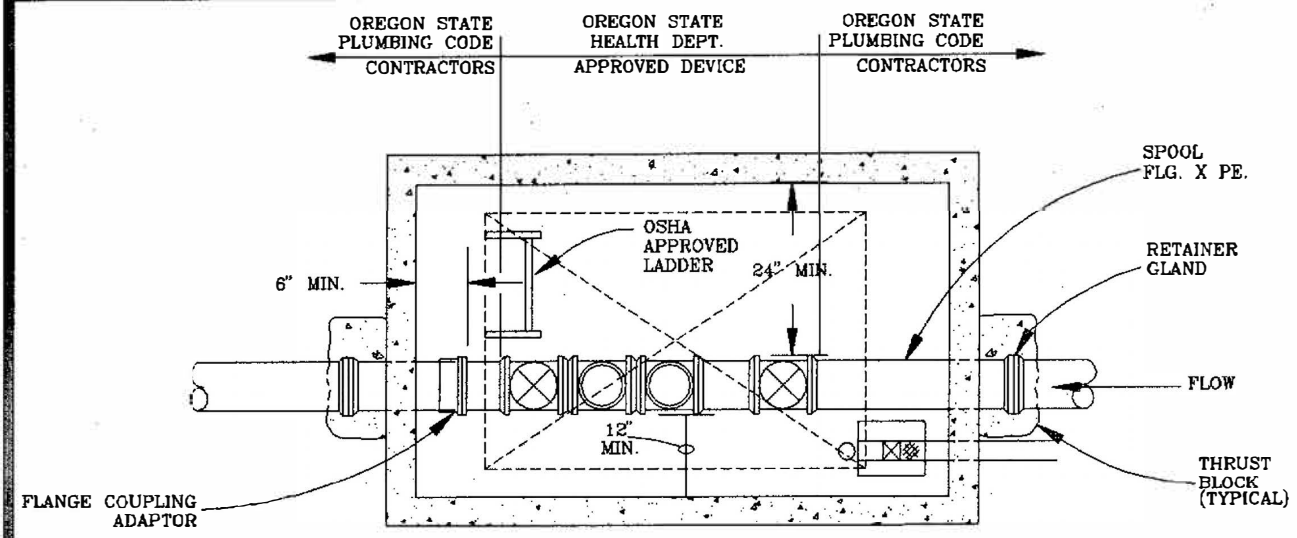
CITY OF TROUTDALE

METER WITH REMOTE READER AND VAULT

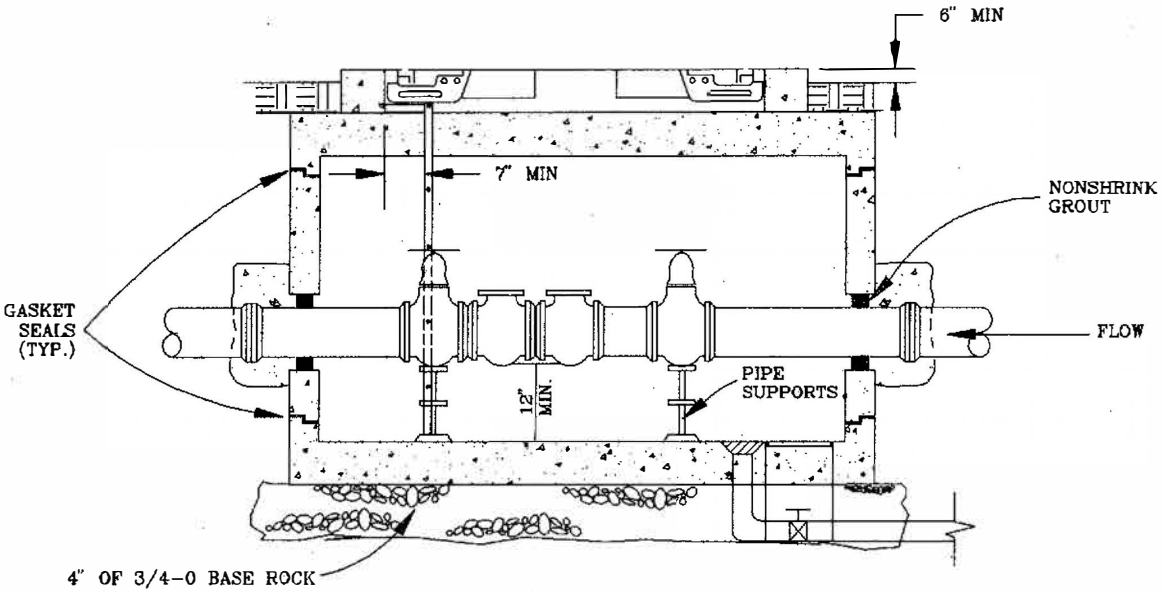
DATE: UPDATED 1994

DRAWING NO. IV – 10

FILENAME: APWA0046.DWG



PLAN VIEW



PROFILE VIEW

GENERAL NOTES:

1. THE INSTALLATION/REMOVAL OF EQUIPMENT IN VAULT WILL DETERMINE THE NUMBER OF DOORS REQUIRED.
2. ALL VAULTS SHALL DRAIN TO STORM SYSTEM WHEN POSSIBLE. WHEN NOT, A FRENCH DRAIN FACILITY NEAR THE VAULT MUST BE PROVIDED.
3. DOORS SHALL BE GALVANIZED DIAMOND PLATE AND SPRING ASSISTED W/H-20 RATING FOR TRAFFIC AREAS; AND, H-10 RATING FOR LANDSCAPED AREAS.
4. REFER TO WATER METER DETAIL, DRAWING # IV - 14 FOR ADDITIONAL DETAIL.
5. D.C. BACKFLOW DEVICES USED FOR FIRE STANDBY, REQUIRE A DETECTOR CHECK METER AND BACKFLOW DEVICE.
6. USE ONLY OREGON STATE HEALTH ADMINISTRATION APPROVED BACKFLOW DEVICES.
7. TYPE OF VAULT REQUIRED WILL BE DETERMINED AS FOLLOWS:

D.D.C SIZE	VAULT SIZE WITH F.D.C.	VAULT SIZE WITHOUT F.D.C.	H-20 GALV. DOOR SIZE
4"	676-WA	577-WA	36" X 36"
6"	687-WA	676-WA	36" X 36"
8"	5106-LA	687-LA	36" X 36"
10"	5106-LA	5106-LA	36" X 36"

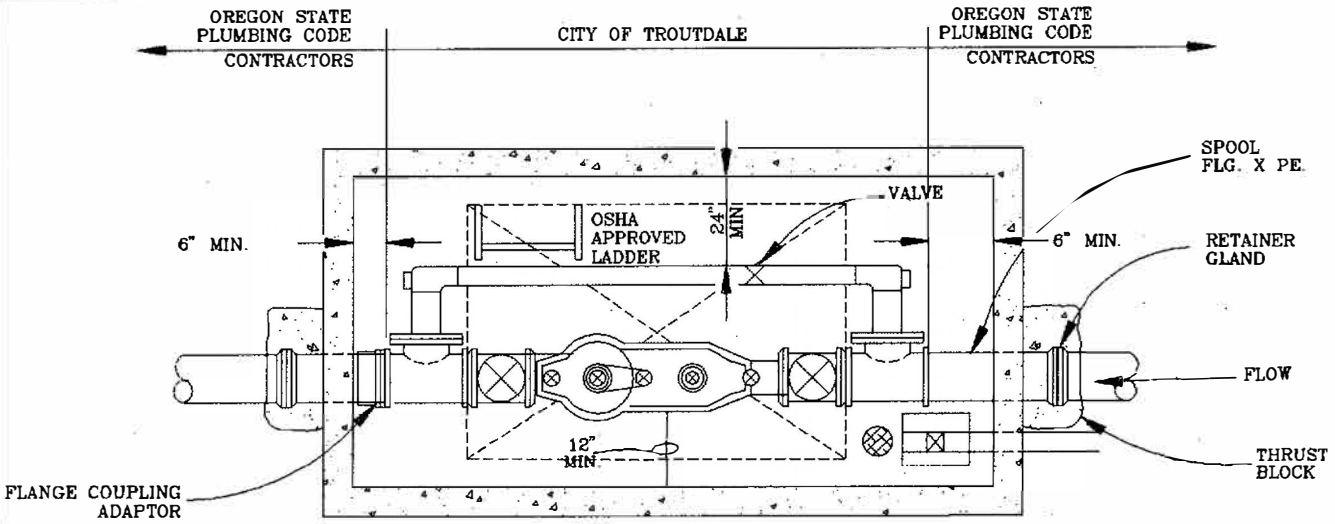
CITY OF TROUTDALE

DOUBLE CHECK BACKFLOW PREVENTOR DEVICE VAULT

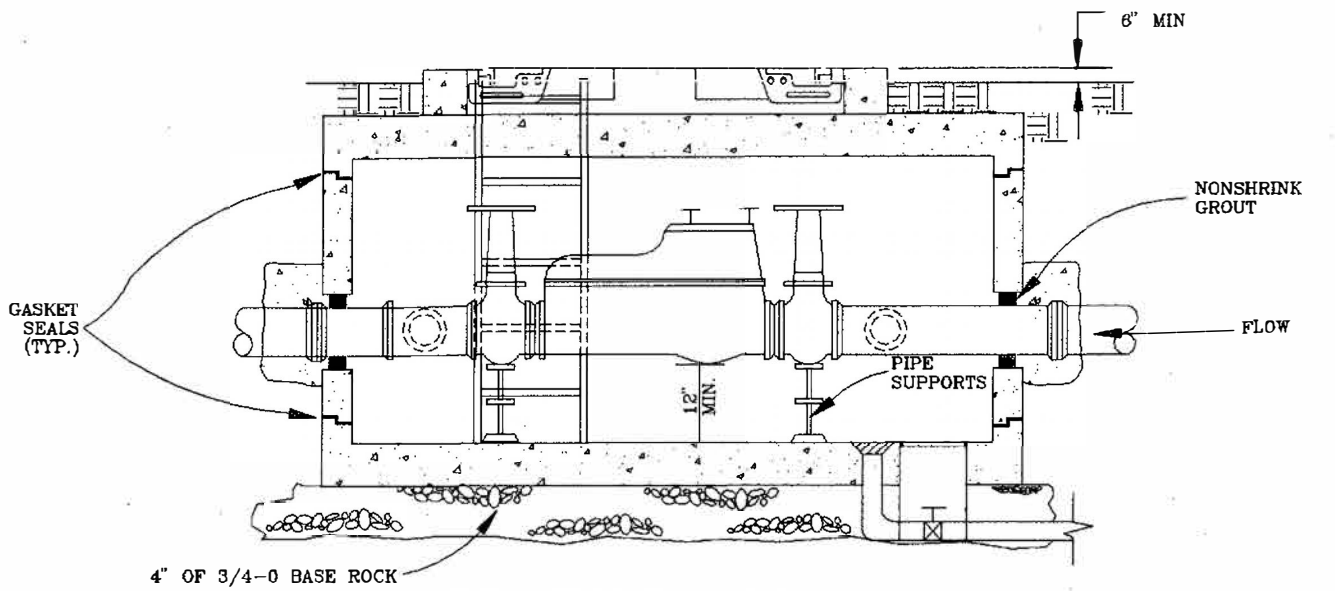
DATE: UPDATED 1994

DRAWING NO. IV - 11

FILENAME: APWA0122.DWG



PLAN VIEW



PROFILE VIEW

GENERAL NOTES:

1. THE INSTALLATION/REMOVAL OF EQUIPMENT IN VAULT WILL DETERMINE THE NUMBER OF DOORS REQUIRED.
2. ALL VAULTS SHALL DRAIN TO STORM SYSTEM WHEN POSSIBLE. WHEN NOT, A FRENCH DRAIN FACILITY NEAR THE VAULT MUST BE PROVIDED.
3. DOORS SHALL BE GALVANIZED DIAMOND PLATE AND SPRING ASSISTED W/H-20 RATING FOR TRAFFIC AREAS; AND, H-10 RATING FOR LANDSCAPED AREAS.
4. REFER TO WATER METER DETAIL, DRAWING # IV - 14 FOR ADDITIONAL DETAIL.
5. D.C. BACKFLOW DEVICES USED FOR FIRE STANDBY, REQUIRE A DETECTOR CHECK METER AND BACKFLOW DEVICE.
6. USE ONLY OREGON STATE HEALTH ADMINISTRATION APPROVED BACKFLOW DEVICES.
7. TYPE OF VAULT REQUIRED WILL BE DETERMINED AS FOLLOWS:

D.D.C SIZE	VAULT SIZE (OR EQUAL)
3"	676-WA
4"	687-WA
6"	687-WA
8"	810-LA

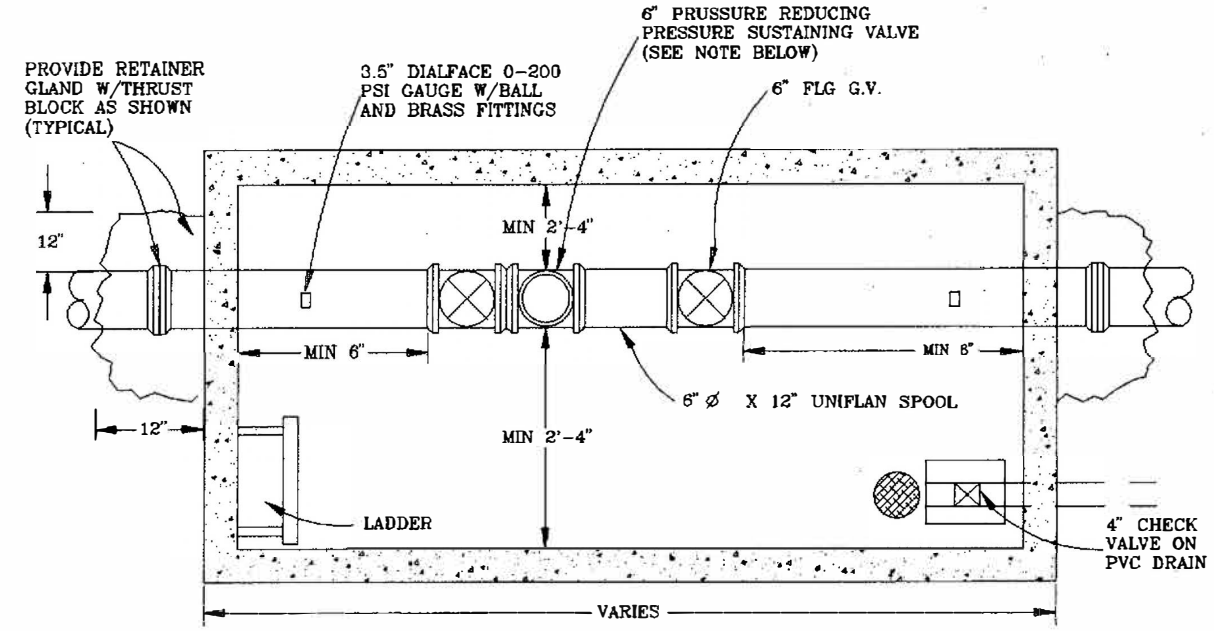
CITY OF TROUTDALE

3" DIAMETER (& LARGER) WATER METER VAULT

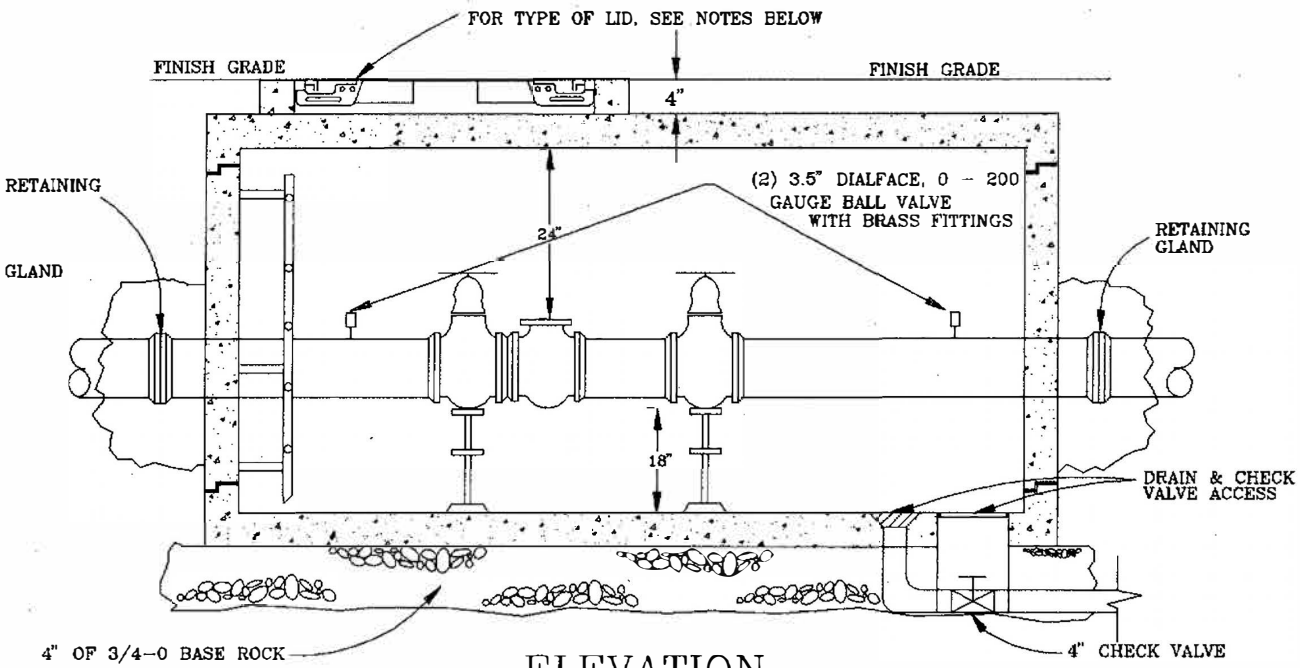
DATE: UPDATED 1994

DRAWING NO. IV - 12

FILENAME: APWA0123.DWG



PLAN VIEW



ELEVATION

NTS

GENERAL NOTES:

1. TYPE OF VAULT REQUIRED WILL BE DETERMINED AS FOLLOWS.

D.D.C. SIZE	VAULT (OR EQUAL)
3"	676-WA
4"	687-WA
6"	687-WA
8"	810-LA

2. PROVIDE LADDER AS SHOWN.
3. AUTOMATIC VALVE SHOULD BE IN PRESSURE REDUCING/ PRESSURE SUSTAINING CONFIGURATION. WILL REQUIRE A CLAYTON AUTOMATIC VALVE BY CLA-VAL COMPANY. PILOT CONTROL SHOULD BE 20-200 PSI. VALVE RATING SHOULD BE 250 ANSI/B16.7
4. THE INSTALLATION/REMOVAL OF EQUIPMENT IN VAULT WILL DETERMINE THE NUMBER OF DOORS REQUIRED.
5. ALL VAULTS SHALL DRAIN TO STORM SYSTEM WHEN POSSIBLE. WHEN NOT, A FRENCH DRAIN FACILITY NEAR THE VAULT MUST BE PROVIDED.
6. DOORS SHALL BE GALVANIZED DIAMOND PLAT AND SPRING ASSISTED W/H-20 RATING FOR TRAFFIC AREAS; AND, H-10 RATING FOR LANDSCAPED AREAS.

