BENTON IRRIGATION DISTRICT

IRRIGATION SYSTEM IMPROVEMENTS

PHASE 3C

2013

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RECORD DRAWINGS
APRIL 18, 2014
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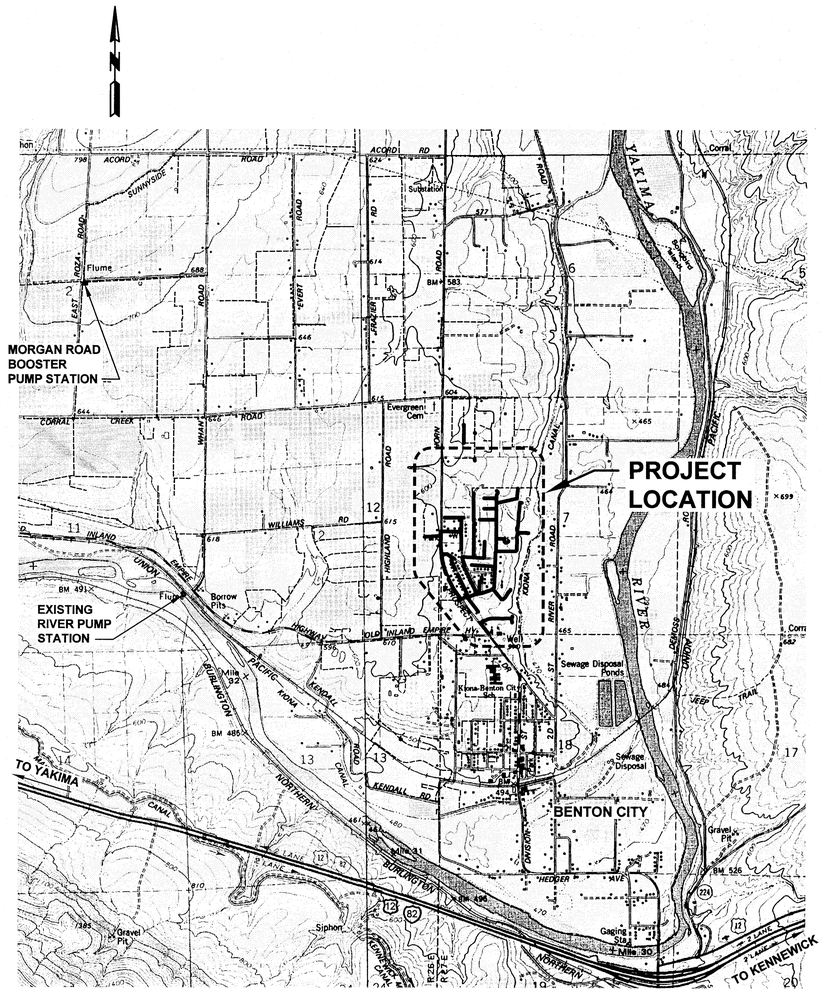
⚠ *RECORD DRAWING B.M. 4/14*



VICINITY MAP
NTS

DISTRICT BOARD OF DIRECTORS

ROBERT BUOY
DIRK MARTIN
ED SCHAB

BRETT MOORE
STATE OF WASHINGTON
48026
REGISTERED
PROFESSIONAL ENGINEER

SIGNED 04-18-14
RECORD DRAWING

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LA GRANDE, OR. WALLA WALLA, WA.

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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	

MISCELLANEOUS UTILITIES

EXISTING

- WATER LINE — W
- BURIED POWER — P
- OVERHEAD POWER — OHP
- BURIED TELEPHONE — UT
- FIBER OPTIC — FO
- GAS SERVICE — 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

NORTH ARROW

DRAFTING

- A / 2 — SECTION DESIGNATION; SHEET WHERE SECTION WAS TAKEN OR WHERE SECTION IS SHOWN.
- 3 ... 3 — SHEET CONTINUATION REFERENCE
- 1 — DRAWING REVISION NUMBER
- AB / 42 — DETAIL DESIGNATION; SHEET WHERE DETAIL IS SHOWN

1.5	SERVICE LINE SIZE (INCHES)
1	DOLE CONTROL VALVE SIZE (INCHES)
6	DOLE CONTROL VALVE FLOW RATE (GPM)
5.82	CALCULATED REQUIRED FLOW (GPM)
0.75	PRV SIZE (INCHES) OR CONTROL TYPE FOR LARGER SERVICES: FCV = FLOW CONTROL VALVE; PRV/FCV = PRESSURE REDUCING AND FLOW CONTROL VALVE

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

- RS — STANDARD RESIDENTIAL SERVICE. LINE SIZE IS 1.0 INCH, DOLE CONTROL VALVE SIZE IS 1.0 INCH WITH 6 GPM FLOW RATE. CALCULATED REQUIRED FLOW IS 5.82 GPM.
- RST — STANDARD RESIDENTIAL SERVICE AS DESCRIBED ABOVE WITH TRAFFIC RATED BOX AND LID.
- RS / 12 — STANDARD RESIDENTIAL SERVICE AS DESCRIBED ABOVE WITH FLOW RATE GREATER THAN 6 GPM. DOLE CONTROL VALVE FLOW RATE

1. 15. ALL REDUCERS WITH A LARGE PIPE END 3-INCHES OR GREATER IN DIAMETER SHALL BE INSTALLED WITH A COLLAR THRUST BLOCK.

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 TREES, THE CONTRACTOR SHALL PROTECT 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 ROAD RIGHT-OF-WAY AS SPECIFIED IN THE TECHNICAL SPECIFICATIONS. SEE THE TECHNICAL SPECIFICATIONS FOR DETAILS.
13. CONNECTIONS TO EXISTING IRRIGATION LINES DURING THE IRRIGATION SEASON WILL NEED TO BE COORDINATED WITH B.I.D. AS EXISTING LINES WILL BE FULL OF WATER.
14. ALL GALVANIZED BURIED PIPE SHALL BE TAPE WRAPPED PER TECHNICAL SPECIFICATIONS.

BRETT MOORE — STATE OF WASHINGTON — 46008 — REGISTERED PROFESSIONAL ENGINEER
SIGNED 04-18-14
RECORD DRAWING

REVISION	BY	DATE
1 RECORD DRAWING	B.M.	4/14

DESIGNED BY H. MORRISON
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE — VERT. SCALE
JOB NUMBER 1199-336 — DATE 2013
ACAD FILE: LEGEND-Ph3C.dwg

RECORD DRAWINGS
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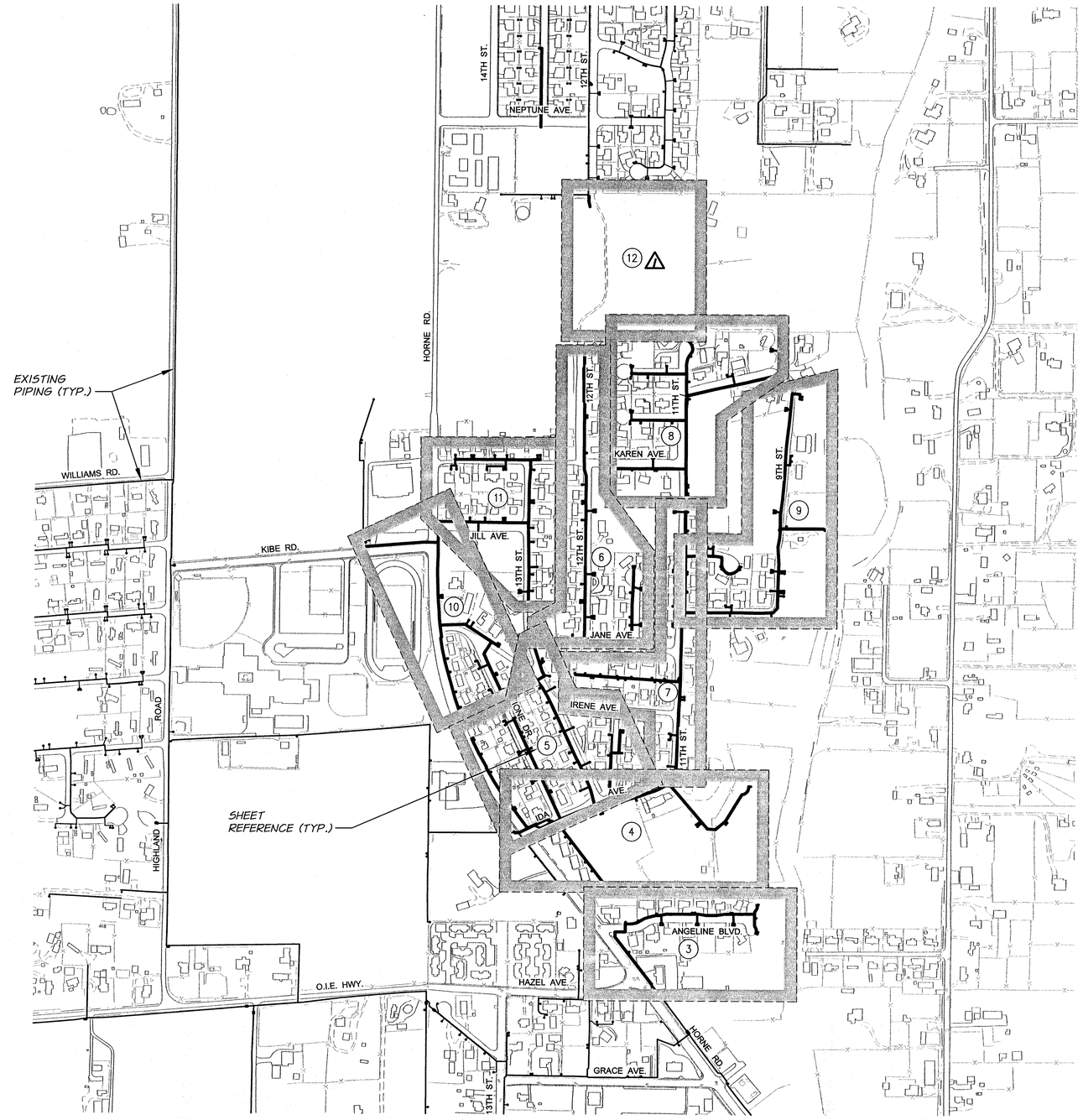
BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3C
LEGEND, NOTES, AND QUANTITIES

SHEET 1



SIGNED 04-18-14
RECORD DRAWING

⚠ RECORD DRAWING	B.M.	4/14
REVISION	BY	DATE
DESIGNED BY H. MORRISON		
DRAWN BY D. CHRISTMAN		
REVIEWED BY B. MOORE		

300 0 300 600 900
SCALE IN FEET

HORZ. SCALE 1"=300'	VERT. SCALE
JOB NUMBER 1199-336	DATE 2013
ACAD FILE: SheetIndexPH3C.dwg	

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BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3C

SHEET INDEX

SHEET 2

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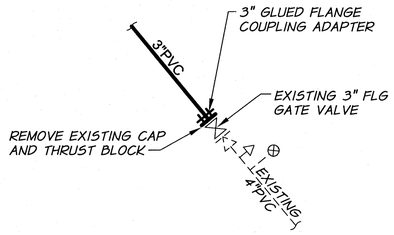

