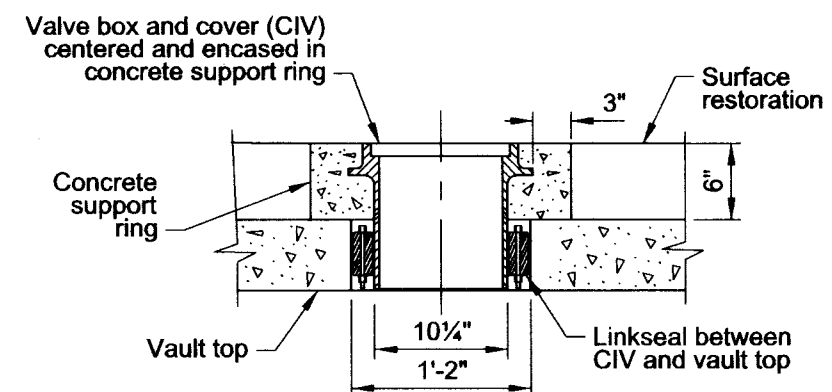
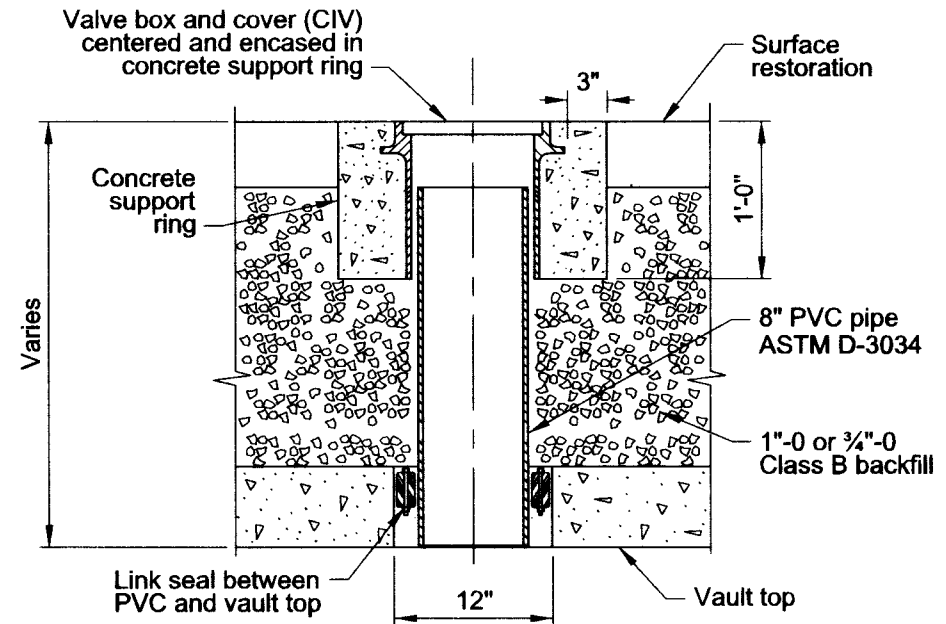


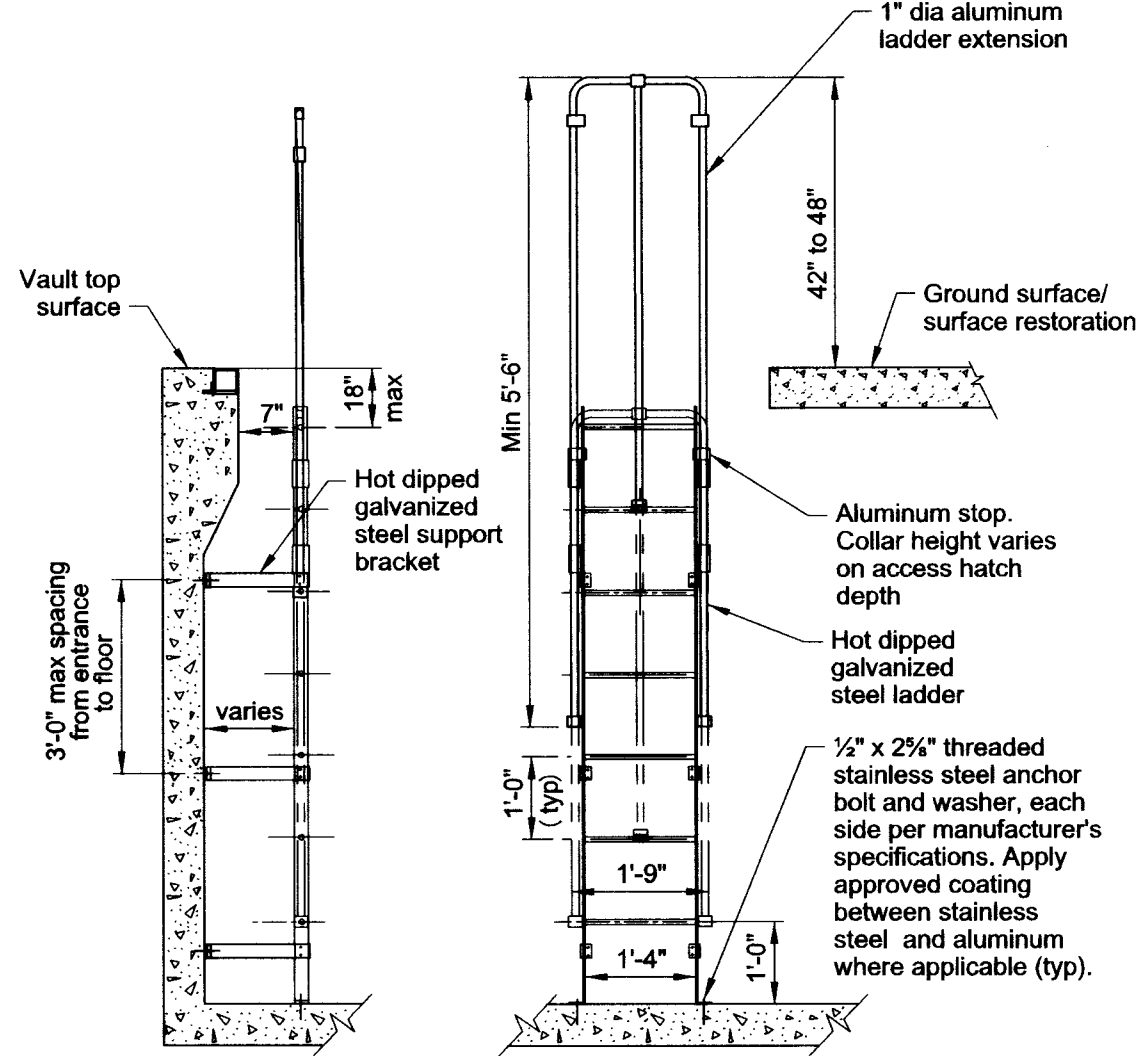
Manhole Installation (In-Street)



Valve Box and Cover (CIV) Installation (In-Sidewalk)



Valve Box and Cover (CIV) Installation (In-Street)





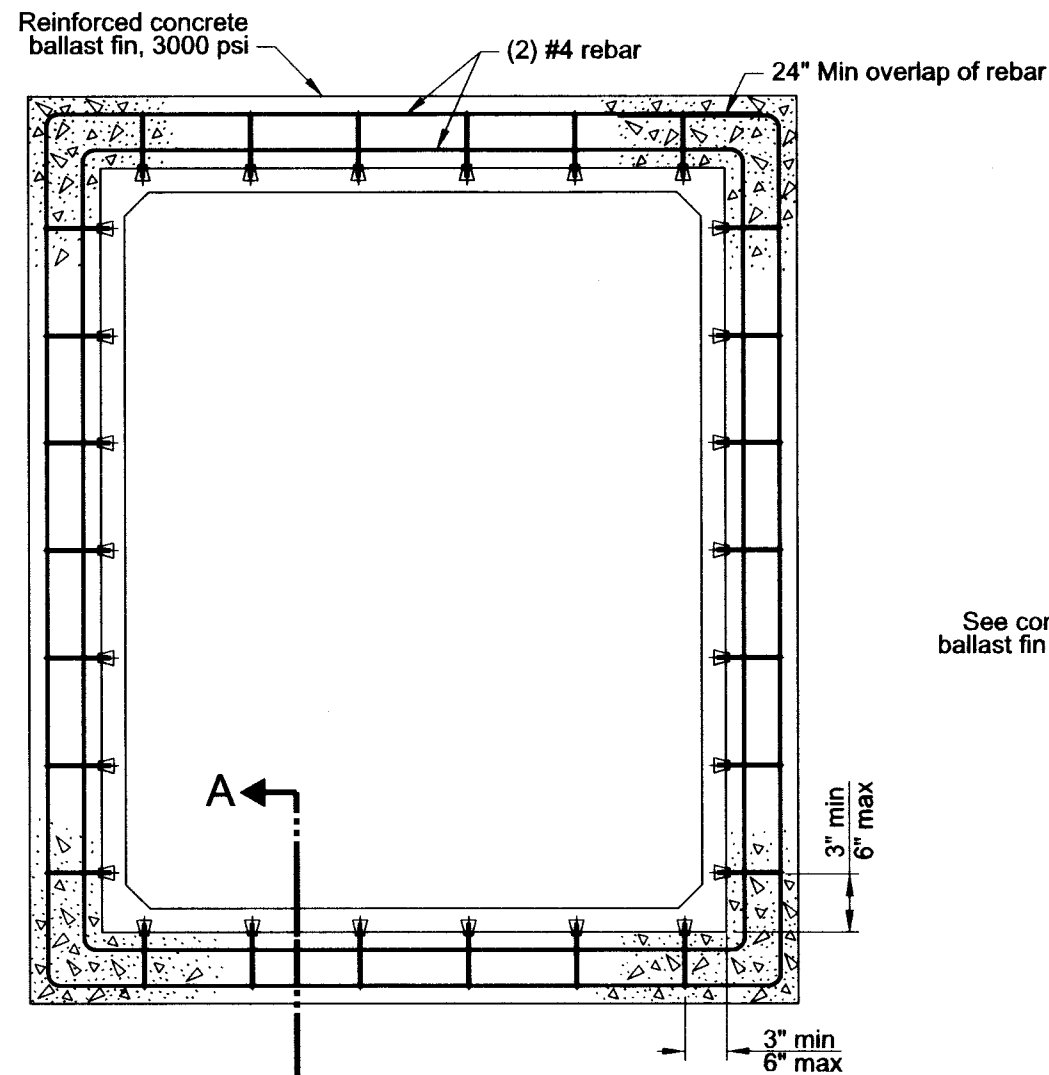
Ladder

General Notes:

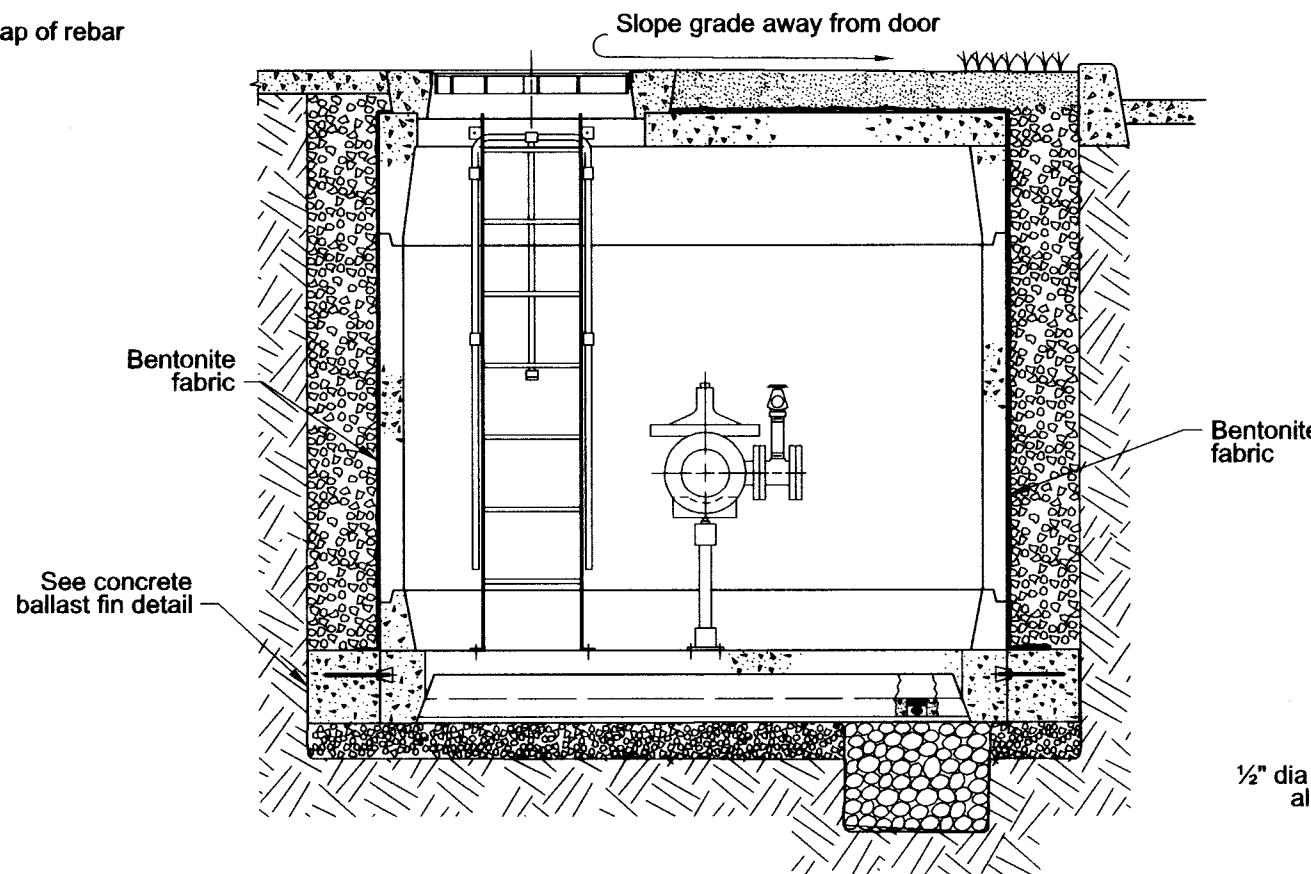
1. Contractor to supply and install all piping, vault and appurtenances except for meter, strainer and dismantling assembly internal to the vault. Verify required length of spacer for meter, strainer and dismantling assembly with PWB shop.
2. Select products are listed for reference only and approved equals may be substituted.
3. Dismantling connections shall be (1) restrained FLG x FLG dismantling joints, (2) restrained FLG x PE DI nipple with wedge action or through bolt flange adapter, or (3) restrained FLG x PE nipple with a torque shear set screw flange adapter. Use in the above order of preference as required by length. Typical installations are shown.
4. Strainer is shown adjacent to meter. Dismantling assembly may be placed between strainer and meter as piping permits. Strainer may be integral to meter.
5. Piping outside of vault shall be designed for dead end restraint to facilitate dismantling pipe within the interior of the vault. Pipe restraint by Engineer.
6. Vaults shall be constructed by the manufacturer with solid walls, bottom drains (grated) and top access valve boxes and covers (CIVs) as shown. All outside surfaces shall be coated by the manufacturer with inorganic silicate pore sealant and the contractor shall provide joint gasket/sealants. Pipe penetrations shall be core drilled and sealed with mechanical seals, no knockouts.
7. Vault bottom shall be installed level for those vaults with a center sump, and vaults with trench sumps shall be set sloping toward the trench to facilitate drainage. The slope shall be approximately 1/4" differential across the floor of the vault. Core a hole through the vault sumps for the drain check valves, and center drain rock surrounded by non-woven filter fabric. Extend drain rock to non-compacted native soil.
8. Obtain custom vault top for sloping sites. Fine adjustments to grade shall be made with non-shrink grout and shims per vault manufacturer's recommendation. Foundation base and backfill aggregate shall be Class B backfill, compacted to 95% density.
9. Vault access hatch doors shall be rated for H-20 wheel loads with non-skid surface per City Standards. Hatch door shall only be used in off street locations not subject to high density or heavy truck traffic. Hatch door shall have a tamper proof locking device that ensures flush closure.
10. Attach ladders, hatches, pipe supports, etc., to vault with SS anchors per manufacturer's specifications. Apply mastic coating between SS and aluminum parts.
11. All piping in vaults shall be epoxy coated. Coat DI with leafing aluminum epoxy (Carbomastic 15) per PWB standards. Bolts shall be hot dipped galvanized, SS, silicon bronze, epoxy or PTFE coated or fitted with petrolatum filled caps.
12. The spools, or spool and nipple combination between the mainline tees and bypass are optional. If spools or nipples are omitted, order vault with modified configuration for pipe penetrations and CIV locations. Provide Foster Adapter for MJ connections.

Plot Date: 8/11/2015 11:46:57 AM Filename: J:\Engineering\CAD\Standards\Working-Vaults\855-General-Vault_Details.dgn

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.	 PORTLAND WATER BUREAU CITY OF PORTLAND, OREGON  Chief Engineer	
	Standard Drawing Title	
General Vault Details		
Note: All material and workmanship shall be in accordance with City of Portland Standard Construction Specifications.	Effective Date	Aug 17 2015
	Calc. Book No.	PWB 1
	Baseline Report Date	Aug 17 2015
		Standard Drawing No. P-855



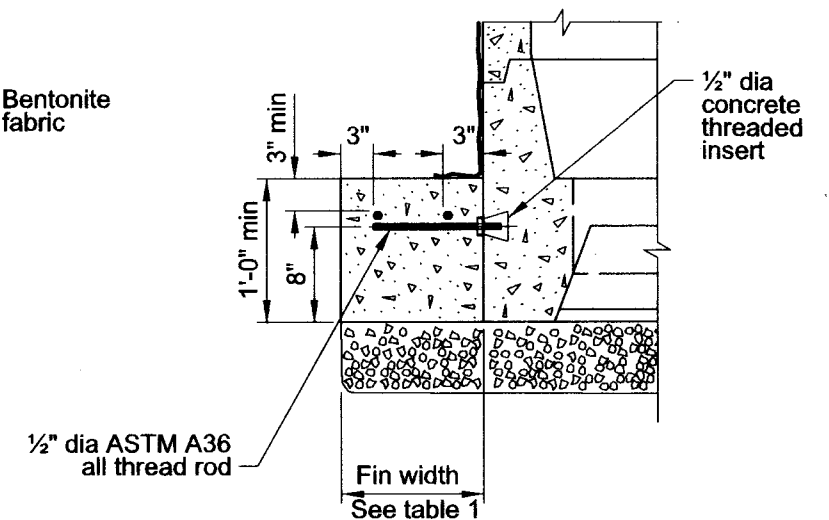
Plan View Concrete Ballast Fin Detail



Elevation View Concrete Apron Ballast Fin Detail

Table 1 - Ballast Fin Width

VAULT SIZE	FIN WIDTH
6' x 8' (Oldcastle Precast 657)	12"
8' x 10' (Oldcastle Precast 810)	18"
8' x 16' (Oldcastle Precast 816)	18"



Ballast Fin Section A-A

Plot Date: 7/30/2015 3:09:28 PM Filename: J:\Engineering\CAD Standards\Working_Vaults\856_Vault_Ballast.dgn

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.

Note:
All material and workmanship shall be in accordance with City of Portland Standard Construction Specifications.



