

DIVISION 2: SITE WORK

SECTION 2A: STORM AND SANITARY SEWERS

2A-01 GENERAL:

- a. GENERAL CONDITIONS AND GENERAL REQUIREMENTS listed in Index to Specifications apply to work under this Section.

2A-02 SCOPE:

- a. The work under this section includes the furnishing of all labor, materials and equipment necessary to install storm sewer lines, sanitary sewers, and related work outside of 5 feet from building line, all as indicated on the Drawings, or as specified herein.
- b. The Contractor shall obtain any permits required for the installation of piping under street areas or connected to municipal or other systems. See Section WATER LINES for connection charges to be paid by Owner directly. The material and installation of piping in these areas shall, in addition to the requirements contained herein, comply with all requirements of the appropriate governmental agencies.

2A-03 MATERIALS

- a. CONCRETE SEWER PIPE: Non-reinforced concrete sewer pipe conforming to ASTM C14 with rubber rings, or where indicated, reinforced concrete sewer pipe conforming to ASTM C76, Class IV with rubber ring joints. Rubber gaskets shall conform to ASTM C443 and C361.
- b. CATCH BASINS: Precast concrete, bituminous coated steel, or approved equal, complying with City of Portland Standards and subject to approval of the Architect.
- c. MANHOLES: Standard precast concrete with mortar joints and poured concrete bases as per ASTM C478 and APWA 2.06 with all appurtenances, complying with City of Portland Standards and subject to approval of the Architect.
- d. MANHOLE FRAMES AND COVERS: Cast iron as per ASTM A 48, 24-inch diameter. City of Portland Standard for Highway loading.

2A-04 WORKMANSHIP

- a. EXCAVATION AND BEDDING: The width and depth of the excavated trench shall be sufficient to permit installation of the pipe at the location and elevations shown on the Drawings. The trench size shall be sufficient to permit proper inspection of the pipe and proper compacting of backfill materials around the pipe. Pipe bedding shall be Class C, Ordinary Bedding. Bed pipe with care in a foundation formed in the trench bottom by a shaped excavation which will fit the pipe barrel with reasonable closeness for a width of at least 50% of the outside pipe diameter, excavate to receive bells, backfill as specified. OR, at the Contractor's option, may be Class B, First Class Bedding (Shaped Bedding with tamped backfill): Shape bottom of trench with a

radius of at least 2-inches greater than the pipe outside radius with sufficient width to permit 6/10 of the width of the pipe barrel to be bedded in fine granular fill placed in the shaped bottom, backfill as specified.

Excavating of earth material below the finished grade of the bottom of the pipe shall be avoided as far as possible. When excavations do extend deeper, the additional depth shall be backfilled with suitable material and the backfill thoroughly compacted by mechanical tampers before the pipe is placed.

- b. PIPE LAYING: The laying of the pipe shall be commenced at the lowest point in the sewer grade, the sections being placed so that the spigot ends point in the direction of the flow. The sections shall be lowered into the trench carefully and shall be set firmly to the lines and grade with joints closely and accurately fitted. All pipe and laying work including bedding and jointing shall be done by experienced workmen and shall follow good standard practice for this type of work. The completed pipe shall meet with the requirements of applicable codes. All dead ends of sewers and branches shall be closed with approved stoppers and securely cemented in place. Provide clean-outs at all changes in direction. Connections to sewers, manholes, catch basins, inlets, and other structures shall be made in accordance with the plans, and as directed by the Engineer, subject to conformance with applicable agency standards. In each case, the work shall be done in accordance with the best sewer construction practices. There shall be no projection of the sewer beyond the inside wall line of the sewer or structures with which the connection is made.
- c. BACKFILLING: The backfill materials shall be placed in layers as required to achieve the compaction specified, but in no case greater than 8-inches. The first layers shall be carefully but solidly rammed and tamped into the spaces around the pipe, care being exercised to avoid any displacement of the pipe. Subsequent layers shall each be solidly compacted by tamping. Backfill materials may be the excavated site materials when approved, or other approved equivalent materials and shall be at the proper moisture content to achieve specified compaction. All backfill shall be compacted to a minimum of 95% of maximum density at optimum moisture content as determined by AASHTO Standard Test T180. Any materials not meeting specified compaction shall be recompacted or removed and properly replaced at the Contractor's expense. Puddling of backfill will not be allowed
- d. TESTS: Furnish all necessary labor, materials and equipment for testing and proving tight all sewer lines. Repair or replace an equipment, materials, piping and workmanship found to be defective and unsatisfactory. Test all piping in as large a section as possible before covering or concealing. Test sewer lines by filling with water to the top of the highest point on the line and allow water to stand for one hour. No lowering of the water level will be permitted. Notify the Architect when tests are to be conducted.

FREIGHTLINER
74-53, 12/16/74 , rev. 12/18/74
2A-2
End

SECTION 2B: WATER LINES

2B-01 GENERAL:

- a. GENERAL CONDITIONS AND GENERAL REQUIREMENTS listed in Index to Specifications apply to work under this Section.

