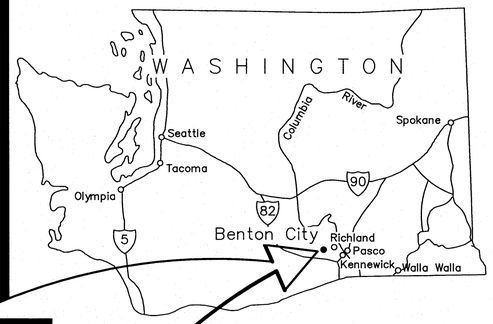
BENTON IRRIGATION DISTRICT

IRRIGATION SYSTEM IMPROVEMENTS

PHASE 3A

2011



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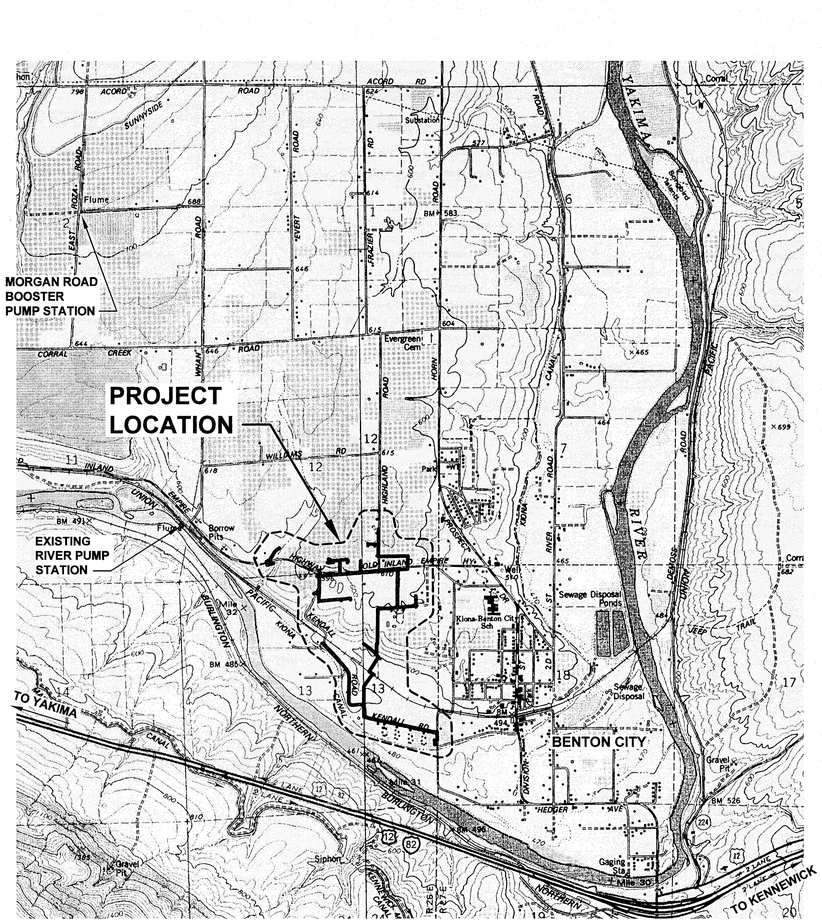

VICINITY MAP
NTS

DISTRICT BOARD OF DIRECTORS

MELISSA GLODO
ROBERT BUOY
DIRK MARTIN

RECORD DRAWINGS

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BRETT MOORE
STATE OF WASHINGTON
46028
REGISTERED
PROFESSIONAL ENGINEER

SIGNED 07-13-12
RECORD DRAWING

anderson perry & associates, inc.
engineering · surveying · natural resources
1901 N. Fir Street - La Grande, OR 97850 Ph: (541)963-8309 Fax: (541)963-5456
LA GRANDE, OR. WALLA WALLA, WA.

PLAN LEGEND

IRRIGATION

	EXISTING	PROPOSED
IRRIGATION LINE	IRR	6"PVC
VALVE		
CAP		
COUPLING		
REDUCER		
AIR/VAC VALVE		
BLOW OFF ASSEMBLY		
SERVICE		
IRRIGATION CONTROL STRUCTURE	IRR — IRR	
SPRINKLER HEAD		

MISCELLANEOUS UTILITIES

EXISTING

- WATER LINE — W — W
- BURIED POWER — P — P — P
- OVERHEAD POWER — OHP — OHP
- BURIED TELEPHONE — UT
- FIBER OPTIC — FO
- GAS SERVICE — G — G
- SIGNAL CABLE IN CONDUIT — SC
- UTILITY POLE
- GUY WIRE
- TELEPHONE RISER
- STREET LIGHT

STREET AND CURB

- PAVED STREET — 1ST ST.
- GRAVEL DRIVEWAY/STREET

SITE SURVEY

EXISTING

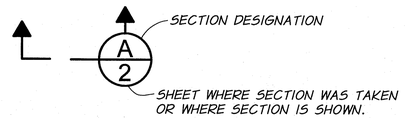
- INDEX CONTOUR — 750
- INTERMEDIATE CONTOUR — 749
- CENTERLINE
- PROPERTY LINE/ EASEMENT
- SECTION LINE
- CULVERT
- BENCH MARK
- MONUMENT
- CONTROL POINT
- TEST PIT (SEE CONTRACT DOCUMENT APPENDIX FOR LOGS) — TP-14
- SPOT ELEVATION — 592.3

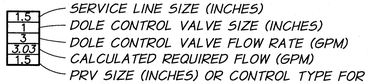
GENERAL

EXISTING

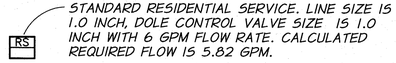
- FENCE LINE/GATE — x — x — x
- CHAINLINK FENCE
- CREEK/DITCH CENTERLINE
- RIVERBANK/ SHORELINE
- SIGN
- CONIFER TREE
- DECIDUOUS TREE
- SHRUB
- BUILDING

DRAFTING





NOTE:
A BLANK DOLE CONTROL VALVE SIZE AND FLOW FIELD INDICATES A FLOWMETER USED. A BLANK PRV SIZE FIELD INDICATES NO PRV VALVE REQUIRED.



ESTIMATED QUANTITIES FOR ROCK EXCAVATION

PHASE 3A: ±300 CUBIC YARDS

NOTE:
REFER TO THE SPECIFICATIONS FOR DESCRIPTION OF ROCK EXCAVATION. THE QUANTITIES SHOWN ARE ESTIMATES PREPARED BY THE ENGINEER AND ARE BASED UPON FIELD SURVEY DATA PERFORMED BY THE ENGINEER, AND THE IMPROVEMENTS SHOWN ON THE DRAWINGS. THE CONTRACTOR SHALL MAKE HIS OWN DETERMINATION OF THE ACTUAL QUANTITIES TO COMPLETE THE WORK AS SHOWN ON THE DRAWINGS AND AS SPECIFIED FOR PREPARING HIS BID FOR THE PROJECT.

CONSTRUCTION NOTES

1. ALL ASPHALT RESTORATION REQUIRED WITHIN AREAS NOT SPECIFIED FOR ASPHALT RESTORATION SHALL BE COMPLETED AT THE CONTRACTOR'S EXPENSE AND AT NO COST TO THE OWNER.
2. REMOVE EXISTING DRAINAGE CULVERTS TO CONSTRUCT IRRIGATION LINE. EXISTING CULVERTS TO BE REINSTALLED AFTER PIPELINE INSTALLATION IS COMPLETED. CULVERTS DAMAGED BY CONSTRUCTION TO BE REPLACED WITH NEW SAME TYPE AND SIZE AT CONTRACTOR'S EXPENSE AND AT NO COST TO THE OWNER UNLESS THE CULVERT AGE AND CONDITION ENSUED THE DAMAGE AS DETERMINED BY THE ENGINEER. THE ENGINEER MAY REQUIRE REPLACEMENT OF CULVERTS DUE TO AGE OF CULVERT AND EXISTING CONDITION. REPLACEMENT REQUIRED BY THE ENGINEER SHALL BE PAID UNDER THE "CULVERT REPLACEMENT" BID ITEM AND MUST HAVE PRIOR APPROVAL BEFORE REPLACEMENT.
3. MAILBOXES, SIGNS, ETC., IN CONFLICT WITH WORK SHALL BE TEMPORARILY RELOCATED, AS REQUIRED BY THE ENGINEER, AND REINSTALLED TO THE ORIGINAL LOCATION AFTER THE IRRIGATION LINE IS CONSTRUCTED, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. DAMAGED MAILBOXES, SIGNS, POSTS, ETC., CAUSED BY THE CONSTRUCTION SHALL BE REPLACED WITH NEW LIKE KIND AS REQUIRED BY THE ENGINEER AT THE CONTRACTOR'S EXPENSE AND AT NO COST TO THE OWNER UNLESS THE AGE AND CONDITION ENSUED THE DAMAGE AS DETERMINED BY THE ENGINEER. THE ENGINEER MAY REQUIRE REPLACEMENT OF POST DUE TO AGE OF POST AND EXISTING CONDITION. REPLACEMENT REQUIRED BY THE ENGINEER SHALL BE PAID UNDER THE "POST REPLACEMENT" BID ITEM.
4. REMOVE EXISTING FENCING TO CONSTRUCT IRRIGATION LINES AS REQUIRED. EXISTING FENCING TO BE REINSTALLED TO THE SATISFACTION OF THE PROPERTY OWNERS AFTER PIPELINE INSTALLATION IS COMPLETED. FENCING DAMAGED BY CONSTRUCTION TO BE REPLACED WITH NEW SAME TYPE AND SIZE TO THE SATISFACTION OF THE PROPERTY OWNERS AT CONTRACTOR'S EXPENSE AND AT NO COST TO THE OWNER.
5. LOCATION FOR ALL SERVICES, AIR/VAC VALVES AND BLOW OFF ASSEMBLIES TO BE FIELD VERIFIED WITH THE ENGINEER PRIOR TO CONSTRUCTION. LOW POINTS ON MAIN LINES AND HIGH POINTS ON MAIN LINES SHOWN ON THE DRAWINGS ARE APPROXIMATE. CONSTRUCT BLOW OFFS AND AIR/VAC VALVES AT CONSTRUCTED LOW POINTS AND HIGH POINTS, RESPECTIVELY.
6. FOR IRRIGATION LINE CONSTRUCTION DIRECTLY ADJACENT TO ORCHARDS, THE CONTRACTOR SHALL PROTECT ORCHARD LIMBS FROM DAMAGE AS REQUIRED DURING CONSTRUCTION. COMPENSATION FOR DAMAGED TREES AND/OR LIMBS CAUSED BY THE CONTRACTOR SHALL BE AT THE CONTRACTOR'S EXPENSE AND AT NO COST TO THE OWNER. SEE TECHNICAL SPECIFICATION FOR DETAIL.
7. FRONTIER UNDERGROUND FIBER OPTIC LINES ARE LOCATED WITHIN THE PROJECT. THE CONTRACTOR SHALL COORDINATE HIS WORK WITH FRONTIER PRIOR TO CONSTRUCTION. FOR NEW IRRIGATION LINES THAT WILL CROSS FIBER OPTIC LINES, THE NEW IRRIGATION LINES SHALL BE INSTALLED UNDERNEATH THE FIBER OPTIC LINES, MAINTAINING A MINIMUM OF 12 INCHES CLEARANCE. ADJUSTMENTS TO THE IRRIGATION LINE VERTICAL GRADE MAY BE REQUIRED, INCLUDING FITTINGS AS REQUIRED. THIS ADJUSTMENT SHALL BE INCIDENTAL TO THE WORK.
8. EXISTING GROUND ELEVATIONS SHOWN ON THE PROFILES ARE APPROXIMATE AND MAY VARY FROM ACTUAL EXISTING GROUND ELEVATIONS ENCOUNTERED DURING CONSTRUCTION. THERE SHALL BE NO ADDITIONAL PAYMENT MADE TO THE CONTRACTOR FOR EXCAVATION AND BACKFILL VARIATIONS CAUSED BY ELEVATION OF EXISTING GROUND DIFFERENCES FROM WHAT IS SHOWN ON THE DRAWINGS.
9. BOTH HORIZONTAL DEFLECTIONS AND CHANGES OF VERTICAL GRADE ARE SHOWN ON THE DRAWINGS. IN SOME LOCATIONS FITTINGS ARE CALLED FOR ON THE DRAWINGS AT HORIZONTAL DEFLECTIONS AND CHANGES IN VERTICAL GRADE, BUT NOT AT ALL LOCATIONS THAT MAY REQUIRE FITTINGS. IF PIPE JOINT DEFLECTION OR BENDING THE PIPE AS DESCRIBED AND ALLOWED IN THE TECHNICAL SPECIFICATIONS DOES NOT MAINTAIN ALIGNMENT OR GRADE, FITTINGS SHALL BE USED WITH APPROPRIATE THRUST BLOCKING AND SHALL BE INCIDENTAL TO THE PIPELINE WORK. ADDITIONALLY, THE CONTRACTOR SHALL MAINTAIN THE 2.5-FOOT MINIMUM COVER OVER THE TOP OF PIPE DURING CONSTRUCTION FOR ALL AREAS EXCEPT DITCH LINES AND ROAD CROSSINGS. MINIMUM COVER FOR DITCH LINES AND ROAD CROSSINGS SHALL BE 3 FEET, UNLESS NOTED OTHERWISE.
10. THE CONTRACTOR SHALL PERFORM EXPLORATORY WORK PRIOR TO CONSTRUCTION INCLUDING POTHOLING OF UTILITIES SUCH AS TELEPHONE, FIBER OPTIC, ELECTRICAL, WATER, ETC., AND IRRIGATION MAINS AND SERVICE LINES THAT LAY ADJACENT TO OR CROSS THE IMPROVEMENTS TO BE CONSTRUCTED. THIS WORK SHALL BE PERFORMED IN ORDER TO ACCURATELY LOCATE AND DETERMINE SIZES OF THE LINES AND TO DETERMINE ANY CONFLICTS THAT MAY EXIST THAT WILL REQUIRE ADJUSTMENT OF UTILITIES, COORDINATION WITH UTILITIES, OR ADJUSTMENT OF IMPROVEMENTS. SEE THE TECHNICAL SPECIFICATIONS FOR ADDITIONAL DETAILS. PAYMENT FOR EXPLORATORY WORK SHALL BE PAID UNDER THE BID ITEM "POTHOLING."
11. THRUST BLOCKING REQUIRED FOR ALL TEES AND ELBOWS 11-1/4 DEGREES OR GREATER FOR PIPE SIZES 3-INCH OR GREATER.
12. THE CONTRACTOR'S WORK SHALL BE LIMITED TO THE WIDTH OF THE IRRIGATION EASEMENT PLUS ANY ADDITIONAL TEMPORARY EASEMENT PROVIDED AND COUNTY ROAD RIGHT-OF-WAY AS SPECIFIED IN THE TECHNICAL SPECIFICATIONS. SEE THE TECHNICAL SPECIFICATIONS FOR DETAILS.
13. SMUDGE POTS AND ACCESSORIES ADJACENT TO ORCHARDS SHALL BE MOVED BY PROPERTY OWNER PRIOR TO CONSTRUCTION.

BRENT MOORE — STATE OF WASHINGTON — 46008 — REGISTERED PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY	R. HARRIS	HORZ. SCALE	NONE
DRAWN BY	D. CHRISTMAN	JOB NUMBER	1199-336
REVIEWED BY	B. MOORE	ACAD FILE:	LEGEND-Ph3A.dwg
		VERT. SCALE	
		DATE	2011

RECORD DRAWINGS
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anderson perry & associates, inc.
engineering · surveying · natural resources
LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A
LEGEND, NOTES, AND QUANTITIES

SHEET 1

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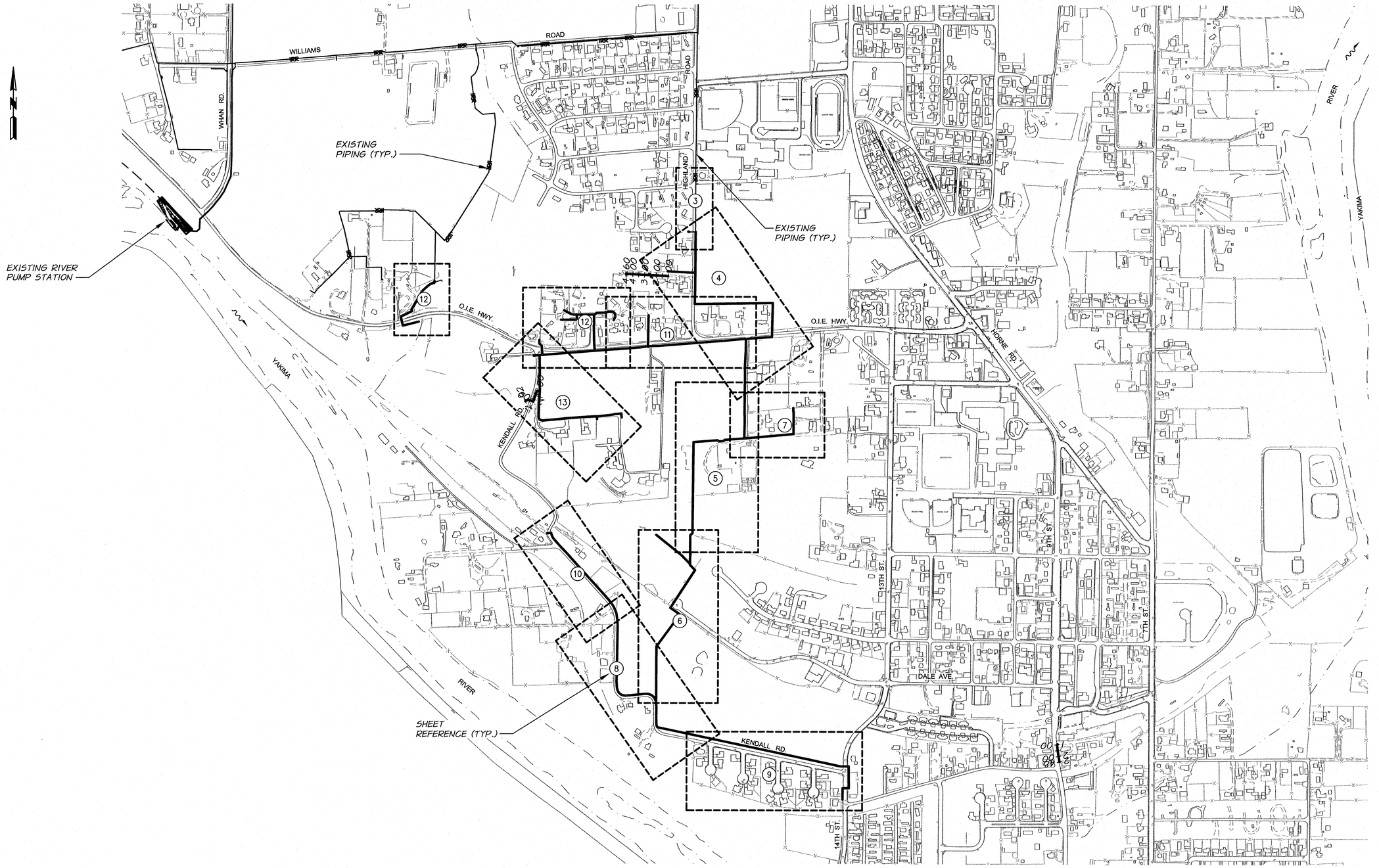

