

FLYING HORSE NORTH
COUNTY OF EL PASO, STATE OF COLORADO
IRRIGATION RESERVOIR EMBANKMENT

SECTION 31, TOWNSHIP 11 SOUTH, RANGE 65 WEST OF 6TH PRINCIPAL MERIDIAN
WATER DIVISION 1, WATER DISTRICT 8

GENERAL CONSTRUCTION NOTES:

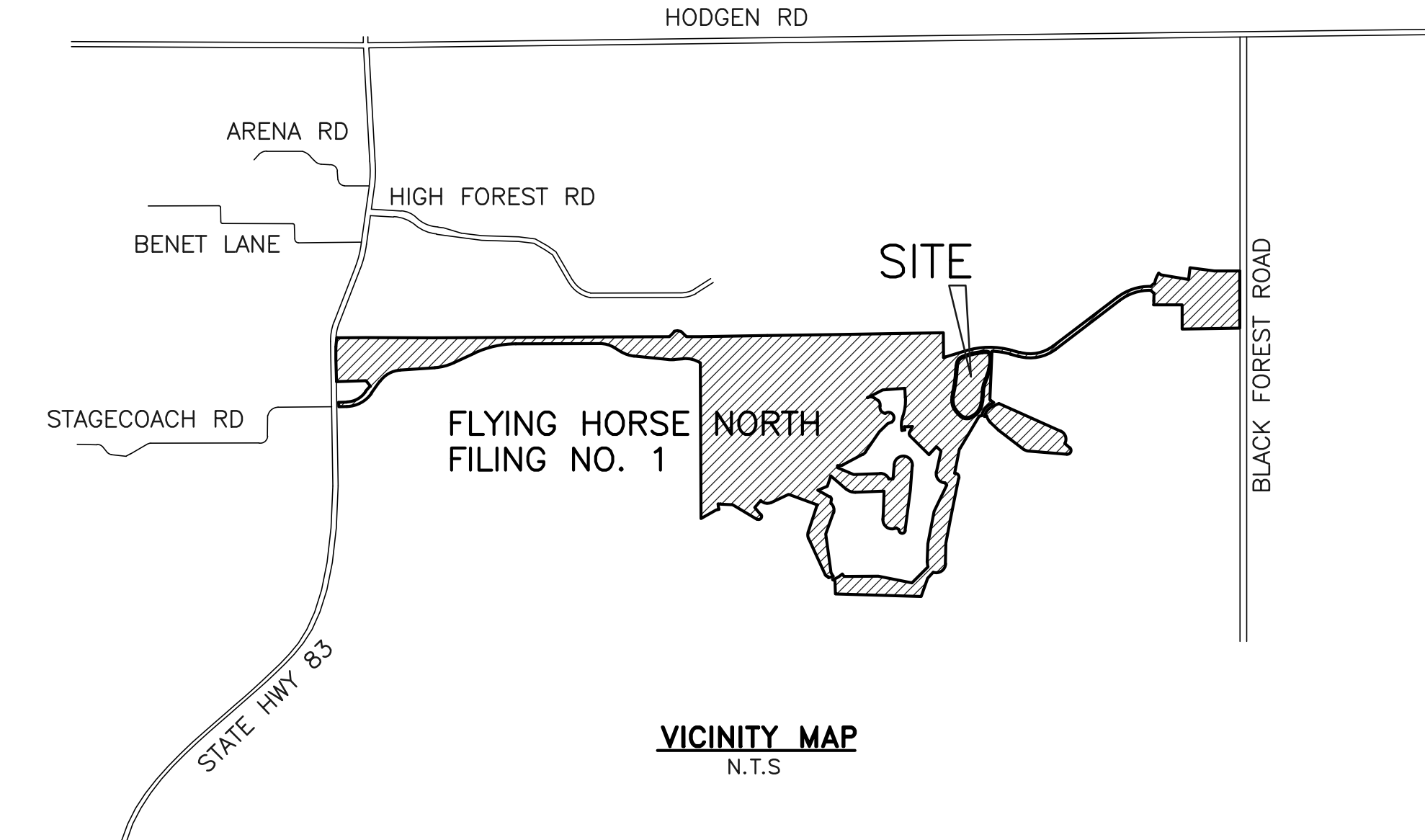
1. THE LOCATION OF EXISTING UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND MAY NOT INCLUDE ALL UTILITIES. THE EXCAVATION CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY HIS FAILURE TO EXACTLY LOCATED AND PRESERVE ANY AND ALL UTILITIES.
2. BEFORE COMMENCING ANY EXCAVATION, CALL 1-800-922-1987 FOR EXISTING UTILITY LOCATIONS.
3. THE CONTRACTOR WILL TAKE THE NECESSARY PRECAUTIONS TO PROTECT EXISTING UTILITIES FROM DAMAGE DUE TO THIS OPERATION. ANY DAMAGE TO THE UTILITIES WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE, AND ANY SERVICE DISRUPTION WILL BE SETTLED BY THE CONTRACTOR.
4. ALL BACKFILL, SUB-BASE AND/OR BASE COURSE (CLASS 6) MATERIAL SHALL BE COMPACTED TO THE SOILS ENGINEER'S RECOMMENDATIONS, AND APPROVED BY EL PASO COUNTY DEVELOPMENT SERVICES ENGINEERING DIVISION.
5. ALL STATIONING IS CENTERLINE UNLESS OTHERWISE INDICATED. ALL ELEVATIONS ARE CENTERLINE UNLESS OTHERWISE INDICATED.
6. THE CONTRACTOR SHALL REVEGETATE ALL DISTURBED AREAS AS SOON AS POSSIBLE AND EROSION CONTROL SHALL BE INSTALLED AND MAINTAINED IN A FUNCTIONAL MANNER AT ALL TIMES. DEVELOPER RESPONSIBLE FOR MAINTAINING DISTURBED AREAS UNTIL REVEGETATION IS COMPLETE.
7. ALL DISTURBED PAVEMENT EDGES SHALL BE CUT TO NEAT LINES. REPAIR SHALL CONFORM TO THE EPC ECM APPENDIX K - 1.2C.
8. ADDITIONAL EROSION CONTROL STRUCTURES MAY BE REQUIRED AT THE TIME OF CONSTRUCTION.
9. BUILDING CONTRACTORS WILL BE RESPONSIBLE FOR CONSTRUCTING POSITIVE DRAINAGE AWAY FROM ALL STRUCTURES.
10. ASPHALT THICKNESS AND BASE COURSE THICKNESS (COMPACTED) FOR ROADS SHALL BE PER DESIGN REPORT BY OWNER'S GEOTECHNICAL ENGINEER. OWNER'S GEOTECHNICAL ENGINEER TO BE ON SITE AT TIME OF ROAD CONSTRUCTION TO EVALUATE SOIL CONDITIONS AND DETERMINE IF ADDITIONAL MEASURES ARE NECESSARY TO ASSURE STABILITY OF THE NEW ROADS. PAVEMENT DESIGN SHALL BE APPROVED BY DEVELOPMENT SERVICES DEPARTMENT PRIOR TO CONSTRUCTION.
11. THE CONTRACTOR SHALL REVEGETATE ALL DISTURBED AREAS WITHIN 21 DAYS OF SUBSTANTIAL GRADING COMPLETION. EROSION CONTROL SHALL BE INSTALLED AND MAINTAINED IN A FUNCTIONAL MANNER AT ALL TIMES. DEVELOPER IS RESPONSIBLE FOR MAINTAINING DISTURBED AREAS UNTIL REVEGETATION IS COMPLETE.
12. TYPE M RIP-RAP WITH 4" OF TYPE II GRANULAR BEDDING AND MIRAFI 180N OR EQUAL MAY BE SUBSTITUTED WHERE TYPE L RIP-RAP WITH MIRAFI FW 700 OR EQUAL IS SPECIFIED.
13. ALL MATERIALS AND INSTALLATION PROCEDURES SHALL BE IN COMPLIANCE WITH ANY AND ALL APPLICABLE EL PASO COUNTY STANDARDS.

STANDARD NOTES FOR EL PASO COUNTY CONSTRUCTION PLANS:

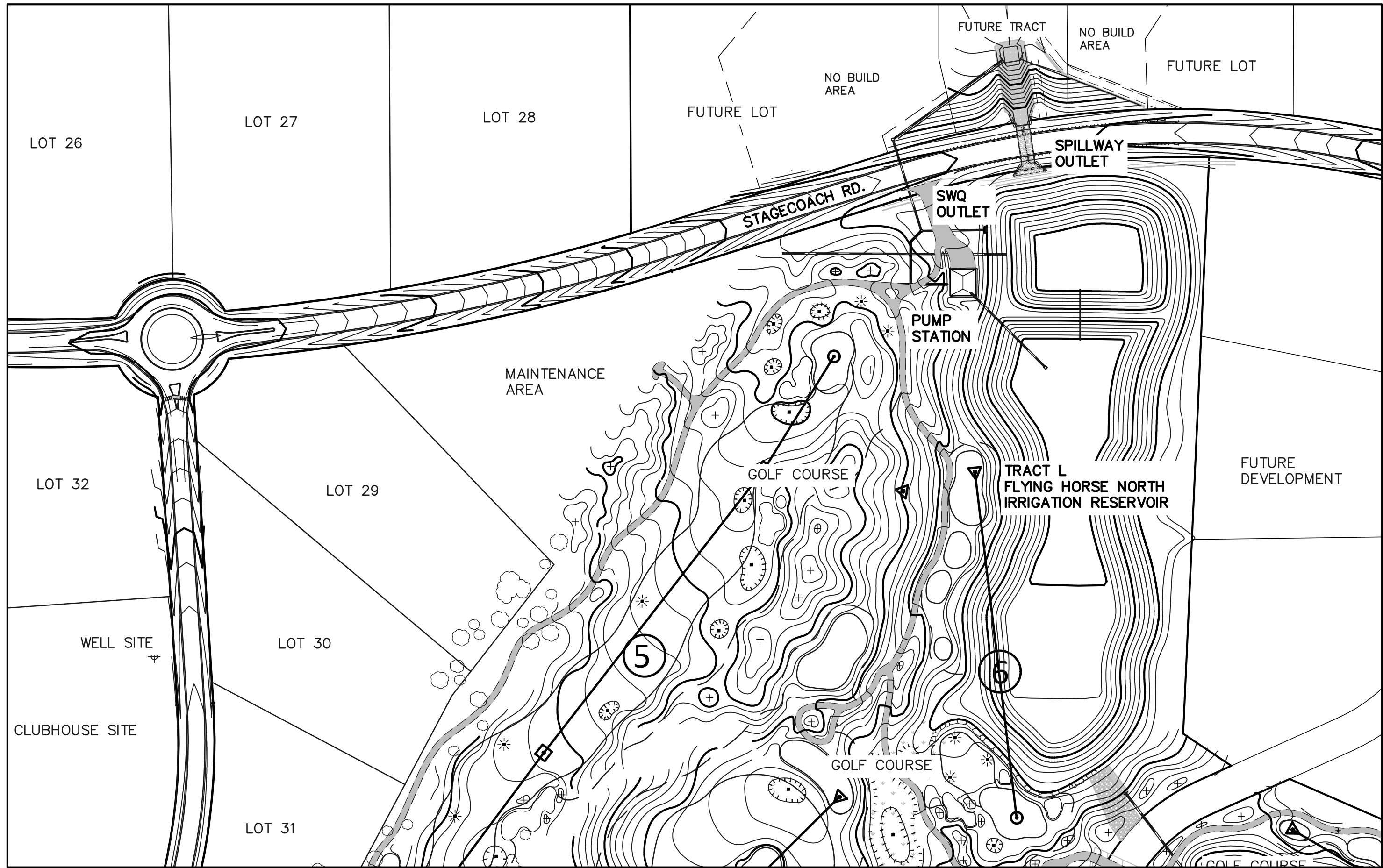
1. ALL DRAINAGE AND ROADWAY CONSTRUCTION SHALL MEET THE STANDARDS AND SPECIFICATIONS OF THE CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2, AND THE EL PASO COUNTY ENGINEERING CRITERIA MANUAL.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE NOTIFICATION AND FIELD NOTIFICATION OF ALL EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, BEFORE BEGINNING CONSTRUCTION. LOCATION OF EXISTING UTILITIES SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. CALL 811 TO CONTACT THE UTILITY NOTIFICATION CENTER OF COLORADO (UNCC).
3. CONTRACTOR SHALL KEEP A COPY OF THESE APPROVED PLANS, THE GRADING AND EROSION CONTROL PLAN, THE STORMWATER MANAGEMENT PLAN (SWMP), THE SOILS AND GEOTECHNICAL REPORT, AND THE APPROPRIATE DESIGN AND CONSTRUCTION STANDARDS AND SPECIFICATIONS AT THE JOB SITE AT ALL TIMES, INCLUDING THE FOLLOWING:
 - a. EL PASO COUNTY ENGINEERING CRITERIA MANUAL (ECM)
 - b. CITY OF COLORADO SPRINGS/EL PASO COUNTY DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2
 - c. COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
 - d. CDOT M & S STANDARDS
4. NOTWITHSTANDING ANYTHING DEPICTED IN THESE PLANS IN WORDS OR GRAPHIC REPRESENTATION, ALL DESIGN AND CONSTRUCTION RELATED TO ROADS, STORM DRAINAGE AND EROSION CONTROL SHALL CONFORM TO THE STANDARDS AND REQUIREMENTS OF THE MOST RECENT VERSION OF THE RELEVANT ADOPTED EL PASO COUNTY STANDARDS, INCLUDING THE LAND DEVELOPMENT CODE, THE ENGINEERING CRITERIA MANUAL, THE DRAINAGE CRITERIA MANUAL, AND THE DRAINAGE CRITERIA MANUAL VOLUME 2. ANY DEVIATIONS FROM REGULATIONS AND STANDARDS MUST BE REQUESTED, AND APPROVED, IN WRITING. ANY MODIFICATIONS NECESSARY TO MEET CRITERIA AFTER-THE-FACT WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
5. IT IS THE DESIGN ENGINEER'S RESPONSIBILITY TO ACCURATELY SHOW EXISTING CONDITIONS, BOTH ONSITE AND OFFSITE, ON THE CONSTRUCTION PLANS. ANY MODIFICATIONS NECESSARY DUE TO CONFLICTS, OMISSIONS, OR CHANGED CONDITIONS WILL BE ENTIRELY THE DEVELOPER'S RESPONSIBILITY TO RECTIFY.
6. CONTRACTOR SHALL SCHEDULE A PRE-CONSTRUCTION MEETING WITH EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT - INSPECTIONS, PRIOR TO STARTING CONSTRUCTION.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO UNDERSTAND THE REQUIREMENTS OF ALL JURISDICTIONAL AGENCIES AND TO OBTAIN ALL REQUIRED PERMITS, INCLUDING BUT NOT LIMITED TO EL PASO COUNTY EROSION AND STORMWATER QUALITY CONTROL PERMIT (ESQCP), REGIONAL BUILDING FLOODPLAIN DEVELOPMENT PERMIT, U.S. ARMY CORPS OF ENGINEERS-ISSUED 401 AND/OR 404 PERMITS, AND COUNTY AND STATE FUGITIVE DUST PERMITS.
8. CONTRACTOR SHALL NOT DEViate FROM THE PLANS WITHOUT FIRST OBTAINING WRITTEN APPROVAL FROM THE DESIGN ENGINEER AND DSD. CONTRACTOR SHALL NOTIFY THE DESIGN ENGINEER IMMEDIATELY UPON DISCOVERY OF ANY ERRORS OR INCONSISTENCIES.
9. ALL STORM DRAIN PIPE SHALL BE CLASS III RCP UNLESS OTHERWISE NOTED AND APPROVED BY DSD.
10. CONTRACTOR SHALL COORDINATE GEOTECHNICAL TESTING PER ECM STANDARDS. PAVEMENT DESIGN SHALL BE APPROVED BY EL PASO COUNTY DSD PRIOR TO PLACEMENT OF CURB AND GUTTER AND PAVEMENT.
11. ALL CONSTRUCTION TRAFFIC MUST ENTER/EXIT THE SITE AT APPROVED CONSTRUCTION ACCESS POINTS.
12. SIGHT VISIBILITY TRIANGLES AS IDENTIFIED IN THE PLANS SHALL BE PROVIDED AT ALL INTERSECTIONS. OBSTRUCTIONS GREATER THAN 18 INCHES ABOVE FLOWLINE ARE NOT ALLOWED WITHIN SIGHT TRIANGLES.
13. SIGNING AND STRIPING SHALL COMPLY WITH EL PASO COUNTY DOT AND MUTCD CRITERIA.
14. CONTRACTOR SHALL OBTAIN ANY PERMITS REQUIRED BY EL PASO COUNTY DOT, INCLUDING WORK WITHIN THE RIGHT-OF-WAY AND SPECIAL TRANSPORT PERMITS.
15. THE LIMITS OF CONSTRUCTION SHALL REMAIN WITHIN THE PROPERTY LINE UNLESS OTHERWISE NOTED. THE OWNER/DEVELOPER SHALL OBTAIN WRITTEN PERMISSION AND EASEMENTS, WHERE REQUIRED, FROM ADJOINING PROPERTY OWNER(S) PRIOR TO ANY OFF-SITE DISTURBANCE, GRADING, OR CONSTRUCTION.

