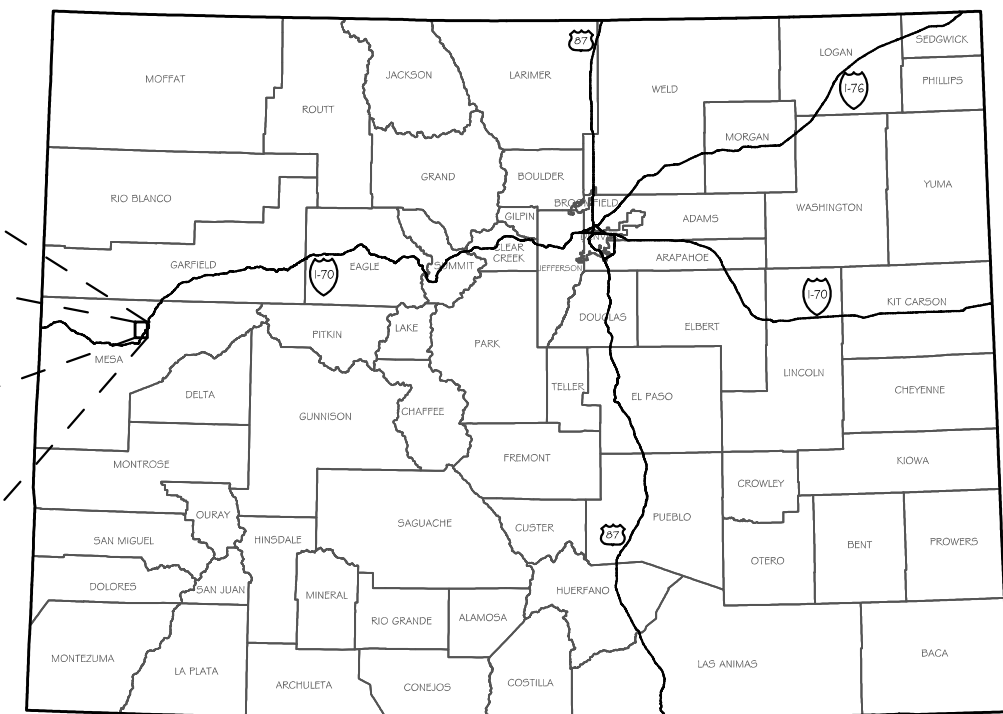
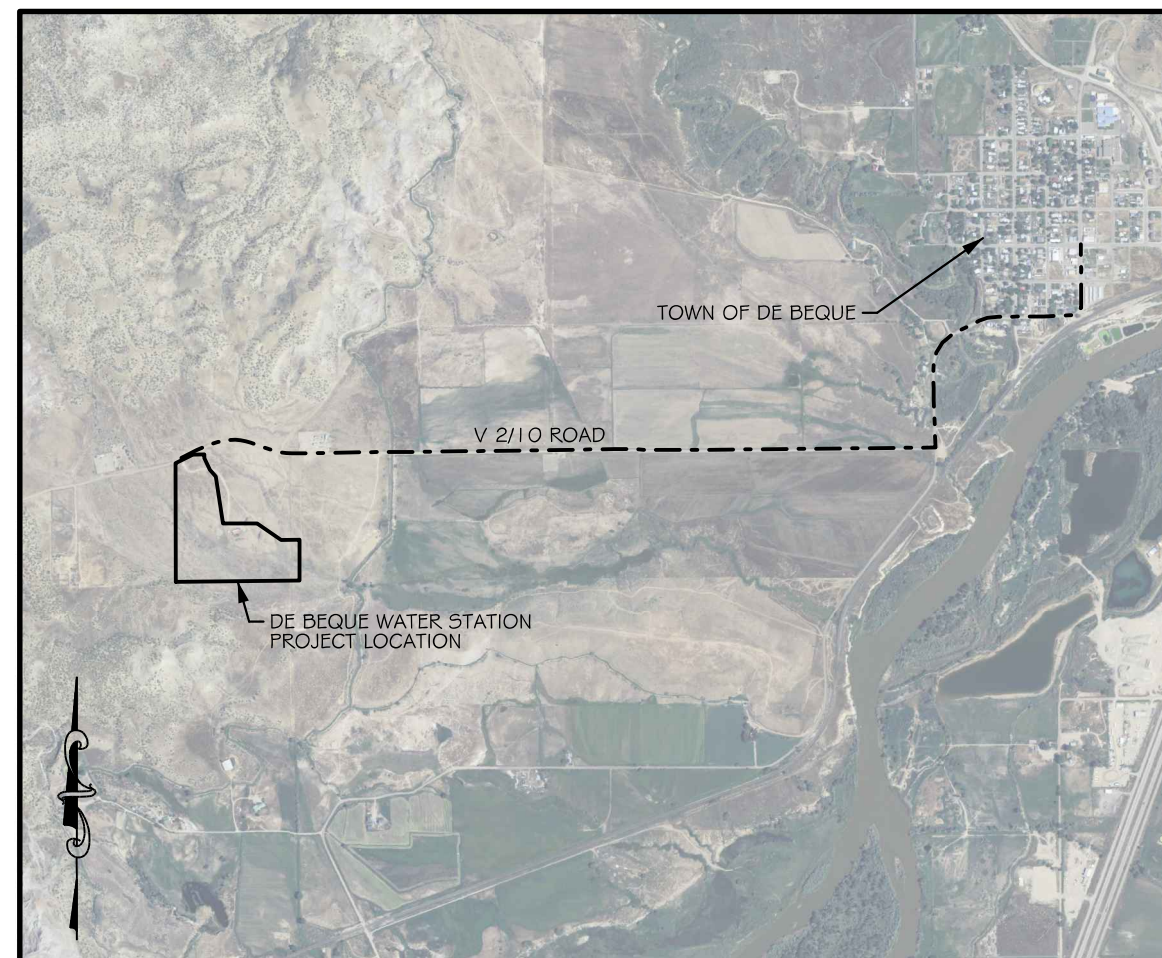




DE BEQUE WATER STATION PRODUCED WATER REUSE FACILITY - POND 2

LOCATED IN SECTION 29, T. 8 S., R. 97 W. 6TH P.M., MESA COUNTY, COLORADO
WATER DIVISION 5 - COLORADO RIVER BASIN
WATER DISTRICT 72 - LOWER COLORADO RIVER
SUBMITTED: MARCH 2015



STATE OF COLORADO

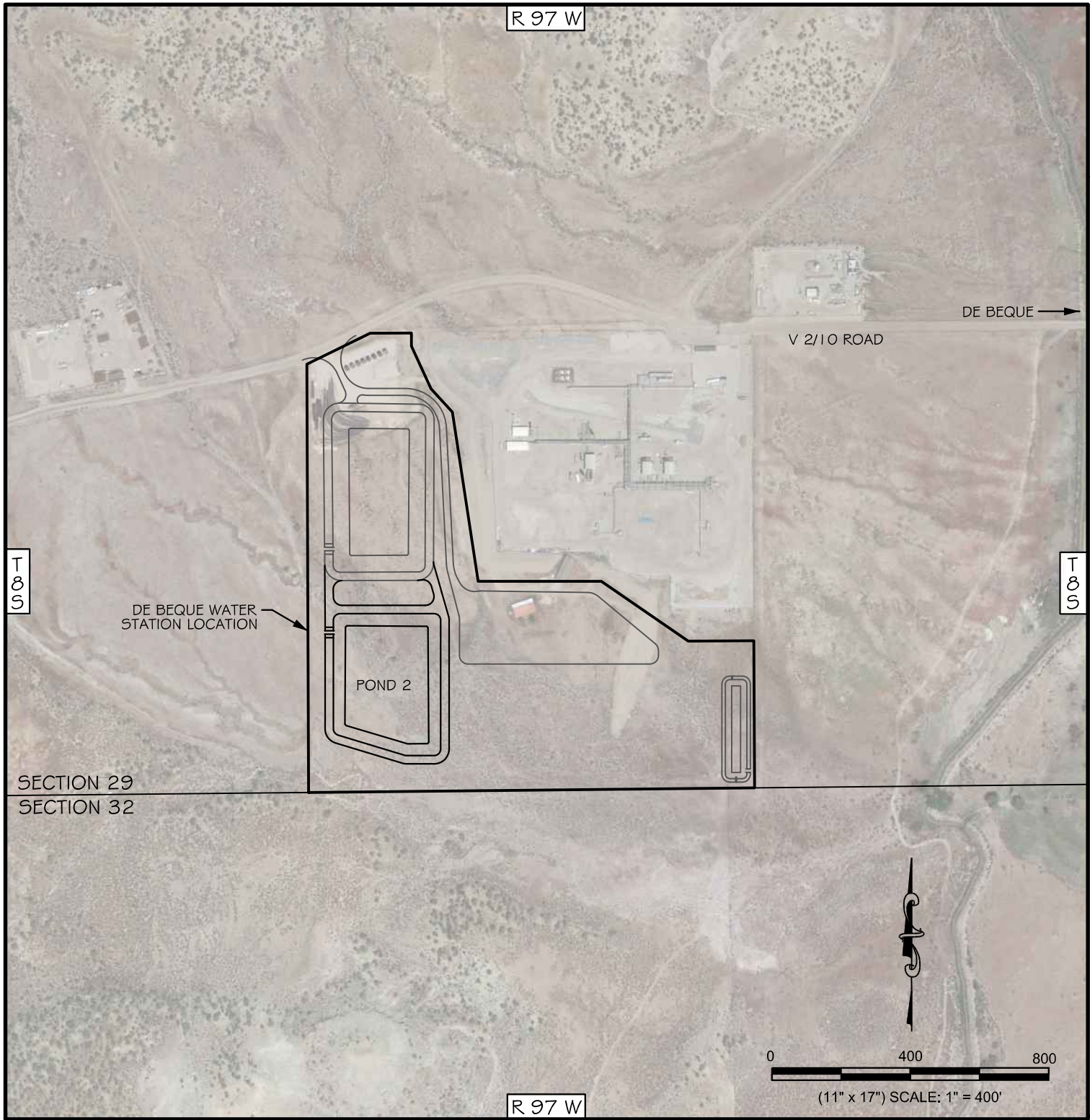


Providing Quality Services to the Rocky Mountain Region Since 1980

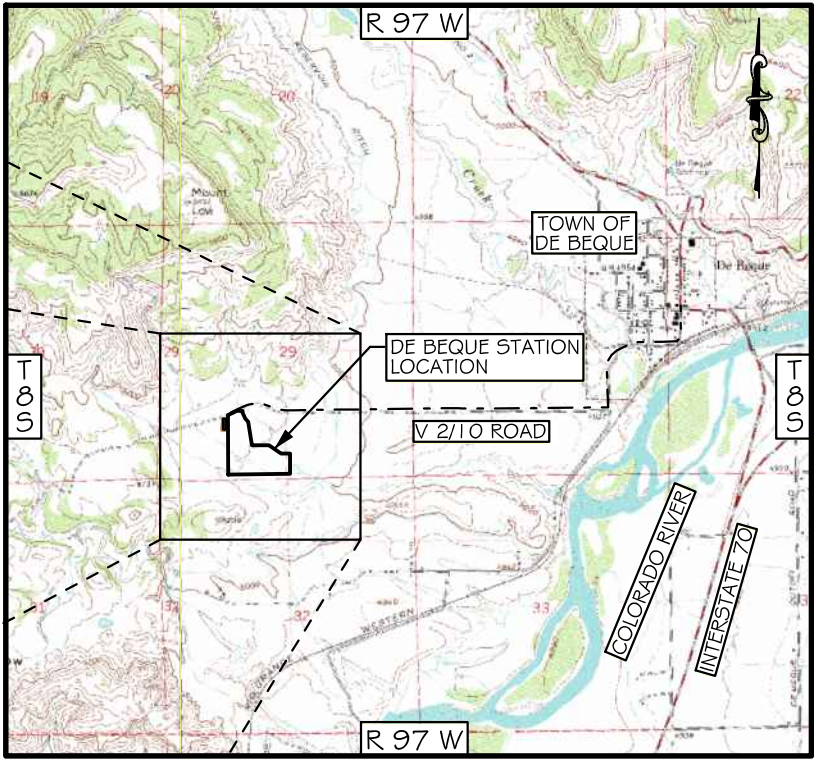


DE BEQUE WATER STATION - POND 2

COLORADO DIVISION OF WATER RESOURCES DAMID 700108
LOCATED IN SECTION 29, T. 8 S., R. 97 W. 6TH P.M.,
MESA COUNTY, COLORADO
WATER DIVISION 5 - COLORADO RIVER BASIN
WATER DISTRICT 72 - LOWER COLORADO RIVER



LOCATION MAP



VICINITY MAP



CERTIFICATE OF ENGINEER

I, SHAWN T. HIGLEY, HEREBY STATE THAT THESE CONSTRUCTION DRAWINGS WERE DESIGNED BY MYSELF OR UNDER MY DIRECT SUPERVISION AND THAT THEY REPRESENT THE CONDITIONS DESCRIBED IN THE ACCOMPANYING FACILITY DESIGN WHICH IS PROVIDED TO MEET THE REQUIREMENTS OF THE COLORADO STATE ENGINEER'S OFFICE AS WELL AS THE COLORADO OIL AND GAS CONSERVATION COMMISSION AND THEIR ACCOMPANYING REGULATIONS.

SHAWN T. HIGLEY, COLORADO P.E. NO. 47398

APPROVED ON THE _____ DAY OF _____ 2015.

WILLIAM T. MCCORMICK III, DAM SAFETY BRANCH CHIEF
CO PE NO. 29127

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DESIGN ENGINEER

CONSTRUCTION
FILE NUMBER
C-2030

DE BEQUE WATER STATION
POND 2
Title Sheet

SHEET
1 OF 29

Black Hills Exploration & Production
A Black Hills Corporation Energyplay
2350 G Road, Suite 101
Grand Junction, CO 81505

WVC ENGINEERING
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JOB # 2013-134		

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PROJECT LEGEND

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ROAD CENTERLINE

FENCE

GAS

UNDERGROUND GAS

PWR

OVERHEAD POWER

DRAINAGE FLOW LINE

GRAVEL ROAD SURFACE

EXISTING GROUND CONTOUR

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CULVERT

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RAW WATER PIPE

LINER ELEMENTS

PRIMARY LINER

GEONET

SECONDARY LINER

GEOCOMPOSITE CLAY LINER

DRAWING NOTATION

A

10

INDICATES CROSS SECTION LOCATION. "A" REFERS TO THE CROSS SECTION DESIGNATION. "10" REFERS TO THE SHEET NUMBER WHERE THE SECTION IS CUT OR SHOWN.

1

12

INDICATES DETAIL LOCATION. "1" REFERS TO THE DETAIL DESIGNATION. "12" REFERS TO THE SHEET NUMBER WHERE THE DETAIL IS INDICATED OR SHOWN.

19

INDICATES DRAWING LOCATION. "19" REFERS TO THE SHEET NUMBER WHERE THE DRAWING IS LOCATED.

Black Hills Exploration & Production

A Black Hills Corporation Enterprise

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Grand Junction, CO 81505

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WATER STATION

TABLE OF CONTENTS

ABBREVIATIONS

@	AT
AB	ANCHOR BOLT, AGGREGATE BASE
ABDN	ABANDON
ABV	ABOVE
AC	ASPHALTIC CONCRETE, ASBESTOS CEMENT
ADD	ADDITIONAL
ADJ	ADJACENT, ADJUST
ADPTR	ADAPTER
AFF	ABOVE FINISHED FLOOR
ANCH	ANCHOR
ALUM	ALUMINUM
ALT	ALTERNATE
ANG	ANGLE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APPROX	APPROXIMATE
APVD	APPROVED
ARCH	ARCHITECTURE, ARCHITECTURAL
ASPH	ASPHALT
ASSEM	ASSEMBLY
AVG	AVERAGE
BD	BOARD
BFV	BUTTERFLY VALVE
BF	BOTTOM FACE
BH	BOREHOLE
BLDG	BUILDING
BLK	BLOCK
BLW	BELOW
BM	BENCHMARK
BMP	STORMWATER BEST MANAGEMENT PRACTICES
BOT	BOTTOM
BRG	BEARING
BRKT	BRACKET
BTWN	BETWEEN
BV	BALL VALVE
BVC	BEGIN VERTICAL CURVE
CF5	CUBIC FEET PER SECOND
CHAN	CHANNEL
CHK	CHECK
CI	CAST IRON
CIMJ	CAST-IRON PIPE MECHANICAL JOINT
CIP	CAST-IRON PIPE FLANGED JOINT
CIPC	CAST-IN-PLACE CONCRETE
CIRC	CIRCULAR
CJ	CONSTRUCTION JOINT, CONTROL JOINT
C	CENTERLINE
CLDI	CEMENT LINED DUCTILE IRON
CLG	CEILING
CLR	CLEAR, CLEARANCE
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNITS
CO	CLEANOUT
COL	COLUMN
COMB	COMBINATION
CONC	CONCRETE OR CONCENTRIC
CONN	CONNECT, CONNECTION
CONST	CONSTRUCTION
CONT	CONTINUE, CONTINUED, CONTINUOUS
CONTR	CONTRACTOR
COORD	COORDINATE
CORR	CORRUGATED
CP	CONTROL POINT
CPLG	COUPLING
CSP	CORRUGATED STEEL PIPE
C TO C	CENTER TO CENTER
CTR	CENTER
CTSK	COUNTERSINK
CU	CUBIC
CU FT	CUBIC FEET
CU IN	CUBIC INCH
CULV	CULVERT
CU YD	CUBIC YARD
D	DRAIN
DBA	DEFORMED BAR ANCHOR
DBL	DOUBLE
DET	DETAIL
DI	DUCTILE IRON, DRAIN INLET

DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIMJ	DUCTILE-IRON MECHANICAL JOINT
DIR	DIRECTION
DN	DOWN
DR	DOOR
DWG	DRAWING
EA	EACH
EF	EACH FACE, EXHAUST FAN
EL, ELEV	ELEVATION
ELB	ELBOW
ELEC	ELECTRIC, ELECTRICAL
ENCL	ENCLOSE
ENGR	ENGINEER
EP	EDGE OF PAVEMENT
EQL	EQUAL, EQUALLY
EQL SP	EQUALLY SPACED
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
EVC	END VERTICAL CURVE
EW	EACH WAY
EXC	EXCAVATE
EXP	EXPANSION
EXP JT	EXPANSION JOINT
EXST	EXISTING
EXT	EXTENSION, EXTERIOR
F	FLANGE
FAB	FABRICATE
FB	FLAT BAR, FACE BRICK
FC	FLEXIBLE COUPLING
FCA	FLANGE COUPLING ADAPTER
FD	FLOOR DRAIN
FDN	FOUNDATION
FES	FLARED END SECTION
FET	FLARED END TERMINAL
FF	FINISHED FLOOR
FG	FINISH GRADE
FH	FIRE HYDRANT
FL	FLOOR, FLOW
FLEX	FLEXIBLE
FLG	FLANGE
FLL	FLOW LINE
FIN	FINISH
FLR	FLOOR
FOC	FACE OF CONCRETE
FSTL	FABRICATED STEEL
FT	FOOT, FEET
FTG	FOOTING, FITTING
F TO F	FACE TO FACE
GA	GAGE, GAUGE
GAL	GALLON
GALV	GALVANIZED
GALVS	GALVANIZED STEEL
GND	GOUND
GPM	GALLONS PER MINUTE
GRTG	GRATING
GSKT	GASKET
GSP	GALVANIZED STEEL PIPE
GVL	GRAVEL
HDW	HARDWARE
HORIZ	HORIZONTAL
HP	HORSEPOWER
HT	HEIGHT, HEAT TRACE
HVAC	HEATING, VENTILATING, AND AIR CONDITIONING
HWY	HIGHWAY
HYD	HYDRANT
ID	INSIDE DIAMETER
INV	INVERT ELEVATION
IF	INSIDE FACE
IN.	INCH
INFL	INFLUENT
INSTL	INSTALL, INSTALLATION
INSTR	INSTRUMENT
INSUL	INSULATE

INT	INTERIOR
JB	JUNCTION BOX
JT	JOINT
LBS	POUNDS
LF	LINEAR FEET
LONG	LONGITUDINAL
LT	LEFT
LVL	LEVEL
MAT	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MFD	MANUFACTURED
MFR	MANUFACTURE, MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MJ	MECHANICAL JOINT
MPW55	MONTANA PUBLIC WORKS STANDARD SPECIFICATIONS
NIC	NOT IN CONTRACT
NO, #	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OHP	OVERHEAD POWER
OPNG	OPENING
OPT	OPTIONAL
PC	POINT OF CURVE
PEN	PENETRATION
PERP	PERPENDICULAR
PH	PIPE HANGER
PI	POINT OF INTERSECTION
PJF	PREMOLDED JOINT FILLER
PL	PROPERTY LINE
PLYWD	PLYWOOD
PNL	PANEL
POT	POINT OF TANGENT
PRCST	PRECAST
PREFAB	PREFABRICATED
PRELIM	PRELIMINARY
PREP	PREPARE, PREPARATION
PROP	PROPERTY
PRV	PRESSURE REDUCING VALVE
PS	PIPE SUPPORT
PT	POINT, POINT OF TANGENCY
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
PWR	OVERHEAD POWERLINES
RAD	RADIUS
RC	REINFORCED CONCRETE
RCP	REINFORCED CONCRETE PIPE
RD	ROAD, ROOF DRAIN
RDCR	REDUCER
REBAR	REINFORCEMENT BAR
REF	REFERENCE
REINF	REINFORCE
RELOC	RELOCATE, RELOCATION
REQD	REQUIRED
RST	REINFORCING STEEL
RT	RIGHT
R/W	RIGHT-OF-WAY
SAN	SANITARY SEWAR
SCHED	SCHEDULE
SDWK	SIDEWALK
SEC	SECTION
SHT	SHEET
SIM	SIMILAR
SLP	SLOPE
SP	SPACE, SPACED
SPEC	SPECIFICATION
SPRT	SUPPORT
SQ	SQUARE
SQ FT	SQUARE FOOT

SQ IN	SQUARE INCH
SST	STAINLESS STEEL
STA	STATION
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURE
SYM	SYMMETRICAL
T#B	TOP AND BOTTOM
TB	THRUST BACK
TBC	TOP BACK OF CURVE
TEL	TELEPHONE
TF	TOP FACE
TEMP	TEMPORARY
THK	THICK
THRU	THROUGH
T.O.	TOP OF
T.P.	OUTSIDE TOP OF PIPE
TOC	TOP OF CONCRETE, TOP OF CURB
TYP	TYPICAL
UBC	UNIFORM BUILDING CODE
UG	UNDERGROUND
ULT	ULTIMATE
UTIL	UTILITY
V	VALVE
VB	VALVE BOX
VERT	VERTICAL
VOL	VOLUME
VRFY	VERIFY
W	WIDTH
W/	WITH
W/O	WITHOUT
WL, W	WATERLINE
WM	WIRE MESH, WATER MAIN
WS	WATERSTOP, WATER SURFACE
WSTL	WELDED STEEL, WROUGHT STEEL
WT	WEIGHT
WTR	WATER
WV	WATER VALVE
WWF	WELDED WIRE FABRIC
WWM	WELDED WIRE MESH
YD	YARD

- NOTES:
- FOR ABBREVIATIONS NOT LISTED, SEE "ABBREVIATIONS FOR USE ON DRAWINGS AND TEXT", PUBLISHED BY THE AMERICAN NATIONAL STANDARDS INSTITUTE INC. (ANSI) OR CONTACT THE ENGINEER.
 - THIS IS A STANDARD ABBREVIATION LIST. THEREFORE, NOT ALL ABBREVIATIONS ARE USED ON THE PLANS.
 - ADDITIONAL ABBREVIATIONS FOR SPECIALIZED WORK DIVISIONS (INSTRUMENTATION AND CONTROL, ELECTRICAL, ETC.) ARE SHOWN ON OTHER LEGEND SHEETS, AS APPLICABLE.



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JOB # 2013-134

GENERAL CONSTRUCTION NOTES:

- 1) UNLESS SPECIFICALLY SHOWN ON THE DRAWINGS OR REFERENCED IN THE SPECIFICATIONS, ALL WORK WILL CONFORM TO THE STATE OF COLORADO RULES AND REGULATIONS FOR DAM SAFETY AND DAM CONSTRUCTION (LATEST ADOPTED EDITION), THE COLORADO DEPARTMENT OF TRANSPORTATION (CDOT) STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION (LATEST ADOPTED EDITION), AND THE COLORADO OIL AND GAS CONSERVATION COMMISSION RULES (LATEST ADOPTED EDITION).
- 2) THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS REQUIRED FOR CONSTRUCTION ACTIVITIES INCLUDING BUT NOT LIMITED TO A STORM WATER DISCHARGE PERMIT AS REQUIRED BY THE COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT.
- 3) THE CONTRACTOR SHALL NOTIFY ONE CALL @ 1-800-922-1987 OR 811 FOR ON SITE UTILITY LOCATION. ALL EXISTING UTILITIES SHALL BE MARKED BEFORE DIGGING.
- 4) THE CONTRACTOR SHALL MAINTAIN SERVICE OF ALL EXISTING UTILITIES. IF SAID SERVICE IS DAMAGED, THE CONTRACTOR SHALL IMMEDIATELY REPAIR THE DAMAGE AT THE CONTRACTOR'S EXPENSE.
- 5) THE CONTRACTOR SHALL FIELD VERIFY THE EXISTENCE, LOCATION, DEPTH, SIZE, LINE, AND GRADE OF EXISTING UTILITIES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING FACILITIES DUE TO FAILURE TO LOCATE OR PROVIDE PROPER PROTECTION WHEN LOCATION IS KNOWN.
- 6) ALL QUANTITIES SHOWN IN THESE PLANS ARE FOR INFORMATIONAL PURPOSES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING ACTUAL QUANTITIES.
- 7) THE CONTRACTOR IS RESPONSIBLE FOR CONTROLLING DUST AND EROSION DURING CONSTRUCTION. AREAS SHALL BE WATERED TO CONTROL DUST AS NEEDED OR WHEN ORDERED BY THE ENGINEER. EROSION SHALL BE CONTROLLED IN ACCORDANCE WITH COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT REGULATIONS AND CDOT STANDARD SPECIFICATIONS SECTION 208. THIS PROGRAM SHALL INCLUDE THE PLACEMENT OF SILT FENCE, STRAW WADDLES, AND VEHICLE MUD TRACK OUT PREVENTION MEASURES WHERE NECESSARY TO PREVENT MUD AND DEBRIS FROM LEAVING THE PROJECT SITE DURING STORM WATER RUNOFF EVENTS, AND/OR ON CONSTRUCTION VEHICLE TIRES. THE CONTRACTOR SHALL MAINTAIN A CURRENT STORM WATER POLLUTION PREVENTION PLAN ON SITE.
- 8) ALL DISTURBED AREAS SHALL BE TOPSOILED AND SEEDED BY THE CONTRACTOR IN ACCORDANCE WITH CDOT STANDARD SPECIFICATIONS SECTION 207 AND 212, THESE PLANS AND SPECIFICATIONS.
- 9) THE CONTRACTOR SHALL REFERENCE ALL SURVEY MONUMENTS, PUBLIC LAND CORNERS AND PRIVATE PROPERTY CORNERS PRIOR TO BEGINNING CONSTRUCTION. ANY MONUMENTS DISTURBED OR OBLITERATED DURING CONSTRUCTION MUST BE REPLACED BY A LICENSED LAND SURVEYOR AT THE CONTRACTOR'S EXPENSE.
- 10) EXCAVATION, BACKFILL, AND COMPACTION SHALL BE PERFORMED IN ACCORDANCE WITH CDOT STANDARD SPECIFICATIONS SECTION 203 AND 206, RULES AND REGULATIONS FOR DAM SAFETY AND DAM CONSTRUCTION SECTION 5.9.4.3.2, AS WELL AS THESE PLANS AND SPECIFICATIONS.
- 11) THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE PROJECT SITE IN A SAFE CONDITION DURING ALL CONSTRUCTION WORK ON THE PROJECT SITE.
- 12) ALL PROFILES REPRESENTING EXISTING GROUND OR GRAVEL ARE DEPICTED WITH A DASHED LINE ALONG THE ALIGNMENTS INDICATED ON THE PLANS. ELEVATIONS ARE EXISTING GRADE ELEVATIONS.
- 13) THE THREE CONSTRUCTED MONITORING WELLS SHOWN ON THESE PLANS SHALL REMAIN UNDISTURBED DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO THESE WELLS.
- 14) ELECTRICAL CONDUITS AND WIRING NEEDED FOR VALVE AUTOMATION IS NOT SHOWN ON THESE PLANS. THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING THESE CONDUITS AND WIRES IN ACCORDANCE WITH THE ELECTRICAL PLANS.
- 15) SEE DE BEQUE STATION GEOTECHNICAL REPORT (SUBMITTED SEPARATELY) FOR LOCATION AND DEPTHS OF BORE HOLES AND CORRESPONDING BORE LOGS.

CULVERT CONSTRUCTION NOTES:

- 1) THE CONTRACTOR SHALL PROVIDE AND INSTALL CORRUGATED STEEL CULVERTS (CMP) IN ACCORDANCE WITH CDOT STANDARD SPECIFICATIONS SECTION 603 AND THESE PLANS AND SPECIFICATIONS. CMP CULVERTS SHALL BE CORRUGATED STEEL PIPE (MINIMUM 16 GAUGE). THE CONTRACTOR MAY USE ANOTHER CULVERT MATERIAL OF EQUIVALENT STRENGTH THAT IS APPROVED BY THE ENGINEER.
- 2) CULVERT BEDDING SHALL BE TYPE 1 MEETING THE REQUIREMENTS OF THESE PLANS AND SPECIFICATIONS.
- 3) THE CONTRACTOR SHALL BE RESPONSIBLE FOR TRENCH SAFETY AND SHALL MAINTAIN TRENCH CONDITIONS IN ACCORDANCE WITH ALL OSHA REQUIREMENTS FOR TRENCHING AND EXCAVATION.

WATER CONSTRUCTION NOTES:

- 1) ALL PRODUCED AND RAW WATER MAINS SHALL BE INSTALLED WITH A MINIMUM COVER OF 6.0 FEET FROM TOP OF PIPE TO FINISHED GRADE.
- 2) ALL VALVES SHALL OPEN CLOCKWISE.
- 3) ALL FITTINGS INCLUDING BENDS GREATER THAN 11.25 DEGREES, TEES AND PLUGS SHALL BE THRUST BLOCKED OR MECHANICALLY RESTRAINED AS INDICATED IN THESE PLANS. SEE THRUST BLOCK DETAIL SHEET FOR ADDITIONAL DETAILS AND NOTES.
- 4) ALL JOINT FITTINGS SHALL BE WELDED STAINLESS STEEL AND PROVIDED WITH THRUST BLOCKS AS SPECIFIED.
- 5) THE CONTRACTOR SHALL ACHIEVE HORIZONTAL AND VERTICAL DEFLECTION WITH STANDARD MECHANICAL JOINTS AND/OR FIELD FABRICATED JOINTS TO ACHIEVE THE DESIRED DEFLECTION. ALL FITTINGS SHALL BE INSTALLED PER THE PIPE MANUFACTURER'S SPECIFICATIONS.
- 6) WHEN CONNECTING TO EXISTING PIPELINES, ADDITIONAL JOINTS MAY BE NEEDED THAT ARE NOT SHOWN ON THESE PLANS TO OBTAIN A PROPER CONNECTION. THE CONTRACTOR SHALL FIELD VERIFY THE LOCATION AND ELEVATION OF ALL EXISTING PIPELINES PRIOR TO CONSTRUCTION.
- 7) ALL STUB OUTS SHALL BE MARKED WITH A WOOD OR STEEL POST AT THE END OF THE STUB OUT IN ORDER TO FACILITATE FUTURE CONNECTIONS.
- 8) ALL WATER PIPELINE SHALL BE SCHEDULE 40 CARBON STEEL. SEE PLAN AND PROFILE SHEETS FOR PIPE SCHEDULE AND SIZES. ALL PIPES SHALL BE FUSION BOND EPOXY 14-16 MIL EXTERNALLY COATED. ALL PIPE SHALL BE WELDED IN ACCORDANCE TO ASME B31.3.

ROAD CONSTRUCTION NOTES:

- 1) ALL AGGREGATE SURFACING MATERIAL SHALL BE CLASS 5 MEETING THE REQUIREMENTS OF CDOT STANDARD SPECIFICATION SECTIONS 304 AND 703.03. AGGREGATE SURFACING MATERIAL SHALL MEET THE GRADATION REQUIREMENTS SHOWN IN THE TABLE BELOW.
- 2) ALL SUB BASE MATERIAL SHALL BE CLASS 2 MEETING THE REQUIREMENTS OF CDOT STANDARD SPECIFICATION SECTIONS 304 AND 703.03. SUB BASE MATERIAL SHALL MEET THE GRADATION REQUIREMENTS SHOWN IN THE TABLE BELOW.
- 3) THE CONTRACTOR IS RESPONSIBLE FOR TRAFFIC CONTROL ON THIS PROJECT. A PORTION OF THE WORK WILL BE IMPROVING THE APPROACH ONTO COUNTY ROAD V 210 ALONG WITH CROSSING THE V 210 ROAD WITH A PROPOSED PRODUCED WATER MAIN.

AGGREGATE SURFACING MATERIAL

GRADATION LIMITS	
SIEVE SIZE	JOB MIX GRADATION TARGET BAND
2 INCH	100
1 INCH	95 - 100
NO. 4	30 - 70
NO. 200	3 - 15

SUB BASE MATERIAL

GRADATION LIMITS	
SIEVE SIZE	JOB MIX GRADATION TARGET BAND
4 INCH	100
3 INCH	95 - 100
NO. 200	3 - 15

CONSTRUCTION
FILE NUMBER

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JOB # 2013-134

DE BEQUE WATER STATION
POND 2

Construction Notes

SHEET
4 OF 29

GRADING			
ITEM	QUANTITY	UNIT	REMARKS
EXCAVATION ¹	24,600	CY	
COMPACTED FILL	33,850	CY	INCLUDES 5% SHRINKAGE
¹ EXCAVATION WILL NOT BE A PAY ITEM AS THE COMPACTED FILL PAY ITEM WILL INCLUDE EXCAVATING, HAULING, AND COMPACTING MATERIAL. ADDITIONAL MATERIAL NEEDED FOR EMBANKMENT WILL BE OBTAINED FROM THE POND 1 EXCESS CUT STOCKPILE.			

TOPSOIL AND REVEGETATION			
ITEM	QUANTITY	UNIT	REMARKS
TOPSOIL SALVAGING AND PLACING	4,600	CY	ASSUMES 6" OF TOPSOIL
TURF REINFORCEMENT MAT	25	SY	
SEEDING	1.8	ACRES	

SURFACING			
ITEM	QUANTITY	UNIT	REMARKS
AGGREGATE SURFACING	200	CY	3" THICKNESS
SUB BASE MATERIAL	400	CY	6" THICKNESS

CULVERTS			
ITEM	QUANTITY	UNIT	REMARKS
POND 1/POND 2 DITCH	60	FT	12" Ø CULVERT
POND 2/POND 3 DITCH ¹	116	FT	12" Ø CULVERT
TEMPORARY ACCESS ROAD	100	FT	12" Ø CULVERT
¹ THIS CULVERT IS ONLY NEEDED IF POND 3 IS CONSTRUCTED PRIOR TO POND 2.			