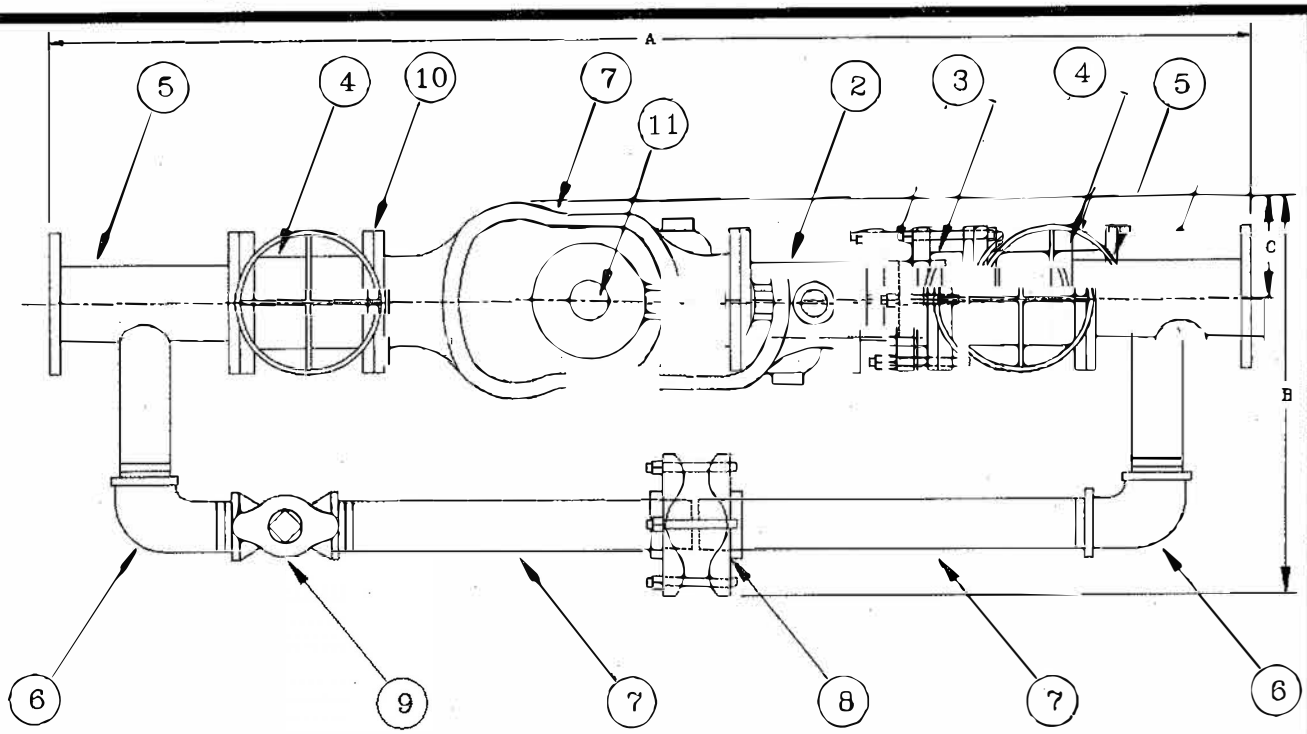
CITY OF TROUTDALE

PRESSURE REGULATING VAULT

DATE: UPDATED 1994

DRAWING NO. IV - 13

FILENAME: APWA0102



1. Spool Piece
2. Adapter
3. Valves
4. Reducing Tee
5. 90° Elbow
6. Bypass Piping
7. Coupling
8. Bypass Valve
9. Adapter Spool (12" size only)
10. Gallon Register

GENERAL NOTES:

1. All meters must be pre-approved by the City.
2. Installation must be restrained to resist axial forces due to internal pressure/flow.
3. Dimensions are in inches.
4. Elbows may be screwed or butt-weld flange, depending on size.
5. Valves may be ball or gate type, depending on size.
6. Meter vault must be approved by the City.
7. Meter test connections required on all 2" meters or larger.

DIMENSIONS	DUCTILE IRON			BRONZE
SIZE:	3"	4"	6"	2"
A. Overall Length	63	73	86	45
B. Overall Width	19	21	26	17 1/2
C. Width, to Mainline Edge	4	5	6	6
Mainline to Max. Edge	16	17	21	15
Mainline to Bottom Surface	4	4.75	5.75	3 3/16
Bypass Size	3	3	4	2
N.P.T. Test Connection	2	2	2	1 1/2

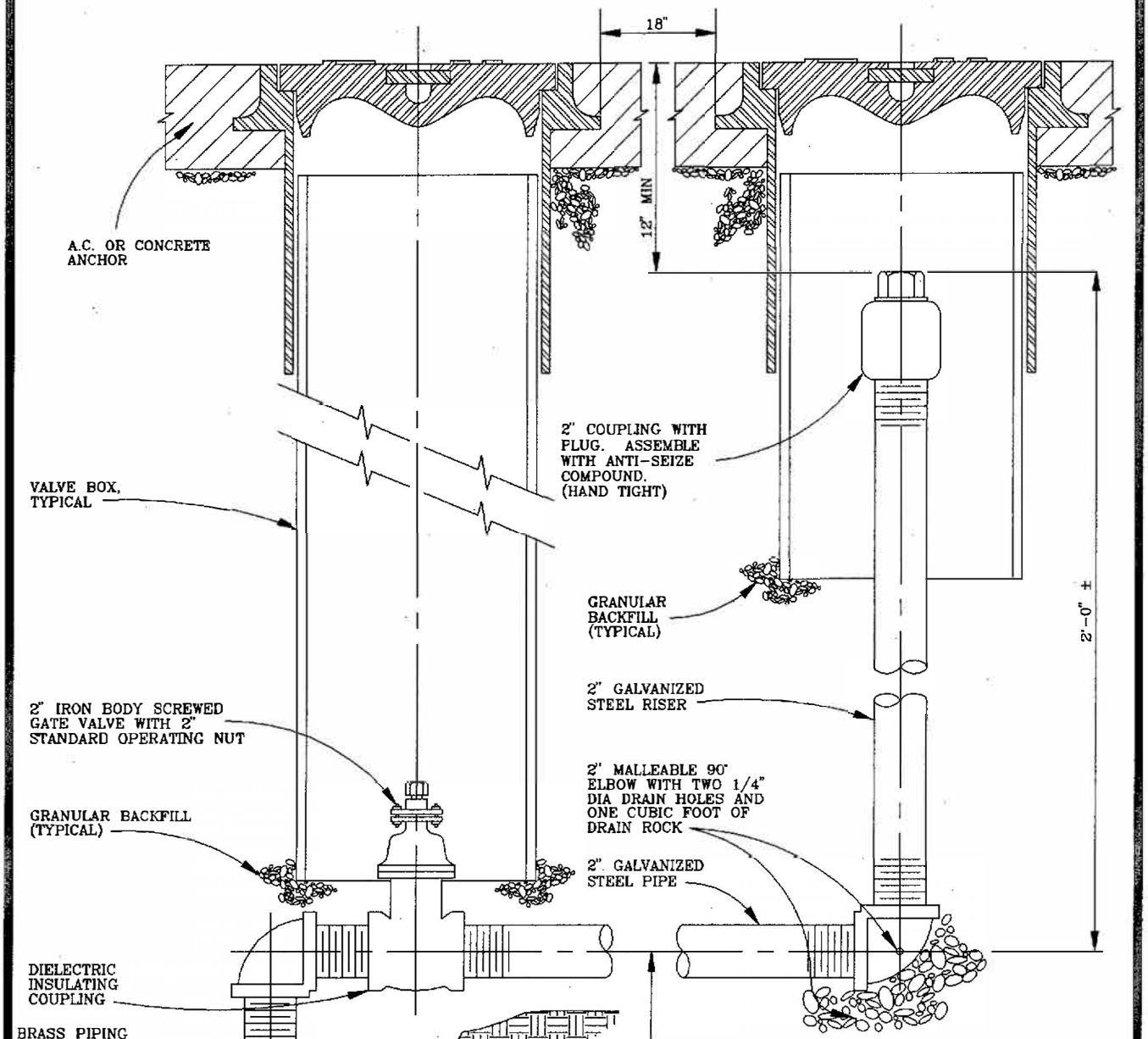
CITY OF TROUTDALE

WATER METER DETAIL

DATE: UPDATED 1994

DRAWING NO. IV - 14

FILENAME: APWA0113.DWG



GENERAL NOTES:

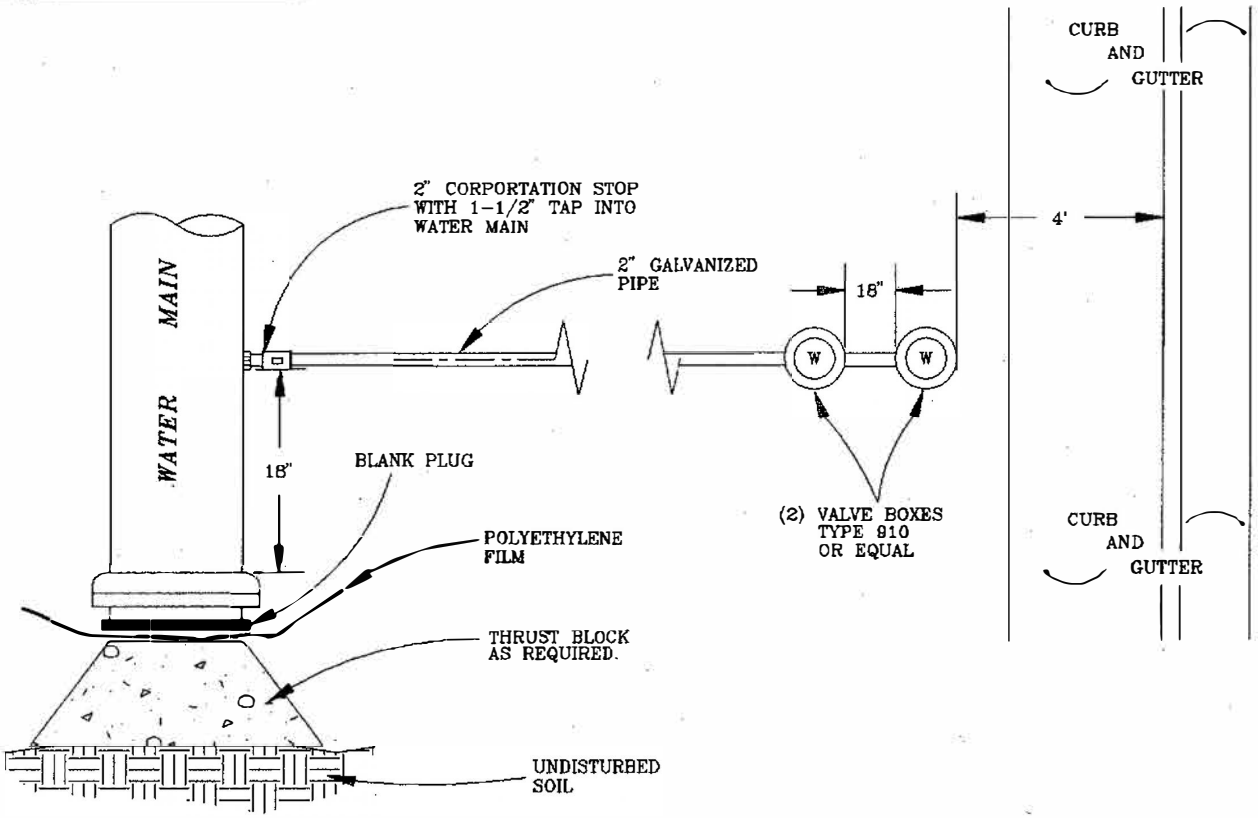
1. WRAP MAIN AND FITTINGS IN THRUST BLOCK ZONE WITH TWO LAYERS OF POLYETHYLENE FILM TO FACILITATE FUTURE REMOVAL.
2. IN LIEU OF CONCRETE THRUST BLOCK, RESTRAIN PIPE OR POUR CONCRETE STRADDLE BLOCK.
3. USE TYPE 910, OR EQUAL VALVE BOXES.
4. IF BLOWOFF IS LOCATED ON UNIMPROVED AREA CONCRETE ANCHORS MUST BE POURED.

CITY OF TROUTDALE

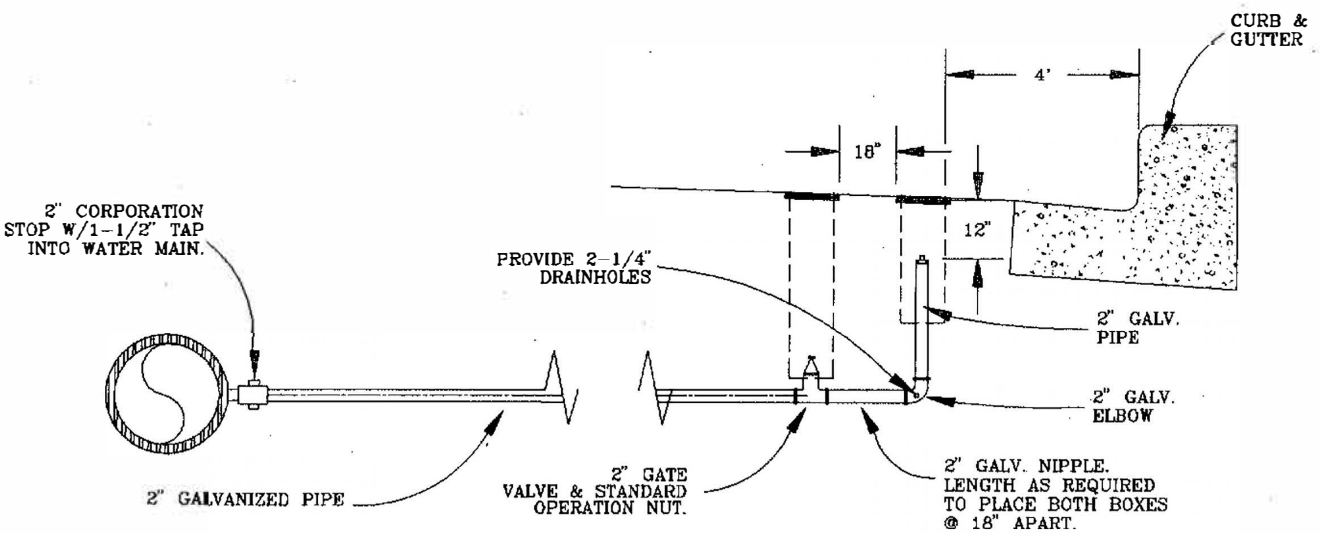
DEAD-END BLOWOFF ASSEMBLY

DATE:	DRAWING NO.
UPDATED 1994	IV – 15

FILENAME: APWA0039.DWG



PLAN VIEW



PROFILE VIEW

GENERAL NOTES:

1. WRAP MAIN & FITTINGS IN THRUST BLOCK ZONE W/TWO LAYERS OF POLYETHYLENE FILM TO FACILITATE FUTURE REMOVAL.
2. A STRADDLE BLOCK IS REQUIRED IF WATER MAIN WILL BE EXTENDED IN THE FUTURE. REFER TO DRAWING # IV – 1 FOR DETAILS.
3. USE VALVE BOXES TYPE 910, OR EQUAL.
4. IF BLOWOFF HAS TO BE LOCATED ON UNIMPROVED SURFACES, A CONCRETE ANCHOR IS REQUIRED.
5. FOR ADDITIONAL DETAIL, PLEASE REFER TO DRAWING # IV – 15, ASSEMBLY.

CITY OF TROUTDALE

IN-LINE BLOWOFF ASSEMBLY

DATE:	DRAWING NO.
UPDATED 1994	IV – 16

FILENAME: APWA0120.DWG

STORM SEWER COLLECTION SYSTEM

(Parts V & VI)

STORM

(Part V)

* General Requirements

STORM SEWER COLLECTION SYSTEM

(General Requirements)

1. **Proposed storm sewer mains must be in accordance with the City of Troutdale's Public Facilities Plan. Main sizes must be adequately sized to handle the flow collected from affected development. Areas above and below the development must be considered in design, and pipes sized accordingly.**

2. **All construction/installation of storm sewer mains shall be done in a safe, neat and workmanlike manner, and under supervision by City forces at all times. All safety requirements from OSHA, and other State regulatory agencies must be met.**

3. **All requirements from DEQ must be met.**

4. **Storm sewer design for subdivisions shall be based on a minimum of a 10-year storm and use of the rational method to determine storm water discharge.**

5. **In no case will a storm sewer less than 12 inches in diameter be approved, including catch basin leads. When locating catch basins near intersections, locate them outside the handicap area to avoid conflict. Preferred location is at either end of the curb returns.**

6. **Time of concentration shall be calculated using a recognized method for determining overland flow, channel flow, or flow in conduits.**

7. **Rainfall intensity shall be based on the most current curves developed for Multnomah County.**

8. **Rainfall coefficients shall be based on the ultimate development planned or the land use shown in the Troutdale Comprehensive Plan.**

9. **Maximum catch basin spacing for street slopes of 1.0 to 4.0% is 300 feet; for slopes greater than 4.0%, 500 feet.**

10. **Provide a 7-inch curb exposure at all catch basin locations.**

11. **Combined sanitary and storm sewers are prohibited.**

12. **Manholes shall be located at all alignment and pipe size changes, grade breaks and all street intersections, but spacing shall not exceed 300 feet.**

13. Manholes shall have a minimum of 0.2 foot drop from pipe invert "in", to pipe invert "out", and storm lines between manholes shall meet the minimum allowable slope requirements as required by general engineering principles and DEQ's rules and regulations.

14. Invert elevations shall be adjusted so that pipe inverts match when pipe size changes occur at manholes. Channels are required to be poured in place as shown in the construction details section.

15. Pipe cover shall be 24 inches minimum from finished grade. If shallower depth is required, pipe must be D.I. and/or encased in concrete. Either must be approved by the City.

16. Storm sewer systems shall have an outlet into a natural body of water, natural drainage channel, stream or previously constructed drain pipe or ditch. At point of daylight, daylight area must be prepared for erosion control, by placing rip-rap, hay bails, or other acceptable method as approved by the City.

17. County and State permission is required to discharge into any County or State storm drain or roadside ditch. Whenever projects affect the jurisdiction of other agencies, a copy of the work permit and/or written authorization from those agencies is required by the City.

18. Dry wells are permitted only after soils tests by a registered soils engineer show that soils are suitable for subsurface disposal of storm water. Test results must be submitted to the City in writing for review and approval. Drywells shall not be allowed if a nearby storm main exists. The City must determine when drywells may or may not be constructed.

19. Minimum diameter allowed for storm sewer mains shall be 12 inches and of concrete only. The use of plastic or PVC pipe in the storm sewer collection system is not allowed. Location of mains in street must be no less than five feet from the sanitary sewer and/or street centerline on either side. See Drawing II-20.

20. Minimum diameter allowed for storm laterals shall be 6-inches and of concrete only. All laterals shall be properly marked at ends as shown on Drawing VI-7.

21. All new storm sewer pipes and manholes must be thoroughly cleaned and pressure tested as required by the City. All tests must be witnessed and passed by the City prior to placing in operation.

22. Connection to storm sewer mains with private storm sewer laterals hooked up to swimming pools, or other structures which may contain high contents of chlorine mixtures is strictly

prohibited. Such facilities, and all others which may contain strong chemical mixtures of any kind, shall be discharged directly into the sanitary sewer only. Approval to connect such facilities into the sanitary sewer shall be approved by the City.

23. All connections to existing storm sewer mains require issuance of a public works permit and inspection by the City prior to backfilling. A permit fee of $50.00 will be assessed for each connection/inspection.

24. If slope of land prevents lot surface and rain drain storm water from draining to street through a curb weephole, a private storm water lateral must be provided by the developer/property owner, and marked as required if connection to the house will not be made at the same time.

25. All public storm sewer mains extending into, through and beyond private property, shall be placed within a legal public utility easement granted to the City by the affected property owner(s). Width and length of such easement will be determined by the City, and will be based on size, type, depth and length of pipe being used. Building Code restrictions, as they apply to public utility easements, shall apply.

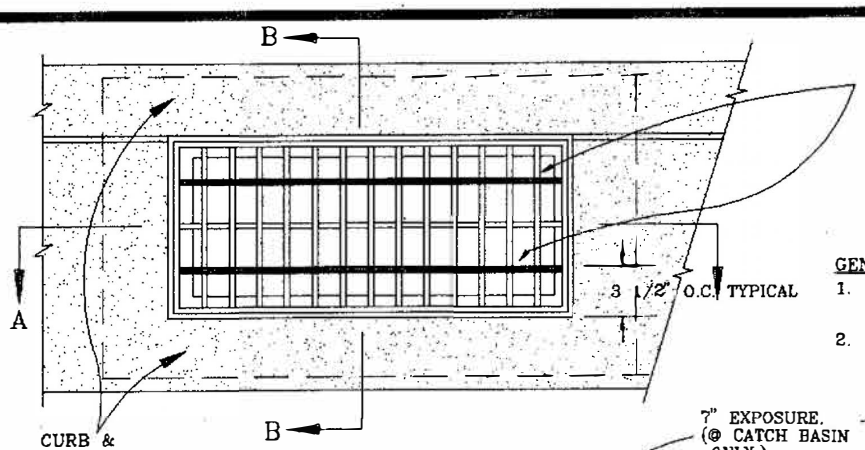
26. The builder/developer must provide to the City any guarantee or warranty normally furnished with the purchase of any materials used in connection with the project at hand. In addition, they must furnish the City a written warranty providing satisfactory in-service operation of all work performed by affected contractor (including but not limited to all storm mains, laterals, manholes, catch basins, grates, etc.) for a period of two (2) years following date of project acceptance.