BRETT MOORE
46026
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

400 0 400 800 1200
SCALE IN FEET

DESIGNED BY	R. HARRIS
DRAWN BY	D. CHRISTMAN
REVIEWED BY	B. MOORE

HORZ. SCALE	1"=400'	VERT. SCALE	
JOB NUMBER	1199-336	DATE	2011
ACAD FILE:	SheetIndexPH3A.dwg		

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LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT

IRRIGATION SYSTEM IMPROVEMENTS
PHASE 3A

SHEET INDEX

SHEET
2

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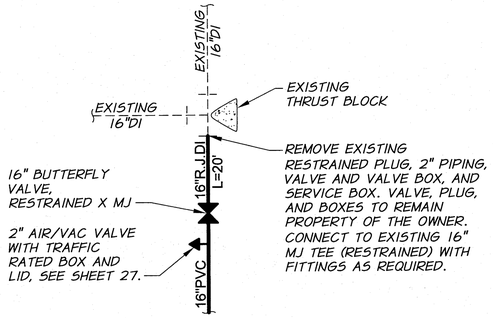

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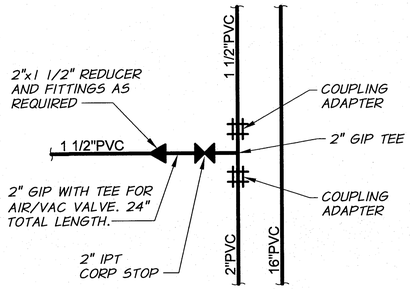

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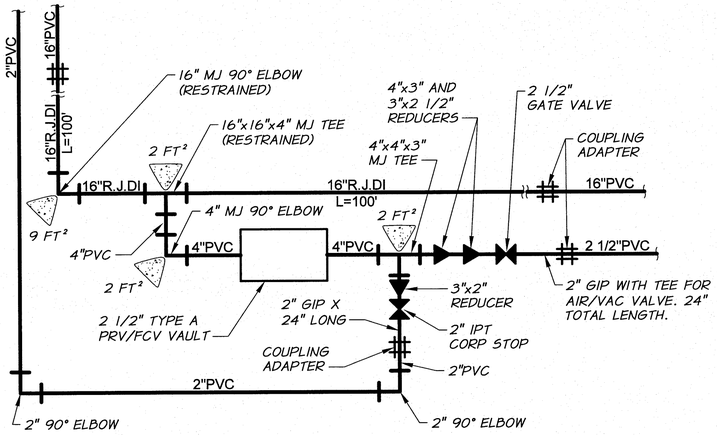

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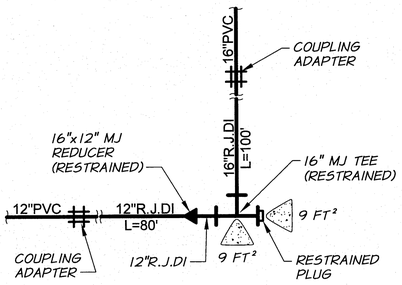

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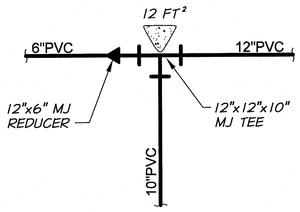

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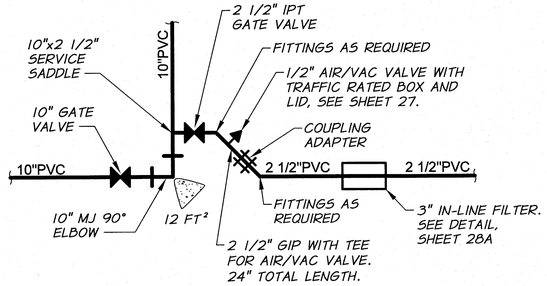

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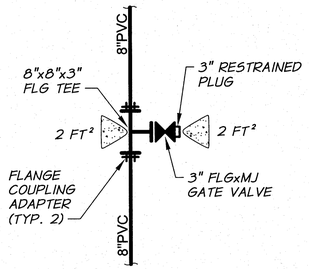

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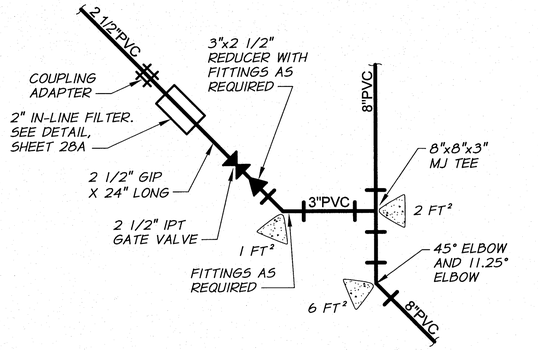

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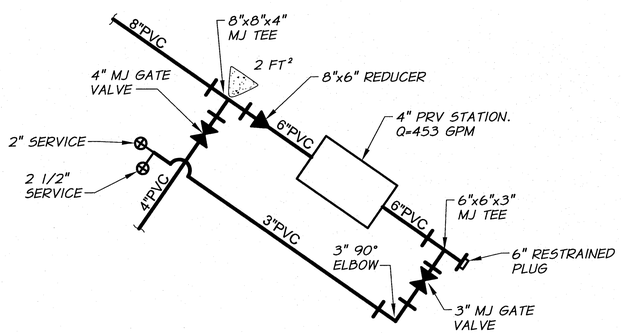

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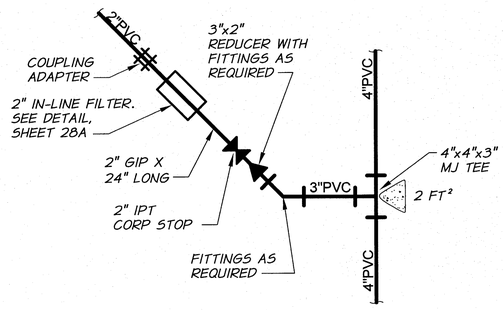

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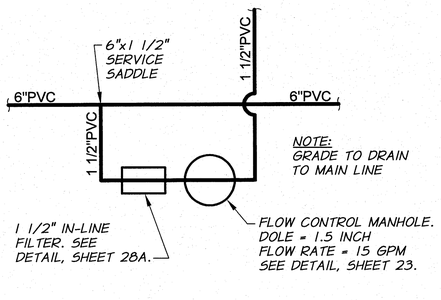

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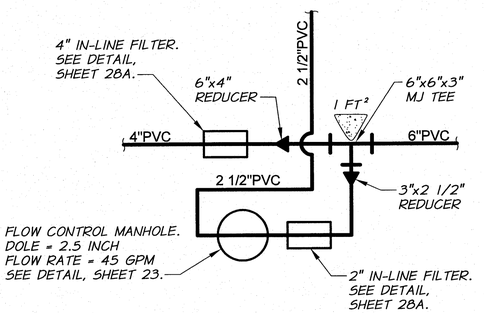

⚠ DETAIL AM

REFERENCE SHEET: 12

BRETT MOORE — STATE OF WASHINGTON — 46028 — REGISTERED PROFESSIONAL ENGINEER

SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE
⚠ RECORD DRAWING	B.M.	7/12

DESIGNED BY R. HARRIS
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE — VERT. SCALE
JOB NUMBER 1199-336 — DATE 2011
ACAD FILE: PipeConnDets-Ph3A.dwg

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engineering · surveying · natural resources
LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

PIPE CONNECTION DETAILS I

SHEET 14

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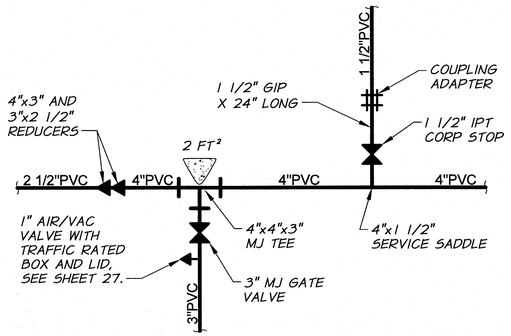

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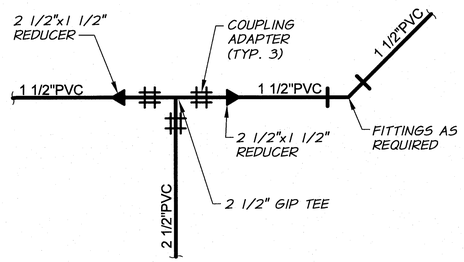

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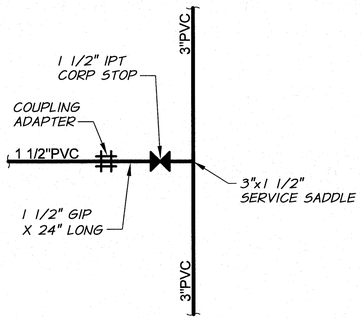

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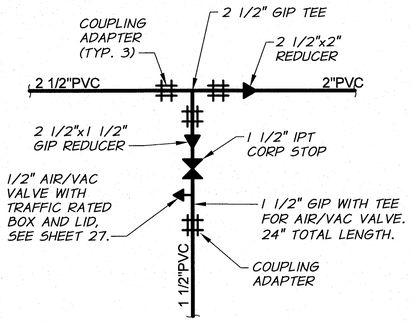

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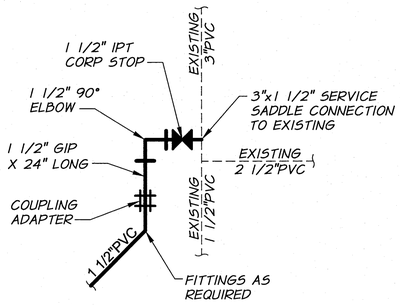

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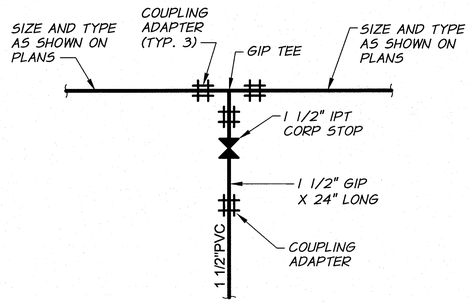

DETAIL AV

REFERENCE SHEET: 9

BRETT MOORE
STATE OF WASHINGTON
46026
REGISTERED PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY	R. HARRIS
DRAWN BY	D. CHRISTMAN
REVIEWED BY	B. MOORE

HORZ. SCALE	NONE	VERT. SCALE	
JOB NUMBER	1199-336	DATE	2011
ACAD FILE:	PipeConnDets-Ph3A.dwg		

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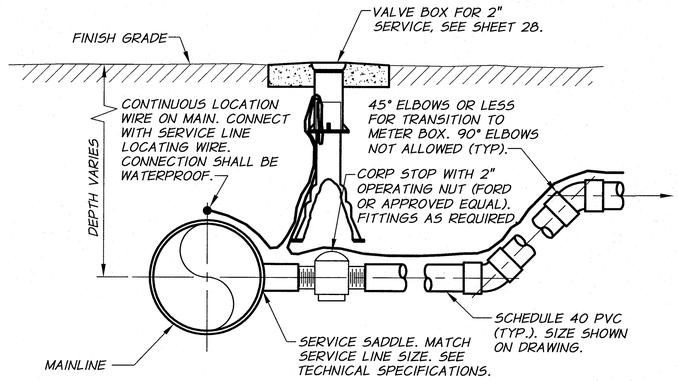
LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT

IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

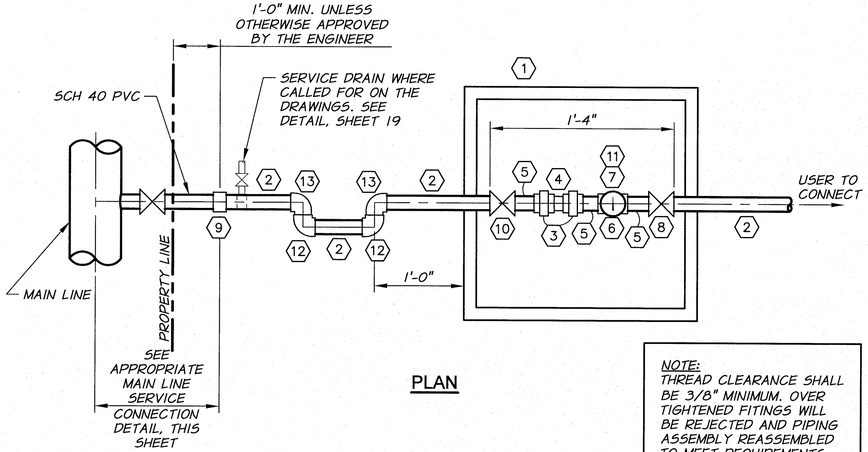
PIPE CONNECTION DETAILS II

SHEET 15



NOTE:
COORDINATE THE LOCATION OF SERVICE LINE CONNECTION WITH B.I.D. PRIOR TO CONSTRUCTION AND INSTALLATION.

MAIN LINE SERVICE CONNECTION
FOR 1.0", 1.5", AND 2" SERVICE
N.T.S.

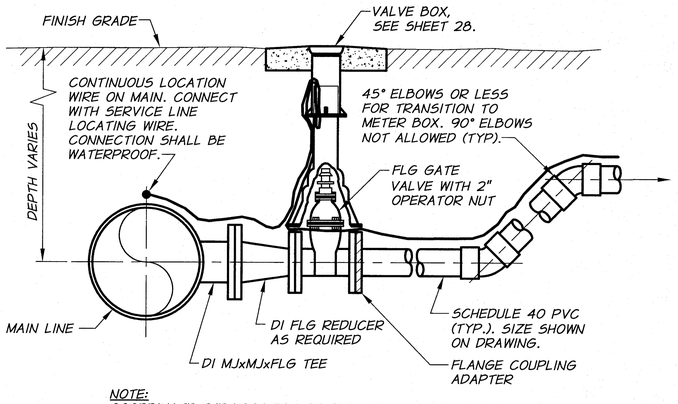


PLAN

NOTE:
THREAD CLEARANCE SHALL BE 3/8" MINIMUM. OVER TIGHTENED FITINGS WILL BE REJECTED AND PIPING ASSEMBLY REASSEMBLED TO MEET REQUIREMENTS. SEE SPECIFICATIONS FOR MORE DETAILS.

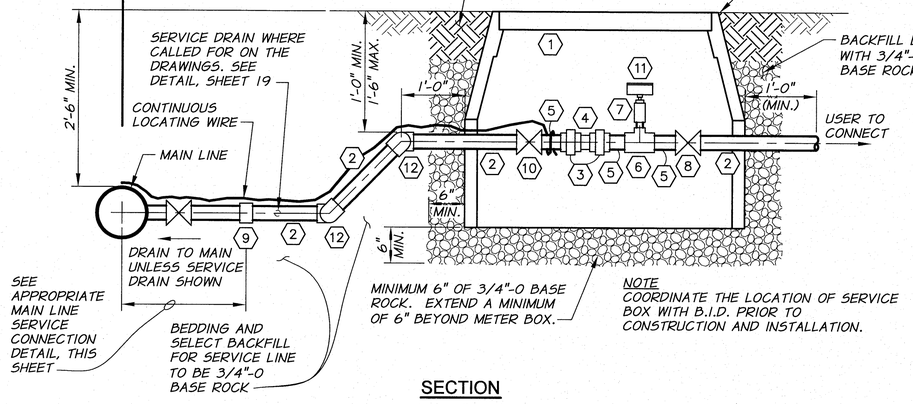
SERVICE FITTING SCHEDULE

1. CARSON INDUSTRIES MODEL L2424 VAULT WITH LID. INSTALL IN NON-TRAFFIC BEARING ZONE.
2. SCH. 40 G.I.P. PIPE
3. G.I.P. UNION
4. DOLE FLOW CONTROL VALVE. SIZE AS SHOWN ON PLANS. INSTALL WITH FLOW RATE LABEL FACING UPWARDS AND NO WRENCH MARKS ON VALVE.
5. THREADED SCH. 40 G.I.P. SPOOL, LENGTH AS REQUIRED.
6. SIZE x 3/4" G.I.P. TEE
7. 3/4" THREADED BRASS BALL VALVE WITH 3/4"x1/4" BUSHING AND BRASS QUICK COUPLING PLUG (UNVALVED)
8. CORP STOP
9. SCH80 PVC TRANSITION COUPLING AND FITTINGS AS REQ'D. FEMALE CONNECTION TO GIP.
10. CORP STOP WITH PADLOCK WING
11. BRASS MALE QUICK COUPLING WITH 1/2" BALL VALVE. ORIENT COUPLING SO THAT WHEN INSTALLED, OWNER SUPPLIED, GAUGE IS VIEWABLE FROM ACCESS OPENING.
12. 90° GIP ELBOW
13. 90° GIP STREET ELBOW



NOTE:
COORDINATE THE LOCATION OF SERVICE LINE CONNECTION WITH B.I.D. PRIOR TO CONSTRUCTION AND INSTALLATION.

MAIN LINE SERVICE CONNECTION
FOR 2.5" AND 3" SERVICE
N.T.S.



NOTE
COORDINATE THE LOCATION OF SERVICE BOX WITH B.I.D. PRIOR TO CONSTRUCTION AND INSTALLATION.

SECTION

TYPICAL 1" SERVICE DETAIL
N.T.S.