SIGNING AND STRIPING NOTES:

1. ALL SIGNS AND PAVEMENT MARKINGS SHALL BE IN COMPLIANCE WITH THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
2. REMOVAL OF EXISTING PAVEMENT MARKINGS SHALL BE ACCOMPLISHED BY A METHOD THAT DOES NOT MATERIALLY DAMAGE THE PAVEMENT. THE PAVEMENT MARKINGS SHALL BE REMOVED TO THE EXTENT THAT THEY WILL NOT BE VISIBLE UNDER DAY OR NIGHT CONDITIONS. AT NO TIME WILL IT BE ACCEPTABLE TO PAINT OVER EXISTING PAVEMENT MARKINGS.
3. ANY DEVIATION FROM THE STRIPING AND SIGNING PLAN SHALL BE APPROVED BY EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT.
4. ALL SIGNS SHOWN ON THE SIGNING AND STRIPING PLAN SHALL BE NEW SIGNS. EXISTING SIGNS MAY REMAIN OR BE REUSED IF THEY MEET CURRENT EL PASO COUNTY AND MUTCD STANDARDS.
5. STREET NAME AND REGULATORY STOP SIGNS SHALL BE ON THE SAME POST AT INTERSECTIONS.
6. ALL REMOVED SIGNS SHALL BE DISPOSED OF IN A PROPER MANNER BY THE CONTRACTOR.
7. ALL STREET NAME SIGNS SHALL HAVE "1" SERIES LETTERS, WITH LOCAL ROADWAY SIGNS BEING 4" UPPER-LOWER CASE LETTERING ON 8" BLANK AND NON-LOCAL ROADWAY SIGNS BEING 6" LETTERING, UPPER-LOWER CASE ON 12" BLANK, WITH A WHITE BORDER THAT IS NOT RECESSED. MULTI-LANE ROADWAYS WITH SPEED LIMITS OF 40 MPH OR HIGHER SHALL HAVE 8" UPPER-LOWER CASE LETTERING ON 18" BLANK WITH A WHITE BORDER THAT IS NOT RECESSED. THE WIDTH OF THE NON-RECESSED WHITE BORDERS SHALL MATCH PAGE 255 OF THE 2012 MUTCD "STANDARD HIGHWAY SIGNS."
8. ALL TRAFFIC SIGNS SHALL HAVE A MINIMUM HIGH INTENSITY PRISMATIC GRADE SHEETING.
9. ALL LOCAL RESIDENTIAL STREET SIGNS SHALL BE MOUNTED ON A 1.75" X 1.75" SQUARE TUBE SIGN POST AND STUB POST BASE. FOR OTHER APPLICATIONS, REFER TO THE CDOT STANDARD S-614-B REGARDING USE OF THE P2 TUBULAR STEEL POST SUBBASE DESIGN.
10. ALL SIGNS SHALL BE SINGLE SHEET ALUMINUM WITH 0.100" MINIMUM THICKNESS.
11. ALL LIMIT LINES/STOP LINES, CROSSWALK LINES, PAVEMENT LEGENDS, AND ARROWS SHALL BE A MINIMUM 125 MIL THICKNESS PREFORMED THERMOPLASTIC PAVEMENT MARKINGS WITH TAPERED LEADING EDGES PER CDOT STANDARD S-627-1. WORD AND SYMBOL MARKINGS SHALL BE THE NARROW TYPE. STOP BARS SHALL BE 24" IN WIDTH. CROSSWALKS LINES SHALL BE 12" WIDE AND 8' LONG PER CDOT S-627-1.
12. ALL LONGITUDINAL LINES SHALL BE A MINIMUM 15MIL THICKNESS EPOXY PAINT. ALL NON-LOCAL RESIDENTIAL ROADWAYS SHALL INCLUDE BOTH RIGHT AND LEFT EDGE LINE STRIPING AND ANY ADDITIONAL STRIPING AS REQUIRED BY CDOT S-627-1.
13. THE CONTRACTOR SHALL NOTIFY EL PASO COUNTY DEVELOPMENT SERVICES (719) 520-6819 PRIOR TO AND UPON COMPLETION OF SIGNING AND STRIPING.
14. THE CONTRACTOR SHALL OBTAIN A WORK IN THE RIGHT OF WAY PERMIT FROM THE EL PASO COUNTY PUBLIC SERVICES DEPARTMENT (PSD) PRIOR TO ANY SIGNAGE OR STRIPING WORK WITHIN AN EXISTING EL PASO COUNTY ROADWAY.



VICINITY MAP
N.T.S.



KEY MAP
N.T.S.

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SHEET 7 OF 12	SPILLWAY ROCK CHUTE DESIGN
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SHEET 12 OF 12	DETAIL SHEET

CONTACT INFORMATION:

PROPERTY OWNER/DEVELOPER:	PRI #2 LLC 6385 CORPORATE DRIVE, SUITE 200 COLORADO SPRINGS, CO 80919 MR. DREW BALSICK, (719) 592-9333
CIVIL ENGINEER:	CLASSIC CONSULTING ENGINEERS & SURVEYORS 619 N. CASCADE, SUITE 200 COLORADO SPRINGS, CO 80903 MR. MARC A. WHORTON, P.E. (719) 785-2802
GEOTECHNICAL ENGINEER:	ENTECH ENGINEERING LLC 505 ELKTON DRIVE COLORADO SPRINGS, CO 80907 MR. JOE GOODE, P.E. (719) 531-5599
DAM SAFETY ENGINEER:	COLORADO DIVISION OF WATER RESOURCES 4255 SINTON ROAD COLORADO SPRINGS, CO 80907 MR. JOHN HUNYADI, P.E. (719) 227-5294
COUNTY ENGINEERING	EL PASO COUNTY PLANNING AND COMMUNITY DEVELOPMENT 2880 INTERNATIONAL CIRCLE, SUITE 110 COLORADO SPRINGS, COLORADO 80903 MR. GILBERT LAFORCE, (719) 520-7945

OWNER/DEVELOPER'S STATEMENT:

I, THE OWNER/DEVELOPER HAVE READ AND WILL COMPLY WITH THE REQUIREMENTS SPECIFIED IN THESE DETAILED PLANS AND SPECIFICATIONS.

DESIGN ENGINEER'S STATEMENT:

THESE DETAILED PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECTION AND SUPERVISION. SAID PLANS AND SPECIFICATIONS HAVE BEEN PREPARED ACCORDING TO THE CRITERIA ESTABLISHED BY THE COUNTY FOR DETAILED ROADWAY, DRAINAGE, GRADING AND EROSION CONTROL PLANS AND SPECIFICATIONS, AND SAID PLANS AND SPECIFICATIONS ARE IN CONFORMITY WITH APPLICABLE MASTER DRAINAGE PLANS AND MASTER TRANSPORTATION PLANS. SAID PLANS AND SPECIFICATIONS MEET THE PURPOSES FOR WHICH THE PARTICULAR ROADWAY AND DRAINAGE FACILITIES ARE DESIGNED AND ARE CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY DIRECTLY CAUSED BY THE NEGLIGENT ACTS, ERRORS, OR OMISSIONS ON MY PART IN PREPARATION OF THESE DETAILED PLANS AND SPECIFICATIONS.

MARC A. WHORTON, COLORADO P.E. #37155
FOR AND ON THE BEHALF OF CLASSIC CONSULTING ENGINEERS & SURVEYORS

EL PASO COUNTY:

COUNTY PLAN REVIEW IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH COUNTY DESIGN CRITERIA. THE COUNTY IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE COUNTY THROUGH THE APPROVAL OF THIS DOCUMENT ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

FILED IN ACCORDANCE WITH THE REQUIREMENTS OF THE EL PASO COUNTY LAND DEVELOPMENT CODE, DRAINAGE CRITERIA MANUAL, VOLUMES 1 AND 2 AND ENGINEERING CRITERIA MANUAL AS AMENDED.

IN ACCORDANCE WITH WITH ECM SECTION 1.12, THESE CONSTRUCTION DOCUMENTS WILL BE VALID FOR CONSTRUCTION FOR A PERIOD OF 2 YEARS FROM THE DATE SIGNED BY THE EL PASO COUNTY ENGINEER. IF CONSTRUCTION HAS NOT STARTED WITHIN THOSE 2 YEARS, THE PLANS WILL NEED TO BE RESUBMITTED FOR APPROVAL, INCLUDING PAYMENT OF REVIEW FEES AT THE PLANNING AND COMMUNITY DEVELOPMENT DIRECTOR'S DISCRETION.