27. All other construction practices (relating to storm sewer) within the City's public right-of-way, not covered in these "General Requirements" and/or "Construction Details" sections, shall comply with the rules and regulations in the most recent editions of the American Pubic Works Association Standard Specifications for Public Works Construction.

STORM

(Part VI)

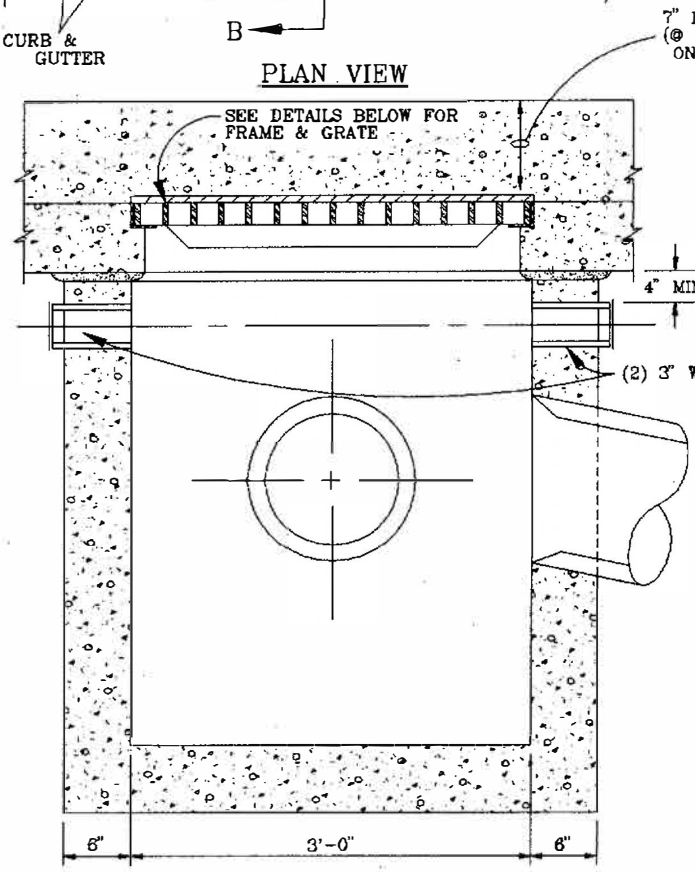
* Construction Details



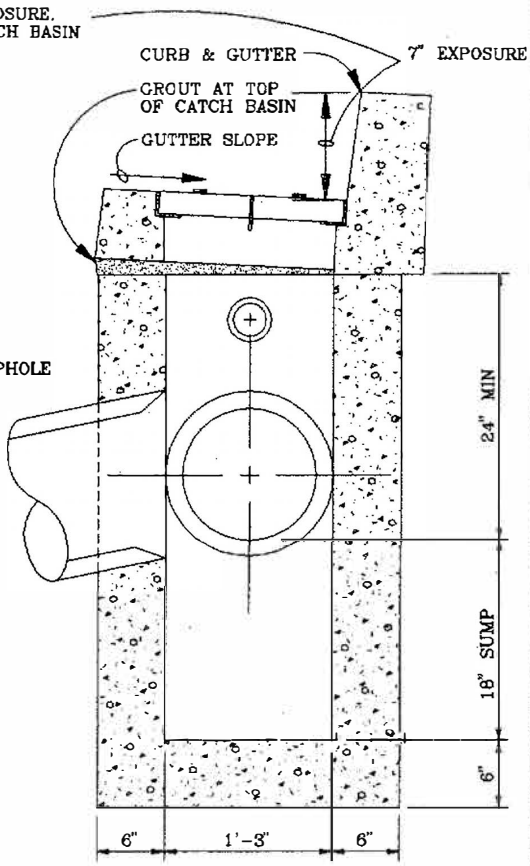
PLAN VIEW

GENERAL NOTES:

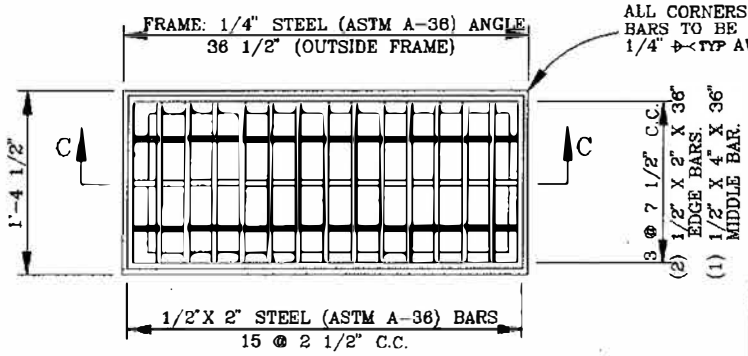
1. CATCH BASIN MUST BE LOCATED OUTSIDE THE HANDICAP RAMP TO AVOID CONFLICT.
2. CONCRETE SHALL BE 3000, PSI, @ 28 DAYS.



SECTION A–A



SECTION B–B



WELDED STEEL FRAME AND GRATE PLAN

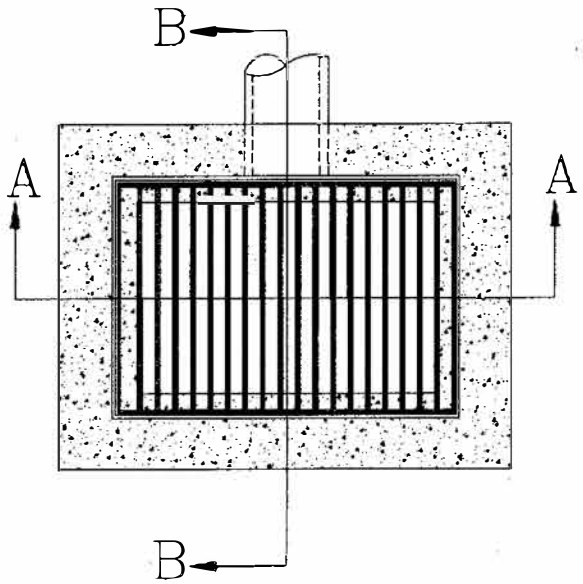
SECTION C–C

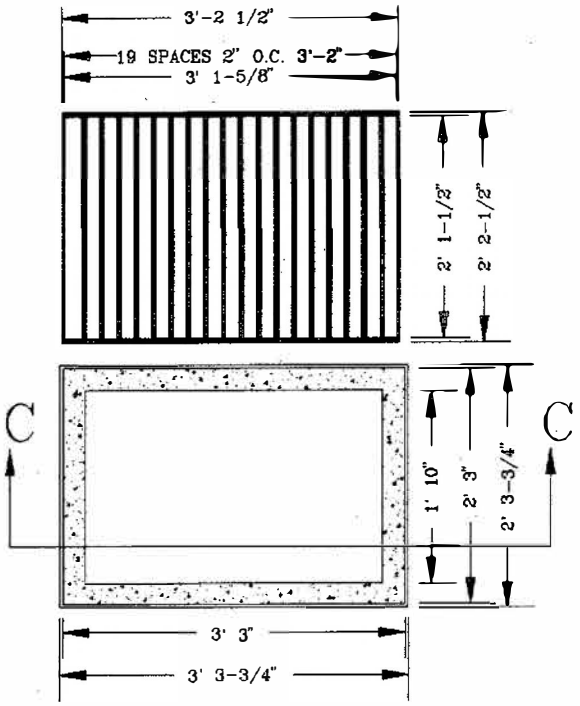
CITY OF TROUTDALE

CATCH BASIN

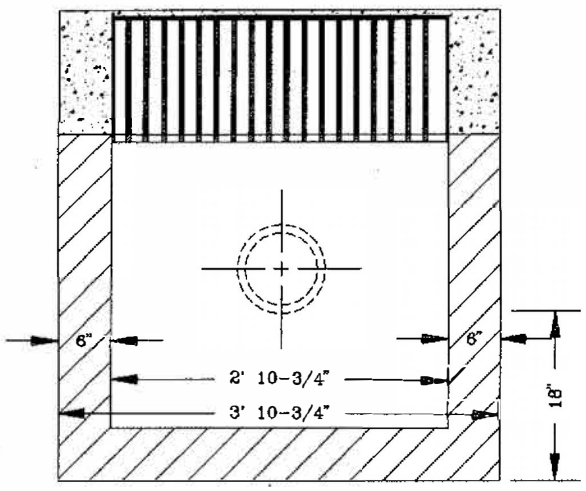
DATE:	DRAWING NO.
UPDATED 1994	VI – 1

FILENAME: AFWA0035.DWG



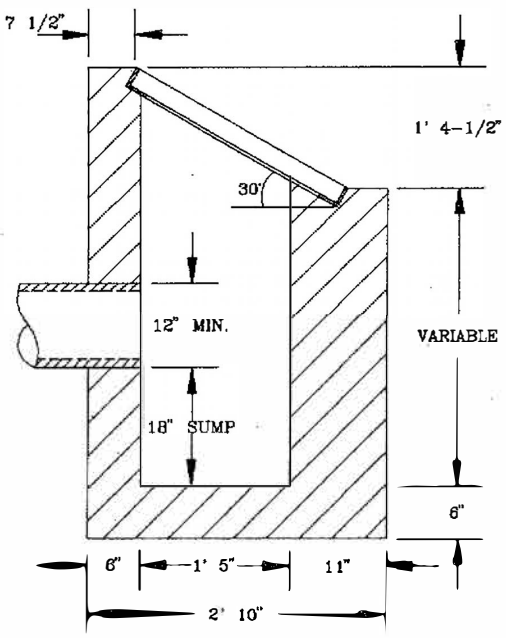


FRAME AND GRATE DETAIL



ELEVATION A-A

SECTION C-C



SECTION B-B

GENERAL NOTES:

1. EROSION CONTROL MEASURES MUST BE TAKEN TO PREVENT SILT FROM WASHING INTO DITCH INLET. USE RIP-RAP TO SLOW DOWN VELOCITY OF WATER & HAY BAILS (OR OTHER METHODS AS APPROVED BY THE CITY) TO SETTLE OUT NATIVE SOILS.

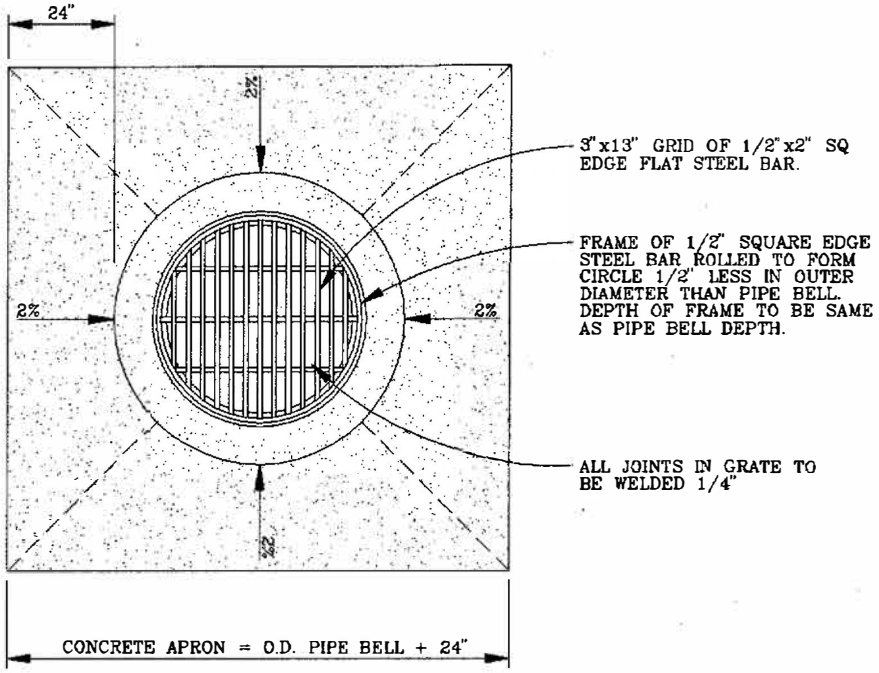
CITY OF TROUTDALE

DITCH INLET

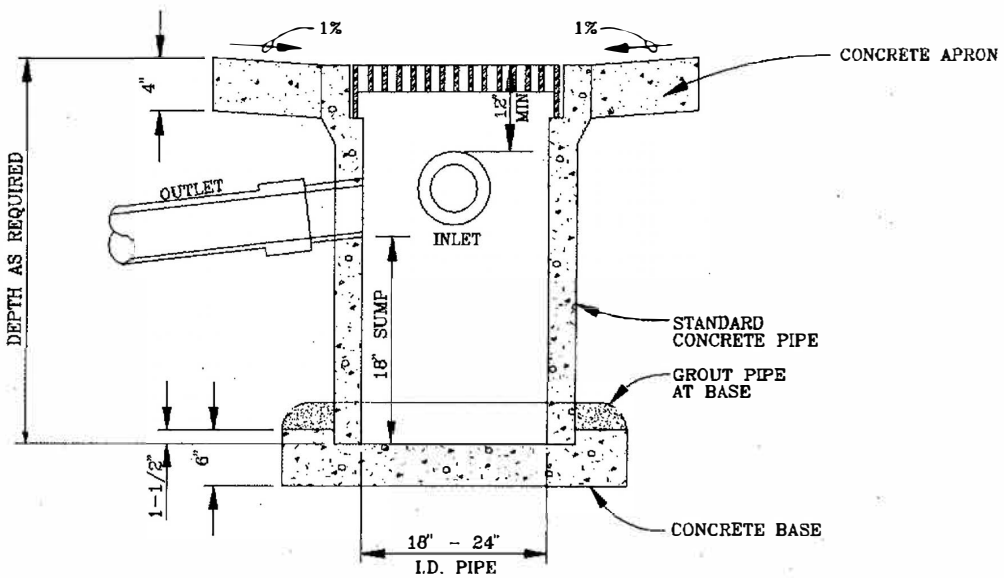
DATE: UPDATED 1994

DRAWING NO. VI - 2

FILENAME: APWA0108.DWG



PLAN



SECTION A-A

GENERAL NOTES:

1. GRATES SHALL BE CONSTRUCTED FOR BICYCLE SAFETY.
2. PRECAST CONCRETE CATCH BASINS MAY BE USED WHEN SPECIFIED OR APPROVED BY THE CITY.

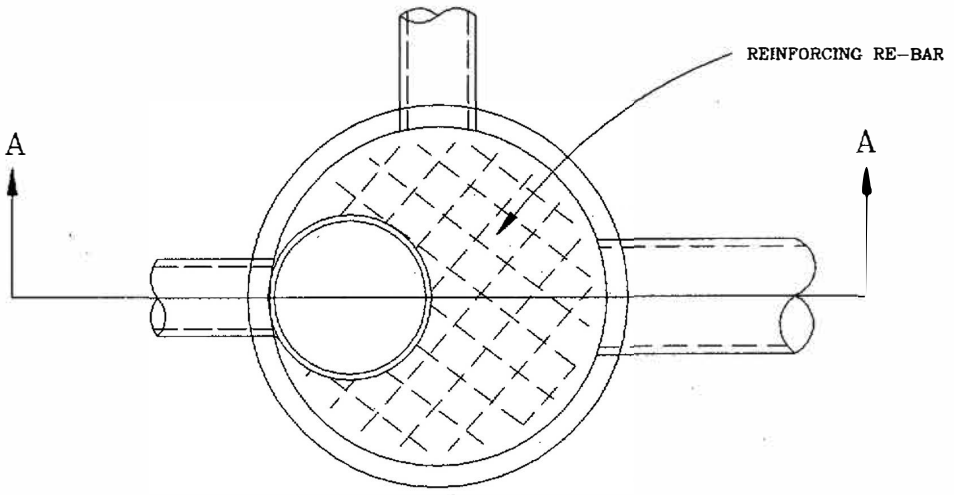
CITY OF TROUTDALE

FLAT AREA INLET

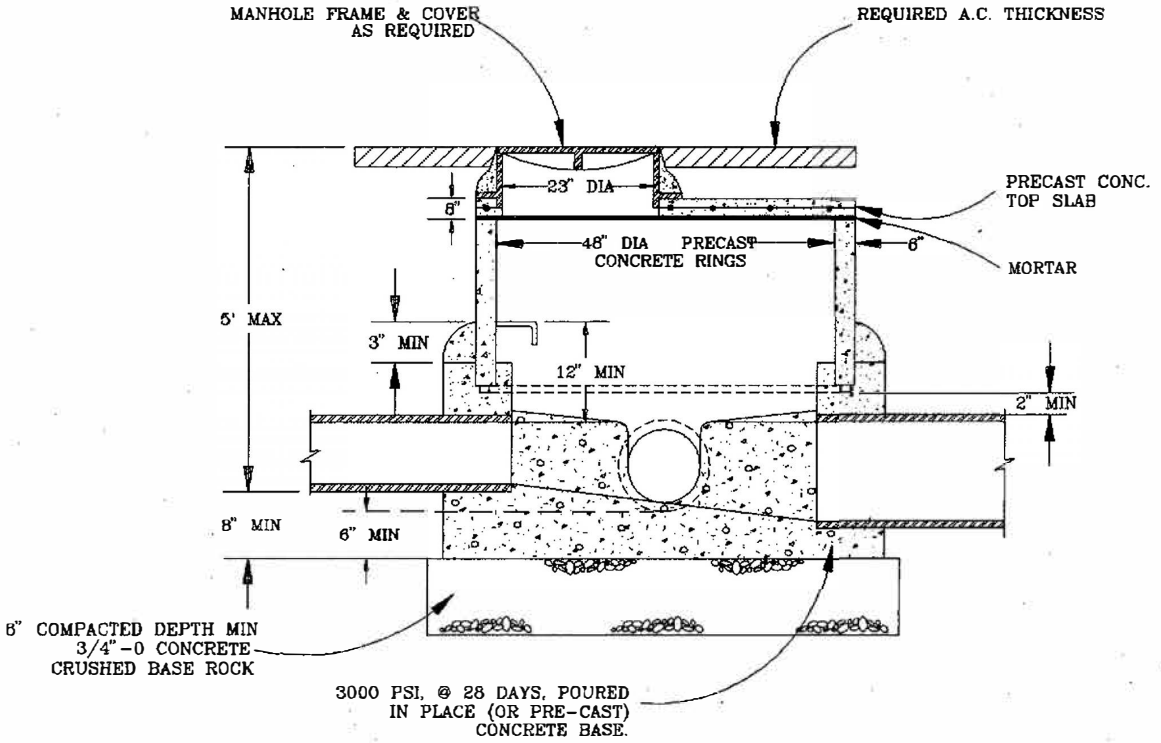
(UNIMPROVED SURFACES ONLY)

DATE:	DRAWING NO.
UPDATED 1994	VI - 3

FILENAME: APWA0021.DWG



PLAN VIEW



SECTION A-A

GENERAL NOTES:

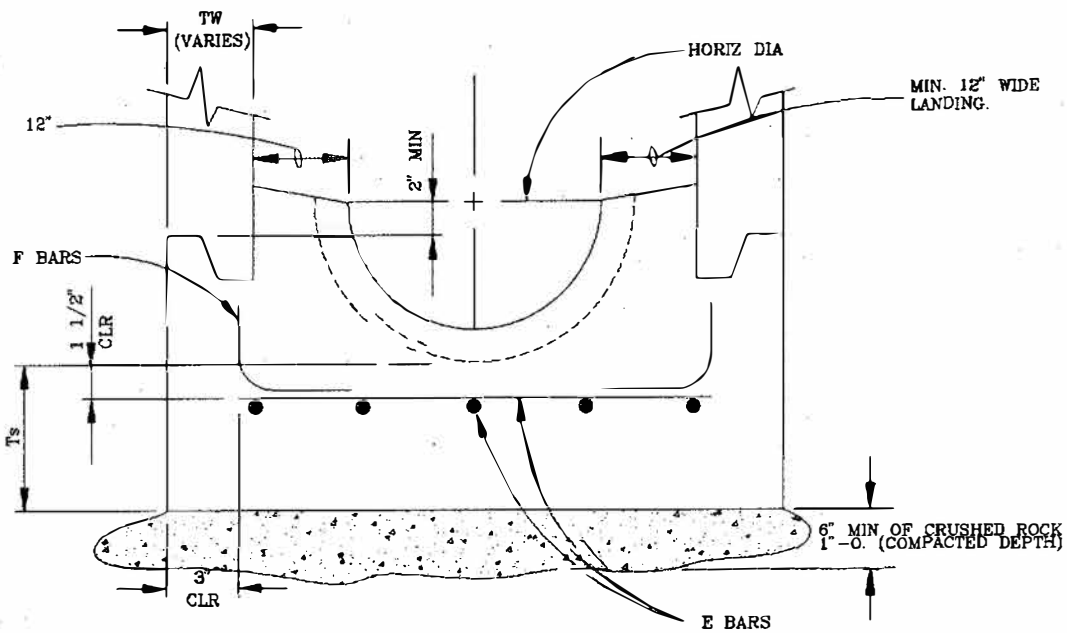
1. PRECAST MANHOLE BASES MAY BE USED. CHANNELS SHALL BE POURED IN PLACE.
2. FLAT TOP MANHOLES SHALL BE USED FOR STORM SEWER ONLY.