BRETT MOORE
STATE OF WASHINGTON
46028
REGISTERED
PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY	R. HARRIS	HORZ. SCALE	NONE
DRAWN BY	D. CHRISTMAN	JOB NUMBER	1199-336
REVIEWED BY	B. MOORE	ACAD FILE:	ServiceDets-Ph3A.dwg

VERT. SCALE
DATE 2011

RECORD DRAWINGS
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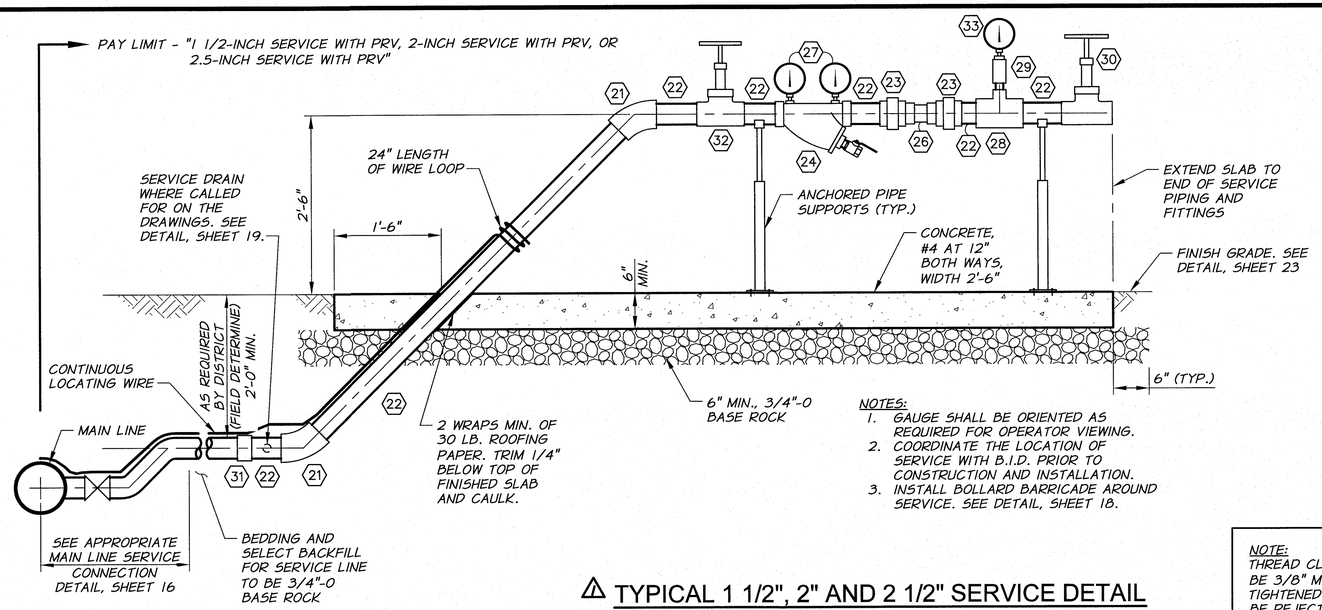
LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

SERVICE DETAILS I

SHEET 16

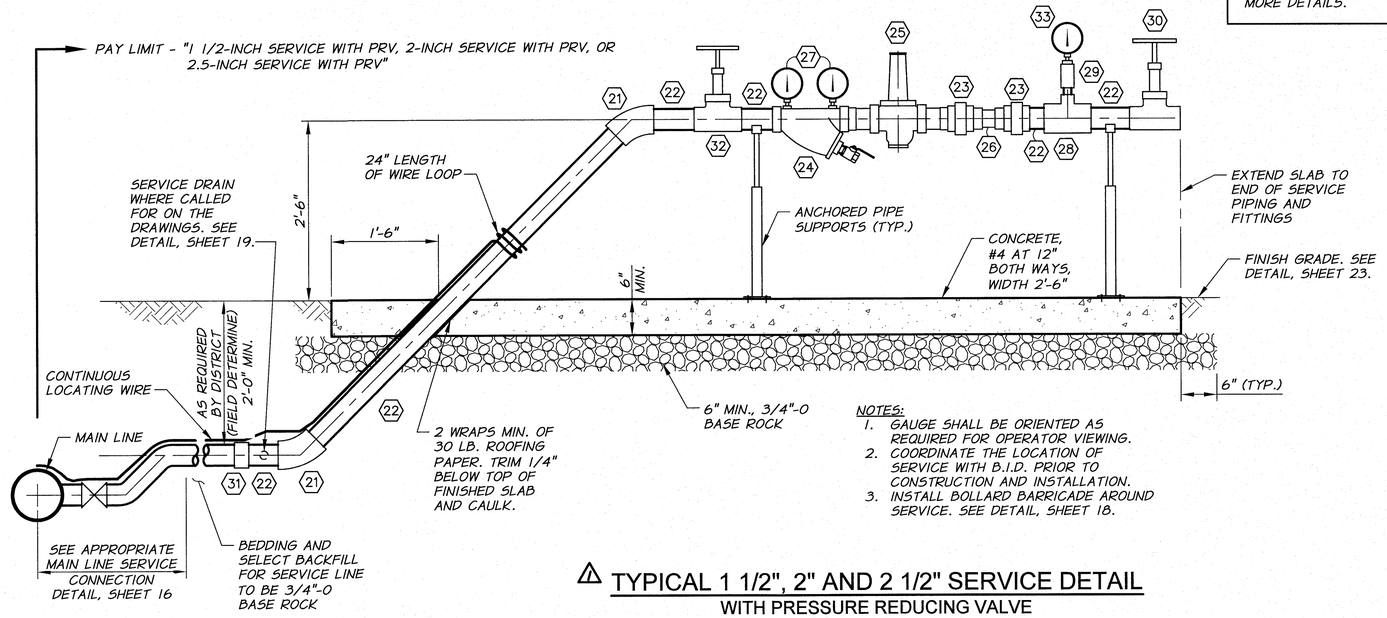
ARCHIVED



NOTES:
1. GAUGE SHALL BE ORIENTED AS REQUIRED FOR OPERATOR VIEWING.
2. COORDINATE THE LOCATION OF SERVICE WITH B.I.D. PRIOR TO CONSTRUCTION AND INSTALLATION.
3. INSTALL BOLLARD BARRICADE AROUND SERVICE. SEE DETAIL, SHEET 18.

⚠ TYPICAL 1 1/2", 2" AND 2 1/2" SERVICE DETAIL
WITHOUT PRESSURE REDUCING VALVE
N.T.S.

NOTE:
THREAD CLEARANCE SHALL BE 3/8" MINIMUM. OVER TIGHTENED FITINGS WILL BE REJECTED AND PIPING ASSEMBLY REASSEMBLED TO MEET REQUIREMENTS. SEE SPECIFICATIONS FOR MORE DETAILS.



NOTES:
1. GAUGE SHALL BE ORIENTED AS REQUIRED FOR OPERATOR VIEWING.
2. COORDINATE THE LOCATION OF SERVICE WITH B.I.D. PRIOR TO CONSTRUCTION AND INSTALLATION.
3. INSTALL BOLLARD BARRICADE AROUND SERVICE. SEE DETAIL, SHEET 18.

⚠ TYPICAL 1 1/2", 2" AND 2 1/2" SERVICE DETAIL
WITH PRESSURE REDUCING VALVE
N.T.S.

⚠ SERVICE FITTING SCHEDULE

21. G.I.P. 45° ELBOW
22. SCH. 40 G.I.P. PIPE
23. G.I.P. UNION OR G.I.P. REDUCING UNION AS REQUIRED
24. SONNTAG ALUMINUM Y-FILTER WITH 40 MESH FILTER SCREEN. 1 1/4" FOR 1 1/2" SERVICE, 2" FOR 2" SERVICE, 3" FOR 2.5" SERVICE (UNLESS OTHERWISE SPECIFIED), WITH FITTINGS AS REQUIRED
25. CLA-VAL 990 PRESSURE REDUCING VALVE WITH BUSHINGS AS REQUIRED. SIZE AS SHOWN ON PLANS. SEE TECHNICAL SPECIFICATIONS FOR DETAILS.
26. DOLE FLOW CONTROL VALVE. SIZE AS SHOWN ON PLANS. INSTALL WITH FLOW RATE LABEL FACING UPWARDS AND NO WRENCH MARKS ON VALVE.
27. 4" SS GLYCERIN FILLED PRESSURE GAUGE, FITTINGS AS REQUIRED
28. SIZE x 3/4" G.I.P. TEE
29. 3/4" THREADED BRASS BALL VALVE WITH 3/4"x1/4" BUSHING AND BRASS QUICK COUPLING PLUG (UNVALVED)
30. BRASS THREADED GATE VALVE
31. SCH 80 PVC TRANSITION COUPLING AND FITTINGS AS REQ'D. FEMALE CONNECTION TO GIP.
32. LOCKING THREADED BRASS GATE VALVE WITH BUSHINGS AS REQ'D. USE 1 1/2" VALVE FOR 1 1/2" SERVICE, USE 2" VALVE FOR 2" OR 2 1/2" SERVICE
33. BRASS QUICK COUPLING SOCKET (UNVALVED) GAUGE BY OWNER.

BRETT MOORE
STATE OF WASHINGTON
46026
REGISTERED
PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE
⚠ RECORD DRAWING	B.M.	7/12

DESIGNED BY	R. HARRIS	HORZ. SCALE	NONE
DRAWN BY	D. CHRISTMAN	VERT. SCALE	
REVIEWED BY	B. MOORE	JOB NUMBER	1199-336
		DATE	2011
		ACAD FILE:	ServiceDets-Ph3A.dwg

RECORD DRAWINGS
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LA GRANDE, OR. WALLA WALLA, WA.

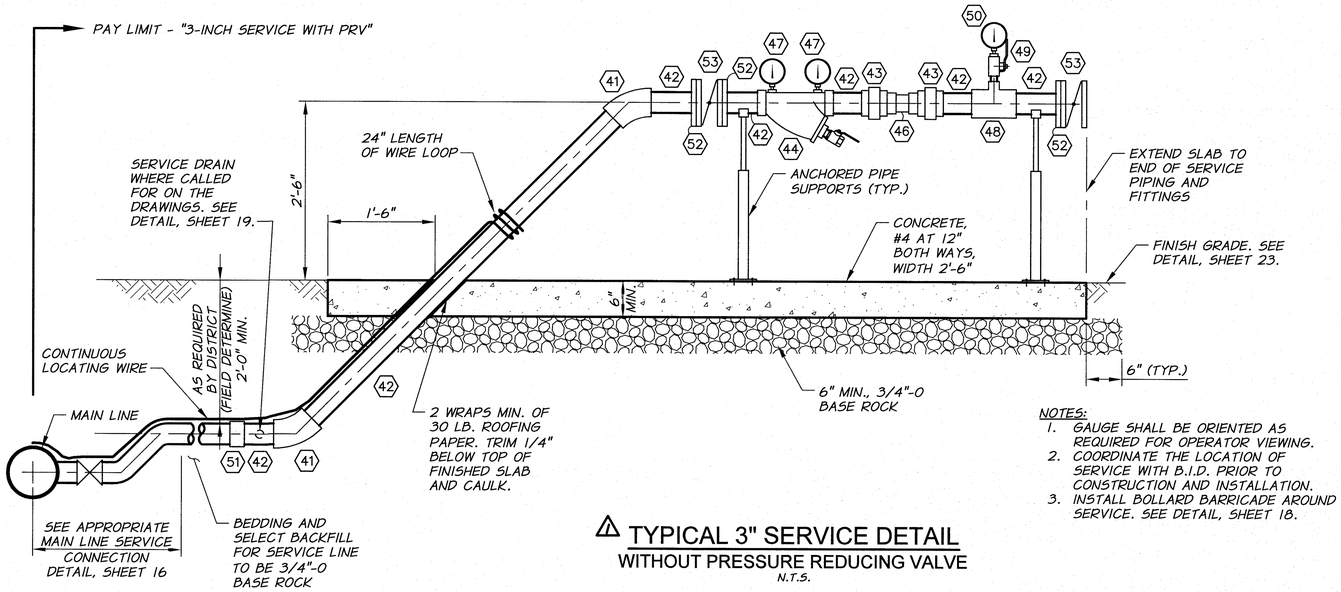
BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

SERVICE DETAILS II

SHEET 17

ARCHIVED

NOTE:
THREAD CLEARANCE SHALL BE 3/8" MINIMUM. OVER TIGHTENED FITINGS WILL BE REJECTED AND PIPING ASSEMBLY REASSEMBLED TO MEET REQUIREMENTS. SEE SPECIFICATIONS FOR MORE DETAILS.

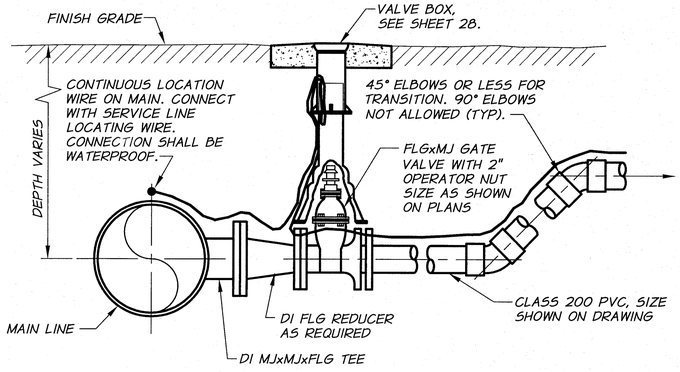


TYPICAL 3" SERVICE DETAIL
WITHOUT PRESSURE REDUCING VALVE
N.T.S.

NOTES:
1. GAUGE SHALL BE ORIENTED AS REQUIRED FOR OPERATOR VIEWING.
2. COORDINATE THE LOCATION OF SERVICE WITH B.I.D. PRIOR TO CONSTRUCTION AND INSTALLATION.
3. INSTALL BOLLARD BARRICADE AROUND SERVICE. SEE DETAIL, SHEET 18.

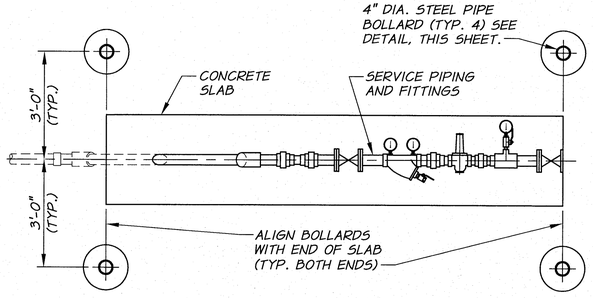
SERVICE FITTING SCHEDULE

41	G.I.P. 45° ELBOW
42	SCH. 40 G.I.P. PIPE
43	G.I.P. UNION OR G.I.P. REDUCING UNION AS REQUIRED
44	3" SONNTAG ALUMINUM Y-FILTER WITH 40 MESH FILTER SCREEN, UNLESS OTHERWISE SPECIFIED
46	DOLE FLOW CONTROL VALVE. SIZE AS SHOWN ON PLANS. INSTALL WITH FLOW RATE LABEL FACING UPWARDS AND NO WRENCH MARKS ON VALVE.
47	4" SS GLYCERIN FILLED PRESSURE GAUGE. FITTINGS AS REQUIRED.
48	3"x3/4" G.I.P. TEE
49	3/4" THREADED BRASS BALL VALVE WITH 3/4"x1/4" BUSHING AND BRASS QUICK COUPLING PLUG (UNVALVED)
50	BRASS QUICK COUPLING SOCKET (UNVALVED) GAUGE BY OWNER
51	SCH 80 PVC TRANSITION COUPLING AND FITTINGS AS REQ'D. FEMALE CONNECTION TO GIP.
52	FLANGE ADAPTER
53	3" FLG BUTTERFLY VALVE WITH WHEEL OPERATOR AND POSITION INDICATOR

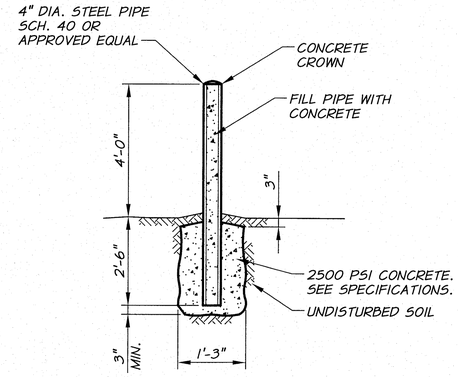


NOTE:
COORDINATE THE LOCATION OF SERVICE LINE CONNECTION WITH B.I.D. PRIOR TO CONSTRUCTION AND INSTALLATION.

MAIN LINE SERVICE CONNECTION
FOR 4" SERVICE AND LARGER
N.T.S.



ABOVE GROUND SERVICE BARRICADE DETAIL
PLAN
N.T.S.



NOTES:
1. 4" DIA. STEEL PIPE SHALL BE PLUMB.
2. PAINTING SHALL BE DONE ONLY AFTER SURFACE IS FREE OF RUST, OIL, AND GREASE. THE METAL SHALL BE PRIMED AND TWO FINISH COATS APPLIED, YELLOW IN COLOR.

BOLLARD DETAIL
N.T.S.

SCOTT MOORE
STATE OF WASHINGTON
16026
REGISTERED
PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE
RECORD DRAWING	B.M.	7/12

DESIGNED BY R. HARRIS
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE | VERT. SCALE
JOB NUMBER 1199-336 | DATE 2011
ACAD FILE: ServiceDets-Ph3A.dwg

RECORD DRAWINGS
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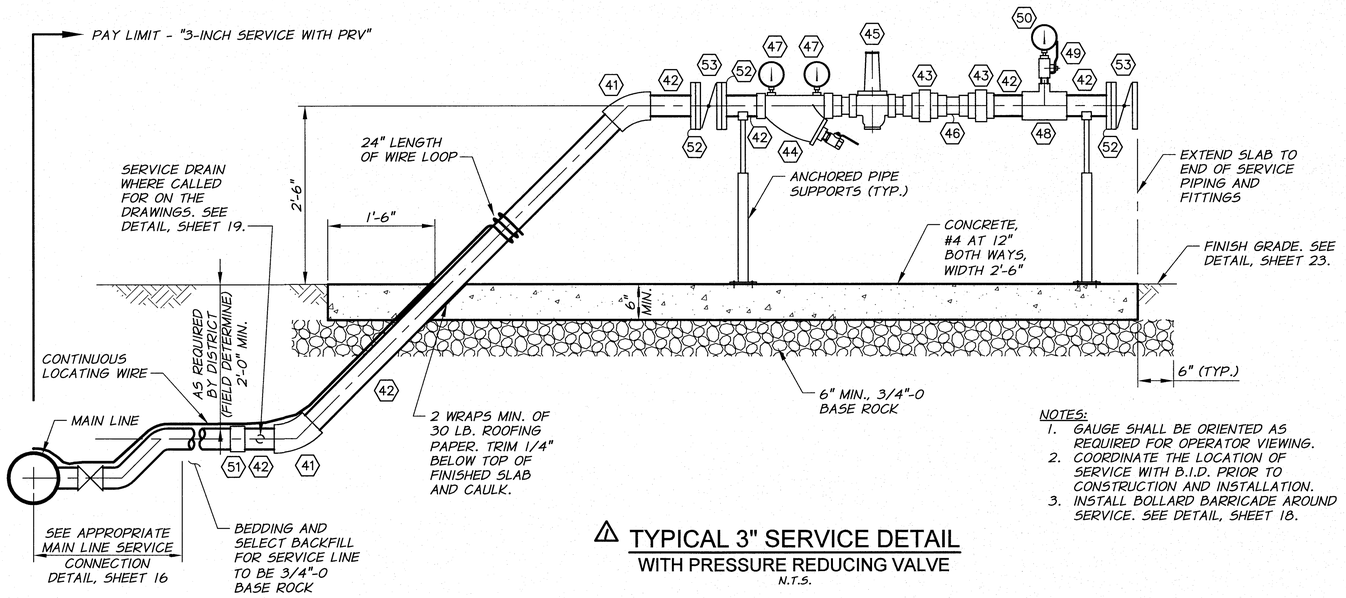
BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS
PHASE 3A

SERVICE DETAILS III

SHEET 18

ARCHIVED

NOTE:
THREAD CLEARANCE SHALL BE 3/8" MINIMUM. OVER TIGHTENED FITINGS WILL BE REJECTED AND PIPING ASSEMBLY REASSEMBLED TO MEET REQUIREMENTS. SEE SPECIFICATIONS FOR MORE DETAILS.



NOTES:
1. GAUGE SHALL BE ORIENTED AS REQUIRED FOR OPERATOR VIEWING.
2. COORDINATE THE LOCATION OF SERVICE WITH B.I.D. PRIOR TO CONSTRUCTION AND INSTALLATION.
3. INSTALL BOLLARD BARRICADE AROUND SERVICE. SEE DETAIL, SHEET 18.

⚠ TYPICAL 3" SERVICE DETAIL
WITH PRESSURE REDUCING VALVE
N.T.S.