POND APPURTENANCES			
ITEM	QUANTITY	UNIT	REMARKS
6" Ø SCH. 80 PVC LEAK DETECTION PIPE	41	FT	
60 MIL HDPE PRIMARY LINER	132,293	SQ FT	OWNER SUPPLIED
200-MIL GEONET	132,293	SQ FT	OWNER SUPPLIED
60 MIL HDPE SECONDARY LINER	132,293	SQ FT	OWNER SUPPLIED
GEOCOMPOSITE CLAY LINER	132,293	SQ FT	OWNER SUPPLIED
FLOATING PROTECTION TILES	111,839	SQ FT	OWNER SUPPLIED
SPILLWAY TRASHRACK	10	FT	

PIPING			
ITEM	QUANTITY	UNIT	REMARKS
10" Ø STEEL PIPELINE	270	FT	PRODUCED WATER SUPPLY
PRESSURE TRANSDUCER	1	EACH	

MISCELLANEOUS ITEMS			
ITEM	QUANTITY	UNIT	REMARKS
CONCRETE BOLLARDS	6	EACH	
CONCRETE SPLASH PADS	1	EACH	

DE BEQUE WATER STATION
POND 2

Quantities

SHEET
5 OF 29

DDP

DATE

09/14

REV

DATE

02/15

DDP

DATE

02/15


CKD

STH

CKD


STH

JOB # 2013-134



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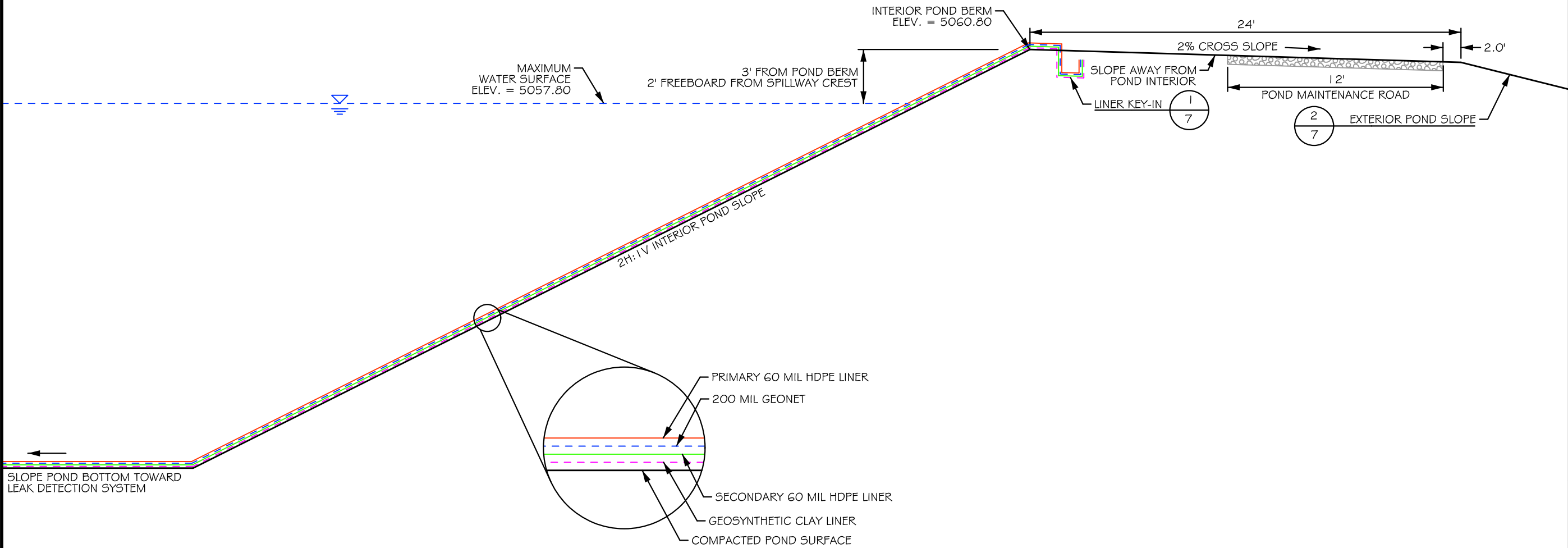
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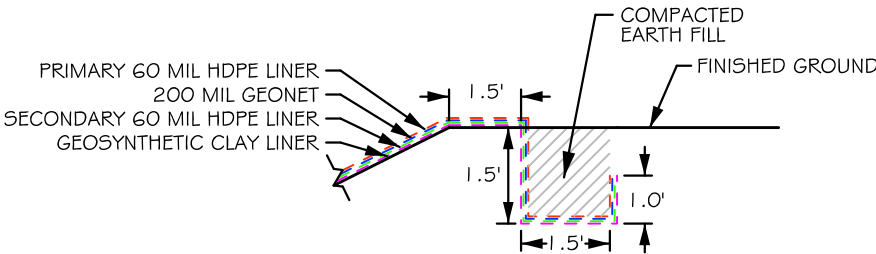
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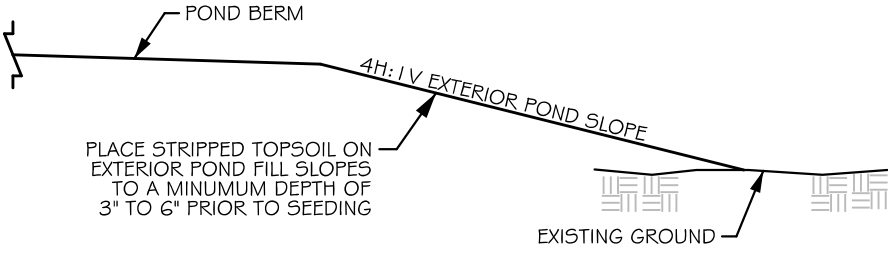
SHEET
6 OF 29



POND 2 TYPICAL SECTION
NOT TO SCALE



SYNTHETIC LINER KEY-IN DETAIL
NOT TO SCALE



EXTERIOR POND FILL SECTION
NOT TO SCALE

CONSTRUCTION
FILE NUMBER
C-2030

DE BEQUE WATER STATION
POND 2
Typical Sections

SHEET
7 OF 29

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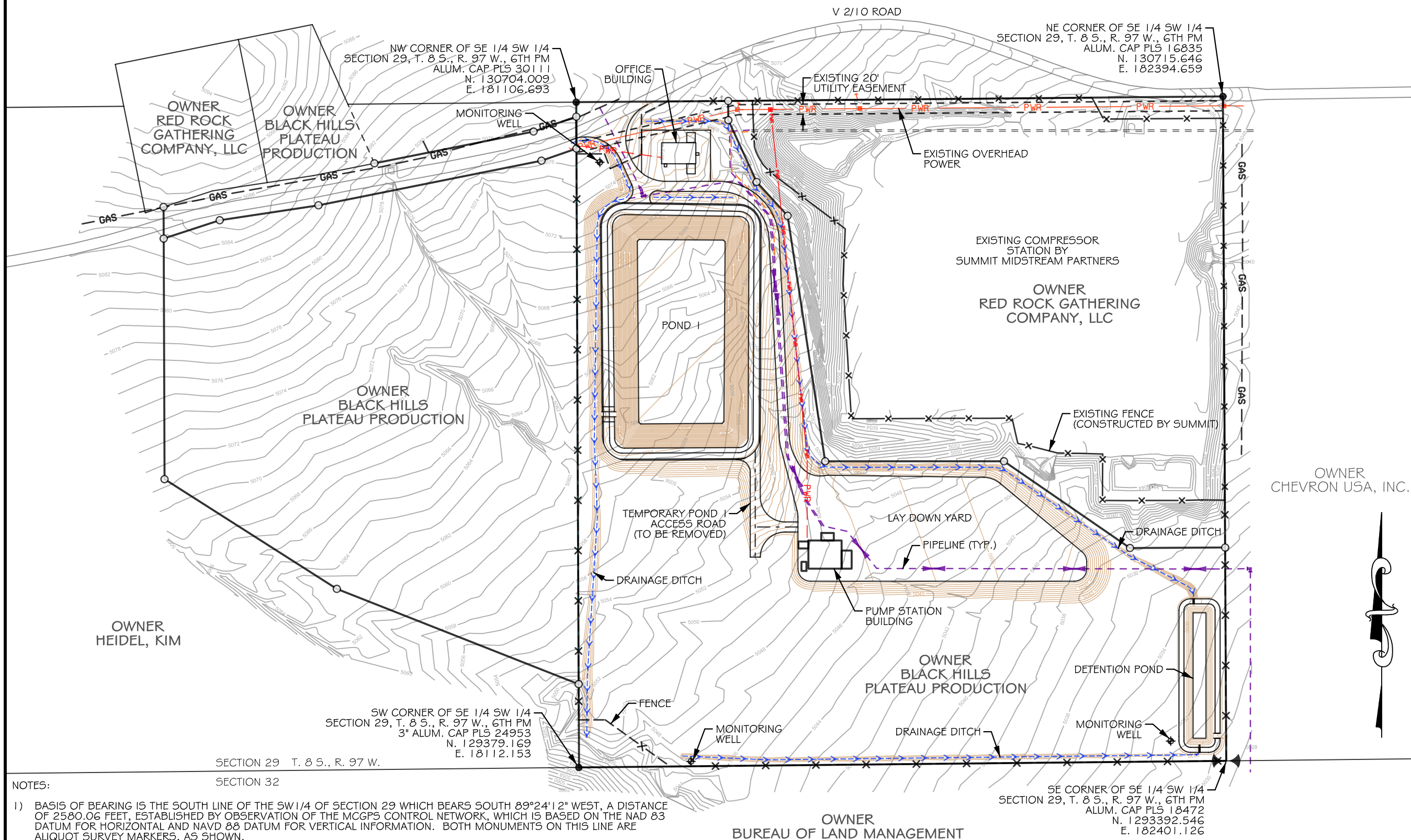
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DDP	09/14	STH	DDP	02/15	STH				

JOB # 2013-134

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3/19/2015 FILE PATH: K:\Hillman\BLACK HILLS\13134 - DE BEQUE STATION\ENGINEERING PLANS (Working Set) 11417.dgn



- NOTES:
- 1) BASIS OF BEARING IS THE SOUTH LINE OF THE SW 1/4 OF SECTION 29 WHICH BEARS SOUTH 89°24'12" WEST, A DISTANCE OF 2580.06 FEET, ESTABLISHED BY OBSERVATION OF THE MCGPS CONTROL NETWORK, WHICH IS BASED ON THE NAD 83 DATUM FOR HORIZONTAL AND NAVD 88 DATUM FOR VERTICAL INFORMATION. BOTH MONUMENTS ON THIS LINE ARE ALIQUOT SURVEY MARKERS, AS SHOWN.
 - 2) ALL UNITS SHOWN IN THIS PLAN SET ARE IN U.S. SURVEY FEET.
 - 3) THE TOPOGRAPHIC AND BOUNDARY SURVEY PERFORMED FOR THIS PROJECT WAS COMPLETED BY HIGH DESERT SURVEYING.
 - 4) ALL EXISTING MONITORING WELLS ARE TO BE PRESERVED.
 - 5) THE COORDINATES WERE DERIVED FROM THE THE MCGPS CONTROL NETWORK, WHICH IS BASED ON THE NAD 83 DATUM FOR HORIZONTAL AND NAVD 88 DATUM FOR VERTICAL INFORMATION. ALL SURVEY WORK PERFORMED IN MESA COUNTY IS SUPPOSED TO BE BASED ON THE MESA COUNTY SURVEY INFORMATION MANAGEMENT SYSTEM (SIMS). THESE ARE INDIVIDUAL CARTESIAN COORDINATE SYSTEMS BASED UPON THE LOCAL CORS WHICH IS THE MCGPS CONTROL NETWORK.