CITY OF TROUTDALE

FLAT TOP MANHOLE (STORM ONLY)

DATE:	DRAWING NO.
UPDATED 1994	VI - 4

FILENAME: APWA0109.DWG



CAST-IN-PLACE BASE

BASE I.D.		60"		72"		84"		96"	
TYPE	DEPTH*	0'-15'	15'-30'	0'-15'	15'-30'	0'-15'	15'-30'	0'-15'	15'-30'
CAST IN PLACE	Ts	7.0"	9.0"	7.0"	9.0"	8.0"	10.0"	9.0"	11.0"
	E BARS	#4 @ 12"	#4 @ 9"	#4 @ 9"	#4 @ 6"	#4 @ 8"	#5 @ 9"	#4 @ 7"	#5 @ 8"
	F BARS	#4 @ 12"	#4 @ 9"	#4 @ 9"	#4 @ 6"	#4 @ 8"	#5 @ 9"	#4 @ 7"	#5 @ 8"

*INVERT TO STREET GRADE

GENERAL NOTES:

1. CONCRETE SHALL BE 3000 PSI, @ 28 DAYS. STEEL fg = GRADE 60.
2. INSIDE DIAMETER OF MANHOLE MUST BE WIDE ENOUGH TO ALLOW ENOUGH ROOM FOR A 12" LANDING ON BOTH SIDES OF PIPE CHANNEL.
3. MANHOLE BASES CAN BE POURED IN PLACE OR PRE-CAST. CHANNELS SHALL BE POURED IN PLACE.
4. LARGE MANHOLE BASES SHALL BE USED FOR PIPE SIZES LARGER THAN 24 INCHES.
5. MINIMUM BASE INSIDE DIAMETER SHALL BE BASED ON THE NUMBER AND SIZE OF PIPES ENTERING MANHOLE, THE ELEVATION OF PIPES, AND MINIMUM SPACING BETWEEN PIPES. MANHOLE BASE SIZE USED SHALL BE APPROVED BY THE CITY.
6. TOP OF MANHOLE SHALL BE AT 18" ABOVE FINISH GRADE IN UNPAVED SURFACES, AND PROPERLY MARKED (SEE MARKER POST DETAIL). IF IN GRAVELED ROAD OR SHOULDER, PLACE A 6' X 6'X 4" THICK CONCRETE APRON AROUND MANHOLE.
7. STORM MANHOLES SHALL HAVE A 16-HOLE LID AND SANITARY MANHOLES A 2-HOLE LID.
8. ALL MANHOLES WILL BE VACUUM TESTED PRIOR TO ACCEPTANCE. ALL TESTS MUST BE WITNESSED BY CITY FORCES.

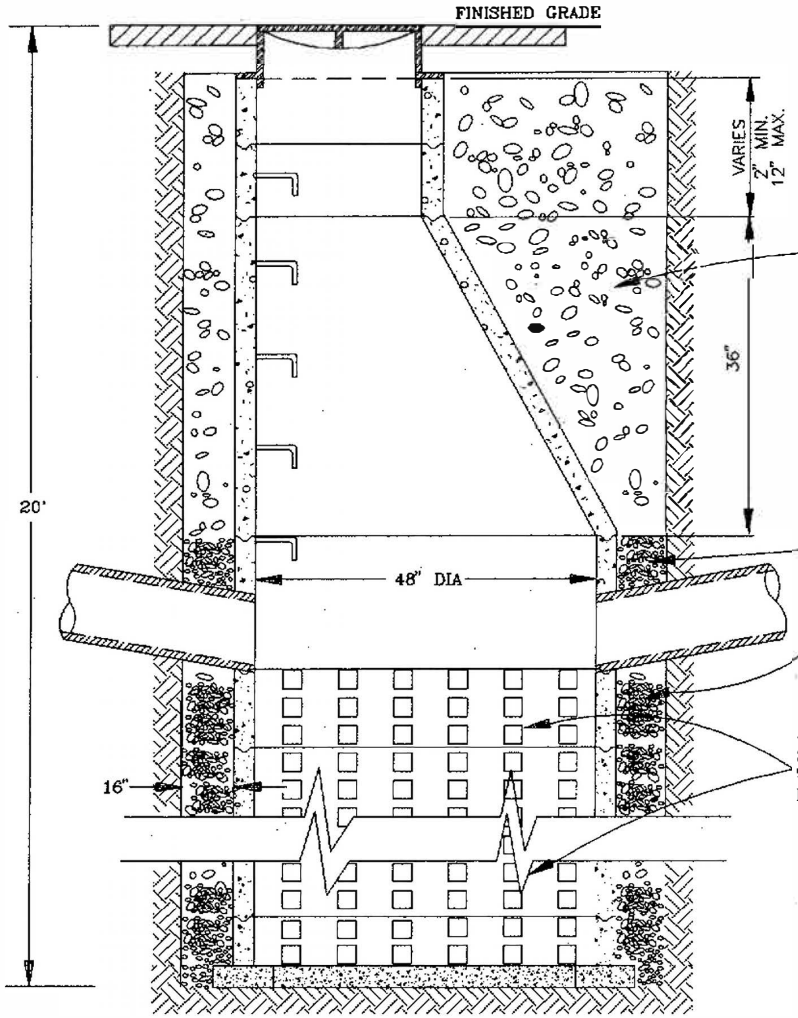
CITY OF TROUTDALE

LARGE CONCRETE STORM MANHOLE BASES

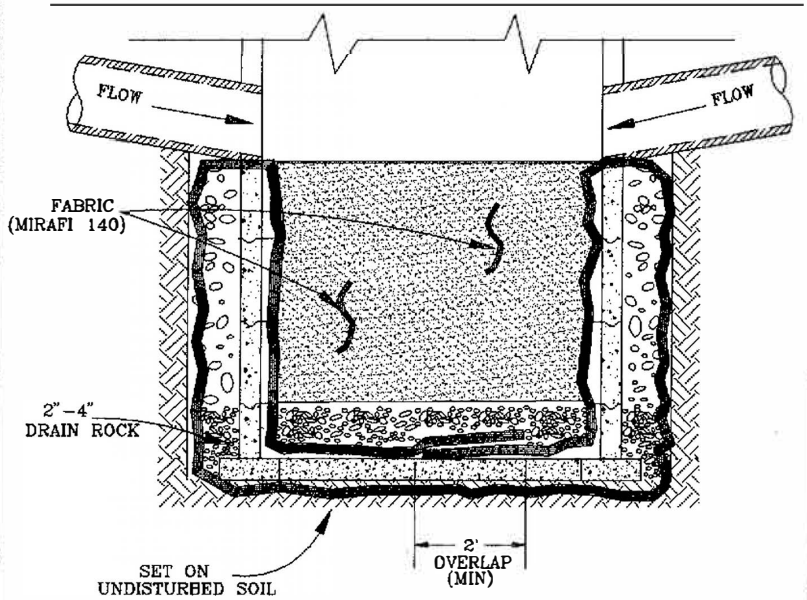
DATE: UPDATED 1994

DRAWING NO. VI - 5

FILENAME: APWA0033.DWG



TYPICAL DRYWELL DETAIL



DRYWELL LINING DETAIL

GENERAL NOTES:

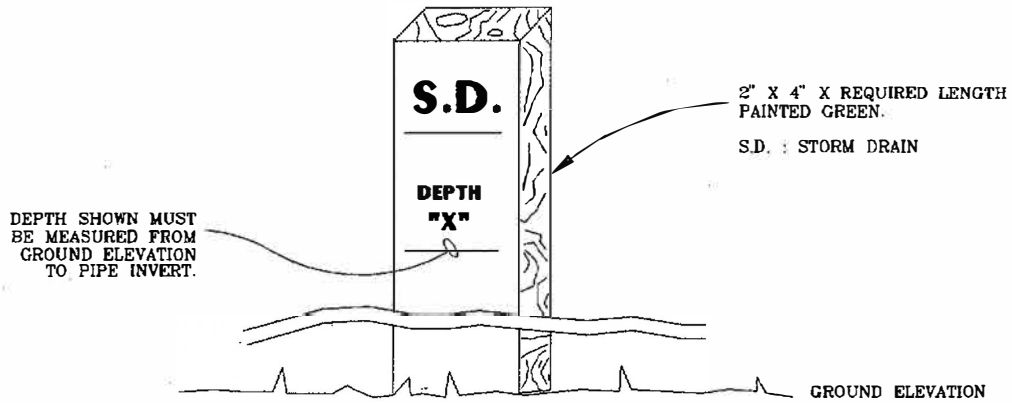
1. STANDARD MANHOLE, FRAME, COVER, CONE, AND SECTIONS, ARE REQUIRED.
2. INFILTRATION TESTS BY A QUALIFIED SOILS ENGINEER SHALL CERTIFY SOILS SUITABILITY FOR DRYWELL INSTALLATION.
3. LINE INSIDE, BOTTOM & OUTSIDE OF PERFORATED MANHOLE SECTION AS SHOWN USE MIRAFI 140.
4. FILL TO BOTTOM OF LOWEST PERFORATED MANHOLE SECTION WITH CLEAN DRAIN ROCK.
5. CONSTRUCTION OF DRYWELLS IS NOT ALLOWED WHERE STORM SEWER MAIN EXISTS NEARBY. CITY WILL DETERMINE WHERE DRYWELLS MAY BE CONSTRUCTED.
6. STEPS SHALL BE COATED WITH POLYPROPALINE.

CITY OF TROUTDALE

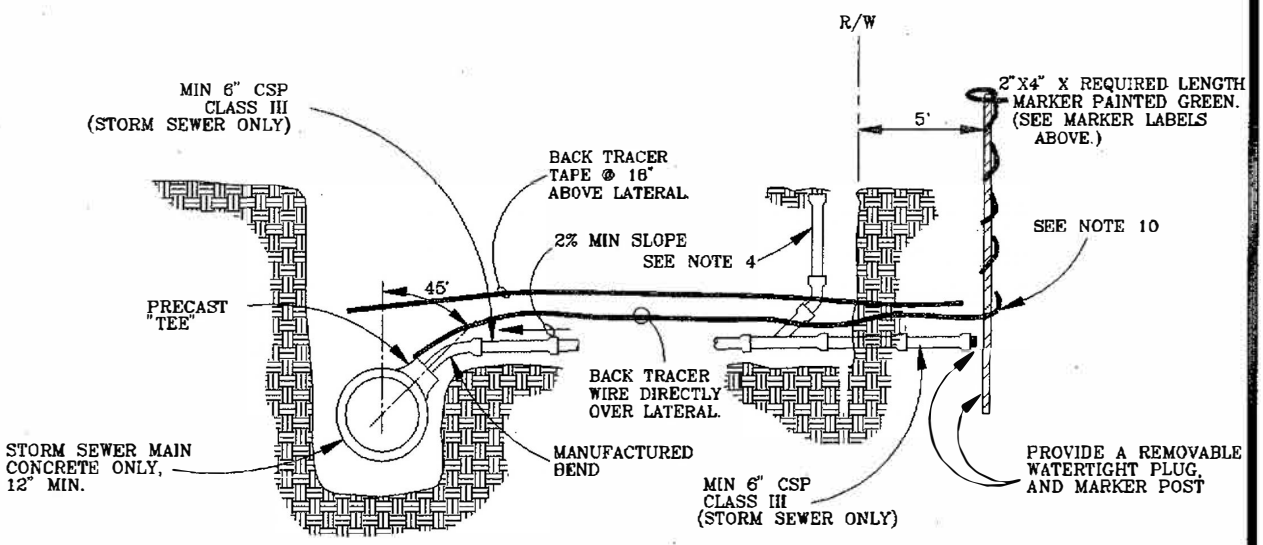
DRYWELL DETAIL

DATE:	DRAWING NO.
UPDATED 1994	VI – 6

FILENAME: APWA0111.DWG



2x4 MARKER LABELS



SHALLOW TRENCH STORM LATERAL

GENERAL NOTES:

1. PIPE AND FITTINGS SHALL BE COMPATIBLE.
2. MINIMUM DEPTH AT RIGHT-OF-WAY OR EASEMENT LINE SHALL BE 4'.
3. MARKER POSTS SHALL BE TREATED WOOD. POST SHALL BE 2" x 4" X REQUIRED LENGTH, FIR. POST TO EXTEND 24" MINIMUM ABOVE FINISH GRADE AND EXPOSED AREA SHALL BE PAINTED GREEN.
4. WHEN REQUIRED, A CLEANOUT SHALL BE INSTALLED @ 100' INTERVALS.
5. MARK ALL STORM LATERALS WITH A GREEN "SD" (FOR STORM DRAIN) ON FACE OF CURB WHERE LATERAL CROSSES CURB.
6. ***STORM LATERALS WILL BE CONCRETE PIPE ONLY AND 6" MINIMUM DIAMETER.***
7. LATERAL SHALL NOT BE BACKFILLED PRIOR TO INSPECTION BY CITY FORCES.
8. VERTICAL DROP INTO STORM MAIN IS NOT PERMITTED.
9. FLAT "T'S" MUST BE APPROVED BY THE CITY.
10. INSTALL #10 TRACER COPPER WIRE DIRECTLY OVER LATERAL & RAP AROUND 2" X 4" MARKER AS SHOWN. TRACER TAPE MUST ALSO BE INSTALLED 18" ABOVE THE PIPE.

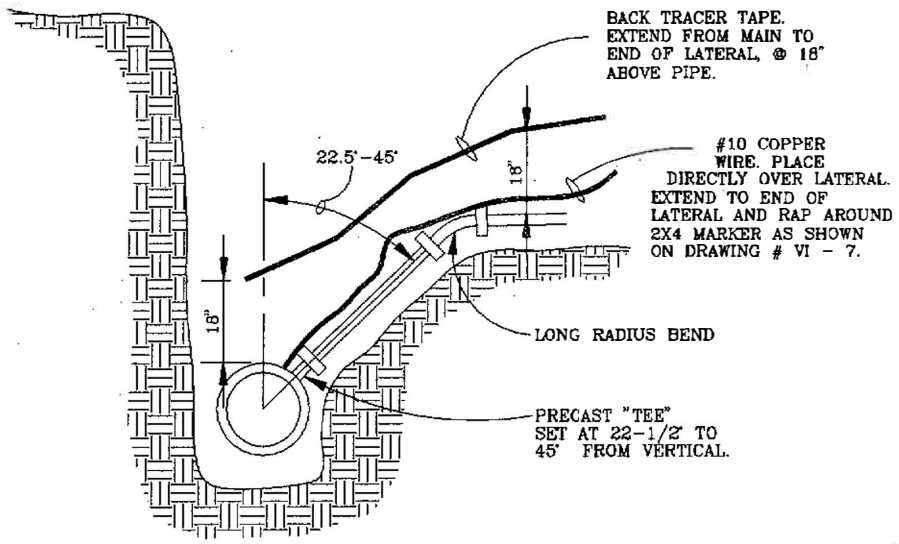
CITY OF TROUTDALE

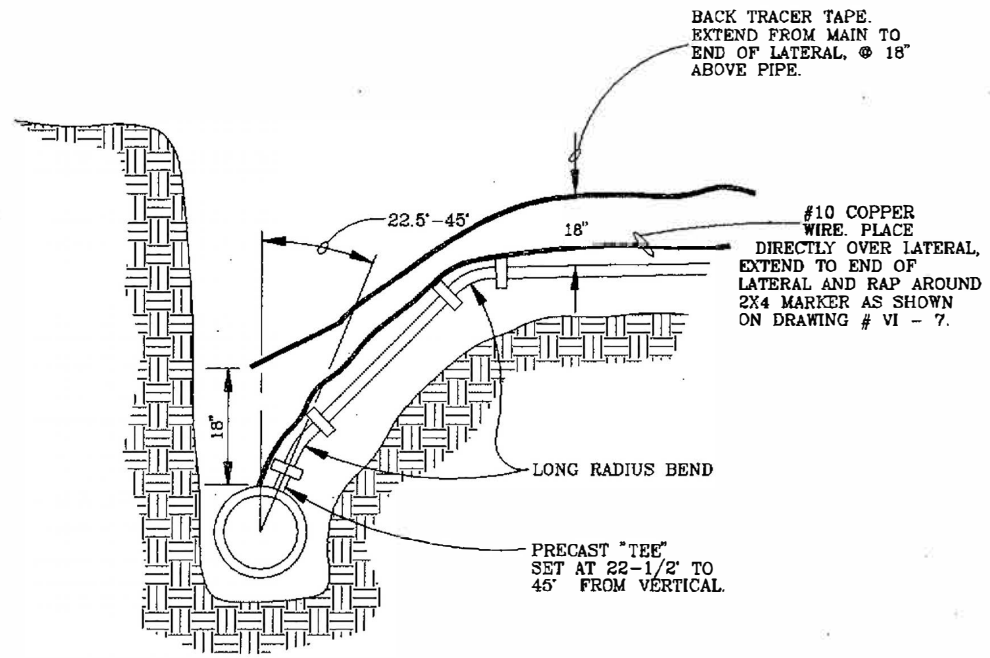
STORM SEWER LATERAL AND MARKER (SHALLOW TRENCH)

DATE: UPDATED 1994

DRAWING NO. VI – 7

FILENAME: APWA0023.DWG





GENERAL NOTES:

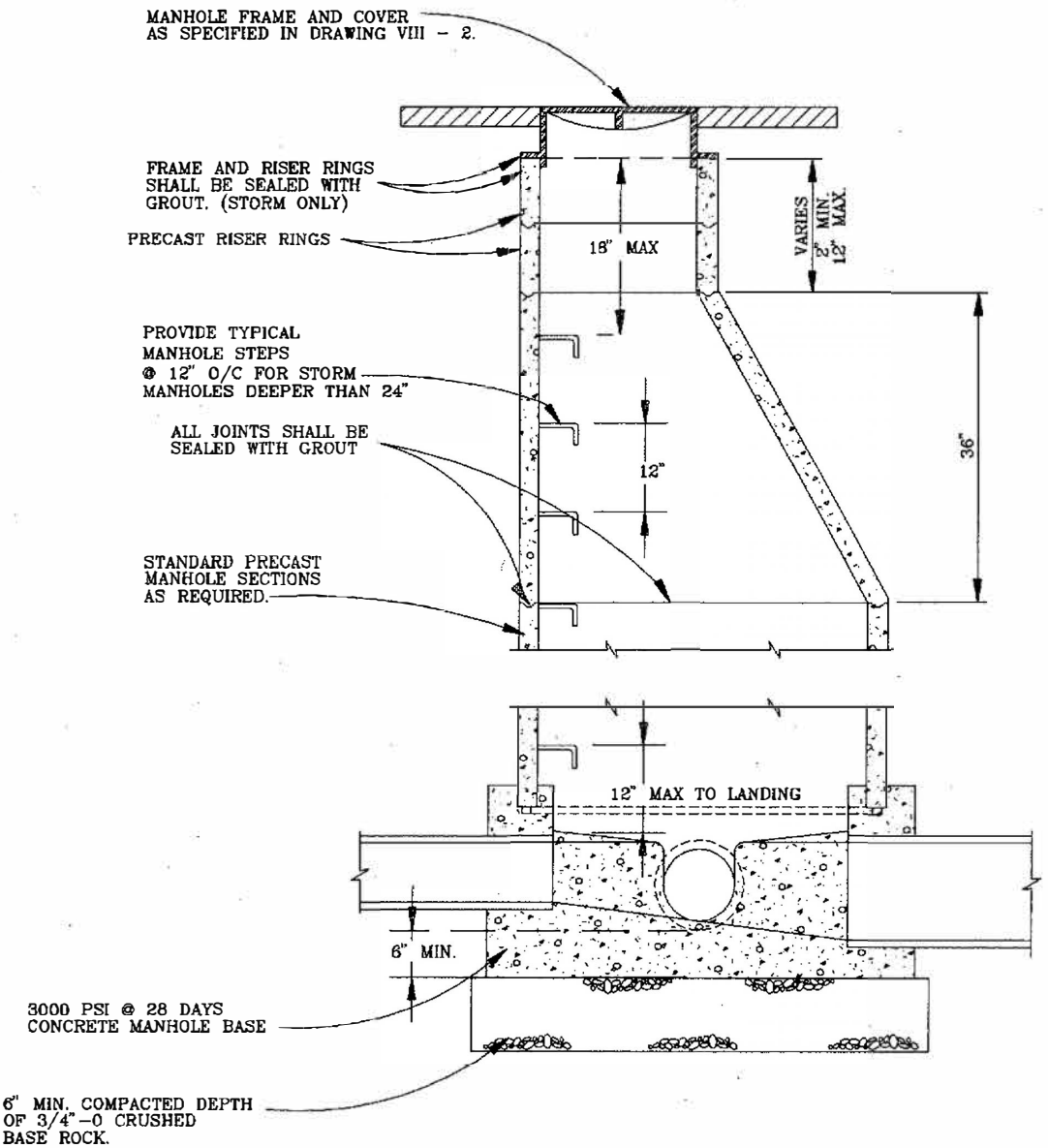
1. PIPE AND FITTINGS SHALL BE COMPATIBLE.
2. MINIMUM DEPTH AT RIGHT-OF-WAY OR EASEMENT LINE SHALL BE 4'
3. PLUGGING, AND MARKING OF UNCONNECTED SERVICES SHALL CONFORM TO DRAWING # VI - 7, STORM SEWER LATERAL AND MARKER (SHALLOW TRENCH).
4. SEE ADDITIONAL NOTES ON DRAWING VI - 7 (SHALLOW TRENCH SERVICE) FOR DETAILS ON MARKING.

CITY OF TROUTDALE

STORM SEWER LATERAL (DEEP TRENCH)

DATE:	DRAWING NO.
UPDATED 1994	VI - 8

FILENAME: APWA0024.DWG



GENERAL NOTES:

1. STANDARD PRECAST MANHOLE SECTION DIAMETER SHALL BE 48".
2. PRECAST OR POURED IN PLACE MANHOLE BASES ARE ALLOWED. CHANNELS MUST BE POURED IN PLACE.
3. STEPS WILL BE STEEL COATED WITH POLYPROPALINE.
4. PROVIDE STEPS FOR ALL MANHOLES DEEPER THAN 24".
5. TOP OF MANHOLES SHALL BE @ 18" ABOVE EXISTING GROUND IN UNPAVED SURFACES, AND PROPERLY MARKED (SEE MARKER POST DETAIL DRAWING # VIII - 8). TOP OF MANHOLE SHOULD BE FLUSH WITH TOP OF FINISH GRADE IN PAVED AREAS. IF IN GRAVEL ROAD OR SHOULDER, PLACE A 6' DIAMETER 4" THICK CONCRETE APRON AROUND MANHOLE. SLOPE APRON AWAY FROM MANHOLE @ 1/4"/FT.
6. A MINIMUM OF 0.2' DROP MUST BE PROVIDED @ ALL MANHOLES FROM INLET PIPE TO OUTLET PIPE.

CITY OF TROUTDALE

STORM MANHOLE (48" DIAMETER)

DATE:	DRAWING NO.
UPDATED 1994	VI - 9

FILENAME: APWA0026.DWG

SANITARY SEWER COLLECTION SYSTEM

(Parts VII & VIII)

SANITARY

(Part VII)

*General Requirements

SANITARY SEWERS

(General Requirements)

1. Proposed storm sewer mains must be in accordance with the City of Troutdale's Public Facilities Plan. Sanitary main sizes must be adequately sized to handle the flow collected from the affected development. Areas above and below the development must be considered in design, and pipes sized accordingly.

2. All construction/installation of sanitary sewer mains shall be done in a safe, neat and workmanlike manner, and under supervision of City forces at all times. All safety requirements from OSHA and other state regulatory agencies must be met.

3. The requirements of DEQ must be met.

4. Manholes shall be placed at all points of change in alignment, change in pipe size, breaks in grade and at all intersections. The maximum permissible spacing is 300 feet. Sanitary sewer manholes shall not be located in backyards or any other areas which would restrict free access to maintenance personnel.

5. The minimum size for public sewer mains shall be eight-inch diameter. All sanitary sewer piping shall be scheduled D3034 PVC or equal. Minimum pipe diameter for private laterals is 4" and of schedule D3034 PVC or equal. All sanitary sewer laterals must be properly marked at ends as shown on Drawing VIII-9. Use of "concrete" pipe in sanitary sewer mains and laterals is not allowed.

6. All manholes shall have a minimum of 0.2 foot drop from pipe invert "in" to pipe invert "out", and all sanitary lines between manholes shall meet the minimum allowable slope requirements as required by general engineering principals and DEQ's rules and regulations.

7. Sewer lines shall be laid in straight alignment and a uniform grade between manholes.

8. Sewer depth shall be adequate to serve all property which may be contributory, but no shallower than 6 feet from finished street grade.

9. Combined storm and sanitary sewers are prohibited.

10. Inside drops will be required for drops exceeding 24 inches. Drops should be avoided whenever possible. All inside drops must be reviewed and approved by the City prior to construction.

11. **Connections into the existing sanitary sewer mains require issuance of a public works permit and inspection by the City prior to backfilling. A permit fee of $50.00 (subject to change without notice) will be assessed for each connection/inspection.**

12. **All new sanitary sewer pipes and manholes must be thoroughly cleaned and pressure/vacuum tested as required by the City. All tests must be witnessed and passed by the City prior to placing in operation.**

13. **All drains from private/public swimming pools must be connected to the sanitary sewer and <u>not</u> to the storm sewer. All other privately owned facilities high in chlorine content or any other strong chemical mixture shall be connected to the sanitary sewer only. Approval from the City is required when making such connections to the sanitary.**

14. **There shall be only one sanitary sewer lateral connection per residential dwelling.**

15. **All public sanitary sewer mains extending into, through, and beyond private property, shall be placed within a legal public utility easement granted to the City by the affected property owner prior to actual construction. Width and length of such easement will be determined by the City, and will be based on size, type, depth and length of pipe being used. All Building Code restrictions, as they apply to public utility easements, shall apply.**

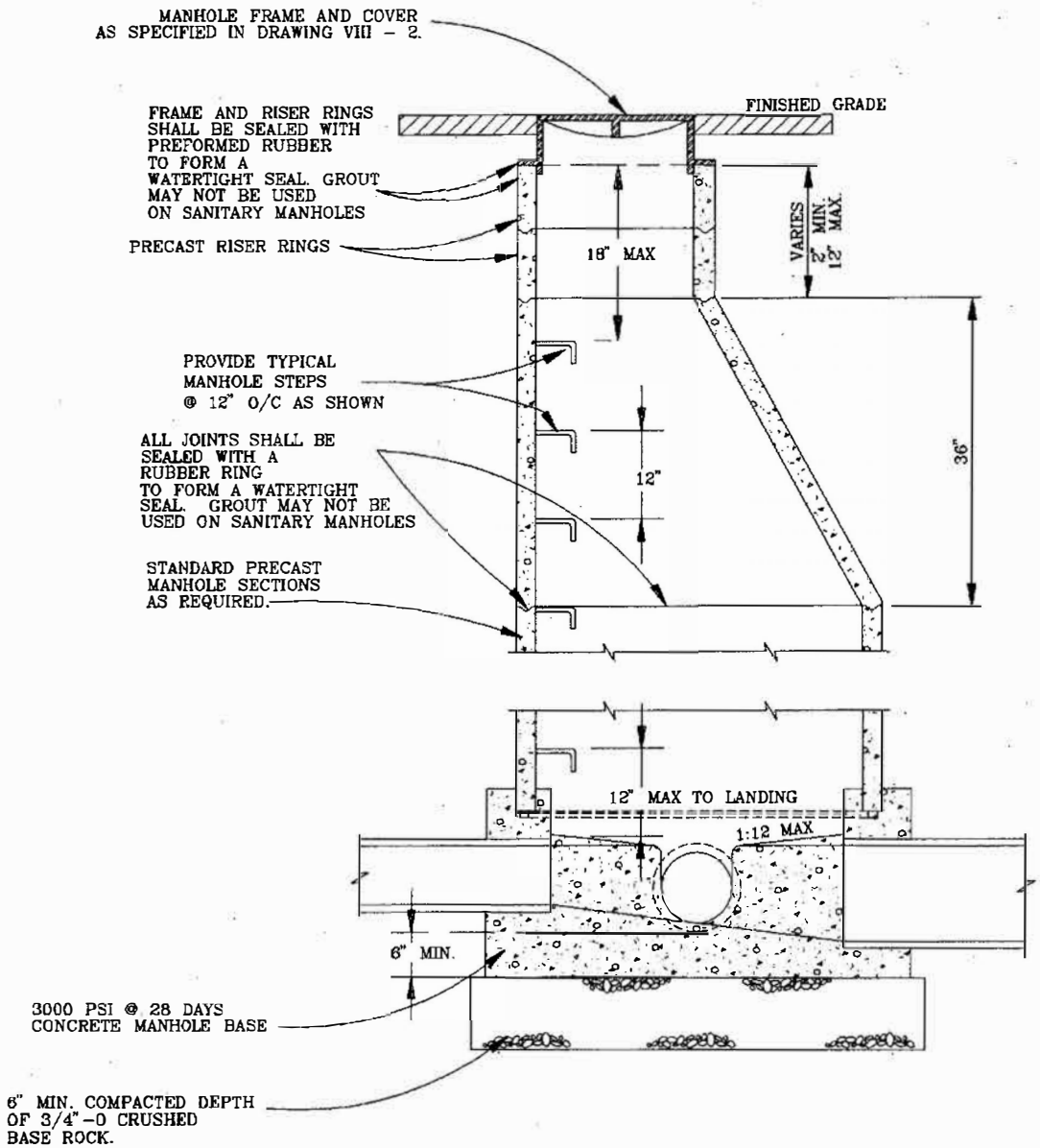
16. **The builder/developer must provide to the City any guarantee or warranty normally furnished with the purchase of any materials used in connection with the project at hand. In addition, they must furnish the City a written warranty providing satisfactory in-service operation of all work performed by affected contractor (including but not limited to all sanitary mains, laterals, manholes, pump stations, force mains, etc.) for a period of two (2) years following date of project acceptance.**

17. **All other construction practices (relating to sanitary sewer) within the City's public right-of-way, not covered in these "General Requirements" and/or "Construction Details" sections, shall comply with the rules and regulations of the most recent edition of this "American Public Works Association Standard Specifications".**

SANITARY

(Part VIII)

* Construction Details



GENERAL NOTES:

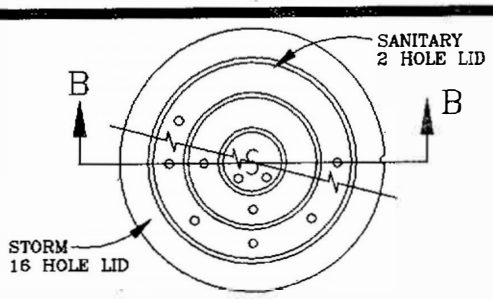
1. STANDARD PRECAST MANHOLE SECTION DIAMETER SHALL BE 48".
2. MANHOLE BASES MAY BE PRECAST OR POURED IN PLACE. CHANNELS SHALL BE POURED IN PLACE.
3. STEPS WILL BE STEEL COATED WITH POLYPROPALINE.
4. PROVIDE STEPS FOR ALL MANHOLES DEEPER THAN 24".
5. TOP OF MANHOLES SHALL BE @ 18" ABOVE EXISTING GROUND IN UNPAVED SURFACES, AND PROPERLY MARKED (SEE MARKER POST DETAIL DRAWING # VIII – 8). TOP OF MANHOLE SHOULD BE FLUSH WITH TOP OF FINISH GRADE IN PAVED AREAS. IF IN GRAVEL ROAD OR SHOULDER, PLACE A 6' DIAMETER 4" THICK CONCRETE APRON AROUND MANHOLE. SLOPE APRON AWAY FROM MANHOLE @ 1/4"/FT.
6. A MINIMUM OF 0.2' DROP MUST BE PROVIDED @ ALL MANHOLES FROM INLET PIPE TO OUTLET PIPE.
7. ALL MANHOLES SHALL BE VACUUM TESTED AND PASSED PRIOR TO ACCEPTANCE BY THE CITY.

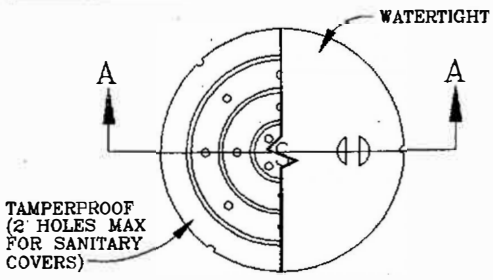
CITY OF TROUTDALE

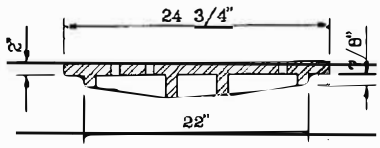
SANITARY MANHOLE (48" DIAMETER)

DATE:	DRAWING NO.
UPDATED 1994	VIII – 1

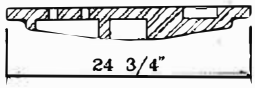
FILENAME: APWA0125.DWG



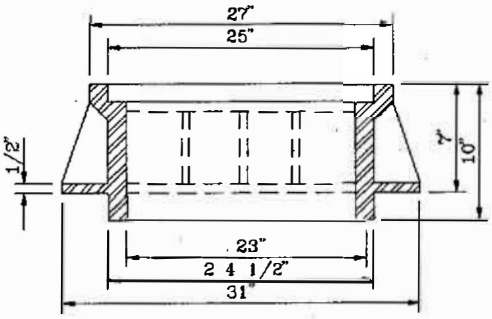




SECTION B–B

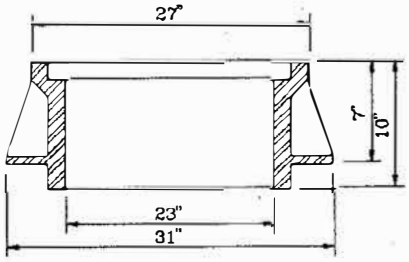


SECTION A–A

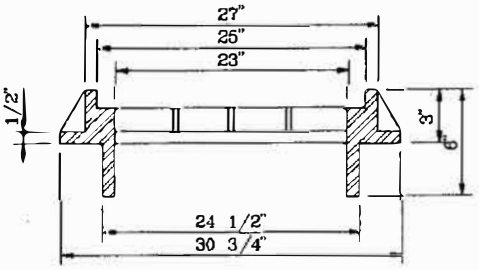


(APPROX. WT. – 387 LBS.)

CAST IRON STANDARD

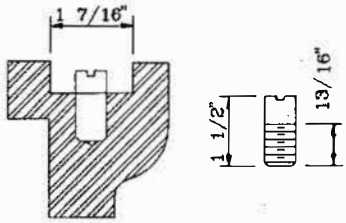


CAST IRON TAMPERPROOF & WATERTIGHT



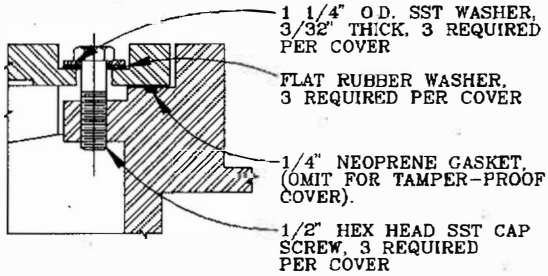
(APPROX. WT. – 305 LBS.)

CAST IRON SUBURBAN



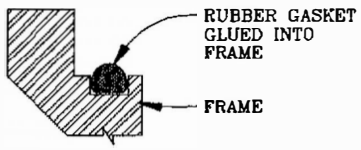
1 REQUIRED PER COVER FOR
WATERTIGHT AND TAMPERPROOF

LOCATING STUD DETAILS



NOTE:
3 REQUIRED, 1/2" x 1 1/4" PENTAGONAL
OR HEXAGONAL HEAD, BRONZE OR CAD. PLATED.

BOLT–DOWN DETAIL
(FOR TAMPERPROOF AND WATERTIGHT)



WATERTIGHT GASKET DETAIL

GENERAL NOTES:

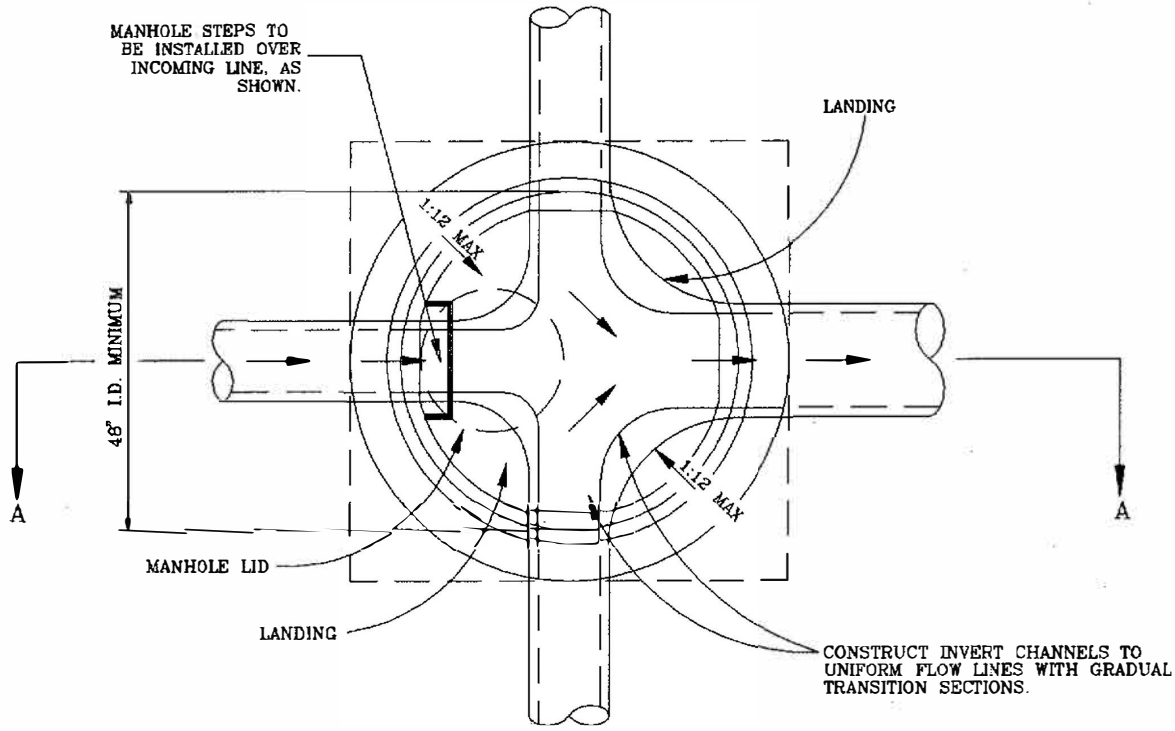
1. TAMPERPROOF COVERS REQ'D ON SANITARY OR STORM DRAIN MANHOLE WHERE LOCATED IN PEDESTRIAN WAYS OR EASMENT AREAS. TAMPERPROOF COVERS FOR SANITARY MANHOLES SHALL HAVE 2 HOLES MAXIMUM.
2. WATERTIGHT COVERS ARE REQUIRED IF LOCATED WHERE COVER MAY BE SUBMERGED, OR IN CURB/GUTTER LINE.
3. USE CAST IRON STANDARD UNLESS OTHERWISE REQUIRED BY THE CITY.