PORTLAND WATER BUREAU
CITY OF PORTLAND, OREGON

[Signature]
Chief Engineer

Standard Drawing Title

Vault Ballast Fin

Effective Date Aug 17 2015

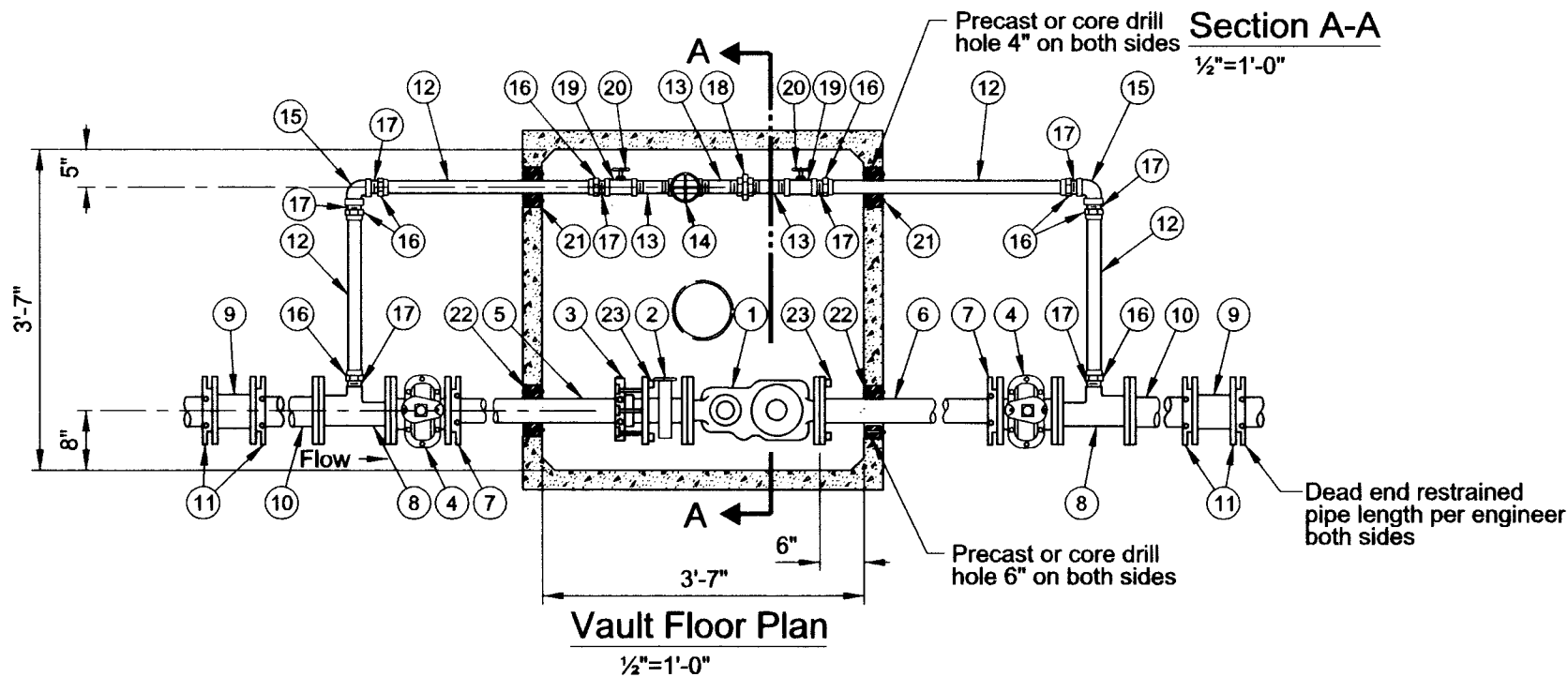
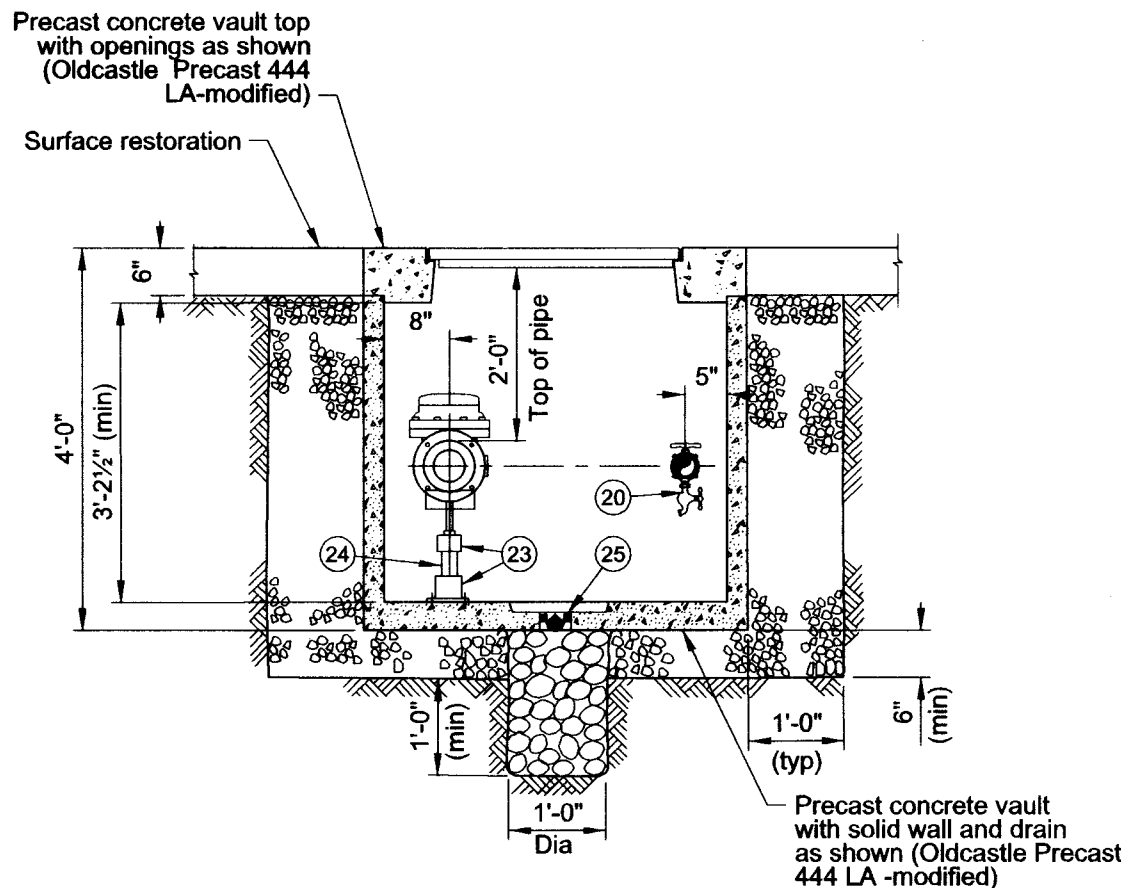
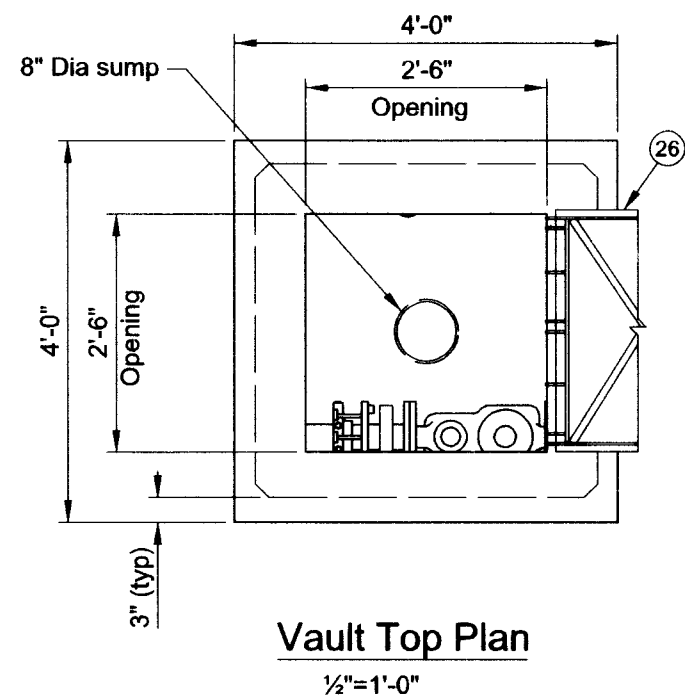
Calc. Book No. PWB 1

Baseline Report Date Aug 17 2015

Standard Drawing No.

P-856



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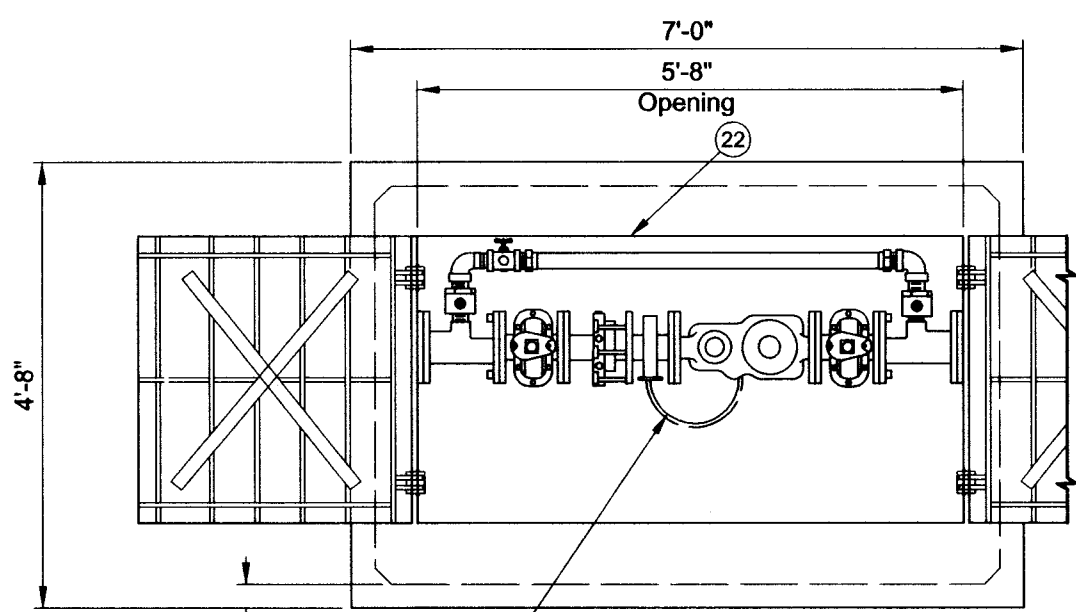
List of Parts			
Item No	Size	Qty	Description
1	3"	1	Meter, compound with test outlet
2	3"	1	Strainer, FLG x FLG
3	3"	1	Restrained dismantling assembly (Megaflange)
4	3"	2	Gate Valve, FLG x MJ OL NRS
5	3"	1	Nipple, DI PE X PE 36" long (field fit)
6	3"	1	Nipple, DI FLG X PE 36" long (field fit)
7	3"	2	Gland, wedge action retainer (Megalug)
8	4"x3"x2"	2	Drip Tee, FLG x FLG x FIPT
9	4"	2	Solid sleeve, DI MJ
10	4"	1	Nipple, DI FLG X PE 48" long (field fit)
11	4"	4	Gland, wedge action retainer (Megalug)
12	2"	3	Tubing, copper (field fit)
13	2"	2	Nipple, brass MIPT ~3" long (field fit)
14	2"	1	Ball valve, brass FIPT x FIPT OL
15	2"	2	Common elbow, brass FIPT x FIPT, 90 degrees
16	2"	8	Coupling, brass FIPT x CC
17	2"	7	Nipple, brass close IPT
18	2"	1	Union, brass FIPT
19	2"x2"x3/4"	2	Tee, brass FIPT x FIPT
20	3/4"	1	Hose bib, brass MIPT
21	2"	2	Seal, mechanical penetration (Link Seal LS-315-C-6)
22	3"	2	Seal, mechanical penetration (Link Seal LS-315-C-10)
23	3"	2	Adjustable pipe support, hot dipped galvanized
24	2"	2	Pipe, galvanized steel (field fit)
25	4"	1	Drain check valve
26	2'-6"x2'-6" or larger	1	Hatch, aluminum single leaf H-20 rated.

Notes:

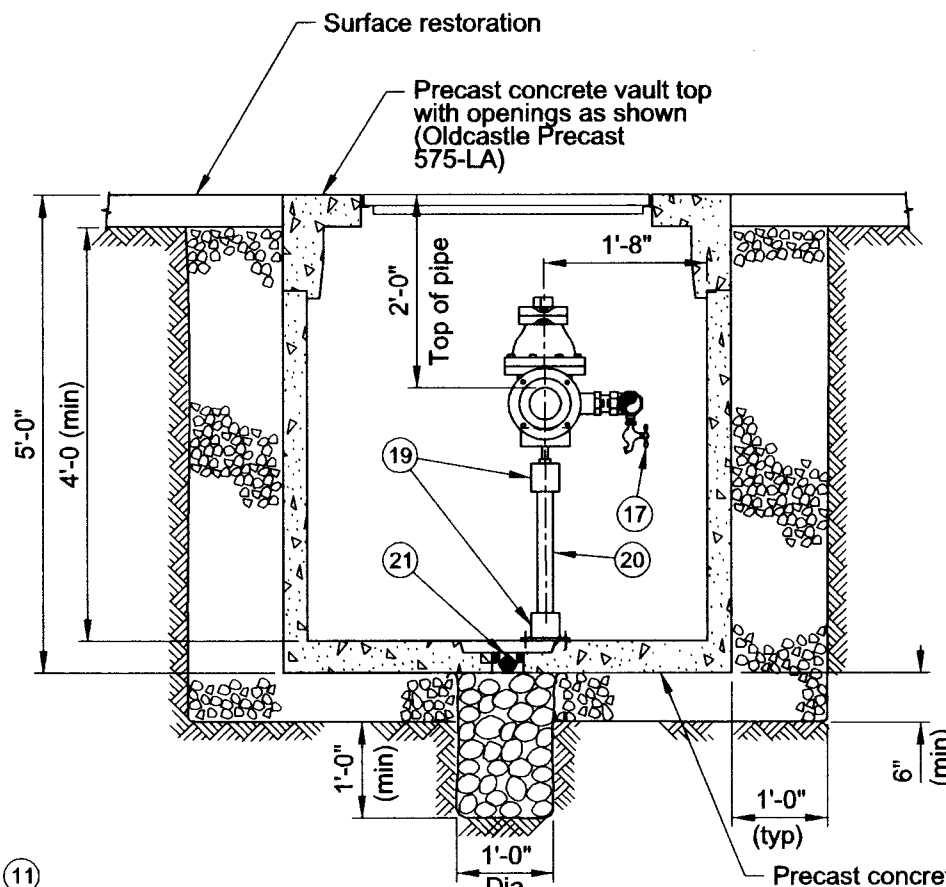
See General Vault Drawing (P-855) for construction and material notes.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.	 PORTLAND WATER BUREAU CITY OF PORTLAND, OREGON  Chief Engineer	
	Standard Drawing Title <h3>3" Compound Meter in 444 Vault (In Sidewalk)</h3>	
Note: All material and workmanship shall be in accordance with City of Portland Standard Construction Specifications.	Effective Date	Aug 17 2015
	Calc. Book No.	PWB 1
	Baseline Report Date	Aug 17 2015
		Standard Drawing No. P-860