⚠ SERVICE FITTING SCHEDULE

41 G.I.P. 45° ELBOW

42 SCH. 40 G.I.P. PIPE

43 G.I.P. UNION OR G.I.P. REDUCING UNION AS REQUIRED

44 3" SONNTAG ALUMINUM Y-FILTER WITH 40 MESH FILTER SCREEN, UNLESS OTHERWISE SPECIFIED

45 CLA-VAL 990 PRESSURE REDUCING VALVE WITH BUSHINGS AS REQUIRED. SIZE AS SHOWN ON PLANS. SEE TECHNICAL SPECIFICATIONS FOR DETAILS.

46 DOLE FLOW CONTROL VALVE. SIZE AS SHOWN ON PLANS. INSTALL WITH FLOW RATE LABEL FACING UPWARDS AND NO WRENCH MARKS ON VALVE.

47 4" SS GLYCERIN FILLED PRESSURE GAUGE. FITTINGS AS REQUIRED.

48 3"x3/4" G.I.P. TEE

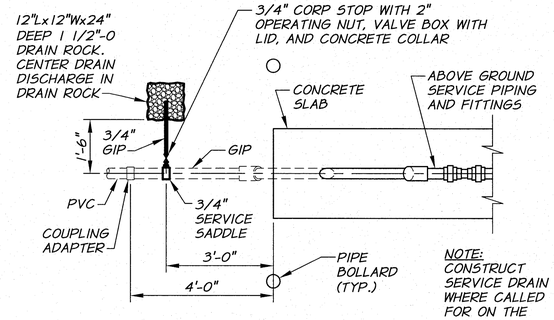
49 3/4" THREADED BRASS BALL VALVE WITH 3/4"x1/4" BUSHING AND BRASS QUICK COUPLING PLUG (UNVALVED)

50 BRASS QUICK COUPLING SOCKET (UNVALVED) GAUGE BY OWNER

51 SCH 80 PVC TRANSITION COUPLING AND FITTINGS AS REQ'D. FEMALE CONNECTION TO GIP.

52 FLANGE ADAPTER

53 3" FLG BUTTERFLY VALVE WITH WHEEL OPERATOR AND POSITION INDICATOR



SERVICE DRAIN DETAIL
PLAN
N.T.S.

BRETT MOORE
STATE OF WASHINGTON
46026
REGISTERED
PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE
⚠ RECORD DRAWING	B.M.	7/12

DESIGNED BY R. HARRIS
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE | VERT. SCALE
JOB NUMBER 1199-336 | DATE 2011
ACAD FILE: ServiceDets-Ph3A.dwg

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LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

SERVICE DETAILS IV

SHEET 19

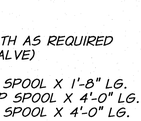
ARCHIVED

FITTING SCHEDULE

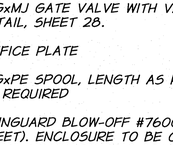
1. SERVICE LINE PVC PIPING
2. MJ ECCENTRIC REDUCER
3. CLASS 200 PVC PIPING (SAME SIZE AS CONTROL VALVE)
4. MJ GATE VALVE WITH VALVE BOX. SEE DETAIL, SHEET 28.
5. COUPLING
6. FLG X PE D.I. SPOOL, LENGTH AS REQUIRED (SAME SIZE AS CONTROL VALVE)
7. FOR 4" SERVICE: 3" FLG DI SPOOL X 1'-8" LG.
   FOR 6" SERVICE: 4" FLG GIP SPOOL X 4'-0" LG.
   FOR 8" SERVICE: 6" FLG DI SPOOL X 4'-0" LG.
8. FOR 4" SERVICE: 3" MICROMETER FLOWMETER MODEL MW500
   FOR 6" SERVICE: 4" MICROMETER FLOWMETER MODEL LP22
   FOR 8" SERVICE: 6" MICROMETER FLOWMETER MODEL LP32
9. FOR PRV/FCV SERVICE ONLY: 3/4" TAPPING SADDLE WITH 3/4" THREADED BRASS BALL VALVE, 3/4"x1/4" BUSHING, AND BRASS QUICK COUPLING PLUG (UNVALVED)
10. CLA-VAL 40-01 FLOW CONTROL OR 49-01 COMBINATION FLOW CONTROL AND PRESSURE REDUCING VALVE, TYPE AS SHOWN ON PLANS. SEE TABLE 1, THIS SHEET, AND SPECIFICATIONS FOR DETAILS.
11. RESTRAINED FLANGE COUPLING ADAPTER
12. BRASS QUICK COUPLING PLUG (UNVALVED) AND FITTINGS AS REQUIRED ON ORIFICE PILOT PIPING. PROVIDE ADDITIONAL ISOLATION VALVE.
13. PE DI SPOOL LENGTH AS REQUIRED (SAME SIZE AS CONTROL VALVE)
14. FLANGE COUPLING ADAPTER AND FITTINGS AS REQUIRED
15. FLG SIZExSIZExSIZE TEE, BRANCH NOT TO EXCEED 6"
16. FLGxMJ GATE VALVE WITH VALVE BOX. SEE DETAIL, SHEET 28.
17. ORIFICE PLATE
18. FLGxPE SPOOL, LENGTH AS REQUIRED, FITTINGS AS REQUIRED
19. MAINGUARD BLOW-OFF #7600 (SEE TABLE 1, THIS SHEET). ENCLOSURE TO BE CARSON INDUSTRIES MODEL H2436 TRAFFIC BEARING VAULT AND LID WITH EXTENSIONS AS REQUIRED.
20. OSHA APPROVED GALVANIZED STEEL LADDER WITH 4 FOOT REMOVABLE EXTENSION
21. PIPE SUPPORT. SEE TYPICAL PIPE SUPPORT DETAIL SHEET 26.
22. SEAL PIPE PENETRATIONS WATERTIGHT WITH NON-SHRINK GROUT
23. BRASS GRATED DRAIN WITH KNOCKOUT HOLE FOR DRAIN PIPE. DO NOT PROVIDE DRAIN IN HIGH GROUND WATER AREA.
24. FLG x PE DI SPOOL x 2 FT. LONG (SAME SIZE AS CONTROL VALVE)

TABLE 1

SERVICE SIZE	CONTROL VALVE SIZE	BLOW-OFF INLET	BLOW-OFF OUTLET	GATE VALVE SIZE
4-INCH	3"	4"	4"	3"
6-INCH	4"	4"	4"	4"
8-INCH	6"	6"	4"	6"



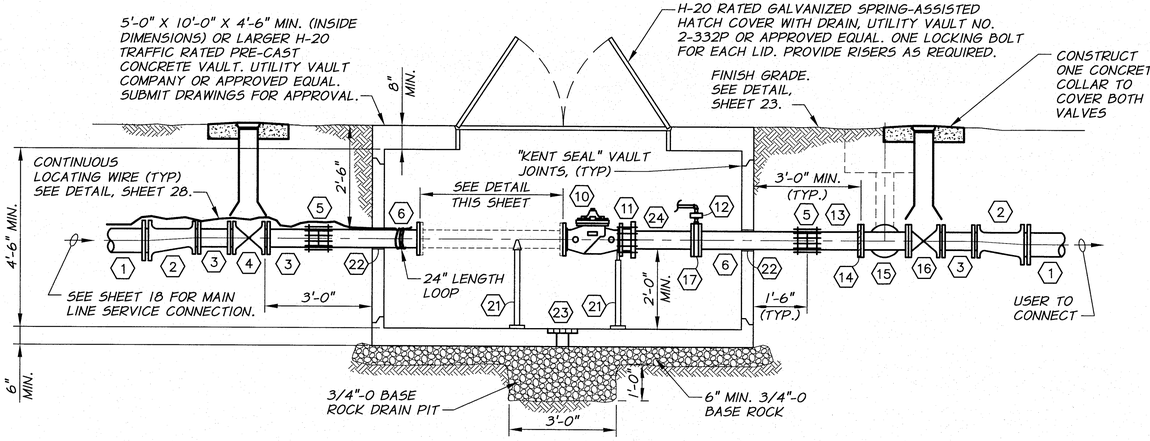
4" SERVICE



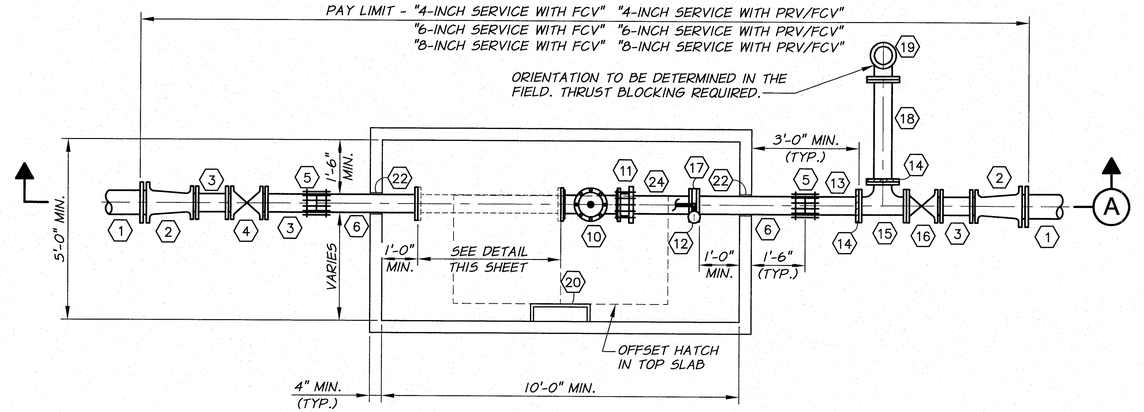
6" AND 8" SERVICE

FLOWMETER PIPING DETAIL

N.T.S.



SECTION A



PLAN

NOTES:
1. PIPING SIZE TO MATCH CONTROL VALVE SIZE UNLESS OTHERWISE NOTED.
2. SET FRAME AND COVER TO GRADE AND PROVIDE GRADE RINGS AS REQUIRED.
3. PIPE SUPPORTS TO BE SIZED APPROPRIATELY FOR PIPE AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
4. ALL WORK SHOWN IN THIS DETAIL, INCLUDING ANY REQUIRED SURFACE RESTORATION, SHALL BE INCLUDED IN THE "_-INCH SERVICE FCV" OR THE "_-INCH SERVICE PRV/FCV" PAY ITEM.

4", 6", AND 8" SERVICE WITH PRV/FCV OR FCV DETAIL

N.T.S.

ROBERT MOORE
STATE OF WASHINGTON
46026
REGISTERED
PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

SCALE IN FEET: 2 0 2 4 6

DESIGNED BY	R. HARRIS	HORZ. SCALE 1/2"=1'-0"	VERT. SCALE
DRAWN BY	D. CHRISTMAN	JOB NUMBER 1199-336	DATE 2011
REVIEWED BY	B. MOORE	ACAD FILE: VaultDets-PH3A.dwg	

RECORD DRAWINGS
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anderson perry & associates, inc.
engineering - surveying - natural resources
LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

SERVICE DETAILS V

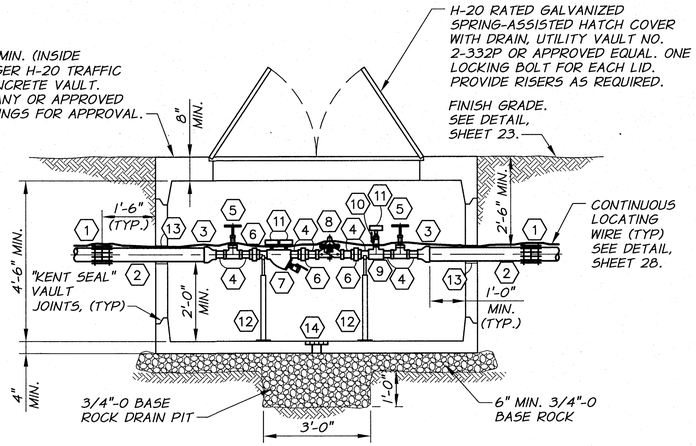
SHEET 20

ARCHIVED

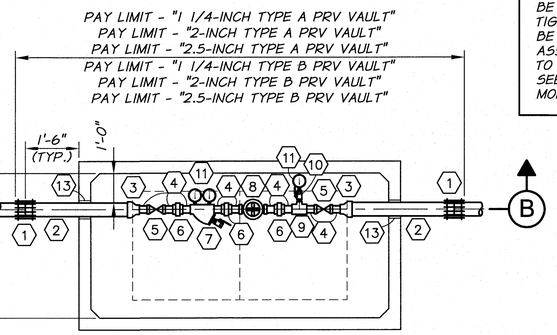
C:\BENTON I.D\1199_336_PRESSURE_IRR\dwg\PHASE_3\VaultDets-PH3A.dwg, SRVC V1.7, eamtz

FITTING SCHEDULE

1. TRANSITION COUPLING
2. GIP, SIZE AS SHOWN ON PLANS
3. THREADED GIP REDUCER WHERE REQUIRED
4. 1 1/4", 2", OR 2 1/2" THREADED GIP
5. BRASS THREADED GATE VALVE
6. GIP UNION
7. SONNTAG ALUMINUM Y FILTER WITH 3/32 SCREEN
8. 1 1/4", 2", OR 2 1/2" THREADED PRESSURE REDUCING VALVE, CLA-VAL 90-01 FOR TYPE A. 1 1/4", 2", OR 2 1/2" THREADED PRESSURE REDUCING VALVE, CLA-VAL 990 FOR TYPE B.
9. SIZE x 3/4" THREADED GIP TEE
10. 3/4" THREADED BRASS BALL VALVE WITH 3/4"x1/4" NPT BUSHING AND QUICK COUPLING
11. 4" SS GLYCERIN FILLED PRESSURE GAUGE WITH FITTINGS AS REQUIRED. ORIENT GAUGE SO THAT FACE IS CLEARLY VISIBLE FROM VAULT ACCESS OPENING.
12. PIPE SUPPORT. SEE DETAIL, SHEET 26.
13. SEAL PIPE PENETRATIONS WATERTIGHT WITH NON-SHRINK GROUT
14. BRASS GRATED DRAIN WITH KNOCKOUT HOLE FOR DRAIN PIPE. DO NOT PROVIDE DRAIN IN HIGH GROUND WATER AREA.



SECTION B



PLAN

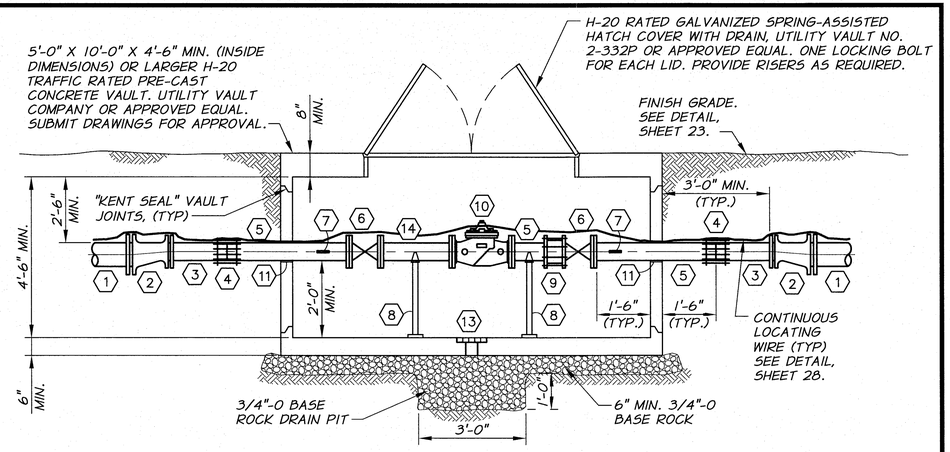
NOTES:
1. SET FRAME AND COVER TO GRADE AND PROVIDE GRADE RINGS AS REQUIRED.
2. PIPE SUPPORTS TO BE SIZED APPROPRIATELY FOR PIPE AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
3. ALL WORK SHOWN IN THIS DETAIL, INCLUDING ANY REQUIRED SURFACE RESTORATION, SHALL BE INCLUDED IN THE "_-INCH TYPE A OR B PRESSURE REDUCING VALVE" PAY ITEM.

1 1/4", 2", AND 2 1/2" PRESSURE REDUCING VALVE VAULT DETAIL

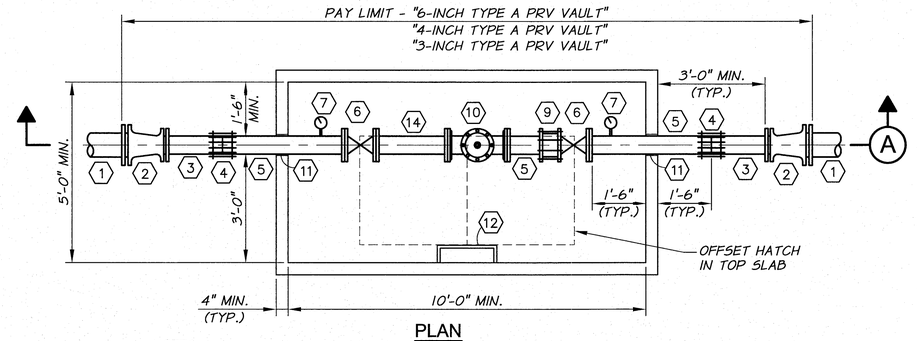
TYPE A OR TYPE B

N.T.S.

NOTE:
THREAD CLEARANCE SHALL BE 3/8" MINIMUM. OVER TIGHTENED FITINGS WILL BE REJECTED AND PIPING ASSEMBLY REASSEMBLED TO MEET REQUIREMENTS. SEE SPECIFICATIONS FOR MORE DETAILS.



SECTION A



PLAN

NOTES:
1. PIPING SIZE TO MATCH CONTROL VALVE SIZE UNLESS OTHERWISE NOTED.
2. SET FRAME AND COVER TO GRADE AND PROVIDE GRADE RINGS AS REQUIRED.
3. PIPE SUPPORTS TO BE SIZED APPROPRIATELY FOR PIPE AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
4. ALL WORK SHOWN IN THIS DETAIL, INCLUDING ANY REQUIRED SURFACE RESTORATION, SHALL BE INCLUDED IN THE "_-INCH PRESSURE REDUCING VALVE" PAY ITEM.

FITTING SCHEDULE

1. PVC PIPING, SIZE PER MAIN LINE
2. MJ ECCENTRIC REDUCER
3. PE D.I. SPOOL, LENGTH AS REQUIRED
4. COUPLING
5. FLG X PE D.I. SPOOL, LENGTH AS REQUIRED
6. FLG GATE VALVE WITH HANDWHEEL OPERATOR
7. 4" S.S. PRESSURE GAUGE, GLYCERIN FILLED, 0-150 P.S.I. WITH 2 P.S.I. GRADUATIONS, ISOLATION VALVE AND FITTINGS AS REQUIRED. TAP D.I. PIPE AS REQUIRED. ORIENT GAUGE SO THAT FACE IS CLEARLY VISIBLE FROM VAULT ACCESS OPENING.
8. PIPE SUPPORT. SEE TYPICAL PIPE SUPPORT DETAIL SHEET 26.
9. RESTRAINED FLANGE COUPLING ADAPTER
10. FLG PRESSURE REDUCING VALVE, CLA-VAL MODEL 90-01 FLANGED, OR APPROVED EQUAL.
11. SEAL PIPE PENETRATIONS WATERTIGHT WITH NON-SHRINK GROUT
12. OSHA APPROVED GALVANIZED STEEL LADDER WITH 4 FOOT REMOVABLE EXTENSION
13. BRASS GRATED DRAIN WITH KNOCKOUT HOLE FOR DRAIN PIPE. DO NOT PROVIDE DRAIN IN HIGH GROUND WATER AREAS.
14. FLG DI SPOOL X 2 FT. LONG

3", 4", AND 6" TYPE A PRESSURE REDUCING VALVE VAULT DETAIL

N.T.S.