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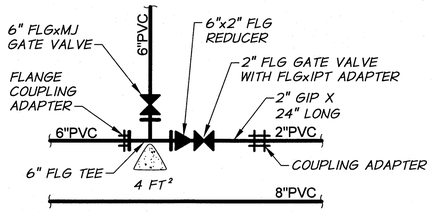

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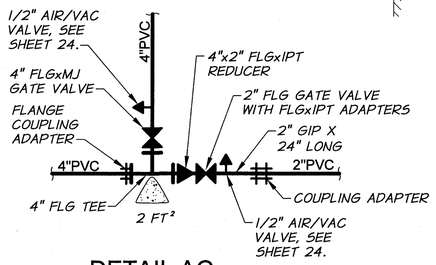

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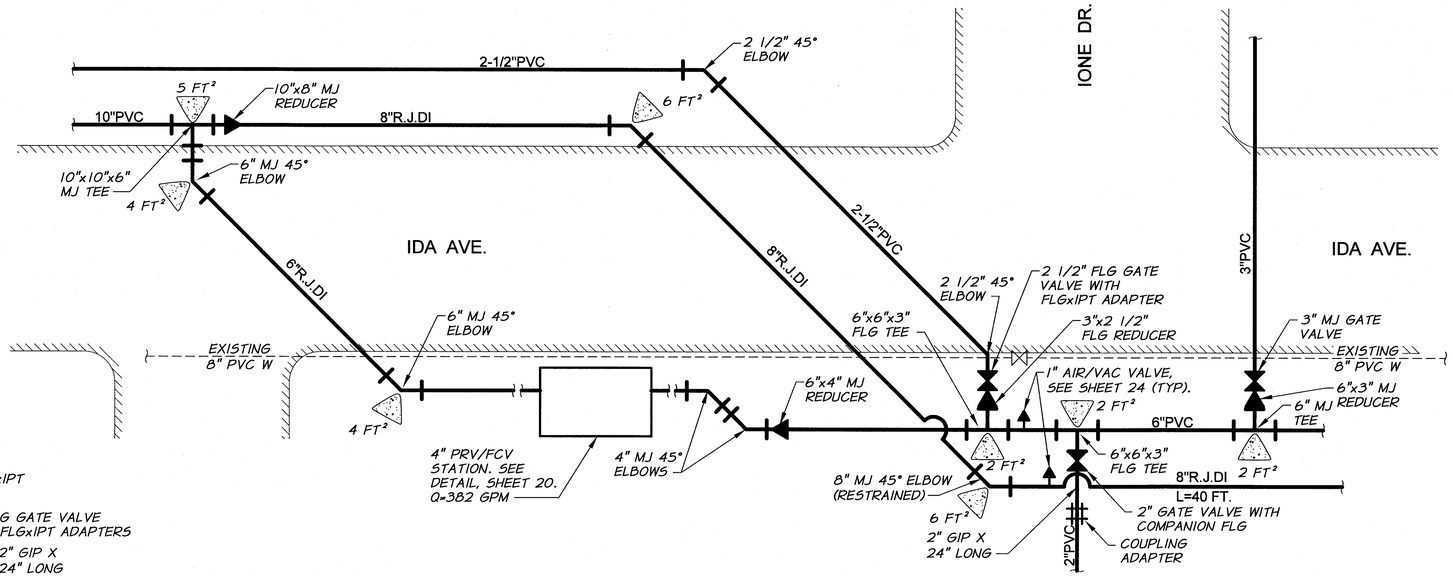

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DETAIL COMBINED WITH DETAIL AC

DETAIL AD
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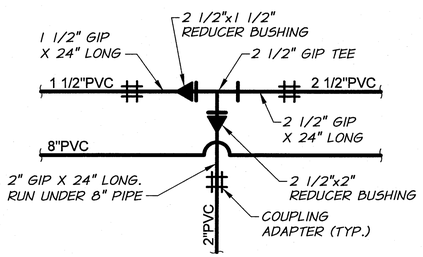

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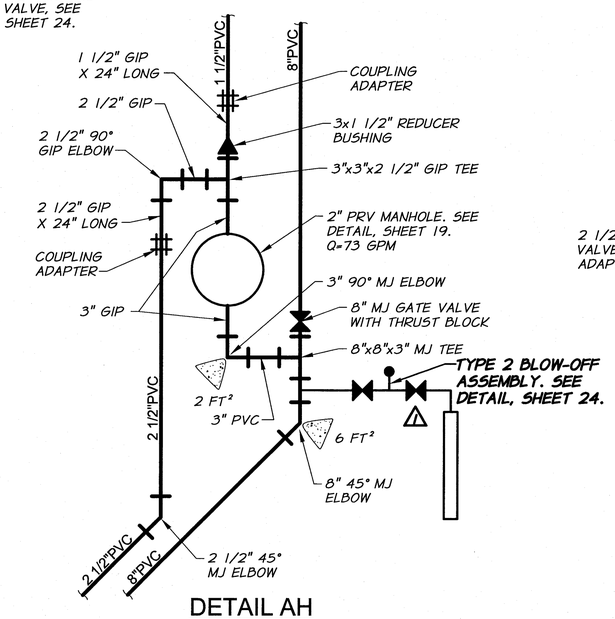

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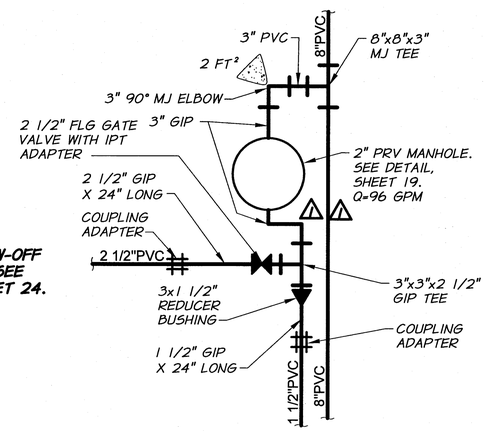

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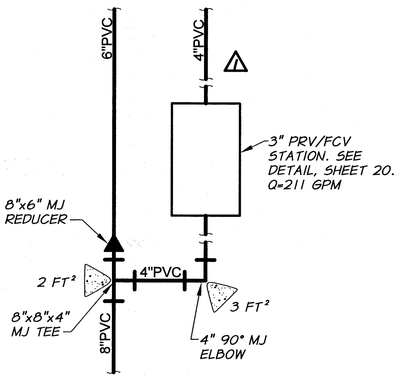

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REVISION	BY	DATE
⚠ RECORD DRAWING	B.M.	4/14

DESIGNED BY H. MORRISON
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE | VERT. SCALE
JOB NUMBER 1199-336 | DATE 2013
ACAD FILE: PipeConnDets-Ph3C.dwg

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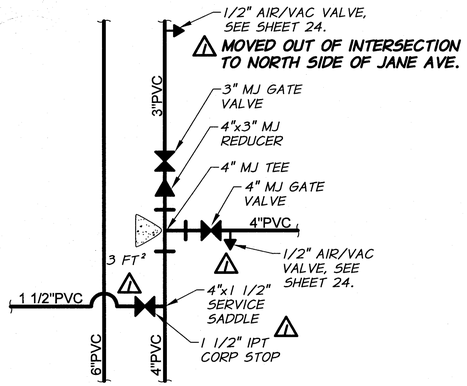
BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3C

PIPE CONNECTION DETAILS I

SHEET 13



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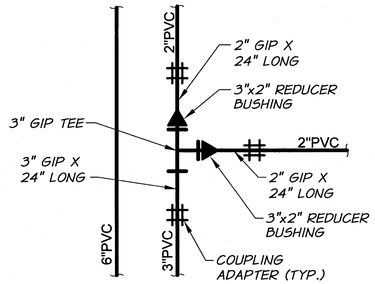

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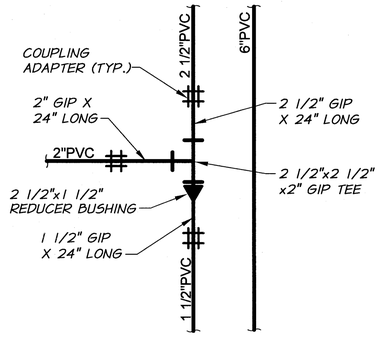

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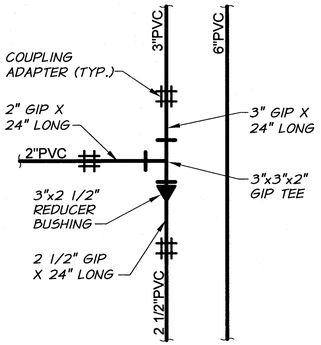

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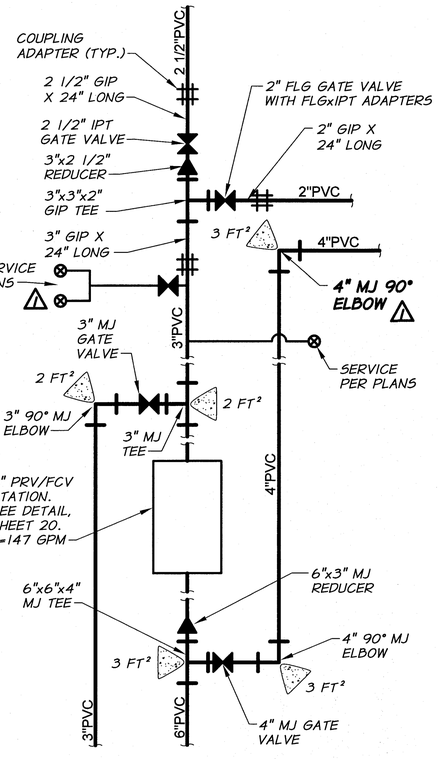

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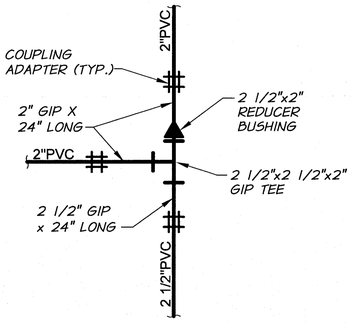

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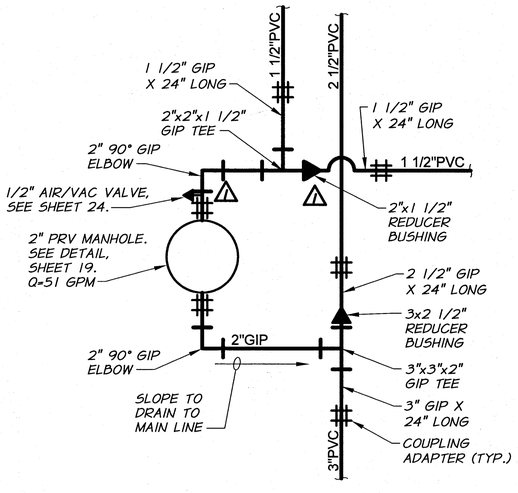

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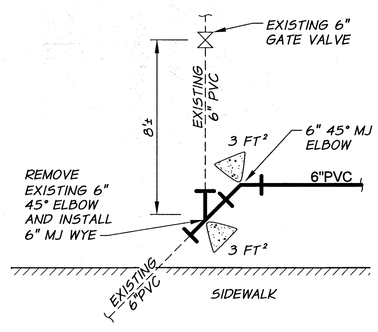