CONSTRUCTION
FILE NUMBER
C-2030

DE BEQUE WATER STATION
POND 2
Existing Conditions and Survey Control

SHEET
8 OF 29

DSGN	DATE	CKD
DDP	09/14	STH
REV	DATE	CKD
DDP	02/15	STH

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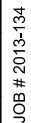
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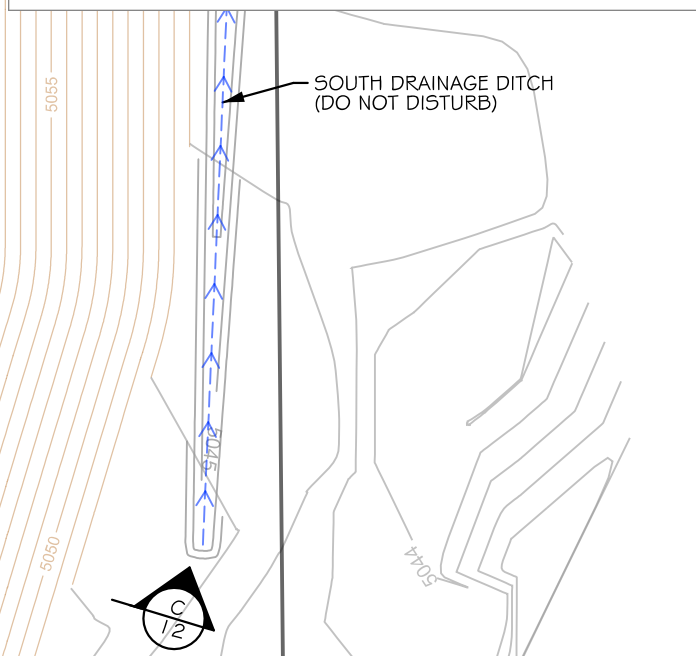
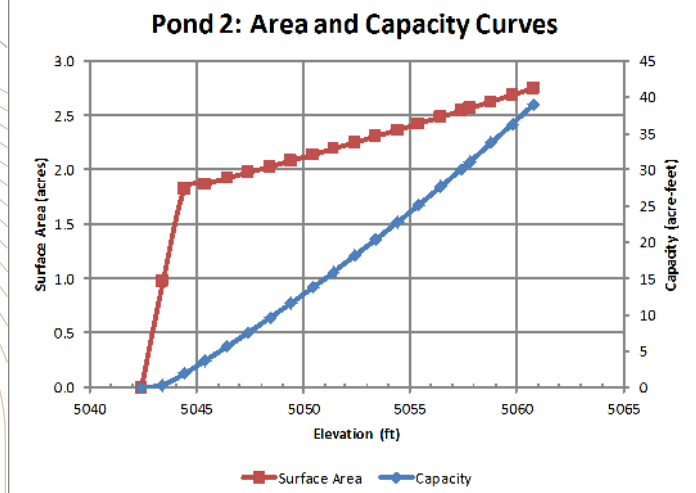
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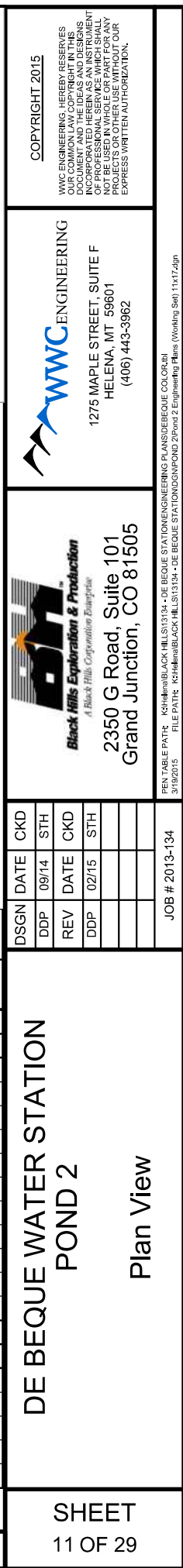
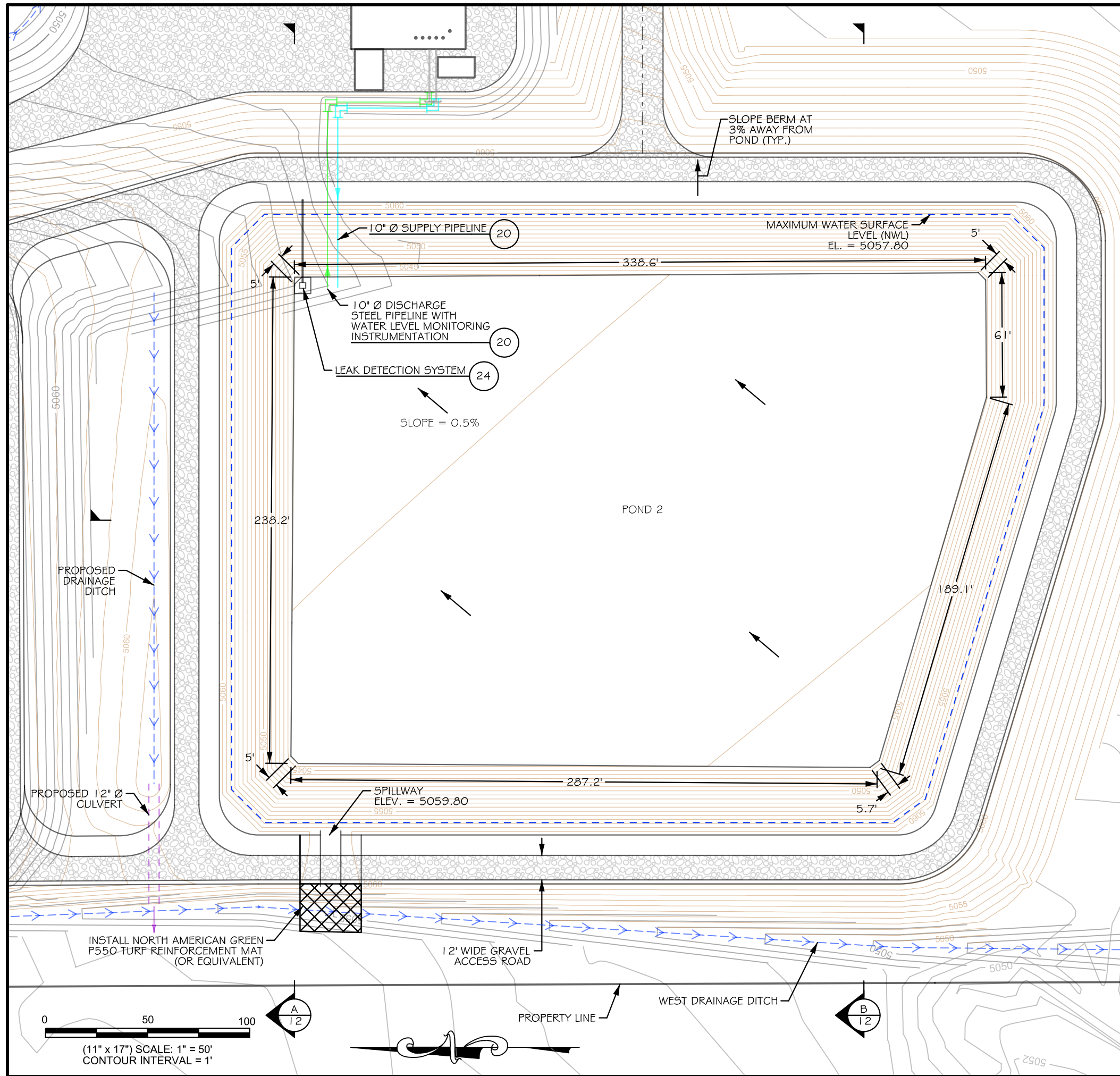
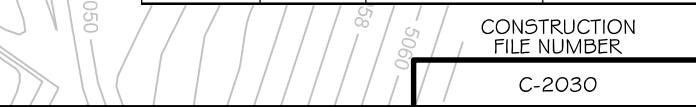
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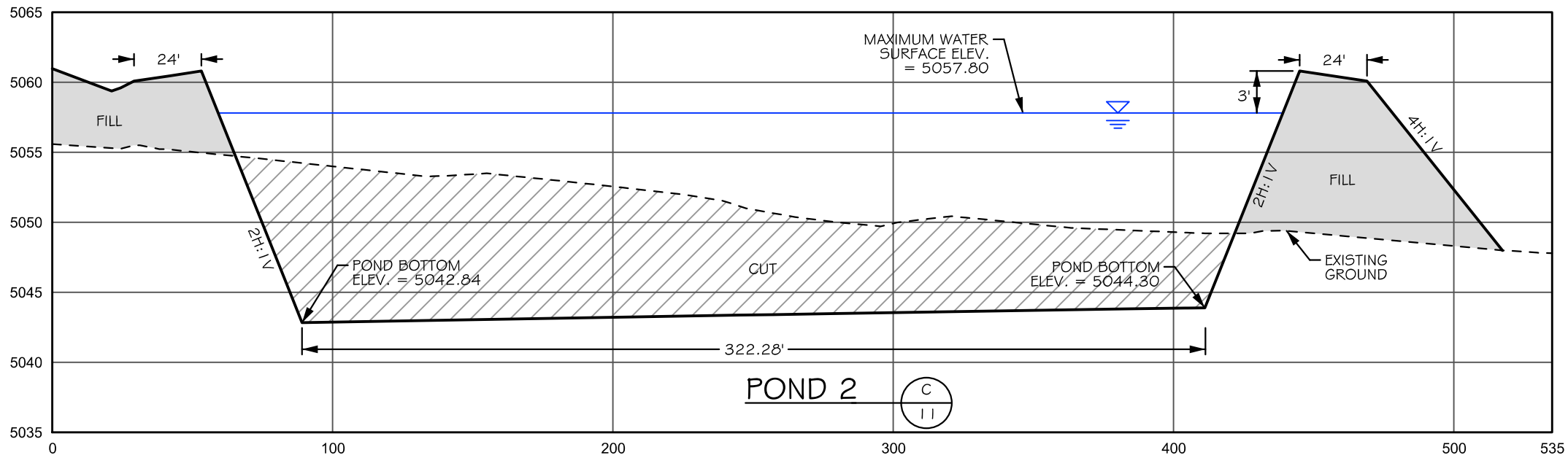
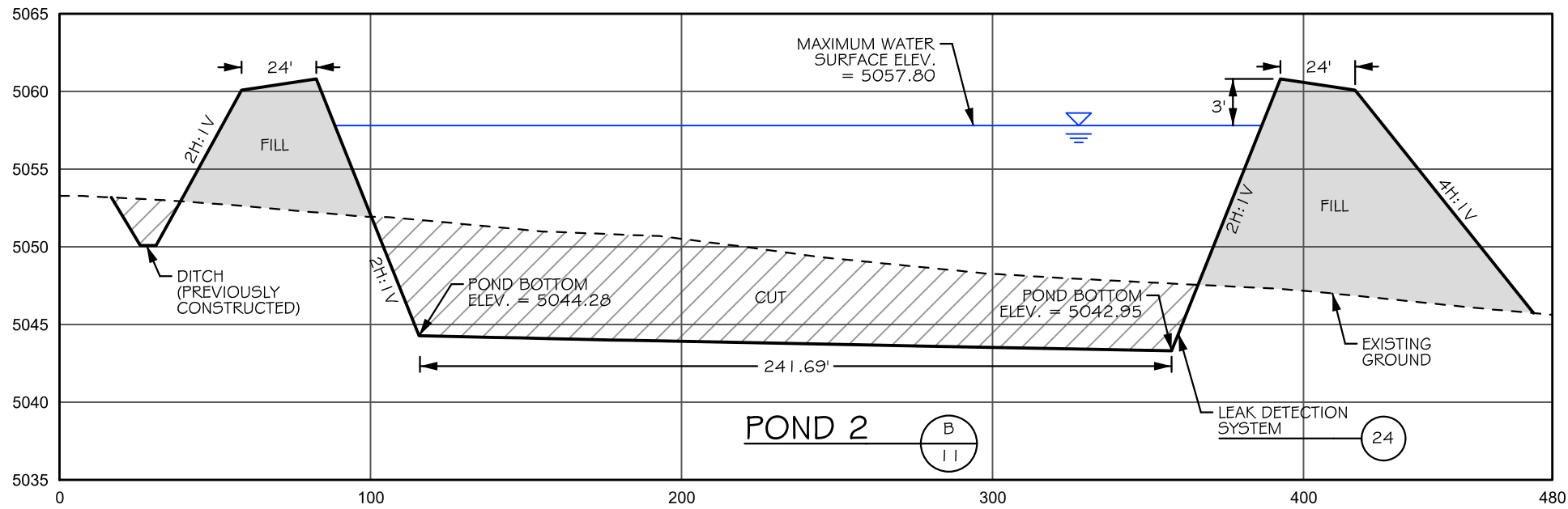
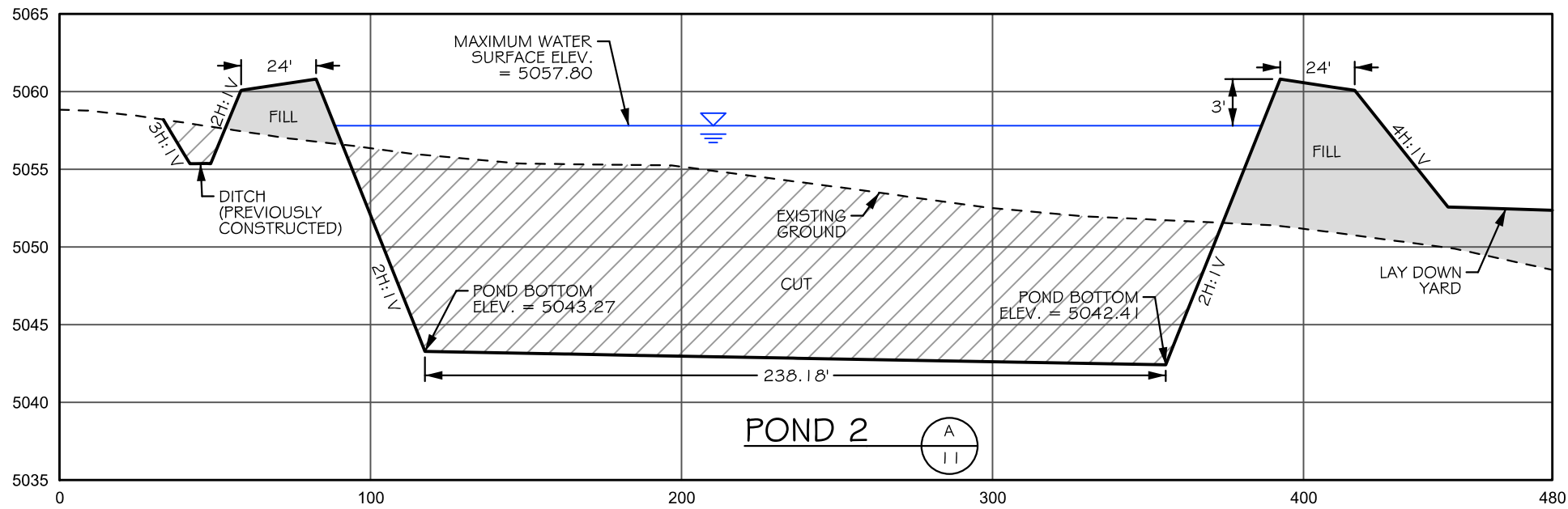
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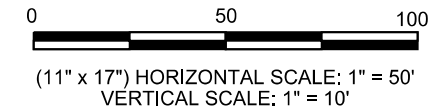


POND 2 ELEVATION-STORAGE TABLE			
ELEVATION	CAPACITY (AC-FT)	CUMULATIVE CAPACITY (AC-FT)	SURFACE AREA (ACRES)
5042.42	0.00	0.00	0.00
5043.42	0.34	0.34	0.97
5044.42	1.56	1.90	1.82
5045.42	1.84	3.74	1.87
5046.42	1.90	5.64	1.92
5047.42	1.95	7.59	1.98
5048.42	2.00	9.59	2.03
5049.42	2.06	11.65	2.09
5050.42	2.11	13.76	2.14
5051.42	2.17	15.93	2.20
5052.42	2.22	18.15	2.25
5053.42	2.28	20.43	2.31
5054.42	2.34	22.77	2.37
5055.42	2.40	25.17	2.43
5056.42	2.45	27.62	2.48
5057.42	2.51	30.14	2.54
5057.80	0.97	31.11	2.57
5058.80	2.60	33.70	2.63
5059.80	2.66	36.36	2.69
5060.80	2.72	39.08	2.75





NOTE:
WATER SURFACE LEVEL (NWL) WILL VARY
WITH THE DEMAND FOR WATER AT
OFF-SITE WELL LOCATIONS.



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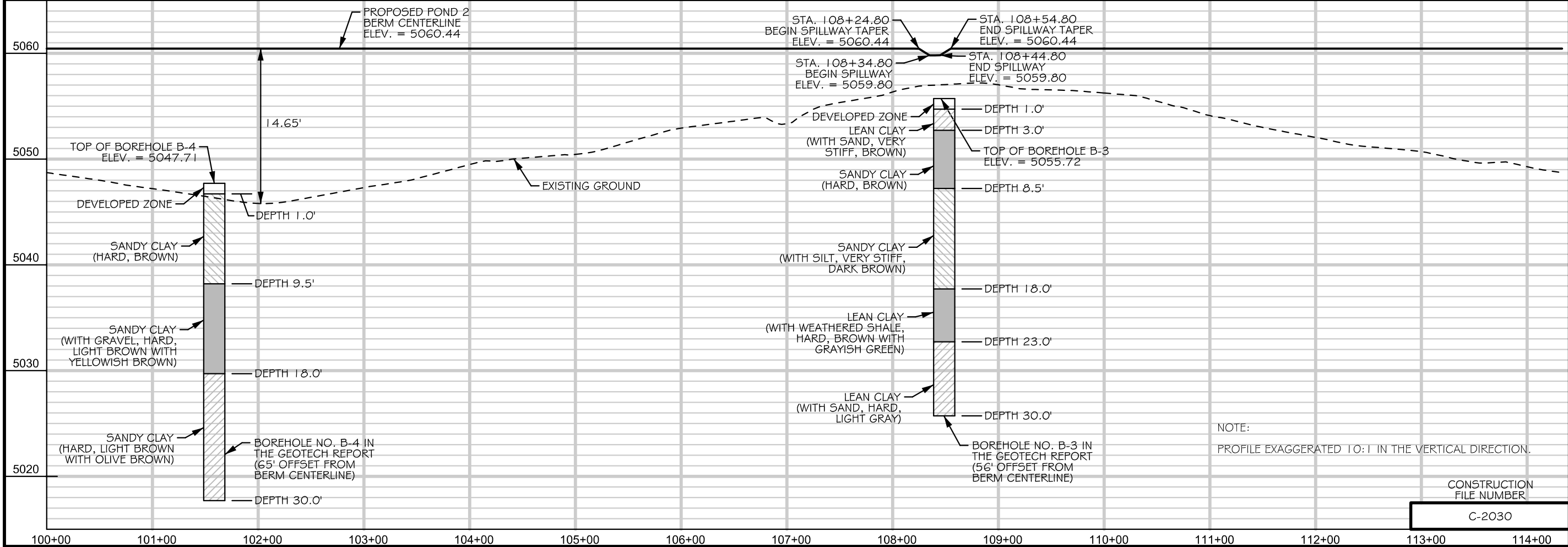
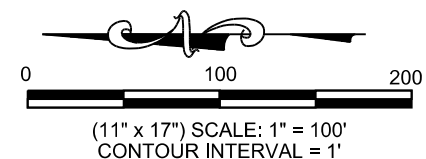
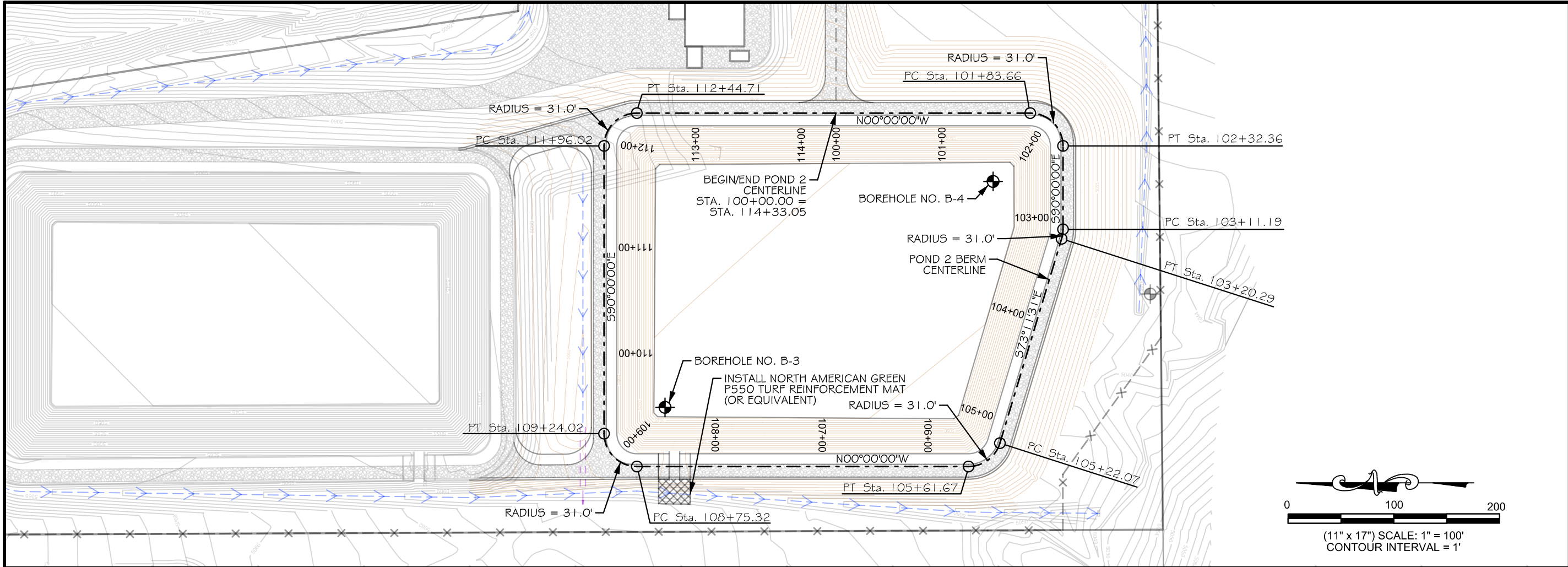
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DDP	09/14			DDP	02/15			2013-134

DE BEQUE WATER STATION
POND 2

Cross Sections

SHEET
12 OF 29

CONSTRUCTION
FILE NUMBER
C-2030



NOTE:
PROFILE EXAGGERATED 10:1 IN THE VERTICAL DIRECTION.

