Bonus Ditch
St. Vrain Creek Diversion Structure
Loan Feasibility Study
August 1, 2017

Prepared by:

Resource Conservation Partners, LLC
P.O. Box 1522
Longmont Colorado, 80502
(303) 532-3362
barb@dgmllc.com

In Cooperation With:

Bonus Ditch Company
P.O. Box 771
Longmont, Co. 80502

Deere and Ault Consultants, Inc.
600 S. Airport Road, Building A, Suite 205
Longmont, CO 80503

City of Longmont
Public Works & Natural Resources
1100 South Sherman Street,
Longmont, CO 80501

FEASIBILITY STUDY APPROVAL
Pursuant to Colorado Revised Statutes 37-60-121 &122, and in accordance with policies adopted by the Board, the CWCB staff has determined this Feasibility Study meets all applicable requirements for approval.

Signed 9/8/2017 Date

Bonus Ditch
St. Vrain Creek Diversion Structure
Loan Feasibility Study
August 1, 2017

Prepared by:

Resource Conservation Partners, LLC
P.O. Box 1522
Longmont Colorado, 80502
(303) 532-3362
barb@dgmllc.com

In Cooperation With:

Bonus Ditch Company
P.O. Box 771
Longmont, Co. 80502

Deere and Ault Consultants, Inc.
600 S. Airport Road, Building A, Suite 205
Longmont, CO 80503

City of Longmont
Public Works & Natural Resources
1100 South Sherman Street,
Longmont, CO 80501

1.1 Background

1.1.1 Purpose

To replace and repair the St. Vrain Creek diversion dam for the Bonus Ditch that was destroyed in the September 2013 flood event, by providing a diversion dam across a proposed wider channel section that will convey the 100-year flood flows for the St. Vrain Creek Improvement Project at an estimated cost of $1,297,000. The St. Vrain Creek diversion dam diverts irrigation water from St. Vrain Creek to the Bonus Ditch.

The diversion structure was located west of Martin Street and north of Ken Pratt Boulevard, in the City of Longmont, Boulder County, just downstream of an existing pedestrian bridge. The St. Vrain Creek diversion structure was severely damaged during the September 2013 flood on St. Vrain Creek. The northern 100 feet of the diversion dam, including two of the three stop log bays, was completely washed out and destroyed. The southern 30 to 40 feet of the diversion dam, as well as the southernmost stop log bay experienced less damage. Approximately 100 feet of the north creek bank, that formed the diversion dam abutment, eroded and was washed away during the flood. This essentially formed a second, new 75-foot wide channel for the St. Vrain Creek, directly north of the original diversion dam location.

The ditch company has been working with the City of Longmont to coordinate the repairs with the City's Resilient St. Vrain flood channel improvements. Deere and Ault performed an alternative analysis to determine the most cost effective and resilient repair. The preferred alternative will tie into the City's flood improvements and consist of a concrete inlet structure with transition walls, trash rack, 6'X6' head gate, 6'X6' sand-out gate and hand rails. The new diversion structure will operate by a submersible pump which will move water through a 12" PVC pipe south to a flow meter vault located at GPS 40.15446, -105.09246 and returning the water to the Ditch Company through a 72" concrete Manhole and outlet structure located at GPS 40.15423, -105.09233.

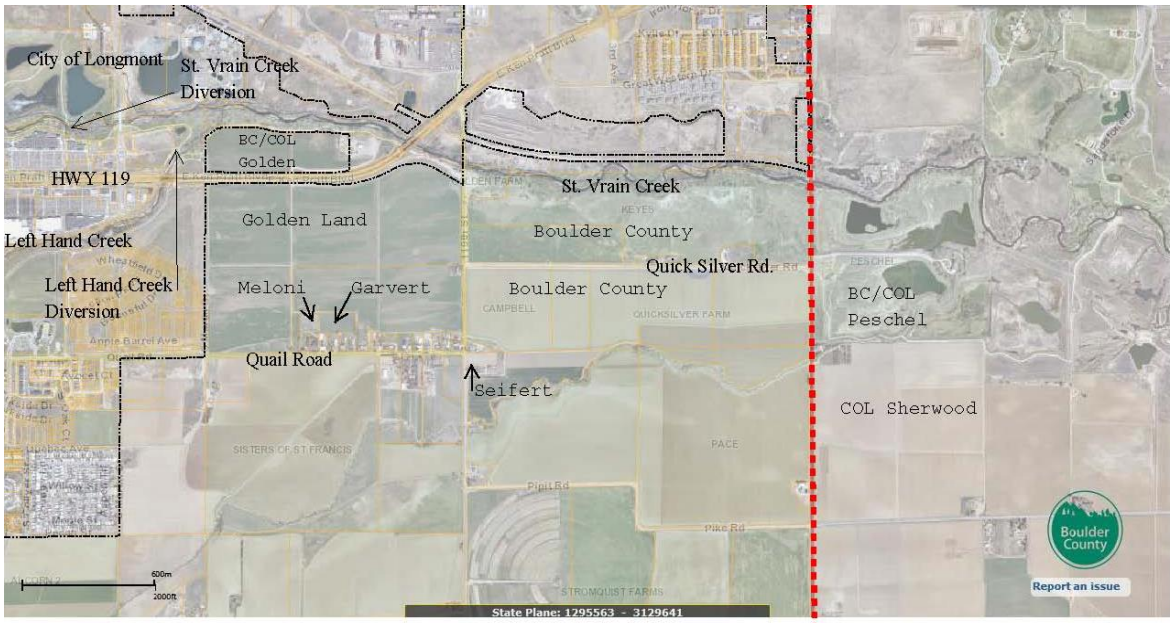
The purpose of the loan is to fund the improvements prior to reimbursement from FEMA. The applicants have an approved project worksheet for FEMA assistance to repair the structure. The existing PW includes a portion of the needed funding to repair the structure. The Bonus Ditch Company has applied for a Scope Change for an Improved Project to increase the level of funding to $1,029,000.00 (without contingency). FEMA requires a 25% match for the funding. If the Scope Change is approved, the Bonus Ditch will be responsible for $525,250 of the cost after the FEMA reimbursement.

1.1.2 Study Area Description

The Bonus Ditch irrigates property in Boulder County and eastern Weld County. The ditch diverts water out of St. Vrain Creek through a pipe to a diversion Structure on Left Hand Creek. Both Diversion structures were damaged as a result of the 2013 flood. The Left Hand Creek diversion structure was repaired in 2014.

a. Lands irrigated are located in Boulder and Weld County, south of St. Vrain Creek and Left Hand Creek. The diversion structures are located with the City of Longmont. The lands irrigated are generally very gently sloping from west to east and north to south toward St. Vrain Creek. All water delivered through the Bonus Ditch Diversion and head gate is used for agricultural irrigation in southwest Boulder County and southeastern Weld County.

b. Study Area Map



c. The study area includes sparsely populated, rural residential and agricultural lands. It is not an employment area and existing land use is limited to rural residential and agricultural lands. Irrigated lands within the study area owned by the City of Longmont and Boulder County are designated as open space. Approximately 220 acres (Golden Land) within the study area is currently in the process of annexation to the City of Longmont. The plan for that property is to complete gravel mining and reclamation and develop the property over time as a mixed use neighborhood within the City of Longmont. All of the Bonus Ditch water associated with the Golden Land property will be dedicated to the City of Longmont in conjunction with annexation of the property.

1.1.3 Previous Studies

Deere and Ault performed an alternative analysis for repair and replacement of the Bonus Ditch St. Vrain Creek diversion Structure. A copy of the analysis is attached. The project as presented is the preferred alternative based on the cost of the improvements, long term stability of the structure and the health of the river.

1.2 Project Sponsor

The Bonus Ditch Company was incorporated in the State of Colorado on October 16, 1908. The company is an irrigation district that services 8 shareholders that own a combined 100 shares, supplied by the St. Vrain River during the months of March – October each year. The per share assessment for the current year is $250.00. The Bonus Ditch is within the St. Vrain and Left Hand Water Conservancy District, in the counties of Boulder and Weld. The average acre-feet of water diverted per year is 2,221. The ditch owns two water diversion structures, the one on the St. Vrain, and one on Left Hand Creek. The Articles of Incorporation and By-laws are appended to this report.

Bonus Ditch Water Users include:

Boulder County
Attn: Karen Martinez
5201 St Vrain Road
Longmont CO 80503
38 shares
1/2 interest in 2 Golden shares, w/ City
1/2 interest in 14.5 Peschel shares, w/ City
46.25 Total

City of Longmont Open Space
c/o Dan Wolford
7 S. Sunset St.
Longmont, CO 80501
1/2 interest in 14.5 Peschel shares, w/ County
1/2 interest in 2 Golden shares, w/ County
8.5 Shares from Sherwood
16.75 Total

Leonard Garvert
2310 9th Ave. #217
Longmont, CO 80503
.5 shares

Golden Farm, LLLP
c/o Reggie Golden
PO Box 54
Longmont, CO 80502
34 shares

St. Vrain & Left Hand Water Cons. Dist.
9595 Nelson Rd., Suite 203
Longmont, CO 80501
1 share

Gary and Mhari Peschel
10220 WCR 1
Longmont, CO 80504
.5 shares

Lisa Flynn
9998 WCR 1
Longmont, CO 80504
.5 shares

Mark Meloni and Dannah Edwards
11553 Quail Rd
Longmont, CO 80501
.5 shares

The Bonus Ditch Company currently owns and operates the existing diversion structure at Left Hand Creek and the head gate and associated facilities located just downstream of the Left Hand Creek Diversion. There is also a pipe that carries water diverted from St. Vain Creek to Left Hand Creek above the diversion.

1.3 Water Rights

1.3.1 Water Availability
The structure summary report from CDWR is outlined below.

Structure Summary Report

State of Colorado — HydroBase

Structure Name: BONUS DITCH — **Water District:** 5 — **Structure ID Number:** 563

Source: ST VRAIN CREEK

Location:	Q10	Q40	Q160	Section	Twnshp	Range	PM
				11	2N	69W	S

Distance From Section Lines: From N/S Line: — From E/W Line:

UTM Coordinates (NAD 83): Northing (UTM y): 4444671 — Easting (UTM x): 492880.4 — Spotted from PLSS distances from section lines

Latitude/Longitude (decimal degrees): 40.152354 — -105.083592

Water Rights Summary:								
	Total Decreed Rate(s) (CFS):	Absolute:	23.2300	Conditional:	0.0000	AP/EX:	0.0000
	Total Decreed Volume(s) (AF):	Absolute:	0.0000	Conditional:	0.0000	AP/EX:	0.0000

Water Rights -- Transactions

Case Number	Adjudication Date	Appropriation Date	Administration Number	Order Number	Priority Number	Decreed Amount	Adjudication Type	Uses	Action Comment
02CW0334	1882-06-02	1861-03-30	4107.00000	0		0.1273 C	O,TF	1	SVLHWCD CHNG USE 12/19/2007
02CW0334	1882-06-02	1861-03-30	4107.00000	0		0.1273 C	O,TT	134568AW	SVLHWCD CHNG USE 12/19/2007
CA1337	1882-06-02	1861-03-30	4107.00000	0		12.7300 C	O	1	36 W-8710/8715 EXCHNG
02CW0334	1882-06-02	1865-05-30	5629.00000	0		0.1050 C	O,TF	1	SVLHWCD CHNG USE 12/19/2007
02CW0334	1882-06-02	1865-05-30	5629.00000	0		0.1050 C	O,TT	134568AW	SVLHWCD CHNG USE 12/19/2007
CA1337	1882-06-02	1865-05-30	5629.00000	0		10.5000 C	O	1	36 W-8710/8715 EXCHNG

Water Rights -- Net Amounts

Adjudication Date	Appropriation Date	Administration Number	Order Number	Priority/Case Number	Rate (CFS)			Volume (Acre-Feet)		
					Absolute	Conditional	AP/EX	Absolute	Conditional	AP/EX
1882-06-02	1861-03-30	4107.00000	0	02CW0334	12.7300	0	0			
1882-06-02	1865-05-30	5629.00000	0	02CW0334	10.5000	0	0			

Irrigated Acres Summary -- Totals From Various Sources

GIS Total (Acres):	464.4192	Reported:	2010
Diversion Comments Total (Acres):	1000	Reported:	2007
Structure Total (Acres):		Reported:	

1.3.2 Water Supply Demands

The study area is currently and has historically been irrigated with the existing water supply. We do not anticipate increased demand on the water supply as a portion of the study area will be annexed to the City of Longmont and will no longer be irrigated. The City of Longmont and Boulder County open space will continue to be irrigated as they have historically.

1.4 Project Description - Analysis of Alternatives & Selected Alternative

1.4.1 Analysis of Alternatives

Two alternatives were considered in this analysis. The first alternative included reconstructing the diversion dam in the pre-flood St. Vrain Creek channel, which is no longer in its place. The second alternative was to provide a diversion dam across the proposed wider channel section that will convey the 100-year flood flows for the St. Vrain Creek Improvement Project. Concept figures and the construction cost estimates are included with this letter. The diversion structures presented herein assume a single grouted boulder drop structure is used in combination with a check structure. Fish passage and boat passage are currently being coordinated with the City and partner agencies, which could result in adjustments to the future structure and associated costs. The costs for the fish passages and associated structures are not included in this report.

To reconstruct the St. Vrain Creek diversion dam, we propose combining the diversion dam with an engineered sloping grouted boulder drop structure. This grouted boulder drop structure is similar to what existed prior to the flood. Grouted boulder drop structures are commonly used along the Front Range for grade control in creeks and rivers. The exposed boulders that form the surface of the downstream slope dissipate erosive energy associated with the elevation drop. These drop structures are easily modified for dual use as a diversion structure. Similar structures survived the September 2013 flood and the subsequent 2014 spring flooding with only minor damage. Since this structure is within a public area, the downstream face is set at approximately a 10:1 (horizontal to vertical) slope for safety. For the St. Vrain Diversion, the boulders will be three feet in diameter, grouted in-place, and bedded on small riprap and gravel. The bedding provides protection from piping and erosion of soils beneath the drop structure.

A sufficiently deep cutoff should also be integrated within the grouted boulder drop structure to further resist piping. We propose to do this with an upstream 12-inch thick reinforced concrete sill wall. A spread footing would be used to support the sill wall. Three stop log bays, similar to the original structure, will be provided for maintaining the existing diversion capabilities into the Bonus Ditch. The bays will be constructed with reinforced concrete and steel log slots. Each bay will be approximately 9.5 feet wide by 2.4 feet tall.

PRE-FLOOD CONDITION REPAIRS

A plan view of the proposed diversion and grouted sloping boulder drop structure across the pre-flood St. Vrain Creek channel is shown on Figure 4 of the included report from Deere & Ault Consultants Inc... Figure 4 represents what it would take to replace the structure before the 2013 flood. The grouted drop structure section is shown on Figure 5.

Additionally to replace the diversion dam within the pre flood channel, the creek bank and north abutment of the diversion dam will need to be re-established. We propose constructing the abutment with soil and protecting it with salvaged rubble riprap and additional imported riprap as needed. The abutment will be constructed to approximately the elevation of the pedestrian bridge deck, or approximately 8 to 10 feet high. The abutment will have a 3:1 (horizontal to vertical) upstream slope with a 20-foot wide top and a downstream slope that will essentially match the 10:1 (horizontal to vertical) slope of the grouted boulder drop structure.

IMPROVED CHANNEL CONDITION REPAIRS

Figure 6 shows the diversion dam across the wider St. Vrain Creek channel proposed for the overall St. Vrain Creek Channel Improvement Project. The channel will be widened to carry the 100-year flood flows of St. Vrain Creek and would require the grouted boulder drop structure be extended approximately 180 feet to the north. We assume the majority of the north abutment earthwork will be included in the St. Vrain Creek Channel Improvement Project.

Two alternatives were considered in this analysis. The first alternative included reconstructing the diversion dam in the pre-flood St. Vrain Creek channel, which is no longer in its place. The second alternative was to provide a diversion dam across the proposed wider channel section that will convey the 100-year flood flows for the St. Vrain Creek Improvement Project. The diversion structures presented herein assume a single grouted boulder drop structure is used in combination with a check structure. Fish passage and boat passage are currently being coordinated with the City and partner agencies, which could result in adjustments to the future structure and associated costs. The costs for the fish passages and associated structures are not included in this report.

Deere and Ault Consultants, Inc. developed an engineer's opinion of probable construction costs for reconstructing the St. Vrain Creek diversion dam for the pre flood channel and the proposed improved St. Vrain Creek channel. Construction costs were based on recent construction bids for similar structures on St. Vrain Creek. The estimated construction cost for replacing the St. Vrain Creek diversion dam in the pre-flood channel is $1,400,000, and the cost for replacing the diversion dam in the wider proposed improved St. Vrain Creek channel that is $2,541,000. The estimated costs are summarized on Table 1 and Table 2, respectively. These costs include a 10 percent mobilization cost and a 25 percent contingency cost.

We anticipate the work would occur in the winter, or when the creek flows are lowest.

a. Outputs/yields - The new structure is designed to provide the decreed yield of the water right.

b. Costs - cost of construction of the new diversion structure are outlined in the attached Engineer's Opinion of Cost.

c. Impacts

1) Impacts on the man-made environment – no residential or commercial buildings will be impacted by the proposed improvements. The project as proposed is compatible with future City of Longmont utilities and recreation activities.

2) Impacts on the natural environment - The City of Longmont prepared and Environmental Assessment as part of the Resilient St. Vrain project. This reach of St. Vrain Creek and the anticipated improvements were included in the study area. There was a "Finding of No Significant Impact" for the project. In addition the City of Longmont has obtained all required permits to work in St. Vrain Creek. A copy of the FONSI is attached to this document. The complete Environmental Assessment is available upon request.

d. Economic analysis and feasibility - The Bonus Ditch Company cannot continue to put the existing water rights to beneficial use without the proposed improvements. We believe that FEMA will reimburse the Ditch Company for 80% of the anticipated costs. This will leave approximately $525,848 to be divided over the 100 shares or $5,258 per share. There are currently 8 shareholders who will benefit from the project. Each shareholder will pay their prorate share of the cost to construct the improvements and operate the ditch through the annual assessment as determined by the Board of Directors and discussed at the annual meeting.

e. Institutional requirements – the required USACE 404 permit is in place for the project. No court actions are required for the project to proceed. The Ditch Company will put the project out to bid and enter into a contract with the successful bidder prior to construction of the improvements.

f. Special considerations – The project has been thoroughly evaluated in the context of the City of Longmont Resilient St. Vrain Project and the requirements of the Bonus Ditch Company. We do not anticipate the need for further investigations. The only outstanding consideration is FEMA review and approval of the revised Scope of Work.

1.4.2 Selected Alternative

a. A detailed description of the *Selected Alternative*:

The new structure will be relocated from the current location of GPS 40.15441, -105.09603 to GPS 40.15465, -105.09245.