BRENT MOORE — STATE OF WASHINGTON — 46026 — REGISTERED PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY	R. HARRIS
DRAWN BY	D. CHRISTMAN
REVIEWED BY	B. MOORE

HORZ. SCALE	NONE	VERT. SCALE	
JOB NUMBER	1199-336	DATE	2011
ACAD FILE:	VaultDets-PH3A.dwg		

RECORD DRAWINGS
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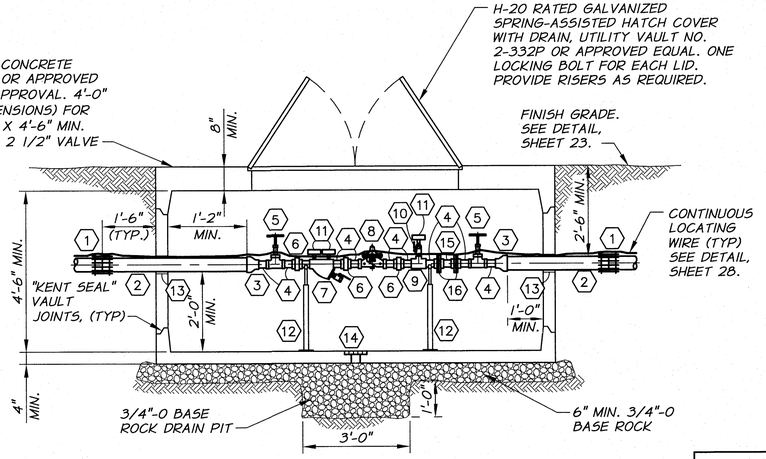
BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

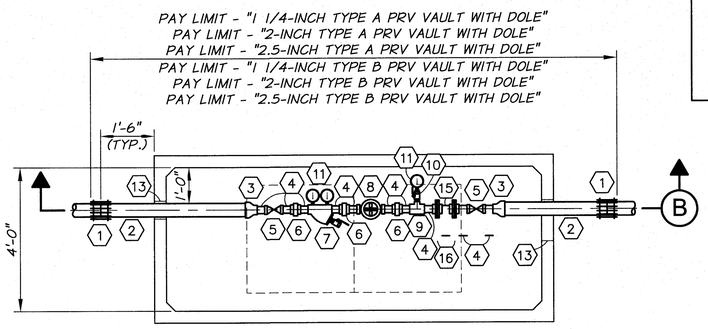
VALVE VAULT DETAILS I

SHEET 21

ARCHIVED



SECTION B



PLAN

NOTES:
1. SET FRAME AND COVER TO GRADE AND PROVIDE GRADE RINGS AS REQUIRED.
2. PIPE SUPPORTS TO BE SIZED APPROPRIATELY FOR PIPE AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
3. ALL WORK SHOWN IN THIS DETAIL, INCLUDING ANY REQUIRED SURFACE RESTORATION, SHALL BE INCLUDED IN THE "_-INCH TYPE A OR B PRV VAULT WITH DOLE" PAY ITEM.

FITTING SCHEDULE

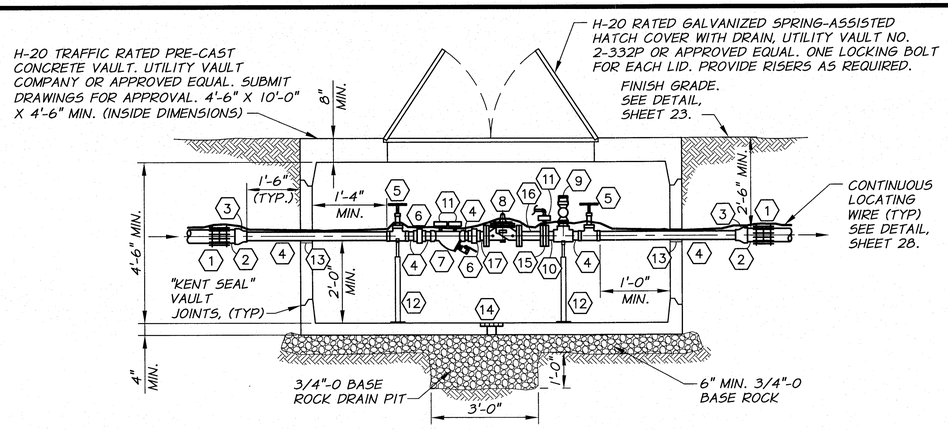
1. TRANSITION COUPLING
2. GIP, SIZE AS SHOWN ON PLANS
3. THREADED GIP REDUCER WHERE REQUIRED
4. 1 1/4", 2", OR 2 1/2" THREADED GIP
5. BRASS THREADED GATE VALVE
6. GIP UNION
7. SONNTAG ALUMINUM Y FILTER WITH 3/32 SCREEN
8. 1 1/4", 2", OR 2 1/2" THREADED PRESSURE REDUCING VALVE, CLA-VAL 90-01 FOR TYPE A. 1 1/4", 2", OR 2 1/2" THREADED PRESSURE REDUCING VALVE, CLA-VAL 990 FOR TYPE B.
9. SIZE x 3/4" THREADED GIP TEE
10. 3/4" THREADED BRASS BALL VALVE WITH 3/4"x1/4" NPT BUSHING AND QUICK COUPLING
11. 4" SS GLYCERIN FILLED PRESSURE GAUGE WITH FITTINGS AS REQUIRED. ORIENT GAUGE SO THAT FACE IS CLEARLY VISIBLE FROM VAULT ACCESS OPENING.
12. PIPE SUPPORT. SEE DETAIL, SHEET 26.
13. SEAL PIPE PENETRATIONS WATERTIGHT WITH NON-SHRINK GROUT
14. BRASS GRATED DRAIN WITH KNOCKOUT HOLE FOR DRAIN PIPE. DO NOT PROVIDE DRAIN IN HIGH GROUND WATER AREA.
15. DOLE FLOW CONTROL VALVE. SIZE AS SHOWN ON PLANS
16. THREADED RAISED FACE FLANGE WITH GASKET MATCHING FACE OF FLANGE. 4 EA. STAINLESS STEEL BOLTS AND NUTS. BOLT LENGTH AS REQUIRED TO PASS THROUGH ALL FLANGES.

NOTE:
THREAD CLEARANCE SHALL BE 3/8" MINIMUM. OVER TIGHTENED FITINGS WILL BE REJECTED AND PIPING ASSEMBLY REASSEMBLED TO MEET REQUIREMENTS. SEE SPECIFICATIONS FOR MORE DETAILS.

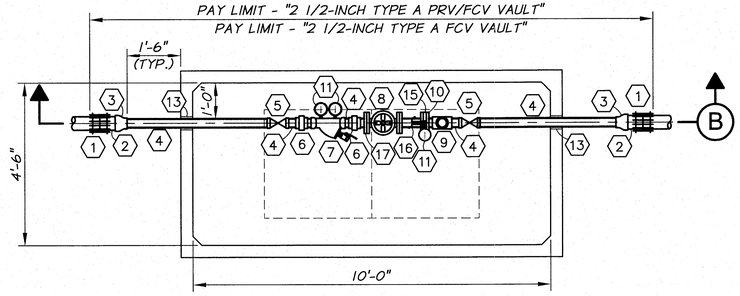
1 1/4", 2", AND 2 1/2" PRV VAULT WITH DOLE FCV DETAIL

TYPE A OR TYPE B

N.T.S.



SECTION B



PLAN

NOTES:
1. SET FRAME AND COVER TO GRADE AND PROVIDE GRADE RINGS AS REQUIRED.
2. PIPE SUPPORTS TO BE SIZED APPROPRIATELY FOR PIPE AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
3. ALL WORK SHOWN IN THIS DETAIL, INCLUDING ANY REQUIRED SURFACE RESTORATION, SHALL BE INCLUDED IN THE PAY ITEM.

FITTING SCHEDULE

1. TRANSITION COUPLING
2. GIP, SIZE AS SHOWN ON PLANS
3. THREADED GIP REDUCER WHERE REQUIRED
4. 2 1/2" THREADED GIP
5. BRASS THREADED GATE VALVE
6. GIP UNION AND BUSHINGS AS REQUIRED
7. 3" SONNTAG ALUMINUM Y FILTER WITH 3/32 SCREEN, FITTINGS AS REQUIRED
8. 2 1/2" FLANGED PRESSURE REDUCING/FLOW CONTROL VALVE, CLA-VAL MODEL 49G-01AB. FOR FLOW CONTROL ONLY, USE CLA-VAL MODEL 40G-01AB.
9. THREADED 2 1/2" GIP TEE WITH BALL VALVE, GIP, AND CAM-LOCK ADAPTER AND CAP
10. RAISED FACE FLANGE X THREADED GIP SPOOL
11. 4" SS GLYCERIN FILLED PRESSURE GAUGE AND ISOLATION VALVE WITH FITTINGS AS REQUIRED ON ORIFICE PILOT PIPING. ORIENT GAUGE SO THAT FACE IS CLEARLY VISIBLE FROM VAULT ACCESS OPENING.
12. PIPE SUPPORT. SEE DETAIL, SHEET 26.
13. SEAL PIPE PENETRATIONS WATERTIGHT WITH NON-SHRINK GROUT
14. BRASS GRATED DRAIN WITH KNOCKOUT HOLE FOR DRAIN PIPE. DO NOT PROVIDE DRAIN IN HIGH GROUND WATER AREA.
15. ORIFICE PLATE
16. FLG X RAISED FACE FLG GIP SPOOL X 8" LG.
17. FLG X THREADED GIP SPOOL

2 1/2" TYPE A PRV/FCV AND FCV VAULT DETAIL

N.T.S.

BRETT MOORE
STATE OF WASHINGTON
46026
REGISTERED
PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY	R. HARRIS	HORZ. SCALE	NONE
DRAWN BY	D. CHRISTMAN	JOB NUMBER	1199-336
REVIEWED BY	B. MOORE	ACAD FILE:	VaultDets-PH3A.dwg
		VERT. SCALE	
		DATE	2011

RECORD DRAWINGS

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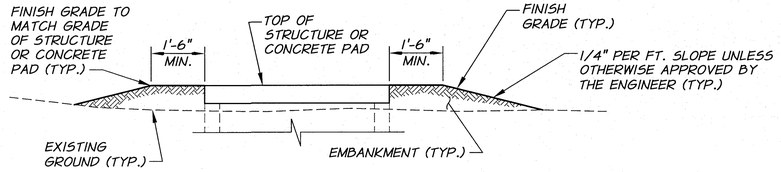
BENTON IRRIGATION DISTRICT

IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

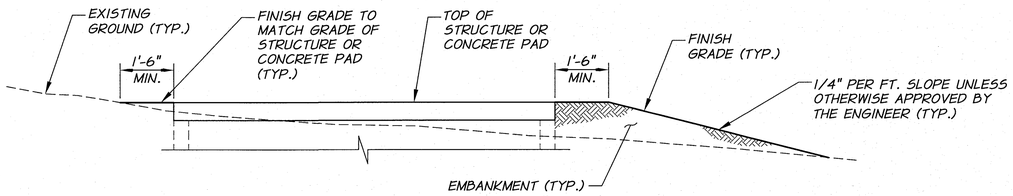
VALVE VAULT DETAILS II

SHEET 22

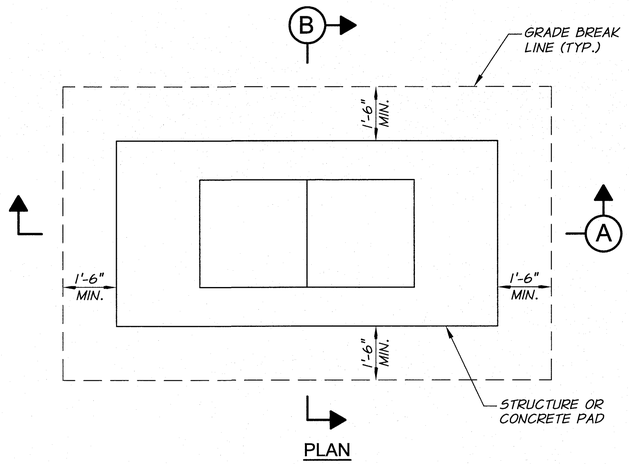
ARCHIVED



SECTION B



SECTION A



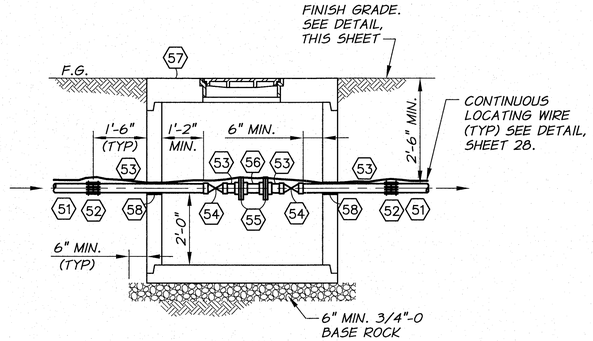
PLAN

GRADING DETAIL

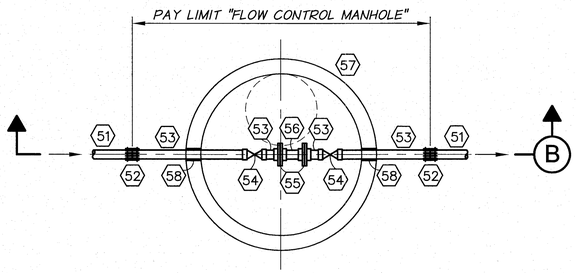
N.T.S.

FITTING SCHEDULE

51. PVC MAIN PIPING
52. COUPLING ADAPTER
53. GIP, SIZE OF MAIN
54. BRASS THREADED GATE VALVE
55. THREADED RAISED FACE FLANGE WITH GASKET MATCHING FACE OF FLANGE. 4 EA. STAINLESS STEEL BOLTS AND NUTS. BOLT LENGTH AS REQUIRED TO PASS THROUGH ALL FLANGES.
56. DOLE FLOW CONTROL VALVE, SIZE SPECIFIED ON DRAWINGS
57. 54" PRECAST MANHOLE WITH H20 TRAFFIC RATED FLAT TOP AND 24" MANHOLE COVER WITH FRAME CAST INTO SLAB
58. SEAL PIPE PENETRATIONS WATERTIGHT WITH NON-SHRINK GROUT



SECTION B



PLAN

FLOW CONTROL MANHOLE DETAIL

N.T.S.

ROBERT MOORE STATE OF WASHINGTON 46026 REGISTERED PROFESSIONAL ENGINEER
SIGNED 07-13-12 RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY	R. HARRIS	HORZ. SCALE	NONE
DRAWN BY	D. CHRISTMAN	JOB NUMBER	1199-336
REVIEWED BY	B. MOORE	ACAD FILE:	VaultDets-PH3A.dwg
		VERT. SCALE	
		DATE	2011

RECORD DRAWINGS

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BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

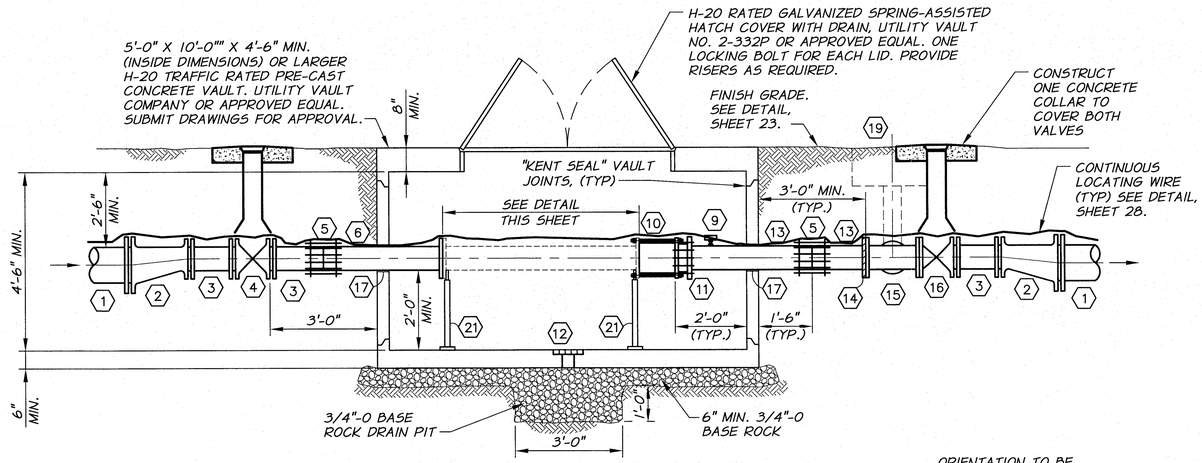
VALVE VAULT DETAILS III

SHEET 23

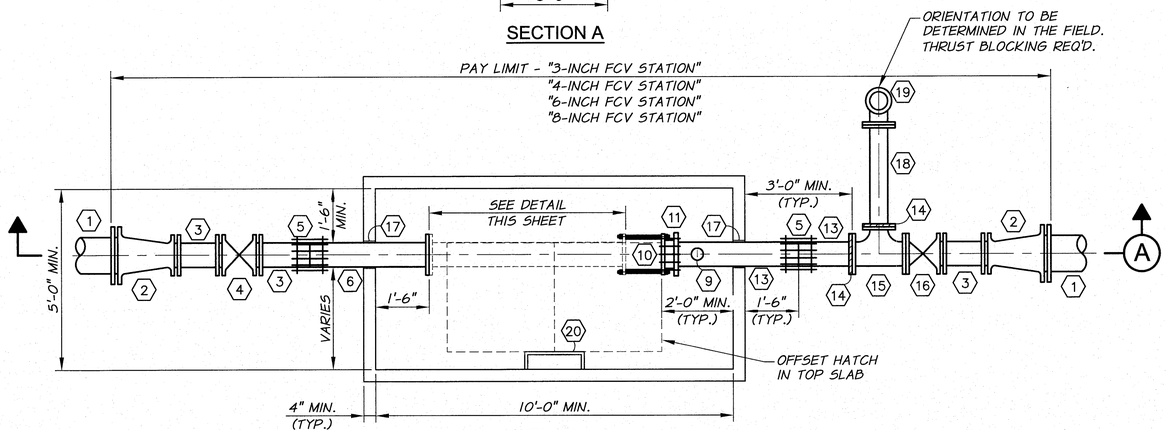
ARCHIVED

FITTING SCHEDULE

1. PVC PIPING, SIZE PER MAIN LINE
2. MJ ECCENTRIC REDUCER
3. PVC PIPING (SAME SIZE AS CONTROL VALVE)
4. MJ GATE VALVE WITH VALVE BOX. SEE DETAIL, SHEET 28.
5. COUPLING
6. FLG X PE D.I. SPOOL, LENGTH AS REQUIRED (SAME SIZE AS CONTROL VALVE)
7. FOR 3" STATION: FLG DI SPOOL x 4'-0" LONG
   FOR 4" STATION: FLG GIP SPOOL x 5'-6" LONG
   FOR 6" AND 8" STATIONS: FLG DI SPOOL x 5'-6" LONG
8. FOR 3" STATION: MICROMETER FLOWMETER MODEL MW500
   FOR 4" STATION: MICROMETER FLOWMETER MODEL LP22
   FOR 6" AND 8" STATION: MICROMETER FLOWMETER MODEL LP32
9. 3/4" TAPPING SADDLE WITH 3/4" THREADED BRASS BALL VALVE, 3/4"x1/4" BUSHING, AND BRASS QUICK COUPLING PLUG (UNVALVED)
10. WAFER STYLE 800 SERIES NELSON FLOW CONTROL VALVE. SEE SPECIFICATIONS FOR DETAILS. PROVIDE LONG BOLTS FOR FLANGES AS REQUIRED. LOCATE PADDLE 6" UPSTREAM OF VALVE. 1-INCH TAPPING SADDLE REQUIRED.
11. RESTRAINED FLANGE COUPLING ADAPTER
12. BRASS GRATED DRAIN WITH KNOCKOUT HOLE FOR DRAIN PIPE. DO NOT PROVIDE DRAIN IN HIGH GROUND WATER AREA.
13. PE DI SPOOL LENGTH AS REQUIRED (SAME SIZE AS CONTROL VALVE)
14. FLANGE COUPLING ADAPTER
15. FLG SIZExSIZExSIZE TEE, BRANCH NOT TO EXCEED 6"
16. FLGxMJ GATE VALVE WITH VALVE BOX. SEE DETAIL, SHEET 28.
17. SEAL PIPE PENETRATIONS WATERTIGHT WITH NON-SHRINK GROUT
18. FLGxPE SPOOL, LENGTH AS REQUIRED, FITTINGS AS REQUIRED
19. MAINGUARD BLOW-OFF #7600 FOR 4-INCH, 6-INCH AND 8-INCH CONTROL VALVE STATIONS. ECLIPSE NO. 85 BLOW-OFF HYDRANT FOR 3-INCH CONTROL VALVE STATIONS (SEE TABLE 1, THIS SHEET). ENCLOSURE TO BE CARSON INDUSTRIES MODEL H2436 TRAFFIC BEARING VAULT AND LID WITH EXTENSIONS AS REQUIRED.
20. OSHA APPROVED GALVANIZED STEEL LADDER WITH 4 FOOT REMOVABLE EXTENSION
21. PIPE SUPPORT. SEE TYPICAL PIPE SUPPORT DETAIL SHEET 26.