2B-02 SCOPE:

- a. Provide all labor, materials and equipment necessary to complete all work in connection with water lines and related appurtenances beyond 5 feet from the building line, all as shown on the drawings and/or as specified herein.
- b. The Contractor shall obtain any permits required for the installation of piping to municipal systems. Materials and installation of piping in these areas shall, in addition to the requirements herein, comply with all requirements of the governmental agency having jurisdiction.
- c. The Contractor shall make application with the City of Portland Water Bureau and pay all permit fees for the installation of water service. Owner will pay connection fee and city installation charges directly to City of Portland. See note on drawings.

2B-03 MATERIALS

- a. PIPE 3 INCHES AND SMALLER: Schedule 40 galvanized steel pipe, conforming to ASTM A120, with screwed fittings conforming to ANSI E-16.3.
- b. PIPE LARGER THAN 3 INCHES: Cast iron, Federal Specification WW-P-421, Class 150, OR Ductile Iron, AWWA C-151, Class 3 with mechanical joints, push-on joints or flanged joints. Rubber rings - Garlock 22 or equal.
- c. GATE VALVES: AWWA C-500, 150 psi minimum water working pressure, as per APWA 75-2 with graphite ring packing.
- d. VALVE BOXES: AWWA C-600, Section 10.3, as per APWA 75-3 with "Water" stamped on cover.
- e. FIRE HYDRANTS: AWWA C-502 with 6 inch inlet, one 4-1/2 inch pumper connection and two 2-1/2 inch hose connections as per Portland Fire Bureau Standards. Pacific Coast States Model 2 or approved equal.
- f. WATER METER: Hersey Bronze case compound meter model MFM-CT or approved equal.
- g. DOUBLE CHECKS: Hersey No. 1 double check valves or approved equal assembled with gate valves on each end.

- h. Miscellaneous fittings and appurtenances shall be of same quality as above specified items.

2B-04 WORKMANSHIP:

- a. PIPE LAYING: The width and depth of the excavated trench shall be sufficient to permit proper installation of the pipe at the locations and elevations shown on the drawings or as required. The trench size shall be sufficient to permit proper inspection of the pipe and proper compacting of backfill materials around the pipe. All pipe laying work including bedding and jointing shall be performed by experienced workmen and shall follow good and standard practice for this type of work. The completed pipe shall meet the requirements of the applicable codes. At changes in direction, provide thrust blocks of poured concrete as required to prevent separation. Pipe shall have a minimum cover of 2 feet.
- b. BACKFILLING: The backfill materials shall be placed in layers as required to achieve the compaction specified, but in no case greater than 8 inches. The first layers shall be carefully but solidly rammed and tamped into the spaces around the pipe, care being exercised to avoid any displacement of the pipe. Subsequent layers shall each be solidly compacted by tamping. Backfill materials may be the excavated site materials when approved or other approved equivalent materials and shall be at the proper moisture content to achieve specified compaction. All backfill shall be compacted to a minimum of 95% of maximum density at optimum moisture content as determined by AASHO Standard Test T180. Any materials not meeting specified compaction shall be recompacted, removed and properly replaced at the Contractor's expense. Puddling of backfill will not be allowed.
- c. TESTING: Provide all necessary labor, materials and equipment for testing and proving tight all water lines. Repair or replace any equipment, materials, piping and workmanship found to be defective and unsatisfactory. Test all piping in as large a section as possible before covering or concealing. Test all water lines at 150 psi with water under pump pressure with all air eliminated from the system. Maintain the above stated pressure for four hours with no pressure loss. Notify the Engineer 48 hours in advance when tests are to be conducted.

FREIGHTLINER
74-53, 12/13/74, rev. 12/18/74
2B-2
End



PETERSON ASSOCIATED ENGINEERS • INC.

N.W. TOILET ROOM WATER CALC. PRELIMINARY

6	WATER CLOSETS	@	10 FU	=	60 FU
3	URINALS	@	5 FU	=	15 FU
6	LAVATORIES	@	1 1/2 FU	=	9 FU
1	DRINK FOUNTAIN	@	1 FU	=	1 FU
1	SERVICE SINK	@	2 1/2 FU	=	2 1/2 FU
					<u>87 1/2 FU</u>

S.E. TOILET ROOM

6	WATER CLOSET	@	10 FU	=	60 FU
3	URINALS	@	5 FU	=	15 FU
6	LAVATORIES	@	1 1/2 FU	=	9 FU
1	DRINK FOUNTAIN	@	1 FU	=	1 FU
1	SERVICE SINK	@	2 1/2 FU	=	2 1/2 FU
					<u>87 1/2 FU</u>