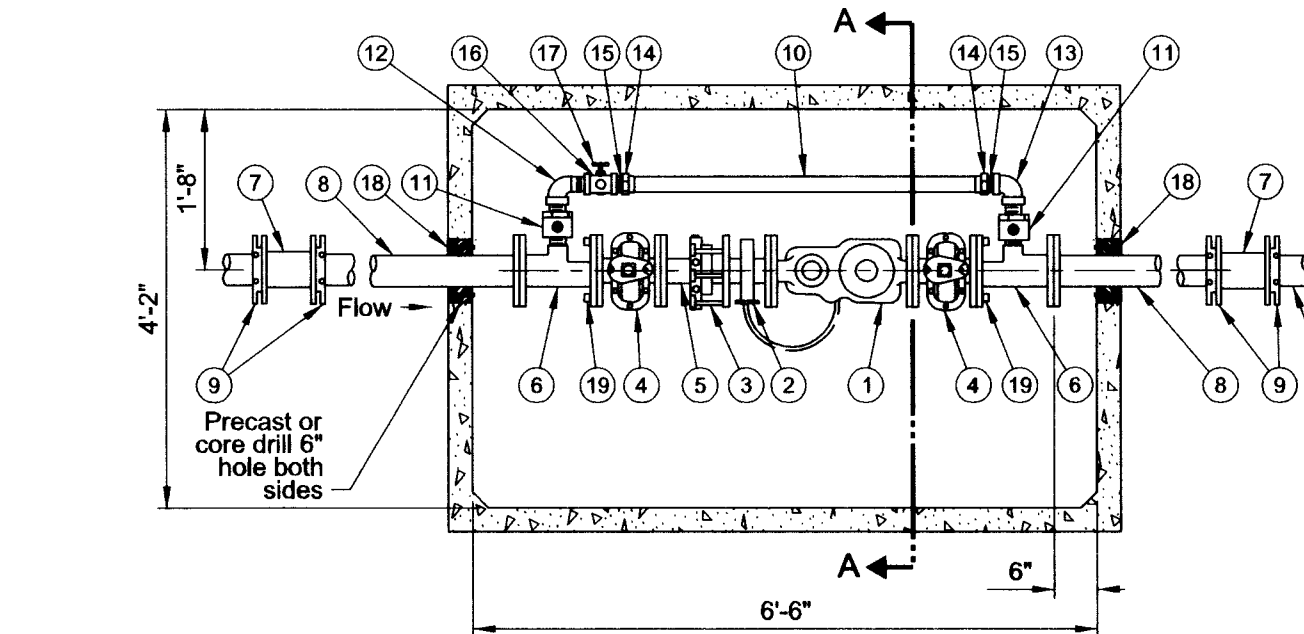
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Vault Top Plan
1/2"=1'-0"



Section A-A
1/2"=1'-0"



Vault Floor Plan
1/2"=1'-0"

List of Parts

Item No	Size	Qty	Description
1	3"	1	Meter, compound with test outlet
2	3"	1	Strainer, FLG x FLG
3	3"	1	Restrained dismantling assembly (Megaflange)
4	3"	2	Gate Valve, FLG x FLG OL NRS
5	3"	1	Nipple, DI FLG X PE 8"-9" long (field fit)
6	4"x3"x2"	2	Drip Tee, FLG x FLG x FIPT
7	4"	2	Solid sleeve, DI MJ
8	4"	2	Nipple, DI FLG X PE ~48" long (field fit)
9	4"	4	Gland, wedge action retainer (Megalug)
10	2"	1	Tubing, copper (field fit)
11	2"	2	Corporation stop, ball valve, MIPT x MIPT
12	2"	1	Street elbow, brass IPT
13	2"	1	Common elbow, brass FIPT x FIPT, 90 degrees
14	2"	2	Coupling, brass FIPT x CC
15	2"	2	Nipple, brass close IPT
16	2"x2"x3/4"	1	Tee, brass FIPT x FIPT
17	3/4"	1	Hose bib, brass MIPT
18	4"	2	Seal, mechanical penetration (Link Seal LS-410-C-7)
19	3"	2	Adjustable pipe support, hot dipped galvanized
20	2"	2	Pipe, galvanized steel (field fit)
21	4"	1	Drain check valve
22	72" x 36"	1	Hatch, galvanized steel double door H-20 rated

Notes:

See General Vault Drawing (P-855) for construction and material notes.

The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.



[Signature]
Chief Engineer

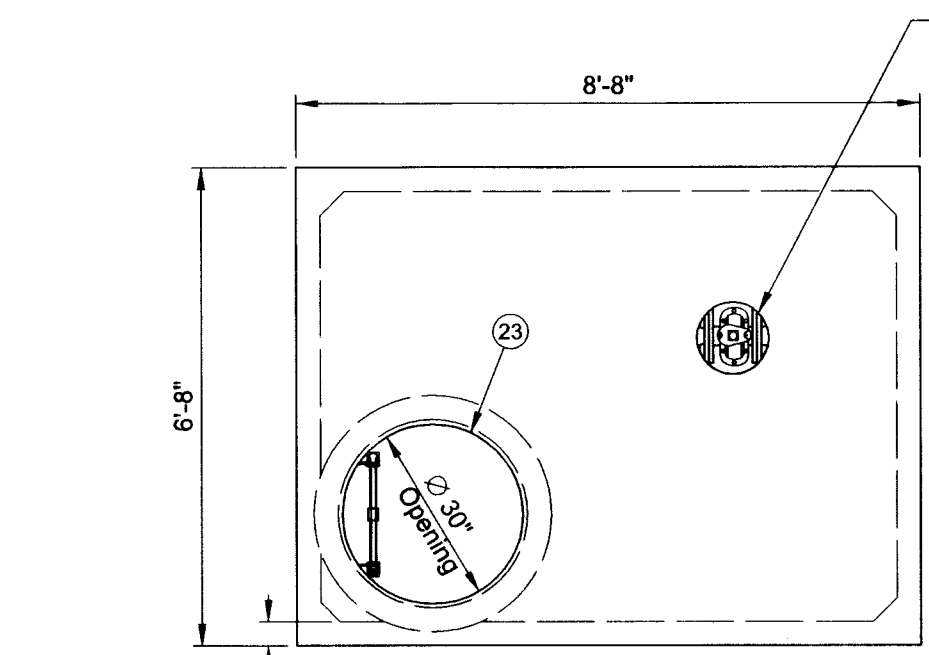
Standard Drawing Title
**3" Compound Meter with
 2" Bypass in 575 Vault
 (In Sidewalk)**

Note:
 All material and workmanship shall be in accordance with City of Portland Standard Construction Specifications.

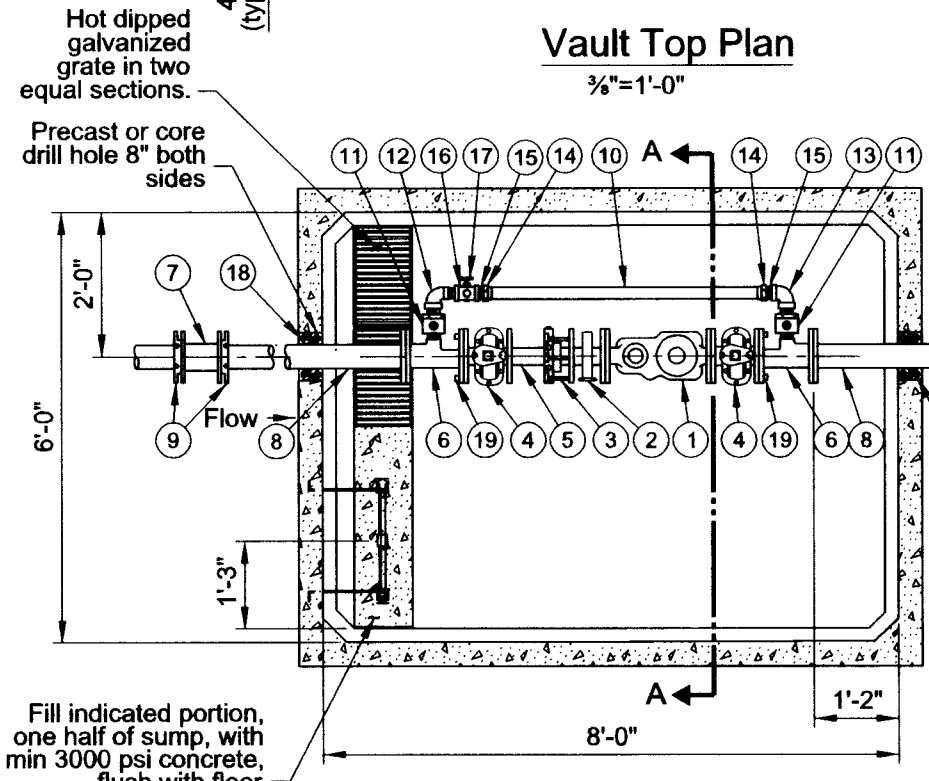
Effective Date Aug 17 2015
 Calc. Book No. PWB 1
 Baseline Report Date Aug 17 2015

Standard Drawing No.
P-861

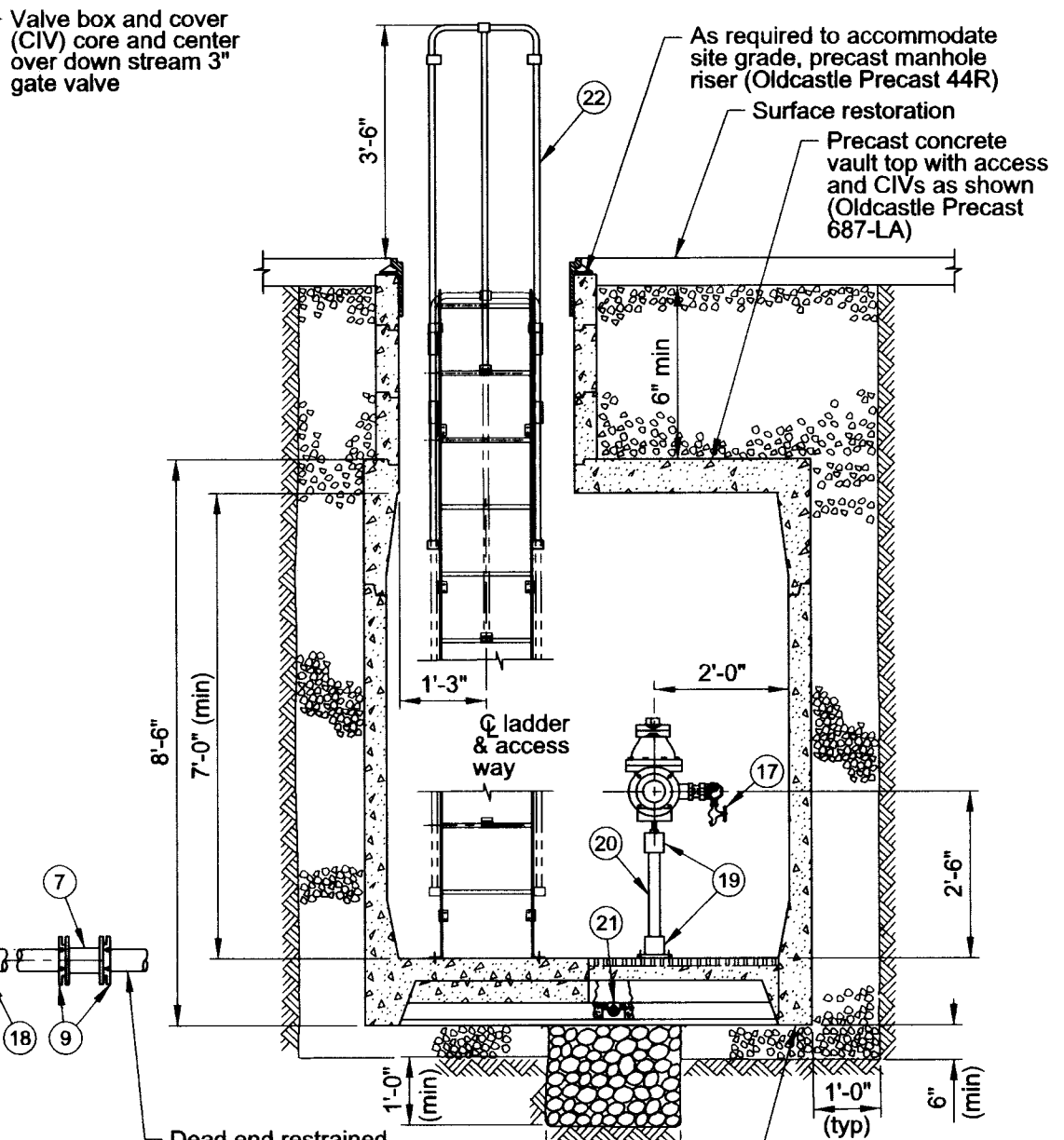
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Vault Top Plan
3/8"=1'-0"