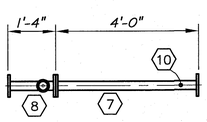


SECTION A

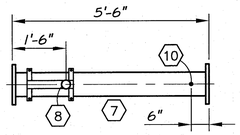


PLAN

NOTES:
1. PIPING SIZE TO MATCH CONTROL VALVE SIZE UNLESS OTHERWISE NOTED.
2. SET FRAME AND COVER TO GRADE AND PROVIDE GRADE RINGS AS REQUIRED.
3. PIPE SUPPORTS TO BE SIZED APPROPRIATELY FOR PIPE AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
4. ALL WORK SHOWN IN THIS DETAIL, INCLUDING ANY REQUIRED SURFACE RESTORATION, SHALL BE INCLUDED IN THE "_-INCH FCV STATION"



3" FCV STATION



4", 6", AND 8" FCV STATION

FLOWMETER PIPING DETAIL

N.T.S.

TABLE 1			
CONTROL VALVE SIZE	BLOW-OFF TYPE	INLET	OUTLET
3-INCH	ECLIPSE NO. 85 BLOW-OFF HYDRANT	3"	2 1/2 NST
4-INCH	MAINGUARD BLOW-OFF #7600	4"	4"
6-INCH	MAINGUARD BLOW-OFF #7600	6"	4"
8-INCH	MAINGUARD BLOW-OFF #7600	6"	4"

3", 4", 6" AND 8" FCV STATION DETAIL

N.T.S.

BRETT MOORE — STATE OF WASHINGTON — 46026 — REGISTERED PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY	R. HARRIS
DRAWN BY	D. CHRISTMAN
REVIEWED BY	B. MOORE

HORZ. SCALE NONE — VERT. SCALE
JOB NUMBER 1199-336 — DATE 2011
ACAD FILE: VaultDets-PH3A.dwg

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LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

VALVE STATION DETAILS I

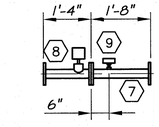
SHEET 24

ARCHIVED

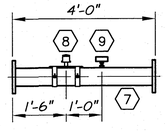
FITTING SCHEDULE

1. SERVICE LINE PVC PIPING
2. MJ ECCENTRIC REDUCER
3. CLASS 200 PVC PIPING (SAME SIZE AS CONTROL VALVE)
4. MJ GATE VALVE WITH VALVE BOX. SEE DETAIL, SHEET 28.
5. COUPLING
6. FLG X PE D.I. SPOOL, LENGTH AS REQUIRED (SAME SIZE AS CONTROL VALVE)
7. FOR 3" STATION: 3" FLG DI SPOOL X 1'-8" LG.
   FOR 4" STATION: 4" FLG GIP SPOOL X 4'-0" LG.
   FOR 6" STATION: 6" FLG DI SPOOL X 4'-0" LG.
   FOR 8" STATION: 8" FLG DI SPOOL X 4'-0" LG.
8. FOR 3" STATION: 3" MICROMETER FLOWMETER MODEL MW500
   FOR 4" STATION: 4" MICROMETER FLOWMETER MODEL LP22
   FOR 6" STATION: 6" MICROMETER FLOWMETER MODEL LP32
   FOR 8" STATION: 8" MICROMETER FLOWMETER MODEL LP32
9. FOR PRV/FCV SERVICE ONLY: 3/4" TAPPING SADDLE WITH 3/4" THREADED BRASS BALL VALVE, 3/4"x1/4" BUSHING, AND BRASS QUICK COUPLING PLUG (UNVALVED)
10. CLA-VAL 40-01 FLOW CONTROL OR 49-01 COMBINATION FLOW CONTROL AND PRESSURE REDUCING VALVE, TYPE AS SHOWN ON PLANS. SEE TABLE 1, THIS SHEET, AND SPECIFICATIONS FOR DETAILS.
11. RESTRAINED FLANGE COUPLING ADAPTER
12. BRASS QUICK COUPLING PLUG (UNVALVED) AND FITTINGS AS REQUIRED ON ORIFICE PILOT PIPING. PROVIDE ADDITIONAL ISOLATION VALVE.
13. PE DI SPOOL LENGTH AS REQUIRED (SAME SIZE AS CONTROL VALVE)
14. FLANGE COUPLING ADAPTER AND FITTINGS AS REQUIRED
15. FLG SIZExSIZExSIZE TEE, BRANCH NOT TO EXCEED 6"
16. FLGxMJ GATE VALVE WITH VALVE BOX. SEE DETAIL, SHEET 28.
17. ORIFICE PLATE
18. FLGxPE SPOOL, LENGTH AS REQUIRED, FITTINGS AS REQUIRED
19. MAINGUARD BLOW-OFF #7600 (SEE TABLE 1, THIS SHEET). ENCLOSURE TO BE CARSON INDUSTRIES MODEL H2436 TRAFFIC BEARING VAULT AND LID WITH EXTENSIONS AS REQUIRED.
20. OSHA APPROVED GALVANIZED STEEL LADDER WITH 4 FOOT REMOVABLE EXTENSION
21. PIPE SUPPORT. SEE TYPICAL PIPE SUPPORT DETAIL SHEET 26.
22. SEAL PIPE PENETRATIONS WATERTIGHT WITH NON-SHRINK GROUT
23. BRASS GRATED DRAIN WITH KNOCKOUT HOLE FOR DRAIN PIPE. DO NOT PROVIDE DRAIN IN HIGH GROUND WATER AREA.
24. FLG x PE DI SPOOL x 2 FT. LONG (SAME SIZE AS CONTROL VALVE)

TABLE 1				
STATION SIZE	CONTROL VALVE SIZE	BLOW-OFF INLET	BLOW-OFF OUTLET	GATE VALVE SIZE
3-INCH	3"	4"	4"	3"
4-INCH	4"	4"	4"	4"
6-INCH	6"	6"	4"	6"
8-INCH	8"	6"	4"	8"



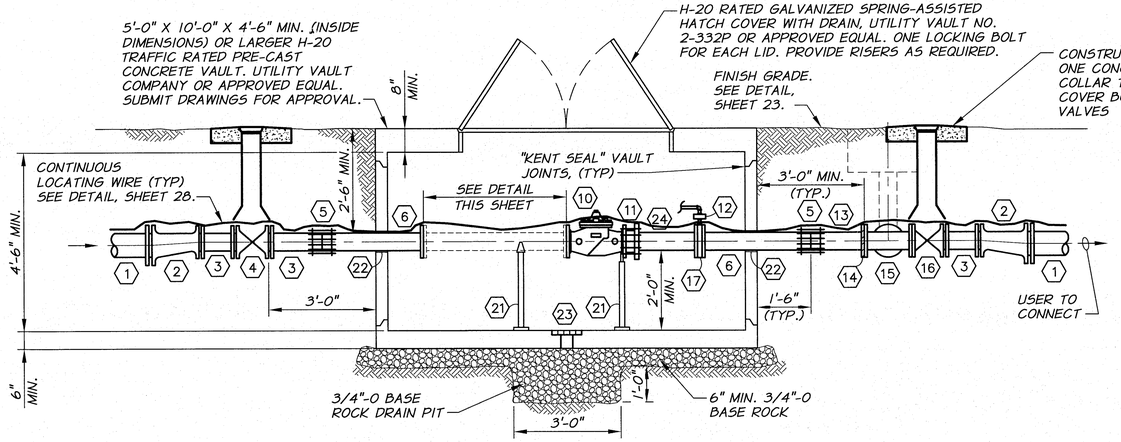
4" SERVICE



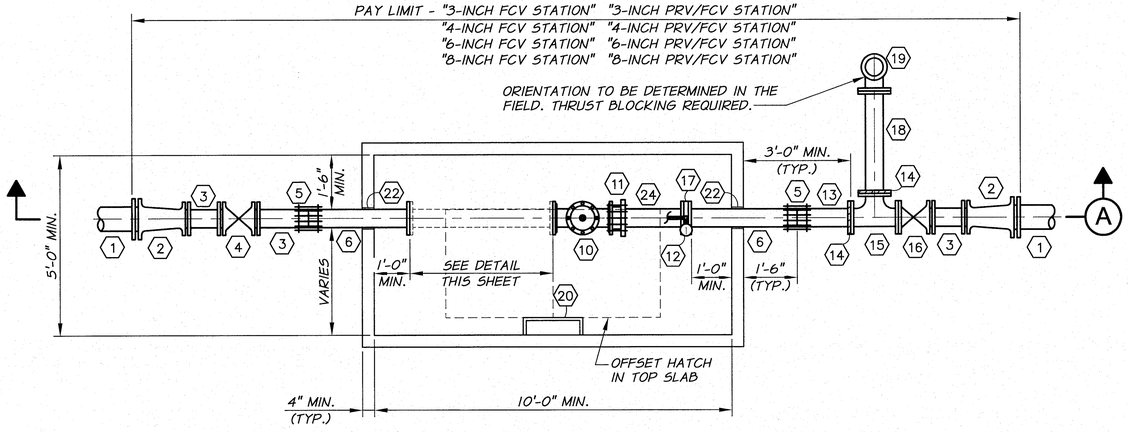
6" AND 8" SERVICE

FLOWMETER PIPING DETAIL

N.T.S.



SECTION A



PLAN

NOTES:
1. PIPING SIZE TO MATCH CONTROL VALVE SIZE UNLESS OTHERWISE NOTED.
2. SET FRAME AND COVER TO GRADE AND PROVIDE GRADE RINGS AS REQUIRED.
3. PIPE SUPPORTS TO BE SIZED APPROPRIATELY FOR PIPE AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
4. ALL WORK SHOWN IN THIS DETAIL, INCLUDING ANY REQUIRED SURFACE RESTORATION, SHALL BE INCLUDED IN THE "_-INCH FCV STATION" OR THE "_-INCH PRV/FCV STATION" PAY ITEM.

3", 4", 6", AND 8" FCV AND PRV/FCV STATION DETAIL

N.T.S.

BRETT MOORE — STATE OF WASHINGTON — 46026 — REGISTERED PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY R. HARRIS
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

SCALE IN FEET (2 0 2 4 6)

HORZ. SCALE 1/2"=1'-0" VERT. SCALE
JOB NUMBER 1199-336 DATE 2011
ACAD FILE: VaultDets-PH3A.dwg

RECORD DRAWINGS
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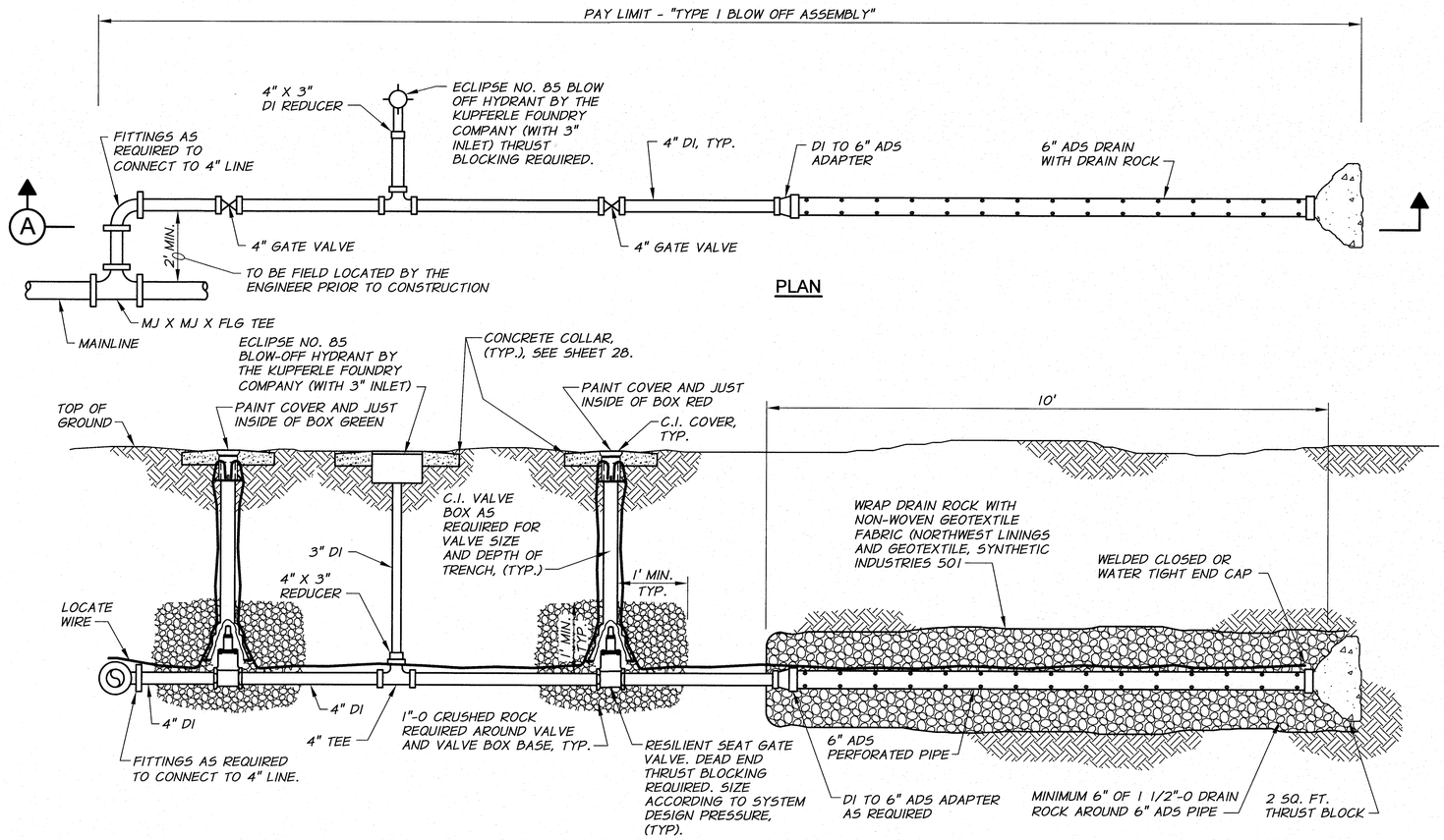
engineering · surveying · natural resources
LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

VALVE STATION DETAILS II

SHEET 25

ARCHIVED

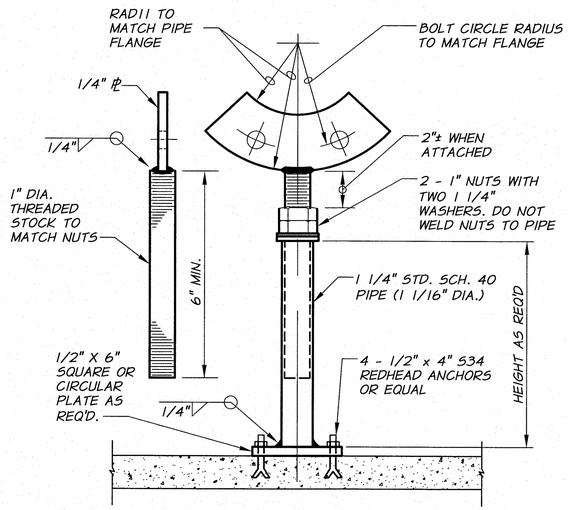


SECTION A

TYPE 1 BLOW-OFF ASSEMBLY DETAIL

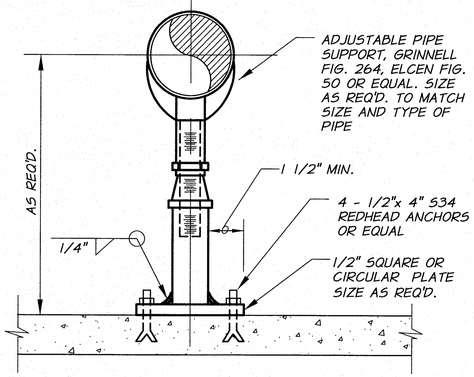
N.T.S.

NOTE:
BLOW-OFF TO BE FIELD LOCATED BY THE ENGINEER PRIOR TO CONSTRUCTION (INCLUDING ORIENTATION).



PIPE SUPPORT DETAIL

N.T.S.



PIPE SUPPORT DETAIL

N.T.S.