SE TOILET = 87 1/2 FU

NW TOILET = 87 1/2 FU

175 FU

175 FU X 3 FLOORS = 525 FU = 150 G.P.M.
 used conversion chart page 7-3 1974 ASPE Data Book

use fairly Rough Pipe chart Page 7-25 1974 ASPE Data Book

150 GPM = 4"

GENERAL CALCULATIONS

Building Freightliner - Portland

Area _____

Sheet 1 of 1Date Dec. 2, 1979By Del Chk'd _____



Storm drain

Start at column on N.W. corner of H.W. Start well
163' to point of connect with site storm drain
begin 18" below floor at invert 31'-0"

$$163 \times .01 = 1.63'$$

$$.01 = 1/8" / FT$$

$$\begin{array}{r} 31.00 \\ 1.63 \\ \hline 29.37 \end{array}$$

$$163 \times .021 (1/4" / FT) = 3.42$$

$$31.00$$

$$3.42$$

$$27.58$$

TOTAL Roof Area = 33,412 sq ft

$$\frac{33,412 \times .083 (1" RAINFALL)}{3600} = .77 \text{ C.F.S.}$$

GENERAL CALCULATIONS

Building Freightliner - Portland
Area _____

Sheet 1 of 1
Date Dec 2 1974
By Del Chk'd _____



SE & N.W. TOILET ROOM PRELIMINARY WASTE CALC.

6 W.C.	@	6 FU	=	36 FU
3 URIN	@	3 FU	=	9 FU
6 LAV	@	1 FU	=	6 FU
1 D.F.	@	1 FU	=	1 FU
1 S.S.	@	3 FU	=	3 FU
				<u>55 FU</u>

6 TOILETS X 55 FU = 330 FU TOTAL FOR
BLDG

3 TOILETS X 55 FU = 165 FU TOTAL EACH
RISER

GENERAL CALCULATIONS

Building Freightliner - Roath

Area _____

Sheet 1 of 1Date Dec 3 74By Del Chk'd _____

GENERAL NOTES

1. Connection to 16" water main, 6" CIP to meter vault, meter vault with cover, and installation of meter to be done by City of Portland Water Bureau and paid for by Owner. Meter to be purchased by contractor and supplied to Water Bureau for testing and installation. The precast meter vault to be approximately 8'-0" x 12'-0" i.d. in plan and 6'-0" deep with a standard 24" x 36" galvanized steel meter box cover.
2. Contractor to provide all labor and material beyond the Water Bureau stub out as detailed on plans or specified. The check valve vault and cover to be similar in size and material to the meter vault.
3. Extend 2-3" P.V.C. conduits as shown. Bury 30" below existing grade. If the telco manhole is in place near the property line, coordinate the connection to their manhole. If manhole is not there stop conduit at property line and plug. Compact backfill to 90%. Plug ends of conduit.
4. Extend 2-3" P.V.C. conduit from building to the primary splice vault. Bury 48" and provide yellow plastic tape 8" wide and 12" above the conduit. Compact backfill to 90%. Coordinate connection to the splice vault with power company. Plug ends of conduit.
5. Any excavated material rejected for backfill by the inspection agency or engineer and excess material shall be spoiled in the area shown on plan.

Bdry. Data
 $\Delta = 14^\circ 14' 11''$
 $R = 674.06'$
 $T = 84.18'$
 $CH = 167.05'$
 $L = 167.48'$
 $CB = N 77^\circ 15' 45'' W$

Bdry. Data
 $\Delta = 31^\circ 47' 50''$
 $R = 516.96'$
 $T = 147.25'$
 $CH = 289.23'$
 $L = 286.90'$
 $CB = N 68^\circ 26' 30'' W$

NOTE:
 Contractor may at his option provide a 15" C.S.P. @ 3'-0" between M.H. 1 & M.H. 2, with a drop type manhole @ M.H. 2. See Detail 2-02.

Coordinate crossing with P.G.E.

LEGEND

- Edge Existing Pavement
 - Existing Grade Elevation
 - C.I.P. Cast Iron Pipe
 - C.S.P. Concrete Sewer Pipe
 - M.H. Manhole
 - C.B. Catch Basin
 - F.H. Fire Hydrant
 - I.E. Invert Elevation
 - Existing Lines
 - New Lines
 - Property Line
 - C.O. Clean Out
 - W. Water
 - San. S. Sanitary Sewer
 - St. S. Storm Sewer
- Datum: All Elevations shown are on Port of Portland Swan Island Datum. Subtract 3.16 ft. from City of Portland Datum to obtain Port of Portland Swan Island Datum.