Vault Floor Plan
3/8"=1'-0"

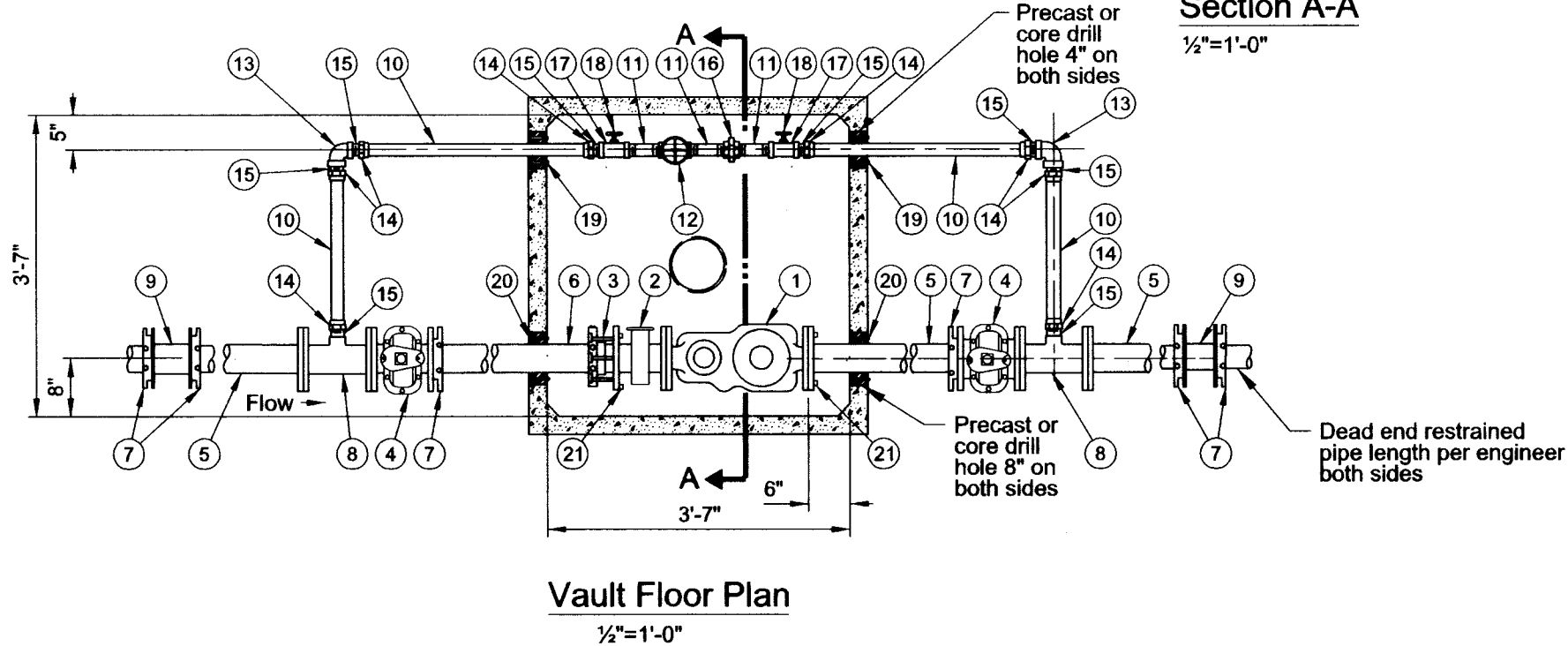
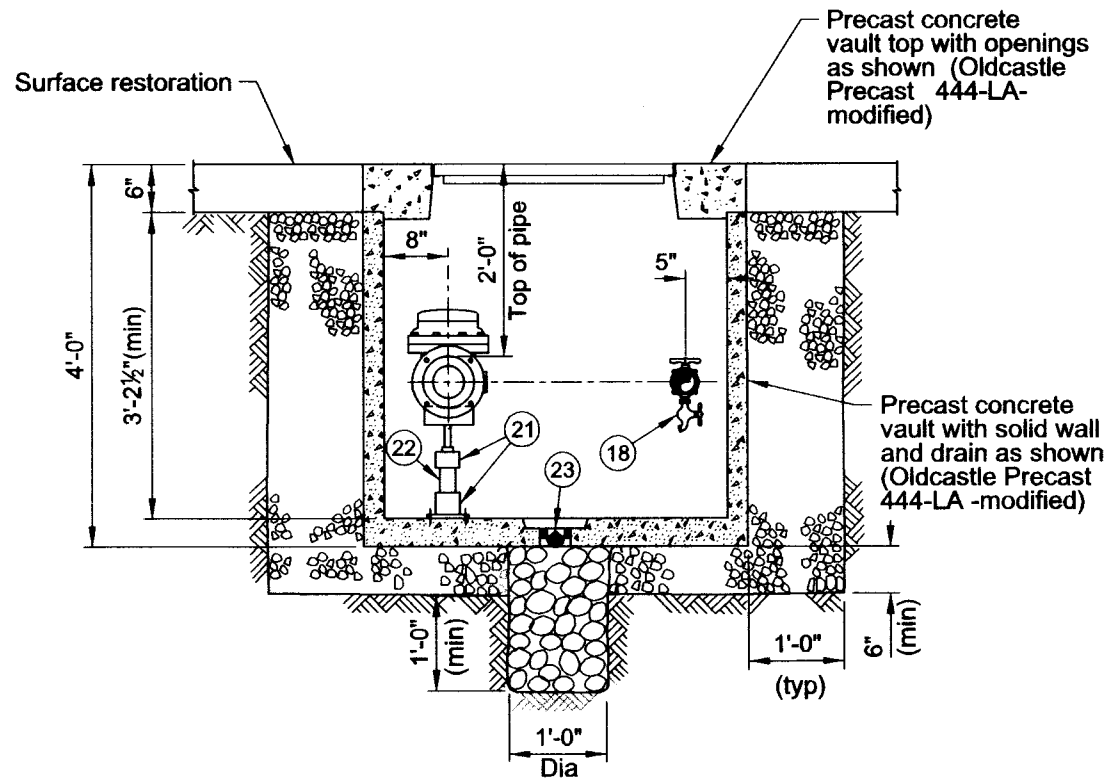
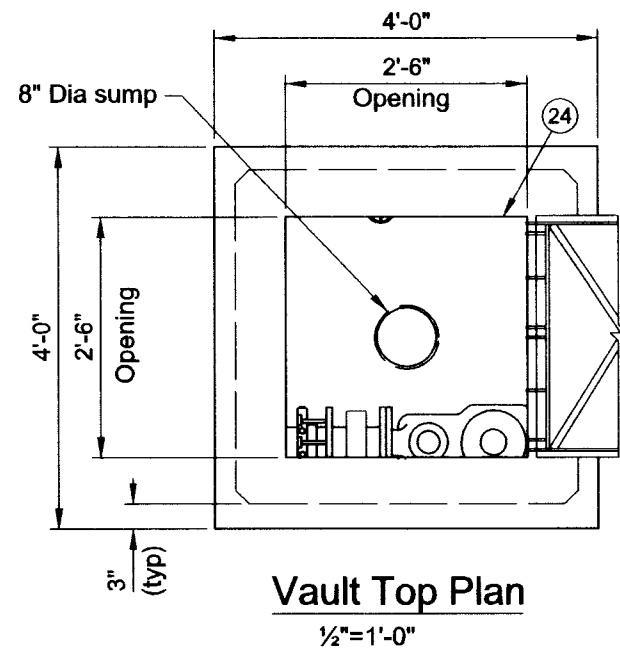


Section A-A
3/8"=1'-0"

List of Parts			
Item No	Size	Qty	Description
1	3"	1	Meter, compound with test outlet
2	3"	1	Strainer, FLG x FLG
3	3"	1	Restrained dismantling assembly (Megaflange)
4	3"	2	Gate Valve, FLG x FLG OL NRS
5	3"	1	Nipple, DI FLG X PE 8"-9" long (field fit)
6	4"x3"x2"	1	Drip Tee, FLG x FLG x FIPT
7	4"	2	Solid sleeve, DI MJ
8	4"	2	Nipple, DI FLG X PE 48" long (field fit)
9	4"	4	Gland, wedge action retainer (Megalug)
10	2"	1	Tubing, copper (field fit)
11	2"	2	Corporation stop, ball valve, MIPT x MIPT
12	2"	1	Street elbow, brass IPT
13	2"	1	Common elbow, brass FIPT x FIPT, 90 degrees
14	2"	2	Coupling, brass FIPT, x CC
15	2"	2	Nipple, brass close IPT
16	2"x2"x3/4"	1	Tee, brass FIPT x FIPT
17	3/4"	1	Hose bib, brass MIPT
18	4"	2	Seal, mechanical penetration (Link Seal LS-410-C-7)
19	3"	2	Adjustable pipe support, hot dipped galvanized
20	2"	2	Pipe, galvanized steel (field fit)
21	4"	1	Drain check valve
22		1	Ladder, galv steel with aluminum extension (field fit)
23	30"	1	Manhole frame and cover, 30" true opening



Notes:
See General Vault Detail (P-855) for construction and material notes.