CONSTRUCTION
FILE NUMBER
C-2030

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REV	DATE	02/15	CKD	STH
DDP	DATE			
	DATE			

JOB # 2013-134

DE BEQUE WATER STATION

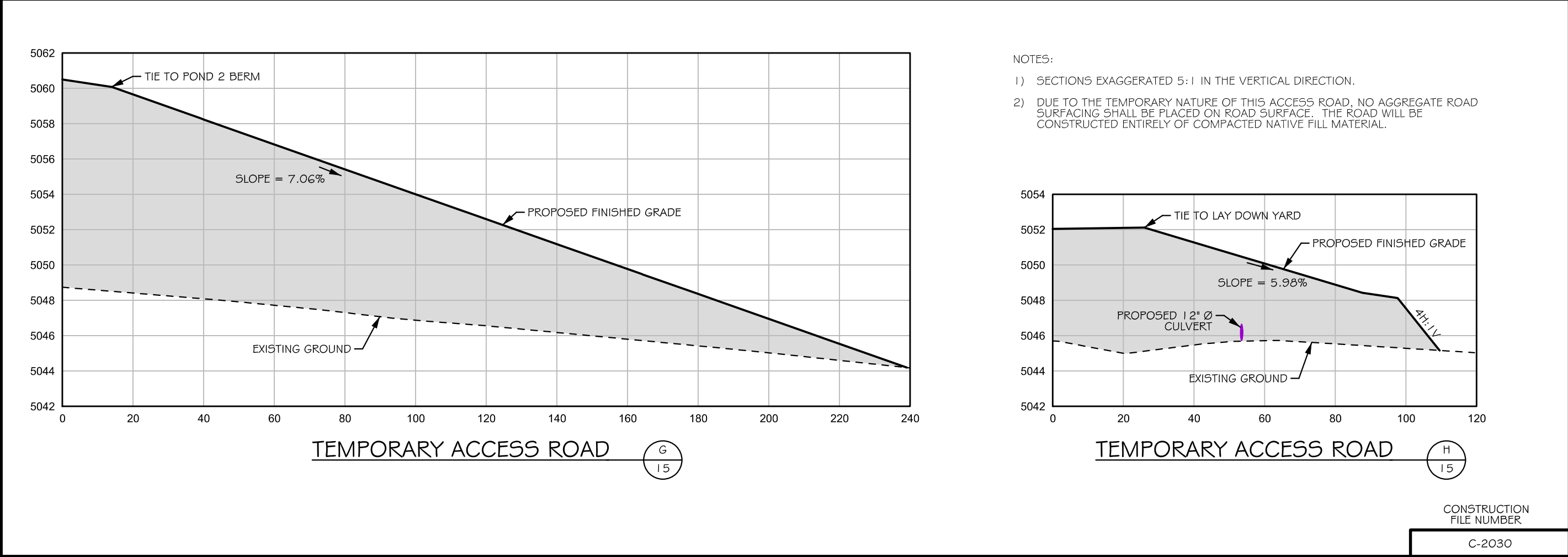
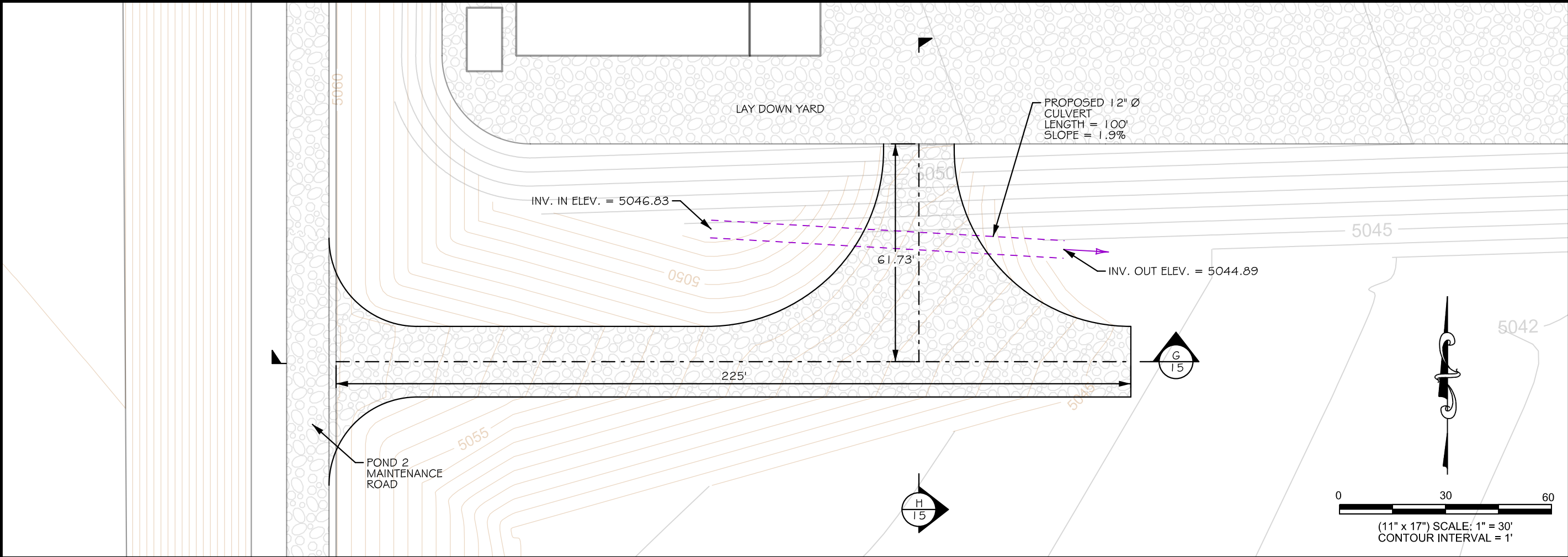
POND 2

Pond Berm Centerline

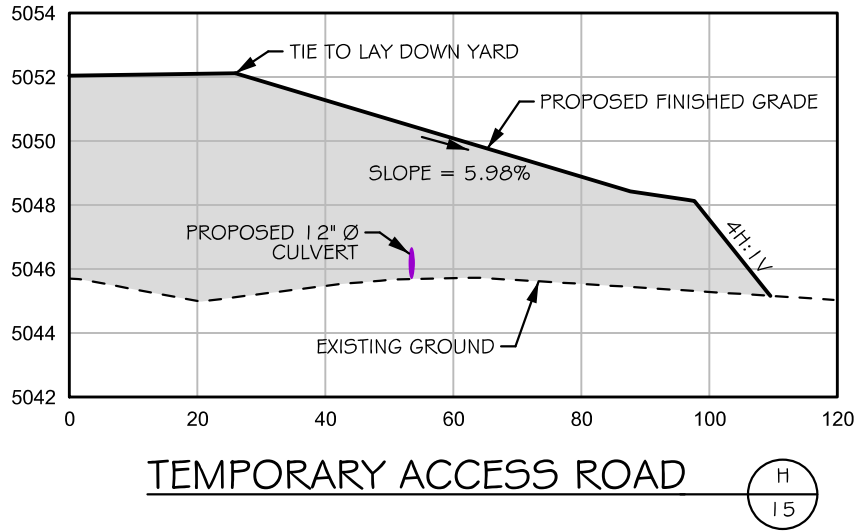
Plan and Profile

SHEET

13 OF 29



- NOTES:
- 1) SECTIONS EXAGGERATED 5:1 IN THE VERTICAL DIRECTION.
 - 2) DUE TO THE TEMPORARY NATURE OF THIS ACCESS ROAD, NO AGGREGATE ROAD SURFACING SHALL BE PLACED ON ROAD SURFACE. THE ROAD WILL BE CONSTRUCTED ENTIRELY OF COMPACTED NATIVE FILL MATERIAL.



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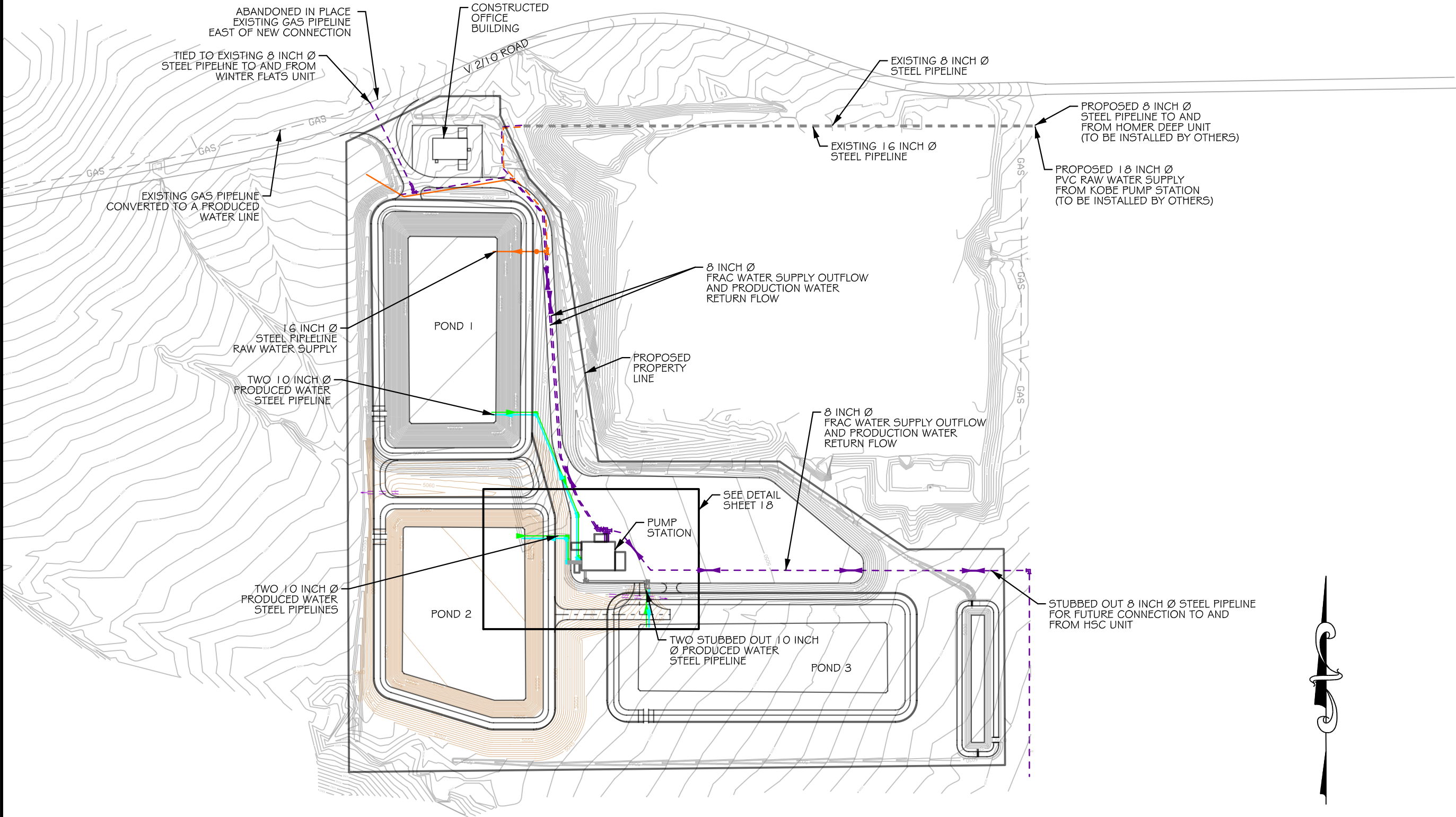
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DDP	09/14	09/14	09/14	DDP	02/15	02/15	02/15	2013-134

DE BEQUE WATER STATION
POND 2

Temporary Access Road
Plan and Profile

SHEET
15 OF 29

CONSTRUCTION
FILE NUMBER
C-2030



0 200 400
(11" x 17") SCALE: 1" = 200'
CONTOUR INTERVAL = 1'

CONSTRUCTION
FILE NUMBER
C-2030

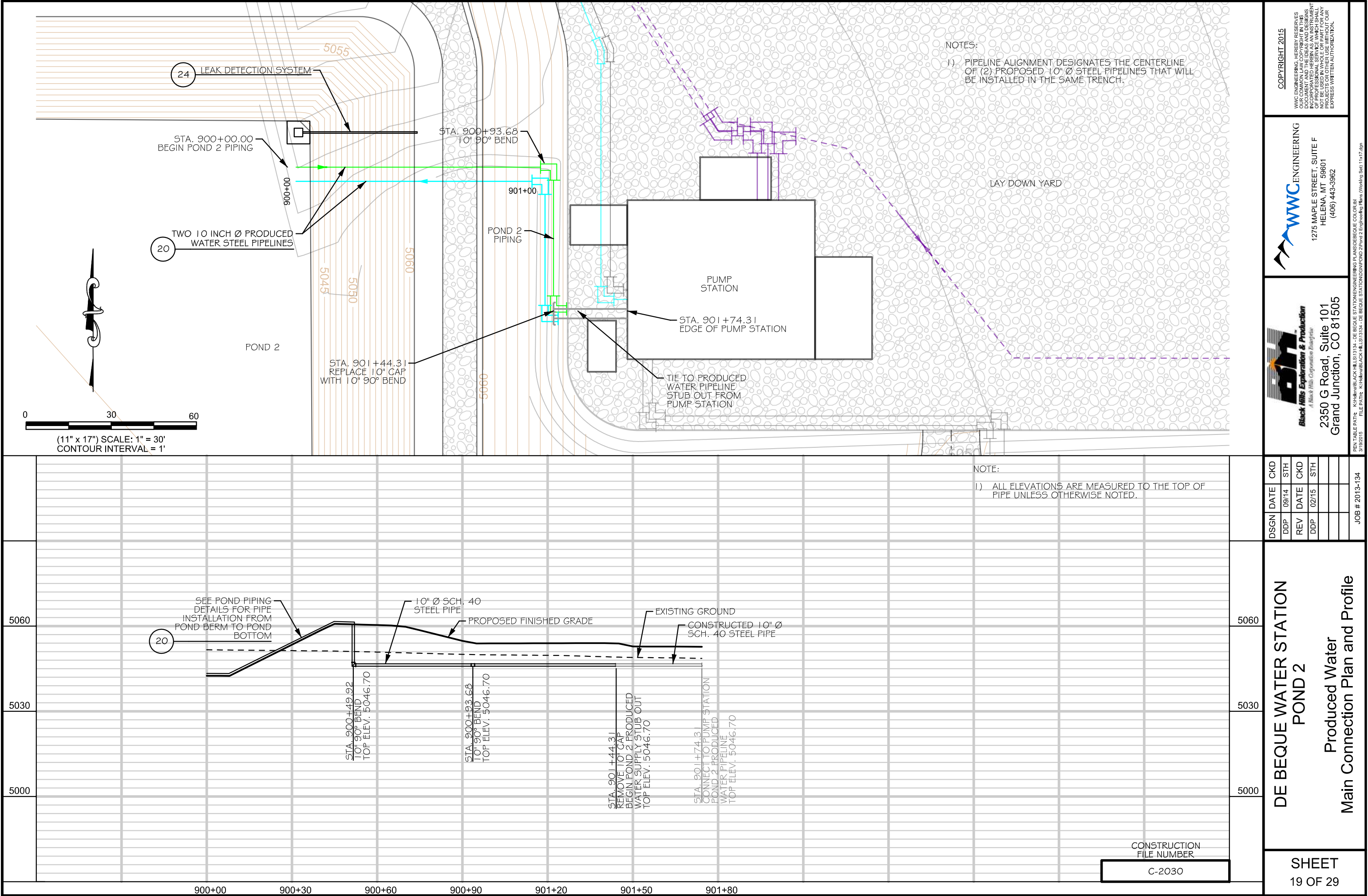
DE BEQUE WATER STATION
POND 2
Overall Pipeline Layout

DSGN	DATE	CKD
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REV	DATE	CKD
DDP	02/15	STH
JOB # 2013-134		

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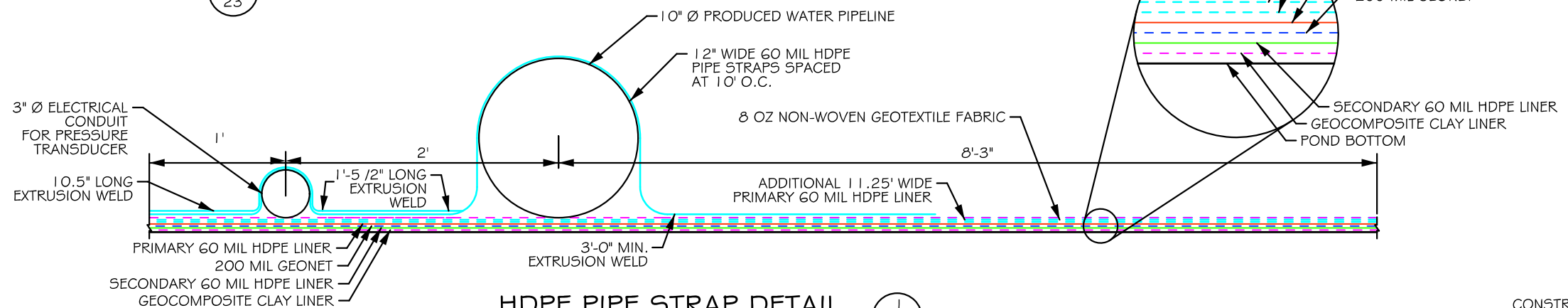
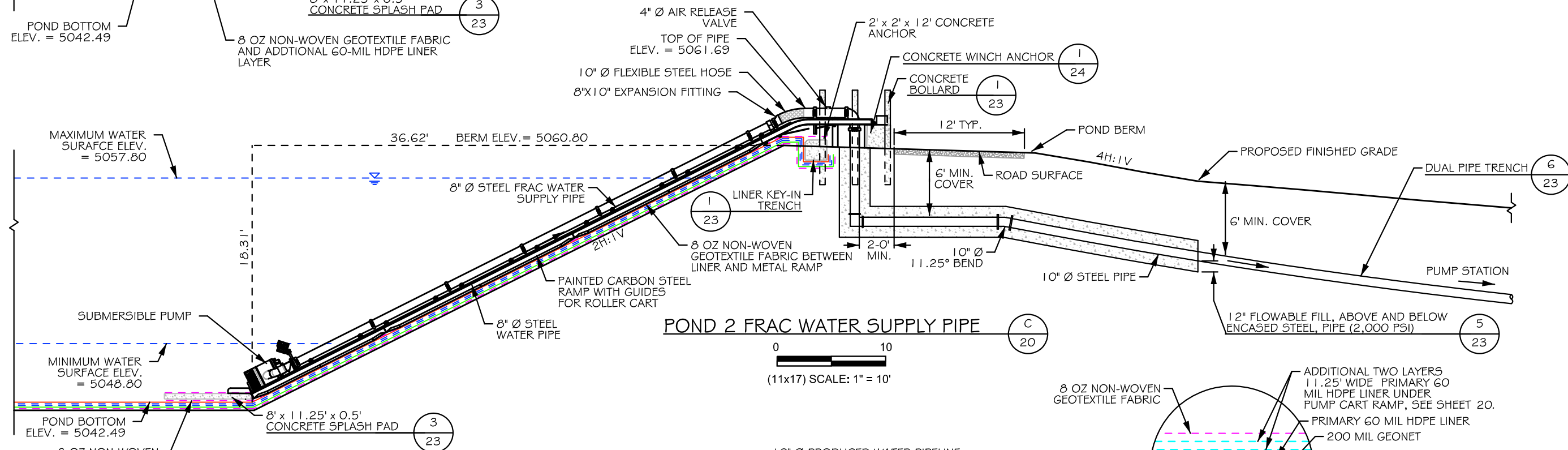
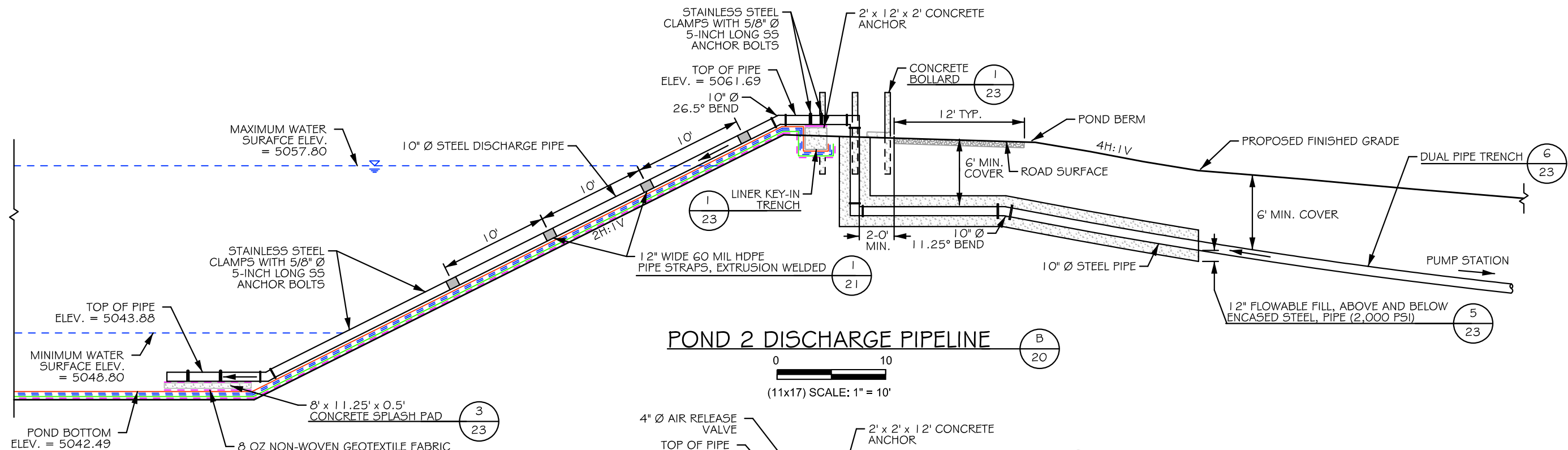
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JOB # 2013-134