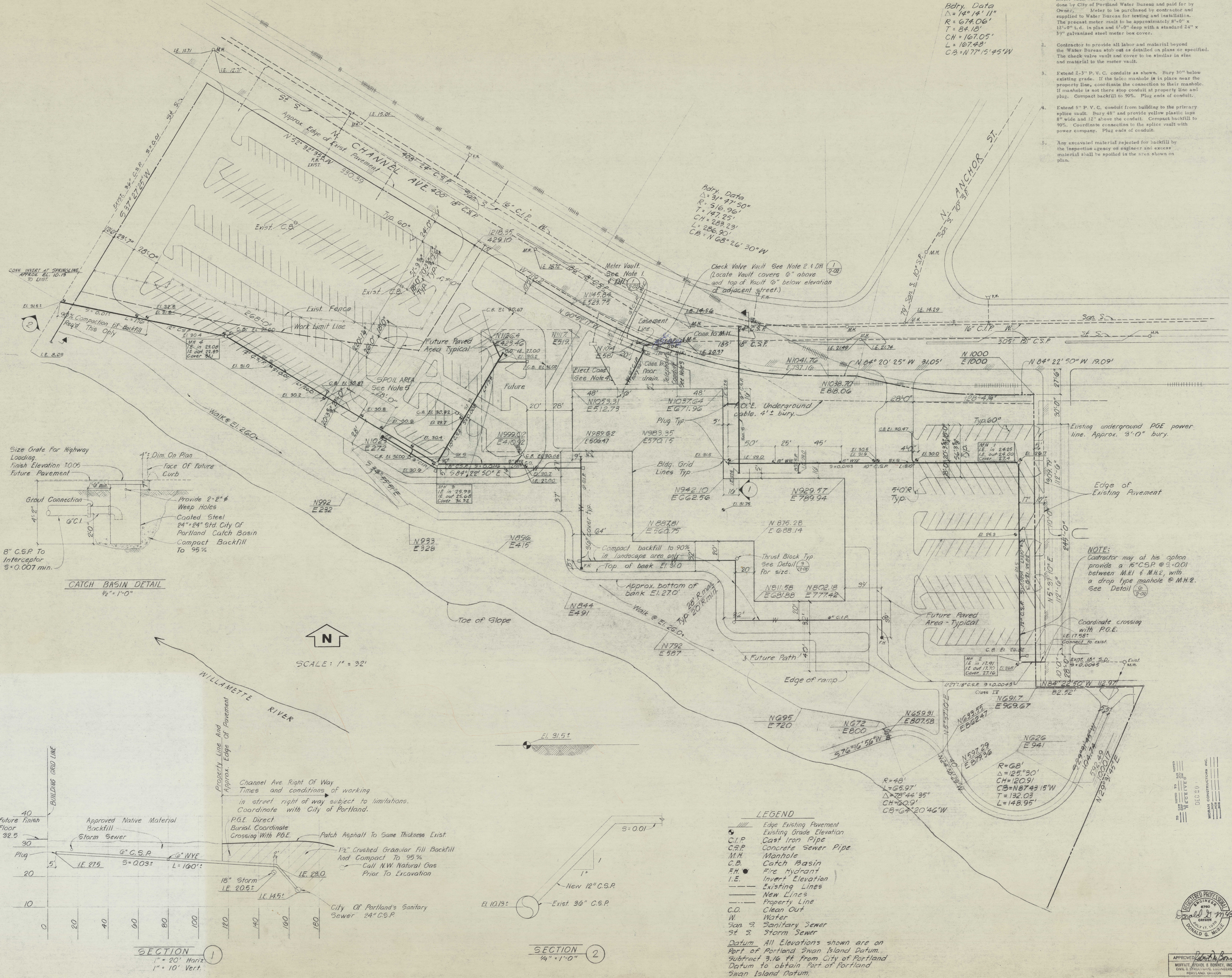
Rudat, Boutwell and Partners 821 Northwest Flanders Street / Portland, Oregon