JENNIFER IRVINE, P.E.
COUNTY ENGINEER / ECM ADMINISTRATOR

STATE ENGINEER APPROVAL:

APPROVED ON THE _____ DAY OF _____ 2018

STATE ENGINEER

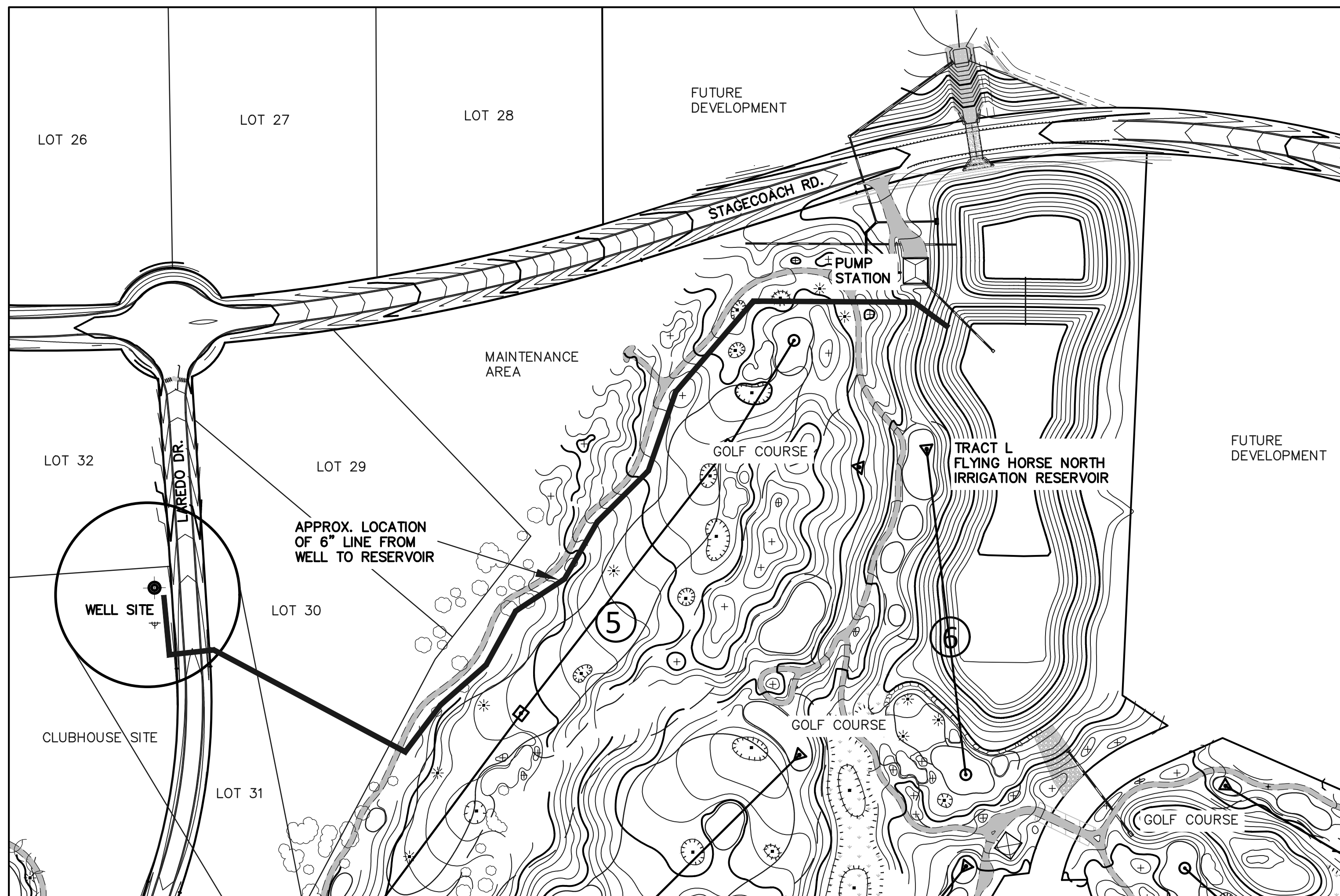
BY: _____
DEPUTY STATE ENGINEER

THESE PLANS REPRESENT THE AS-CONSTRUCTED CONDITIONS OF THE FLYING HORSE NORTH IRRIGATION RESERVOIR EMBANKMENT TO THE BEST OF OUR KNOWLEDGE AND JUDGEMENT, BASED IN PART ON INFORMATION FURNISHED BY OTHERS, AS OF THE _____ DAY OF _____ 2018.

FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC
MARC A. WHORTON, P.E. #37155

STATE ENGINEER'S CONSTRUCTION FILE NUMBER: C-2085

<p>48 HOURS BEFORE YOU DIG, CALL UTILITY LOCATORS 811 UTILITY NOTIFICATION CENTER OF COLORADO IT'S THE LAW</p> <p>THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.</p>	<table><tr><th>NO.</th><th>REVISION</th><th>DATE</th></tr><tr><td>1</td><td>REVISED PER STATE COMMENTS</td><td>4-3-18</td></tr><tr><td>2</td><td>REVISED PER COUNTY COMMENTS</td><td>7-31-18</td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr><tr><td> </td><td> </td><td> </td></tr></table>	NO.	REVISION	DATE	1	REVISED PER STATE COMMENTS	4-3-18	2	REVISED PER COUNTY COMMENTS	7-31-18													<p>REVIEW:</p> <p>PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC</p> <p>MARC A. WHORTON, P.E. #37155</p> <p>DATE _____</p>	<p>CLASSIC CONSULTING ENGINEERS & SURVEYORS</p> <p>619 N. Cascade Avenue, Suite 200 Colorado Springs, Colorado 80903</p> <p>(719) 785-0790 (719) 785-0799 (fax)</p>	<p>FLYING HORSE NORTH IRRIGATION RESERVOIR EMBANKMENT</p> <p>TITLE SHEET</p> <p>DAM ID -- 080459</p> <table><tr><td>DESIGNED BY</td><td>MAW</td><td>SCALE</td><td>DATE</td><td>1-4-18</td></tr><tr><td>DRAWN BY</td><td>MAW</td><td>(H) 1"= N/A</td><td>SHEET 1 OF 12</td><td> </td></tr><tr><td>CHECKED BY</td><td> </td><td>(V) 1"= N/A</td><td>JOB NO.</td><td>1096.11</td></tr></table>	DESIGNED BY	MAW	SCALE	DATE	1-4-18	DRAWN BY	MAW	(H) 1"= N/A	SHEET 1 OF 12		CHECKED BY		(V) 1"= N/A	JOB NO.	1096.11
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KEY MAP
N.T.S.

WELL INFORMATION:

WELL NAME: FLYING HORSE NORTH A-1

LOCATION: SEC. 36, T 11 SOUTH, R 66 WEST, 6TH P.M.
NORTHING: 1445275.0
EASTING: 3220345.0
(STATE PLANE)

PERMIT # 81145-F

ISSUE DATE: 7/24/17

WATER DIVISION 1

WATER DISTRICT 8

ARAPAHOE AQUIFER
TOTAL DEPTH 2400 FT.

<div><div><div><div><div><div></div><div>Layne</div></div></div><div><div><div></div><div>Western</div></div><div><div></div><div>Company</div></div></div><div>Layne-Western, a Division of Layne Christensen Company</div><div>17800 East 22nd Avenue</div><div>Aurora, CO 80011</div><div>Phone: 303-755-1281 FAX: 303-755-1236 E-Mail: 1031@laynechristensen.com</div></div></div></div>									
WELL TEST ENGINE									
Well #	47170	Date	12/01/17	Customer	FLYING HORSE	City	BLACK FOREST	State	COLORADO
Pump Setting (Depth ft)	1830	Test Type (Step, Continuous, Dynamic)	CONT	Tested By	SNIDER	Transducer setting depth	1812.28		
Static Water Level (ft)	1834	Flow Meter (GPM) (ft)	125	Flow Meter (GPM) (ft)	125	Transducer reading @ Start	277FT		
Flow Meter Transducer (ft)	0	Test Pump Make & Model	500PSI	Pump Size (in)	31	Probe Model	500PSI DYNATEC		
Ground Level Correction									
Time of Day	08:00	Elapsed Time (min)	0	Altitude (ft)	0	Pressure (in)	0	Flow Meter (GPM)	0
800A	0	0	125	277	0	0	0	0	0
805A	17	186	109	234.13	1576.15	44.15	X	X	47
807A	19	184	107	231	1581.28	47.28	X	X	X
809A	21	188	105	229	1583.28	49.28	X	X	45.7
811A	23	188	105	225	1587.28	53.28	X	X	X
813A	25	183	105	223.91	1588.37	54.37	X	X	X
815A	27	186	104	221	1591.28	57.28	355	317	47
817A	29	183	101	223.5	1588.76	54.76	X	X	X
819A	31	197	101	221.2	1591.08	57.08	X	X	14
843A	35	202	100	219.93	1592.65	58.65	X	X	12
845A	37	196	101	216.8	1596.48	62.48	X	X	10
850A	42	203	100	215.03	1597.25	63.25	X	X	10
855A	47	195	99	212.02	1600.20	66.20	X	X	10
1000A	52	200	99	209	1603.29	69.29	X	X	10
1005A	60	194	98	209.84	1602.34	68.34	X	X	10
1018A	70	202	98	211.89	1600.59	66.59	X	X	10
1028A	80	195	95	207.45	1604.82	70.82	X	X	10
1038A	90	203	95	207.29	1604.99	70.99	X	X	10
1048A	100	191	94	206.28	1606	72	X	X	10
1058A	110	192	94	204.36	1607.92	73.92	356	318	47
1108A	120	195	94	202.2	1610.08	76.08	X	X	10
1110A	122	299	90	189.28	1628	92	415	412	51.9
1112A	124	300	86	180.9	1631.38	97.38	X	X	51.9
1114A	126	302	84	177.35	1634.88	100.88	X	X	51.9
1116	128	302	84	175.04	1637.24	103.24	X	X	51.9
1118	130	299	82	173.74	1638.54	104.54	X	X	51.9
1120A	132	300	82	172.39	1639.89	105.89	X	X	51.9
1122A	134	299	81	171.25	1641.03	107.03	X	X	51.9
1124A	136	300	81	170.27	1642.01	108.01	X	X	51.9
1126A	138	298	81	170.23	1642.25	108.25	X	X	51.9
1128A	140	299	80	169.54	1642.74	108.74	X	X	51.9
1130A	142	300	80	168.2	1644.05	110.05	X	X	51.9
1135A	147	297	80	166.77	1645.51	111.51	X	X	51.9
Scale from 4 to 6									
CLEAN OUT TUBE									
ADJUST VALVE									
ADJUST VALVE									

47170 FLYING HORSE GOLF PUMP TEST.XXX

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1800	532	445	40	78.03	1734.25	200.25	X	X	X	9.5	0.5	188374	
1830	562	445	40	78.32	1735.96	201.96	X	X	X	9.5	0.5	189707	
1860	592	445	40	78.22	1737.06	203.06	X	X	X	9.5	0.5	213059	
2000	652	448	39	72.98	1739.3	205.3	X	X	X	9.4	0.5	239494	
2100	712	445	37	71.27	1741.01	207.01	X	X	X	9	0.5	265900	
2200	772	445	37	69.03	1743.25	209.25	X	X	X	9.5	0.5	292280	
2300	832	442	35	67.93	1744.35	210.35	511	471	59.5	9	0.5	318539	
2400	892	448	35	66.79	1745.49	211.49	X	X	X	10	0.6	344891	
100A	952	448	34	65.89	1746.59	212.59	X	X	X	10	0.6	370800	
200A	1012	445	34	63.41	1748.87	214.87	X	X	X	59.6	9	0.6	396906
300A	1072	447	33	62.84	1749.44	215.44	X	X	X	10	0.6	425522	
400A	1132	443	33	61.17	1751.11	217.11	513	470	59.6	10	0.6	449018	
500A	1192	448	30	56.69	1755.87	221.87	X	X	X	10	0.6	475551	
600A	1252	448	29	54.98	1757.3	223.3	X	X	X	10	0.6	502254	
700A	1312	448	29	53.88	1759.4	224.4	X	X	X	10	0.6	529291	
800A	1372	447	27	52.85	1759.83	225.83	513	471	59.6	9.5	0.6	556394	
900A	1432	449	26	51.23	1761.05	227.05	513	471	59.6	9.5	0.6	583399	
918A	1450	449	26	50.82	1761.46	227.46	514	472	59.6	9	0.6	591333	
918A	X	X	X	63.56	1769.72	174.72	X	X	X	X	X	X	
928A	X	X	X	150.42	1855.86	121.86	X	X	X	X	X	X	
1027A	X	X	X	201.23	1611.05	77.05	X	X	X	X	X	X	
1101A	X	X	X	208.84	1603.44	69.44	X	X	X	X	X	X	

47170 FLYING HORSE GOLF PUMP TEST.XXX

Page # 3 of 3

1140A	152	299	80	165.22	1647.06	113.06		X	X	51.9	15	TRACE	30553
1145A	157	-	X	X	X	X	X	X	X	X	X	X	X
1150A	162	297	79	163.88	1648.6	114.6	X	X	X	X	15	TRACE	33487
1155A	167	296	79	163.02	1649.26	115.26		415	414	52	15	TRACE	34988
1200P	172	299	77	161.8	1650.48	116.48	X	X	X	52	15	TRACE	36472
1206P	177	300	77	160.58	1651.7	117.7		415	414	52	15	TRACE	37972
1210P	182	300	76	160.01	1652.27	118.27	X	X	X	52	15	TRACE	39457
1220P	182	297	76	159.2	1653.08	119.08		415	414	52	15	TRACE	42457
1230P	202	300	76	157.77	1654.31	120.31		415	414	52	15	TRACE	45459
1240P	212	299	75	157.38	1654.92	120.92	X	X	X	52	15	TRACE	48461
1250P	222	299	75	156.06	1656.22	122.22		415	414	52	15	TRACE	51385
1300	232	299	75	155.28	1656.99	122.99		415	414	52	14	TRACE	54372
1308	240	298	75	153.86	1658.42	124.42		415	414	52	14	TRACE	56970
1310	242	438	X	X	X	X	X	X	59.9	X	X	X	57953
1312	244	450	62	123.93	1688.35	154.35	X	X	59.9	10	TRACE	59843	
1314	246	448	59	116.27	1694.01	160.01	X	X	59.9	10	TRACE	59843	
1316	248	448	59	116.03	1696.25	162.25	X	X	59.9	10	TRACE	59843	
1318	250	449	57	114.48	1697.8	163.8	X	X	59.9	10	TRACE	60231	
1320	252	449	56	112.97	1699.31	165.31	509	461	59.9	10	0.1	60989	
1322	254	447	55	110.73	1701.55	167.55	X	X	59.9	10	0.1	61886	
1324	256	448	55	110	1702.28	168.28	X	X	59.9	10	0.1	63136	
1326	258	446	55	109.19	1703.09	169.09	X	X	59.9	10	0.1	63996	
1328	260	447	54	107.76	1704.92	170.92	X	X	59.9	9	0.2	64572	
1330	262	445	54	107.31	1704.97	170.97	X	X	59.9	9	0.2	65659	
1335	267	450	52	104.56	1707.7	173.7	X	X	59.9	9	0.2	66345	
1340	272	453	52	102.79	1709.49	175.49	X	X	59.9	9	0.2	68606	
1345	277	448	51	101.9	1710.38	176.38	X	X	59.9	9	0.2	70873	
1350	282	449	51	100.51	1711.77	177.77	X	X	59.9	9	0.25	73371	
1355	287	450	50	99.45	1712.83	178.83	509	461	59.9	9	0.3	77666	
1400	292	449	50	98.57	1713.81	179.81	X	X	59.9	9	0.3	79816	
1410	300	450	50	97.57	1714.71	180.71	X	X	59.9	9	0.3	84235	
1420	312	449	50	96.5	1716.78	182.78	X	X	59.9	9	0.3	88789	
1430	322	445	49	94.84	1717.64	183.64	X	X	59.9	9	0.3	93288	
1440	332	447	48	92.52	1719.76	185.76	X	X	59.9	9	0.3	96995	
1450	342	450	47	91.71	1720.57	186.57	X	X	59.9	9	0.3	102268	
1500	352	450	46	90.41	1721.87	187.87	X	X	59.9	9	0.35	106744	
1515	367	449	45	89.49	1722.81	188.81	X	X	59.9	9	0.4	113988	
1530	382	447	45	88.17	1724.11	190.11	X	X	59.9	10	0.4	120007	
1545	397	449	45	86.66	1725.62	191.62	512	472	59.4	9.5	0.4	126730	
1600	412	449	45	85.01	1726.27	192.27	X	X	59.4	9.5	0.4	133398	
1615	427	448	42	84.54	1727.74	193.74	X	X	59.4	9.5	0.4	140493	
1630	442	448	42	84.79	1727.49	193.49	X	X	59.4	9.5	0.4	146691	
1645	457	446	42	82.75	1729.48	195.48	X	X	59.4	9.5	0.4	153478	
1700	472	449	42	81.53	1730.45	196.45	X	X	59.4	9.5	0.4	160184	
1730	502	449	41	80.39	1731.89	197.89	512	475	59.4	9.5	0.45	173906	