BRENT MOORE
STATE OF WASHINGTON
48028
REGISTERED PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

HORZ. SCALE NONE | VERT. SCALE

DESIGNED BY R. HARRIS | JOB NUMBER 1199-336 | DATE 2011
DRAWN BY D. CHRISTMAN | ACAD FILE: IrrgDets-PH3A.dwg
REVIEWED BY B. MOORE

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BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

MISCELLANEOUS DETAILS I

SHEET 26

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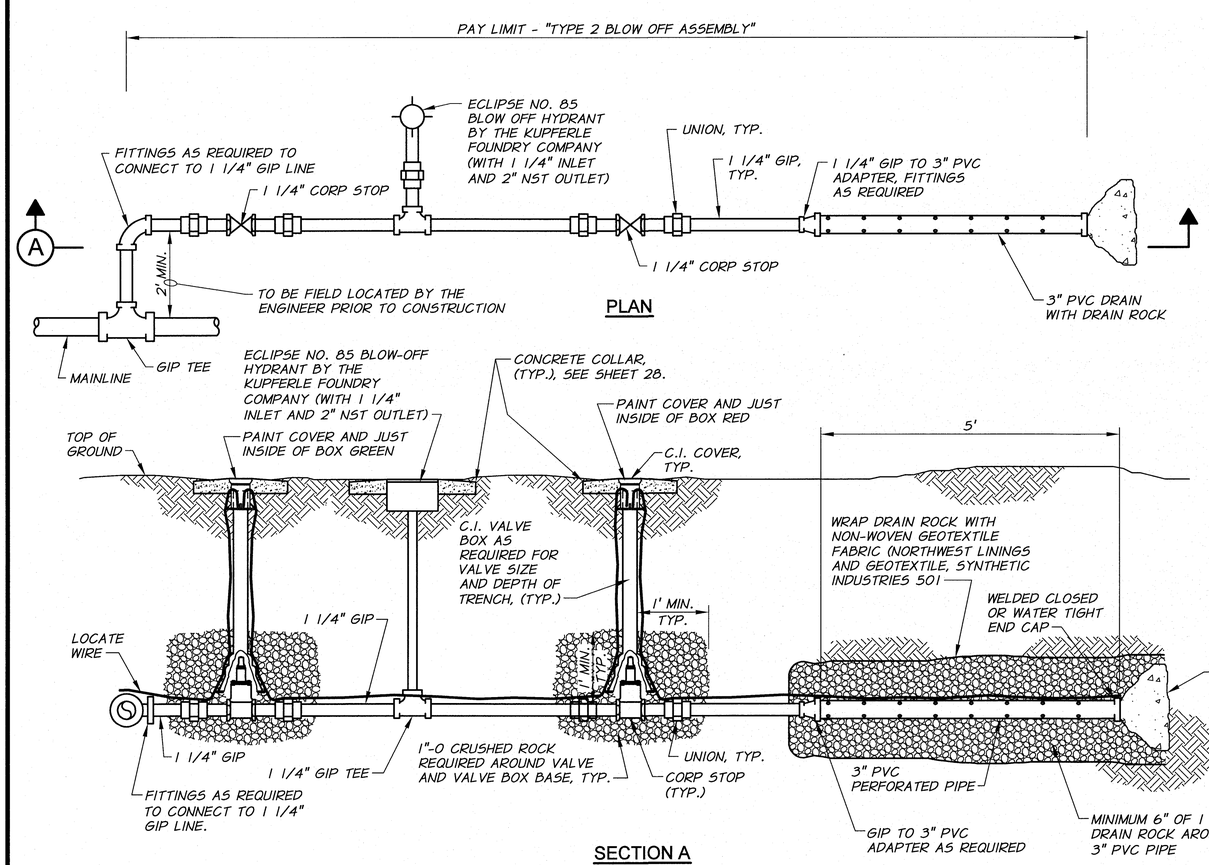
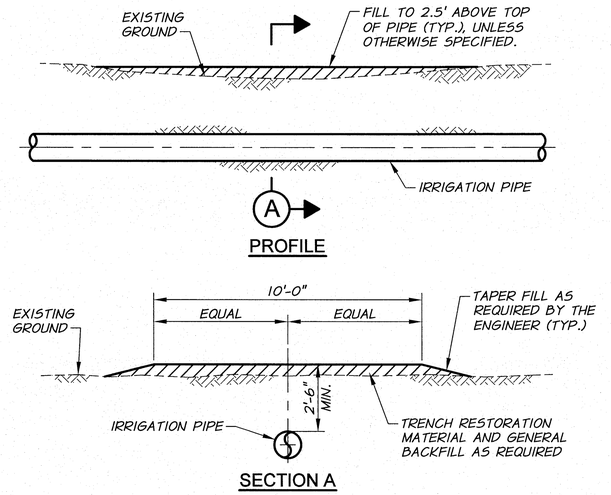


TYPE 2 BLOW-OFF ASSEMBLY DETAIL

N.T.S.

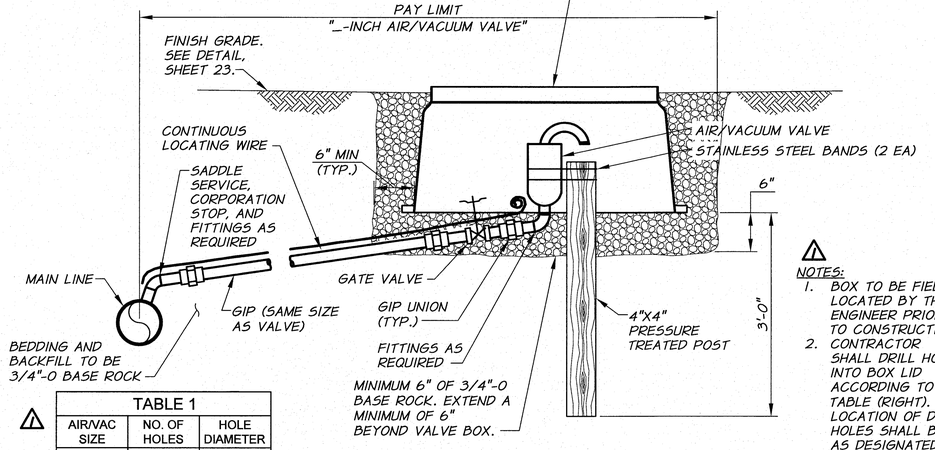
NOTE:
BLOW-OFF TO BE FIELD LOCATED BY THE ENGINEER PRIOR TO CONSTRUCTION (INCLUDING ORIENTATION).



TYPICAL PIPELINE LOW AREA BACKFILL DETAIL

N.T.S.

FOR NON TRAFFIC RATED, CARSON INDUSTRIES MODEL 1730-24 METER BOX WITH LID (GREEN) FOR 1/2" AND 1" VALVES, AND CARSON INDUSTRIES MODEL 2436-36 VAULT WITH LID FOR 2" AND 3" VALVES. INSTALL IN NON-TRAFFIC BEARING ZONE. FOR TRAFFIC RATED AS CALLED FOR ON THE DRAWINGS, CARSON INDUSTRIES MODEL 2436-24 H SERIES WITH LID FOR ½" AND 1" VALVES. AND CARSON INDUSTRIES MODEL 3048-36 H SERIES WITH LID FOR 2" AND 3" VALVES.



⚠ TABLE 1

AIR/VAC SIZE	NO. OF HOLES	HOLE DIAMETER
3"	5	1 1/2"
2"	5	1"
1"	2	1"
1/2"	1	1"

⚠ NOTES:
1. BOX TO BE FIELD LOCATED BY THE ENGINEER PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL DRILL HOLES INTO BOX LID ACCORDING TO THE TABLE (RIGHT). LOCATION OF DRILL HOLES SHALL BE AS DESIGNATED BY THE ENGINEER.

⚠ AIR / VACUUM VALVE

N.T.S.

BRENT MOORE
STATE OF WASHINGTON
48008
REGISTERED PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE
⚠ RECORD DRAWING	B.M.	7/12

DESIGNED BY R. HARRIS
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE | VERT. SCALE
JOB NUMBER 1199-336 | DATE 2011
ACAD FILE: IrrgDets-PH3A.dwg

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BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A
MISCELLANEOUS DETAILS II

SHEET 27

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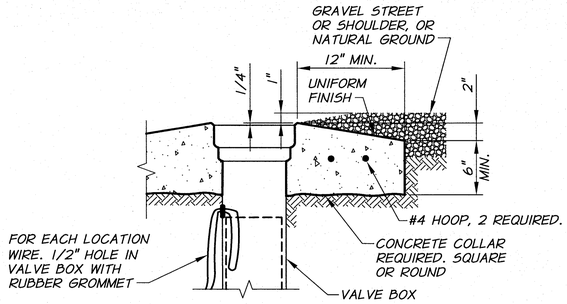
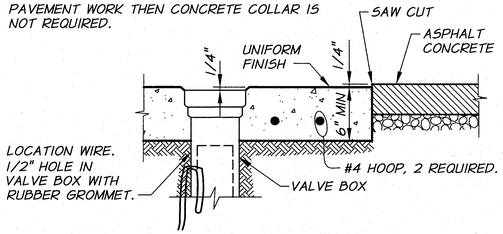


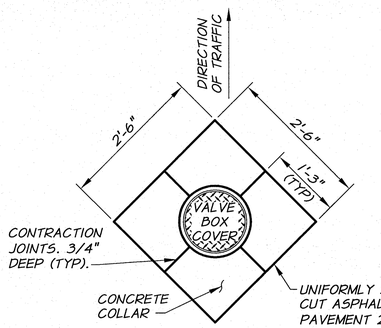
REQUIREMENTS FOR CONCRETE COLLARS:
1. CONCRETE : 3/4", 7 SACK, 4000 PSI AT 28 DAYS, 2" TO 4" SLUMP, 4-7% AIR.
2. COLLAR TO BE FORMED AND UNIFORMLY ROUND.
3. SMOOTH BROOMED FINISH REQUIRED.
4. APPLY CONCRETE CURING COMPOUND.
5. PROTECT FROM TRAFFIC FOR 4 DAYS MIN.

CONCRETE COLLAR DETAIL
IN GRAVEL STREETS OR NATURAL GROUND
N.T.S.

NOTE:
CONCRETE COLLAR REQUIRED IF VALVE BOX GRADE IS ADJUSTED AFTER ASPHALT PAVEMENT WORK IS PERFORMED. IF GRADE ADJUSTMENT OCCURS PRIOR TO ASPHALT PAVEMENT WORK THEN CONCRETE COLLAR IS NOT REQUIRED.



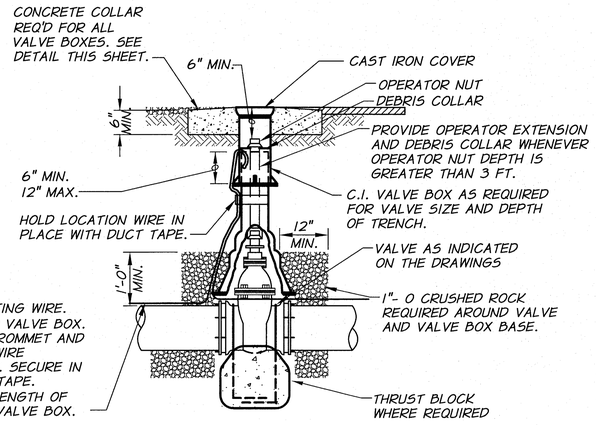
TYPICAL SECTION



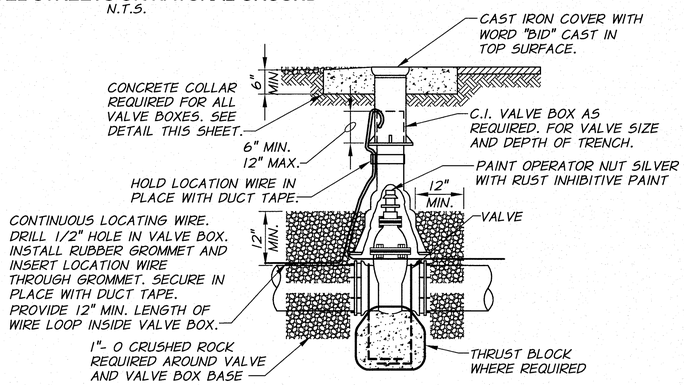
PLAN

REQUIREMENTS FOR CONCRETE COLLARS:
1. CONCRETE: 3/4", 7 SACK, 4000 PSI AT 28 DAYS, 2" TO 4" SLUMP, 4-7% AIR.
2. SMOOTH BROOMED FINISH REQUIRED.
3. APPLY CONCRETE CURING COMPOUND.
4. PROTECT FROM TRAFFIC FOR 4 DAYS MINIMUM.

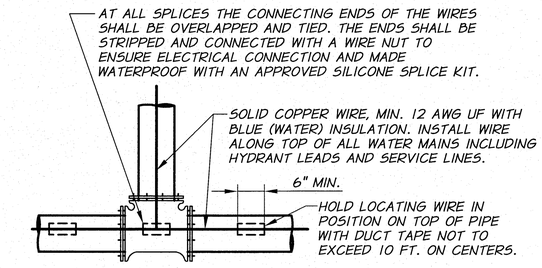
VALVE BOX CONCRETE COLLAR DETAIL
IN ASPHALT PAVEMENT
N.T.S.



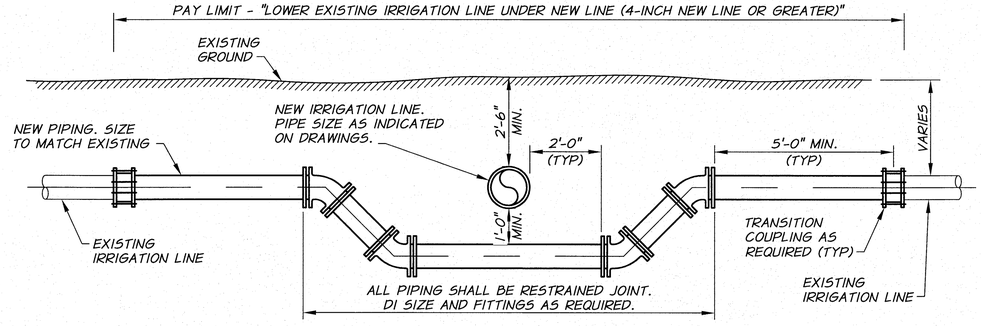
VALVE BOX EXTENSION DETAIL
N.T.S.



VALVE BOX DETAIL
N.T.S.



CONTINUOUS LOCATING WIRE DETAIL
N.T.S.



LOWER EXISTING IRRIGATION LINE UNDER NEW
SECTION
N.T.S.

BRETT MOORE
STATE OF WASHINGTON
46026
REGISTERED PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY	R. HARRIS	HORZ. SCALE	NONE
DRAWN BY	D. CHRISTMAN	JOB NUMBER	1199-336
REVIEWED BY	B. MOORE	ACAD FILE:	IrrgDets2-PH3A.dwg

VERT. SCALE
DATE 2011

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BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

MISCELLANEOUS DETAILS III

SHEET
28

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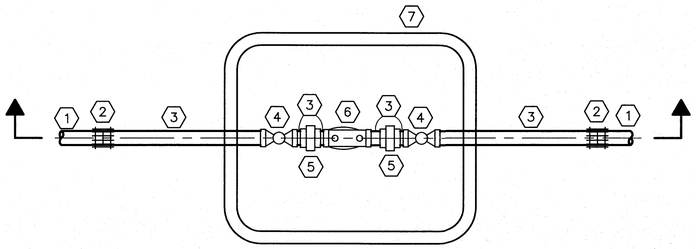
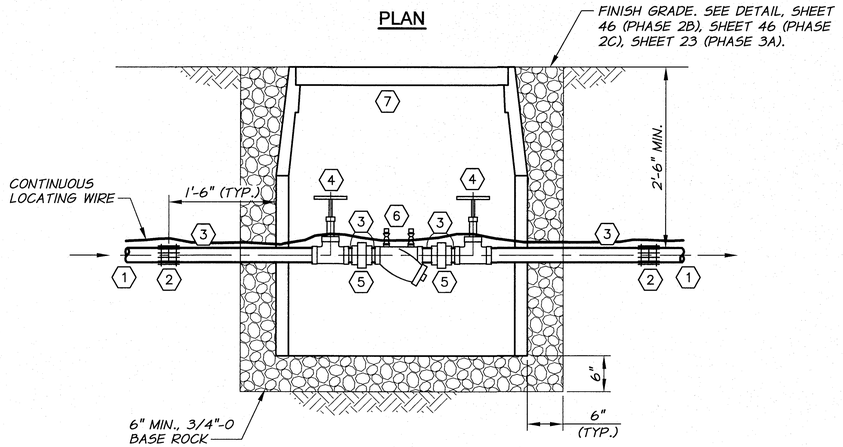
FITTING SCHEDULE

1. PVC PIPE AS SHOWN ON PLANS
2. SCH 80 PVC TRANSITION COUPLING AND FITTINGS AS REQUIRED. FEMALE CONNECTION TO GIP.
3. SCH 40 GIP
4. BRASS THREADED BALL VALVE
5. G.I.P. UNION
6. SONNTAG ALUMINUM Y-FILTER WITH 40 MESH FILTER SCREEN. 1 1/4" FOR 1 1/2" MAIN, AND 2" FOR 2" MAIN WITH FITTINGS AS REQUIRED. INCLUDE 2 EACH 3/4" THREADED BRASS BALL VALVE WITH 3/4"x1/4" BUSHING AND BRASS QUICK COUPLING PLUG (UNVALVED) FOR OWNER GAUGE.
7. CARSON INDUSTRIES MODEL 2436-48 H SERIES BOX WITH LID



PLAN



SECTION

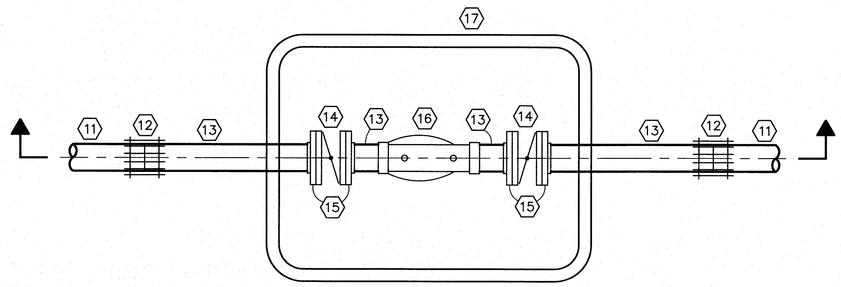
TYPICAL 1 1/2" AND 2" IN-LINE FILTER VAULT DETAIL

N.T.S.

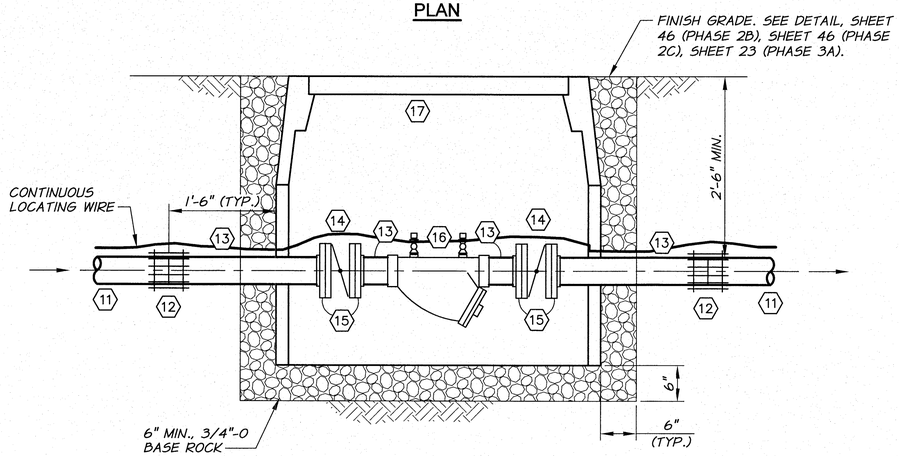
NOTE:
THREAD CLEARANCE SHALL BE 3/8" MINIMUM. OVER TIGHTENED FITINGS WILL BE REJECTED AND PIPING ASSEMBLY REASSEMBLED TO MEET REQUIREMENTS. SEE SPECIFICATIONS FOR MORE DETAILS.