The new facility will consist of a concrete inlet structure with transition walls, trash rack, 6'X6' head gate, 6'X6' sand-out gate and hand rails. The new diversion structure will operate by a submersible pump which will move water through a 12" PVC pipe south to a flow meter vault located at GPS 40.15446, -105.09246 and returning the water to the Ditch Company through a 72" concrete Manhole and outlet structure located at GPS 40.15423, -105.09233.

See attachments:

1. Bonus Ditch FULL Plan Set.PDF
2. Bonus Ditch Intake and Pump Station- Engineer Opinion of Cost 8-5-16.PDF
   The new scope of work will include the following bid items:

Mobilization, Demobilization & General Conditions
Care of River / Dewatering
Earthwork

a. Site Access QTY 1 LS
b. Structural Excavation and Subgrade Preparation QTY 1 LS
c. Soil Export QTY 1000 CY

Diversion & Inlet Structure

a. Install Inlet Structure Concrete Walls with Transition Walls QTY 135 CY
b. Install 4" Leveling Gravel and 4" Compressible board QTY 550 SF
c. Install 6' X 6' SS Self Contained Fabricated Slide Gates QTY 2
d. Install Trash Rack, Grating and Miscellaneous Metals QTY 1 LS
e. Drilled Piers QTY 1
f. Install Concrete Pile Cap QTY 3 EA
g. Install Submersible Pump QTY 1
h. Install Discharge Piping QTY 1 LS
i. Install Road Base Working Area QTY 50 CY
j. Bollards QTY 6 EA

Flow Meter Vault & 12" Discharge Pipeline

a. Install 9' X 8' Concrete Vault W/Hatch QTY 20 CY
b. Install 12" Dia.C900 PVC Discharge Pipeline QTY 145 LF
c. Install Sump Pump QTY 1
d. Install Flow Meter and Data Logger QTY 1 EA
e. Install Pipe & Fittings QTY 1 LS

Bonus Ditch Connection Manhole

a. Install 72" Precast Manhole QTY 1
b. Install Connection to Existing 42" Dia. RCP Pipeline QTY 1 LS

Electrical

a. Install Utility Transformer QTY 1 LS
b. Install Service to Meter QTY 1 LS
c. Install Panel and Equipment QTY 1 LS
d. Install Service to Flow Meter Vault QTY 1 LS

Miscellaneous Items

a. Tracking Pad QTY 1 LS
b. Tree Removal QTY 1 LS
c. Concrete Trail Demolition QTY 1 LS
d. Revegetation / Seeding / Erosion Control QTY 2 Acre

e. Surveying / Quality Control QTY 1 LS

Total Engineers Estimated Base Construction Cost $1,029,000.00 W/O Contingency

b. Map - A complete design for the project is attached for review.

c. Field Investigations – The City of Longmont performed complete field investigation as part of the resilient St. Vrain Project. Copies of their investigations are available upon request.

d. Right-of-Way/Land - the Bonus Ditch Company has a prescriptive right to own and operate a diversion structure on land owned by the City of Longmont within St. Vrain Creek. The improvements will continue to be located on land owned by the City of Longmont and connect to existing improvements located within existing easements on adjacent property. The City of Longmont and the Ditch Company are entering into an easement agreement regarding the new location of the improvements. A copy of the executed agreement will be forwarded upon completion.

1.4.3 Cost Estimate - see engineer's opinion of cost below:

BONUS DITCH

Engineers Opinion of Probable Construction Costs
Intake Structure and Pump Station

8/5/2016
Preliminary Design

	Construction Item	*Quantity*	*Unit*		*Cost*		*Extension*
1	**Mobilization, Demobilization, & General Conditions (10%)**	1	LS	$	94,000	$	94,000
					Subtotal	**$**	**94,000**
2	**Care of the River / Dewatering**	1	LS	$	75,000	$	75,000
					Subtotal	**$**	**75,000**
3	**Earthwork**						
	a. Site access	1	LS	$	15,000	$	15,000
	b. Structural Excavation and subgrade preparation	1	LS	$	45,000	$	45,000
	c. Soil Export	1000	CY	$	20	$	20,000
					Subtotal	**$**	**80,000**
3	**Diversion & Inlet Structure**						
	a. Inlet Structure Concrete with Transition Walls	135	CY	$	1,300	$	175,500
	b. 4" Leveling Gravel and 4" compressible board (Inlet Structure)	550	SF	$	25	$	13,750
	c. 6' x 6' SS Self Contained Fabricated Slide Gate	2	EA	$	40,000	$	80,000
	d. Trash Rack, Grating, and Miscellaneous Metals	1	LS	$	85,000	$	85,000
	e. Drilled Piers	1	LS	$	100,000	$	100,000
	f. Concrete pile cap	3	EA	$	4,000		12,000
	g. Submersible Pump	1	LS	$	32,000	$	32,000
	h. Discharge Piping	1	LS	$	43,000	$	43,000
	i. Road base working area	50	CY	$	60		3,000
	j. Bollards	6	EA	$	500	$	3,000
					Subtotal	**$**	**547,250**
4	**Flow Meter Vault & 12" Discharge Pipeline**						
	a. 9'x8' concrete vault w/ hatch	20	CY	$	1,300	$	26,000
	b. 12" Dia. C900 PVC Discharge Pipeline	145	LF	$	175	$	25,375
	c. Sump pump	1	LS	$	1,200	$	1,200
	d. Flowmeter and data logger	1	EA	$	20,000	$	20,000
	e. Pipe & fittings	1	LS	$	5,000	$	5,000
					Subtotal	**$**	**77,575**
5	**Bonus Ditch Connection Manhole**						
	a. 72" Precast Manhole	1	LS	$	12,000	$	12,000
	b. Connection to Existing 42" Dia. RCP Pipeline	1	LS	$	5,000	$	5,000
					Subtotal	**$**	**17,000**
6	**Electrical**						
	a. Utility Transformer	1	LS		28,800		28,800
	b. Service to Meter	1	LS		14,095		14,095
	c. Panel and equipment	1	LS		23,801		23,801
	d. Service to flow meter vault	1	LS		5,526		5,526
					Subtotal	**$**	**72,222**
6	**Miscellaneous**						
	a. Tracking Pad	1	LS	$	3,000	$	3,000
	b. Tree Removal	1	LS	$	12,000	$	12,000
	c. Concrete trail demolition	1	LS	$	15,000	$	15,000
	d. Revegetation / Seeding	2	Acre	$	3,000	$	6,000
	e. Surveying / Quality Control	1	LS	$	30,000	$	30,000
					Subtotal	**$**	**66,000**
					Total Construction Items (Items 1 through 6)	**$**	**1,029,000**
					Miscellaneous Unlisted Items @ 5%	**$**	51,450
					Subtotal	**$**	**1,080,450**
					Contingency @ 20%	$	216,090
					Estimated Total (rounded to nearest $1,000)	**$**	**1,297,000**

Notes:
1. Federal, State, or local permitting costs are not included.
2. Assumes construction will be completed in the late fall and winter months when creek flows are low.
3. Engineering costs not included.
4. Cost Estimate assumes City will provide power to new transformer.
5. Costs not included for land acquisition, easements, or right of way.
6. Communications or SCADA costs not included.
7. Construction costs may vary depending on the final alignment, shape, width, etc. of St. Vrain Creek.
8. Cost estimate for diverting St. Vrain creek, grade control wall, sandout channel, grouted boulders, riprap, etc. are to be included in the Creek project.
9. Cost estimate for reconstruction of greenway trail is not included.
10. Erosion control BMP's are not included

2.4.4 Implementation Schedule

We anticipate the project will be constructed fall 2017/spring 2018 will completion by March 30, 2018.

Apply to CWCB for Loan	August 2017
Place project out to bid	September 2017
Obtain City of Longmont Flood Plain Development Permit & Storm Water Quality Permit	September 2017
Award contract	October 2017
Begin Construction	November 2017
Complete Construction	March 2018

2.4.5 Impacts

The plan to construct the project during fall/winter months when the river is at its lowest will minimize impacts to the environment. The phasing and implementation is meant to coincide with the City of Longmont Resilient St. Vrain Project. No impacts to land use, recreation or economic development have been identified. Water quality impacts will be managed through the construction process through appropriate storm water quality management. The City of Longmont will issue a Flood Plain Development Permit and Storm Water Quality Management permit prior to construction.

1.4.6 Institutional Feasibility

The City of Longmont completed an Environmental Assessment for the Resilient St. Vrain Project. This reach of the river was included in the assessment. Work in the river will be completed by the City as part of their project. That work is currently under construction with all necessary permits in hand. The Resilient St. Vrain Project (including the needed Bonus Ditch Diversion Structure) obtained a Finding of No Significant Impact as part of the review process. All appropriate agencies were consulted as part of that process. The Ditch Company will obtain a flood plain development permit and Storm Water Quality Management permit from the City of Longmont. We do not anticipate that additional permits or consultation will be required to implement the project as proposed.

1.5 Financial Feasibility Analysis

1. Loan Amount - This request is for 90% of the $1,297,000 project costs - $1,167,300 for a 30 year cost at a 1.75% rate of interest.

2. Financing Sources – Sources of funding for the project, include this loan and 10% funding for the loan match by the shareholders through assessments. Please see the attached analysis, including how the local share will be provided.

3. Revenue and Expenditure Projections – Please see the attached analysis.

4. Loan Repayment Sources - we anticipate reimbursement from FEMA for approximately $771,750 and annual assessments to pay off the remainder of the loan. Please see the attached analysis, including how the local share will be provided.

5. Financial Impacts – The ditch Company has no existing debt. The loan will be repaid through a combination of a flood recovery grant from FEMA and annual assessments to the shareholders.

6. TABOR (Taxpayer's Bill of Rights) Issues – TABOR does not apply to this project.

7. Collateral – The Ditch Company can use the new structure and associate pumps if required to secure the loan.

8. Sponsor Creditworthiness -

   a) Current schedule of rates or assessments - the 2017 assessment is $250 per share.

   b) Copies of the three most recent audit reports of financial statements - the Bonus Ditch does not have audited financial reports. The past three years of financial reports are attached.

   c) A current credit report, if requested. Please let us know if CWCB requires a credit report.

1.6 Conclusions and Recommendation

Based on the information provided we believe the project as presented is feasible. The environmental considerations have been addressed and the project was designed by a professional engineering firm with significant experience designing diversion structures in Colorado. The Bonus Ditch has a history of maintenance and operation of their facilities and managed repair of the Left Hand Creek Diversion Structure in 2014. In addition, the City of Longmont and Boulder County will soon own 87 of the 100 shares in the Ditch. The portion of the irrigated area owned by Golden Land is currently in the process of Annexation to the City of Longmont. If the Annexation is approved, the 34 shares belonging to Golden Land will be dedicated to the City of Longmont as part of the process.

1.7 Loan Request Submittals

The following is a list of documents that should be submitted with a loan request:

a. Transmittal Letter – Attached
b. Loan Application - A signed Loan Application is attached
c. Loan Feasibility Study – A completed Loan Feasibility Study is submitted for staff review and comment.

Loan Feasibility Report Attachments include:

Bonus Ditch Articles of Incorporation
Bonus Ditch Bylaws
Bonus Ditch Financial Statement 2014-2016
Loan Repayment Analysis
Resilient St. Vrain Environmental Impact Statement
Resilient St. Vrain Finding of No Significant Impact
Bonus Ditch Intake and Pump Station -Engineers Opinion of Cost
Bonus Ditch Pre-disaster Estimate and New Channel Width Estimate

7.21.16 Bonus Ditch Full Plan Set reduced

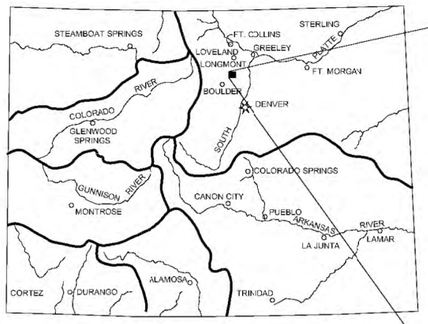
CONSTRUCTION PLANS FOR

BONUS DITCH COMPANY
INTAKE STRUCTURE AND PUMP STATION

BOUNDER COUNTY,COLORADO

PREPARED FOR:

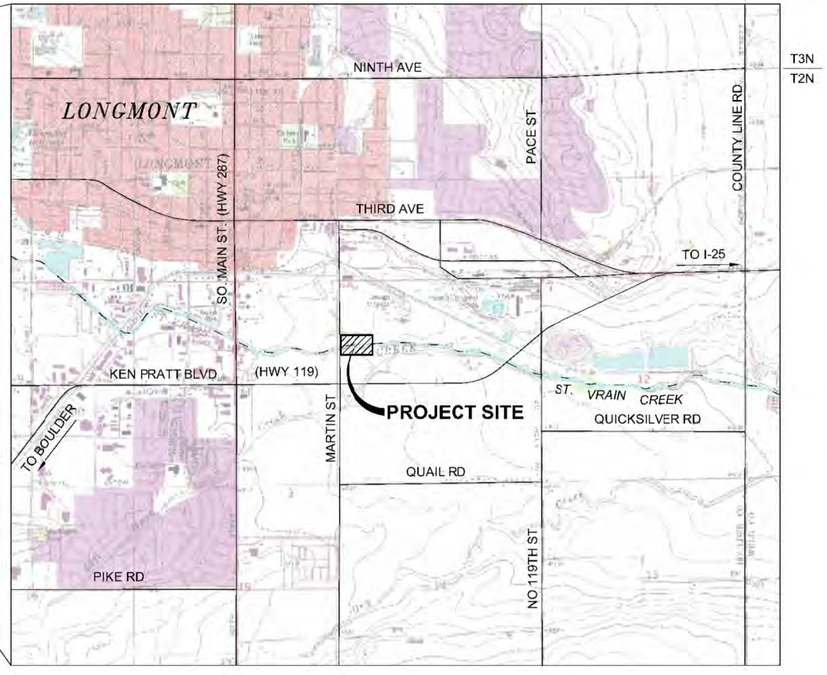
BONUS DITCH COMPANY
PO BOX 771,
LONGMONT, COLORADO 80502



STATE OF COLORADO
PROJECT LOCATION MAP

NORTH

SCALE: NONE



PROJECT VICINITY MAP

NORTH

APPROX. SCALE: 1"=2000'

0 2000 4000

SCALE IN FEET

Sheet List Table

NOTES:

DEERE AND AULT CONSULTANTS, INC. IS NOT A GUARANTOR OF THE PERFORMANCE OF THE WORK.

DEERE AND AULT CONSULTANTS, INC. IS NOT RESPONSIBLE FOR SAFETY, IN, ON, OR ABOUT THE PROJECT SITE, NOR FOR COMPLIANCE BY THE APPROPRIATE PARTY WITH ANY REGULATIONS RELATED THERETO.

DEERE AND AULT CONSULTANTS, INC. EXERCISES NO CONTROL OVER THE SAFETY OR ADEQUACY OF ANY EQUIPMENT, BUILDING COMPONENTS, FORMS, OR OTHER WORK AIDS USED IN OR ABOUT THE PROJECT, OR OVER THE SUPERINTENDING OF THE SAME.

WRITTEN SCALES ON PLAN ARE FOR FULL SIZED 22" x 34" PLANS AND DO NOT APPLY TO REDUCED PLAN SETS.

811 Know what's below. Call before you dig.

CALL 3-BUSINESS DAYS IN ADVANCE BEFORE YOU DIG, GRADE, OR EXCAVATE FOR THE MARKING OF UNDERGROUND MEMBER UTILITIES.

DEERE & AULT CONSULTANTS, INC. ASSUMES NO RESPONSIBILITY FOR EXISTING UTILITY LOCATIONS (HORIZONTAL AND VERTICAL). THE EXISTING UTILITIES SHOWN ON THIS DRAWING HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. IT IS, HOWEVER, THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY THE LOCATION OF ALL UTILITIES PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION ACTIVITIES.

CERTIFICATION:

I HEREBY CERTIFY THAT THESE PLANS FOR THE CONSTRUCTION OF DIVERSION & INTAKE STRUCTURES TO BONUS DITCH WERE PREPARED UNDER MY DIRECT SUPERVISION FOR THE OWNERS THEREOF

BY: _____

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		DR CHK	G CHURCH	APVD

R HINES, A WOLFEL RECK, B HOGNESS

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

SAINT VRAIN IMPROVEMENT PROJECT – CITY REACH 1

COVER SHEET

DESIGN DEVELOPMENT

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD–C–01
SHEET	of

EXISTING CONDITIONS

0 50 100
SCALE IN FEET

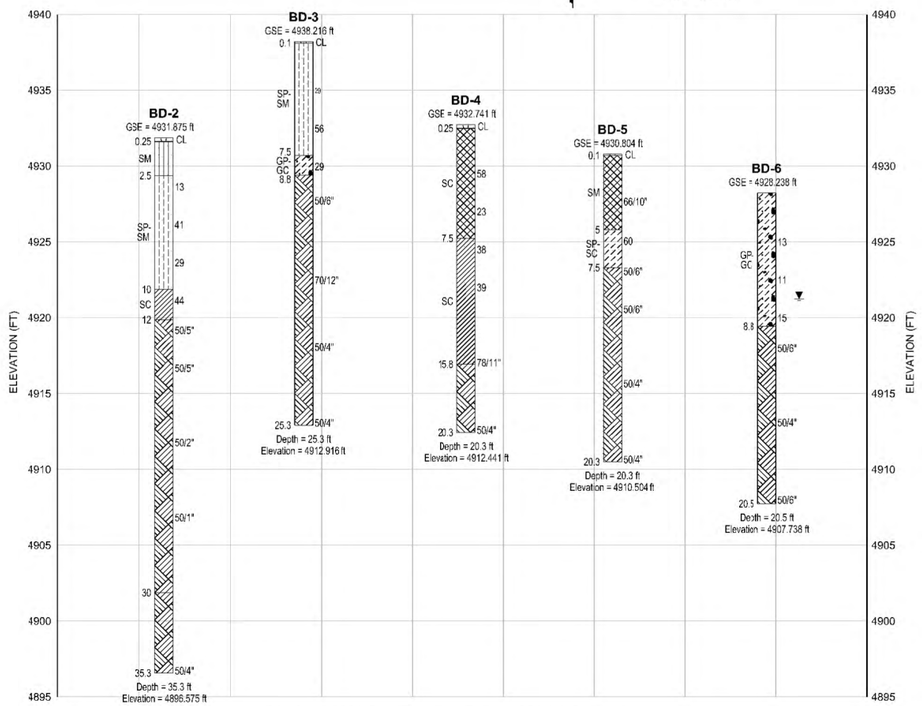
SURVEY CONTROL TABLE
PROJECT CONTROL

POINT NUMBER	NORTHING	EASTING	ELEVATION
116	1299761.589	3114788.554	4932.712
117	1299740.689	3114533.168	4931.225
118	1299991.521	3114809.151	4926.345
129	1299994.562	3114570.178	4929.626

CP118 SURVEY CONTROL POINT

SURVEY CONTROL NOTES:

1. NOT ALL CONTROL POINTS ARE WITHIN PROJECT LIMITS.
2. SEE GRADING PLANS SHEETS FOR PARCEL OWNERS.
3. SOURCE OF TOPOGRAPHY SHOWN ON THE CIVIL PLANS ARE BASE MAPS PROVIDED BY SURVEYING AND MAPPING LLC. ADDITIONAL MAPPING HAS BEEN ADDED FROM AS-BUILT DATA, DESIGN DATA, AND SUPPLEMENTAL SURVEY FROM CITY OF LONGMONT, ATKINS, AND ANDERSON CONSULTING ENGINEERS, INC. EXISTING CONDITIONS MAY VARY FROM THOSE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND ADJUST WORK PLAN ACCORDINGLY PRIOR TO BEGINNING CONSTRUCTION.
4. HORIZONTAL DATUM: COLORADO STATE PLANE (NAD83) NORTH ZONE SCALED TO GROUND AT 0, 0, 0 SCALE FACTOR 1.000276887
5. VERTICAL DATUM: NAVD88.
6. EXISTING TOPOGRAPHY, STRUCTURES, AND SITE FEATURES ARE DASHED, SHOWN SCREENED AND/OR LIGHT-LINED. NEW FINISH GRADE, STRUCTURES, AND SITE FEATURES ARE SHOWN SOLID AND/OR HEAVY LINED.
7. MAINTAIN, RELOCATE, OR REPLACE EXISTING SURVEY MONUMENTS, CONTROL POINTS, AND STAKES WHICH ARE DISTURBED OR DESTROYED. PERFORM THE WORK TO PRODUCE THE SAME LEVEL OF ACCURACY AS THE ORIGINAL MONUMENT(S) IN A TIMELY MANNER, AND AT THE CONTRACTOR'S EXPENSE.
8. TEST HOLE LOCATIONS (BD2, BD3, BD4, BD5 & BD6) ARE APPROXIMATE AND WERE DRILLED BY CH2M IN EARLY 2016. FOR SUMMARY LOGS SEE SHEET BD-C-02.