DETAIL AT

REFERENCE SHEET: 10

BRETT MOORE
STATE OF WASHINGTON
48026
REGISTERED PROFESSIONAL ENGINEER
SIGNED 04-18-14
RECORD DRAWING

REVISION	BY	DATE
RECORD DRAWING	B.M.	4/14

DESIGNED BY	H. MORRISON
DRAWN BY	D. CHRISTMAN
REVIEWED BY	B. MOORE

HORZ. SCALE: NONE — VERT. SCALE:
JOB NUMBER: 1199-336 — DATE: 2013
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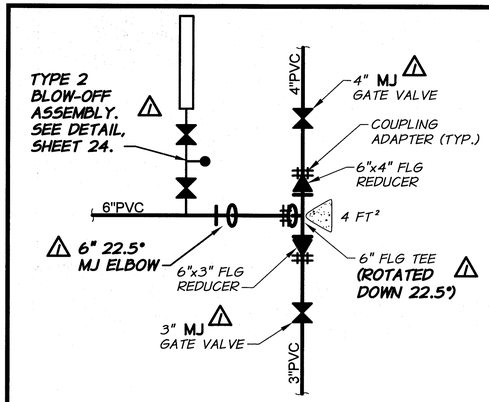
BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3C

PIPE CONNECTION DETAILS II

SHEET 14



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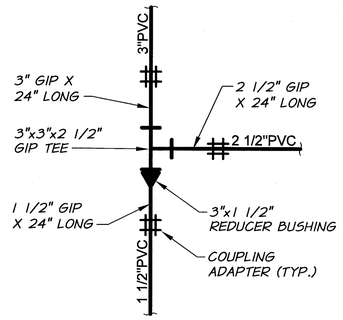

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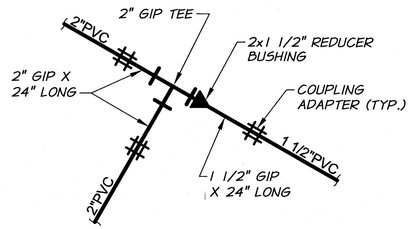

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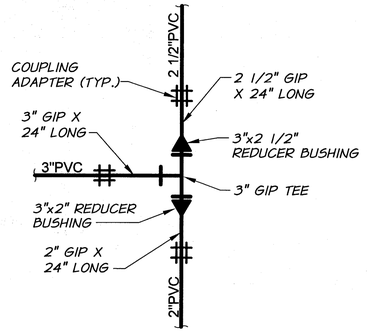

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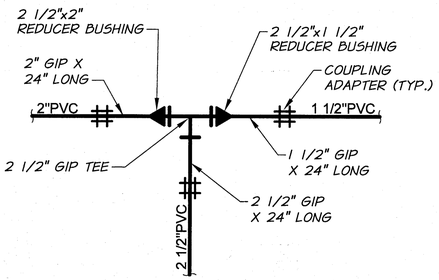

DETAIL AY

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DETAIL AZ

REFERENCE SHEET: 12

DELETED

DETAIL BA

REFERENCE SHEET: 12

DELETED

DETAIL BB

REFERENCE SHEET: 12

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REGISTERED PROFESSIONAL ENGINEER
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RECORD DRAWING

REVISION	BY	DATE
RECORD DRAWING	B.M.	4/14

DESIGNED BY H. MORRISON
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE
VERT. SCALE
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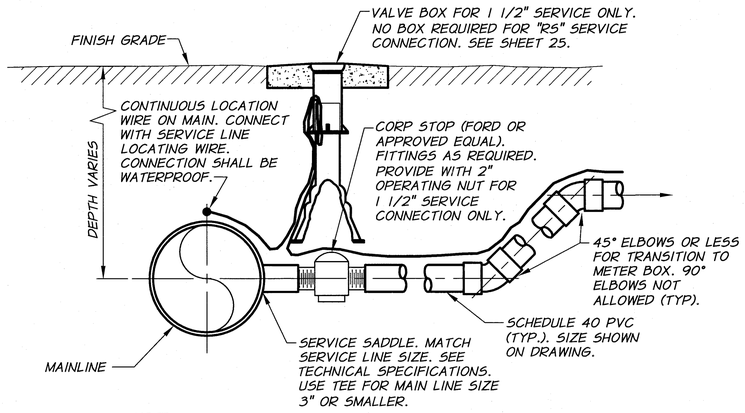
LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3C

PIPE CONNECTION DETAILS III

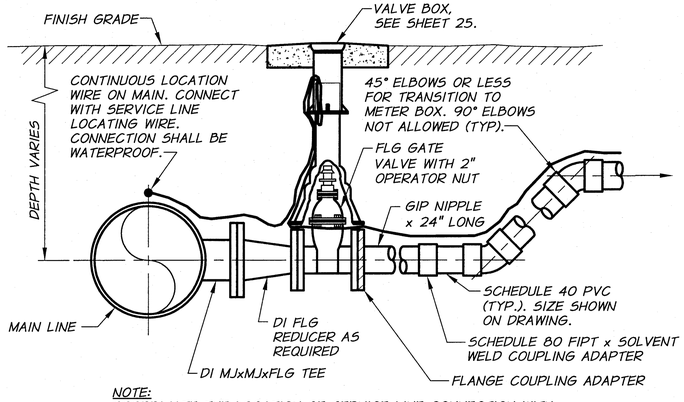
SHEET
15

ARCHIVED



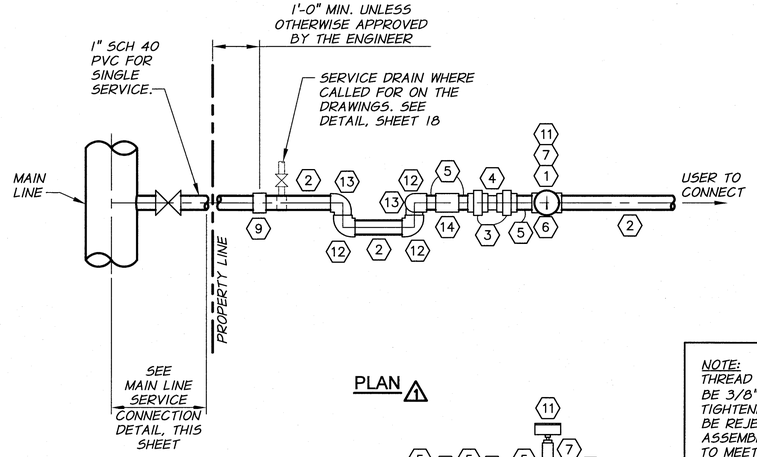
NOTE:
COORDINATE THE LOCATION OF SERVICE LINE CONNECTION WITH B.I.D. PRIOR TO CONSTRUCTION AND INSTALLATION.

MAIN LINE SERVICE CONNECTION
FOR "RS" AND 1 1/2" SERVICE
N.T.S.

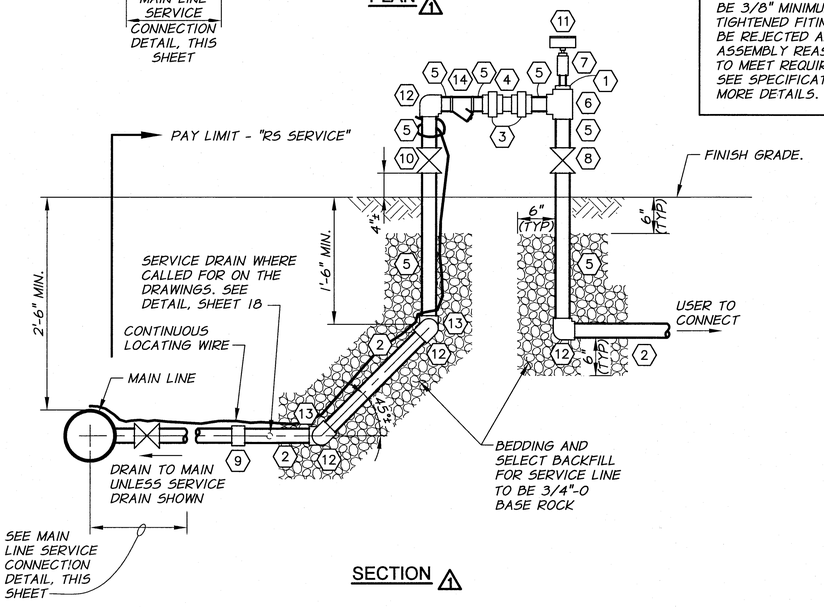


NOTE:
COORDINATE THE LOCATION OF SERVICE LINE CONNECTION WITH B.I.D. PRIOR TO CONSTRUCTION AND INSTALLATION.

MAIN LINE SERVICE CONNECTION
FOR 2" AND 3" SERVICE
N.T.S.

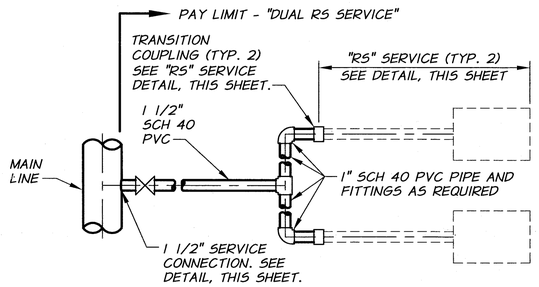


PLAN ⚠1



SECTION ⚠1

TYPICAL "RS" SERVICE DETAIL ⚠
N.T.S.



DUAL "RS" SERVICE 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.

SERVICE FITTING SCHEDULE

⚠1 (1) 1" X 3/4" BUSHING
(2) 1" SCH. 40 G.I.P. PIPE, 12" MIN. LENGTH
(3) 1" G.I.P. UNION
(4) 1" DOLE FLOW CONTROL VALVE. SIZE AS SHOWN ON PLANS. INSTALL WITH FLOW RATE LABEL FACING UPWARDS AND NO WRENCH MARKS ON VALVE.
(5) 1" THREADED SCH. 40 G.I.P. SPOOL, LENGTH AS REQUIRED.
⚠1 (6) 1" G.I.P. TEE
(7) 3/4" THREADED BRASS BALL VALVE WITH 3/4"x1/4" BUSHING AND BRASS QUICK COUPLING PLUG (UNVALVED)
(8) BRASS GATE VALVE
(9) SCH80 PVC TRANSITION COUPLING AND FITTINGS AS REQ'D. FEMALE CONNECTION TO GIP.
(10) CORP STOP WITH PADLOCK WING
(11) OWNER SUPPLIED GAUGE
(12) 1" 90° GIP ELBOW
(13) 1" 90° GIP STREET ELBOW
⚠1 (14) Y-STRAINER WITH TAPPED CAP AND BLOW-OFF PLUG

NOTES:
1. COORDINATE THE LOCATION OF SERVICE WITH B.I.D. PRIOR TO CONSTRUCTION AND INSTALLATION.
2. ALL BURIED GALVANIZED PIPE SHALL BE TAPE WRAPPED PER TECHNICAL SPECIFICATIONS.