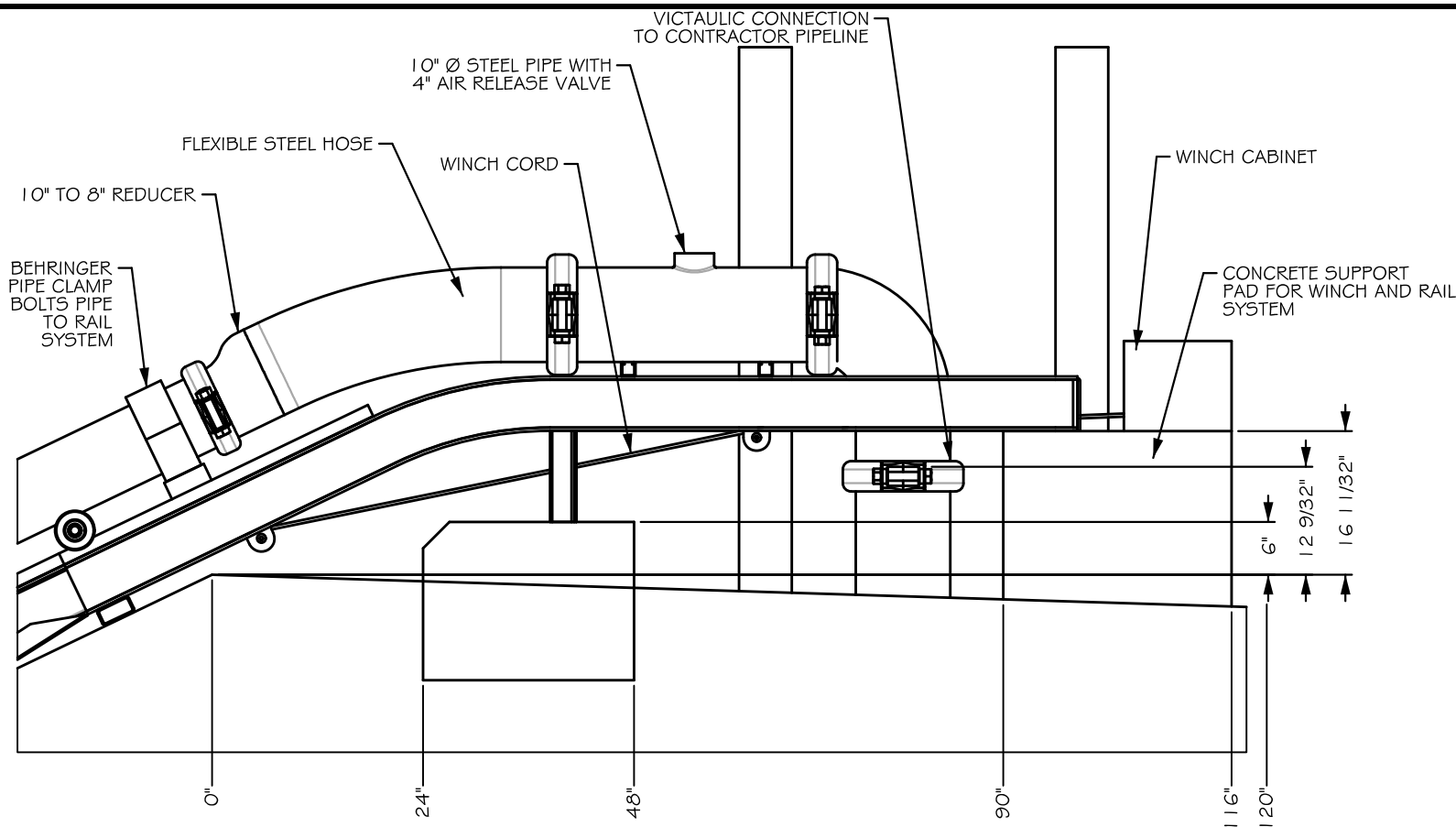
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DE BEQUE WATER STATION
POND 2

Produced Water Pond Piping Details

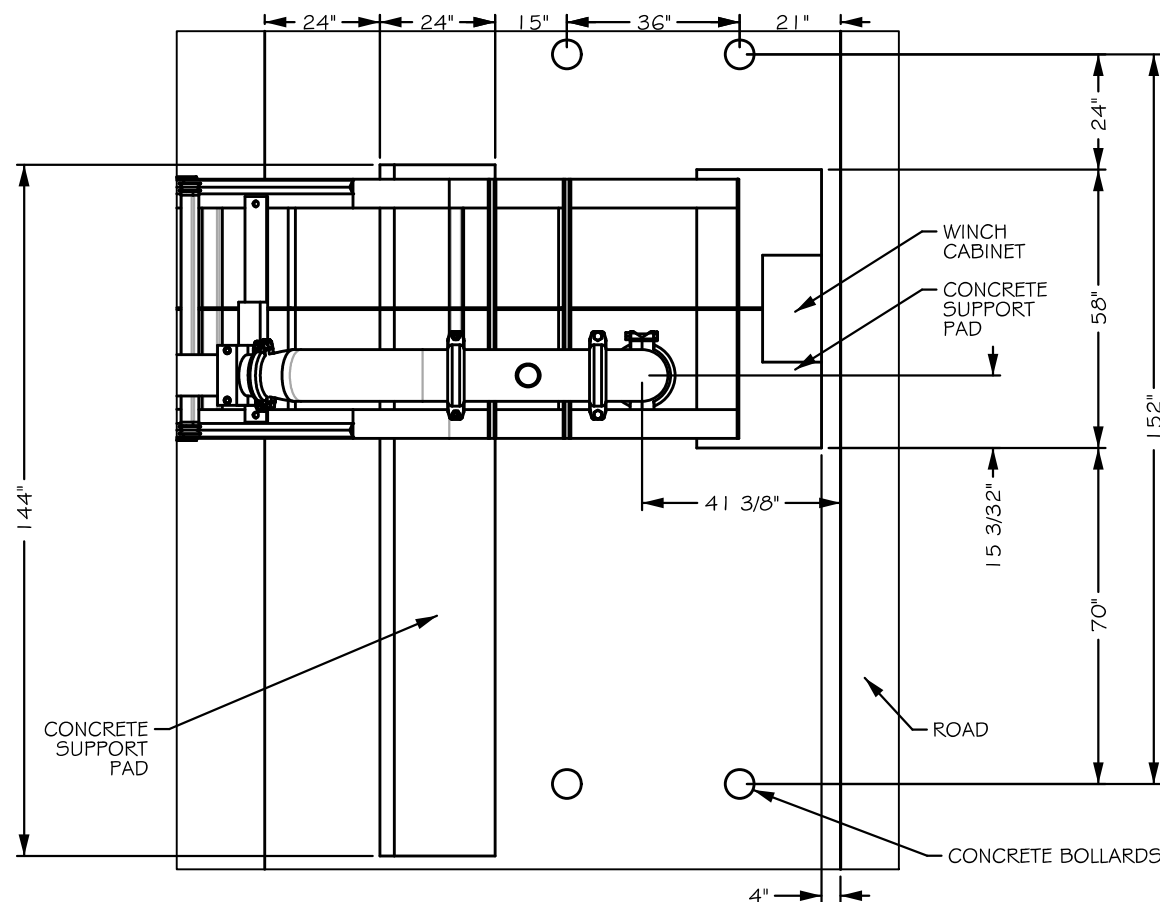
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21 OF 29

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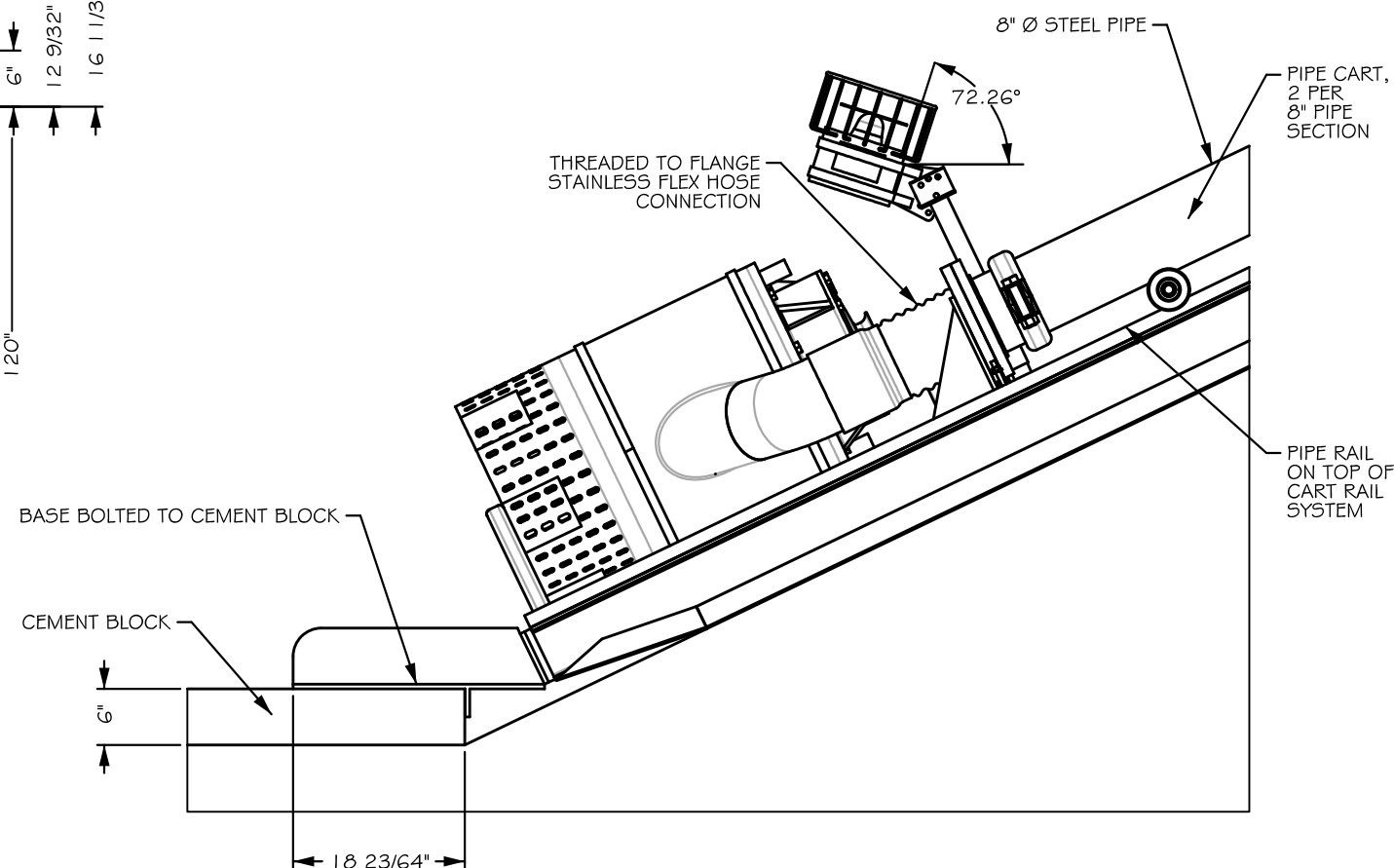
TOP RAIL ASSEMBLY SIDE VIEW

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TOP RAIL ASSEMBLY TOP VIEW

NOT TO SCALE



BOTTOM RAIL ASSEMBLY

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16 DEC 2014

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BLACK HILLS
DATE
Monday, December 15, 2014 11:39:29 AM

DRAWN BY
BRYAN BRUNTZ

TITLE:

POWER ZONE
EQUIPMENT, INC.

CONSTRUCTION
FILE NUMBER
C-2030
SIZE WORK ORDER NO.
B 10591
REV
1
SCALE: 1:500 WEIGHT: - SHEET 3 OF 8

DE BEQUE WATER STATION
POND 2
Produced Water Pond Piping Details

SHEET
22 OF 29

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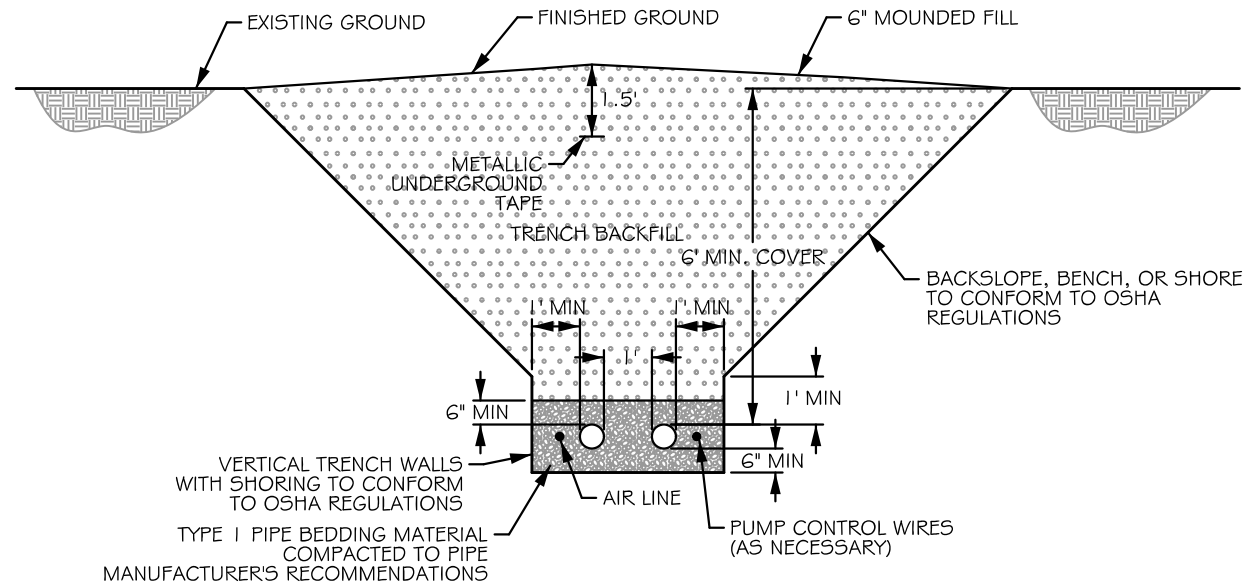
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JOB # 2013-134

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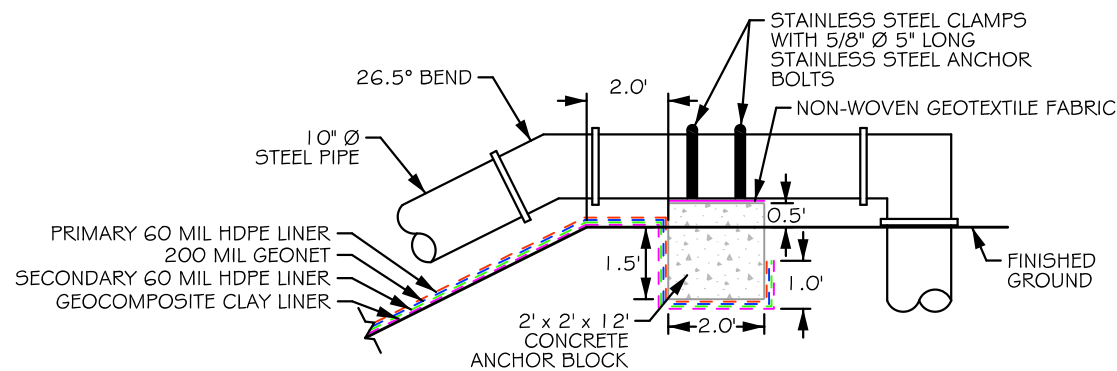