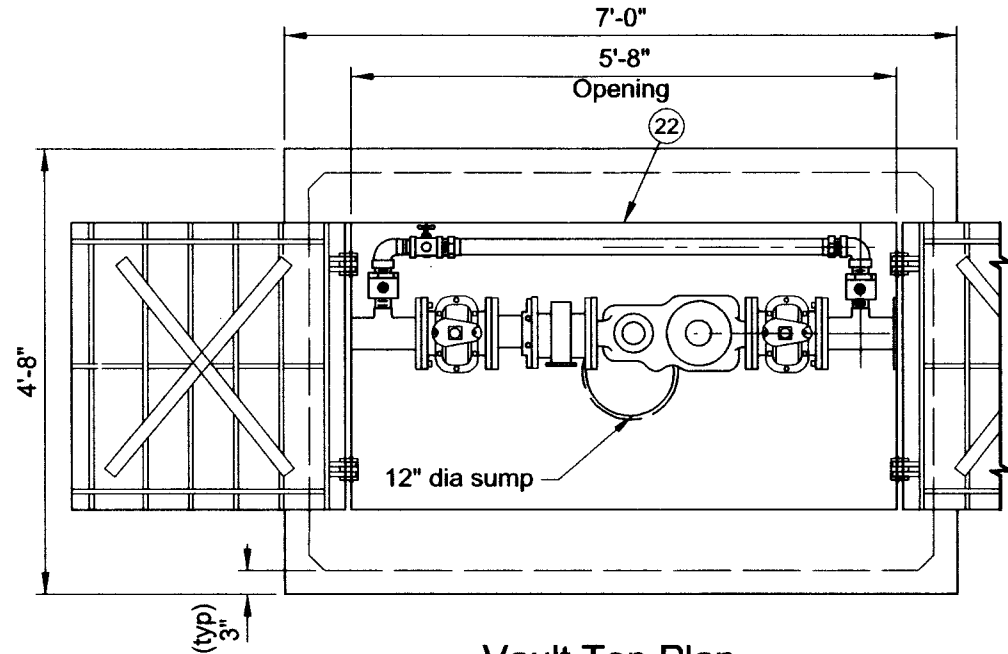
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.	PORTLAND WATER BUREAU CITY OF PORTLAND OREGON Chief Engineer	
	Standard Drawing Title <h3 style="text-align: center;">3" Compound Meter with 2" Bypass in 687 Vault (In Street)</h3>	
Note: All material and workmanship shall be in accordance with City of Portland Standard Construction Specifications.	Effective Date	Aug 17 2015
	Calc. Book No.	PWB 1
	Baseline Report Date	Aug 17 2015
		Standard Drawing No. P-862



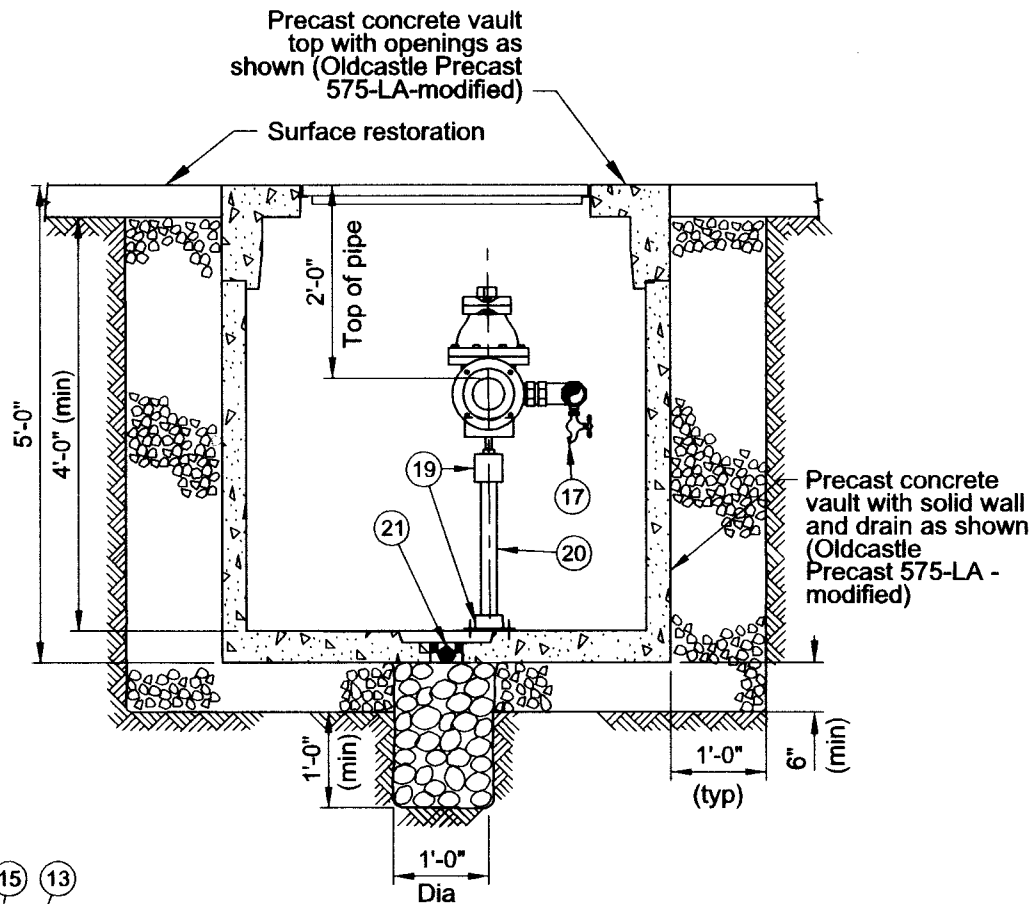
List of Parts			
Item No	Size	Qty	Description
1	4"	1	Meter, compound with test outlet
2	4"	1	Strainer, FLG x FLG
3	4"	1	Restrained dismantling assembly (MegaFlange)
4	4"	2	Gate Valve, FLG x MJ OL
5	4"	3	Nipple, DI FLG X PE 36" long (field fit)
6	4"	1	Nipple, DI PE X PE long 36" (field fit)
7	4"	6	Gland, wedge action retainer (Megalug)
8	4"x4"x2"	2	Drip Tee, FLG x FLG X FIPT
9	4"	2	Solid sleeve, DI MJ
10	2"	4	Tubing, copper (field fit)
11	2"	3	Nipple, brass MIPT 3" long
12	2"	1	Ball valve, brass FIPT x FIPT OL
13	2"	2	Common elbow, brass FIPT x FIPT 90 degrees
14	2"	8	Coupling, brass FIPT x CC
15	2"	7	Nipple, brass close IPT
16	2"	1	Union, brass FIPT
17	2"x2"x3/4"	2	Tee, brass FIPT x FIPT
18	3/4"	2	Hose bib, brass MIPT
19	2"	2	Seal, mechanical penetration (Link Seal LS-315-C-6)
20	4"	2	Seal, mechanical penetration (Link Seal LS-410-C-7)
21	4"	2	Adjustable pipe support, hot-dipped galvanized
22	2"	2	Pipe, galvanized steel (field fit)
23	4"	1	Drain check valve
24	2'-6"x2'-6" or larger	1	Hatch, aluminum single leaf H-20 rated

Note:
 See General Vault Drawing (P-855) for construction and material notes.

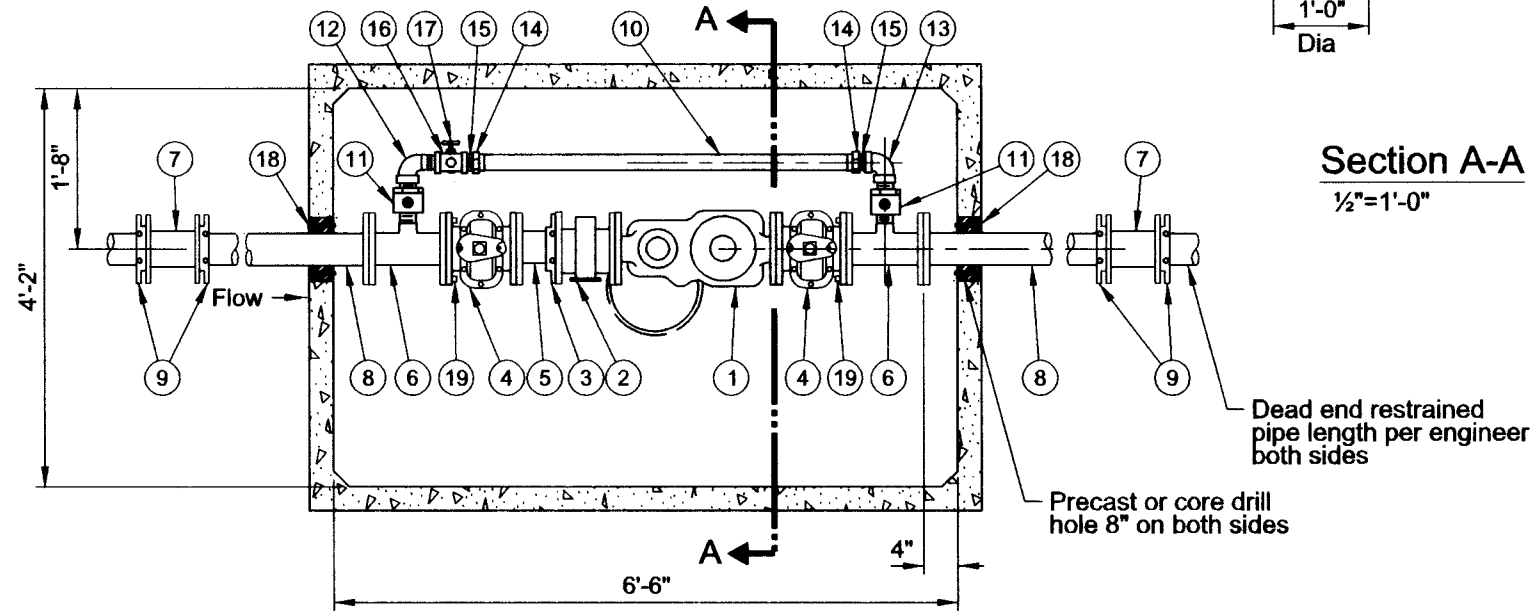
The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.	 PORTLAND WATER BUREAU CITY OF PORTLAND, OREGON  Chief Engineer	
	Standard Drawing Title <h3>4" Compound Meter in 4-4-4 Vault (In Sidewalk)</h3>	
Note: All material and workmanship shall be in accordance with City of Portland Standard Construction Specifications.	Effective Date Aug 17 2015	Standard Drawing No. <h2>P-865</h2>
	Calc. Book No. PWB 1	
	Baseline Report Date Aug 17 2015	



Vault Top Plan
1/2"=1'-0"



Section A-A
1/2"=1'-0"



Vault Floor Plan
1/2"=1'-0"

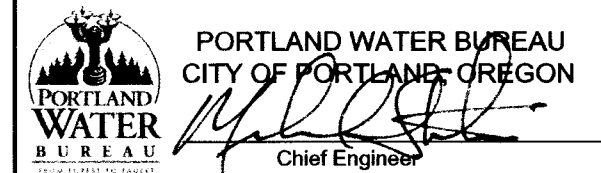
List of Parts

Item No	Size	Qty	Description
1	4"	1	Meter, compound with test outlet
2	4"	1	Strainer, FLG x FLG
3	4"	1	Flange adapter, torque shear set-screw (Uniflange)
4	4"	2	Gate Valve, FLG x FLG OL
5	4"	1	Nipple, DI FLG x PE 8"-9" long (field fit)
6	4"x4"x2"	2	Drip Tee, FLG x FLG x FIPT
7	4"	2	Solid sleeve, DI MJ
8	4"	2	Nipple, DI FLG X PE 48" long (field fit)
9	4"	4	Gland, wedge action retainer (Megalug)
10	2"	1	Tubing, copper (field fit)
11	2"	2	Corporation stop, ball valve, MIPT x MIPT
12	2"	1	Street elbow, brass IPT
13	2"	1	Common elbow, brass FIPT x FIPT, 90 degrees
14	2"	2	Coupling, brass FIPT x CC
15	2"	2	Nipple, brass close IPT
16	2"x2"x3/4"	1	Tee, brass FIPT x FIPT
17	3/4"	1	Hose bib, brass MIPT
18	4"	2	Seal, mechanical penetration (Link Seal LS-410-C-7)
19	4"	2	Adjustable pipe support, hot-dipped galvanized
20	2"	2	Pipe, galvanized steel (field fit)
21	4"	1	Drain check valve
22	72" x 36"	1	Hatch, galvanized steel double door H-20 rated

Notes:

1. See General Vault Drawing (P-855) for construction and material notes.
2. No full dismantling assembly, flange adapter only.