BRETT MOORE — STATE OF WASHINGTON — 46026 — REGISTERED PROFESSIONAL ENGINEER
SIGNED 04-18-14
SIGNED 09-12-13

REVISION	BY	DATE
⚠ RECORD DRAWING	B.M.	4/14
⚠ CHANGE ORDER	E.H.	8-13

DESIGNED BY H. MORRISON
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE — VERT. SCALE
JOB NUMBER 1199-336 — DATE 2013
ACAD FILE: ServiceDets-Ph3C.dwg

RECORD DRAWINGS
APRIL 18, 2014
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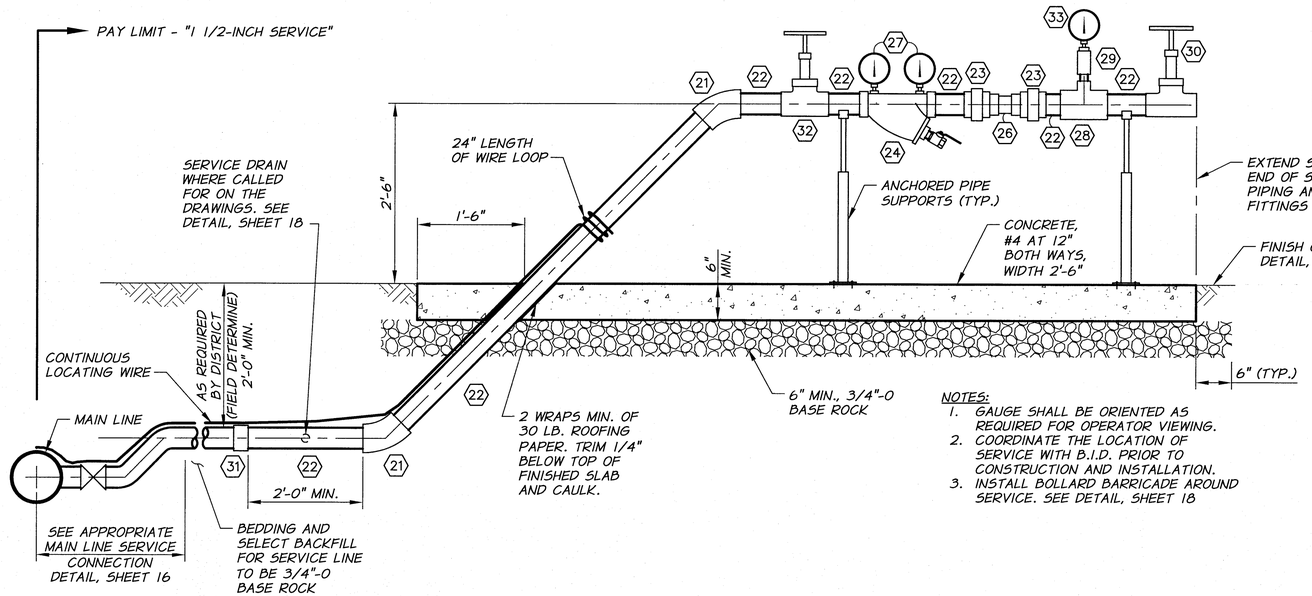
BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS
PHASE 3C

SERVICE DETAILS I

SHEET 16



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

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

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. 1 1/4" SONNTAG ALUMINUM Y-FILTER WITH 10 MESH FILTER SCREEN (UNLESS OTHERWISE SPECIFIED), WITH FITTINGS AS REQUIRED. PROVIDE NIPPLE AND BALL VALVE AT FLUSH PORT. SIZE TO MATCH PORT.
25. RESERVED
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 1 1/2" GATE VALVE WITH BUSHINGS AS REQ'D.
33. GAUGE BY OWNER

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

BRETT MOORE STATE OF WASHINGTON 46008 REGISTERED PROFESSIONAL ENGINEER
SIGNED 04-18-14
RECORD DRAWING

REVISION	BY	DATE
⚠ RECORD DRAWING	B.M.	4/14

DESIGNED BY H. MORRISON
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE | VERT. SCALE
JOB NUMBER 1199-336 | DATE 2013
ACAD FILE: ServiceDets-Ph3C.dwg

RECORD DRAWINGS
APRIL 18, 2014
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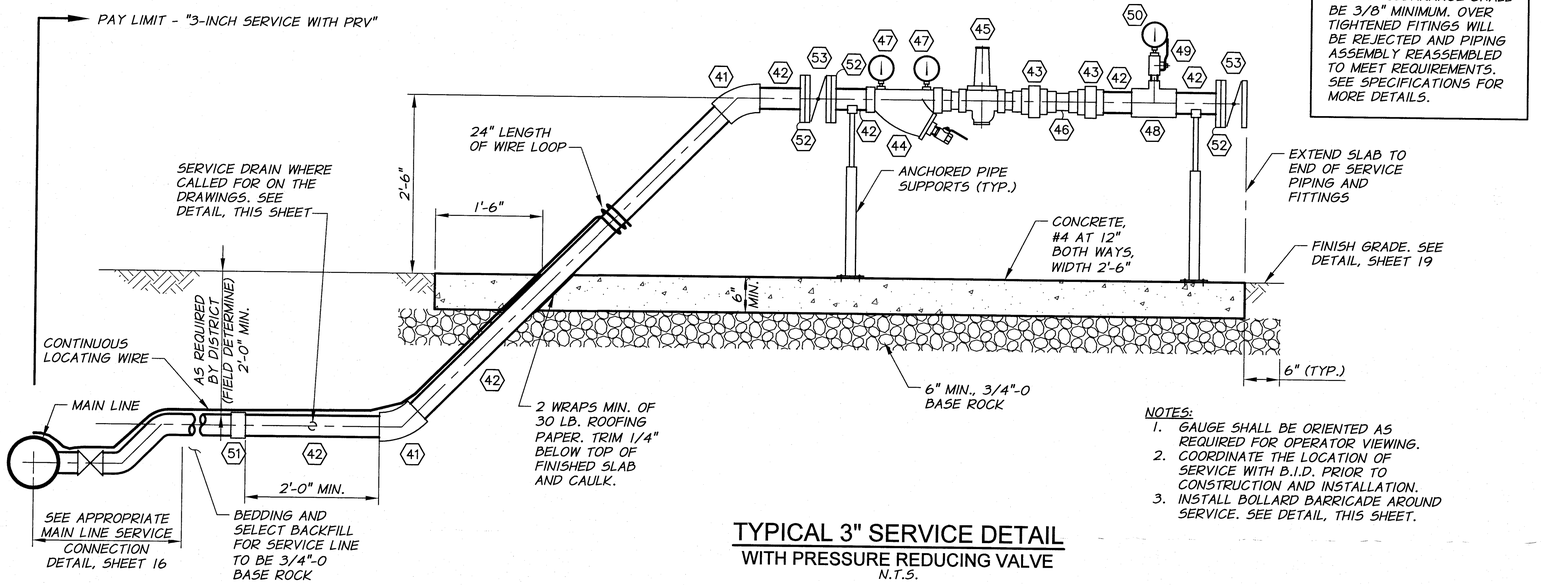
LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS
PHASE 3C

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.

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, THIS SHEET.

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. PROVIDE NIPPLE AND BALL VALVE AT FLUSH PORT, SIZE TO MATCH PORT.

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

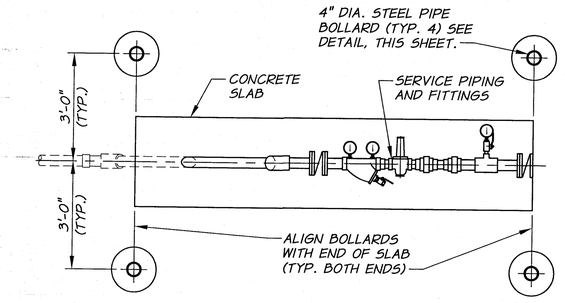
49 3/4" THREADED BRASS BALL VALVE WITH 3/4"x1/4" BUSHING AND BRASS QUICK COUPLING PLUG (UNVALVED)

50 GAUGE BY OWNER

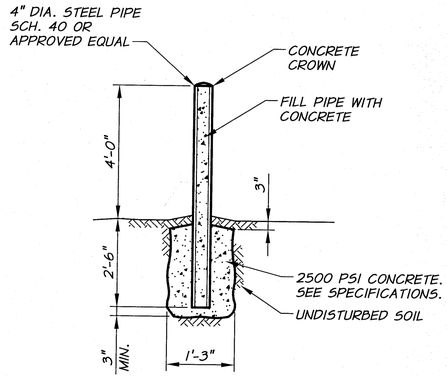
51 SCH 80 PVC TRANSITION COUPLING AND FITTINGS AS REQ'D. FEMALE CONNECTION TO GIP.

52 FLANGE ADAPTER

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

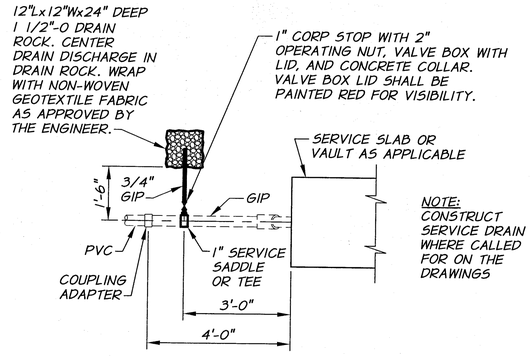


ABOVE GROUND SERVICE BARRICADE DETAIL
PLAN
N.T.S.



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 HIGH SOLIDS EPOXY (12 MILS MIN.) APPLIED, YELLOW IN COLOR.

BOLLARD DETAIL
N.T.S.



SERVICE DRAIN DETAIL
PLAN
N.T.S.

BRETT MOORE
STATE OF WASHINGTON
18026
REGISTERED
PROFESSIONAL ENGINEER
SIGNED 04-18-14
RECORD DRAWING

REVISION	BY	DATE
⚠ RECORD DRAWING	B.M.	4/14

DESIGNED BY H. MORRISON
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE | VERT. SCALE
JOB NUMBER 1199-336 | DATE 2013
ACAD FILE: ServiceDets-Ph3C.dwg

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BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS
PHASE 3C

SERVICE DETAILS III

SHEET 18

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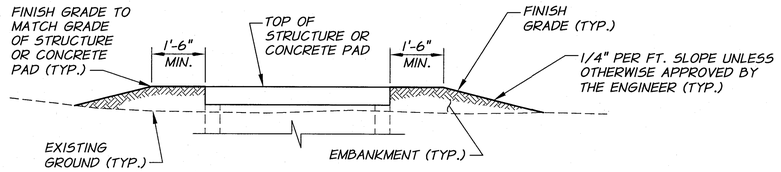
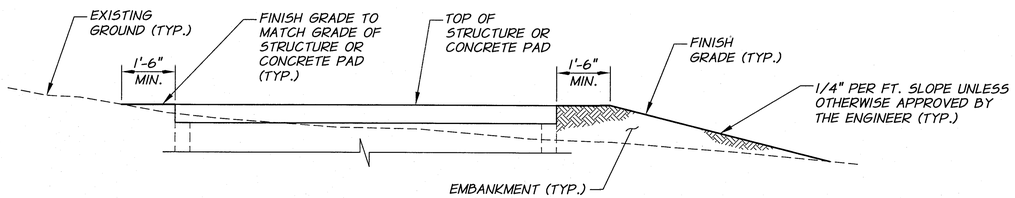
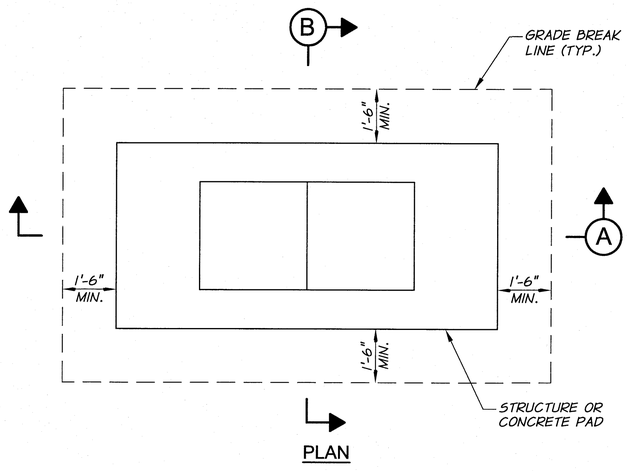