PIPE TRENCH DETAIL - DUAL PIPE TYPICAL

0 4

(11x17) SCALE: 1" = 4'

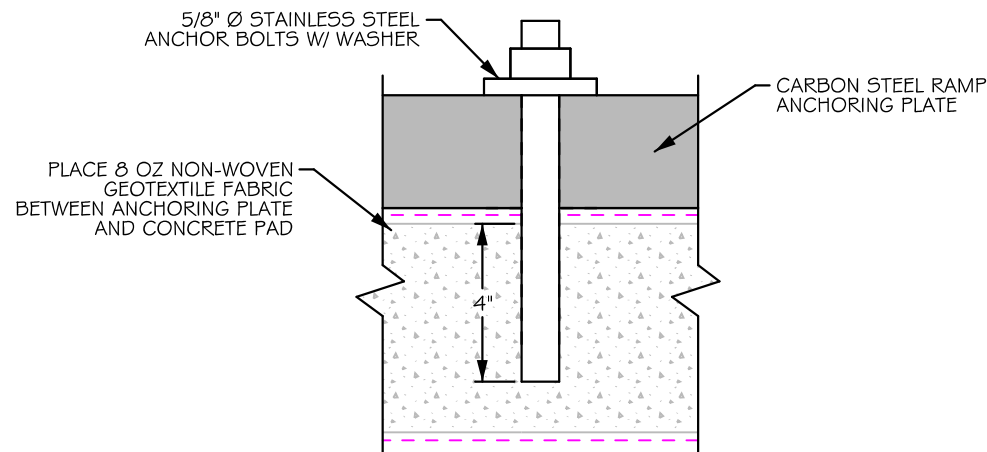
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21



CONCRETE LINER KEY-IN DETAIL

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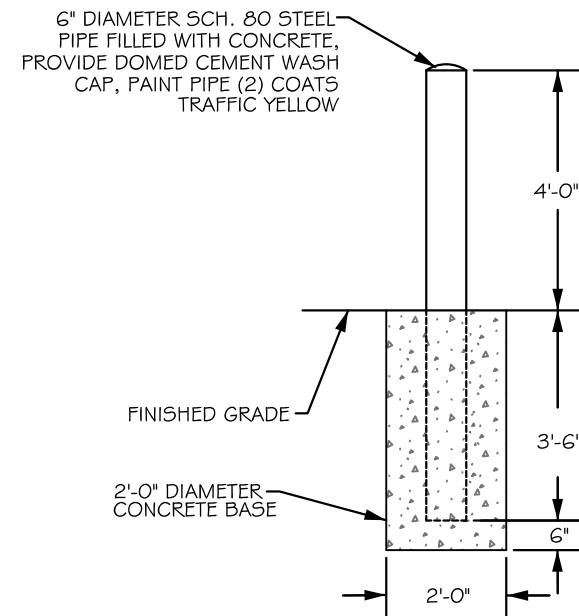
2
21



ANCHOR BOLT

NOT TO SCALE

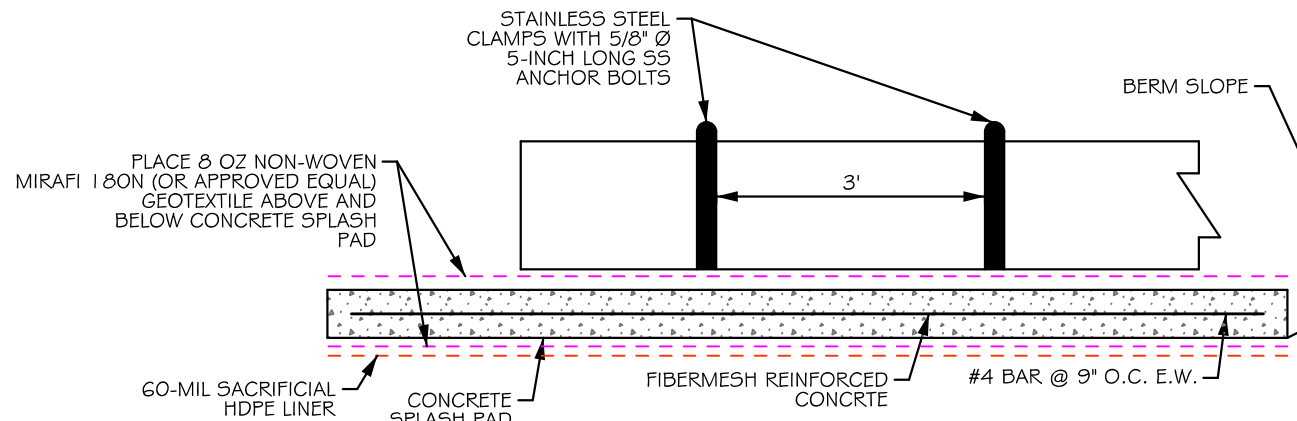
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20



CONCRETE BOLLARD

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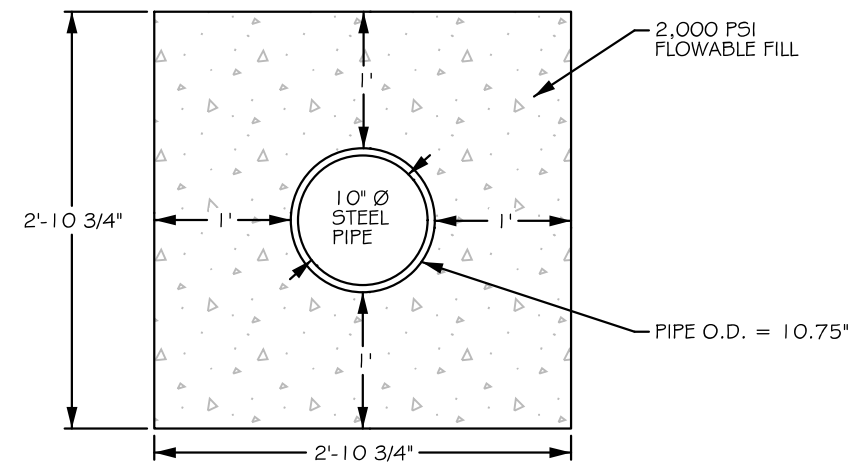
1
21



CONCRETE SPLASH PAD

NOT TO SCALE

3
21



FLOWABLE FILL ENCASED STEEL PIPE

NOT TO SCALE

5
21

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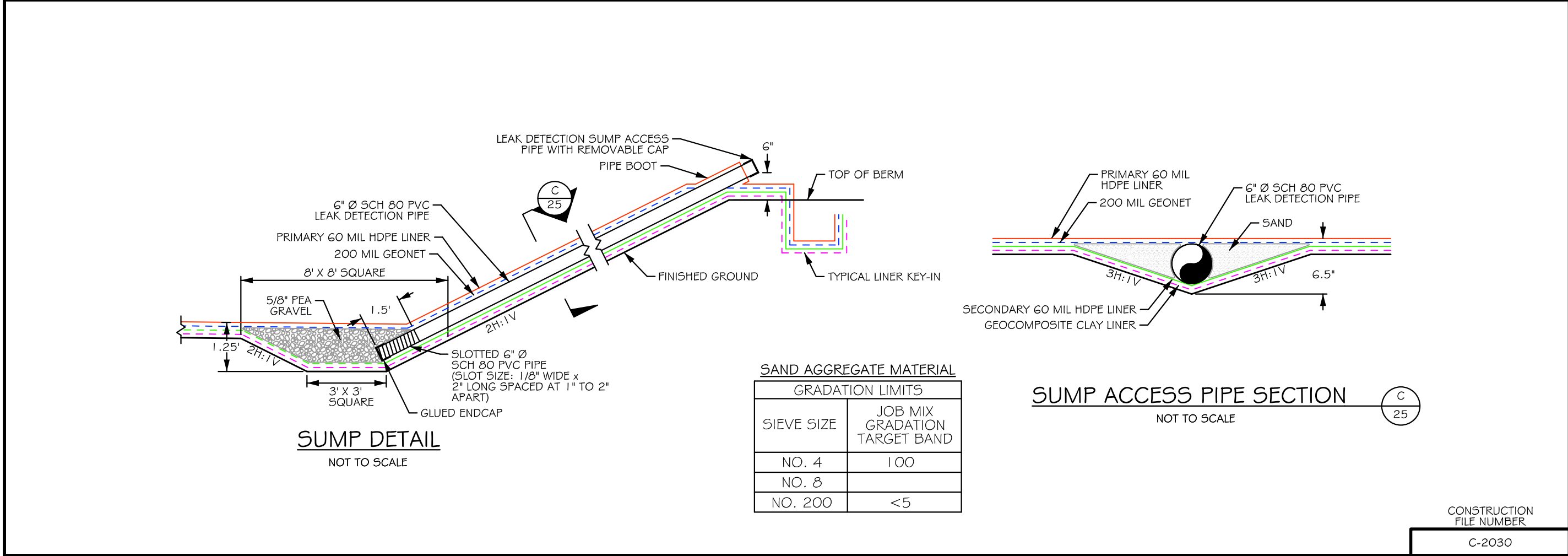
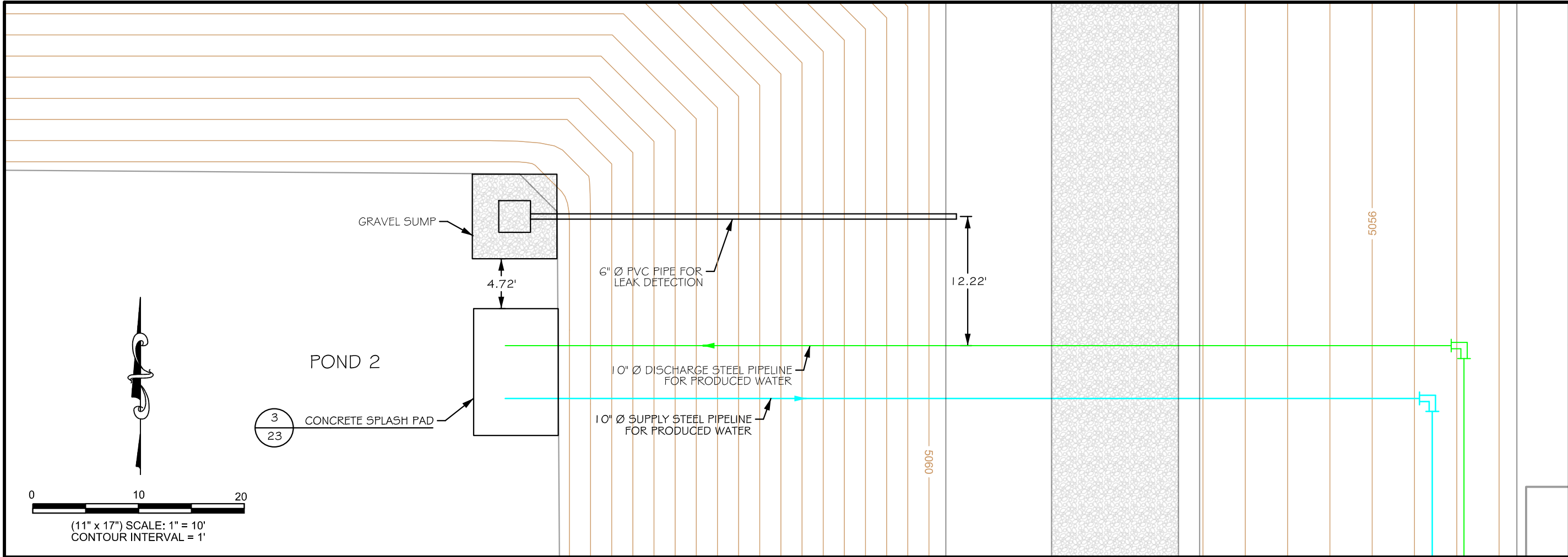
DE BEQUE WATER STATION
POND 2
Pond Details