PLEASE USE THE SPACE BELOW FOR ANY ADDITIONAL COMMENTS:

1. MIN. WATER LEVEL IN THE WET WELL 56" FROM THE BOTTOM
2. NORMAL WATER LEVEL AT THE WET WELL ??
3. MAX/HIGH WATER LEVEL IN THE WET WELL ??
4. TO DRAIN THE BOND COMPLETELY THE BOTTOM OF THE BOND NEED
TO BE LOWER THAN THE BOTTOM OF WET WELL !

DIMENSIONS AND SIZES OF EXISTING STRUCTURES, AND/OR COMPONENTS MUST BE VERIFIED TO WATERTRONICS BEFORE STATION CONSTRUCTION BEGINS.

THE PUMP STATION PROPOSED HEREIN IS DESIGNED TO BE PLACED IN A PUMP HOUSE FOR PROTECTION FROM THE ENVIRONMENT. IF A PUMP HOUSE IS NOT USED, WATERTRONICS MUST BE NOTIFIED AT TIME OF QUOTATION SO SPECIAL PROVISIONS CAN BE MADE.

☐ APPROVED AS SUBMITTED

☐ APPROVED AS NOTED

☐ REVISE AND RESUBMIT

REVIEWED BY: _____

NAME: _____

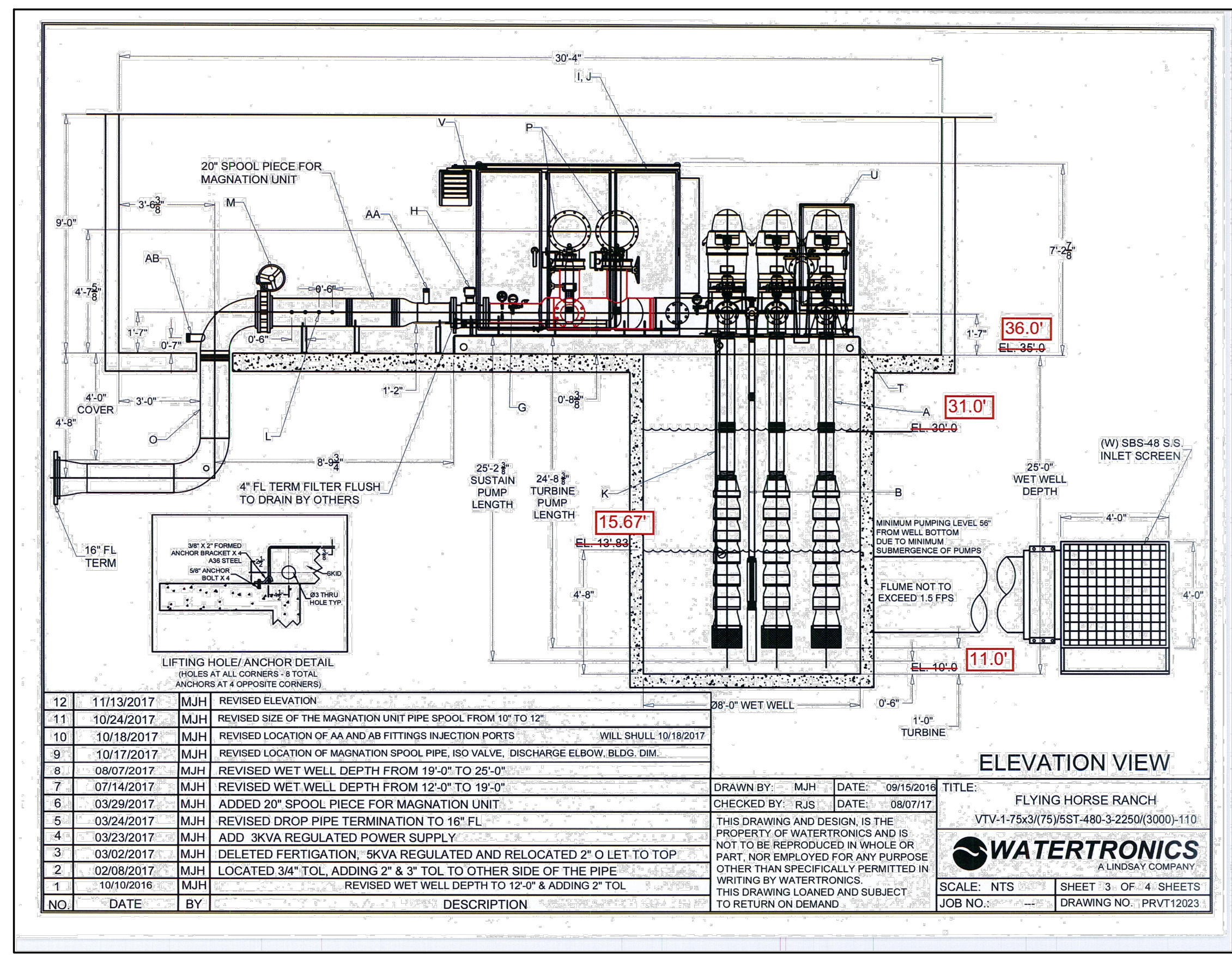
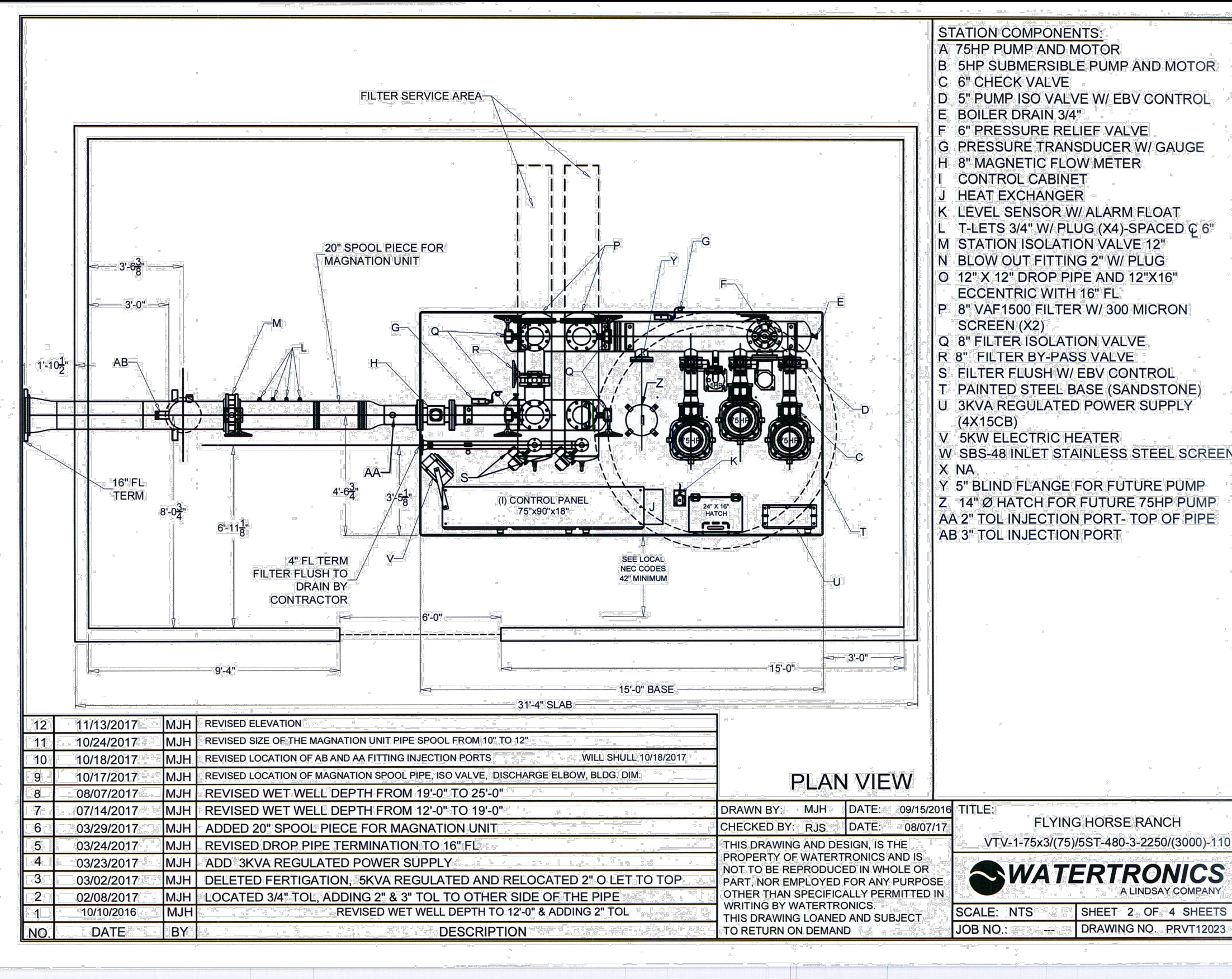
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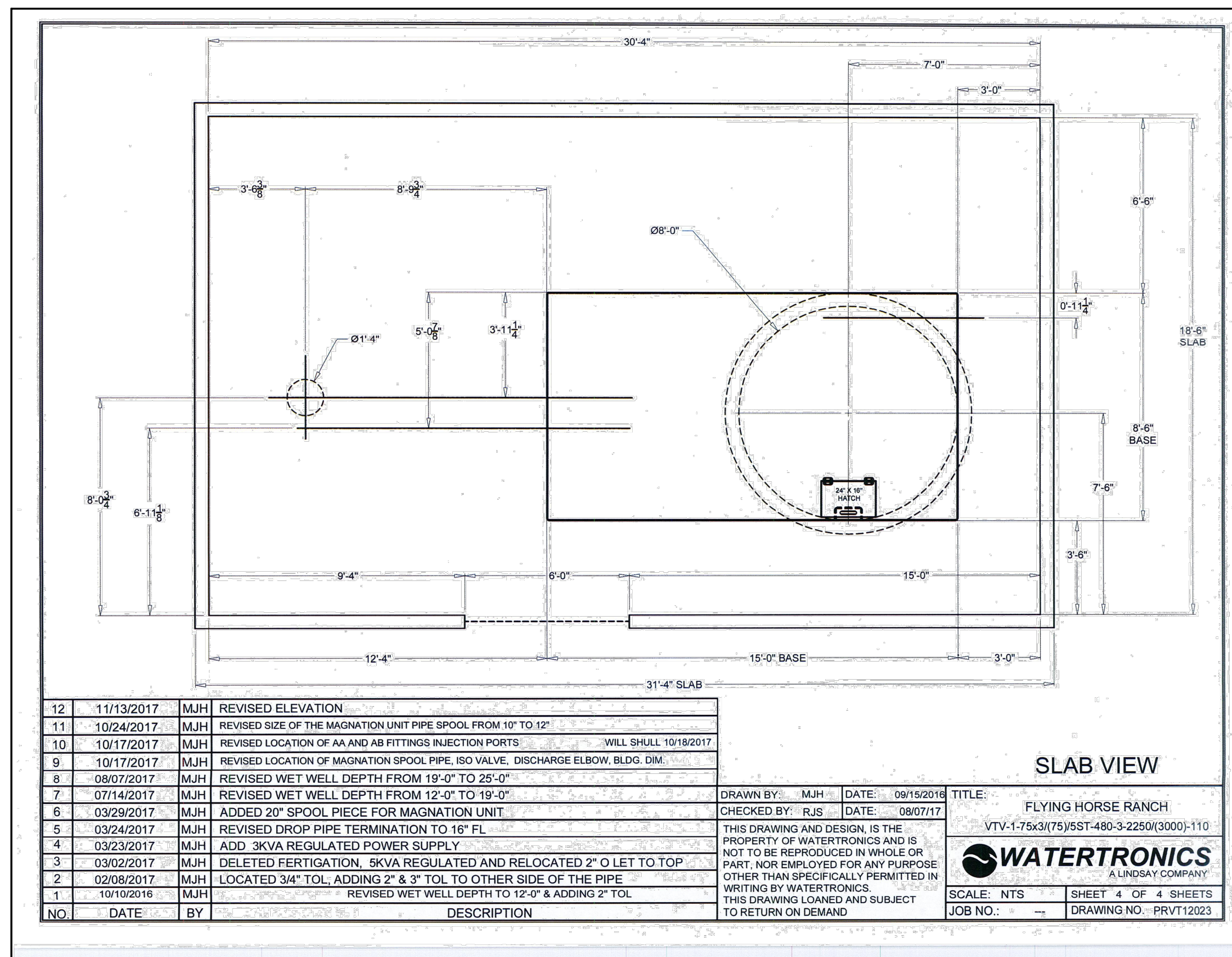
PHONE: 1-262-367-5000
FAX: 1-262-367-5551

SHEET 1 OF 4 SHEETS

DRAWING NO. PRVT12023 09/15/2016



***NOTE: The invert elevation of the 30" PVC is not indicated on the detail drawing. To be confirmed by contractor.**



Pump Data Sheet - Hydroflo Pumps USA, Inc.