SECTION B



SECTION A



PLAN

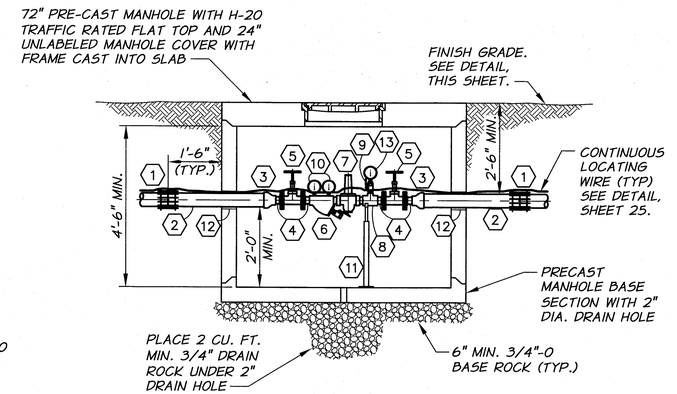
GRADING DETAIL

N.T.S.

FITTING SCHEDULE

1. TRANSITION COUPLING
2. GIP, SIZE AS SHOWN ON PLANS
3. THREADED GIP REDUCER WHERE REQUIRED
4. 2" THREADED GIP
5. 2" FLG GATE VALVE WITH FLGxFIPT ADAPTOR FLANGES
6. SONNTAG ALUMINUM Y FILTER WITH 3/32 SCREEN. PROVIDE NIPPLE AND BALL VALVE AT FLUSH PORT, SIZE TO MATCH PORT.
7. 2" THREADED PRESSURE REDUCING VALVE, CLA-VAL 990
8. 2"x3/4" THREADED GIP TEE
9. 3/4" THREADED BRASS BALL VALVE WITH 3/4"x1/4" NPT BUSHING AND BRASS QUICK COUPLING PLUG (UNVALVED)
10. 4" 55 GLYCERIN FILLED PRESSURE GAUGE WITH FITTINGS AS REQUIRED. ORIENT GAUGE SO THAT FACE IS CLEARLY VISIBLE FROM VAULT ACCESS OPENING.
11. PIPE SUPPORT. SEE DETAIL, SHEET 23.
12. SEAL PIPE PENETRATIONS WATERTIGHT WITH NON-SHRINK GROUT
13. OWNER SUPPLIED GAUGE

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.



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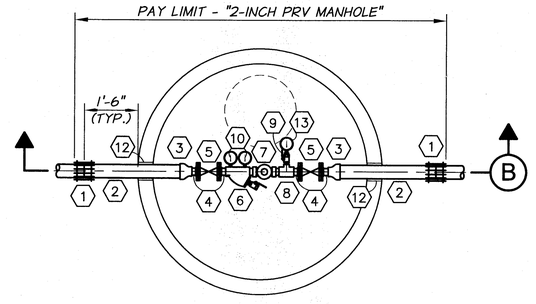

PLAN

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 "2-INCH PRV MANHOLE" PAY ITEM.

2" PRESSURE REDUCING VALVE MANHOLE DETAIL

N.T.S.

BRETT MOORE — STATE OF WASHINGTON — 46008 — REGISTERED PROFESSIONAL ENGINEER
SIGNED 04-18-14
RECORD DRAWING

⚠ RECORD DRAWING	B.M.	4/14
REVISION	BY	DATE
DESIGNED BY H. MORRISON		
DRAWN BY D. CHRISTMAN		
REVIEWED BY B. MOORE		

HORZ. SCALE NONE — VERT. SCALE
JOB NUMBER 1199-336 — DATE 2013
ACAD FILE: VaultDets-PH3C.dwg

RECORD DRAWINGS
APRIL 18, 2014
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LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3C

CONTROL VALVE DETAILS I

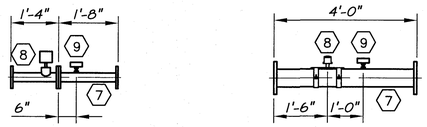
SHEET 19

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 51.
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 51.
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 49.
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"

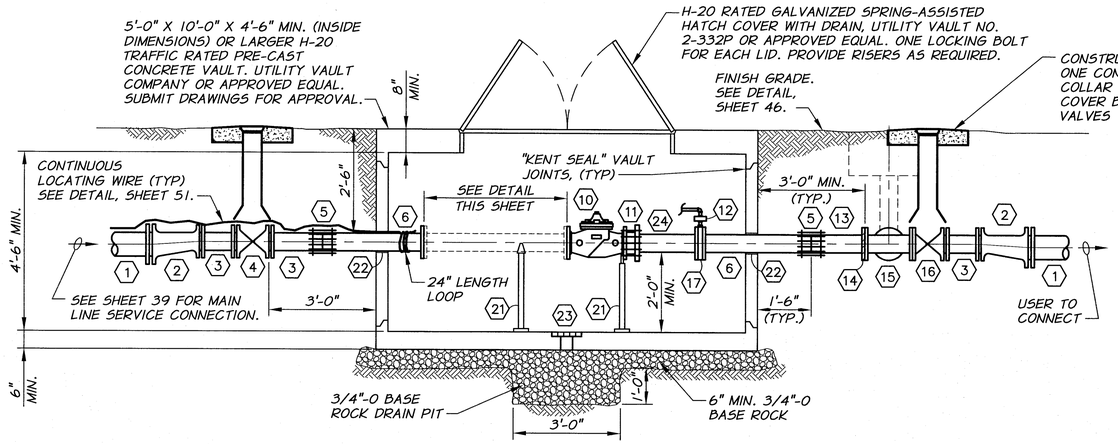


4" SERVICE

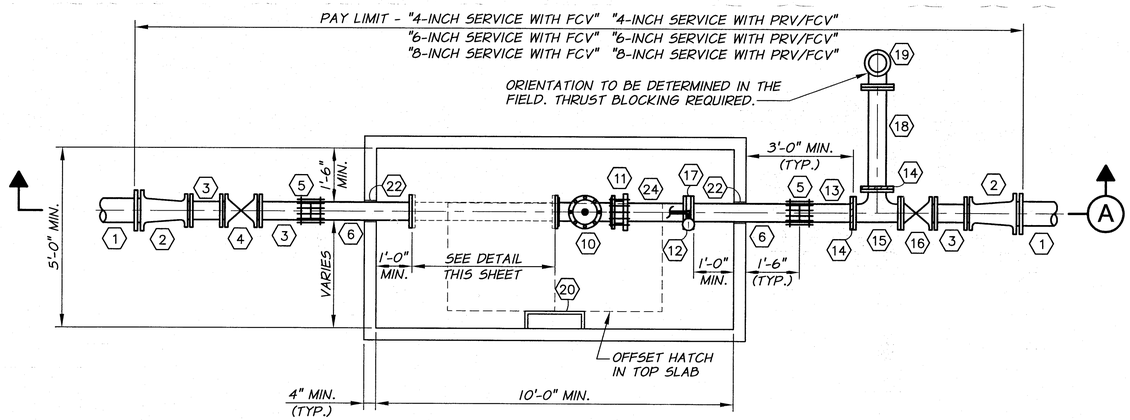
6" AND 8" SERVICE

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.

BRETT MOORRIS — STATE OF WASHINGTON — 46026 — REGISTERED PROFESSIONAL ENGINEER
SIGNED 04-18-14
RECORD DRAWING

REVISION	BY	DATE
RECORD DRAWING	B.M.	4/14
CHANGE ORDER 1.2	B.M.	1/14

SCALE IN FEET: 2 0 2 4 6

DESIGNED BY H. MORRISON
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE 1/2"=1'-0" VERT. SCALE
JOB NUMBER 1199-336 DATE 2013
ACAD FILE: Ph3C VaultDets-CO.dwg

RECORD DRAWINGS
APRIL 18, 2014
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LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3C