SUMMARY LOGS OF EXPLORATORY BORINGS

0 5 10
SCALE IN FEET

TYPICAL TEST HOLE SYMBOL

BD-5 LOCATION IN PLAN VIEW

TYPICAL TEST HOLE LOG

GROUNDWATER DEPTH AT TIME OF DRILLING

GRAPHIC MATERIAL DESCRIPTION

LEGEND:

CL	SANDY LEAN CLAY WITH GRAVEL
SC	CLAYEY SAND WITH GRAVEL
GC	CLAYEY GRAVEL AND SAND
SM	SILTY SAND WITH GRAVEL
GP-GC	POORLY GRADED GRAVEL WITH SAND
SP-SM	POORLY GRADED SAND WITH SILT AND GRAVEL
GM	SILTY GRAVEL WITH SAND
GP-GM	POORLY GRADED GRAVEL WITH SILT AND SAND
BR	BEDROCK

GENERAL SITE NOTES:

1. STAGING AREA SHALL BE FOR CONTRACTOR'S EMPLOYEE PARKING, CONTRACTOR'S TRAILERS AND ON-SITE STORAGE OF MATERIALS.
2. SLOPE UNIFORMLY BETWEEN CONTOURS AND SPOT ELEVATIONS SHOWN.
3. UNLESS SHOWN ON THE LANDSCAPING, ALL DISTURBED AREAS NOT RECEIVING A HARD SURFACE SHALL BE SEEDED AND MULCHED.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR IMPLEMENTING AND MAINTAINING EROSION CONTROL DEVICES DURING CONSTRUCTION. EROSION CONTROL DEVICES SHOWN ARE THE MINIMUM REQUIRED. REFER TO VOL 3 STORM WATER POLLUTION CONTROL.
5. CONTRACTOR SHALL TAKE ALL OTHER MEASURES TO POSITIVELY PRECLUDE EROSION MATERIALS FROM LEAVING THE SITE. CONTRACTOR TO SUBMIT EROSION CONTROL PLAN FOR APPROVAL PRIOR TO MOBILIZATION.
6. ALL CALL OUTS AND NOTES ARE DIRECTED TO CONTRACTOR UNLESS SPECIFICALLY STATED OTHERWISE.
7. REMOVE TREES, SHRUBS, OR OTHER PLANTINGS ONLY IF DIRECTED BY THE ENGINEER TO DO SO.
8. THE ABBREVIATIONS AND SYMBOLS IN THESE PLANS SUPPLEMENT OR MODIFY, I.E. TAKE PRIORITY OVER THOSE IN THE STANDARD SPECIFICATION.
9. CONTRACTOR SHALL PROTECT PUBLIC AND PRIVATE PROPERTY IN ACCORDANCE WITH SPECIFICATIONS.
10. CONTRACTOR SHALL REPLACE OR REPAIR DAMAGED PROPERTY AT HIS SOLE EXPENSE.
11. ALL WORK SHALL CONFORM TO THESE DRAWINGS AND SPECIFICATIONS. DRAWING SCALES ARE SHOWN FOR REFERENCE ONLY. DIMENSIONS ON THE DRAWINGS SHALL BE USED FOR CONSTRUCTION AND SHALL ALWAYS TAKE PRECEDENCE OVER SCALED MEASUREMENTS.
12. DISPOSE OF ALL MATERIALS DESIGNATED FOR REMOVAL AT AN APPROVED DISPOSAL SITE, UNLESS NOTED OTHERWISE.

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		DR	CHK	APVD

R HINES, A WOLFE| RECK, B HOGNESS | G CHURCH | G CHURCH

DESIGN DEVELOPMENT

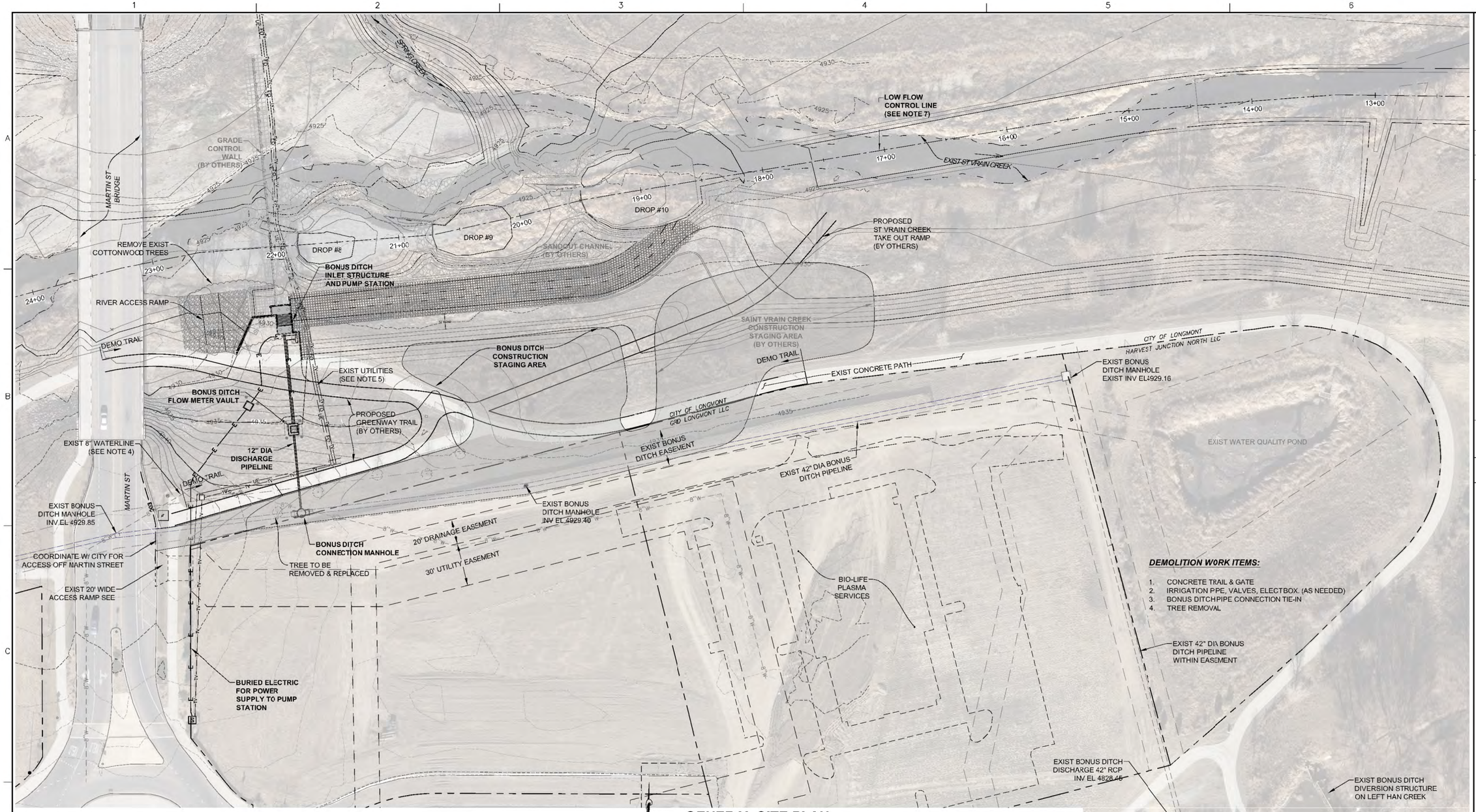
DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

EXISTING CONDITIONS, SURVEY CONTROL & GEOTECH DATA

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-C-02
SHEET	of



GENERAL SITE PLAN

0 40 80

SCALE IN FEET
CONTOUR INTERVAL = 5 FT

DEMOLITION WORK ITEMS:

1. CONCRETE TRAIL & GATE
2. IRRIGATION PPE, VALVES, ELECTBOX. (AS NEEDED)
3. BONUS DITCH PIPE CONNECTION TIE-IN
4. TREE REMOVAL

NOTES:

1. EXISTING AIR PHOTO TAKEN FROM 2015 ORTHOGRAPHIC PHOTOS SUPPLIED BY CH2M HILL.
2. PROPERTY AND EASEMENT LNE LOCATIONS ARE APPROXIMATE AND WERE PROVIDED BY CH2M AND WERE TAKEN FROM THE CITY OF LONGMONT GIS AND THE PRELIMINARY PUD/FINAL PUD FOR BIOLIFEPLASMA SERVICES. BONUS DITCH EASEMENT IS DESCRIBED AS 30 FT WIDE.
3. PROPOSED GRADING CONTOURS ARE TAKEN FROM CURRENT DESIGN AND WEREPROVDED PER CH2M HILL, AND MAY BE ADJUSTED.
4. PRESERVE & PROTECT EXISTING 8" DIA WATERLNE LOCATION TYPE, AND SIZE PROVIDED BY CITY OF LONGMONT. LOCATION IS APPROXIMATE.
5. EXISTING UTILITIES CROSSING ST VRAIN CREEK WERE INSTALLED BY DIRECTIONAL DRILLING IN SPRING 2015. THE UTILITIES CONSIST OF 3-3" CONDUITS WITH HIGH VOLTAGE TRANSMISSION CABLES (LPC), 1-2" CONDUIT WITH FIBER OPTIC CABLES (LPC) AND 2 OR 3-2" COMCAST COMMUNICATION CABLES. THE CONTRACTOR SHALL CONTACT UTILITY LOCATION FOR CLEARANCE BEFORE ANY EXCAVATION SHALL BEGIN.
6. EXISTING IRRIGATION LINES NOT SHOWN ON THIS SHEET. SEE SHEET BD-C-02, REMOVE AS NEEDED. IRRIGATION WILL BE REPLACED BY OTHERS.
7. LOW FLOW CONTROL LINE PROVIDED BY CH2M HILL TO REPRESENT THE PROPOSED ST. VRAIN CREEK CHANNEL CENTERLINE.
8. ACCESS FOR CONSTRUCTION OF BONUS DITCH INTAKE STRUCTURE & PUMP STATION SHALL BE FROM MARTIN STREET FOLLOWING THE CONSTRUCTION ACCESS ROAD TO THE BONUS DITCH STAGING AREA. THIS ACCESS WILL BE SHARED W/ THE SAINT VRAIN CREEK PROJECT CONTRACTOR.
9. CONSTRUCTION SIGNAGE SHALL BE POSTED ALONG MARTIN STREET PER CITY OF LONGMONT STANDARDS. TRAFFIC CONTROL PLAN TO BE SUBMITTED TO THE CITY OF LONGMONT FOR APPROVAL
10. PLACEMENT FOR GRAVEL TRACKING PAD SHALL BE CONFIRMED AND APPROVED BY THE CITY OF LONGMONT GRAVEL TRACKING PAD SHALL BE MAINTAINED DURING CONSTRUCTION ACTIVITIES.
11. CONSTRUCTION PARKING AND STAGING INCLUDING CONCRETE WASHOUT SHALL BE AS SHOWN ON THE CONSTRUCTION DRAWINGS IN THE "CONSTRUCTION STAGING AREA" ANY CHANGES TO STAGING IN THIS AREA SHALL BE APPROVED BY ENGINEER AND CITY OF LONGMONT.
12. REMOVAL OF EXISTING TREES SHALL NOT BEGIN UNTIL APPROVAL IS RECEIVED FROM THE ENGINEER AND CITY OF LONGMONT.

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		DR	CHK	APVD

R HINES, A WOLFEL RECK, B HOGNESS — G CHURCH — G CHURCH

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

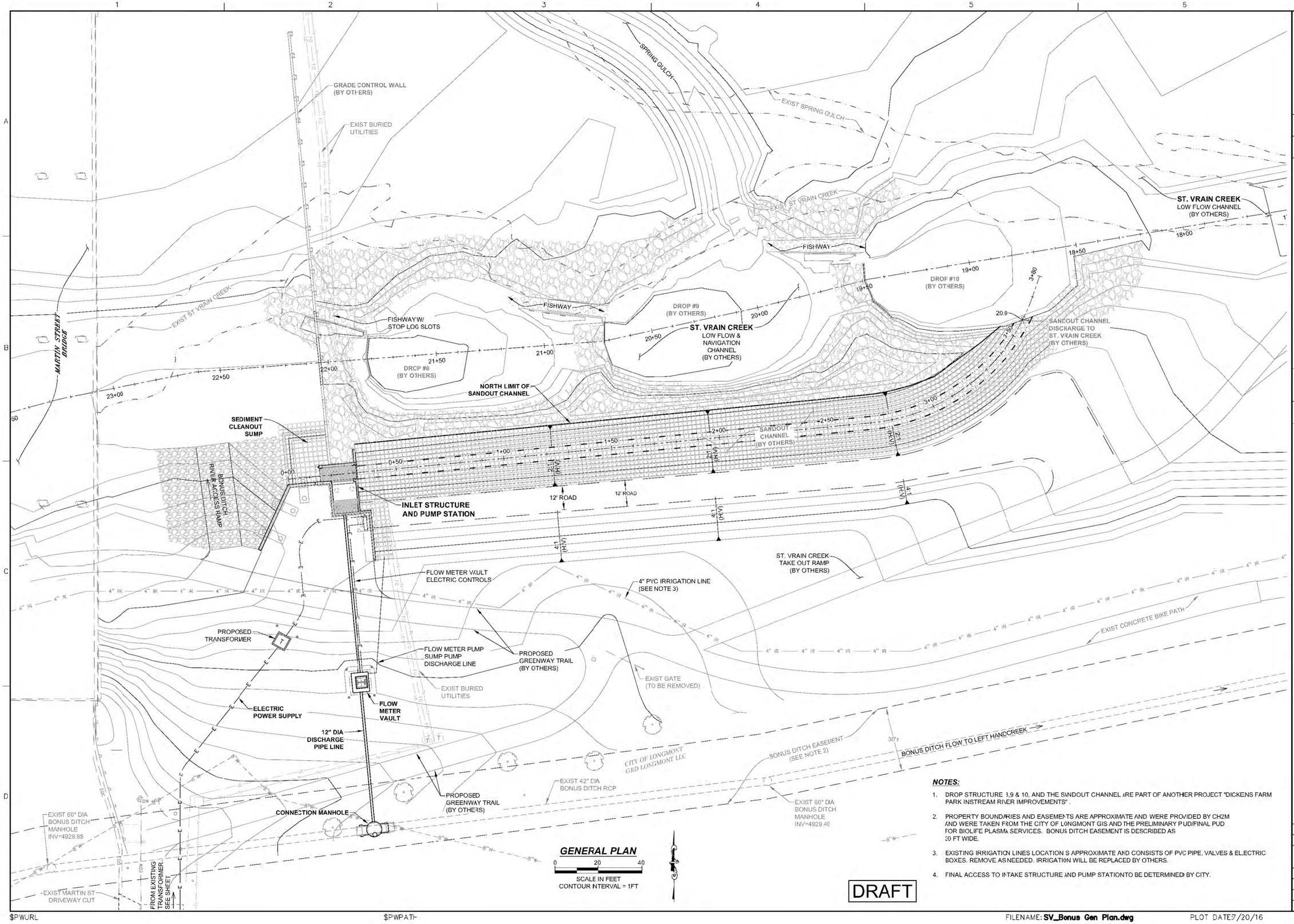
GENERAL SITE PLAN

DESIGN DEVELOPMENT

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-C-03
SHEET	of



GENERAL PLAN

0 20 40

SCALE IN FEET
CONTOUR INTERVAL = 1FT

DRAFT

NOTES:

1. DROP STRUCTURE 3,9 & 10, AND THE SANDOUT CHANNEL ARE PART OF ANOTHER PROJECT "DICKENS FARM PARK INSTREAM RIVER IMPROVEMENTS".
2. PROPERTY BOUNDARIES AND EASEMENTS ARE APPROXIMATE AND WERE PROVIDED BY CH2M AND WERE TAKEN FROM THE CITY OF LONGMONT GIS AND THE PRELIMINARY PUD/FINAL PUD FOR BIOLIFE PLASMA SERVICES. BONUS DITCH EASEMENT IS DESCRIBED AS 30 FT WIDE.
3. EXISTING IRRIGATION LINES LOCATION S APPROXIMATE AND CONSISTS OF PVC PIPE, VALVES & ELECTRIC BOXES. REMOVE AS NEEDED. IRRIGATION WILL BE REPLACED BY OTHERS.
4. FINAL ACCESS TO INTAKE STRUCTURE AND PUMP STATION TO BE DETERMINED BY CITY.