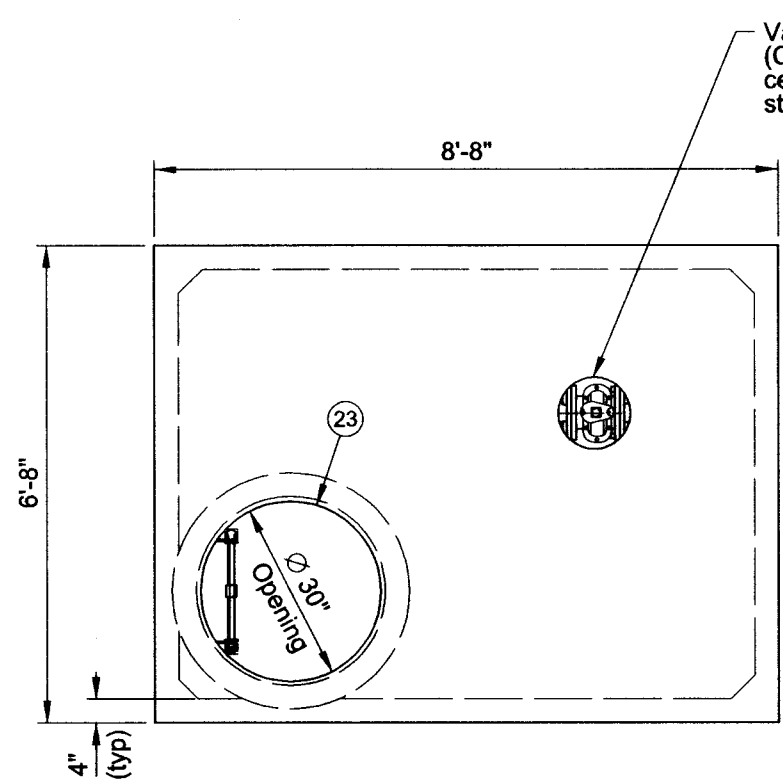
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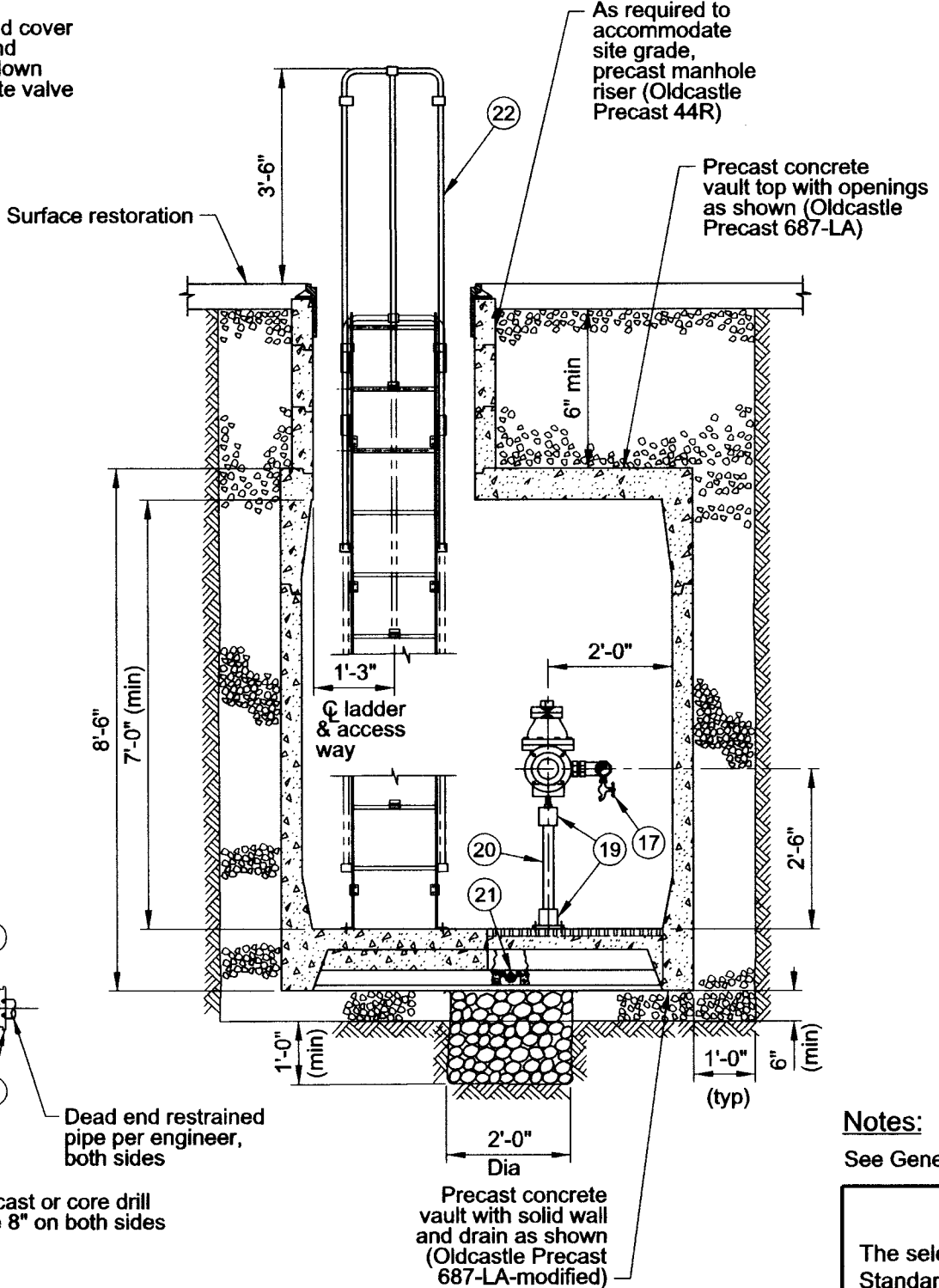
Standard Drawing Title
4" Compound Meter with 2" Bypass in 575 Vault (In Sidewalk)

Note:
All material and workmanship shall be in accordance with City of Portland Standard Construction Specifications.

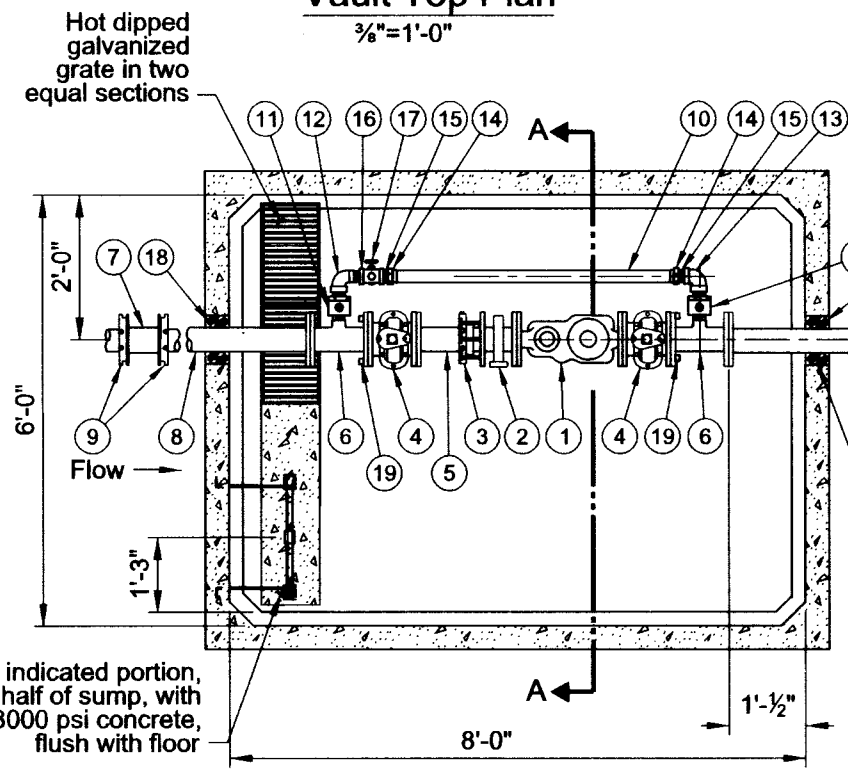
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Calc. Book No.	PWB 1	
Baseline Report Date	Aug 17 2015	



Vault Top Plan
3/8"=1'-0"



Section A-A
3/8"=1'-0"




Vault Floor Plan
3/8"=1'-0"

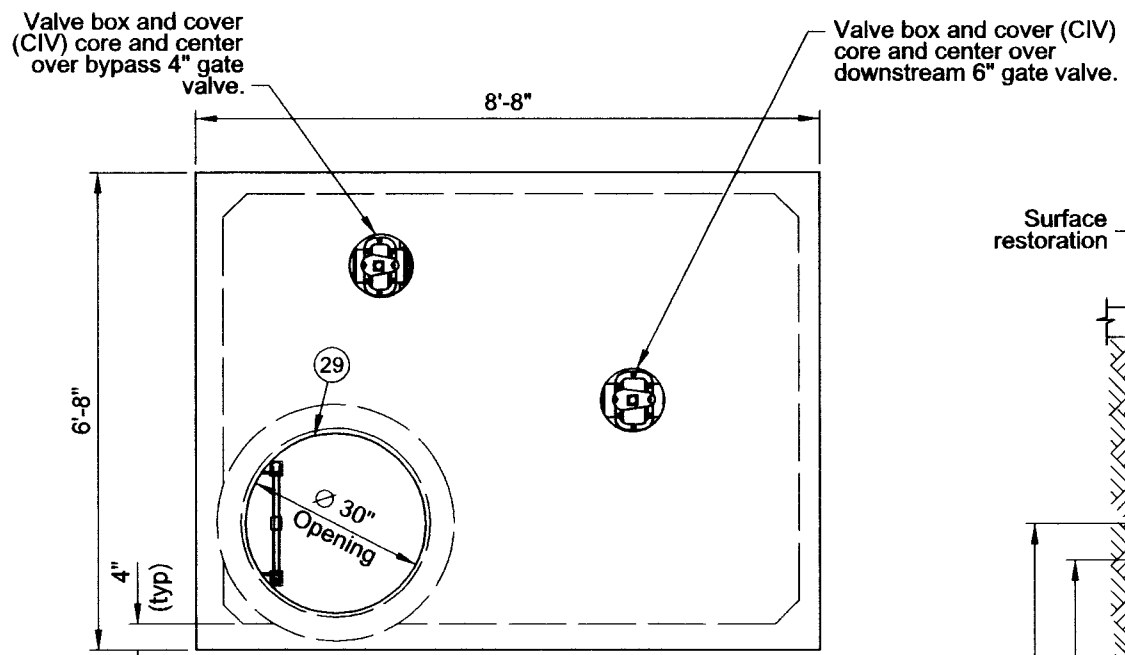
List of Parts			
Item No	Size	Qty	Description
1	4"	1	Meter, compound with test outlet
2	4"	1	Strainer, FLG x FLG
3	4"	1	Restrained dismantling assembly (MegaFlange)
4	4"	2	Gate Valve, FLG x FLG OL
5	4"	1	Nipple, DI FLG x PE 8"-9" long (field fit)
6	4"x4"x2"	2	Drip Tee, FLG x FLG x FIPT
7	4"	2	Solid sleeve, DI MJ
8	4"	2	Nipple, DI FLG X PE 48" long (field fit)
9	4"	4	Gland, wedge action retainer (Megalug)
10	2"	1	Tubing, copper (field fit)
11	2"	2	Corporation stop, ball valve, MIPT x MIPT
12	2"	1	Street elbow, brass FIPT
13	2"	1	Common elbow, brass FIPT x FIPT, 90 degrees
14	2"	2	Coupling, brass FIPT x CC
15	2"	2	Nipple, brass close IPT
16	2"x2"x3/4"	1	Tee, brass FIPT x FIPT
17	3/4"	1	Hose bib, brass MIPT
18	4"	2	Seal, mechanical penetration (Link Seal LS-410-C-7)
19	4"	2	Adjustable pipe support, hot dipped galvanized
20	2"	2	Pipe, galvanized steel (field fit)
21	4"	1	Drain check valve
22		1	Ladder, galv steel with aluminum extension (field fit) (Oldcastle Precast)
23	30"	1	Manhole frame and cover, 30" true opening