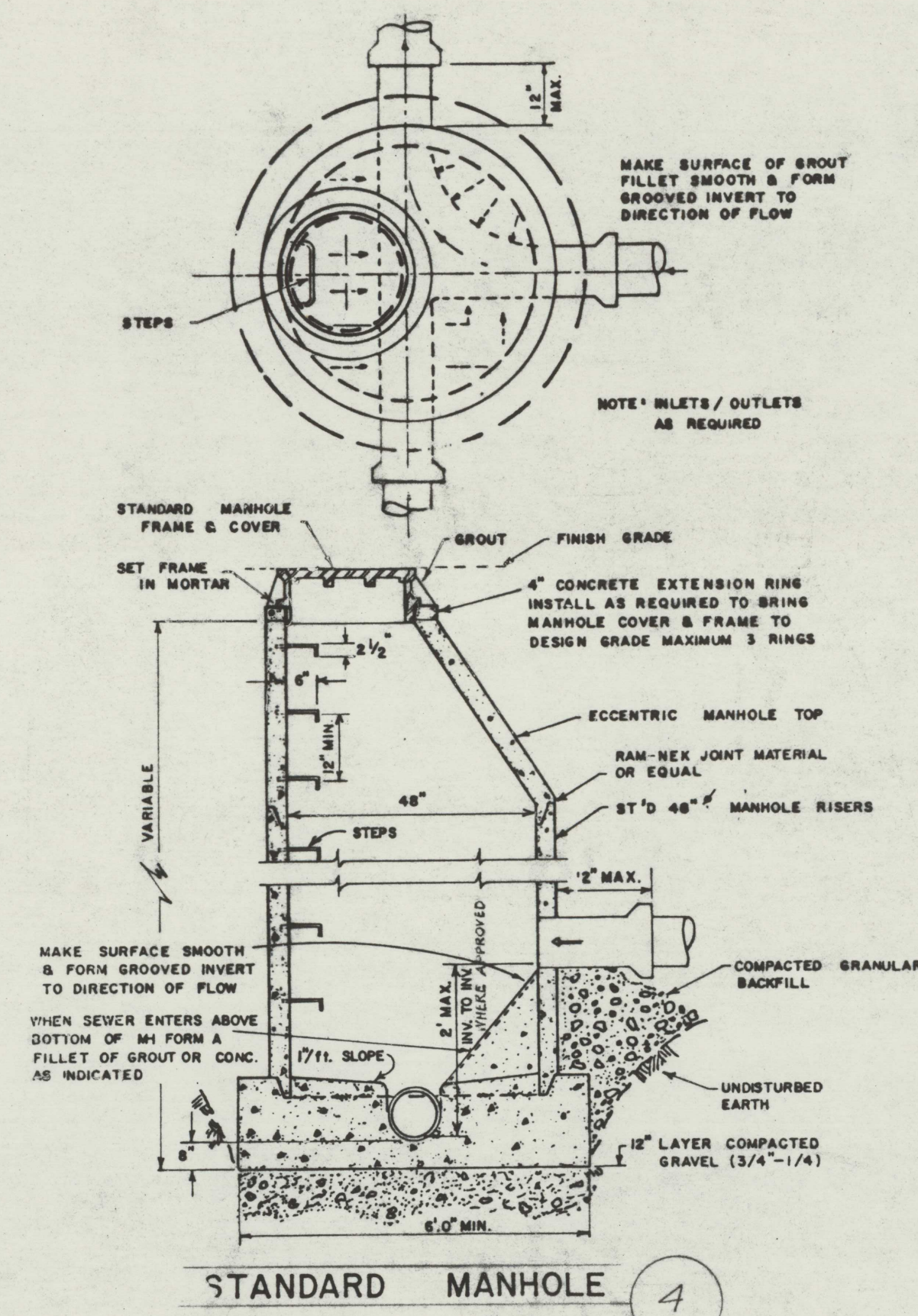
Freightliner
 Corporate Headquarters

Utility Plan

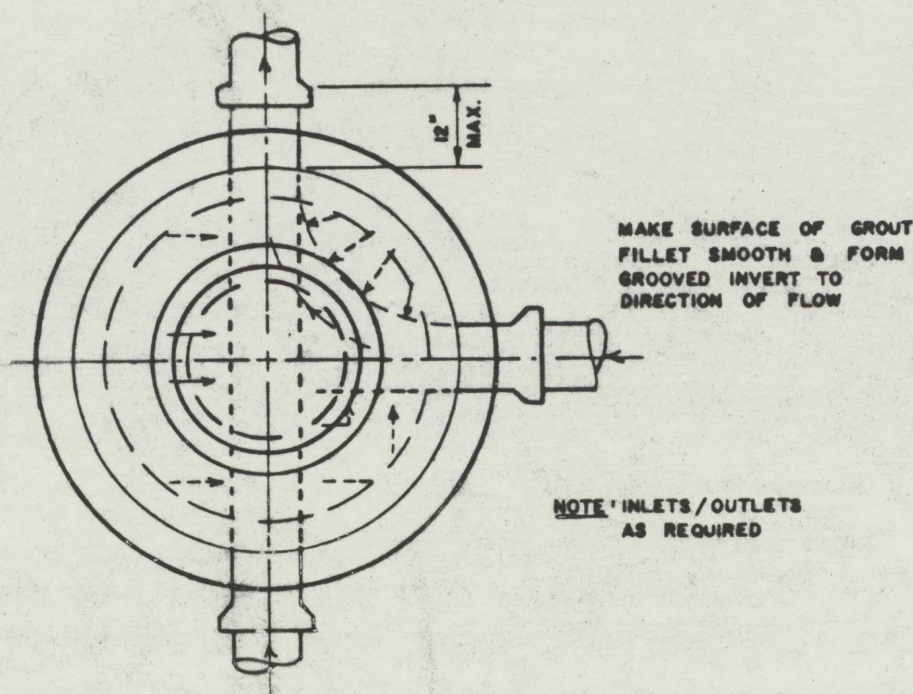