PRELIMINARY
NOT FOR
CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		DR	CHK	APVD

G CHURCH

R HINES, A WOLFEL RECK, B HOGNESS

G CHURCH

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH CONFLUENCE

GENERAL INTAKE STRUCTURE, PUMP STATION & PIPING

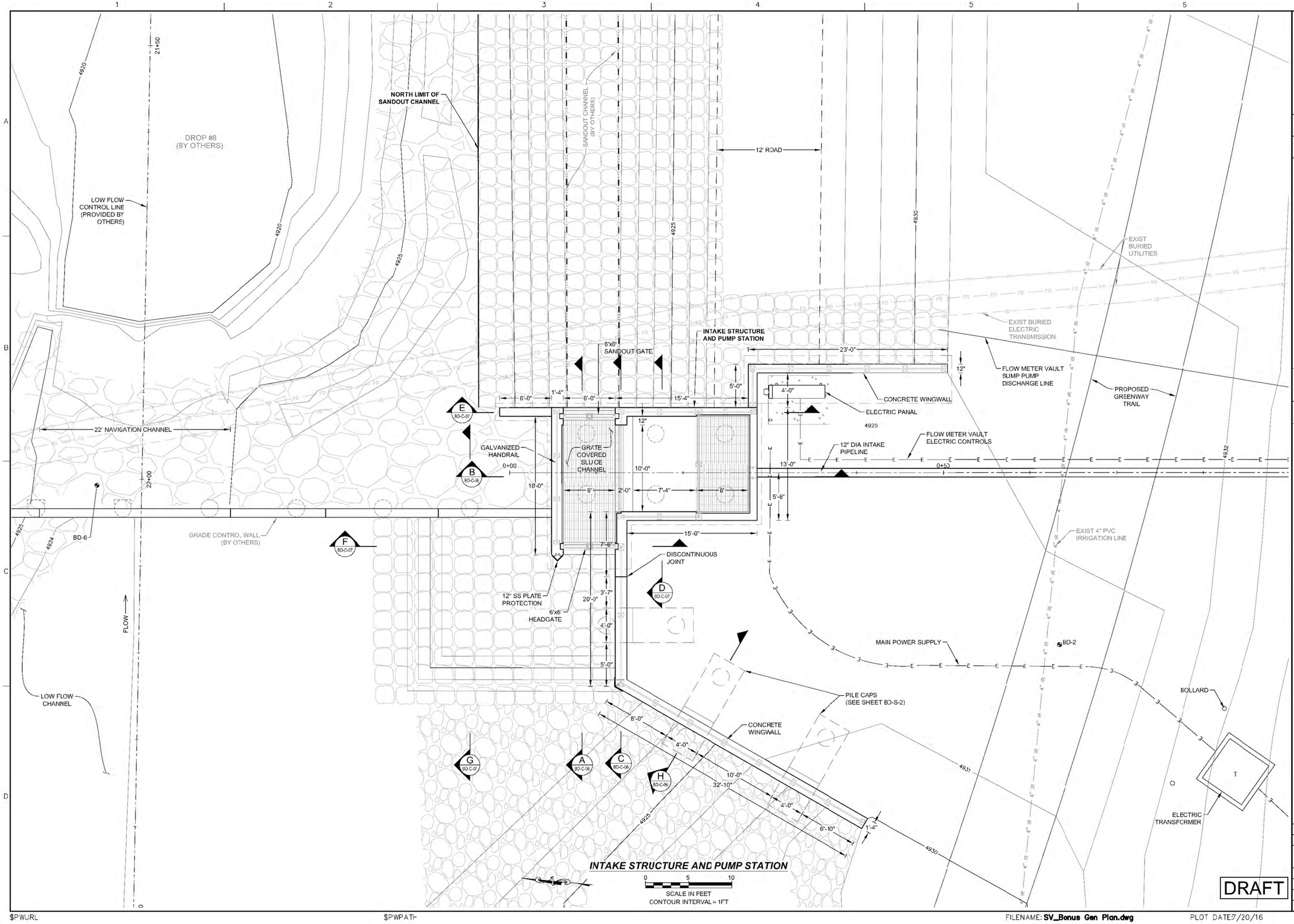
DESIGN DEVELOPMENT

VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD–C–04
SHEET	of

$PWURL $PWPATH FILENAME: SV_Bonus Gen Plan.dwg PLOT DATE: 7/20/16 PLOT TIME: 15:04



PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		DR CHK	G CHURCH	APVD

R HINES, A WOLFEL RECK, B HOGNESS

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

INTAKE STRUCTURE AND PUMP STATION PLAN

DESIGN DEVELOPMENT

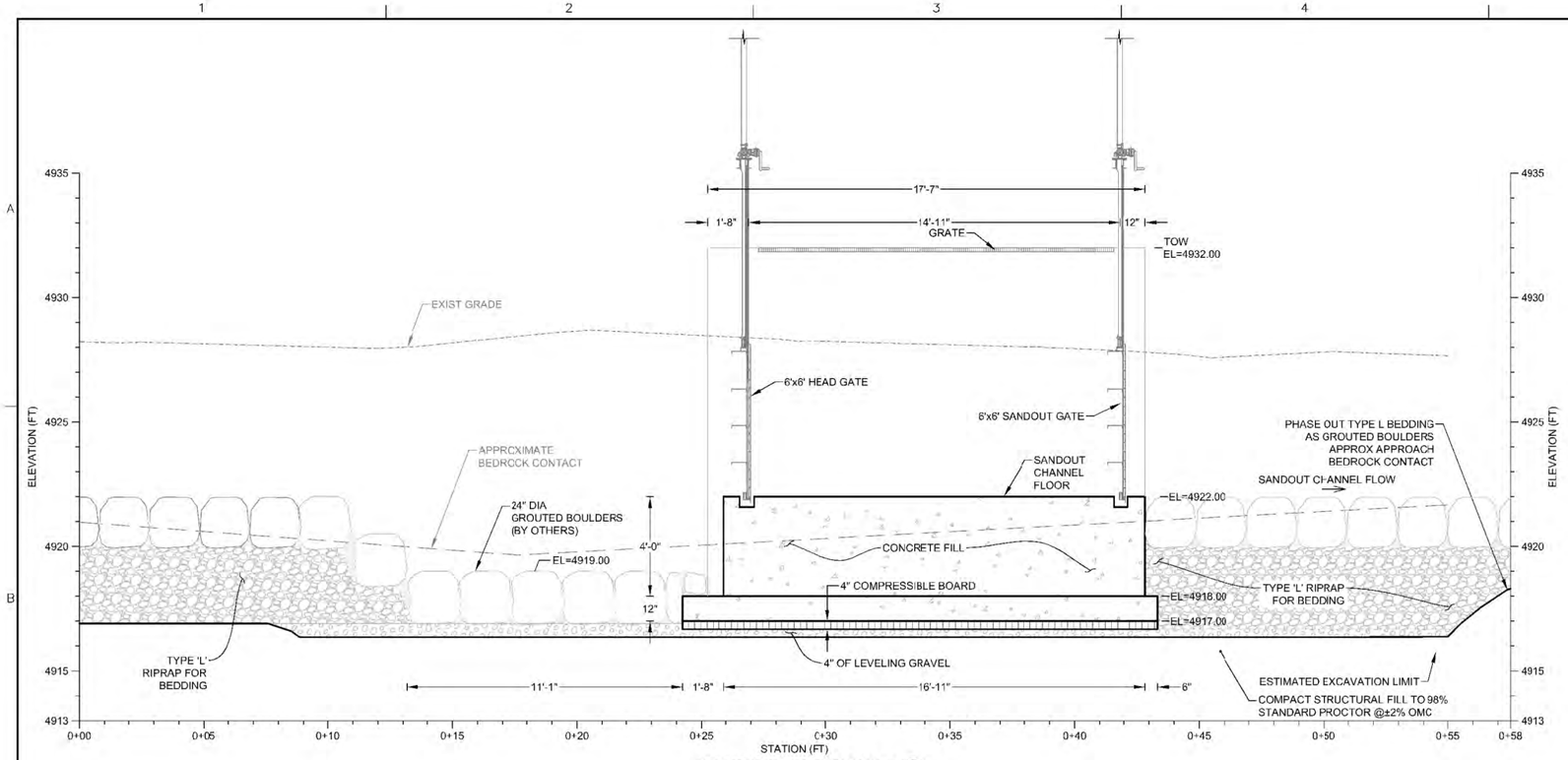
VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-C-05
SHEET	of

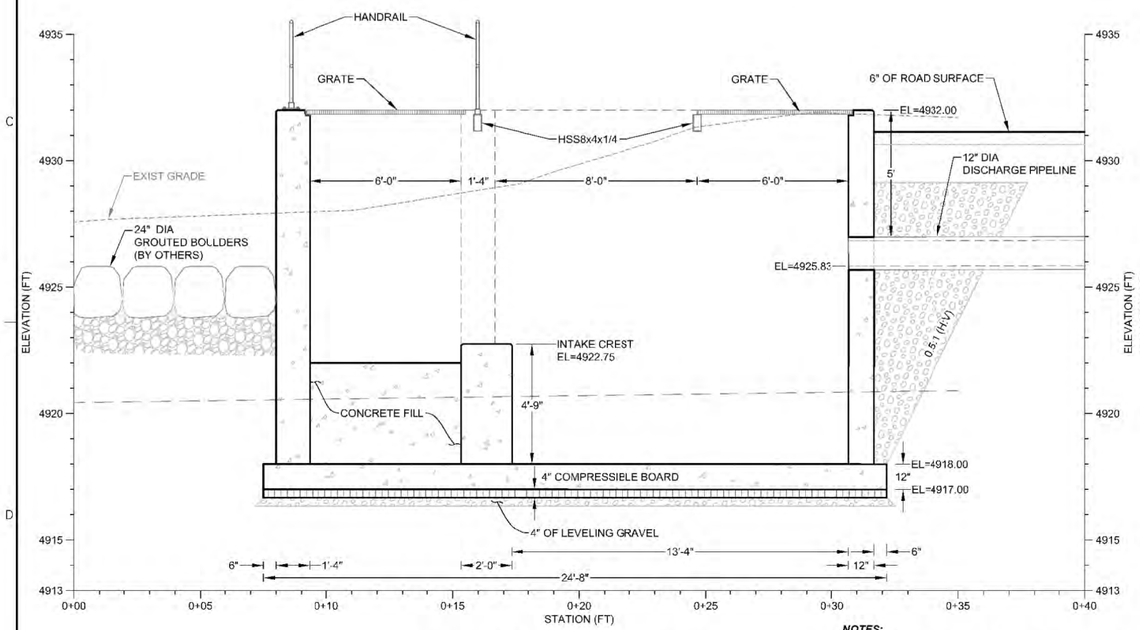
DRAFT

$PWURL $PWPATH FILENAME: SV_Bonus Gen Plan.dwg PLOT DATE7/20/16 PLOT TIME:15:04



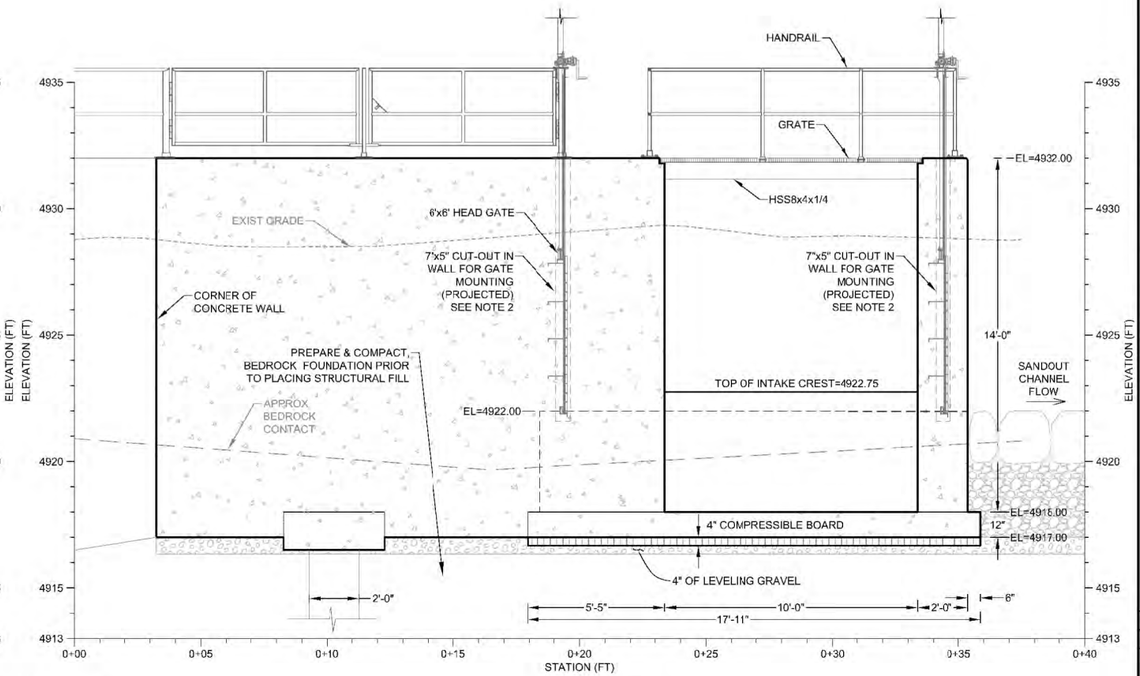
SEDIMENT CLEANOUT & DIVERSION STRUCTURE (A, BD-C-05)

0 3 6
SCALE IN FEET



DIVERSION & INTAKE SECTION (B, BD-C-05)

0 3 6
SCALE IN FEET



SECTION (C, BD-C-05)

0 3 6
SCALE IN FEET

NOTES:

1. ELEVATION 4923.4 IS THE APPROXIMATE MINIMUM DESIGN WATER LEVEL FOR PROVIDING 10CFS OF WATER OVER THE INTAKE CREST.
2. CONTRACTOR TO VERIFY GATE MOUNTING BLOCK-OUT DIMENSIONS FOR FLOOR & WALLS PRIOR TO PLACING CONCRETE FORMS.

PRELIMINARY
NOT FOR
CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		DR	CHK	APVD

R HINES, A WOLFEL RECK, B HOGNESS — G CHURCH — G CHURCH

DEERE & AULT CONSULTANTS, INC.

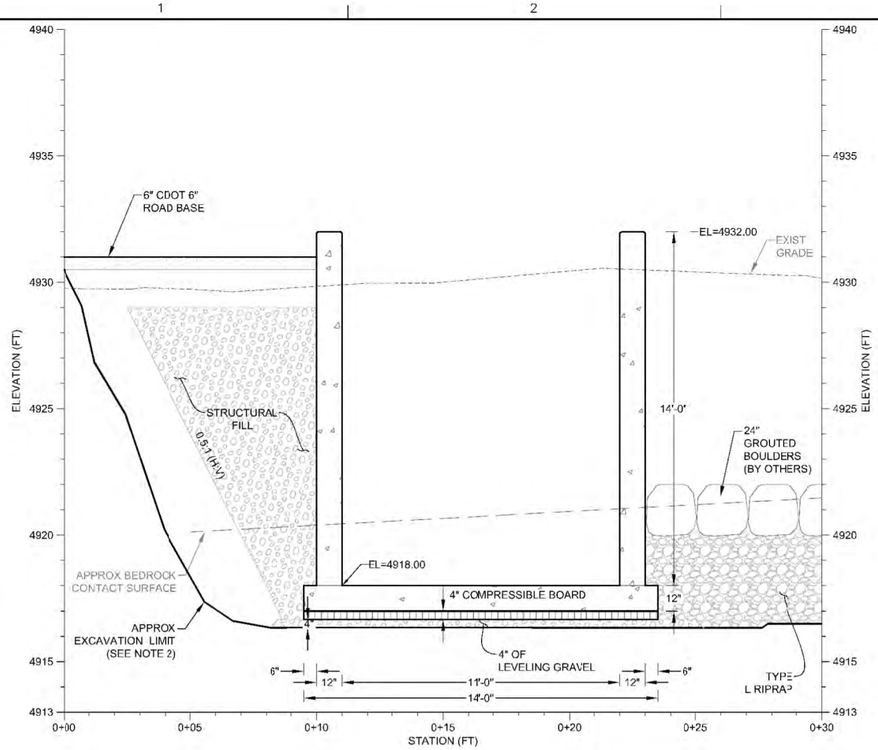
BONUS DITCH COMPANY

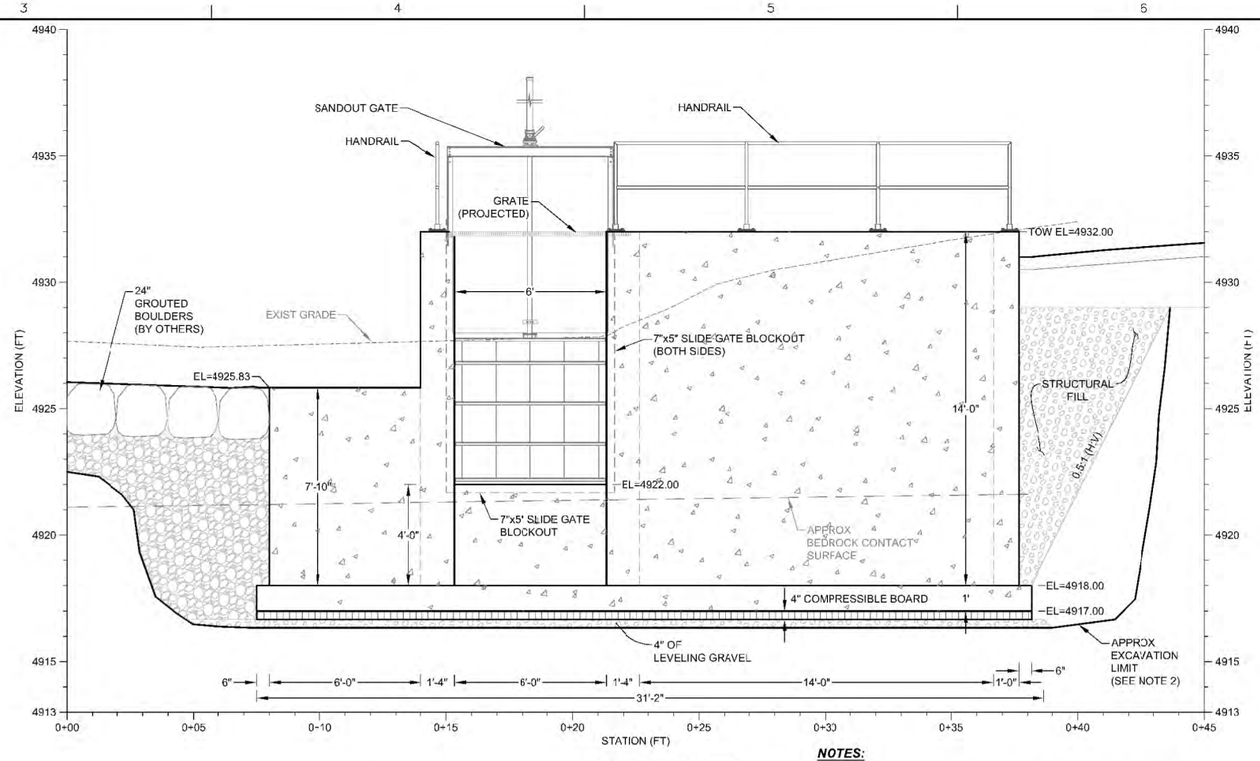
INTAKE STRUCTURE SECTIONS I

DESIGN DEVELOPMENT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-C-06
SHEET	of