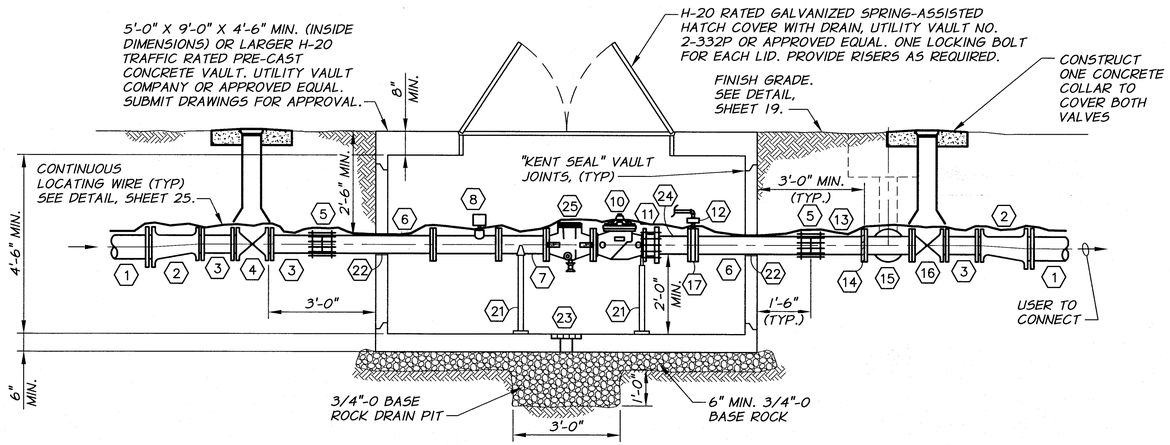
CONTROL VALVE DETAILS 1A
SEITZ DELIVERY - CHANGE ORDER 1.2

SHEET
19A
CHANGE ORDER 1.2

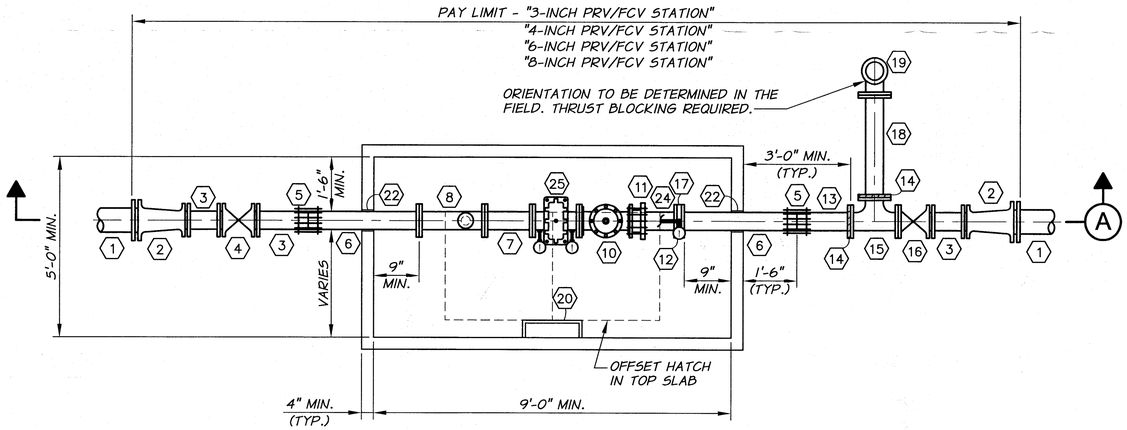
FITTING SCHEDULE

1. MAIN OR SERVICE LINE PIPING
2. MJ REDUCER
3. CLASS 200 PVC PIPING (SAME SIZE AS CONTROL VALVE)
4. MJ GATE VALVE WITH VALVE BOX. SEE DETAIL, SHEET 25.
5. COUPLING
6. FLG X PE D.I. SPOOL, LENGTH AS REQUIRED (SAME SIZE AS CONTROL VALVE)
7. FLG DI SPOOL X 12" LG.
8. McCROMETER FLOWMETER MODEL MW500 (SIZE SAME AS CONTROL VALVE)
9. RESERVED
10. CLA-VAL 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. 1/4" THREADED BRASS BALL VALVE, 4" SS GLYCERIN FILLED PRESSURE GAUGE, AND FITTINGS AS REQUIRED ON ORIFICE PILOT PIPING. ORIENT GAUGE SO THAT THE FACE IS CLEARLY VISIBLE FROM VAULT ACCESS OPENING.
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 25.
17. ORIFICE PLATE. ORIENT SENSING PORT TO THE SIDE OF THE PIPE LINE.
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 23.
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 15" LONG (SAME SIZE AS CONTROL VALVE)
25. CLA-VAL H-STYLE STRAINER MODEL X43H STANDARD 10 MESH SCREEN WITH 1 1/4" BALL VALVE ON DRAIN. DRILL AND TAP UPSTREAM AND DOWNSTREAM BOSSES 1/4" FIPT. INSTALL 2 EA. 4" SS GLYCERIN FILLED PRESSURE GAUGE. ORIENT GAUGE SO THAT THE FACE IS CLEARLY VISIBLE FROM VAULT ACCESS OPENING.

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"



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 PRV/FCV STATION" PAY ITEM.

3" AND 4" PRV/FCV STATION DETAIL

N.T.S.

BRETT MOORE — STATE OF WASHINGTON — 46026 — REGISTERED PROFESSIONAL ENGINEER
SIGNED 04-18-14
RECORD DRAWING

REVISION	BY	DATE
RECORD DRAWING	B.M.	4/14

DESIGNED BY H. MORRISON
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE — VERT. SCALE
JOB NUMBER 1199-336 — DATE 2013
ACAD FILE: VaultDets-PH3C.dwg

RECORD DRAWINGS
APRIL 18, 2014
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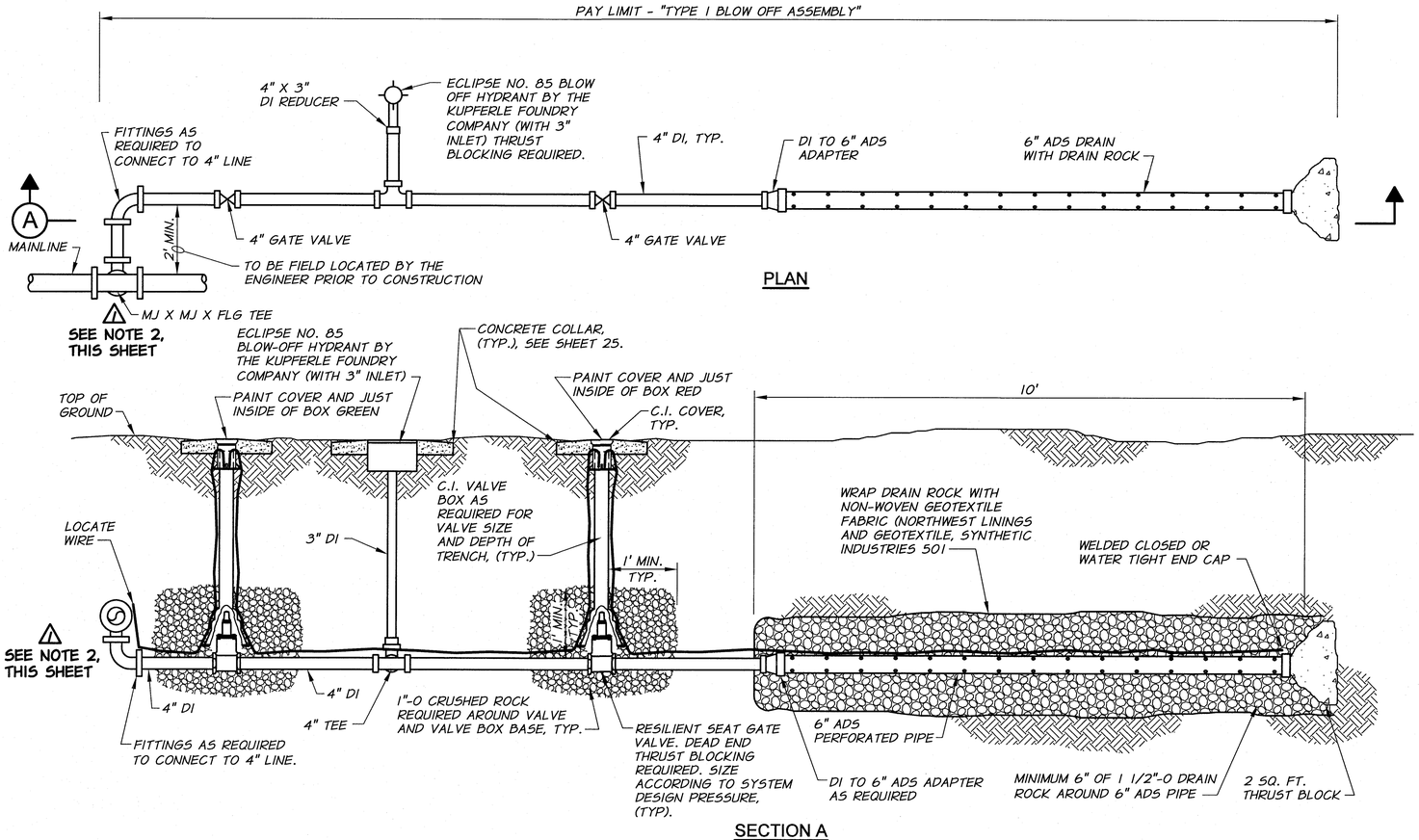
BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3C
CONTROL VALVE DETAILS II

SHEET 20



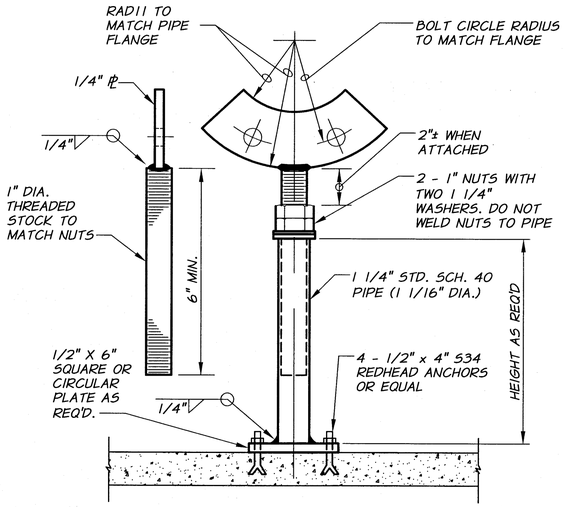
SECTION A

TYPE 1 BLOW-OFF ASSEMBLY DETAIL

N.T.S.

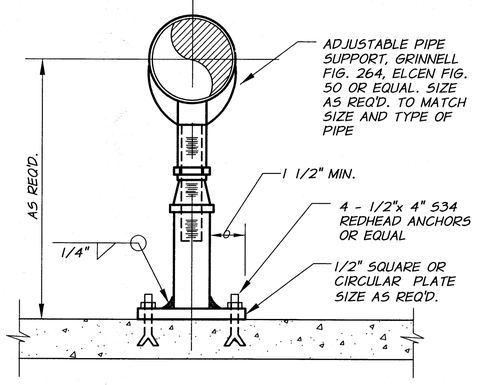
NOTES:

1. BLOW-OFF TO BE FIELD LOCATED BY THE ENGINEER PRIOR TO CONSTRUCTION (INCLUDING ORIENTATION).
2. **FOR 6" AND LARGER MAIN LINE, PROVIDE 90° ELBOW WITH TEE ROTATED 90° AS SHOWN**
3. PROVIDE THRUST RESTRAINT ON ALL FITTINGS AND VALVES.



PIPE SUPPORT DETAIL

N.T.S.



PIPE SUPPORT DETAIL

N.T.S.

BRETT MOORE
STATE OF WASHINGTON
46026
REGISTERED PROFESSIONAL ENGINEER
SIGNED 04-18-14
RECORD DRAWING

REVISION	BY	DATE
⚠ RECORD DRAWING	B.M.	4/14

DESIGNED BY	H. MORRISON	HORZ. SCALE	NONE
DRAWN BY	D. CHRISTMAN	VERT. SCALE	
REVIEWED BY	B. MOORE	JOB NUMBER	1199-336
		DATE	2013
		ACAD FILE:	IrrgDets-PH3C.dwg