SHEET
23 OF 29

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FILE NUMBER

C-2030

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DE BEQUE WATER STATION

POND 2

Leak Detection Details

SHEET

25 OF 29

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WVC ENGINEERING

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(406) 443-3962

Black Hills Exploration & Production

2350 G Road, Suite 101
Grand Junction, CO 81505

DE BEQUE WATER STATION

POND 2

Leak Detection Details

SHEET

25 OF 29

CONSTRUCTION

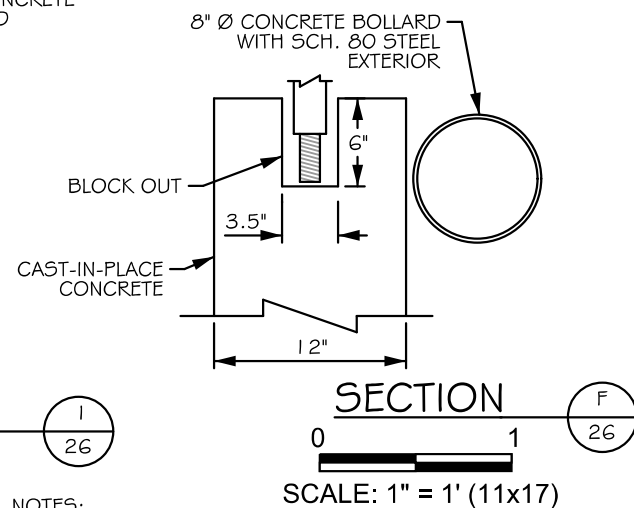
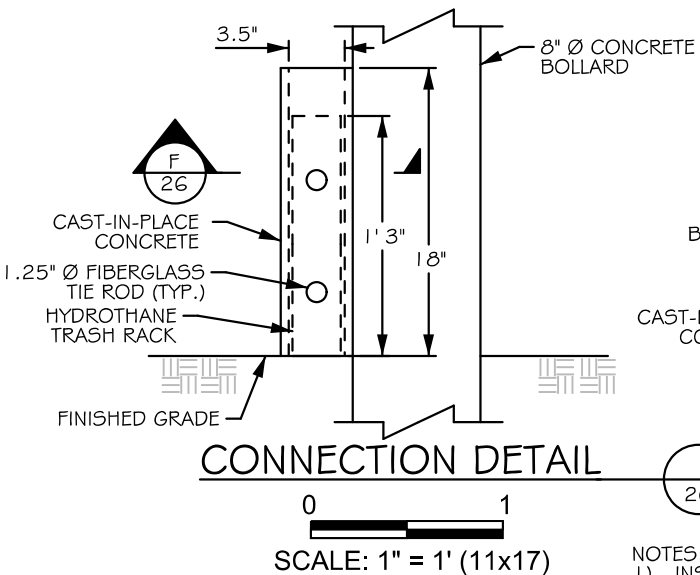
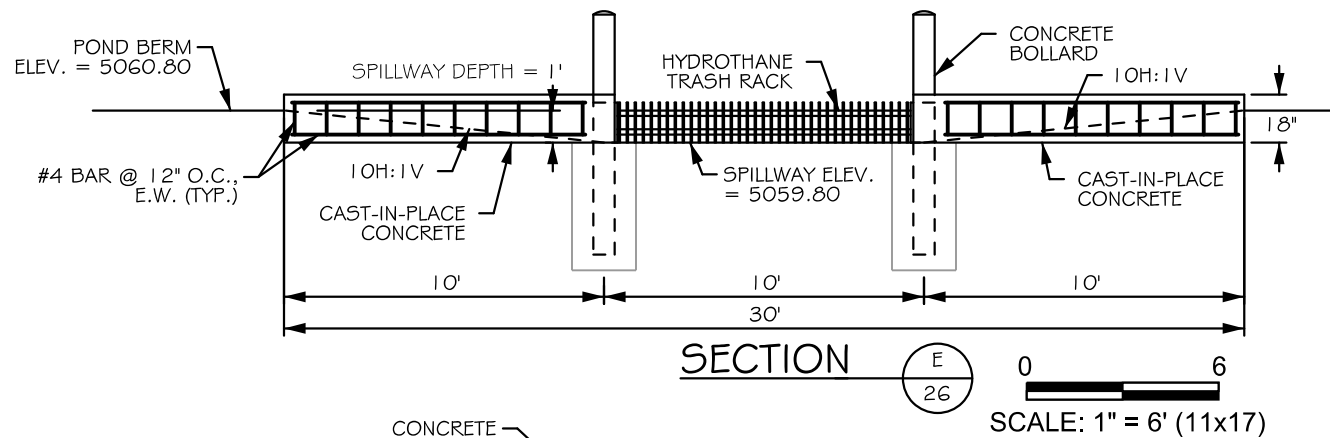
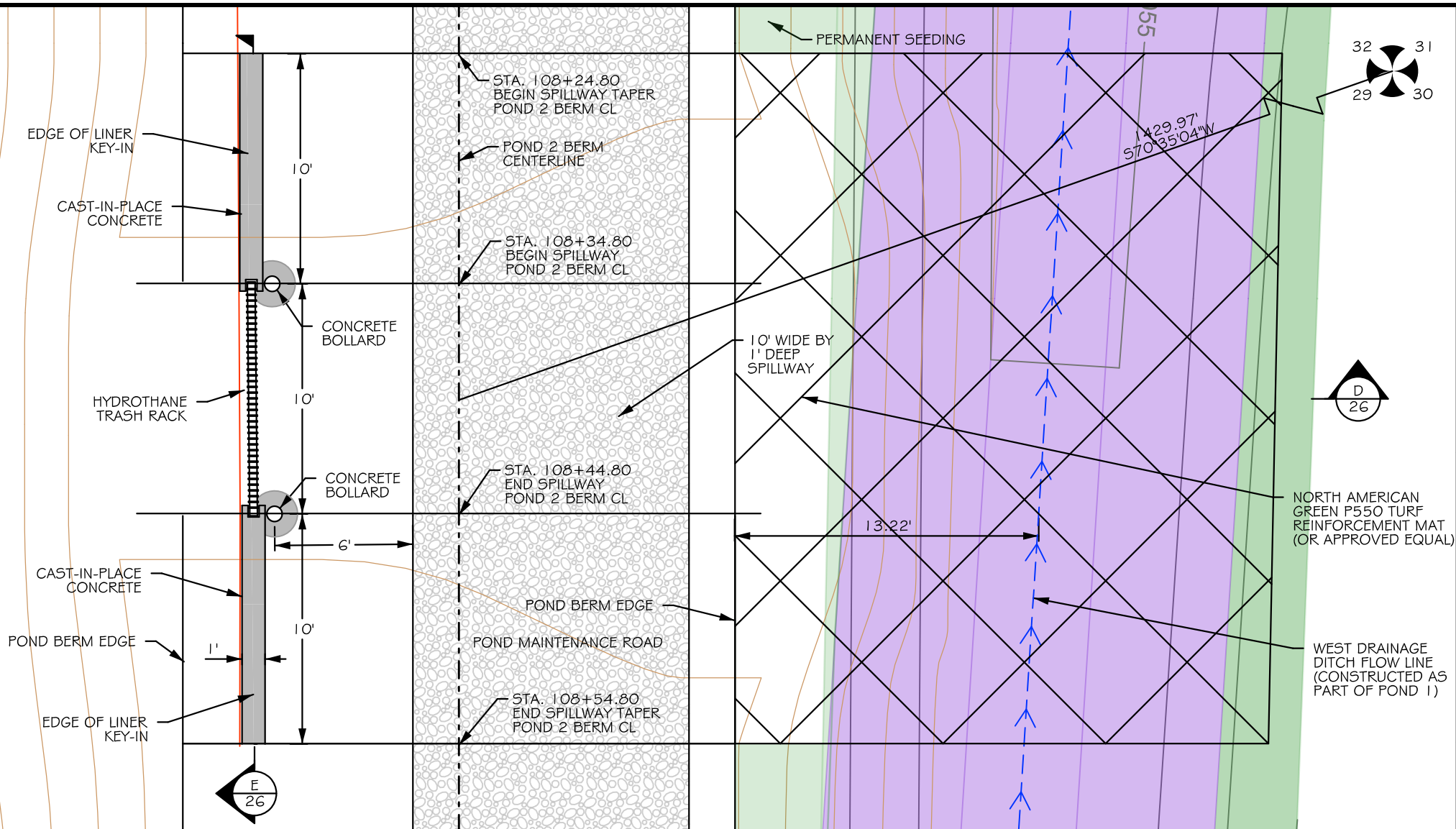
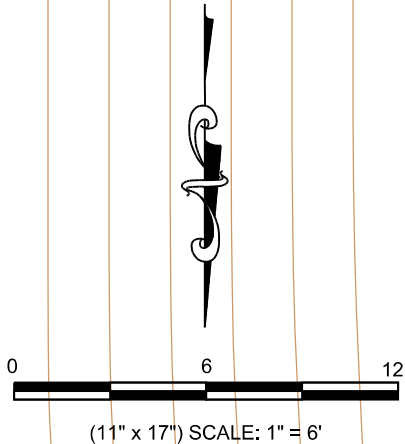
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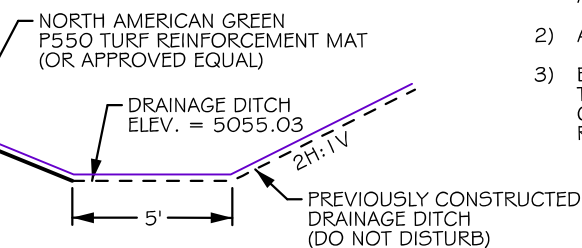
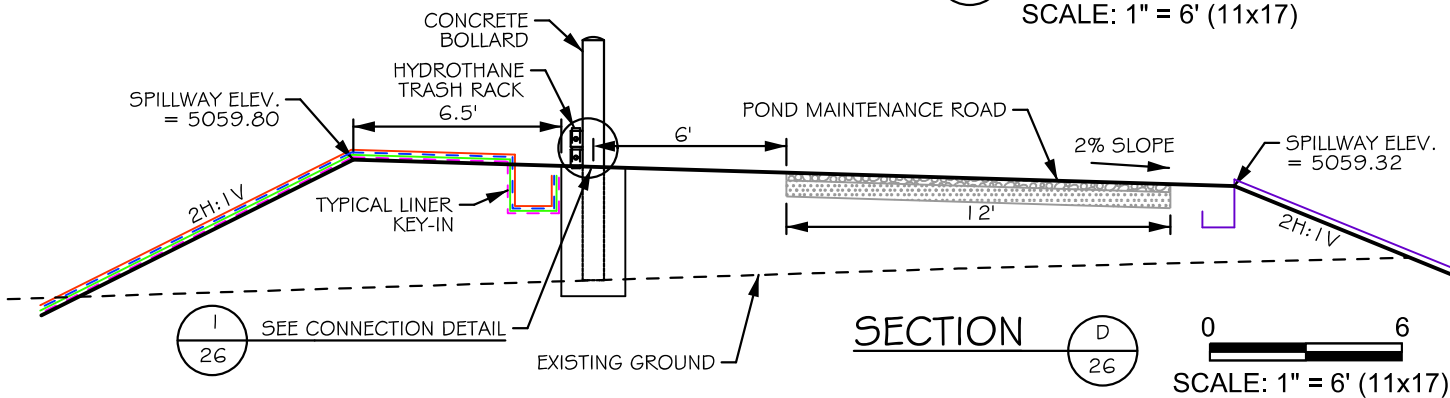
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POND 2 SPILLWAY ELEVATION- DISCHARGE TABLE	
ELEVATION	DISCHARGE (CFS)
5059.8	0
5060.0	3.91
5060.2	12.08
5060.4	23.15
5060.6	36.50
5060.8	51.720



- NOTES:
- 1) INSTALL HYDROTHANE NON-METALLIC TRASH RACK (OR ENGINEER APPROVED EQUAL) PER MANUFACTURER'S RECOMMENDATION.
 - 2) APPLY CONNECTION DETAIL TO BOTH ENDS OF THE TRASH RACK.
 - 3) BLOCK OUT FOR TRASH RACK SHALL BE SIZED AND CONSTRUCTED TO BE ABLE TO SLIDE THE TRASH RACK VERTICALLY IN THE BLOCK OUT GROOVE. THIS WILL ALLOW THE TRASH RACK TO BE EASILY REMOVED IN THE FUTURE FOR CLEANING AND MAINTENANCE.

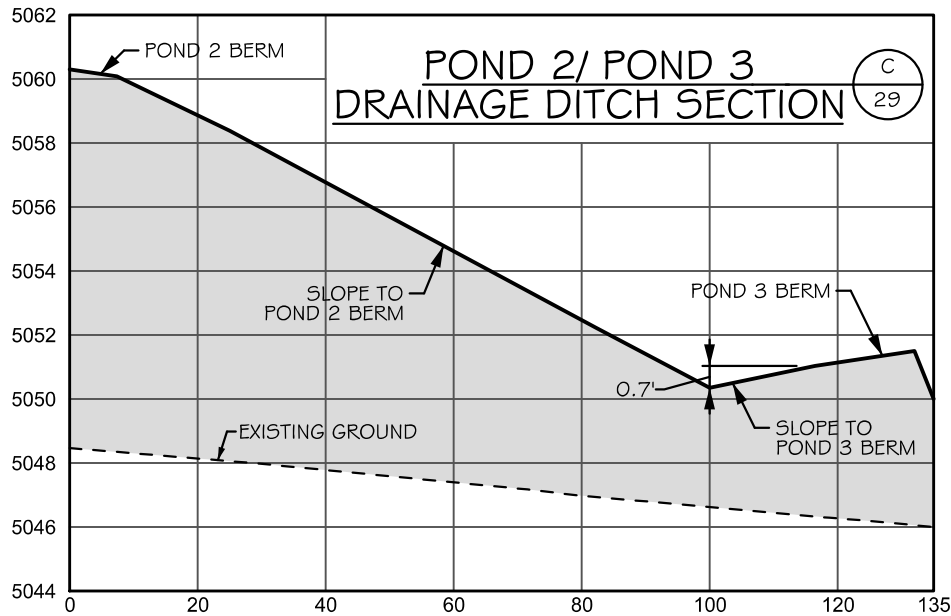
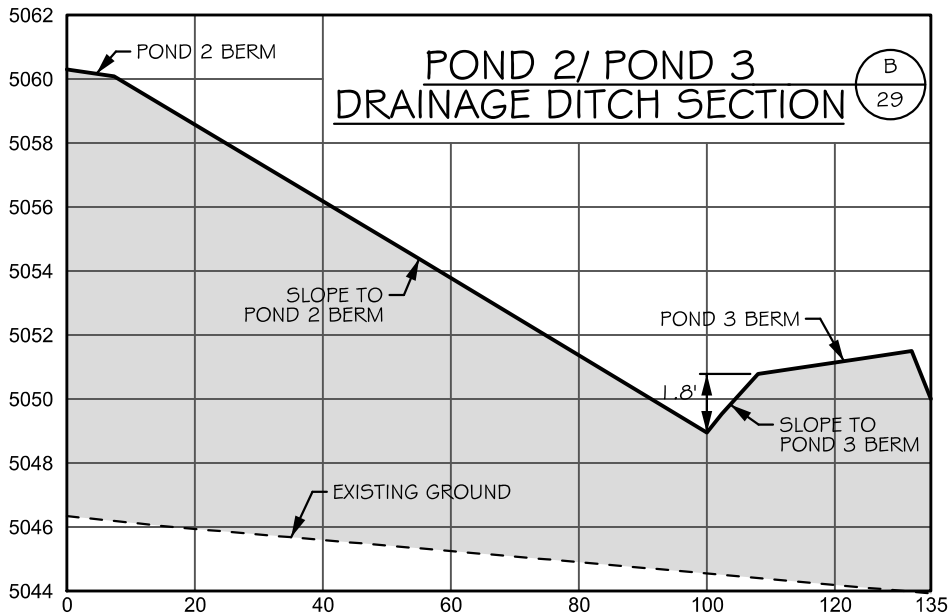
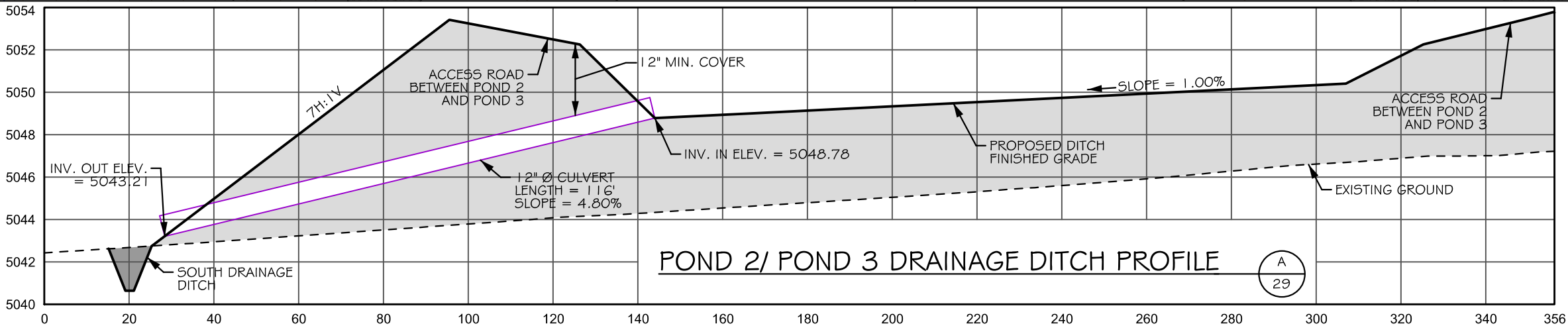
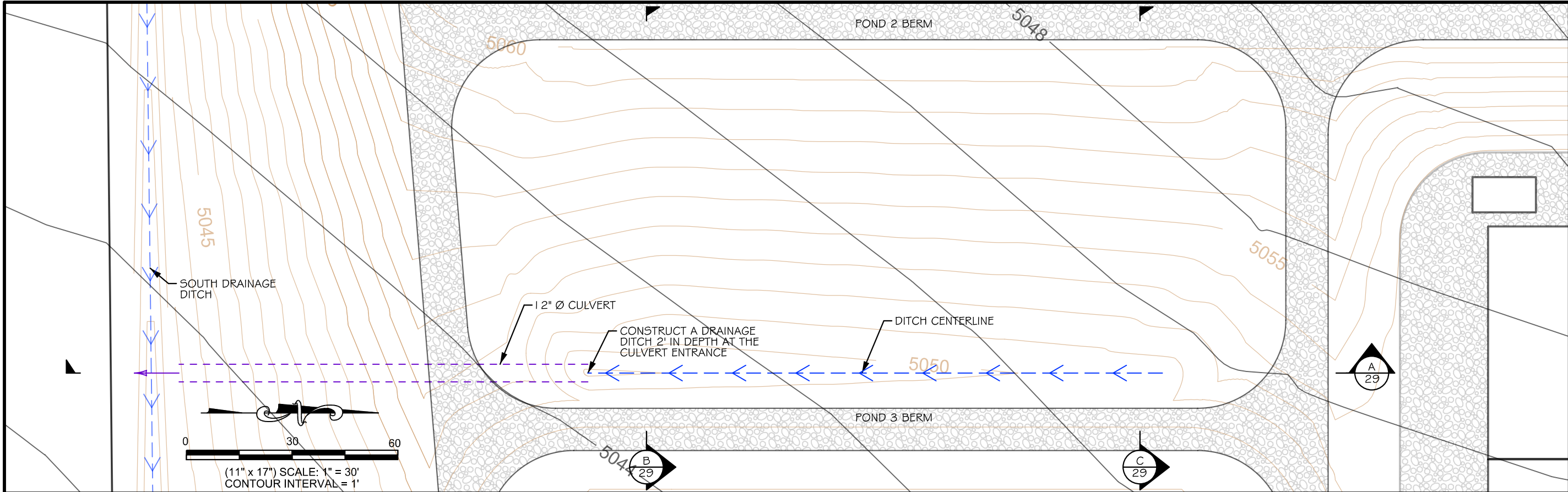


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DSGN DDP REV DDP	DATE 09/14 DATE 02/15
CKD STH CKD STH	JOB # 2013-134

DE BEQUE WATER STATION
POND 2
Spillway Detail

SHEET
26 OF 29

CONSTRUCTION
FILE NUMBER
C-2030



- NOTES:
- 1) THIS CONNECTION BERM, DITCH AND MAINTENANCE ROADS WILL BE CONSTRUCTED IF POND 3 IS CONSTRUCTED PRIOR TO POND 2. THE CONSTRUCTION PHASING OF POND 2 AND POND 3 WILL BE DETERMINED BY THE OWNER.
 - 1) SECTIONS EXAGGERATED 5:1 IN THE VERTICAL DIRECTION.

CONSTRUCTION
FILE NUMBER
C-2030

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Black Hills Exploration & Production
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Grand Junction, CO 81505

DSGN	CKD	DATE	09/14
DDP	STH	DATE	02/15
REV	CKD	DATE	
DDP	STH	DATE	

JOB # 2013-134

DE BEQUE WATER STATION
POND 2
Pond 2/Pond 3 Drainage Ditch
Plan and Profile

SHEET
29 OF 29

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WATER SUPPLY, TREATMENT AND DISTRIBUTION

- AVAILABILITY STUDIES
- DISTRIBUTION SYSTEM MODELING
- DISTRIBUTION SYSTEM DESIGN
- SURFACE & GROUNDWATER MODELING
- RISK & VULNERABILITY ANALYSIS
- PUMP STATION DESIGN
- WATER STORAGE TANK DESIGN
- MONITORING SERVICES
- DEQ PERMITTING
- WATER RIGHTS

WASTEWATER TREATMENT AND DISPOSAL

- TREATMENT SYSTEM DESIGN
- COLLECTION SYSTEM MODELING
- INFILTRATION/INFLOW ANALYSIS
- LIFT STATION DESIGN
- PROJECT FUNDING APPLICATIONS & ADMINISTRATION
- FORCE MAIN DESIGN
- MONITORING SERVICES
- DEQ PERMITTING

STORMWATER MANAGEMENT

- HYDROLOGY & HYDRAULICS MODELING
- COLLECTION SYSTEM DESIGN
- FLOODPLAIN ASSESSMENT & ADMINISTRATION
- SWPPP REPORTS & PERMITTING
- DETENTION & STORAGE DESIGN
- EROSION & SEDIMENT CONTROL
- DEQ PERMITTING
- POINT SOURCE DISCHARGE COMPLIANCE

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HYDROCARBON PRODUCT RECOVERY SYSTEM DESIGN
HYDROLOGIC & WATER QUALITY MONITORING
HAZARDOUS & NON-HAZARDOUS WASTE MANAGEMENT PLANNING
SITE REMEDIATION PLANNING & DESIGN
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BRIDGE HYDRAULICS, SCOUR ANALYSIS, STRUCTURE SELECTION
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PARKING FACILITIES

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SUBDIVISION REGULATIONS DEVELOPMENT
SUBDIVISION REVIEWS
ZONING REGULATIONS & ADMINISTRATION
ANNEXATION POLICIES & REVIEW

GIS SERVICES

DATABASE DEVELOPMENT
MAPPING
DATA MANAGEMENT
PLANNING TOOLS

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