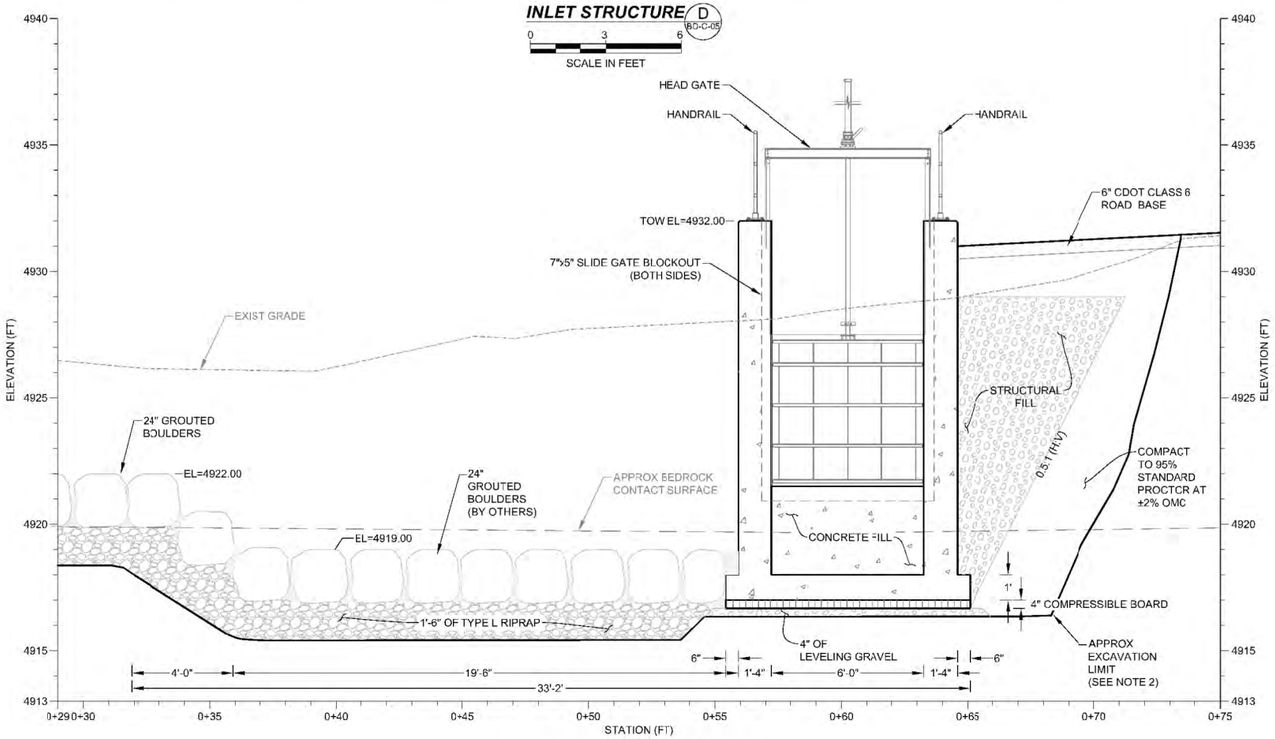


INLET STRUCTURE D

BD-C-05

0 3 6

SCALE IN FEET



SEDIMENT CLEANOUT SUMP F

BD-C-05

0 3 6

SCALE IN FEET

INLET STRUCTURE E

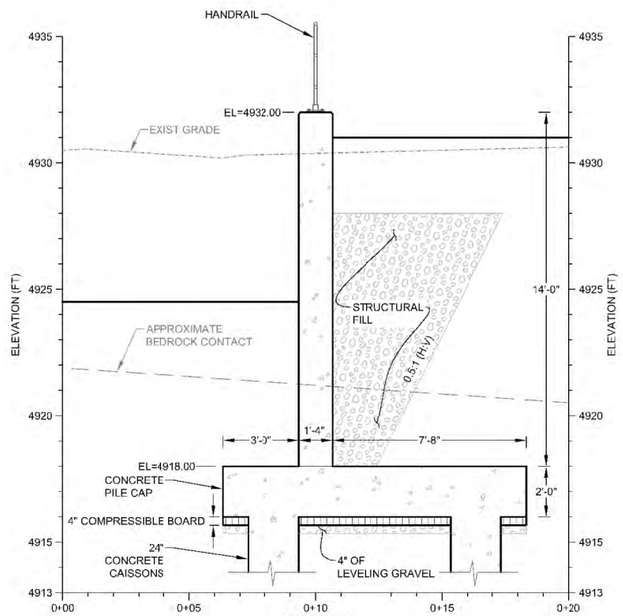
BD-C-05

0 3 6

SCALE IN FEET

NOTES:

1. DEPTH OF GATE EMBED INTO CONCRETE WALL TO BE VERIFIED BY CONTRACTOR PRIOR TO SUBMITTAL TO ENGINEER FOR APPROVAL.
2. EXCAVATION LINES FOR STRUCTUREINSTALLATION ARE SHOWN FOR INFORMATION PURPOSES ONLY. CONTRACTOR TO SHORE OR SLOPE ALL EXCAVATION SLOPES TO MEET ALL OSHA REGULATIONS.



WEST WINGWALL SECTION H

BD-C-05

0 3 6

SCALE IN FEET

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		DR	CHK	G CHURCH
			APVD	G CHURCH

R HINES, A WOLFE| RECK, B HOGNESS

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

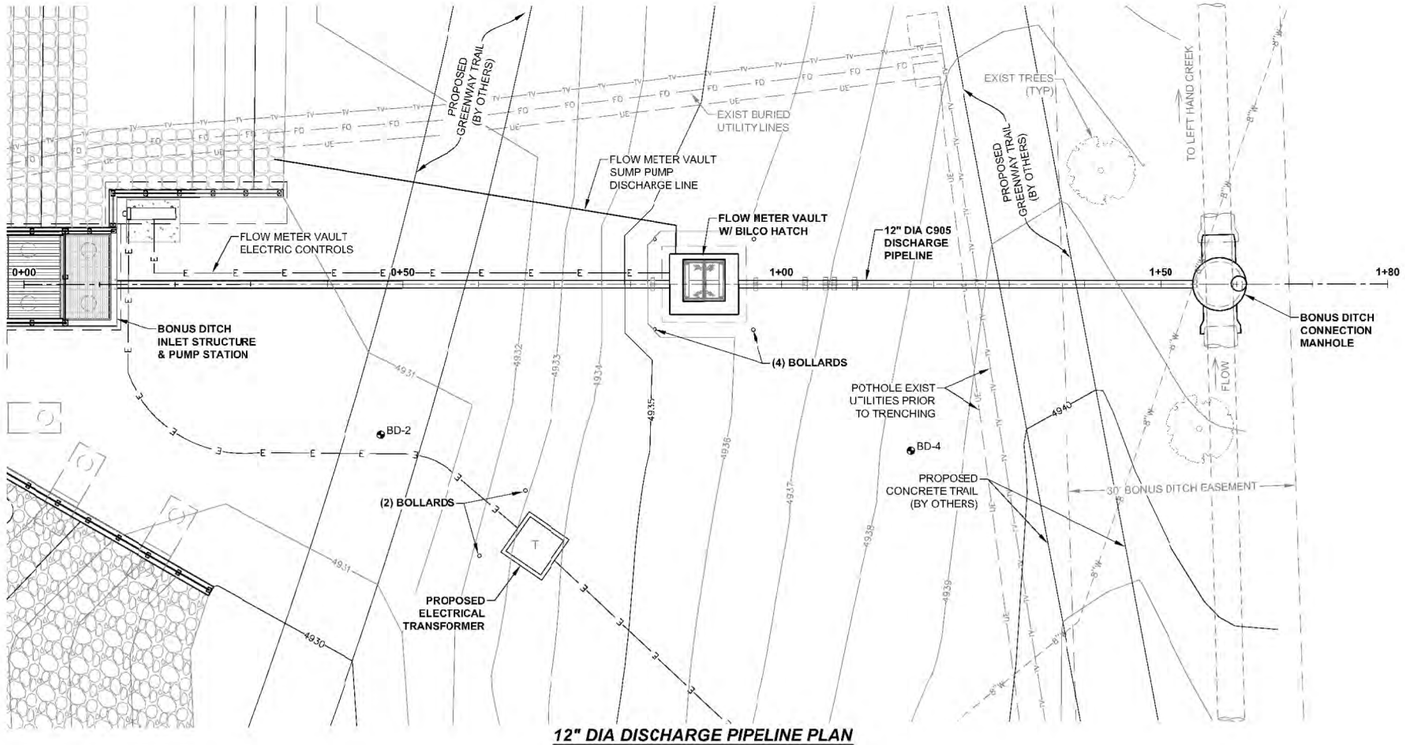
INTAKE STRUCTURE SECTIONS II

DESIGN DEVELOPMENT

VERIFY SCALE

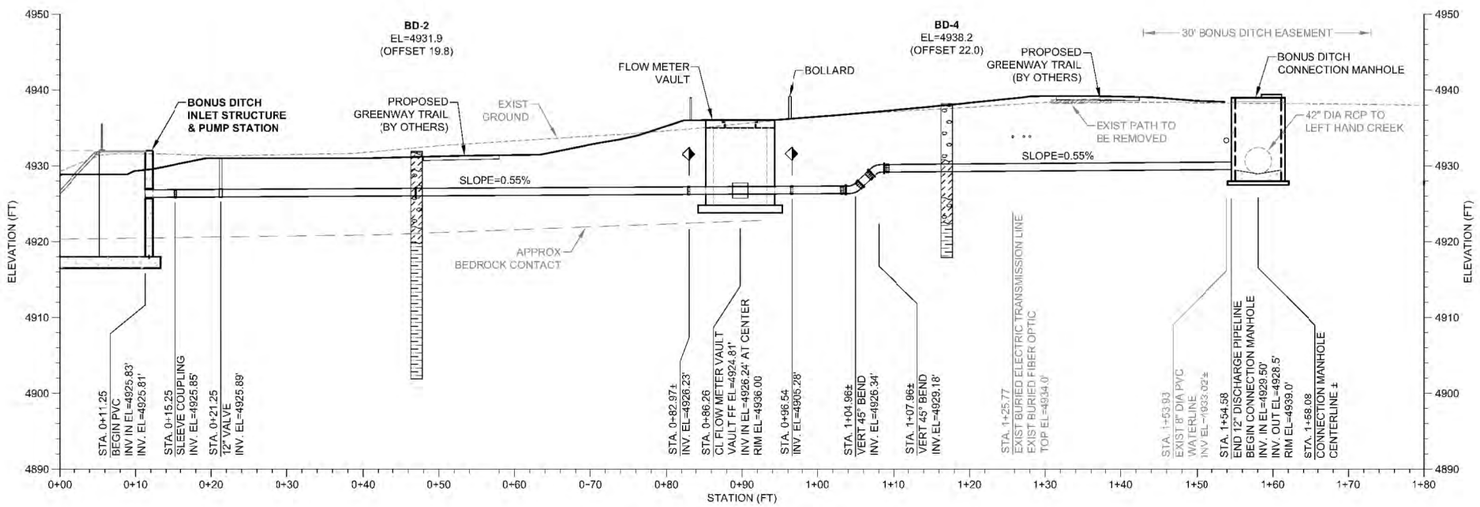
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-C-07
SHEET	of



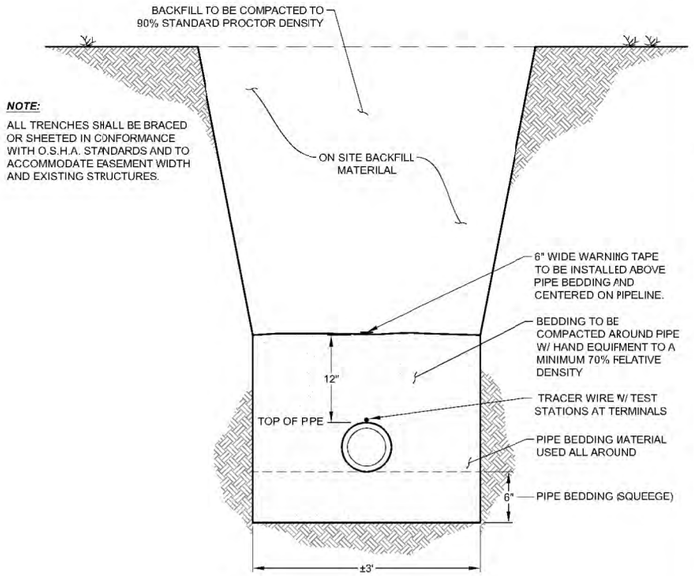
12" DIA DISCHARGE PIPELINE PLAN

0 10 20
SCALE IN FEET
CONTOUR INTERVAL = 1FT



12" DIA DISCHARGE PIPELINE PROFILE

0 10 20
SCALE IN FEET



NOTE:

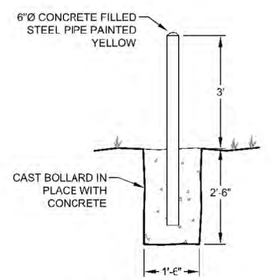
ALL TRENCHES SHALL BE BRACED OR SHEETED IN CONFORMANCE WITH O.S.H.A. STANDARDS AND TO ACCOMMODATE EASEMENT WIDTH AND EXISTING STRUCTURES.

TYPICAL TRENCH DETAIL

NTS

NOTES:

1. MIN. COVER TO BE BELOW FINAL STREET GRADE WHEN AVAILABLE.
2. TRENCH TO BE BRACED OF SHEETED AS NECESSARY FOR THE PROTECTION OF OTHER UTILITIES AND TO MEET LOCAL, STATE & FEDERAL REQUIREMENTS.
3. TRENCH WIDTH SHALL BE MORE THAN 16 INCHES NOR LESS THAN 12 INCHES WIDER THAN THE LARGEST OUTSIDE DIAMETER OF THE PIPE LAID THEREIN. (BELL OR COUPLING O.D., IF APPLICABLE).



BOLLARD DETAIL

J
BD-C-05

0 2 4
SCALE IN FEET

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	DR	REVISION	CHK	APVD	BY	APVD
DSGN							G CHURCH

R HINES, A WOLFEL RECK, B HOGNESS — G CHURCH

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

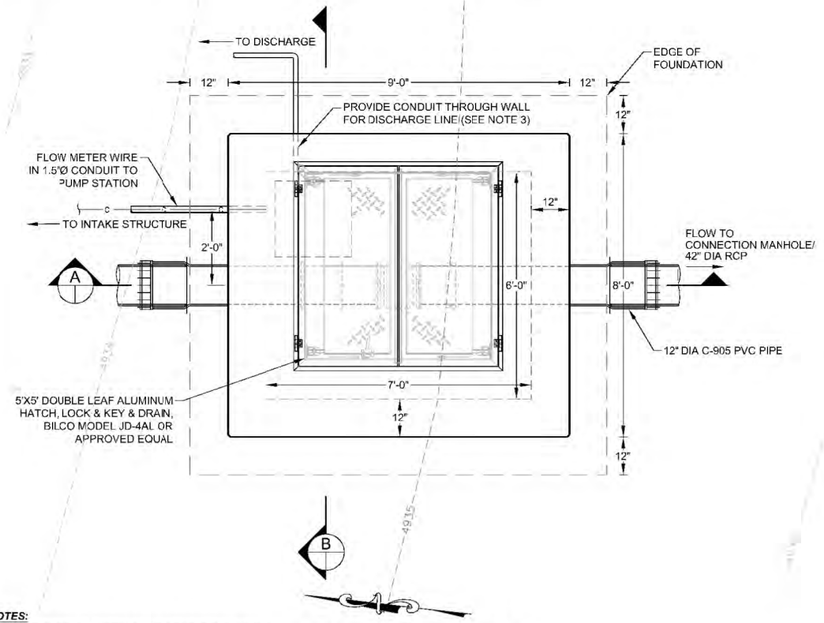
12-INCH DIA DISCHARGE PIPELINE PLAN & PROFILE

DESIGN DEVELOPMENT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-C-08
SHEET	of

$PWURL $PWPATH FILENAME: SV_Bonus Intake Discharge.dwg PLOT DATE: 7/20/16 PLOT TIME: 15:06

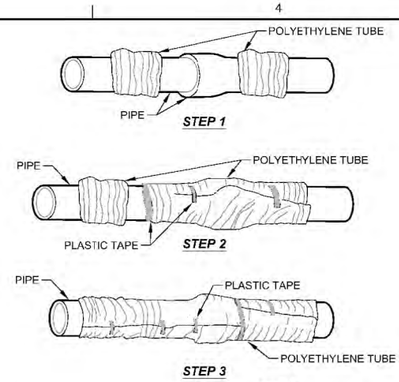


FLOW METER VAULT PLAN

0 2 4
SCALE IN FEET

NOTES:

1. PLUG ENDS OF EXTRA CONDUITS THROUGH WALL WITH SPRAY FOAM OR AS APPROVED BY ENGINEER.
2. EXTRA FLOW METER WIRE TO BE LOOPED AND STORED IN FLOW METER VAULT.
3. FOR SUMP PUMP DISCHARGE PIPE CONDUIT THROUGH WALL PROVIDE MODULAR SEAL (CS-300-C-5) & WALL SLEEVE(CS-3-1/2-12) MANUFACTURED BY LINKSEAL.
4. GENTLY SLOPE METER VAULT FLOOR TOWARDS SUMP.



STEP 1-

PLACE TUBE OF POLYETHYLENE MATERIAL ON PIPE PRIOR TO LOWERING IT INTO TRENCH.

STEP 2-

PULL THE TUBE OVER THE LENGTH OF THE PIPE. TAPE TUBE TO PIPE AT JOINT. FOLD MATERIAL AROUND THE ADJACENT SPIGOT END AND WRAP WITH TAPE TO HOLD THE PLASTIC TUBE IN PLACE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF PIPE AND TAPED IN PLACE.

TIPS:

MAKE TAPS BY WRAPPING THREE LAYERS OF COMPATIBLE TAPE AROUND THE PIPE TO COVER THE TAPPING MACHINE AREA. INSTALL CORPORATION STOP THROUGH THE TAPE AND POLYETHYLENE.

STEP 3-

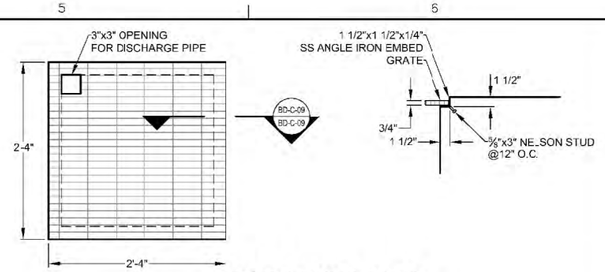
OVERLAP FIRST TUBE WITH ADJACENT TUBE AND SECURE WITH PLASTIC ADHESIVE TAPE. THE POLYETHYLENE TUBE MATERIAL COVERING THE PIPE SHALL BE LOOSE. EXCESS MATERIAL SHALL BE NEATLY DRAWN UP AROUND THE PIPE BARREL, FOLDED ON TOP OF PIPE AND TAPED IN PLACE.

STEP 4-

CAREFULLY BACKFILL WITH CLEAN MATERIAL THAT WILL NOT DAMAGE ENCASEMENT.