CITY OF TROUTDALE

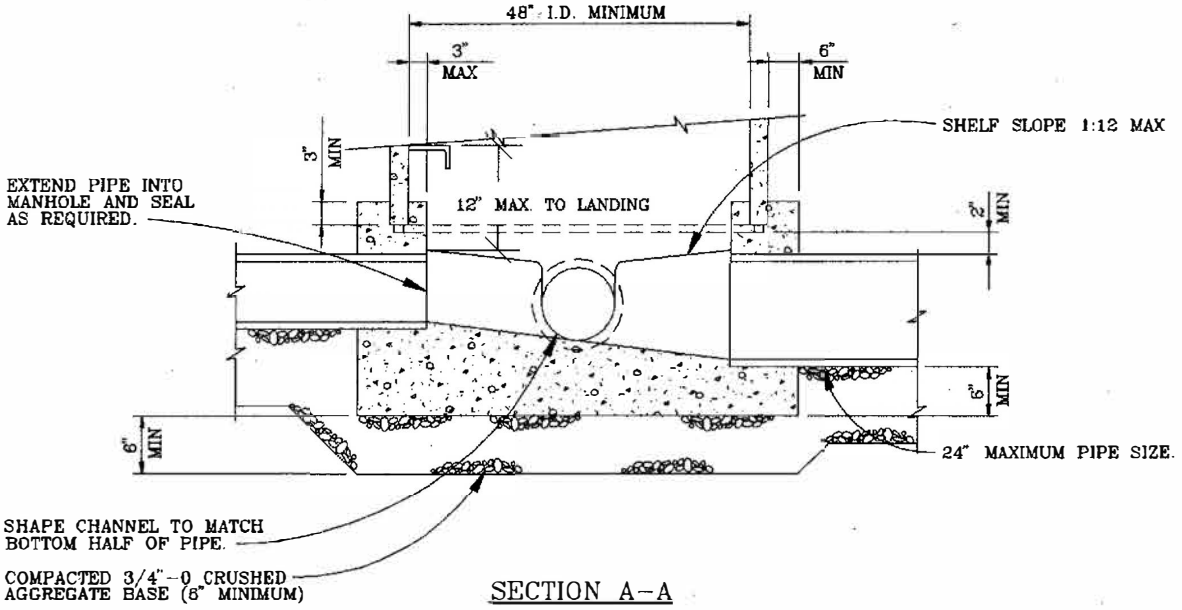
MANHOLE LIDS AND FRAMES (SANITARY AND STORM)

DATE:	DRAWING NO.
UPDATED 1994	VIII – 2

FILENAME: APWA0027.DWG



PLAN VIEW



SECTION A–A

GENERAL NOTES:

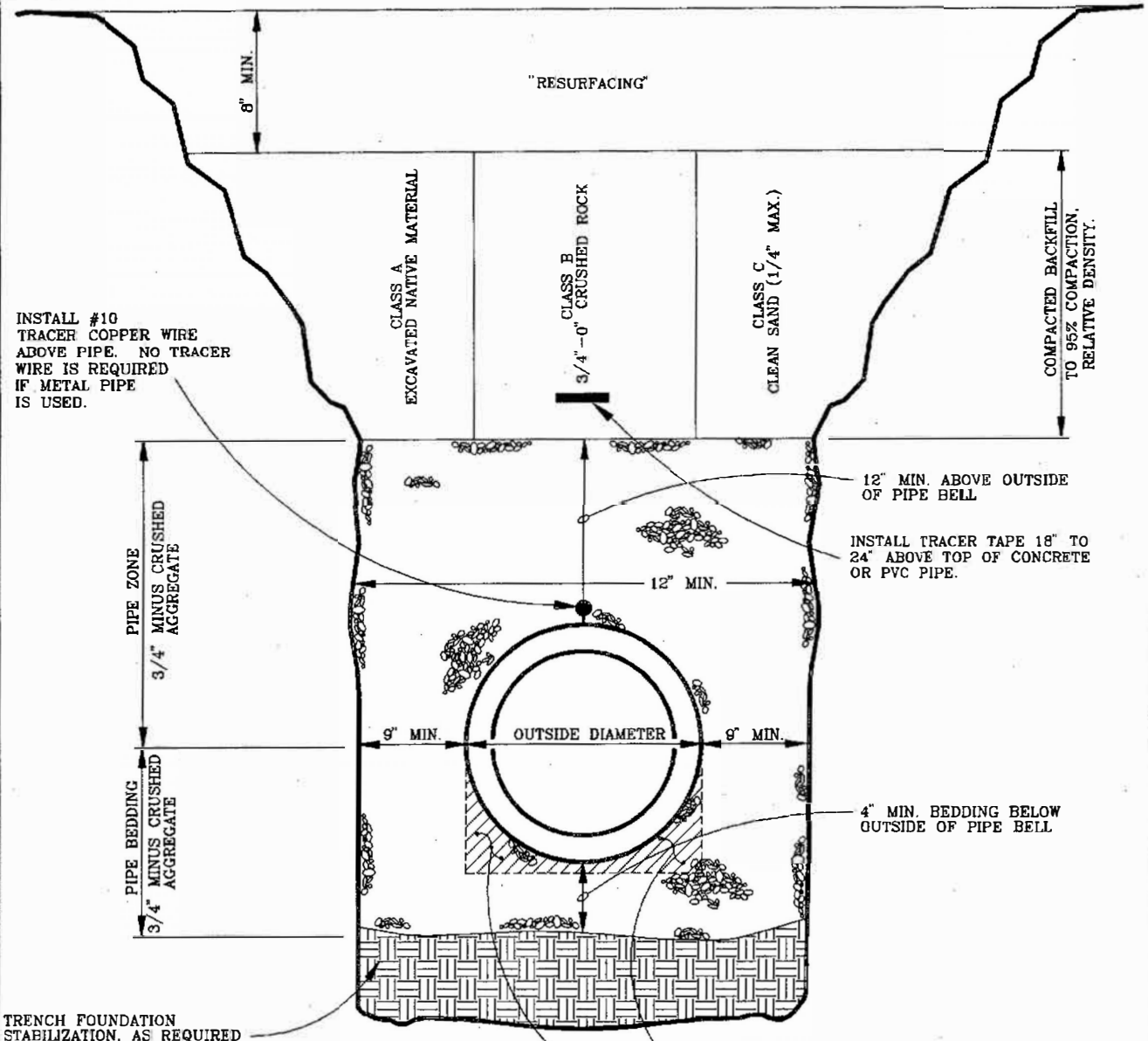
1. CHANNELS SHALL BE CONSTRUCTED TO PROVIDE SMOOTH SLOPES AND RADII TO OUTLET PIPE.
2. BASES MAY BE POURED IN PLACE OR PRECAST. USE 3000 PSI CONCRETE @ 28 DAYS FOR BASE IF POURED IN PLACE.
3. ALLOW A MINIMUM OF 24 HOURS TO ELAPSE BEFORE PLACING REMAINING RINGS AND CONE.
4. THIS MANHOLE BASE SECTION SHALL BE USED FOR PIPE SIZES UP TO 24" ONLY. A LARGER SIZE BASE IS REQUIRED IF LARGER PIPE SIZE IS NECESSARY.
5. A MINIMUM OF 0.2' DROP IS REQUIRED FROM INLET PIPE TO OUTLET PIPE.

CITY OF TROUTDALE

48" MANHOLE BASE (SANITARY OR STORM)

DATE:	DRAWING NO.
UPDATED 1994	VIII – 3

FILENAME: APWA0029.DWG



GENERAL NOTES:

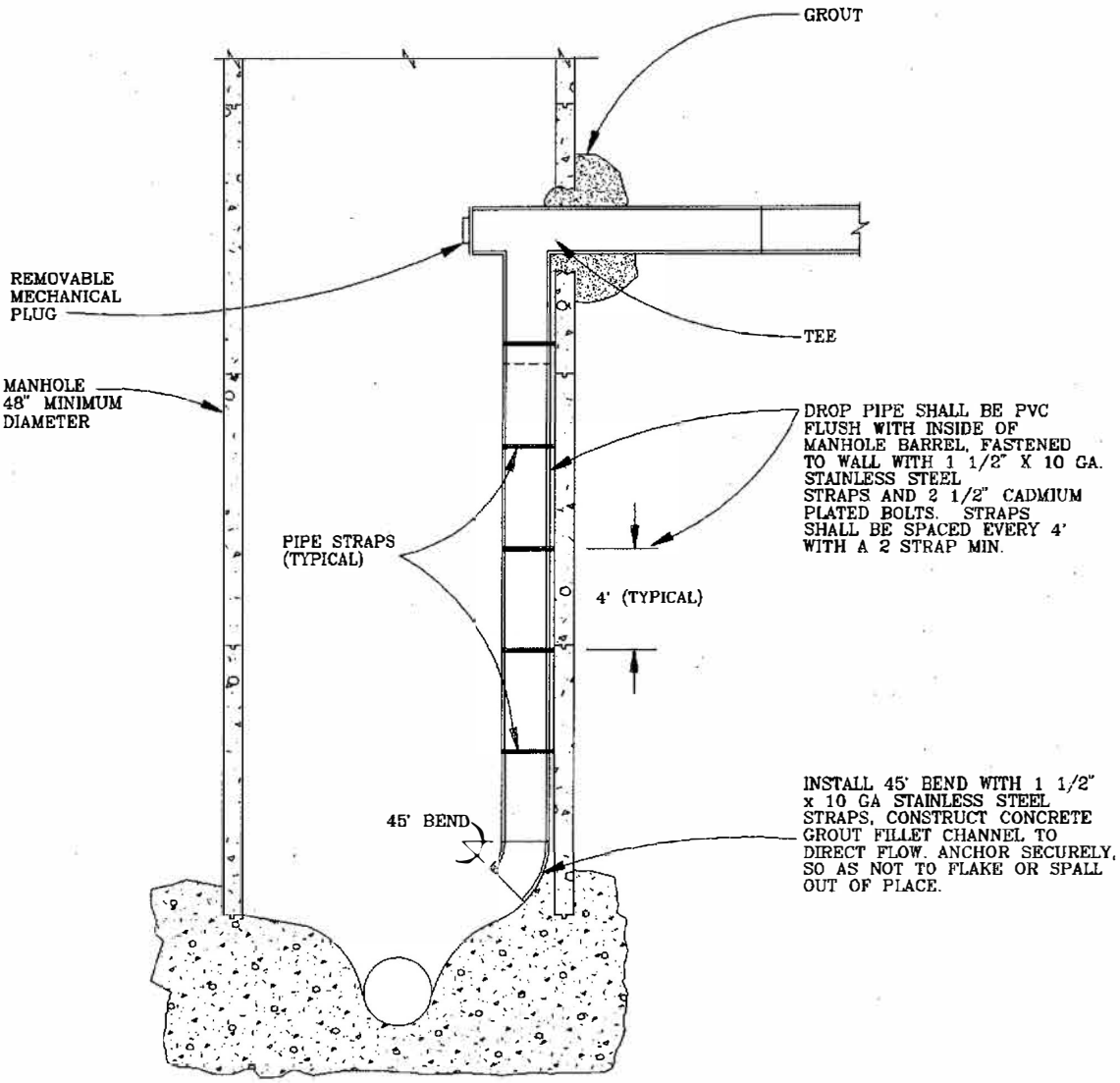
1. THIS TRENCH/PIPE DETAIL APPLIES FOR INSTALLATION OF PLASTIC, PVC, DUCTILE IRON, CAST IRON AND CONCRETE PIPES.
2. TRACER TAPE AND COPPER WIRE #10 ARE REQUIRED FOR ALL PLASTIC, PVC, AND CONCRETE PIPES. COPPER WIRE IS NOT REQUIRED OVER DUCTILE OR CAST IRON PIPES; HOWEVER, TRACER TAPE IS, AS SHOWN ABOVE.
3. ALL PLASTIC OR PVC PIPES WILL BE TESTED FOR "ROUNDNESS" AFTER COMPACTION BY RUNNING A MANDRELL (OR OTHER METHOD AS REQUIRED BY THE CITY) THROUGH ALL PIPES.
4. ALL PIPES SHALL BE CHLORINATED, PRESSURE TESTED, FLUSHED AND OTHERWISE TESTED AS REQUIRED BY THE CITY. METHODS REQUIRED TO TEST PIPES WILL DEPEND ON INTENDED USE OF PIPE. ALL TESTS MUST BE WITNESSED BY CITY FORCES. METHODS FOR TESTING AND ACCEPTABLE RESULTS USED WILL BE AS SPECIFIED IN THE LATEST EDITION OF THE APWA STANDARD SPECIFICATIONS.
5. TYPE OF BACKFILL USED WILL BE DETERMINED BY THE CITY
6. BEDDING GREATER THAN 4" MAY BE REQUIRED BY THE CITY, IF NATIVE MATERIAL IS NOT SUITABLE.
7. ALL CURRENT SAFETY REQUIREMENTS OR REGULATIONS (AS SET FORTH BY OSHA AND OTHER STATE REGULATORY AGENCIES) MUST BE ADHERED TO DURING TRENCH EXCAVATION.
8. WHEN DIGGING TRENCH IN TRAFFIC ZONES, A TRAFFIC PLAN MUST BE APPROVED BY THE CITY OF TROUTDALE OR AFFECTED JURISDICITON.

CITY OF TROUTDALE

TRENCH BACKFILL BEDDING AND PIPE ZONE

DATE:	DRAWING NO.
UPDATED 1994	VIII - 4

FILENAME: APWA0015.DWG



GENERAL NOTES:

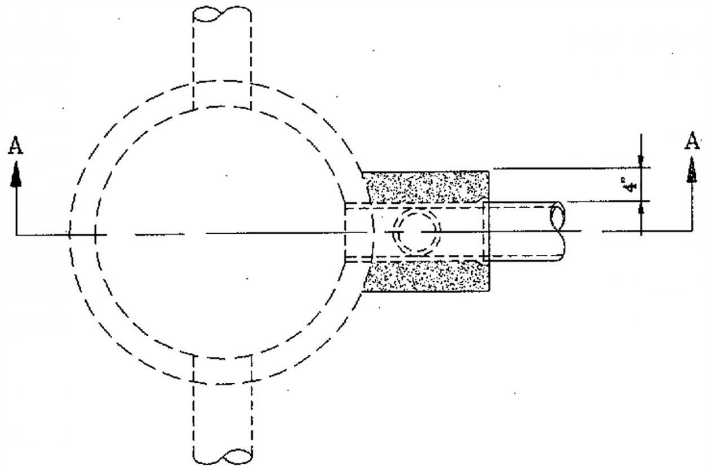
1. ONLY ONE INSIDE DROP CONNECTION ALLOWED PER MANHOLE.
2. DROP MANHOLE CONFIGURATION (AS SHOWN) IS REQUIRED IF PIPE IS 25" OR HIGHER FROM LANDING (AT BOTTOM OF MANHOLE) TO PIPE INVERT.
3. APPROVAL IS REQUIRED BY CITY FOR "ALL" DROP CONNECTIONS.
4. CITY MAY REQUIRE THAT AN "OUTSIDE DROP CONNECTION" BE PROVIDED SEE DRAWING # VIII - 6.

CITY OF TROUTDALE

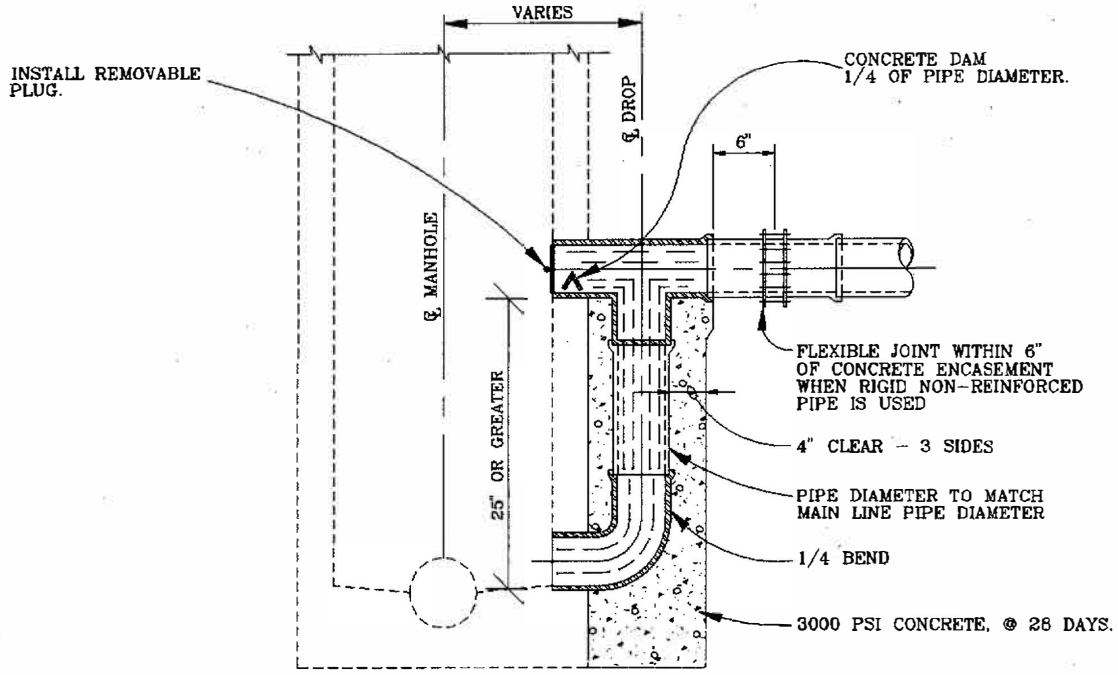
INSIDE DROP CONNECTION FOR MANHOLES (SANITARY OR STORM)

DATE:	DRAWING NO.
UPDATED 1994	VIII - 5

FILENAME: APWA0030.DWG



PLAN VIEW



SECTION A-A

GENERAL NOTES:

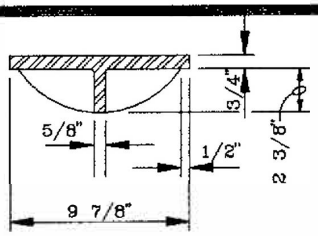
1. DROP MANHOLE CONFIGURATION (AS SHOWN) IS REQUIRED IF PIPE IS HIGHER THAN 25" FROM LANDING (@ BOTTOM OF MANHOLE) TO PIPE INVERT.
2. APPROVAL IS REQUIRED BY CITY FOR ALL DROP CONNECTIONS.
3. CITY MAY REQUIRE THAT AN "INSIDE DROP CONNECTION" BE PROVIDED. SEE DRAWING # VIII - 5.