FITTING SCHEDULE

11. PVC PIPE AS SHOWN ON PLANS
12. SCH 80 PVC TRANSITION COUPLING AND FITTINGS AS REQUIRED. FEMALE CONNECTION TO GIP.
13. SCH 40 GIP
14. BUTTERFLY VALVE WITH WHEEL OPERATOR AND POSITION INDICATOR
15. FLANGE ADAPTER
16. SONNTAG ALUMINUM Y-FILTER WITH 40 MESH FILTER SCREEN. 3" FOR 3" MAIN, AND 4" FOR 4" MAIN WITH FITTINGS AS REQUIRED. INCLUDE 2 EACH 3/4" THREADED BRASS BALL VALVE WITH 3/4"x1/4" BUSHING AND BRASS QUICK COUPLING PLUG (UNVALVED) FOR OWNER GAUGE.
17. CARSON INDUSTRIES MODEL 2448-48 H SERIES BOX WITH LID



PLAN



SECTION

TYPICAL 3" AND 4" IN-LINE FILTER VAULT DETAIL

N.T.S.

⚠ ADDED SHEET

SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE
⚠ RECORD DRAWING	B.M.	7/12

DESIGNED BY R. HARRIS
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE | VERT. SCALE
JOB NUMBER 1199-336 | DATE 2011
ACAD FILE: InlineFilter-Ph3A.dwg

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BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A

MISCELLANEOUS DETAILS IV

SHEET **28A**

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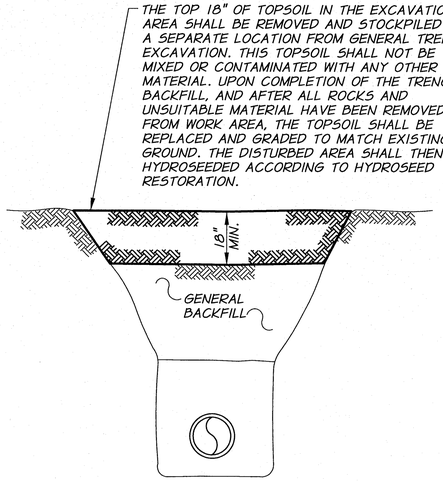
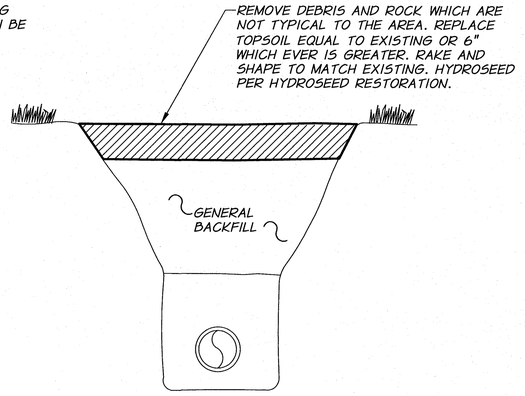


TRENCH RESTORATION
AGRICULTURAL AREAS
N.T.S.



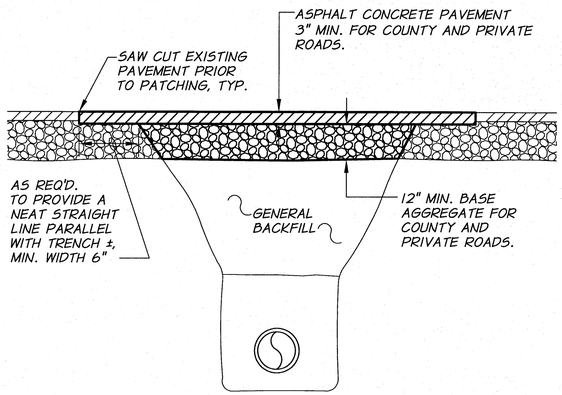
TRENCH RESTORATION
LAWNS & LANDSCAPED AREAS
N.T.S.

MULTIPLE INSTALLATIONS (ALL SHAPES)	
DIA. (SPAN)	
DIAMETER	MIN. SPACE BETWEEN PIPE
UP TO 18"	18"

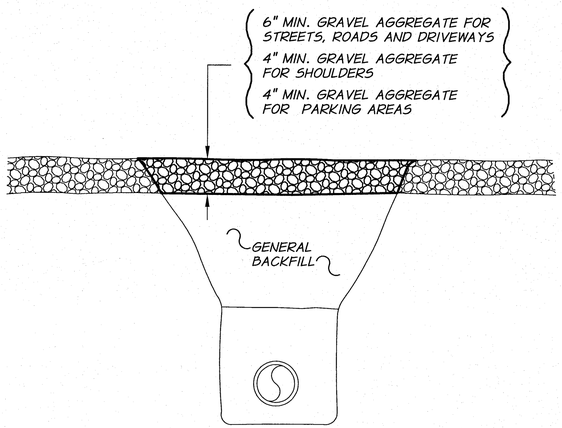
NOTES
1. SURFACING OF PAVED AREAS SHALL COMPLY WITH STREET CUT STANDARD DRAWING.

TRENCH BACKFILL AND BEDDING TABLE

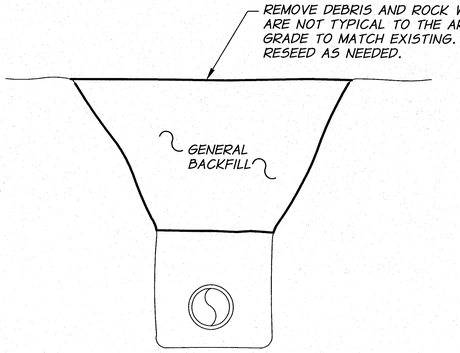
	ASPHALT SURFACE RESTORATION	GRAVEL STREETS, ROADWAYS, SHOULDERS AND PARKING AREAS	GENERAL / HYDROSEED RESTORATION AREAS
SURFACE	SURFACING MATCHING EXISTING	3/4"-0 GRAVEL AGGREGATE (FOR THICKNESS SEE DETAIL THIS SHEET)	TOPSOIL OR AS DIRECTED
BASE MATERIAL UNDER SURFACE	3/4"-0 BASE ROCK	GENERAL BACKFILL	TOPSOIL OR AS DIRECTED
GENERAL BACKFILL	3/4"-0 BASE ROCK	GENERAL BACKFILL	GENERAL BACKFILL
SELECT BACKFILL	3/4"-0 BASE ROCK	3/4"-0 BASE ROCK	3/4"-0 BASE ROCK
BEDDING	3/4"-0 BASE ROCK	3/4"-0 BASE ROCK	3/4"-0 BASE ROCK



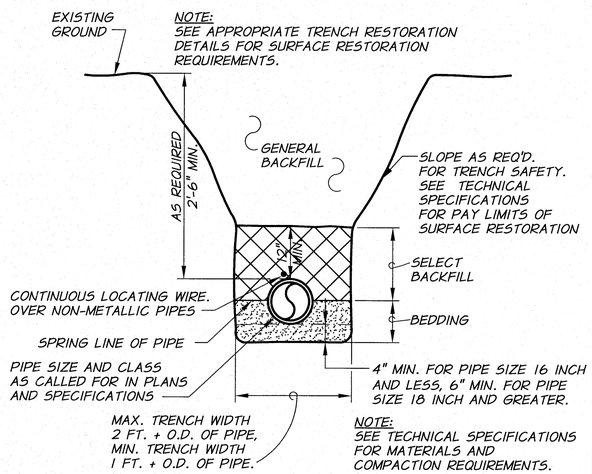
TRENCH RESTORATION
PAVED STREETS AND ROADWAYS
("ASPHALT SURFACE RESTORATION" PAY ITEM)
N.T.S.



TRENCH RESTORATION
GRAVEL STREETS, ROADWAYS, SHOULDERS, AND PARKING AREAS
("GRAVEL SURFACE RESTORATION" PAY ITEM)
N.T.S.



TRENCH RESTORATION
GENERAL AREAS
N.T.S.



TRENCH EXCAVATION AND BACKFILL
N.T.S.

BRENT MOORE — STATE OF WASHINGTON — 46026 — REGISTERED PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY R. HARRIS
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE — VERT. SCALE
JOB NUMBER 1199-336 — DATE 2011
ACAD FILE: TrenchDets-PH3A.dwg

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BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A
TRENCH DETAILS

SHEET 29

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THRUST BLOCK NOTES

1. THRUST BLOCKS SHALL BE REQUIRED AT THE FOLLOWING LOCATIONS:
   A. ALL CHANGES IN DIRECTION.
   B. ALL DEAD–ENDS.
   C. ALL VALVES 8–INCHES AND LARGER SHALL BE SIZE FOR CLOSED CONDITION EXCEPTIONS:
      (1) WHEN RESTRAINED JOINT PIPE IS USED ON BOTH SIDES OF VALVE.
      (2) WHEN VALVE IS RESTRAINED JOINT CONNECTED TO A FITTING WHICH HAS APPROPRATE THRUST BLOCKING.
   D. AT LOCATIONS SPECIFICALLY CALLED OUT ON THE DRAWINGS.
   E. AT TEMPORARY DEAD ENDS DURING PIPE INSTALLATIONS AS REQUIRED FOR TEMPORARY PRESSURE TESTING.
   F. AT OTHER LOCATIONS REQUIRED BY THE ENGINEER.
2. THRUST BLOCKS SHALL BE SIZED AS REQUIRED BY SOIL CONDITIONS AND DESIGN PRESSURE.
3. PLACE CONCRETE AGAINST UNDISTURBED TRENCH WALL.
4. CONCRETE SHALL BE 2,500 PSI MINIMUM.
5. ALL CONCRETE SHALL BE PLACED SO THAT PIPE, FITTING JOINTS, BOLTS AND NUTS, ETC., WILL BE ACCESSIBLE FOR REPAIRS.
6. PLACE ONE LAYER OF VISQUEEN BETWEEN FITTING AND CONCRETE TO FACILITATE FUTURE REMOVAL OF THRUST BLOCK IF REQUIRED.
7. ANCHOR RODS SHALL BE 3/4" DIAMETER GALVANIZED STEEL RODS OR #6 EPOXY COATED REINFORCEMENT BAR, AASHTO M284, HAVING AN 18" MINIMUM EMBEDMENT IN CONCRETE.
8. IF THE REQUIRED BEARING AREA IS LESS THAN 1 SQUARE FOOT, A THRUST BLOCK SHALL NOT BE REQUIRED.
9. WHERE THRUST BLOCK IS NOT DESIGNATED, ALL THRUST BLOCKS SHALL BE SIZED PER THE PRESSURES SHOWN IN THE TECHNICAL SSPECIFICATIONS, UNLESS OTHERWISE NOTED.

DETERMINATION OF THRUST BLOCK BEARING AREA

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

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

$A = T - B$

EXAMPLE: DESIGN PRESSURE = 175 PSI
PIPE = 12"
FITTING = TEE
SOIL – SANDY GRAVEL
FROM TABLE NO. 1: T = 15,050 LB.
FROM TABLE NO. 2: B = 3000 LB/SQ.FT.

$A = \frac{15{,}050 \times 1.75}{3{,}000} = 8.8$ SQ.FT. = 9 SQ.FT. (ROUND UP TO NEAREST WHOLE SQ.FT.)

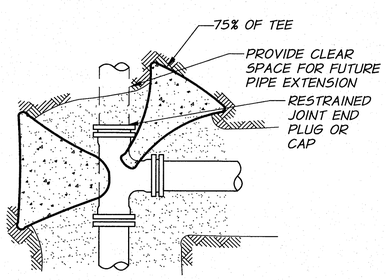
TABLE NO. 1
THRUST AT FITTINGS IN POUNDS AT 100 PSI OF PRESSURE

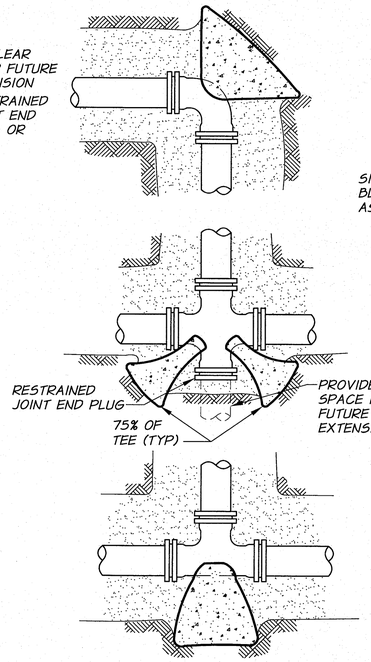
PIPE SIZE	TEES AND DEAD ENDS	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND
4"	1,680	2,310	1,290	660	340
6"	3,770	5,320	2,890	1,480	750
8"	6,690	9,460	5,120	2,620	1,320
10"	10,440	14,780	8,010	4,090	2,050
12"	15,050	21,280	11,520	5,880	2,960
14"	20,490	28,960	15,680	8,000	4,020
16"	26,750	37,830	20,470	10,440	5,260
18"	33,850	47,870	25,910	13,210	6,640
20"	41,790	59,090	31,980	16,310	8,190
24"	60,170	85,100	46,060	23,490	11,800

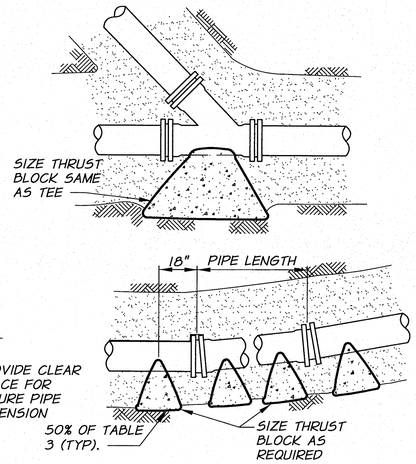
NOTE:
FOR WATER PRESSURES DIFFERENT THAN 100 PSI, MULTIPLY THRUST FOUND IN TABLE NO. 1 BY REQUIRED PROPORTION.
EXAMPLE: DESIGN PRESSURE = 175 PSI.
MULTIPLY VALUE IN TABLE BY 1.75

TABLE NO. 2

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

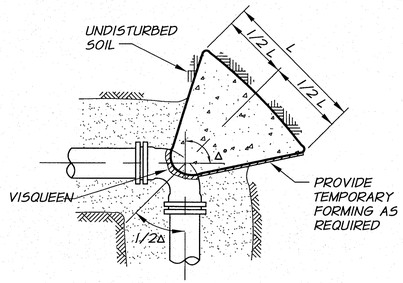






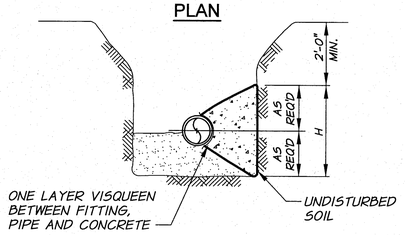
TYPICAL THRUST BLOCK LOCATIONS

PLAN VIEWS



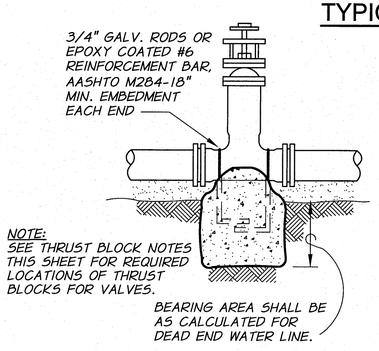
BEARING AREA (A) = HEIGHT (H) x LENGTH (L)
$A = H \times L$

PLAN



SECTION

TYPICAL THRUST BLOCK DETAILS



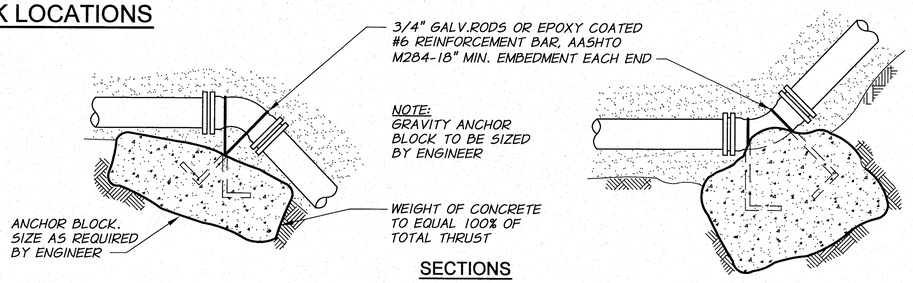
TYPICAL VALVE THRUST BLOCK

NOTE: NOT REQUIRED FOR VALVES WITH FLANGED CONNECTION TO TEE WITH THRUST BLOCK.

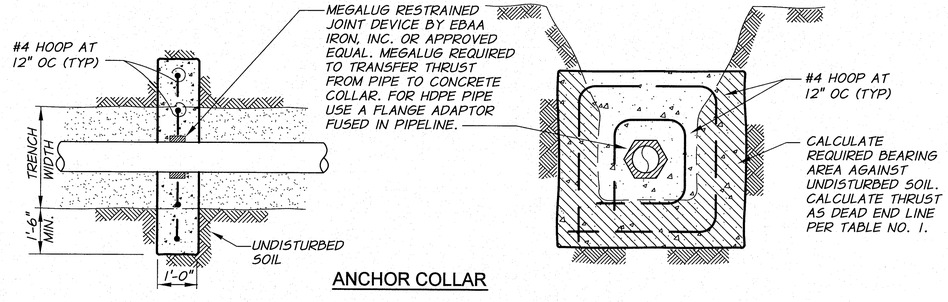
TABLE NO. 3

SIDE THRUST PER 100 LB./SQ.IN. PRESSURE PER DEGREE OF DEFLECTION			
PIPE SIZE	SIDE THRUST–LB	PIPE SIZE	SIDE THRUST–LB
4"	N/A	14"	360
6"	N/A	16"	470
8"	N/A	18"	600
10"	190	20"	730
12"	270	24"	1,050

MULTIPLY THRUST BY DEGREE OF DEFLECTION TO OBTAIN TOTAL THRUST



SECTIONS



ANCHOR COLLAR

TYPICAL ANCHOR BLOCKS

BRENT MOORE
STATE OF WASHINGTON
46028
REGISTERED
PROFESSIONAL ENGINEER
SIGNED 07-13-12
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY R. HARRIS
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE
VERT. SCALE
JOB NUMBER 1199-336
DATE 2011
ACAD FILE: Thrust-PH3 A.dwg

RECORD DRAWINGS
These record drawings have been prepared, in part, on the basis of information compiled and furnished by others. They may contain some discrepancies and omissions, and do not necessarily represent "exact" field conditions. The Owner and the Engineer accept no responsibility for their accuracy.

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LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3A
THRUST BLOCK DETAILS

SHEET 30