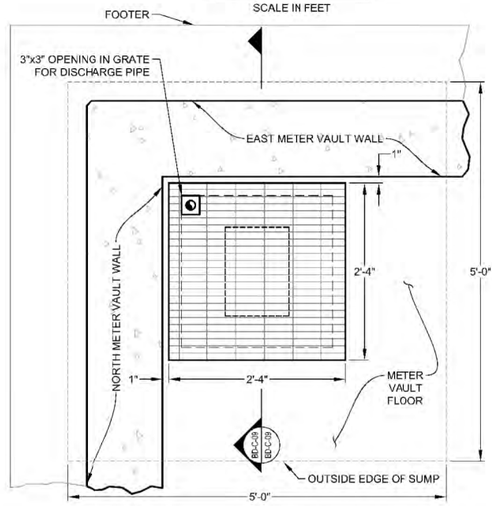
FIELD INSTALLATION POLYETHYLENE AWWA C 105 METHOD "A"

NTS



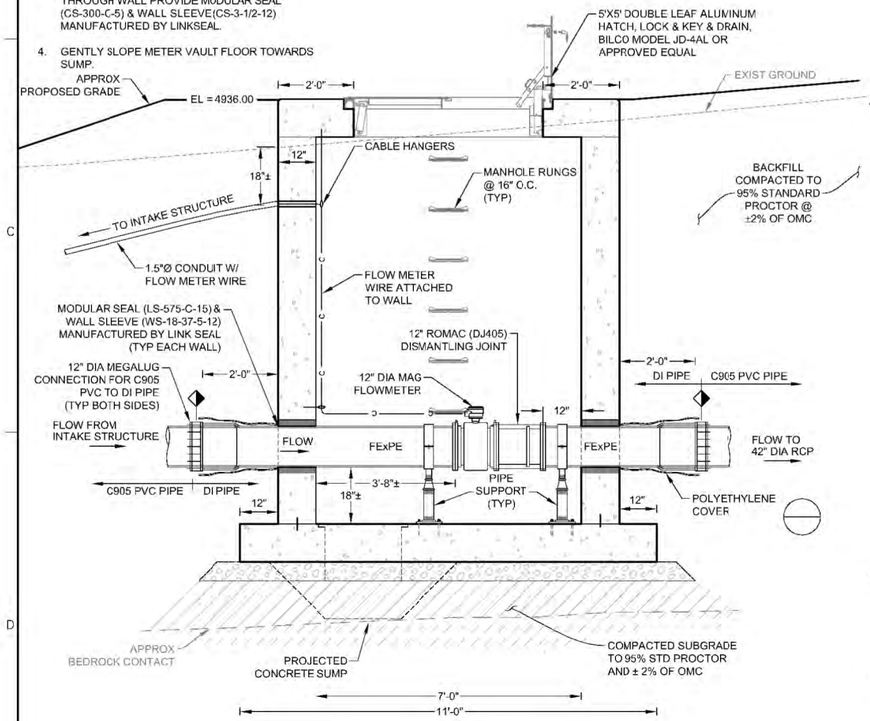
GRATE & EMBED DETAIL

0 1 2
SCALE IN FEET



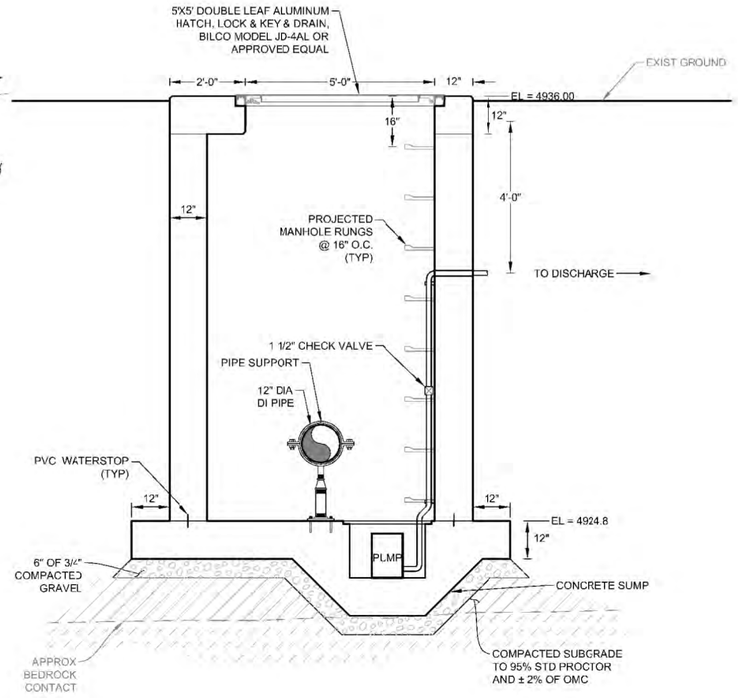
SUMP LOCATION PLAN

0 1 2
SCALE IN FEET



FLOW METER VAULT PROFILE (A)

0 2 4
SCALE IN FEET



SECTION B (B)

0 2 4
SCALE IN FEET

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DSGN	DATE	DR	REVISION	CHK	APVD

R HINES, A WOLFE| RECK, B HOGNESS| G CHURCH | G CHURCH | APVD

DESIGN DEVELOPMENT

BONUS DITCH COMPANY

DEERE & AULT CONSULTANTS, INC.

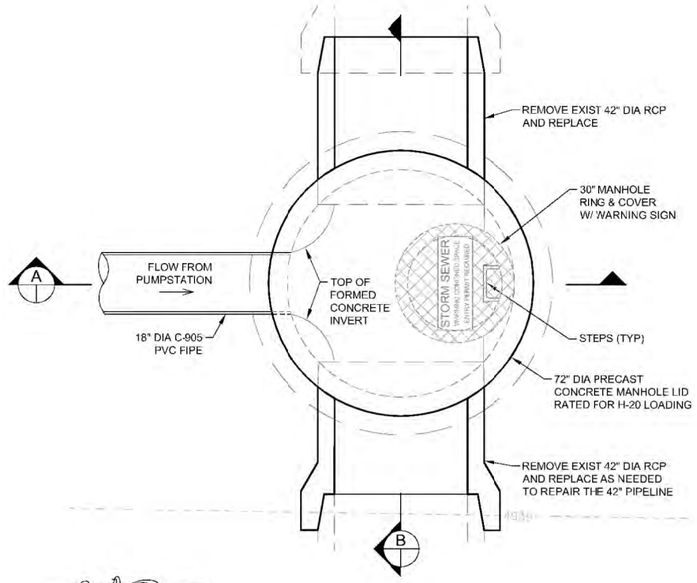
FLOW METER VAULT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-C-09
SHEET	of

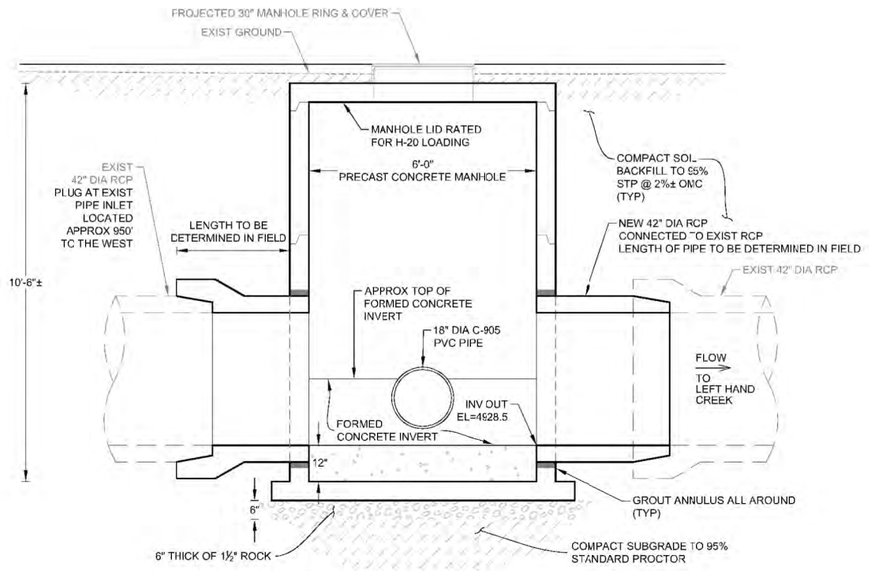
MANHOLE NOTES:

1. ALL MANHOLES SHALL BE MANUFACTURED IN CONFORMITY WITH ASTM DESIGNATION C478.
2. ALL MANHOLE CASTINGS SHALL BE MANUFACTURED BY EAST JORDAN OR APPROVED EQUAL.
3. ALL MANHOLES TO CONFORM WITH CITY OF LONGMONT STANDARDS.
4. MANHOLE RING & COVER SHALL BE CAST IRON, CITY OF LONGMONT STANDARD. "STORM SEWER" SHALL BE MARKED WITH RAISED LETTERING ON MANHOLE COVERS. COVERS SHALL HAVE ONE LIFTING SLOT 1"x1 ⅛". THE MANHOLE LIDSHALL HAVE THE FOLLOWING MARKED ON IT "WARNING CONFINED SPACE ENTRY PERMIT REQUIRED".
5. MANHOLE STEPS SHALL BE CORROSION RESISTANT AND CONFORM WITH CITY OF LONGMONT STANDARDS.
6. MANHOLE LID SHALL BERATED FOR A H-20 LOADING.
7. ALL MANHOLE RIM ELEVATIONS TO BE CONFIRMED BY CONTRACTOR WITH ENGINEER PRIOR TO ORDERING PRECAST MANHOLE.
8. SUBMIT SHOP DRAWINGS ON MANHOLES FOR REVIEW AND APPROVAL PRIOR TO ORDERING. ADJUSTMENTS IN THE PROPOSED ELEVATIONS MAY BE REQUIRED DEPENDING ON SITE CONDITIONS.



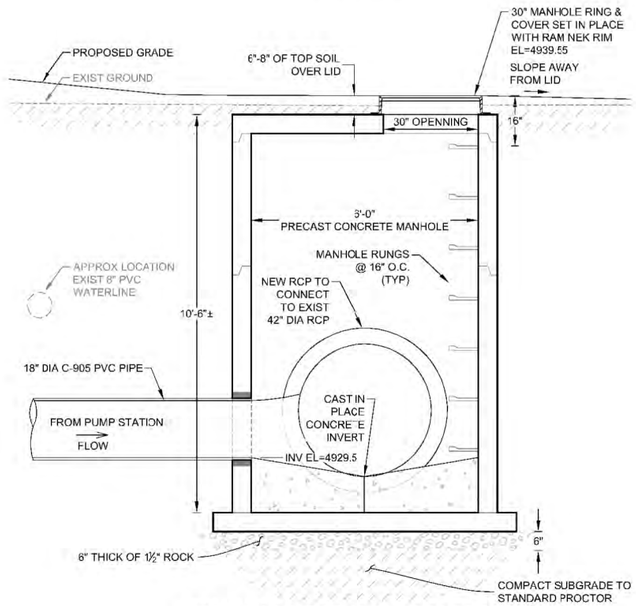
72" DIA CONNECTION MANHOLE PLAN

0 2 4
SCALE IN FEET
CONTOUR INTERVAL = 1FT



72" DIA CONNECTION MANHOLE PROFILE A/13

0 2 4
SCALE IN FEET



72" DIA CONNECTION MANHOLE PROFILE B/13

0 2 4
SCALE IN FEET

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	DR	CHK	APVD	BY	APVD
DSGN			R HINES, A WOLFE	I RECK, B HOGNESS		G CHURCH	

DESIGN DEVELOPMENT

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

BONUS DITCH CONNECTION MANHOLE

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-C-10
SHEET	of

PRELIMINARY
NOT FOR
CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		DR	CHK	APVD

R HINES, A WOLFE| RECK, B HOGNESS| G CHURCH| G CHURCH

DESIGN DEVELOPMENT

BONUS DITCH COMPANY

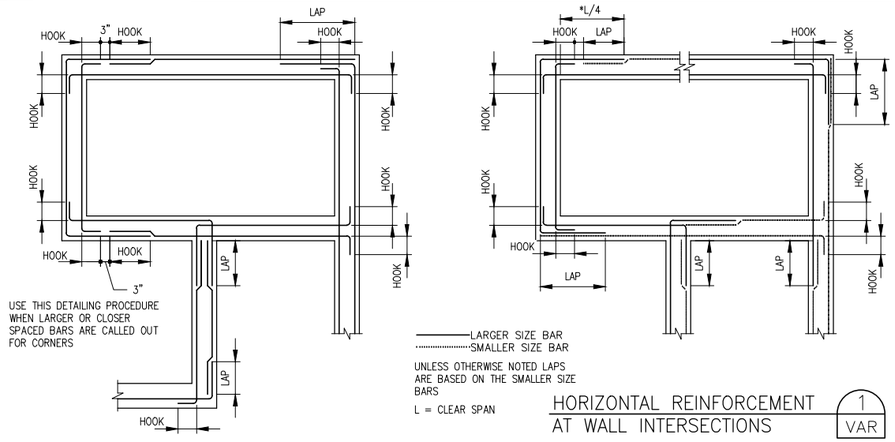
DEERE & AULT CONSULTANTS, INC.

VERIFY SCALE

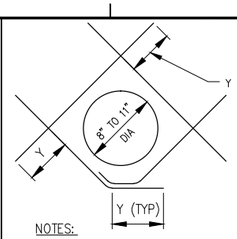
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-C-11
SHEET	of

$PWURL $PWPATH FILENAME: **SV-Bonus Details.dwg** PLOT DATE:7/20/16 PLOT TIME:15:06



HORIZONTAL REINFORCEMENT AT WALL INTERSECTIONS — 1 VAR



BAR SIZE	Y GRADE 60
#4	15"
#5	21"
#6	24"
#7	27"
#8	36"
#9	42"

NOTES:

1. CUT NORMAL REINFORCEMENT 2" CLEAR OF OPENING.
2. DIAGONAL BARS TO BE PLACED:
   A) AT CENTERLINE OF WALL OR SLAB WHERE ONE LAYER OF REINFORCEMENT IS PROVIDED.
   B) AT EACH FACE OF WALL OF SLAB WHERE TWO LAYERS OF REINFORCEMENT ARE PROVIDED.
3. UNLESS OTHERWISE NOTED, SIZE OF DIAGONAL BARS SHALL BE THE SIZE OF THE LARGEST NORMAL REINFORCING BAR CUT.
4. THIS DETAIL TO BE USED ONLY WHEN CALLED FOR ON THE DRAWINGS OR WHEN NO OTHER DETAIL IS SPECIFIED.

DIAGONAL REINFORCEMENT AT CIRCULAR OPENINGS — 2 VAR

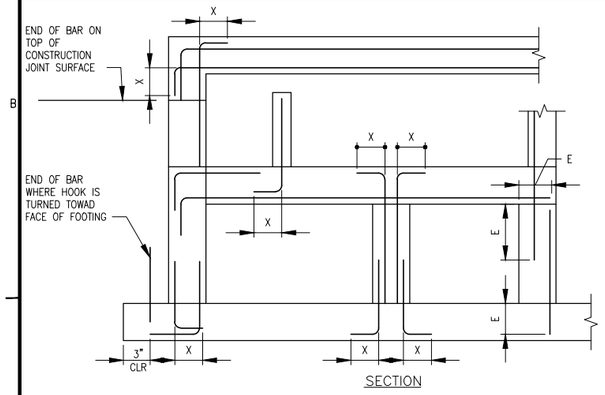
BAR LAP TABLE

LENGTH (*)

BAR SIZE	HOOK X	LAP	EMBEDMENT E
#3	6"	16" (21")	12" (16")
#4	8"	16" (21")	12" (16")
#5	10"	20" (26")	15" (20")
#6	12"	28" (37")	22" (28")
#7	14"	48" (62")	37" (48")
#8	16"	62" (81")	48" (62")
#9	19"	79" (102")	61" (79")
#10	22"	100" (130")	77" (100")
#11	24"	123" (160")	95" (123")

*USE LENGTH IN PARENTHESIS FOR WALL HORIZONTAL REBARS AND SLAB BARS WITH 12" OR MORE OF FRESH CONCRETE UNDERNEATH

BAR SCHEDULE — 3 VAR



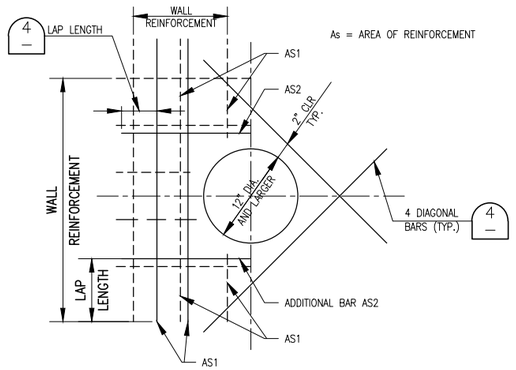
LENGTH (*)			
BAR SIZE	HOOK X	LAP	EMBEDMENT E
#3	6"	16" (21")	12" (16")
#4	8"	16" (21")	12" (16")
#5	10"	20" (26")	15" (20")
#6	12"	28" (37")	22" (28")
#7	14"	48" (62")	37" (48")
#8	16"	62" (81")	48" (62")
#9	19"	79" (102")	61" (79")
#10	22"	100" (130")	77" (100")
#11	24"	123" (160")	95" (123")

* USE LENGTH IN PARENTHESIS FOR WALL HORIZONTAL REBARS AND SLAB BARS WITH 12" OR MORE OF FRESH CONCRETE UNDERNEATH

NOTES:

1. USE LAP LENGTHS AS DETERMINED FOR THESE TABLES UNLESS SHOWN OTHERWISE.
2. THE TABLES SHOWN ARE FOR fc=4000psi, fy=50,000psi, 1.5" MIN CONCRETE COVER AND 3" MIN BAR SPACING.
3. WHEN BARS OF DIFFERENT SIZES ARE LAP SPLICED, LAP LENGTH SHALL BE THE LARGER OF:
4. EMBEDMENT LENGTH OF LARGER BAR
5. LAP LENGTH OF SMALLER BAR
6. STAGGER ADJACENT BAR SPLICES IN SLABS AND IN WALLS.
   EXCEPTION: SPLICES OF VERTICAL BARS AT DOWELS EMBEDDED IN BASE SLABS OR FOOTINGS NEED NOT BE STAGGERED.
7. ALL DOWEL BARS SHALL EXTEND AN EMBEDMENT LENGTH E INTO ANOTHER MEMBER OR ACROSS A CONSTRUCTION JOINT UNLESS SHOWN TO SPLICE WITH OTHER BARS OR TO EXTEND TO THE FAR FACE OF THE MEMBER AND END WITH A STANDARD HOOK.