Dec 19 1974

C2
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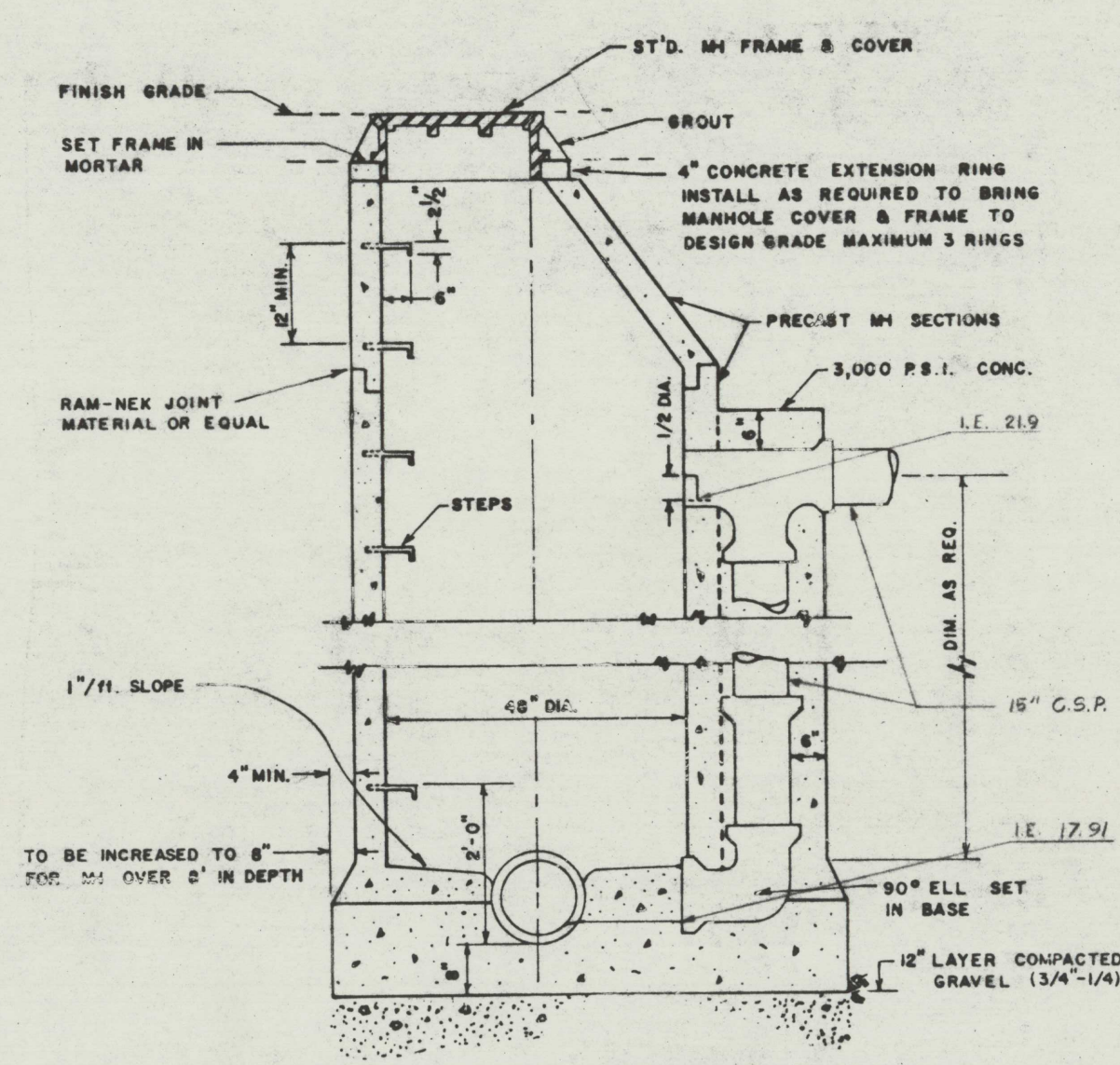