RECORD DRAWINGS
APRIL 18, 2014
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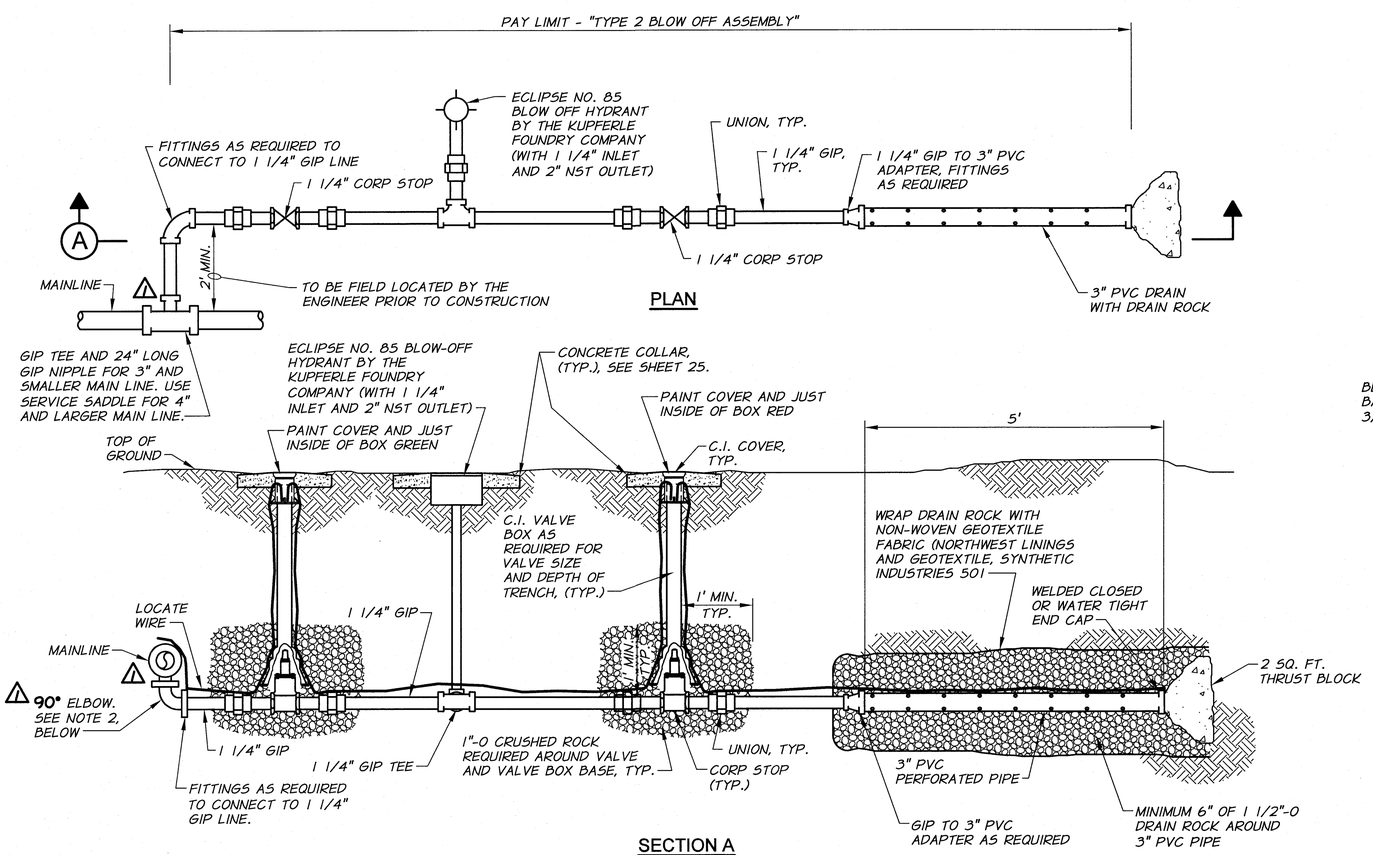
BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3C

MISCELLANEOUS DETAILS I

SHEET
23

ARCHIVED



NOTES:

1. BLOW-OFF TO BE FIELD LOCATED BY THE ENGINEER PRIOR TO CONSTRUCTION (INCLUDING ORIENTATION).
2. ⚠ FOR 3" AND LARGER MAIN LINE, PROVIDE **90°** ELBOW WITH TEE ROTATED **90°** AS SHOWN. THIS FEATURE NOT REQUIRED FOR MAIN LINE SIZE SMALLER THAN 3".
3. ⚠ **CORP STOP SHALL BE 1/4 TURN WITH STOPS AND 2" DRIVE NUTS.**

TYPE 2 BLOW-OFF ASSEMBLY DETAIL

N.T.S.

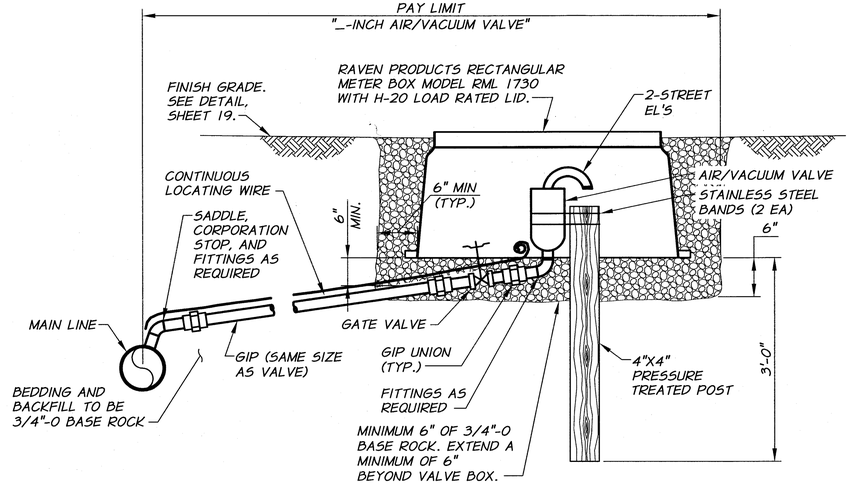


TABLE 1		
AIR/VAC SIZE	NO. OF HOLES	HOLE DIAMETER
2"	5	1"
1"	2	1"
1/2"	1	1"

NOTES:

1. BOX TO BE FIELD LOCATED BY THE ENGINEER PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL DRILL HOLES INTO THE BOX LID ACCORDING TO TABLE 1, THIS SHEET. LOCATION OF DRILL HOLES SHALL BE AS DESIGNATED BY THE ENGINEER.

AIR / VACUUM VALVE

N.T.S.

BRENT MOORE — STATE OF WASHINGTON — 46026 — REGISTERED PROFESSIONAL ENGINEER

SIGNED 04-18-14
RECORD DRAWING

REVISION	BY	DATE
⚠ RECORD DRAWING	B.M.	4/14

DESIGNED BY H. MORRISON
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE — VERT. SCALE
JOB NUMBER 1199-336 — DATE 2013
ACAD FILE: IrrgDets-PH3C.dwg

RECORD DRAWINGS
APRIL 18, 2014
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BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3C

MISCELLANEOUS DETAILS II

SHEET 24

G:\BENTON\1011199_3PC_PRESSURE_IRR\dwg\PHASE_3\dwg\ben-PH3C.dwg, VIATEXT 6, ebertz

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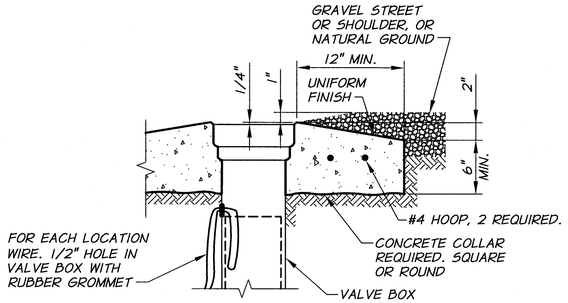
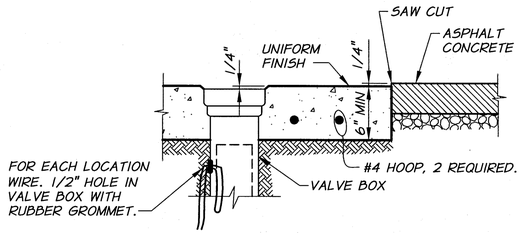
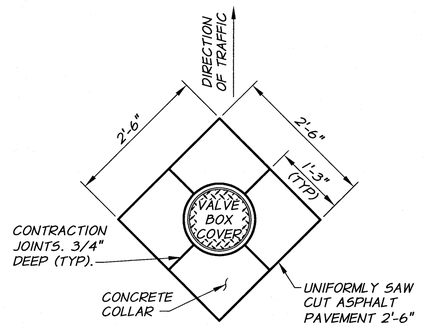


REQUIREMENTS FOR CONCRETE COLLARS:
1. CONCRETE : 3/4", 7 SACK, 4000 PSI AT 28 DAYS, 2" TO 4" SLUMP, 4-7% AIR.
2. COLLAR TO BE FORMED AND UNIFORMLY ROUND.
3. SMOOTH BROOMED FINISH REQUIRED.
4. APPLY CONCRETE CURING COMPOUND.
5. PROTECT FROM TRAFFIC FOR 4 DAYS MIN.

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



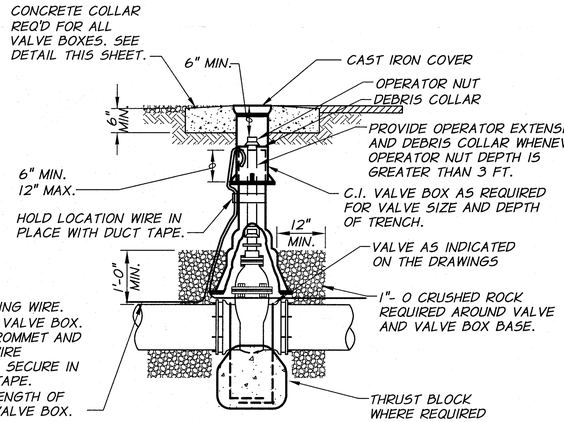
TYPICAL SECTION



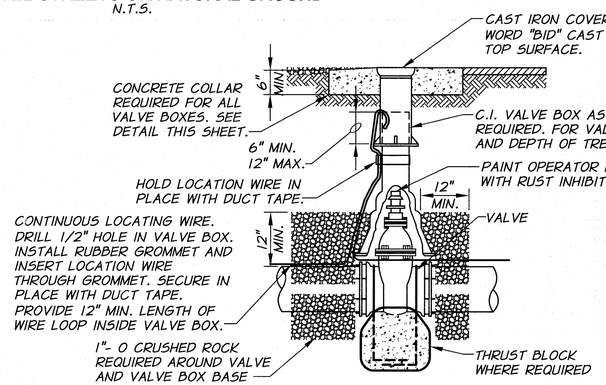
PLAN

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.

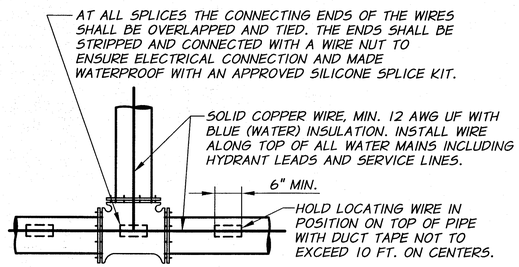
VALVE BOX CONCRETE COLLAR DETAIL
IN ASPHALT PAVEMENT
N.T.S.



VALVE OPERATOR EXTENSION DETAIL
N.T.S.



VALVE BOX DETAIL
N.T.S.



CONTINUOUS LOCATING WIRE DETAIL
N.T.S.

BRETT MOORE
STATE OF WASHINGTON
46003
REGISTERED PROFESSIONAL ENGINEER
SIGNED 04-18-14
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY	H. MORRISON	HORZ. SCALE	NONE
DRAWN BY	D. CHRISTMAN	JOB NUMBER	1199-336
REVIEWED BY	B. MOORE	ACAD FILE:	IrrgDets2-PH3C.dwg
		VERT. SCALE	
		DATE	2013

RECORD DRAWINGS
APRIL 18, 2014
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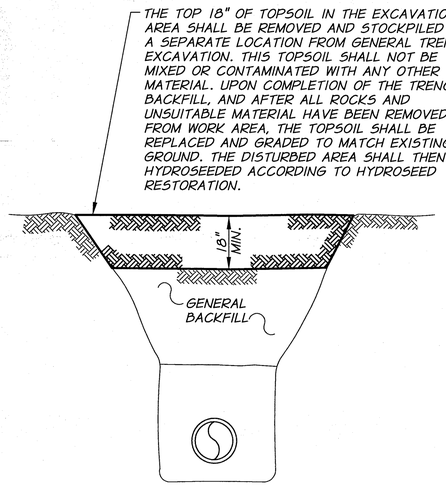
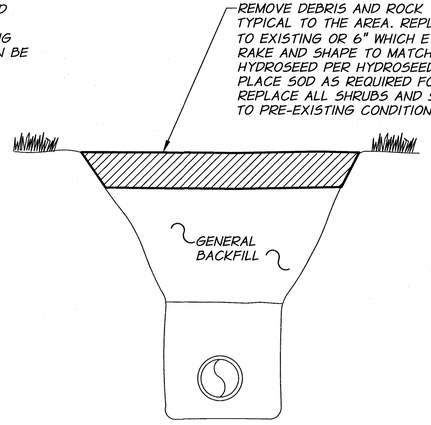
BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS
PHASE 3C

MISCELLANEOUS DETAILS III

SHEET
25

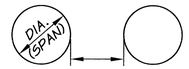


TRENCH RESTORATION
AGRICULTURAL AREAS
N.T.S.