CITY OF TROUTDALE

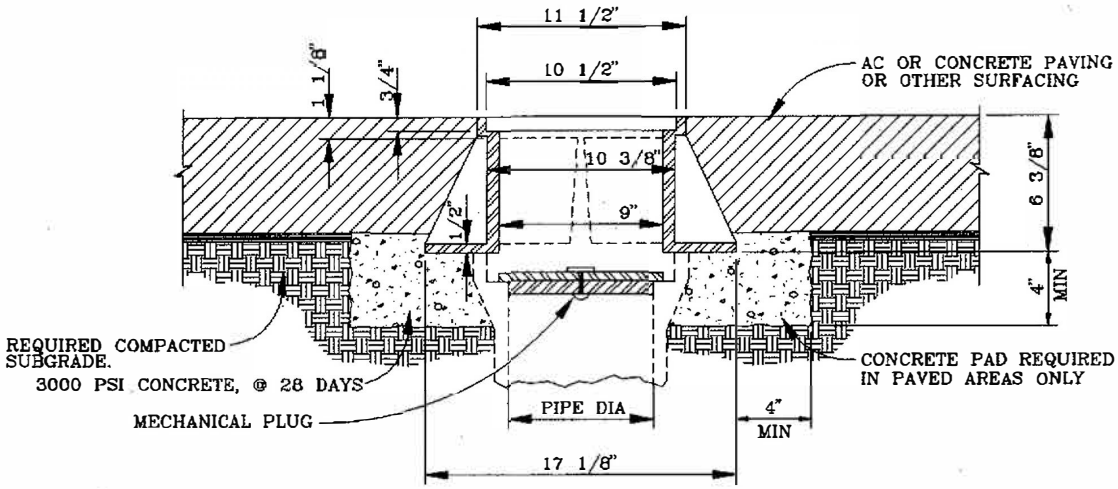
OUTSIDE DROP CONNECTION FOR MANHOLES (SANITARY OR STORM)

DATE:	DRAWING NO.
UPDATED 1994	VIII - 6

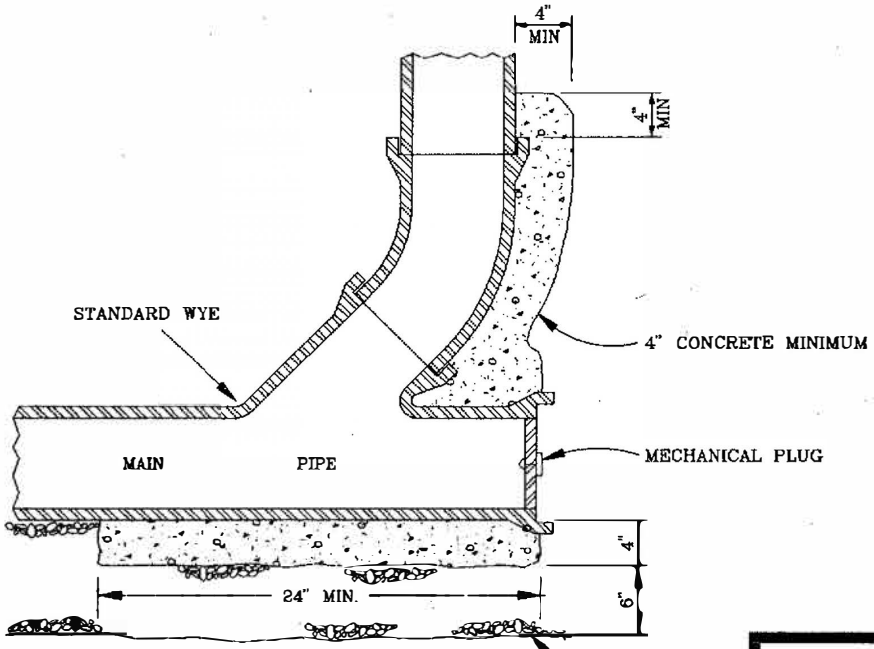
FILENAME: APWA0031.DWG



CAST IRON COVER



CAST IRON FRAME



CLEANOUT

GENERAL NOTES:

1. IF LOCATED IN GRAVELED AREAS, PLACE A 4" THICK, 4' DIAMETER CONCRETE APRON AROUND CLEANOUT. SLOPE CONCRETE APRON AWAY FROM CLEANOUT @ 1"/FT.
2. MARK AS SHOWN ON DRAWING # VIII - 8. IF APPLICABLE.
3. ALL CLEANOUT MATERIAL SHALL BE SAME AS MAIN PIPE.

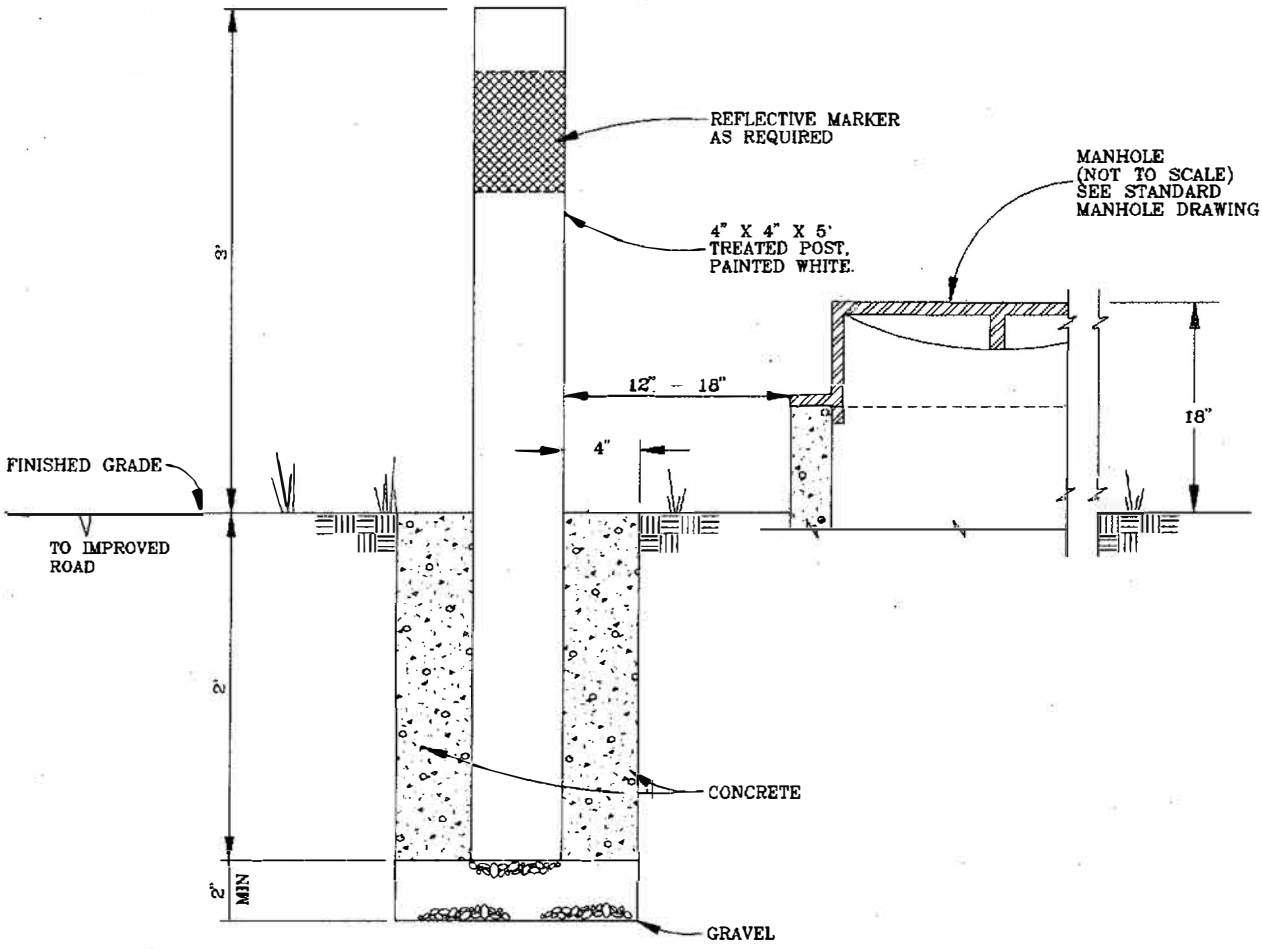
CITY OF TROUTDALE

CLEANOUT

DATE: UPDATED 1994

DRAWING NO. VIII - 7

FILENAME: APWA0052.DWG



MARKER POST AT MANHOLE OR CLEANOUT

GENERAL NOTES:

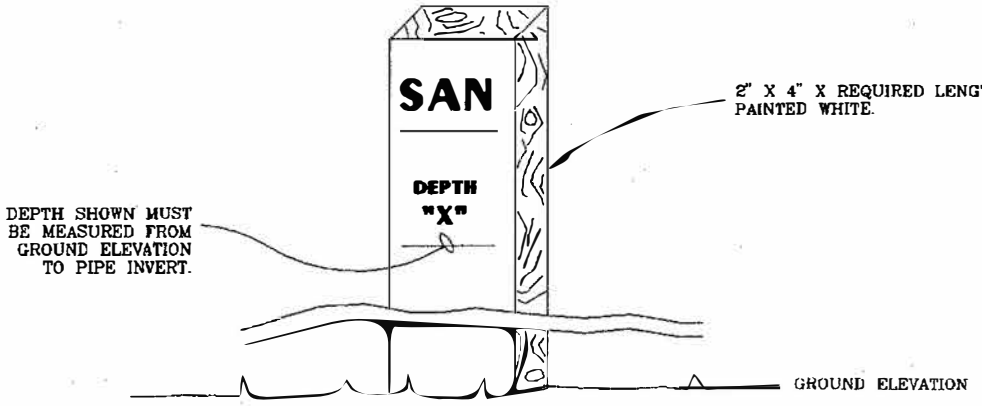
1. "ALL" MARKER POSTS SHALL BE SET IN CONCRETE, AS SHOWN.
2. POSTS SHALL BE PAINTED WHITE.
3. REQUIRED FOR "ALL" MANHOLES AND CLEANOUTS LOCATED IN OFF-SITE AREAS. EXCLUDES SHOULDERS OF ROADS.
4. INSTALL MARKER AS SHOWN, BETWEEN ROAD AND MANHOLE OR CLEANOUT.

CITY OF TROUTDALE

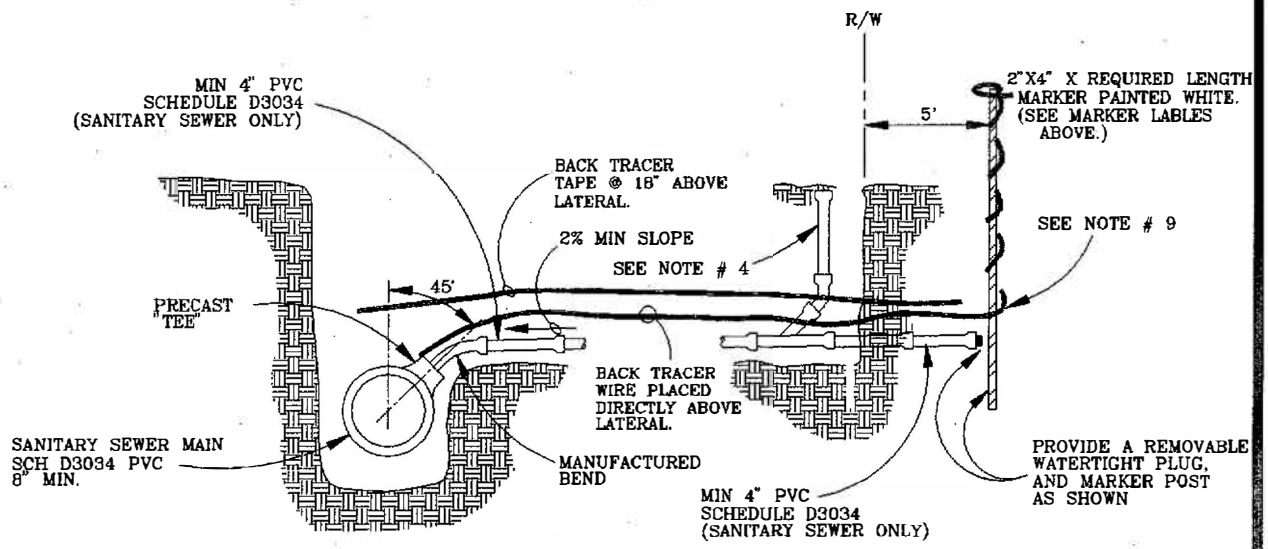
SANITARY & STORM, MANHOLES AND CLEANOUTS MARKER POST

DATE:	DRAWING NO.
UPDATED 1994	VIII - 8

FILENAME: APWA0025.DWG



2x4 MARKER LABELS



SHALLOW TRENCH SANITARY LATERAL.

GENERAL NOTES:

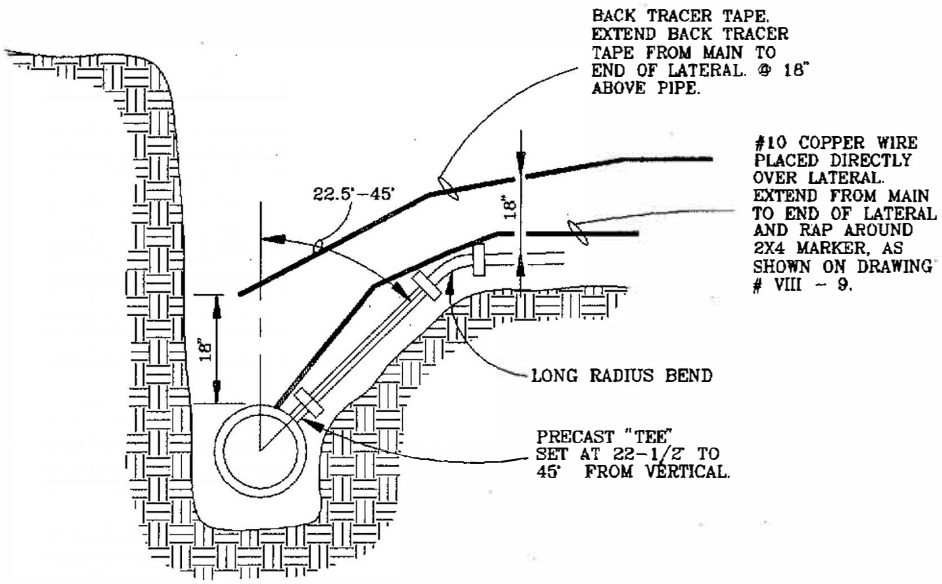
1. PIPE AND FITTINGS SHALL BE COMPATIBLE. ONLY MANUFACTURED FITTINGS SHALL BE USED.
2. MINIMUM DEPTH AT RIGHT-OF-WAY OR EASEMENT LINE SHALL BE 4'.
3. MARKER POSTS SHALL BE TREATED WOOD. POST SHALL BE 2" x 4" X REQUIRED LENGTH, FIR. POST TO EXTEND 24" MINIMUM ABOVE FINISH GRADE AND EXPOSED AREA SHALL BE PAINTED WHITE.
4. WHEN REQUIRED, A CLEANOUT SHALL BE INSTALLED @ 100' INTERVALS.
5. MARK ALL SANITARY LATERALS WITH A WHITE "SAN" (FOR SANITARY) ON FACE OF CURB WHERE LATERAL CROSSES CURB.
6. LATERALS SHALL NOT BE BACKFILLED PRIOR TO INSPECTION BY THE CITY.
7. VERTICAL DROP INTO SANITARY MAIN IS NOT PERMITTED.
8. FLAT "T'S" MUST BE APPROVED BY THE CITY.
9. INSTALL #10 TRACER COPPER WIRE DIRECTLY OVER LATERAL & RAP AROUND 2" X 4" MARKER AS SHOWN. TRACER TAPE MUST ALSO BE INSTALLED 18" ABOVE THE PIPE.

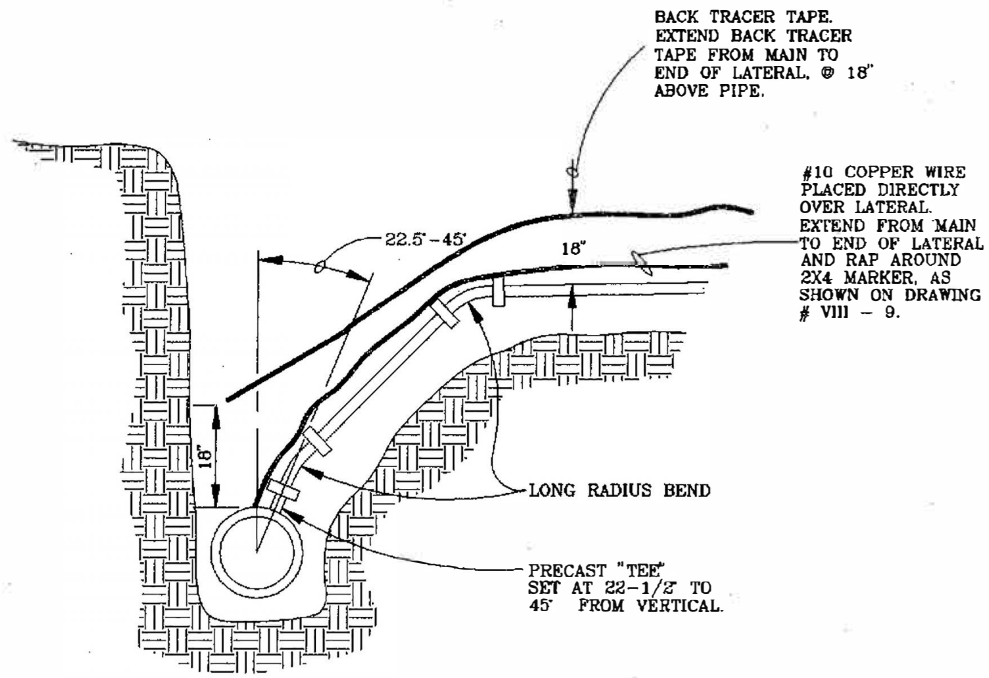
CITY OF TROUTDALE

SANITARY SEWER LATERAL AND MARKER (SHALLOW TRENCH)

DATE:	DRAWING NO.
UPDATED 1994	VIII – 9

FILENAME: APWA0126.DWG





GENERAL NOTES:

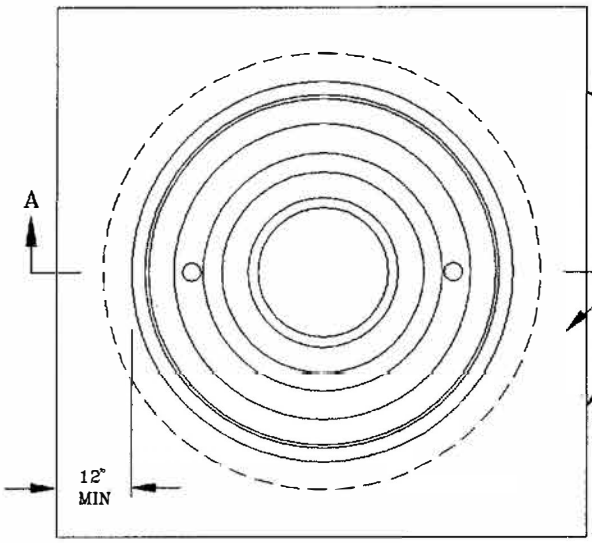
1. PIPE AND FITTINGS SHALL BE COMPATIBLE.
2. MINIMUM DEPTH AT RIGHT-OF-WAY OR EASEMENT LINE SHALL BE 4'.
3. PLUGGING, AND MARKING OF UNCONNECTED SERVICES SHALL CONFORM TO DRAWING # VIII - 9, SANITARY SEWER LATERAL AND MARKER (SHALLOW TRENCH)
4. SEE ADDITIONAL NOTES ON DRAWING VIII - 9 (SHALLOW TRENCH SERVICE) FOR DETAILS ON MARKER.