Company:
Name:
Date: 9/15/2016

Pump:

Size: 11MH (5 stage)
Type: Vertical
Synch speed: 1800 rpm
Type: 11MH
Specific Speeds:
NPSH:
Dimensions:
Vertical Turbine:

Speed: 1770 rpm
Dis: 7.445 in
Impeller: 11MH SS ENCL
Ns: 2130
Nss: ---
Suction: 8 in
Discharge: 8 in
Bowl size: 11 in
Max lateral: 0.75 in
Thrust K factor: 7.5 lb/ft

Search Criteria:

Flow: 750 US gpm
Head: 291 ft

Fluid:

Water
SG: 1
Viscosity: 1.105 cP
NPSHr: ---

Temperature: 60 °F
Vapor pressure: 0.2563 psi a
Atm pressure: 14.7 psi a

Motor:

Standard: NEMA
Enclosure: WPI
Sizing criteria: Max Power on Design Curve

Size: 100 hp
Speed: 1800
Frame: 404T

Pump Limits:

Temperature: 120 °F
Pressure: 400 psi g
Sphere size: 0.68 in

Power: ---
Eye area: ---

--- Data Point ---

Flow: 750 US gpm
Head: 291 ft
Eff: 83.1%
Power: 66.2 hp
NPSHr: 8.63 ft

--- Design Curve ---

Shutoff head: 335 ft
Shutoff cP: 145 psi
Min flow: 158 US gpm
BEP: 83.5% @ 792 US gpm
NOL power:
79.7 hp @ 1280 US gpm

--- Max Curve ---

Max power:
102 hp @ 1300 US gpm

The figure consists of two vertically stacked graphs sharing a common x-axis representing flow rate in US gpm, ranging from 250 to 1250.

The top graph plots Head in feet (ft) on the y-axis, ranging from 100 to 400. It shows a design curve (solid black line) and a max curve (dashed black line). A red vertical line at 750 US gpm intersects the design curve at 291 ft head. The design curve is labeled with efficiency values: 83.1%, 83.5%, 82.5%, 80.5%, 80.3%, 76.5%, 71.5%, and 75 hp. The max curve is labeled with efficiency values: 83.1%, 82.5%, 80.5%, 80.3%, 76.5%, 71.5%, and 75 hp. The design curve is also labeled with flow values: 750 US gpm, 792 US gpm, and 1300 US gpm. The max curve is labeled with flow values: 750 US gpm, 792 US gpm, and 1300 US gpm.

The bottom graph plots NPSHr in feet (ft) on the y-axis, ranging from 0 to 20. It shows a solid black curve and a dashed blue curve. A red vertical line at 750 US gpm intersects the solid black curve at 8.63 ft NPSHr. The dashed blue curve is labeled with flow values: 750 US gpm, 792 US gpm, and 1300 US gpm.

Performance Evaluation:

Flow US gpm	Speed rpm	Head ft	Efficiency %	Power hp	NPSHr ft
900	1770	261	82.5	71.7	10.9
750	1770	291	83.1	66.2	8.63
600	1770	311	79.5	59	7.33
450	1770	320	69.7	52	7
300	1770	325	58.7	43.8	7

Selected from catalog: hydroflo vs pumps.60 Vers: 18.3



<p>48 HOURS BEFORE YOU DIG, CALL UTILITY LOCATORS</p> <p>811</p> <p>UTILITY NOTIFICATION CENTER OF COLORADO ITS THE LAW</p> <p>THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.</p>	NO. REVISION		DATE

REVIEW:

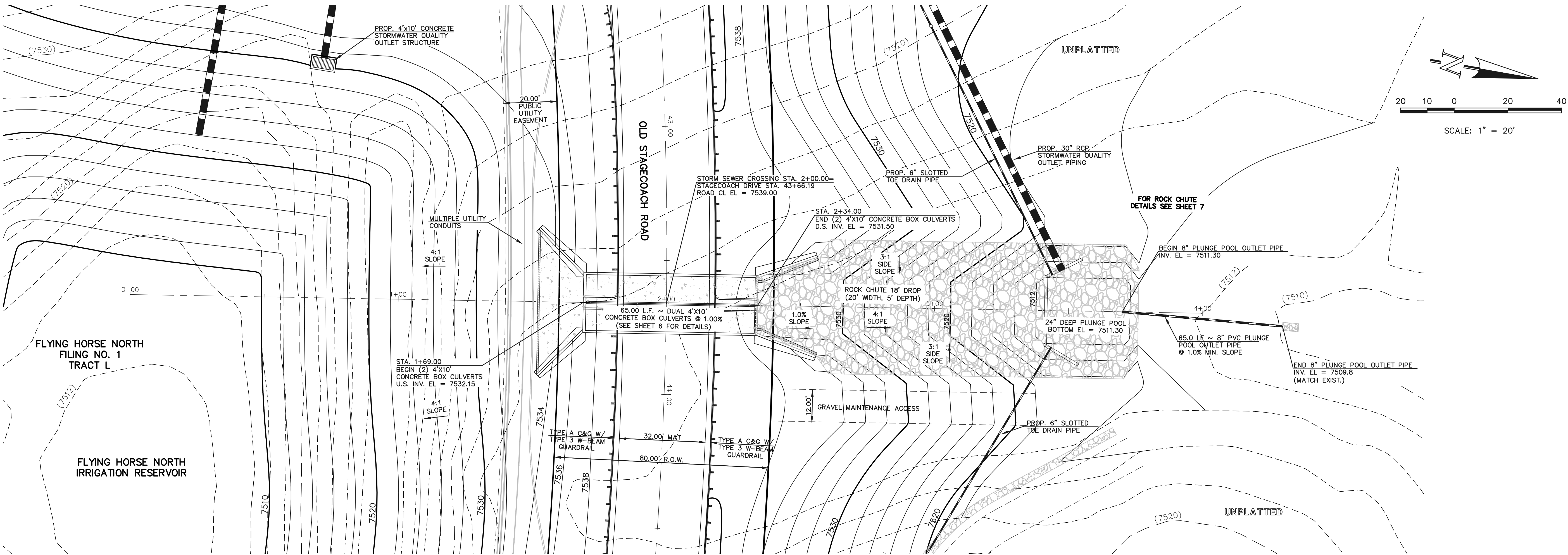
PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF
CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC

MARC A. WHORTON, P.E. #37155

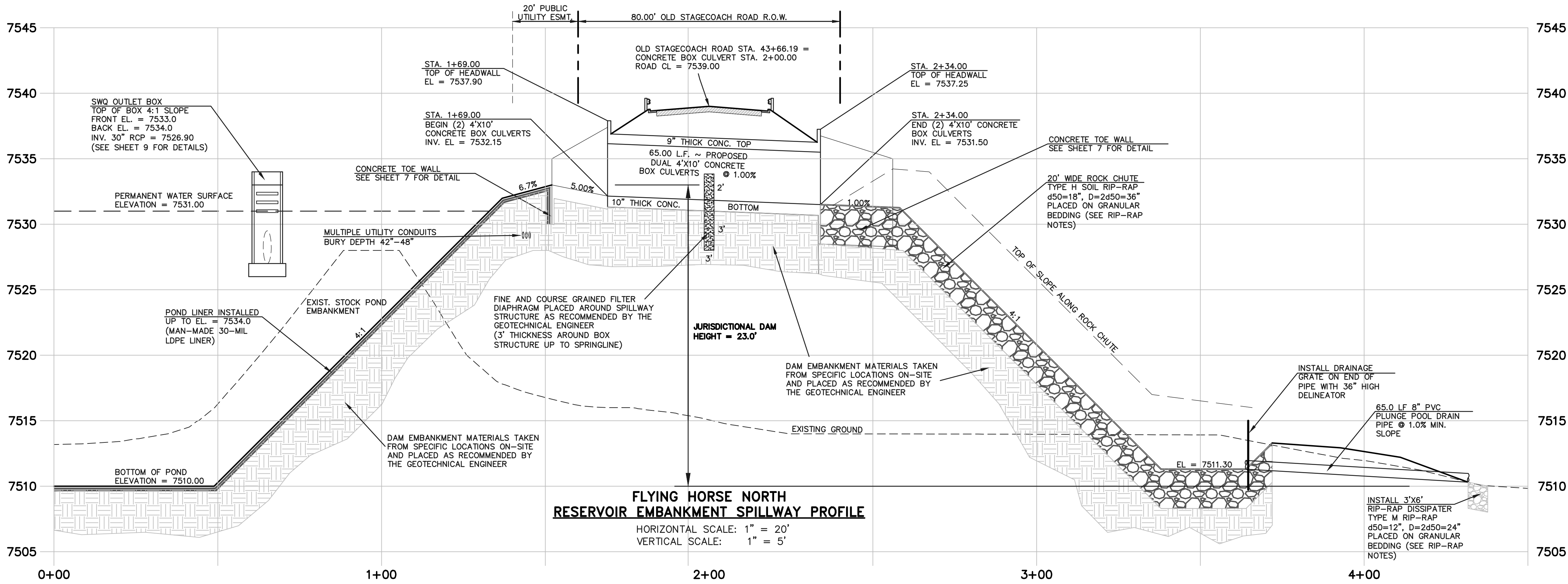
DATE

 CONSULTING ENGINEERS & SURVEYORS	FLYING HORSE NORTH IRRIGATION RESERVOIR EMBANKMENT PUMP STATION PLAN / DETAILS																
619 N. Cascade Avenue, Suite 200 Colorado Springs, Colorado 80903 (719) 785-0790 (719) 785-0799 (Fax)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">DESIGNED BY</td> <td style="width: 15%;">MAW</td> <td style="width: 20%;">SCALE</td> <td style="width: 20%;">DATE</td> <td style="width: 20%; text-align: center;">1-4-18</td> </tr> <tr> <td>DRAWN BY</td> <td>MAW</td> <td>(H) 1"= N/A</td> <td>SHEET 3</td> <td>OF 12</td> </tr> <tr> <td>CHECKED BY</td> <td></td> <td>(V) 1"= N/A</td> <td>JOB NO.</td> <td>1096.11</td> </tr> </table>	DESIGNED BY	MAW	SCALE	DATE	1-4-18	DRAWN BY	MAW	(H) 1"= N/A	SHEET 3	OF 12	CHECKED BY		(V) 1"= N/A	JOB NO.	1096.11	
DESIGNED BY	MAW	SCALE	DATE	1-4-18													
DRAWN BY	MAW	(H) 1"= N/A	SHEET 3	OF 12													
CHECKED BY		(V) 1"= N/A	JOB NO.	1096.11													





FLYING HORSE NORTH
RESERVOIR EMBANKMENT SPILLWAY PLAN



FLYING HORSE NORTH
RESERVOIR EMBANKMENT SPILLWAY PROFILE

STATE ENGINEER'S CONSTRUCTION FILE NUMBER: C-2085

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811

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NO. REVISION

1 REVISED PER STATE COMMENTS
2 REVISED PER COUNTY COMMENTS

DATE

4-2-18
7-31-18

REVIEW:

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF
CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC

MARC A. WHORTON, COLORADO P.E. #37155

DATE



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Colorado Springs, Colorado 80903
(719) 785-0790
(719) 785-0799 (Fax)