Notes:

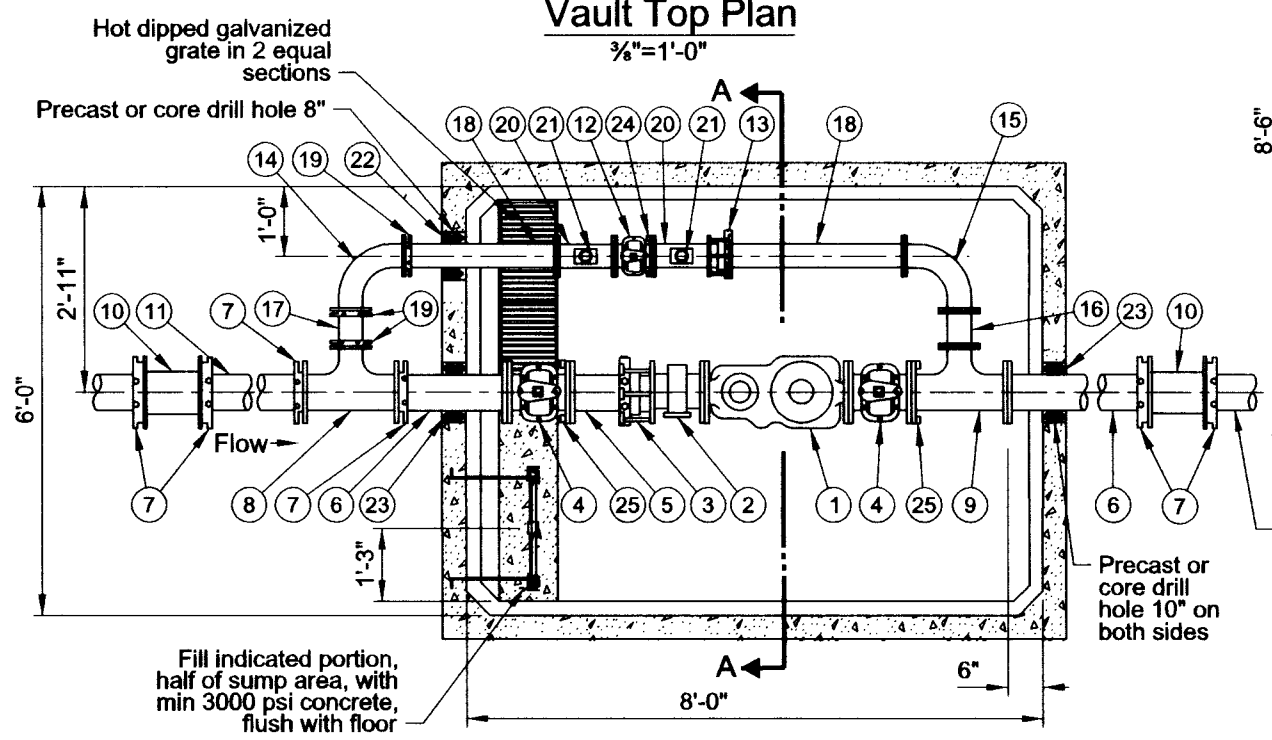
See General Vault Drawing (P-855) for construction and material notes.

<p>The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.</p>	 <p>PORTLAND WATER BUREAU CITY OF PORTLAND, OREGON</p> <p><i>[Signature]</i> Chief Engineer</p>							
	<p>Standard Drawing Title</p> <p>4" Compound Meter with 2" Bypass in 6-8-7 Vault (In Street)</p>							
<p>Note: All material and workmanship shall be in accordance with City of Portland Standard Construction Specifications.</p>	<table border="1"> <tr> <td>Effective Date</td> <td>Aug 17 2015</td> <td rowspan="3">Standard Drawing No. P-867</td> </tr> <tr> <td>Calc. Book No.</td> <td>PWB 1</td> </tr> <tr> <td>Baseline Report Date</td> <td>Aug 17 2015</td> </tr> </table>	Effective Date	Aug 17 2015	Standard Drawing No. P-867	Calc. Book No.	PWB 1	Baseline Report Date	Aug 17 2015
Effective Date	Aug 17 2015	Standard Drawing No. P-867						
Calc. Book No.	PWB 1							
Baseline Report Date	Aug 17 2015							

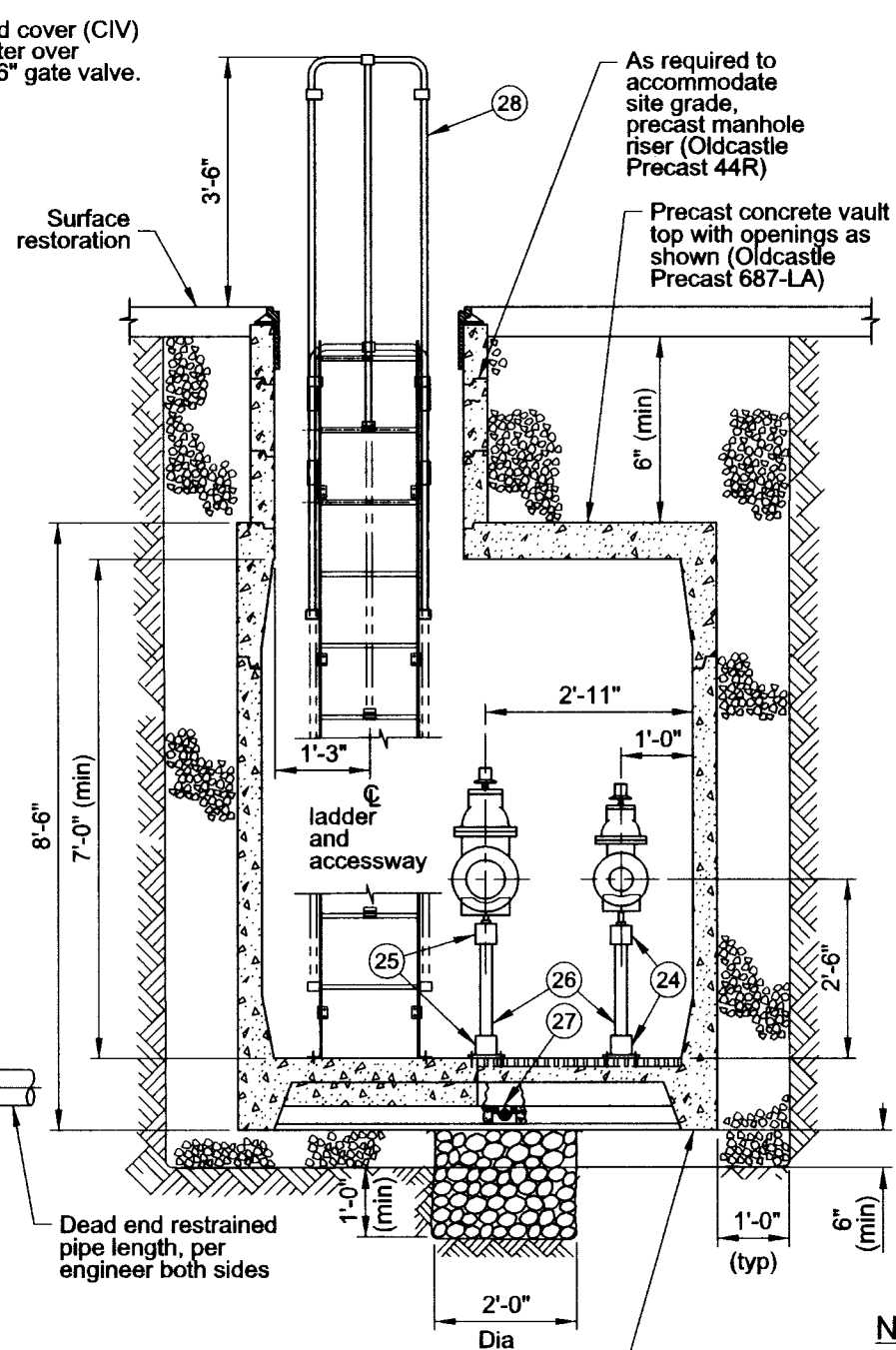
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Vault Top Plan
3/8"=1'-0"




Vault Floor Plan
3/8"=1'-0"



Section A-A
3/8"=1'-0"

List of Parts			
Item No	Size	Qty	Description
1	6"	1	Meter, compound with test outlet
2	6"	1	Strainer, FLG x FLG
3	6"	1	Restrained dismantling assembly (MegaFlange)
4	6"	2	Gate Valve, FLG x FLG OL
5	6"	1	Nipple, DI FLG x PE 8"-9" long (field fit)
6	6"	2	Nipple, DI FLG x PE 36" long (field fit)
7	6"	6	Gland, wedge action retainer (Megalug)
8	6"x6"x4"	2	Tee, DI MJ x MJ
9	6"x6"x4"	1	Tee, DI FLG x FLG
10	6"	2	Solid sleeve, DI MJ
11	6"	1	Nipple, DI PE x PE 36" long (field fit)
12	4"	1	Gate valve, FLG x FLG OL
13	4"	1	Restrained dismantling assembly (MegaFlange)
14	4"	1	Bend, DI MJ long radius 90 degrees
15	4"	1	Bend, DI FLG long radius 90 degrees
16	4"	1	Spool, DI FLG x FLG 6" long
17	4"	1	Nipple, DI PE x PE 8"-9" long (field fit)
18	4"	2	Nipple, DI FLG x PE 36" long (field fit)
19	4"	3	Gland, wedge action retainer (Megalug)
20	4"x4"x2"	2	Drip tee, FLG x FLG x FIPT
21	2"	2	Gate Valve, brass with plug
22	4"	1	Seal, mechanical penetration (Link Seal LS-410-C-7)
23	6"	2	Seal, mechanical penetration (Link Seal LS-410-C-10)
24	4"	1	Adjustable pipe support, hot dipped galvanized
25	6"	2	Adjustable pipe support, hot dipped galvanized
26	2"	3	Pipe, galvanized steel (field fit)
27	4"	1	Drain check valve
28		1	Ladder, galv steel with aluminum extension (field fit) (Oldcastle Precast)
29	30"	1	Manhole frame and cover, 30" true opening

Notes:
1. See General Vault Detail (P-855) for construction and material notes.

<p>The selection and use of this Standard Drawing, while designed in accordance with generally accepted engineering principles and practices, is the sole responsibility of the user.</p>	 <p>PORTLAND WATER BUREAU CITY OF PORTLAND, OREGON</p> <p><i>[Signature]</i> Chief Engineer</p>	
	<p>Standard Drawing Title</p> <p>6" Compound Meter with 4" Bypass in 6-8-7 Vault (In Street)</p>	
<p>Note: All material and workmanship shall be in accordance with City of Portland Standard Construction Specifications.</p>	Effective Date	Aug 17 2015
	Calc. Book No.	PWB 1
	Baseline Report Date	Aug 17 2015
		Standard Drawing No.
		P-869

Plot Date: 7/31/2015 7:37:45 AM
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