STANDARD MANHOLE 4

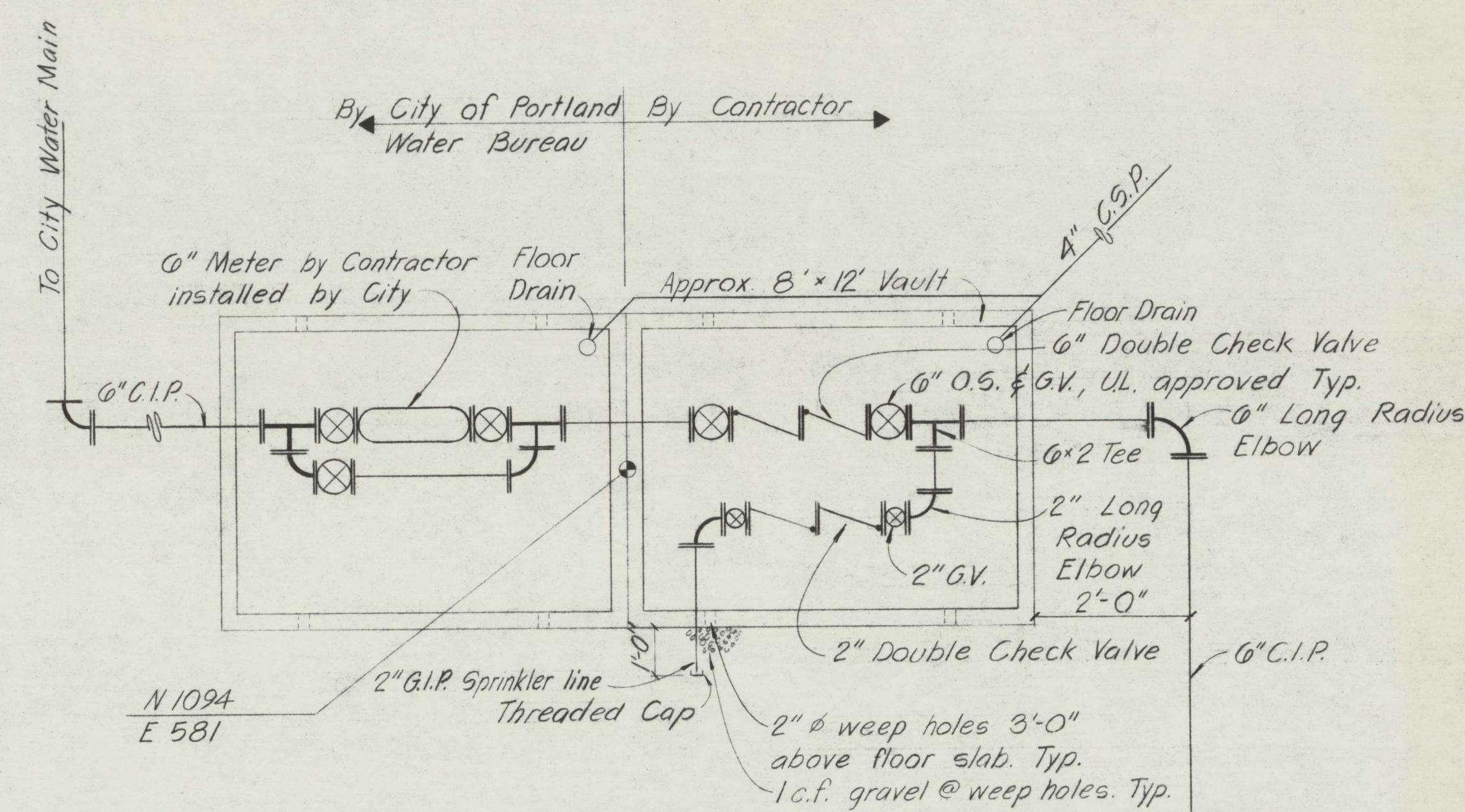


STANDARD SHALLOW MANHOLE 5

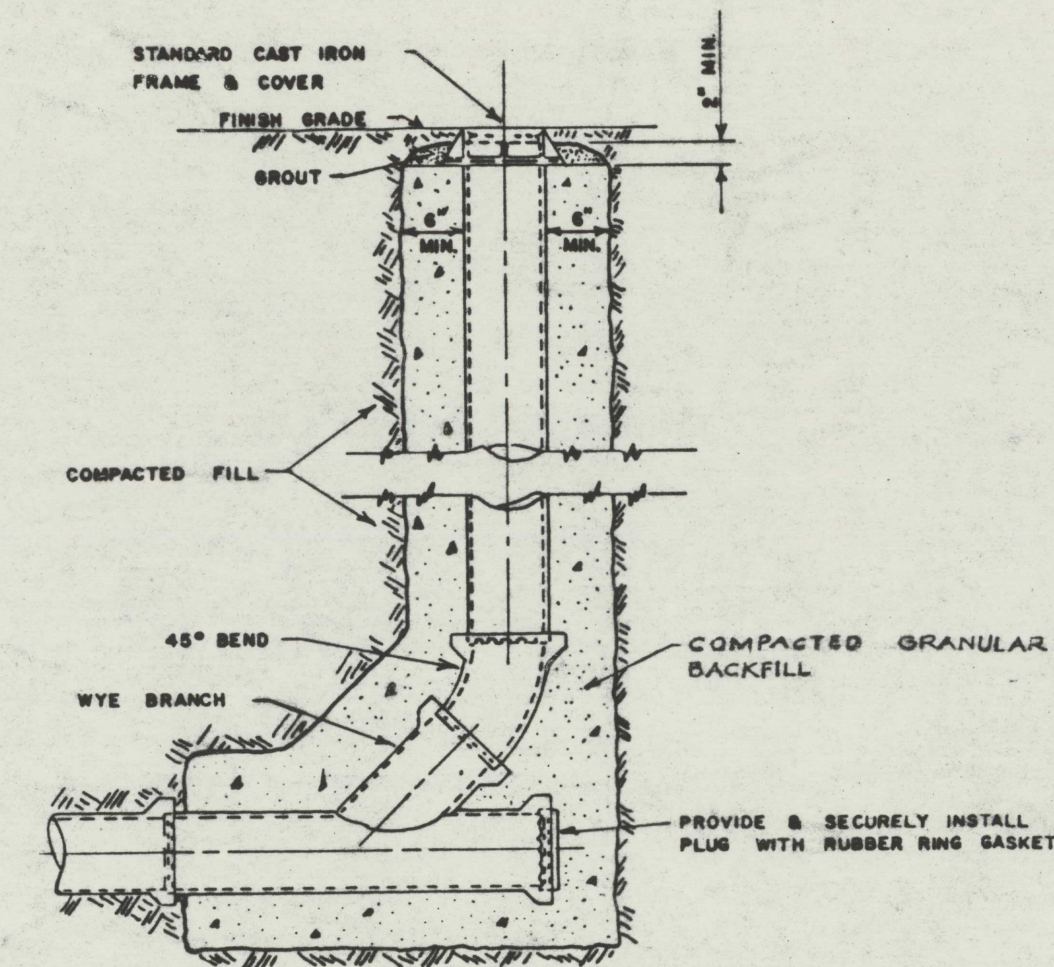


DROP MANHOLE DETAIL 6

NOTE: Drop Manhole contractors option in lieu of full depth line between M.H.1 and M.H.2