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

MULTIPLE INSTALLATIONS (ALL SHAPES)

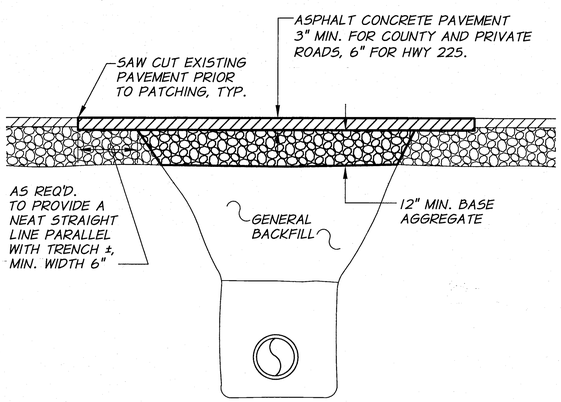


DIAMETER	MIN. SPACE BETWEEN PIPE
UP TO 18"	18"

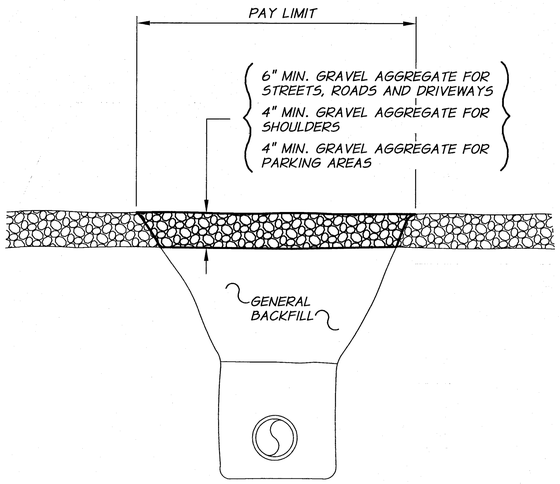
NOTES
1. SURFACING OF PAVED AREAS SHALL COMPLY WITH STREET CUT STANDARD DRAWING.

TRENCH BACKFILL AND BEDDING TABLE

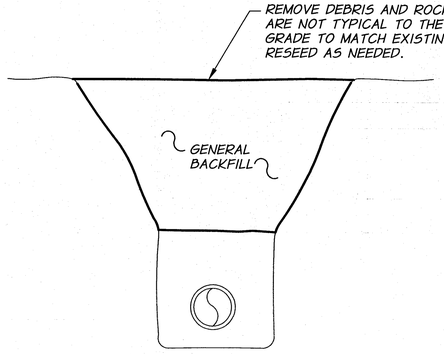
	ASPHALT SURFACE RESTORATION	GRAVEL STREETS, ROADWAYS, SHOULDERS AND PARKING AREAS	GENERAL / HYDROSEED RESTORATION AREAS
SURFACE	SURFACING MATCHING EXISTING	3/4"-0 GRAVEL AGGREGATE (FOR THICKNESS SEE DETAIL THIS SHEET)	TOPSOIL OR AS DIRECTED
BASE MATERIAL UNDER SURFACE	3/4"-0 BASE ROCK	GENERAL BACKFILL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



TRENCH RESTORATION
PAVED STREETS AND ROADWAYS
("ASPHALT SURFACE RESTORATION" PAY ITEM)
("HWY. 225 ASPHALT 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
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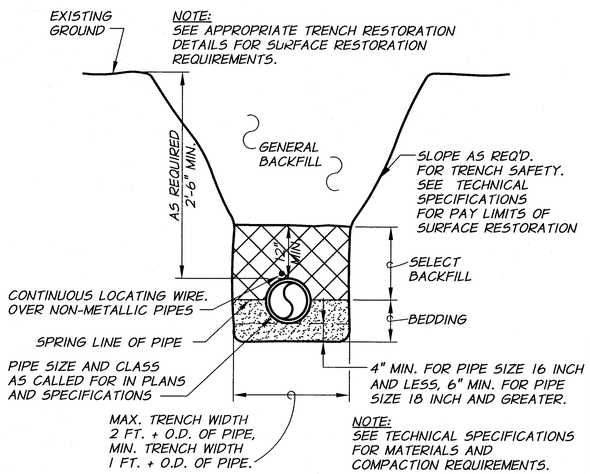

TRENCH EXCAVATION AND BACKFILL
N.T.S.

EMERETT MOORE — STATE OF WASHINGTON — 46026 — REGISTERED PROFESSIONAL ENGINEER
SIGNED 04-18-14
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY	H. MORRISON	HORZ. SCALE	NONE
DRAWN BY	D. CHRISTMAN	VERT. SCALE	
REVIEWED BY	B. MOORE	JOB NUMBER	1199-336
		DATE	2013
		ACAD FILE:	TrenchDets-PH3C.dwg

RECORD DRAWINGS
APRIL 18, 2014
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BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS PHASE 3C
TRENCH DETAILS

SHEET
26

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 SPECIFICATIONS, 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.)

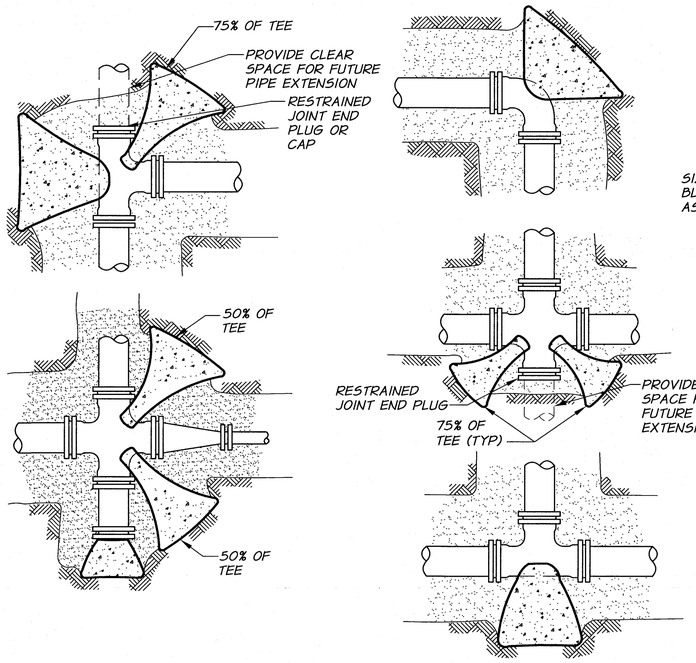
TABLE NO. 1
THRUST AT FITTINGS IN POUNDS AT 100 PSI OF PRESSURE

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

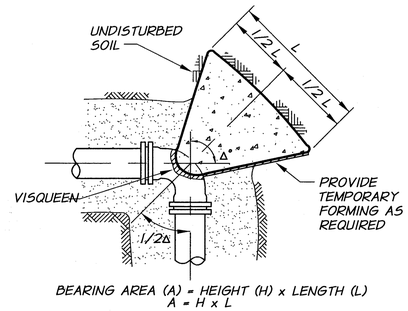
TABLE NO. 2

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



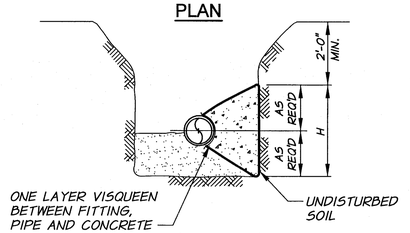
TYPICAL THRUST BLOCK LOCATIONS

PLAN VIEWS



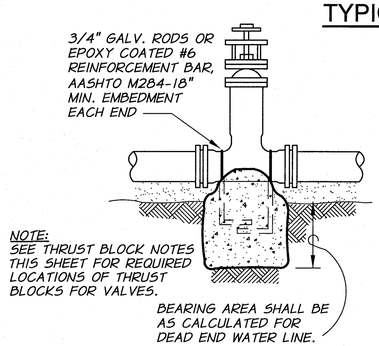
BEARING AREA (A) = HEIGHT (H) x LENGTH (L)
$A = H \times L$

PLAN



SECTION

TYPICAL THRUST BLOCK DETAILS



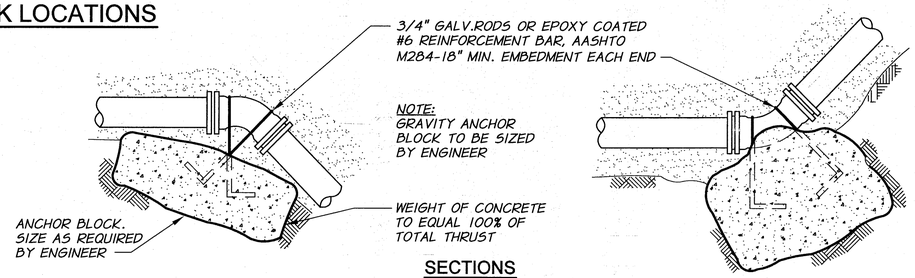
TYPICAL VALVE THRUST BLOCK

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

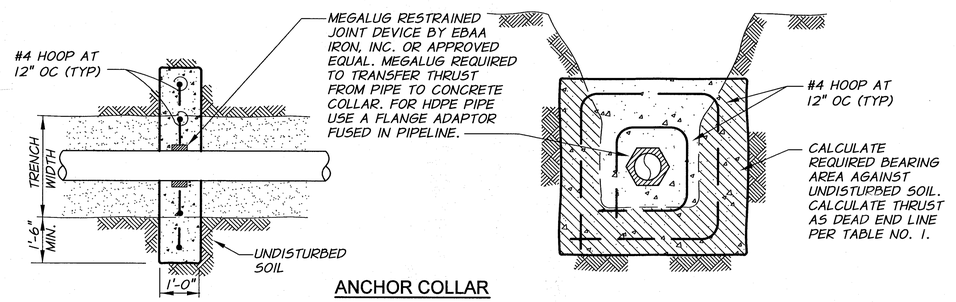
TABLE NO. 3

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

ERNEST MOORE
STATE OF WASHINGTON
46028
REGISTERED PROFESSIONAL ENGINEER
SIGNED 04-18-14
RECORD DRAWING

REVISION	BY	DATE

DESIGNED BY H. MORRISON
DRAWN BY D. CHRISTMAN
REVIEWED BY B. MOORE

HORZ. SCALE NONE
VERT. SCALE
JOB NUMBER 1199-336
DATE 2013
ACAD FILE: Thrust-PH3C.dwg

RECORD DRAWINGS
APRIL 18, 2014
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.

anderson perry & associates, inc.
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LA GRANDE, OR. WALLA WALLA, WA.

BENTON IRRIGATION DISTRICT
IRRIGATION SYSTEM IMPROVEMENTS
PHASE 3C

THRUST BLOCK DETAILS

SHEET
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