CITY OF TROUTDALE

SANITARY SEWER LATERAL (DEEP TRENCH)

DATE:	DRAWING NO.
UPDATED 1994	VIII - 10

FILENAME: APWA0127.DWG

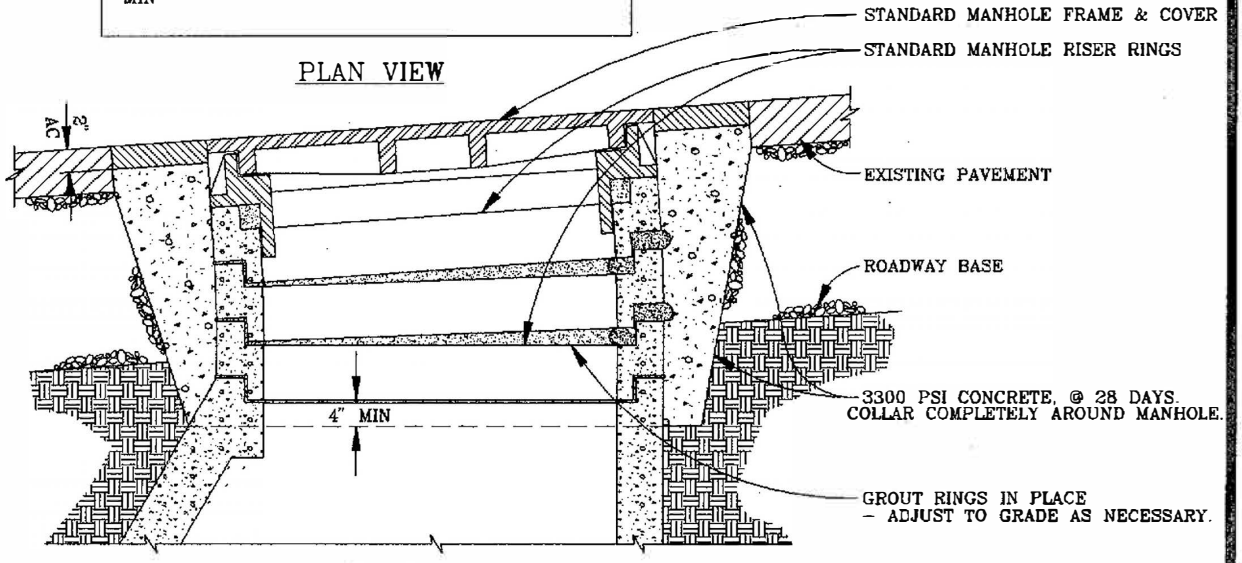


SAW CUT SQUARE AND REMOVE PAVEMENT 2' MIN. LARGER THAN MANHOLE FRAME DIMENSION.

REPLACE WITH 3" THICK CLASS "C" MIX A.C. OR CONCRETE AS REQUIRED BY CITY.

APPLY TACK COAT TO EDGES OF EXISTING PAVEMENT BEFORE INSTALLING PATCH. FINISH JOINT WITH ASPHALTIC SEAL AND SAND.

PLAN VIEW

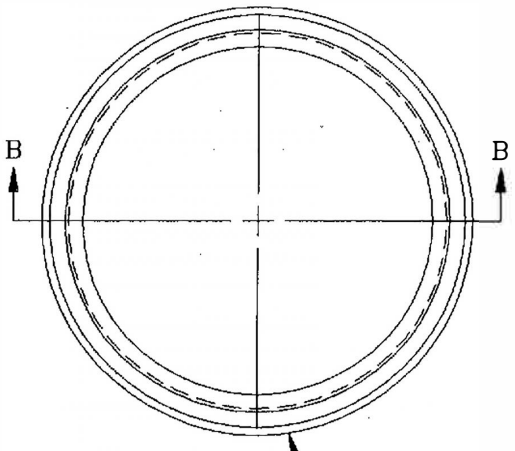


SECTION A–A

TYPICAL MANHOLE GRADE ADJUSTMENT IN STREET

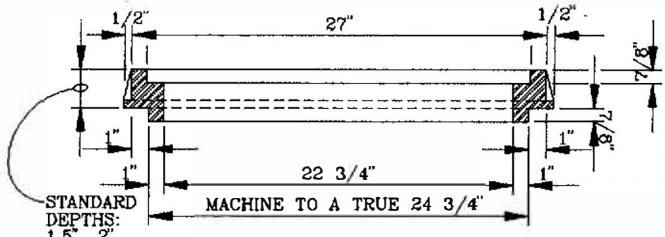
GENERAL NOTES:

1. 2 HOLE LIDS FOR SANITARY.
2. 16 HOLE LIDS FOR STORM.
3. TOTAL DEPTH OF RINGS SHALL NOT EXCEED 10".



MATERIAL SHALL BE ALUMINUM ALLOY 319.2, 356.2 OR A–380.

MANHOLE ADJUSTMENT RINGS FOR RESURFACING



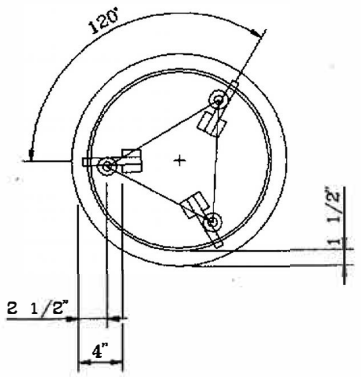
SECTION B–B

CITY OF TROUTDALE

MANHOLE RING ADJUSTMENTS (SANITARY & STORM)

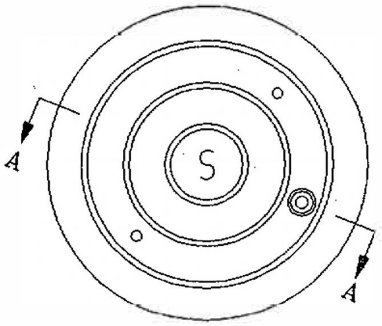
DATE:	DRAWING NO.
UPDATED 1994	VIII – 11

FILENAME: APWA0026.DWG

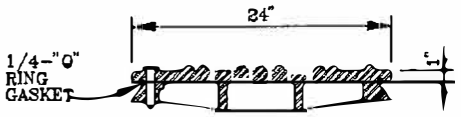


GENERAL:
BOLTS TO BE FURNISHED WITH STANDARD HEX-HEAD NUTS & COTTER KEYS. COVER AND RING TO BE MACHINED TO A TRUE BEARING AT CONTACT POINTS.

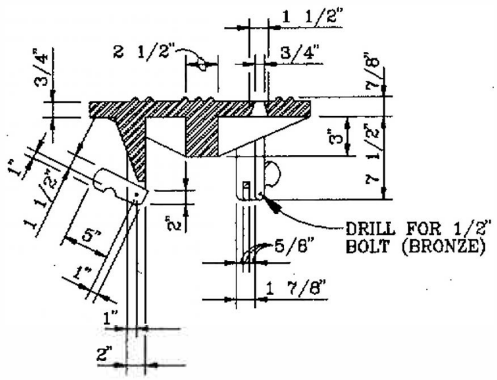
PLAN VIEW



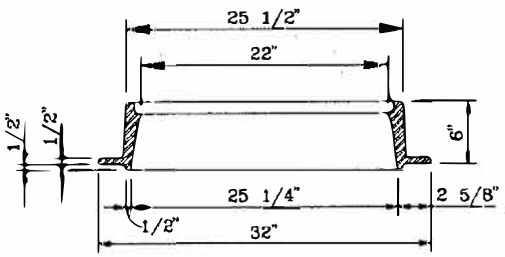
PLAN VIEW



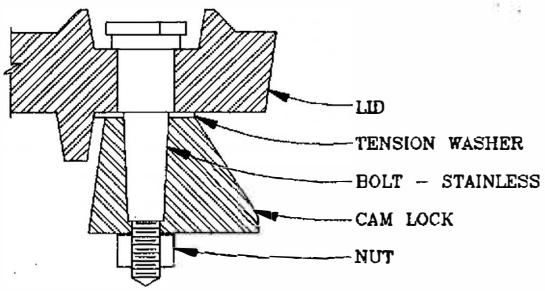
COVER SECTION



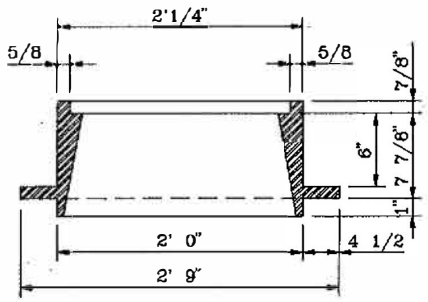
COVER SECTION



SECTION A-A



CAM-LOCK ASSEMBLY



FRAME SECTION

STANDARD CAM-LOCK CAST IRON FRAME AND COVER

STANDARD CAM-LOCK ALUMINUM FRAME AND COVER
(SANITARY AND STORM)

GENERAL NOTES:

1. CITY WILL DETERMINE WHEN THESE LIDS WILL BE REQUIRED, ON A "PER PROJECT" BASIS.

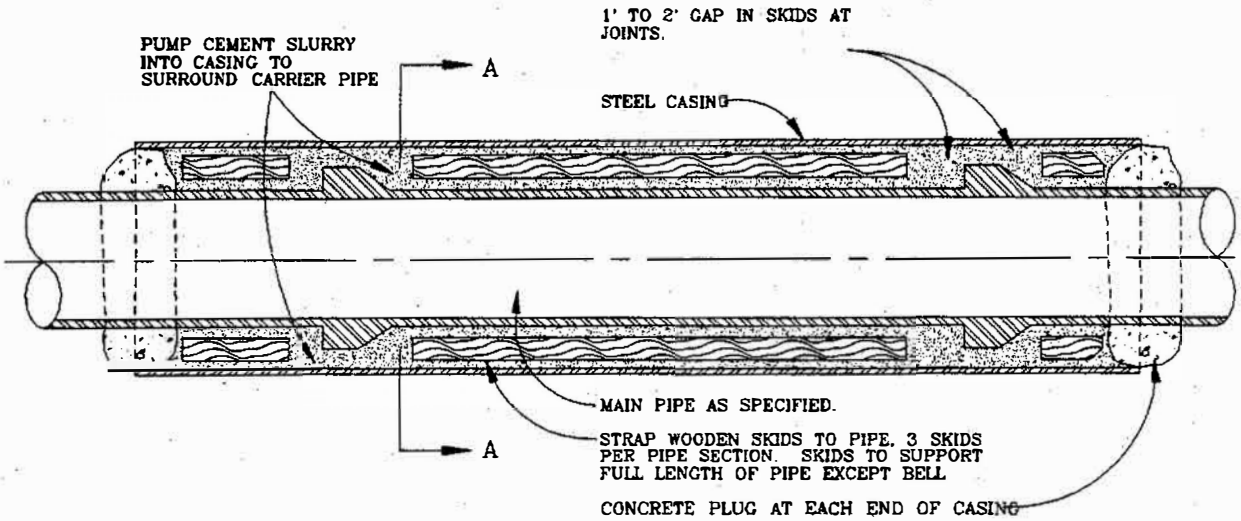
CITY OF TROUTDALE

CAM-LOCK MANHOLE COVER AND FRAME DETAILS (CAST IRON AND ALUMINUM)

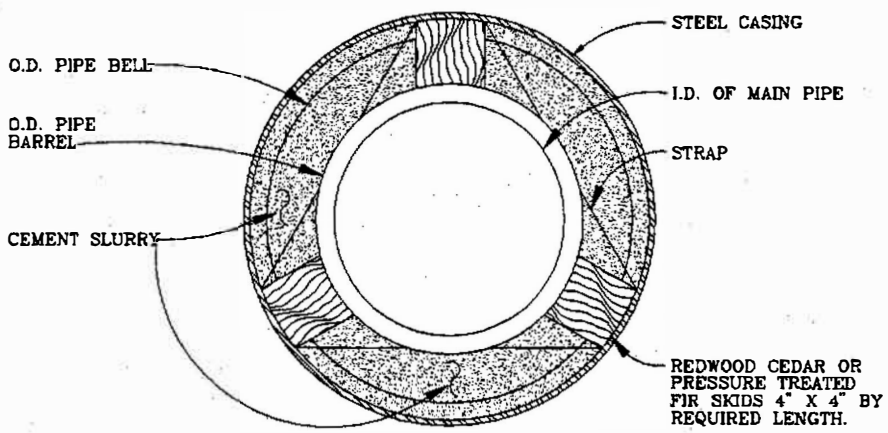
DATE: UPDATED 1994

DRAWING NO. VIII - 12

FILENAME: APWA005S.DWG



PLAN



SECTION A-A

GENERAL NOTES:

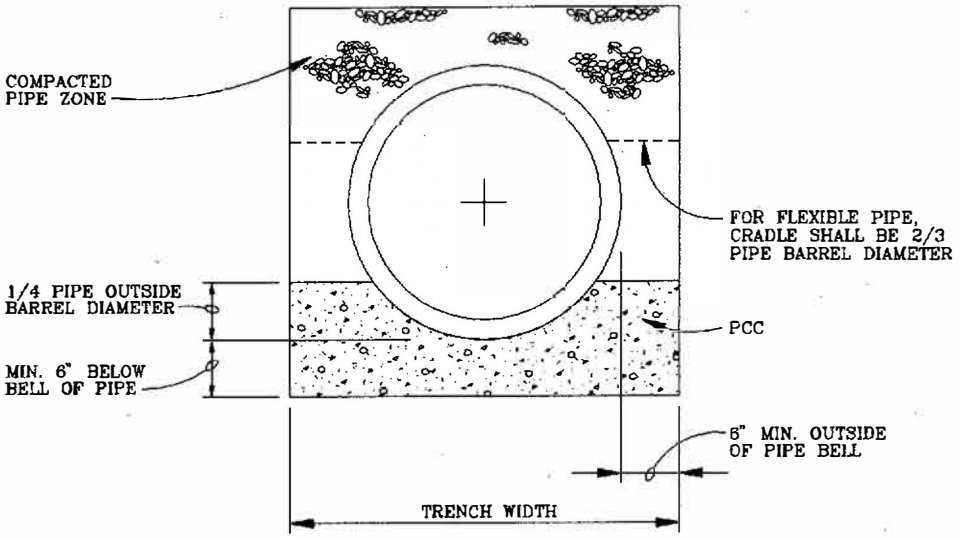
1. PLUG ENDS OF CASING WITH CONCRETE, AS SHOWN.
2. A LOCATE REQUEST FOR ALL PUBLIC AND PRIVATE UTILITIES IS REQUIRED PRIOR TO BORE.
3. ALL INSTALLATIONS MUST BE WITNESSED BY CITY FORCES.

CITY OF TROUTDALE

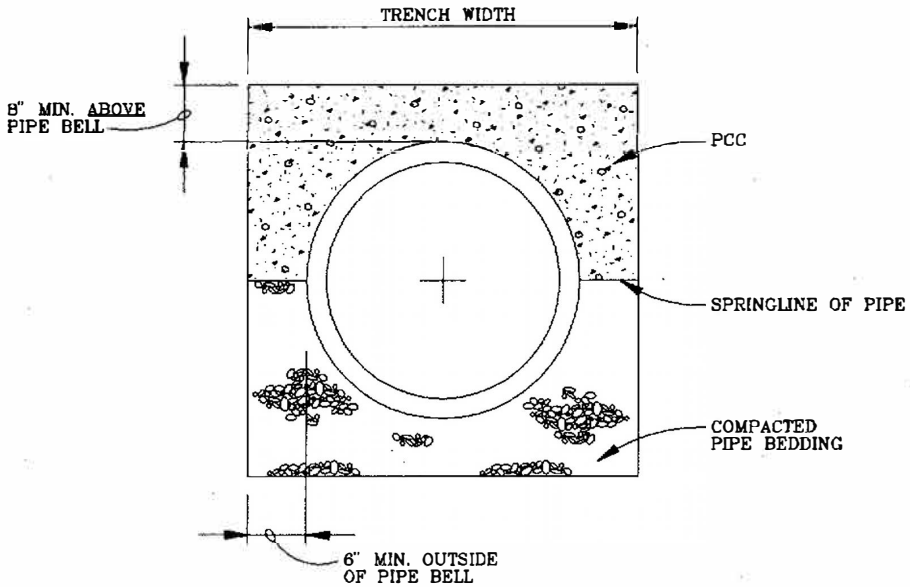
BORE CASING DETAIL

DATE:	DRAWING NO.
UPDATED 1994	VIII - 13

FILENAME: APWA0022.DWG



ENCASEMENT DETAIL



CAP DETAIL

GENERAL NOTES:

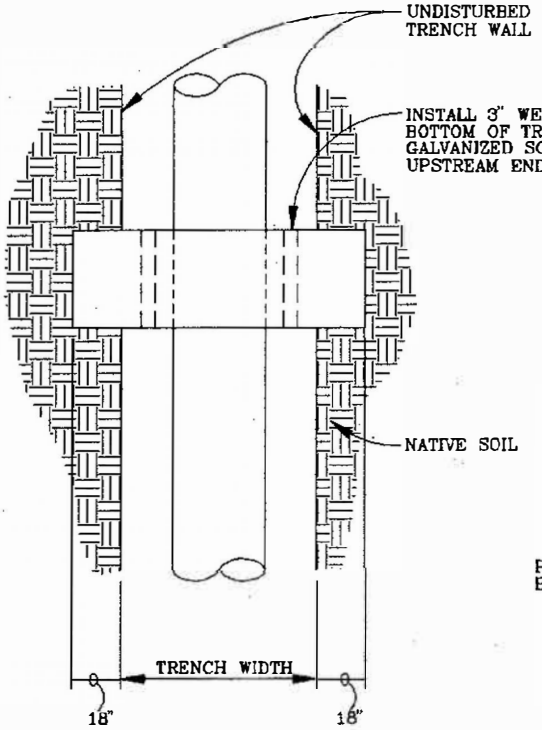
1. CONCRETE SHALL BE 3000 PSI, @ 28 DAYS.
2. CITY TO DETERMINE WHEN REQUIRED, ON A "PER PROJECT" BASIS.
3. APPLIES TO SANITARY, STORM AND WATER MAINS.

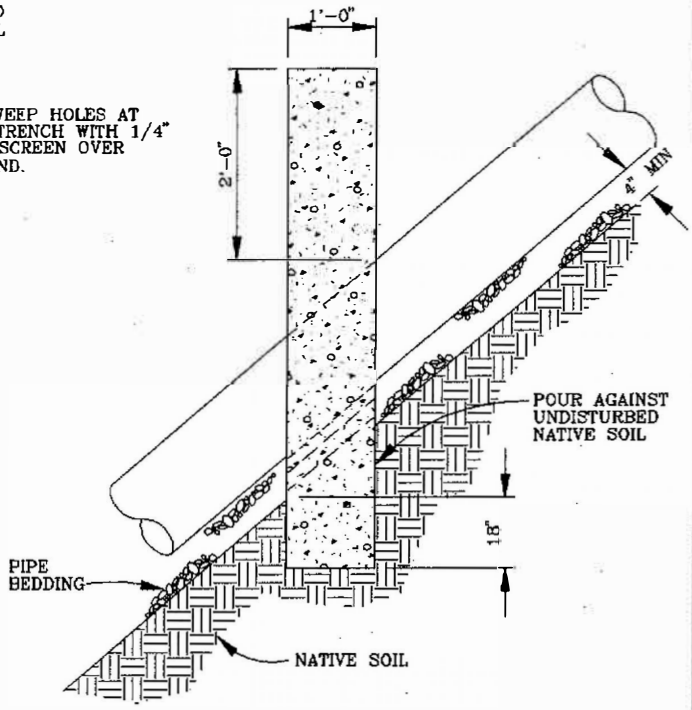
CITY OF TROUTDALE

CONCRETE CRADLE AND CAP DETAILS

DATE:	DRAWING NO.
UPDATED 1994	VIII – 14

FILENAME: APWA0016.DWG





GENERAL NOTES:

1. CONCRETE ANCHOR WALLS (3300 PSI, @ 28 DAYS) SHALL BE CONSTRUCTED USING FORMS WHEN SEWERS, STORM DRAINS, AND OTHER PIPELINES ARE CONSTRUCTED WITH SLOPES 20 PERCENT OR GREATER. REMOVE FORMS PRIOR TO BACKFILLING TRENCH.
2. SPACING OF ANCHOR WALLS SHALL BE:

SLOPE:	SPACING:
20-34%	35 FEET
35-50%	25 FEET
50+ %	15 FEET OR CONCRETE ENCASEMENT

3. VISUAL INSPECTION BY CITY FORCES IS REQUIRED PRIOR TO BACKFILLING.
4. APPLIES TO WATER, STORM AND SEWER MAINS.

CITY OF TROUTDALE

PIPE ANCHOR DETAIL

DATE:	DRAWING NO.
UPDATED 1994	VIII – 15

FILENAME: APWA0017.DWG