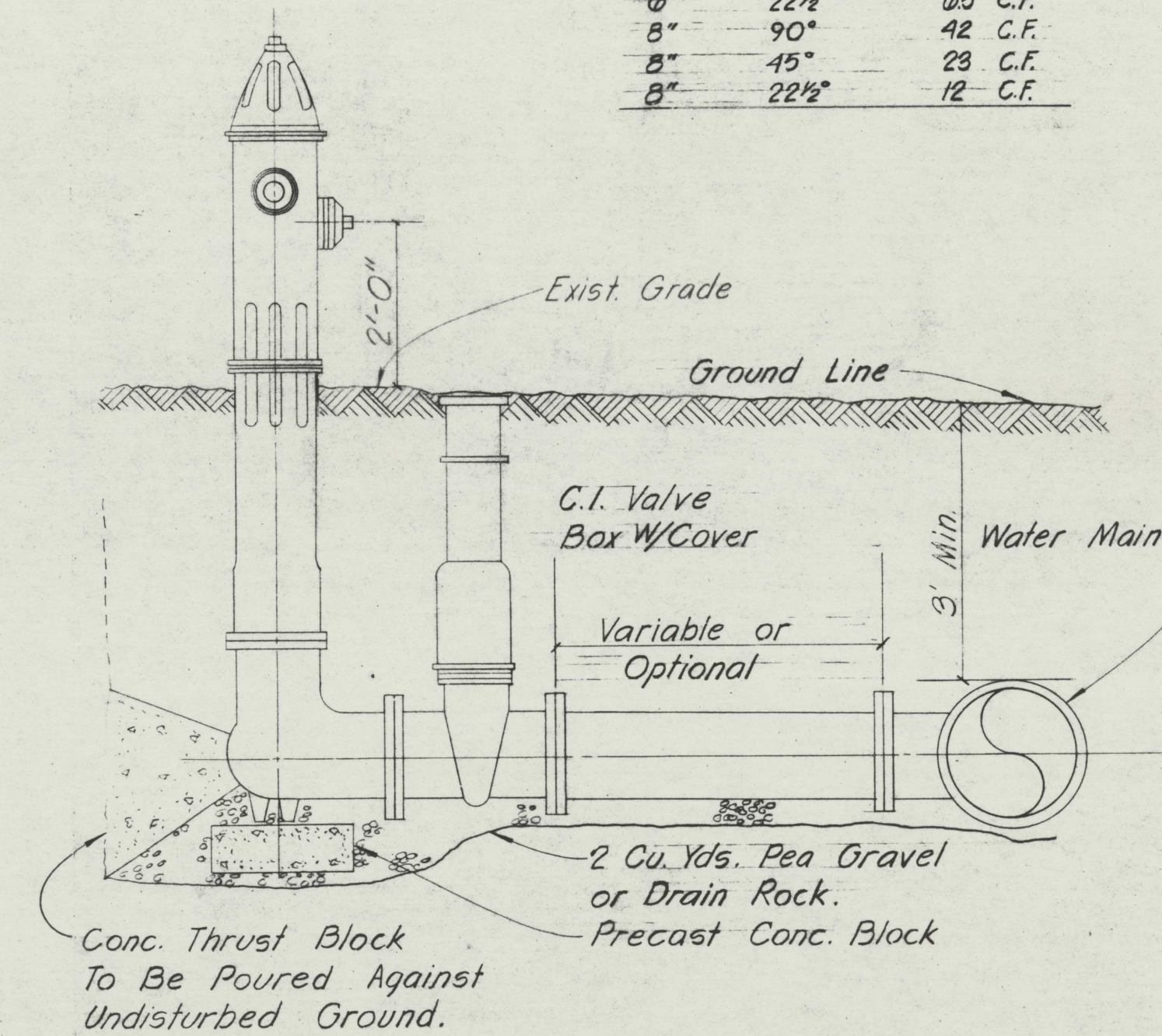
METER AND CHECK VALVE VAULTS 1 No Scale



STANDARD CLEAN OUT 2

FIRE LINE CONC. THRUST BLOCK REQUIREMENTS

Pipe Size	Bend Angle	Conc. Volume Required
6"	90°	24 C.F.
6"	45°	19 C.F.
6"	22 1/2°	65 C.F.
8"	90°	42 C.F.
8"	45°	28 C.F.
8"	22 1/2°	12 C.F.



FIRE HYDRANT DETAIL 3 No Scale

NOTED TO: RECEIVED BY: DATE: 12/20/1974

REGISTERED PROFESSIONAL ENGINEER DONALD G. MABLE

APPROVED: [Signature] MOFFATT, MICHAEL & BONNEY, INC. CIVIL & STRUCTURAL ENGINEERS PORTLAND, OREGON

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Freightliner Corporate Headquarters

Details

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