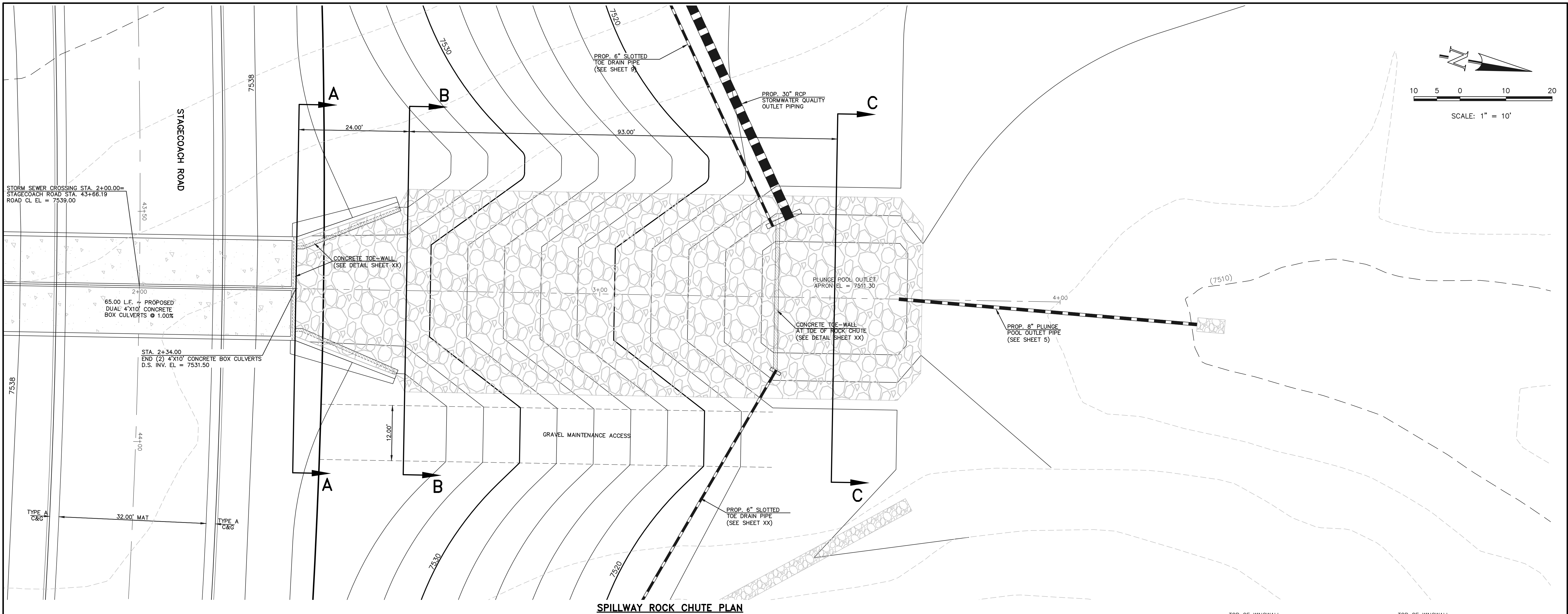
FLYING HORSE NORTH
IRRIGATION RESERVOIR EMBANKMENT

EMBANKMENT SPILLWAY PLAN
DAM ID - 080459

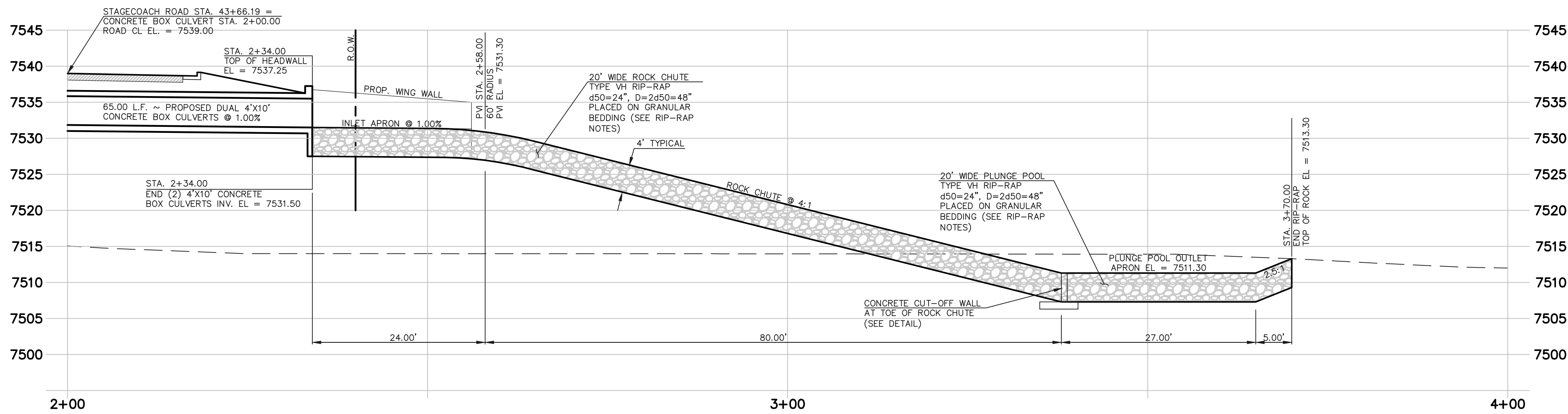
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CHECKED BY		(V) 1"= 5'	JOB NO.	1096.11



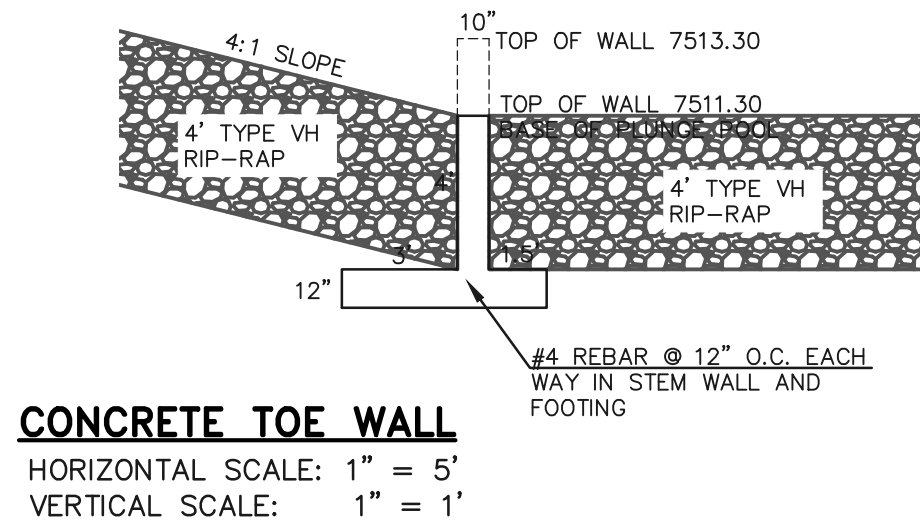
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SPILLWAY ROCK CHUTE PLAN



SPILLWAY ROCK CHUTE PROFILE



CONCRETE TOE WALL
HORIZONTAL SCALE: 1\"/>

48 HOURS BEFORE YOU DIG, CALL UTILITY LOCATORS 811 UTILITY NOTIFICATION CENTER OF COLORADO IT'S THE LAW		NO. REVISION		DATE	
THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.		1	REVISED PER STATE COMMENTS	5-4-18	

REVIEW:	
PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC	
MARC A. WHORTON, COLORADO P.E. #37155	DATE



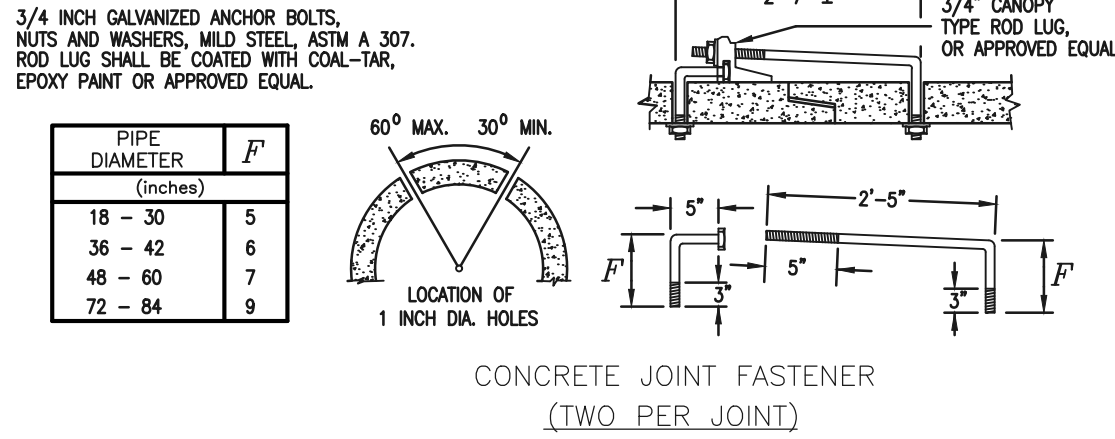
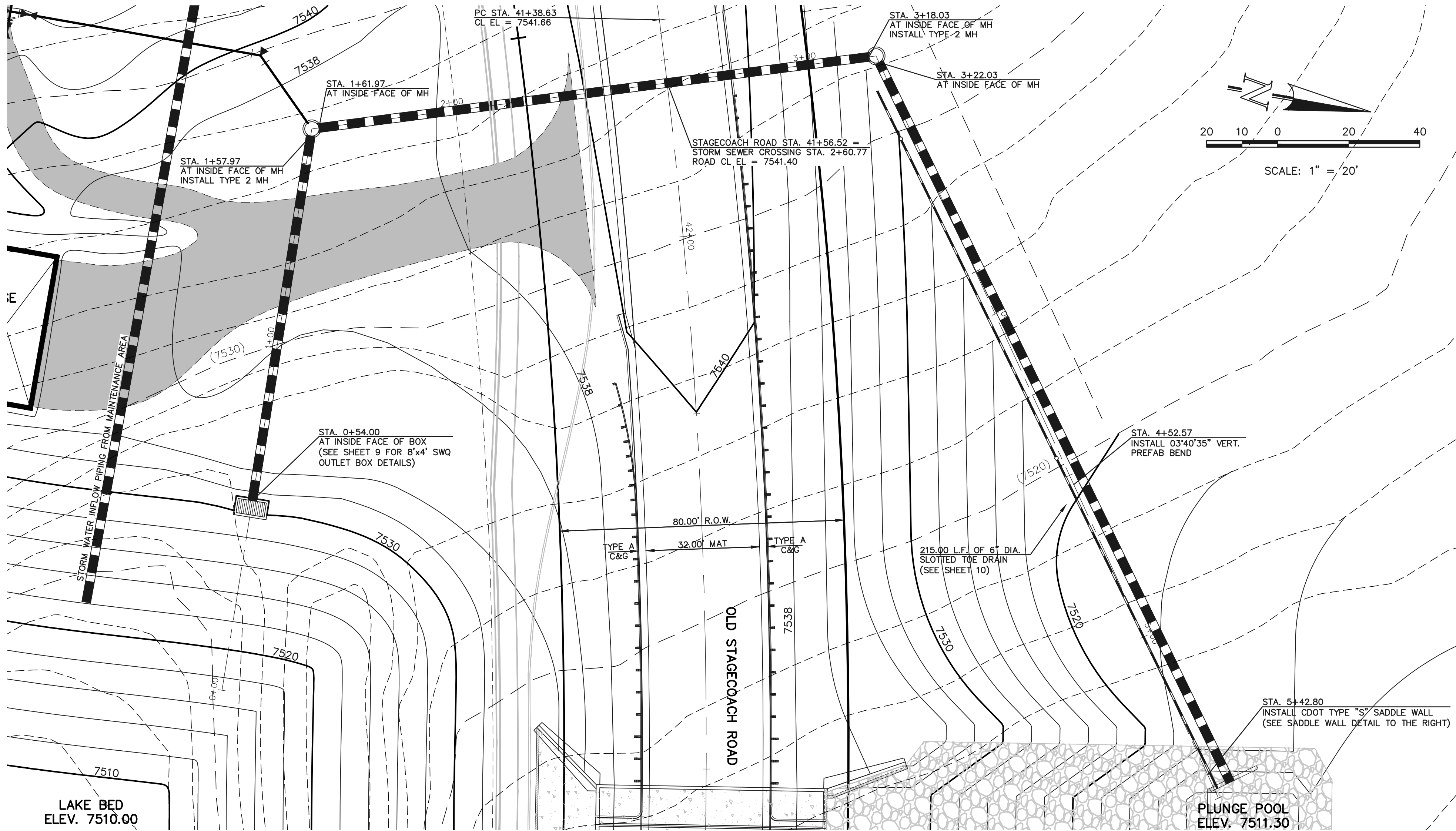
619 N. Cascade Avenue, Suite 200
Colorado Springs, Colorado 80903

(719)785-0790
(719)785-0799(Fax)

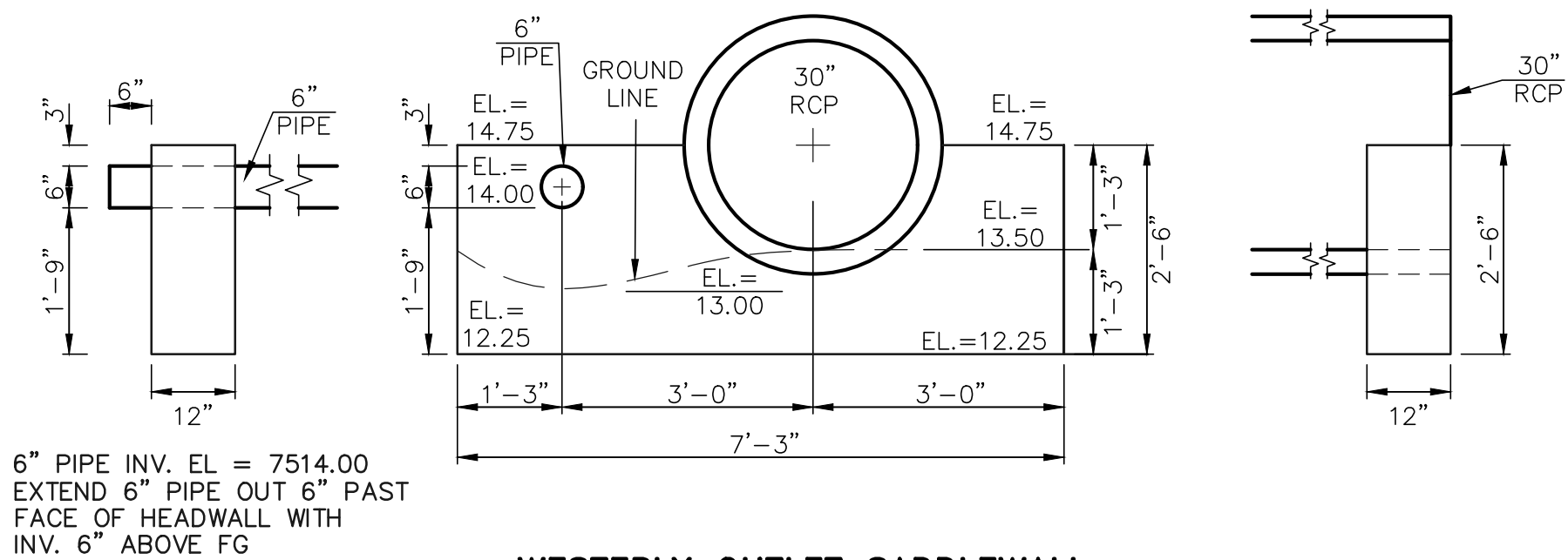
FLYING HORSE NORTH IRRIGATION RESERVOIR EMBANKMENT SPILLWAY ROCK CHUTE DESIGN DAM ID - 080459					
DESIGNED BY	MAW	SCALE	DATE	1-4-18	
DRAWN BY	MAW	(H) 1"= 10'	SHEET 7	OF 12	
CHECKED BY		(V) 1"= 1'	JOB NO.	1096.11	