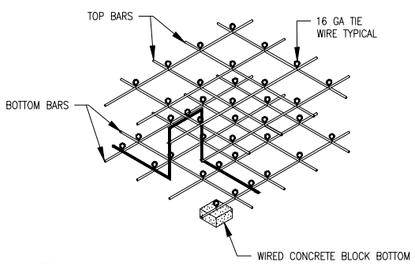
STANDARD 90° BAR HOOKS AT EMBEDMENT LENGTHS — 4 VAR



NOTES:

1. DISCONTINUE WALL REINFORCEMENT AT OPENINGS:
   AS1 AND AS2 = ½ AREA OF CUT BARS TO BE ADDED ON EACH SIDE OF OPENING
2. ADDITIONAL BARS AS1 AND AS2 TO BE PLACED:
   A. AT CENTERLINE OF WALLS OR SLABS WITH ONE LAYER OF REINFORCEMENT.
   B. AT EACH FACE OF WALLS OR SLABS WITH TWO LAYERS OF REINFORCEMENT.
3. THIS DETAIL TO BE USED ONLY WHEN NO OTHER DETAIL IS INDICATED ON THE DRAWINGS.
4. WHERE A SLAB OR INTERSECTING WALL CONNECTS WITHIN ONE WALL THICKNESS OF THE OPENING ADDITIONAL BARS ON THAT SIDE MAY BE OMITTED,

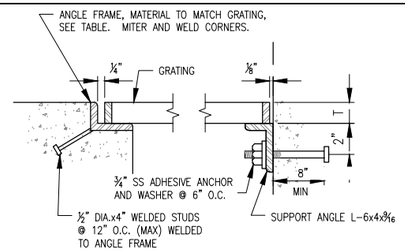
ADDITIONAL REINFORCEMENT AT CIRCULAR OPENINGS (12" DIA OR LARGER) — 5 VAR



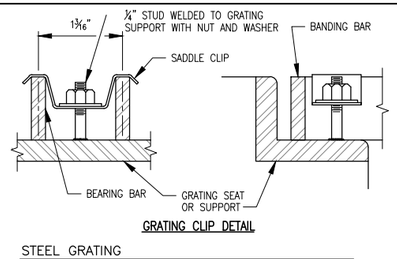
NOTES:

1. METAL BAR SUPPORTS IF USED IN SLABS NOT ON GROUND SHALL NOT MAKE CONTACT WITH FORMS
2. REINFORCING BARS AND ACCESSORIES SHALL NOT BE IN CONTACT WITH ANY OTHER METAL INSTALLATION OR ACCESSORY EMBEDDED IN CONCRETE. A MINIMUM OF 2" CLEARANCE SHALL BE PROVIDED IN ALL CASES

REINFORCEMENT SUPPORT — 6 VAR



GRATING FRAME TABLE						
TYPE	GRATING DEPTH "T"	FRAME ANGLE (STEEL)	TYPE	GRATING DEPTH "T"	FRAME ANGLE
1	1"	1¾x1¼x¼	5	2"	2½x2½x½
2	1¼"	2x1½x ¼	6	2¼"	2½x2½x¼
3	1½"	1¾x1¾x¼	7	2½"	3x2½"x½
4	1¾"	2x2x¼			



GRATING CLIP DETAIL

STEEL GRATING

UNLESS OTHERWISE NOTED:
BEARING BARS, DEPTH T x 3⁄16" @ 1 3⁄16" OC
CROSS BARS @ 4" OC
USE STEEL ANGLE SUPPORTS AND BOLTS
GALVANIZE AFTER FABRICATION. UNLESS OTHERWISE NOTED.

BAR SPACING SHALL BE 15/16" UNLESS OTHERWISE NOTED. GRATING OF DEPTH T AS NOTED ON DRAWINGS SHALL BE AS SPECIFIED HEREIN ALL ENDS AND OPENINGS SHALL BE BANDED ALL GRATINGS SHALL SIT FLAT AND STABLE. PROVIDE 4-CLIPS (MIN)

DETAIL
SCALE: NTS — 9 BD-S-1

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	DR	CHK	APVD	BY	REVISION
DSGN	R. ELDRIDGE	P. HUNTER	R. ELDRIDGE	APVD	G. CHURCH	

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

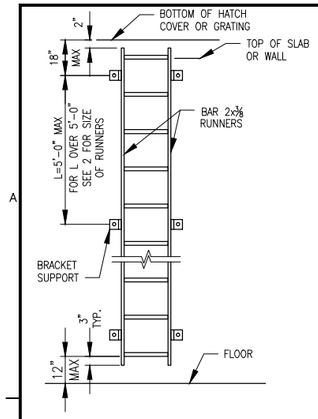
GENERAL STRUCTURAL DETAILS - I

DESIGN DEVELOPMENT

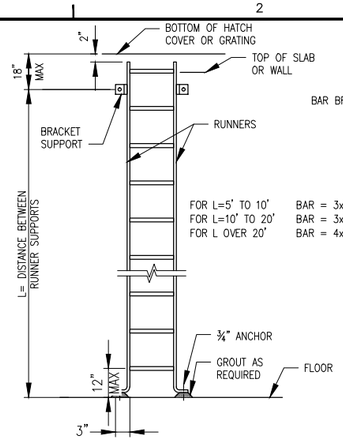
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-GS-1
SHEET	of

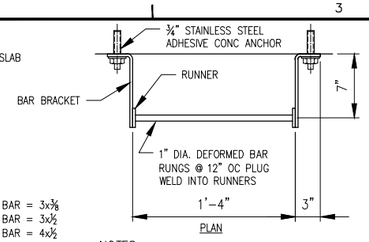
$PWURL $PWPATH FILENAME: PLOT DATE: 7/19/16 PLOT TIME: 15:01



1. STANDARD
LADDER WITH RUNNER
SUPPORTS AT 5'-0" MAX



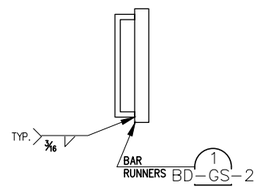
2. OPTION
LADDER WITH RUNNER
SUPPORTS OVER 5'-0"



NOTES:

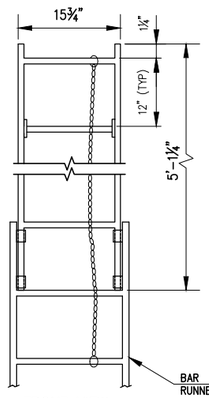
1. LADDERS SHALL BE SST, GALV OR ALU. SEE SPEC.
2. ANCHORS AND FASTENERS SHALL BE STAINLESS STEEL, EXCEPT FASTENERS FOR GALVANIZED STEEL LADDERS SHALL BE GALVANIZED STEEL.
3. PROVIDE ANCHOR BOLT INSERTS FOR PRESTRESSED TANK WALL.
4. LADDERS SHALL BE OSHA AND ANSI APPROVED.

FIXED LADDER 1 VAR

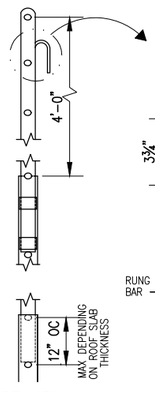


TOP VIEW

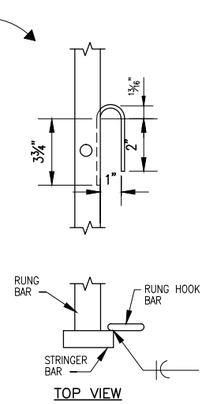
GUIDE STRAP



FRONT VIEW



SIDE VIEW

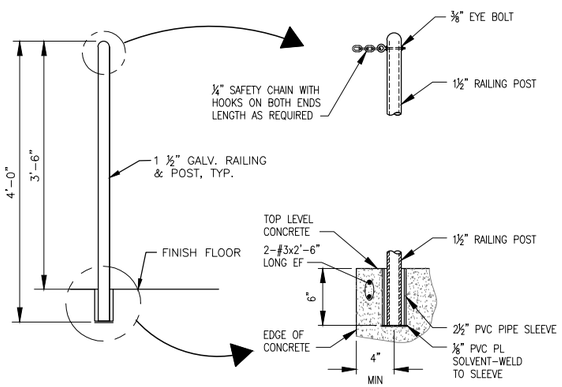


TOP VIEW

NOTES:

1. LADDER EXTENSION TO BE SAME MATERIAL AS LADDER
2. FIBERGLASS SIM DESIGN BY MANUFACTURER

LADDER EXTENSION 2 VAR



GUARD RAIL (REMOVABLE) 3 BD-S-1

GENERAL STRUCTURAL NOTES

DESIGN CRITERIA

DESIGN IN ACCORDANCE WITH THE 2015 EDITION OF THE INTERNATIONAL BUILDING CODE, EXCEPT WHERE OTHER APPLICABLE CODES OR THE FOLLOWING NOTES ARE MORE RESTRICTIVE.

LOADINGS

EARTH LOADS:

SOIL DENSITY (PCF)	130 PCF
FRICTION ANGLE (DEGREES)	35

PLATFORM LIVE LOADS:

UNIFORM LIVE LOAD (PSF)	100 PSF
REDUCED LIVE LOAD (PSF)	N/A
IMPACT LOAD (% OF LOAD)	N/A

GENERAL

THESE NOTES ARE GENERAL AND APPLY TO THE ENTIRE PROJECT EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE.

STRUCTURAL DIMENSIONS CONTROLLED BY OR RELATED TO MECHANICAL OR ELECTRICAL EQUIPMENT SHALL BE COORDINATED BY THE CONTRACTOR PRIOR TO CONSTRUCTION. BOLT SIZES, TYPES, AND PATTERNS SHALL BE VERIFIED WITH THE MANUFACTURER. ALL BOLT PATTERNS SHALL BE TEMPLATED TO INSURE ACCURACY OF PLACEMENT.

MECHANICAL AND ELECTRICAL EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES AND REVEALS NOT SHOWN ON THE STRUCTURAL DRAWINGS BUT REQUIRED BY OTHER CONTRACT DRAWINGS, SHALL BE PROVIDED FOR PRIOR TO PLACING CONCRETE.

STRUCTURAL DRAWINGS SHALL BE USED IN COORDINATION WITH MECHANICAL, ELECTRICAL, ARCHITECTURAL, CIVIL DRAWINGS AND SHOP DRAWINGS PROVIDED BY MANUFACTURERS OF EQUIPMENT.

STRUCTURES HAVE BEEN DESIGNED FOR OPERATIONAL, HYDROSTATIC, AND BACKFILL LOADS ON THE COMPLETED STRUCTURES. THESE PLANS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR SAFETY OF THE BUILDING OR EQUIPMENT DURING CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK RELATING TO CONSTRUCTION, ERECTION METHODS, BRACING, SHORING, RIGGING, GUYS, SCAFFOLDING, FORMWORK, AND OTHER WORK REQUIRED TO SAFELY PERFORMING THE WORK SHOWN.

UNLESS OTHERWISE SHOWN, ON ALL STRUCTURAL DRAWINGS THE FINISHED GRADE AROUND STRUCTURES IS SHOWN THUS INDICATING EITHER GROUND SURFACE, TOP OF CONCRETE SLAB, OR AC PAVEMENT. FOR DETAILS OF FINISH SURFACES SEE CIVIL AND ARCHITECTURAL DRAWINGS.

STRUCTURAL STEEL

STEEL CONSTRUCTION SHALL CONFORM TO THE SPECIFICATIONS AND STANDARDS AS CONTAINED IN THE LATEST EDITION OF THE LRFD MANUAL OF STEEL CONSTRUCTION.

STRUCTURAL WIDE FLANGE SHAPES SHALL BE STEEL MEETING ASTM A-572 SPECIFICATIONS.

PIPE, PIPE COLUMNS, AND BOLLARDS SHALL BE OF STEEL MEETING ASTM A-53, TYPE E OR S, GRADE B STANDARD WEIGHT, UNO

HSS SHALL BE OF STEEL MEETING ASTM A-500 GRADE B.

OTHER SHAPES, BARS, PLATES AND SHEETS SHALL BE OF STEEL MEETING ASTM A-36 SPECIFICATIONS.

ALL BOLTS SHALL BE ¾" DIA AND GALVANIZED UNLESS NOTED OTHERWISE.

HEADED CONCRETE ANCHORS (HCA) SHALL BE ¾" DIAMETER MINIMUM AND DEFORMED BAR ANCHORS (DBA) SHALL BE #6 MINIMUM UNLESS NOTED OTHERWISE. WELDED ANCHORS SHALL BE AS MANUFACTURED BY NELSON STUD.

STEEL JOISTS, BEAMS, AND GIRDERS SHALL NOT BE NOTCHED, CUT OR RELOCATED WITHOUT APPROVAL BY THE ENGINEER.

ALL WELDING SHALL BE BY THE SHIELDED ARC METHOD AND SHALL CONFORM TO AWS CODE FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION. QUALIFICATIONS OF WELDERS SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS FOR STANDARD QUALIFICATION PROCEDURE OF THE AWS. CONTRACTOR SHALL SUBMIT WPS.

ALL DETAILING, FABRICATION AND PLACING SHALL CONFORM TO AISC CODE OF STANDARD PRACTICE, LATEST EDITION.

CONCRETE

ALL CONCRETE DESIGN AND CONSTRUCTION SHALL CONFORM TO ACI 350.

UNLESS OTHERWISE NOTED OR SPECIFIED, MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS FOR ALL STRUCTURAL CONCRETE SHALL BE 4000 PSI.

REINFORCING STEEL SHALL BE DEFORMED BARS CONFORMING IN QUALITY TO THE REQUIREMENTS OF ASTM A-615, "SPECIFICATIONS FOR DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT", GRADE 60. EXCEPTION: BARS RECEIVING WELDS SHALL CONFORM TO ASTM A706. DEFORMED WELDED WIRE REINFORCING STEEL (WWR/WWF) SHALL CONFORM TO ASTM A1064, GRADE 60.

ALL DETAILING, FABRICATION AND PLACING OF REINFORCING BARS, UNLESS OTHERWISE INDICATED, SHALL BE IN ACCORDANCE WITH ACI-315, "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", LATEST EDITION.

ALL CONSTRUCTION JOINTS AND SURFACES OF EXISTING CONCRETE RECEIVING ADJACENT PLACEMENT OF FRESH CONCRETE SHALL BE ROUGH AND THOROUGHLY CLEANED FOR BOND AS SPECIFIED.

LOCATION OF ALL CONSTRUCTION JOINTS SHALL BE AS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER.

UNLESS SHOWN OTHERWISE MINIMUM REINFORCEMENT FOR SLAB AND WALLS SHALL BE #5 @ 12" E.F., E.W OR AT CENTER FOR 8" THICK SECTIONS.

DOWELS, PIPE, BASE PLATES, AND OTHER EMBEDDED MATERIALS AND ACCESSORIES SHALL BE HELD SECURELY IN POSITION. THE FOLLOWING SHALL BE ADDED:

A) IN SLABS #5 RISER BARS AT 36 INCHES OC MAXIMUM TO SUPPORT TOP REINFORCING BARS.

B) IN WALLS WITH 2 CURTAINS #3 U OR Z SHAPE SPACERS AT 6 FEET OC EACH WAY.

CONCRETE (CONT)

EMBEDDED STEEL ANCHORS SHALL BE 3/4" DIAMETER ASTM A193 TYPE 304 STAINLESS STEEL THREADED ROD UNLESS NOTED OTHERWISE. CAST IN PLACE ANCHORS SHALL HAVE A DOUBLE NUT AND WASHER WHERE THE EMBEDMENT LENGTH IS MEASURED FROM THE CONCRETE SURFACE TO THE WASHER. ADHESIVE ANCHORS SHALL BE EMBEDDED 6" MINIMUM. ADHESIVE SHALL BE HIT HY200 AS MANUFACTURED BY HILTI CORPORATION AND SHALL BE INSTALLED IN ACCORDANCE WITH ICC/ES ESR-3187. ANY SUBSTITUTIONS SHALL HAVE EQUIVALENT PROPERTIES AND ICC/ES ESR EVALUATION REPORT AND SHALL BE SUBMITTED TO ENGINEER FOR REVIEW. ALL ANCHORS SHALL BE GALVANIZED. UNLESS NOTED OTHERWISE.

ALL GROUT SHALL BE CENENTITIOUS NON-METALIC NON-SHRINK GROUT HAVING MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI UNLESS INDICATED OTHERWISE.
UNLESS OTHERWISE SHOWN CONCRETE WALLS AND SLABS SHALL BE REINFORCED AS FOLLOWS: #4@12" EW, CENTER OF 6" SECTIONS; #5@12" EW, CENTER OF 8" SECTIONS; #5@12" EW EF OF 12" SECTIONS; #7 @ 12" EW EF OF 14" AND THICKER SECTIONS.

NO METAL WIRES, CLIPS AND SUPPORTS SHALL BE PLACED IN CONTACT WITH THE FORMS OR THE SUBGRADE. SUPPORTS FOR BARS ABOVE SUBGRADE SHALL BE IN SUFFICIENT NUMBERS TO MAINTAIN LOCATION SHOWN, BUT IN NO CASE SHALL SUCH SUPPORT BE CONTINUOUS.

DOWELS AND CAST IN PLACE EMBEDS SHALL BE WIRED OR OTHERWISE HELD IN POSITION PRIOR TO PLACEMENT OF CONCRETE.

UNLESS OTHERWISE INDICATED ON THE DRAWINGS, LAPS OF REINFORCEMENT SHALL BE AS SHOWN ON DETAIL 3/GS-2.

LOCATE TWO 3/4 INCH GALVANIZED RICHMOND ROCKET INSERTS, HOHMANN & BARNARD OR EQUAL, STRADDLING CENTERLINE OF EQUIPMENT OVER ALL PUMPS, FLANGE OR METAL PARTS EMBEDDED IN CONCRETE, A MINIMUM OF 2 INCHES CLEARANCE SHALL BE PROVIDED AT ALL TIMES.

REINFORCING BARS, EMBEDS, AND ACCESSORIES SHALL NOT BE IN CONTACT WITH AND PIPE, PIPE FLANGE OR METAL PARTS EMBEDDED IN CONCRETE, A MINIMUM OF 2 INCHES CLEAR CONCRETE COVER SHALL BE PROVIDED AT ALL TIMES.

UNLESS OTHERWISE SHOWN ON THE DRAWINGS ALL ITEMS EMBEDDED IN CONCRETE SHALL BE SPACED ON CENTER AT LEAST 4 TIMES THEIR OUTSIDE DIMENSION. THE OUTSIDE DIMENSION SHALL NOT EXCEED ONE THIRD OF THE MEMBER THICKNESS.

ELECTRICAL CONDUIT EMBEDDED IN CONCRETE SHALL NOT BE SPACED CLOSER THAN 3 OUTSIDE DIAMETERS ON CENTER. ALUMINUM CONDUIT SHALL NOT BE ENCASED IN CONCRETE.

UNLESS OTHERWISE SHOWN ON THE DRAWINGS CONCRETE COVER FOR REINFORCING BARS SHALL BE AS FOLLOWS:

FOR CONCRETE PLACED AGAINST EARTH
SEE CONSTRUCTION JOINT DETAILS FOR
THIN SLABS-ON-GRADE. BOTTOM COVER
MAY BE LESS THAN 3" IF SO INDICATED . . . . . 3"

FOR SURFACES IN CONTACT WITH WATER OF WEATHER
AND FORMED SURFACES IN CONTACT WITH EARTH. . . . . 2"

FOR CONCRETE NOT EXPOSED TO WEATHER,
OR IN CONTACT WITH WATER OR EARTH. . . . . 1 1/2"

UNLESS OTHERWISE NOTED, WALLS AND SLABS SHOWN WITH A SINGLE LAYER OF REINFORCEMENT SHALL HAVE THAT REINFORCEMENT CENTERED.