STATE ENGINEER'S CONSTRUCTION FILE NUMBER: C-2085

N:\009811\DRAWINGS\CONSTRUCTION\Additional Plans\8-D POND - SWQ BOX OUTFALL PLAN & PROFILE.dwg, 8/6/2018 7:20:04 AM, 1:1

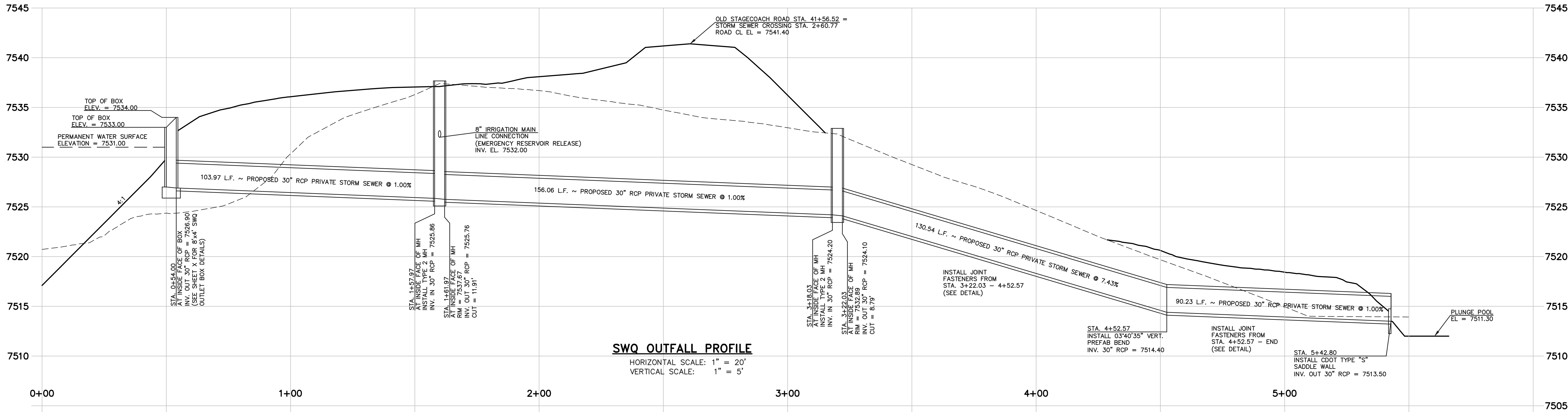


CONCRETE JOINT FASTENER



WESTERLY OUTLET SADDLEWALL

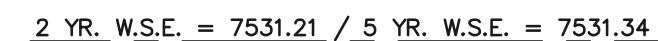
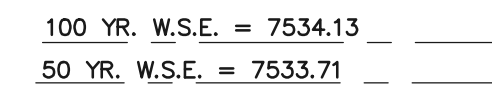
PER CDOT M-601-11
SEE CDOT M-601-11 FOR DESIGN REQUIREMENTS
6" PIPE INV. OUT EL = 7514.00
30" RCP INV. OUT EL = 7513.50
EL AT TOP OF SADDLEWALL = 7514.75
EL AT BOTTOM SADDLEWALL = 7512.25



48 HOURS BEFORE YOU DIG, CALL UTILITY LOCATORS 811 UTILITY NOTIFICATION CENTER OF COLORADO IT'S THE LAW THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.		NO. REVISION 1 REVISED PER STATE COMMENTS 2 REVISED PER COUNTY COMMENTS	DATE 5-8-18 7-31-18	REVIEW: PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC MARC A. WHORTON, COLORADO P.E. #37155	DATE
STATE ENGINEER'S CONSTRUCTION FILE NUMBER: C-2085		FLYING HORSE NORTH IRRIGATION RESERVOIR EMBANKMENT SWQ OUTFALL PLAN & PROFILE DAM ID - 080459			
DESIGNED BY	MAW	SCALE	DATE	1-4-18	
DRAWN BY	MAW	(H) 1"= 20'	SHEET	8	OF 12
CHECKED BY		(V) 1"= 5'	JOB NO.	1096.11	



619 N. Cascade Avenue, Suite 200
Colorado Springs, Colorado 80903
(719)785-0790
(719)785-0799(Fax)



SCALE: 1"=2'



SCALE: 1"=2'

- (ALL MATERIALS PER EL PASO COUNTY SPECIFICATIONS)
- ORIFICE PLATE NOTES:
1. INSTALL HOLES AS SHOWN ON DETAIL TO RIGHT.
 2. PROVIDE GASKET MATERIAL BETWEEN THE ORIFICE PLATE AND CONCRETE

EURV AND WQCV TRASH RACKS:

3. WELL-SCREEN TRASH RACKS SHALL BE STAINLESS STEEL AND SHALL BE ATTACHED BY INTERMITTENT WELDS ALONG THE EDGE OF THE MOUNTING FRAME.
4. BAR GRATE TRASH RACKS SHALL BE ALUMINUM AND SHALL BE BOLTED USING STAINLESS STEEL HARDWARE.
5. STRUCTURAL DESIGN OF TRASH RACKS SHALL BE BASED ON FULL HYDROSTATIC HEAD WITH ZERO HEAD DOWNSTREAM OF RACK.

OVERFLOW TRASH RACKS:

1. ALL TRASH RACKS SHALL BE MOUNTED USING STAINLESS STEEL HARDWARE AND PROVIDED WITH HINGED AND LOCKABLE OR BOLTABLE ACCESS PANELS.
2. TRASH RACKS SHALL BE STAINLESS STEEL, ALUMINUM, OR STEEL. STEEL TRASH RACKS SHALL BE HOT DIP GALVANIZED AND MAY BE HOT POWDER COATED AFTER GALVANIZING.
3. TRASH RACKS SHALL BE DESIGNED SUCH THAT THE DIAGONAL DIMENSION OF EACH OPENING IS SMALLER THAN THE DIAMETER OF THE OUTLET PIPE.
4. STRUCTURAL DESIGN OF THE TRASH RACKS SHALL BE BASED ON FULL HYDROSTATIC HEAD WITH ZERO HEAD DOWNSTREAM OF THE RACK.



UTILITY NOTIFICATION OF COLORADO
IT'S THE LAW

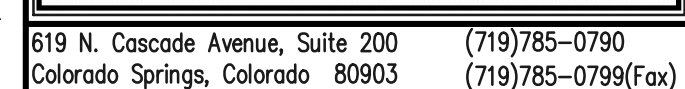
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REVIEW:

PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF
CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC

MARC A WHORTON, COLORADO P.E. #37155

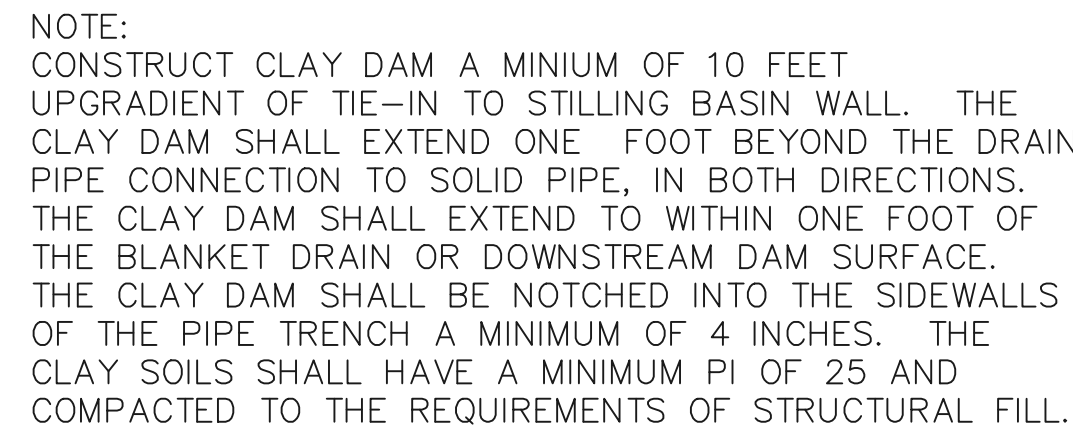
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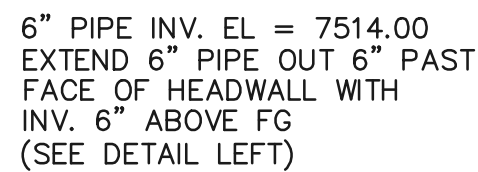
FLYING HORSE NORTH
IRRIGATION RESERVOIR EMBANKMENT
DETENTION/SWQ OUTLET BOX DESIGN

DESIGNED BY	MAW	SCALE	DATE	1-4-18
DRAWN BY	MAW	(H) 1"= 2'	SHEET 9	OF 12
CHECKED BY		(V) 1"= 2'	JOB NO.	1096.11

CLASSIC
CONSULTING
ENGINEERS & SURVEYORS

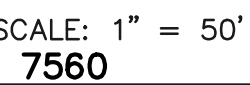


6" PIPE INV. OUT EL = 7514.00
30" RCP INV. OUT EL = 7513.50
EL AT TOP OF SADDLEWALL = 7514.75
EL AT BOTTOM SADDLEWALL = 7512.25



EASTERLY OUTLET HEADWALL

6" PIPE INV. OUT EL = 7514.00
EL AT TOP OF SADDLEWALL = 7514.75
EL AT BOTTOM SADDLEWALL = 7512.25



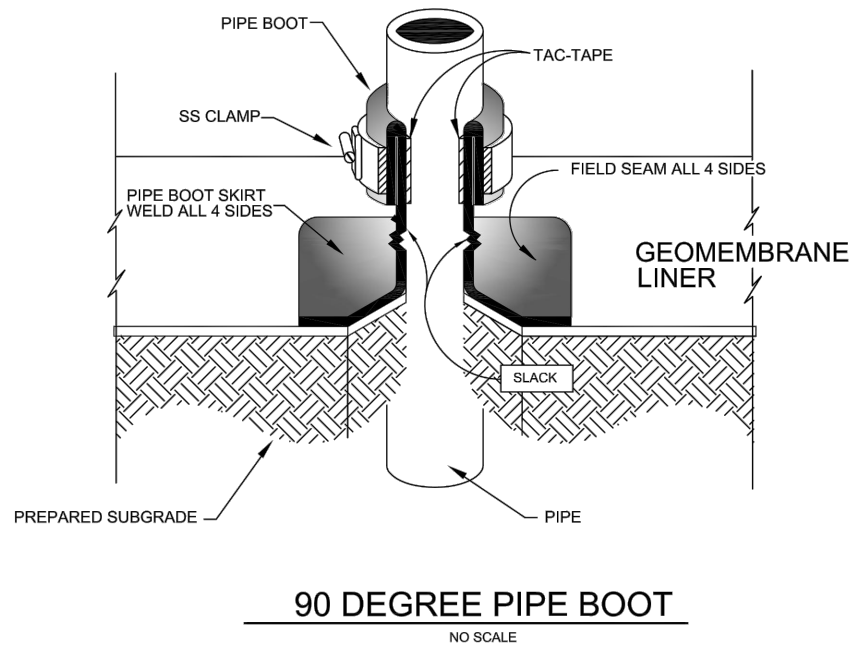
NOTES:					
1.	SPECIFIED DRAIN FILTER SECTION TO BE CONSTRUCTED ENTIRE LENGTH OF SLOTTED TOE DRAIN PIPING.				
2.	MINIMUM 12" OF SPECIFIED EMBANKMENT MATERIAL PLACED ABOVE DRAIN FILTER.				
3.	SEE GEOTECH. REPORT APPENDIX D FOR ADDITIONAL FILTER CALCULATIONS/DETAILS.				


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CONSULTING
ENGINEERS & SURVEYORS

FLYING HORSE NORTH
IRRIGATION RESERVOIR EMBANKMENT
ROAD EMBANKMENT / TOE DRAIN DESIGN
DAM ID - 080459

DESIGNED BY	MAW	SCALE	DATE	1-4-18
DRAWN BY	MAW	(H) 1"= 50'	SHEET 10	OF 12
CHECKED BY		(V) 1"= 5'	JOB NO.	1096.11

619 N. Cascade Avenue, Suite 200 (719)785-0790
Colorado Springs, Colorado 80903 (719)785-0799(Fax)



90 DEGREE PIPE BOOT
NO SCALE

MATERIALS AND DIMENSIONS SHOWN ARE FOR GENERAL INFORMATION ONLY.
AND SHOULD BE DETERMINED BY SITE SPECIFIC DESIGN.

Drawing Title:
STANDARD DETAIL
90 DEGREE PIPE BOOT

DESIGNED BY: KEN C.
DATE: 11/06/13
SCALE: AS SHOWN

Sheet:
4 of 9

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5870 E. 56th Ave.
Commerce City, CO 80022
Phone: 303-289-1818
Fax: 303-287-3138

CDI

ENVIRONMENTAL CONTRACTORS

CDI

ENVIRONMENTAL CONTRACTORS

45 DEGREE PIPE BOOT
NO SCALE

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Drawing Title:
STANDARD DETAIL
45 DEGREE PIPE BOOT

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7 of 9

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TABLE 10-7
CLASSIFICATION AND GRADATION OF ORDINARY RIPRAP

Riprap Designation	% Smaller Than Given Size By Weight	Intermediate Rock Dimension (Inches)	d ₅₀ * (Inches)
Type VL	70-100	12	6
	50-70	9	
	35-50	6	
	2-10	2	
Type L	70-100	15	9
	50-70	12	
	35-50	9	
	2-10	3	
Type M	70-100	21	12
	50-70	18	
	35-50	12	
	2-10	4	
Type H	100	30	18
	50-70	24	
	35-50	18	
	2-10	6	
Type VH	100	42	24
	50-70	33	
	35-50	24	
	2-10	9	

*d₅₀ = Mean particle size

TABLE 10-8
RIPRAP GRADATION LIMITS FOR STEEP SLOPES

D _{max}	=	1.25
D ₅₀	=	100
D ₅₀	=	2-3
D ₁₀₋₂₀	=	2-3

9/30/90

10-65

TABLE 10-9
THICKNESS REQUIREMENTS FOR GRANULAR BEDDING

Riprap Designation	Minimum Bedding Thickness (Inches)		
	Fine Grained Soils* (Two Layer System)		Coarse Grained Soils**
	Type I	Type II	Type II
L, G, SM	4	4	6
M	4	4	6
H	4	6	8
VH	4	6	8

*May substitute one 12 inch layer of Type II bedding. Substitution of one layer of Type II bedding shall not be permitted at drop structures. Use of a combination of filter fabric and Type II bedding at drop structures is acceptable.

** Fifty percent or more by weight retained on the #40 sieve.

TABLE 10-10
GRADATION FOR GRANULAR BEDDING

U.S. Standard Sieve Size	Percent Weight By Passing	Square Mesh Sieves
Type I	Type II	Type II
3"	-	90 - 100
1-1/2"	-	-
3/4"	-	20 - 90
#100	100	-
#4	95 - 100	0 - 20
#16	45 - 80	-
#50	10 - 30	-
#100	2 - 10	-
#200	0 - 2	0 - 3

9/30/90

10-66

NOTES

1. TYPE II MANHOLES SHALL BE USED WHEN APPROPRIATE AND TYPICALLY WHEN THE PIPE SIZES ARE 30" OR LESS INSIDE DIAMETER.
2. VIEW AND DETAILS ARE TYPICAL. DESIGN ENGINEER SHALL DETERMINE MANHOLE BASE CONFIGURATION AND DIMENSIONS FOR PARTICULAR PIPE SIZES AND ALIGNMENT.
3. EITHER LADDER OF STEPS SHALL BE INSTALLED WHEN MANHOLE DEPTH EXCEEDS 30". STEPS IN BASE SHALL BE INSTALLED IN "TOE POCKETS" (SEE DETAIL THIS SHEET). LOWEST STEP SHALL BE A MAXIMUM OF 16" ABOVE THE FLOOR.
4. PIPES SHALL BE TRIMMED TO FINAL SHAPE AND SET BEFORE MANHOLE IS POURED.
5. BENCH SHALL BE SLOPED TOWARD CENTER OF MANHOLE BASE (4:1 MAX., 1/2" PER FOOT. MIN.).
6. FLOOR OF MANHOLE SHALL BE TROWELLED TO A SMOOTH, HARD SURFACE AND SHALL SLOPE TOWARDS THE OUTLET (8:1., 1/2" PER FT. MIN.). FLOOR SHALL BE SHAPED AND CHANNELED; SEE DETAILS THIS SHEET.

SCALE: NOT TO SCALE

DATE APPROVED:
André P. Brackin
DEPARTMENT OF TRANSPORTATION

Storm Sewer Manhole Detail
Type II
Standard Drawing

REVISION DATE:
11/10/04

FILE NAME:
SD_3-2

EL PASO COUNTY

DEPARTMENT OF TRANSPORTATION

2" MIN. STD. LETTERING
STAMPED INTO CONCRETE

STORM SEWER NO DUMPING

TYPE 'R' INLET
ALTERNATIVE LABELING

SCALE: NOT TO SCALE

9/16/10

Storm Sewer Manhole
Details
Standard Drawing

DATE APPROVED:
André P. Brackin
DEPARTMENT OF TRANSPORTATION

REVISION DATE:
9/16/10

FILE NAME:
SD_3-5

EL PASO COUNTY

DEPARTMENT OF TRANSPORTATION

48 HOURS BEFORE YOU DIG,
CALL UTILITY LOCATORS
811
UTILITY NOTIFICATION CENTER OF COLORADO
IT'S THE LAW

THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.

NO. REVISION	DATE
1 REVISED PER STATE COMMENTS	5-4-18

REVIEW:
PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF
CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC

MARC A. WHORTON, COLORADO P.E. #37155

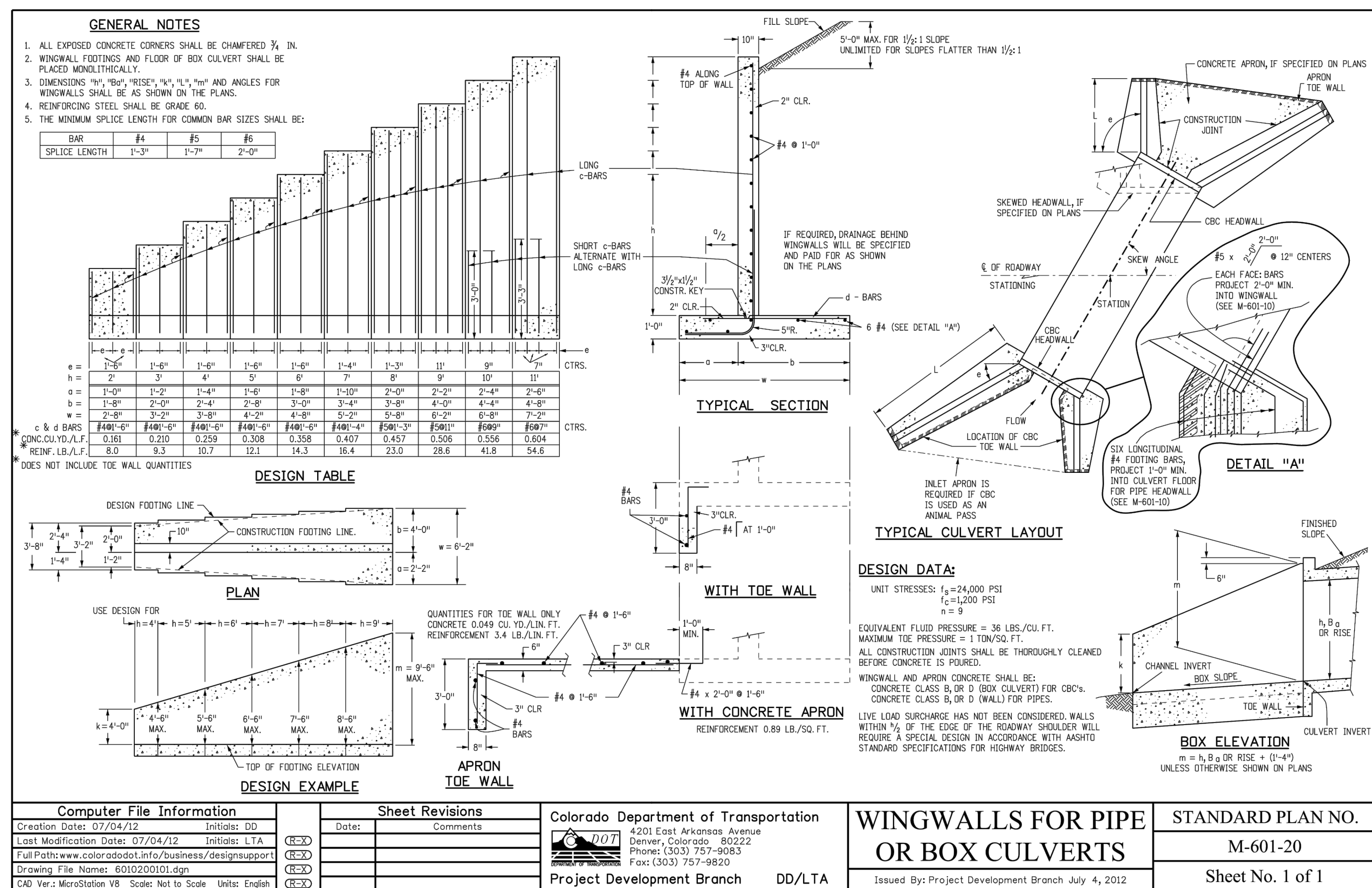
DATE

619 N. Cascade Avenue, Suite 200
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STATE ENGINEER'S CONSTRUCTION FILE NUMBER: C-2085

FLYING HORSE NORTH
IRRIGATION RESERVOIR EMBANKMENT
DETAIL SHEET
DAM ID - 080459

DESIGNED BY	MAW	SCALE	DATE	1-4-18
DRAWN BY	MAW	(H) 1"= 20'	SHEET 11 OF 12	
CHECKED BY		(V) 1"= 5'	JOB NO.	1096.11



WFF # 4 x 4 - #4 at 18 LB./50 SQ. FT.
3" CLEARANCE AT TOP AND SIDES OF PIPE,
6" CLEARANCE AT BOTTOM (TYP. ALL WALLS)

FLEXIBLE SINGLE PIPE

FLEXIBLE DOUBLE PIPE

RANGE OF EQUIV. DIAM.	RANGE OF SPANS	RANGE OF RISES	SINGLE		DOUBLE					
			CONCRETE	STEEL	CONCRETE	STEEL				
cu. yds.	lbs.	cu. yds.	lbs.	cu. yds.	lbs.					
36-42	36-47	30-36	36	194	749	6,72	26.2	1,22	49.8	
42-48	48-59	30-41	41	198	891	104	36.5	1,77	68.7	
54-60	60-71	40-51	51	142	107	285	67.2	2.82	96.7	
60-75	72-83	44-60	69	166	118	245	2.49	78.3	4.14	142.0
72-81	84-95	63-72	72	190	131	321	2.93	93.1	4.76	166.5
84-90	96-107	69-78	78	143	357	342	10.3	6.45	184.6	

Ø HEADWALL FOR METAL PIPE ARCH (MPA)

N.M. DIA.	RCP DIA.	k	FLEXIBLE PIPE				RIGID PIPE									
			Lm	Lc	B	Tc	DOUBLE	DOUBLE	DOUBLE	DOUBLE						
CONCRETE	STEEL	CONCRETE	STEEL	CONCRETE	STEEL	CONCRETE	STEEL	CONCRETE	STEEL							
36	44	36	81	99	58	137	155	177	6.82	2.53	1.01	39.6	0.72	26.3	1.04	46.2
42	51	42	94	114	63	157	177	194	9.84	3.61	1.34	51.6	0.92	34.5	1.39	59.9
48	58	48	108	130	72	180	202	110	38.0	17.6	6.44	127	4.33	1.81	181	75.3
54	65	54	120	146	80	202	222	139	44.8	22.2	8.61	160	5.41	2.30	200	92.6
60	72	60	134	161	90	224	251	170	54.1	27.3	96.8	1.96	6.57	2.83	112	114.2
66	79	66	148	177	99	238	272	184	62.6	31.2	78.1	2.42	33.9	3.42	133.9	150
72	86	72	161	193	108	260	300	246	76.4	33.5	12.3	28.3	39.9	4.08	184.4	214.4
78	93	78	175	208	114	289	322	280	89.1	4.57	158.8	3.30	108.6	4.71	177.1	217.1
84	100	84	188	224	120	308	344	330	102.4	5.73	177.4	4.83	122.4	6.23	203.6	240.6
90	107	90	202	240	126	336	366	386	117.1	5.96	200.6	4.40	139.7	6.16	227.8	282.8
96	114	96	215	255	132	364	397	438	133.3	6.71	225.1	4.98	157.5	6.83	254.9	314.9

HEADWALL FOR ROUND PIPE


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CUI Year: 2010
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Units: English

Sheet Revisions
Date: _____ Comments: _____
DGT
Project Development Branch
DD/LTA

Colorado Department of Transportation
4201 East Arkansas Avenue
Denver, Colorado, 80222
Phone: (303) 757-9983
Fax: (303) 757-9820

TYPE "S" SADDLE HEADWALLS FOR PIPE
Issued By: Project Development Branch July 4, 2012

STANDARD PLAN NO.
M-601-11
Sheet No. 1 of 1

<p align="center">48 HOURS BEFORE YOU DIG, CALL UTILITY LOCATORS</p> <p align="center">811</p> <p align="center">UTILITY NOTIFICATION CENTER OF COLORADO IT'S THE LAW</p> <p>THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE CAUSED BY HIS FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES.</p>	NO. REVISION		DATE		<p>REVIEW:</p> <p>PREPARED UNDER MY DIRECT SUPERVISION FOR AND ON BEHALF OF CLASSIC CONSULTING ENGINEERS AND SURVEYORS, LLC</p> <p>MARC A. WHORTON, COLORADO P.E. #37155 DATE _____</p> <div style="text-align: right;">  </div>	<p>FLYING HORSE NORTH IRRIGATION RESERVOIR EMBANKMENT</p> <p>DETAIL SHEET</p> <table border="1"> <thead> <tr> <th>DESIGNED BY</th> <th>MAW</th> <th>SCALE</th> <th>DATE</th> <th>1-4-18</th> </tr> </thead> <tbody> <tr> <td>DRAWN BY</td> <td>MAW</td> <td>(H) 1"= 20'</td> <td>SHEET 12</td> <td>OF 12</td> </tr> <tr> <td>CHECKED BY</td> <td></td> <td>(V) 1"= 5'</td> <td>JOB NO.</td> <td>1096.11</td> </tr> </tbody> </table>	DESIGNED BY	MAW	SCALE	DATE	1-4-18	DRAWN BY	MAW	(H) 1"= 20'	SHEET 12	OF 12	CHECKED BY		(V) 1"= 5'	JOB NO.	1096.11
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