SLABS WITH SLOPING SURFACES SHALL HAVE THE INDICATED SLAB THICKNESS MAINTAINED AS THE MINIMUM. SLAB BOTTOMS MAY EITHER SLOPE WITH THE TOP SURFACE OF BE LEVEL. REINFORCING IN SLABS WITH SLOPING SURFACES SHALL BE PLACED AT THE REQUIRED CLEARANCE FROM THE SLAB SURFACES.

ALUMINUM

ALUMINUM CONSTRUCTION SHALL BE IN ACCORDANCE WITH AMERICAN SOCIETY OF CIVIL ENGINEERS SPECIFICATION FOR STRUCTURES OF ALUMINUM ALLOY 6061-T6 OR 6063-T6.

ALUMINUM SURFACES SHALL BE PREVENTED FROM COMING IN DIRECT CONTACT WITH CONCRETE OR WITH METALS NOT COMPATIBLE WITH ALUMINUM, USING METHODS DESCRIBED IN THE SPECIFICATIONS.

WOOD

PLANKS FOR STOP LOGS SHALL BE SOLID SAWN LUMBER DFL-NO. 2 OR BETTER.

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DSGN	DATE	DR	REVISION	CHK	APVD	BY	APVD
		R. ELDRIDGE	P. HUNTER		R. ELDRIDGE		G. CHURCH	

DESIGN DEVELOPMENT

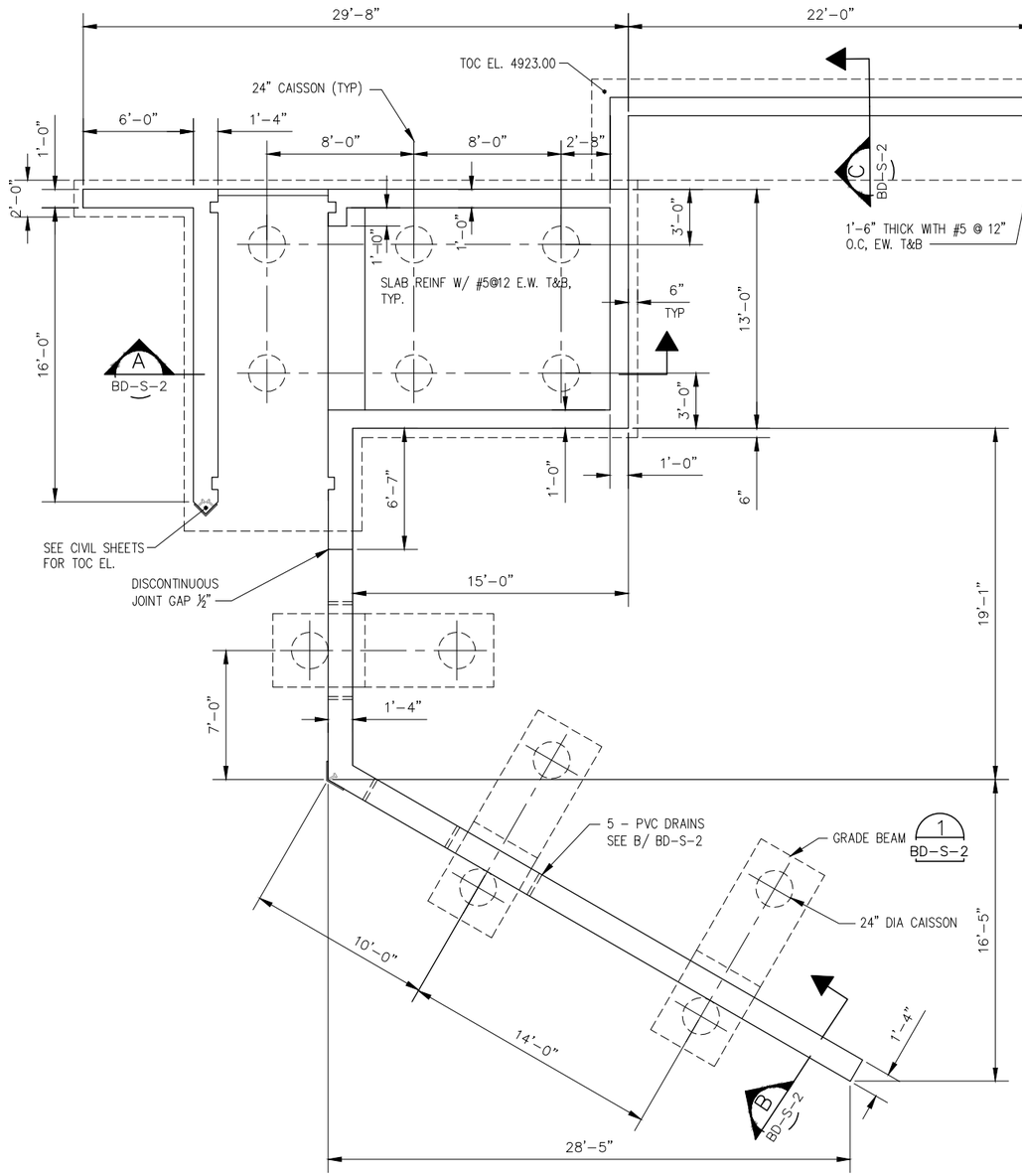
BONUS DITCH COMPANY

DEERE & AULT CONSULTANTS, INC.

GENERAL STRUCTURAL DETAILS - II

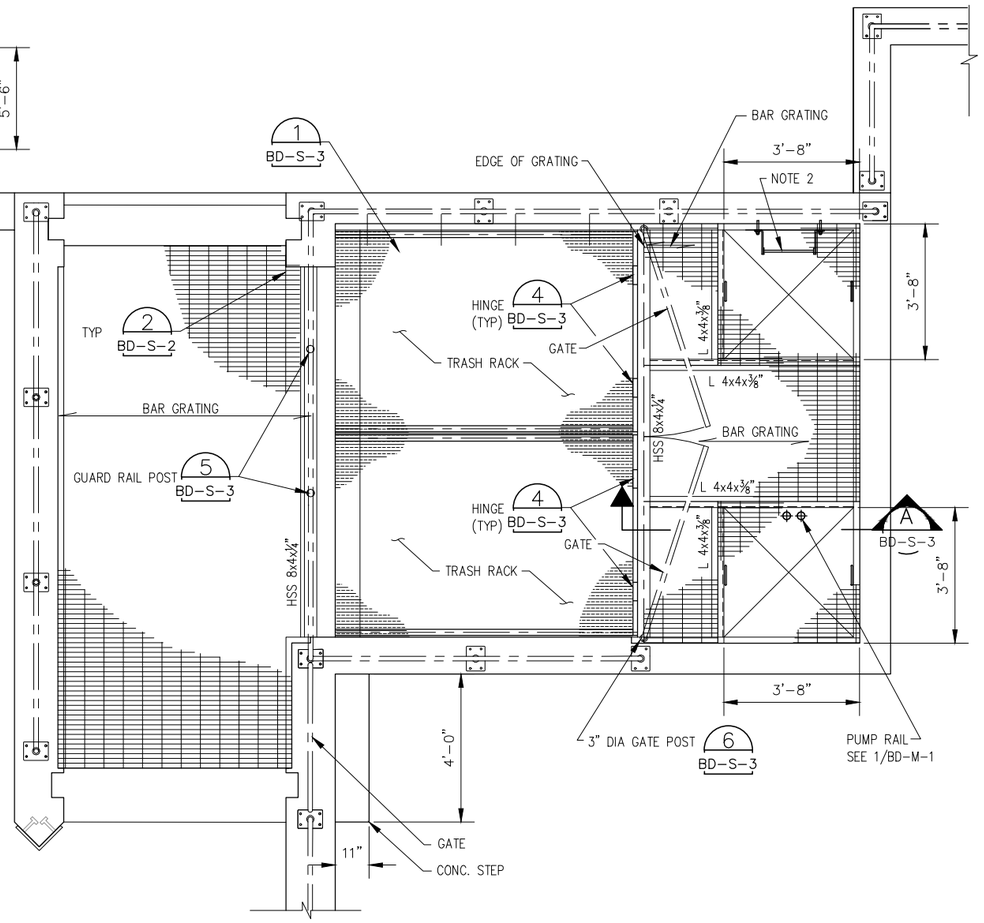
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-GS-2
SHEET	of



FOUNDATION PLAN

SCALE: 1/4"=1'-0"



TRASH RACK AND PLATFORM PLAN

SCALE: 1/2"=1'-0"

NOTE:

1. GRATING SHALL BE ¼"x2" DEEP GALVANIZED GRATING. BARS SPAN IN DIRECTION OF ARROW.
   BAR GRATING
2. INSTALL LADDER RUNGS AND RETRACTABLE POLE PER SPECIFICATION.

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN	R. ELDRIDGE	DR P. HUNTER	CHK R. ELDRIDGE	APVD G. CHURCH

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

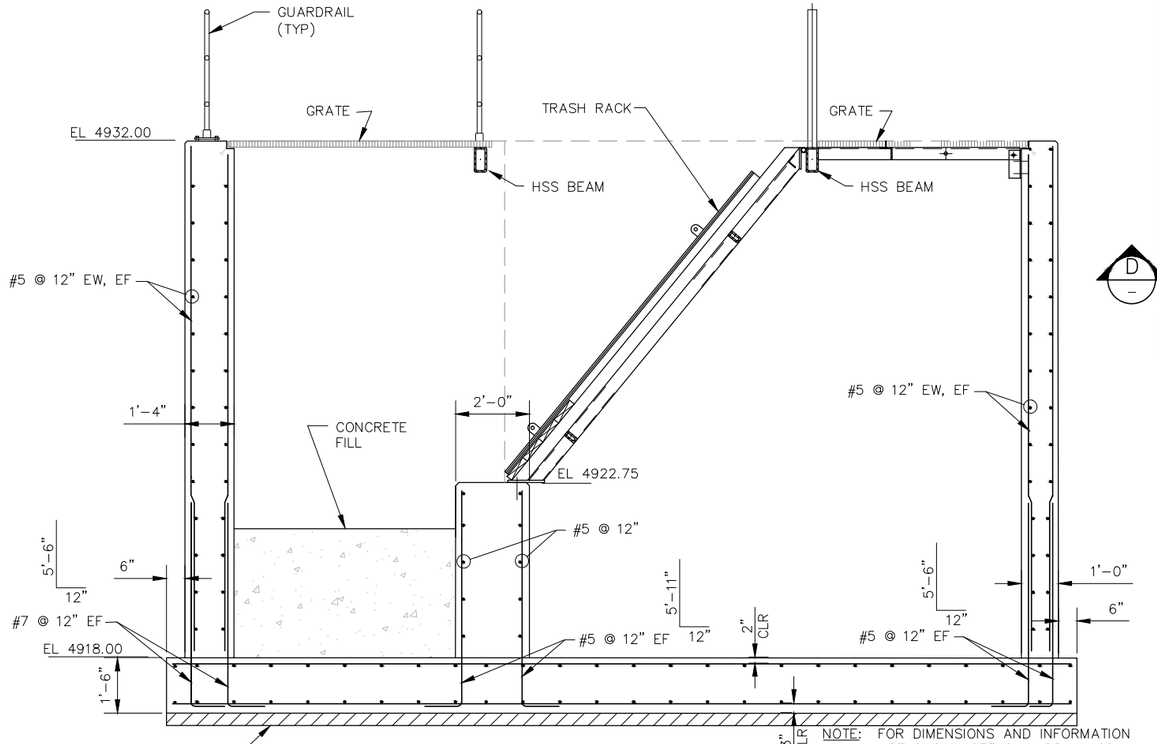
DIVERSION INTAKE & CHECK STRUCTURE PLAN

DESIGN DEVELOPMENT

VERIFY SCALE

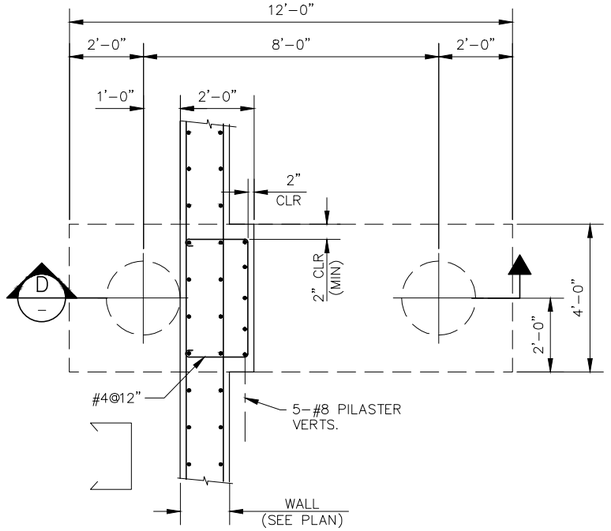
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2016
PROJ	0118.013.00
DWG	BD-S-1
SHEET	of

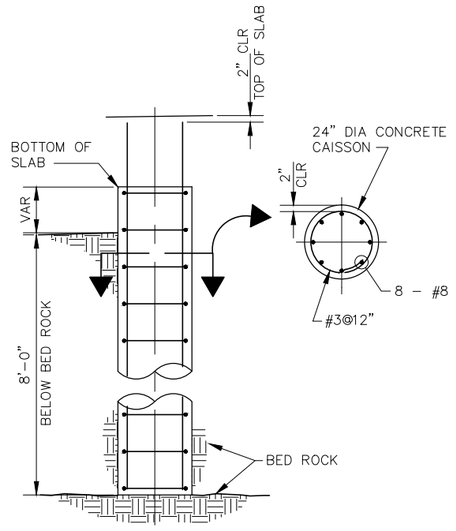


NOTE: FOR DIMENSIONS AND INFORMATION NOT SHOWN SEE CIVIL DRAWINGS. REINFORCING STEEL IN SECTIONS NOT SHOWN SHALL BE #5@12 E.F. E.W.

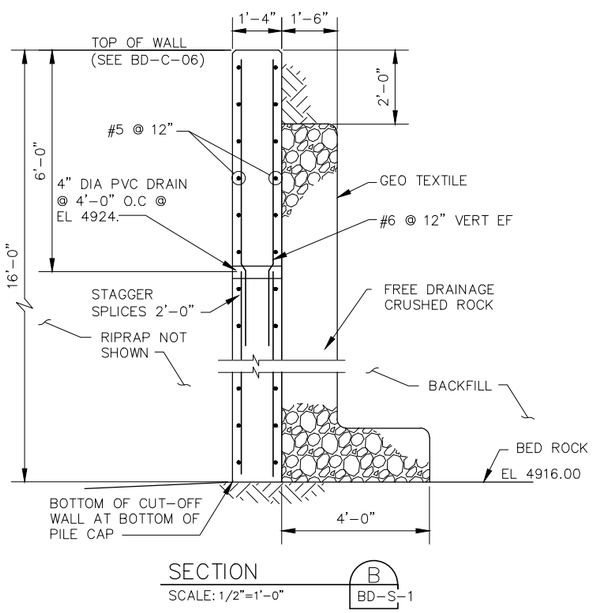
DIVISION & INTAKE SECTION A
SCALE: 1/2"=1'-0" BD-S-01



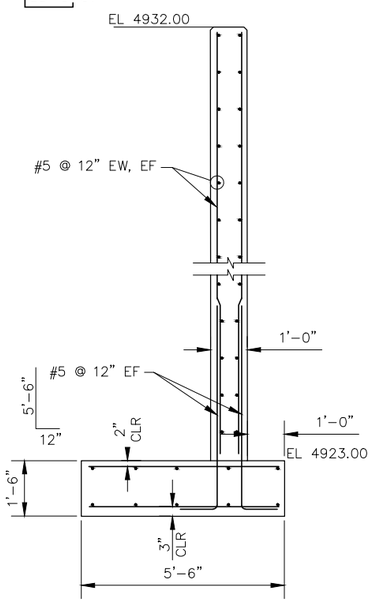
DETAIL 1 BD-S-1
SCALE: 1/2"=1'-0"



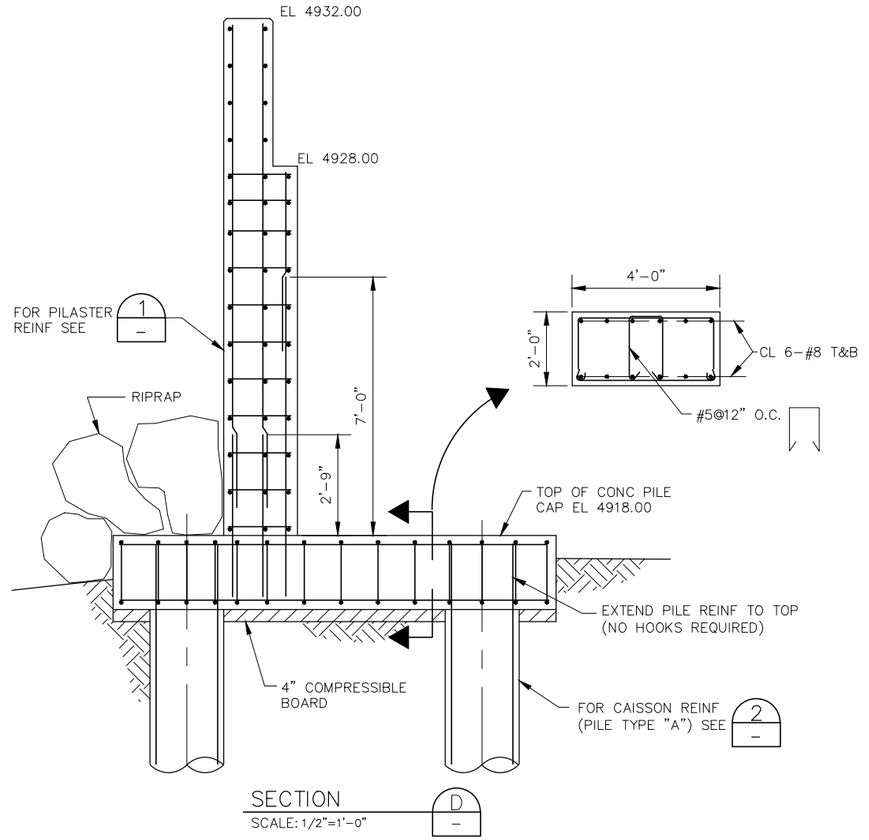
DETAIL 2 –
SCALE: 1/2"=1'-0"



SECTION B BD-S-1
SCALE: 1/2"=1'-0"



SECTION C BD-S-1
SCALE: 1/2"=1'-0"



SECTION D –
SCALE: 1/2"=1'-0"

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD	BY	REVISION
		R. ELDRIDGE	P. HUNTER	R. ELDRIDGE	APVD	G CHURCH	APVD

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

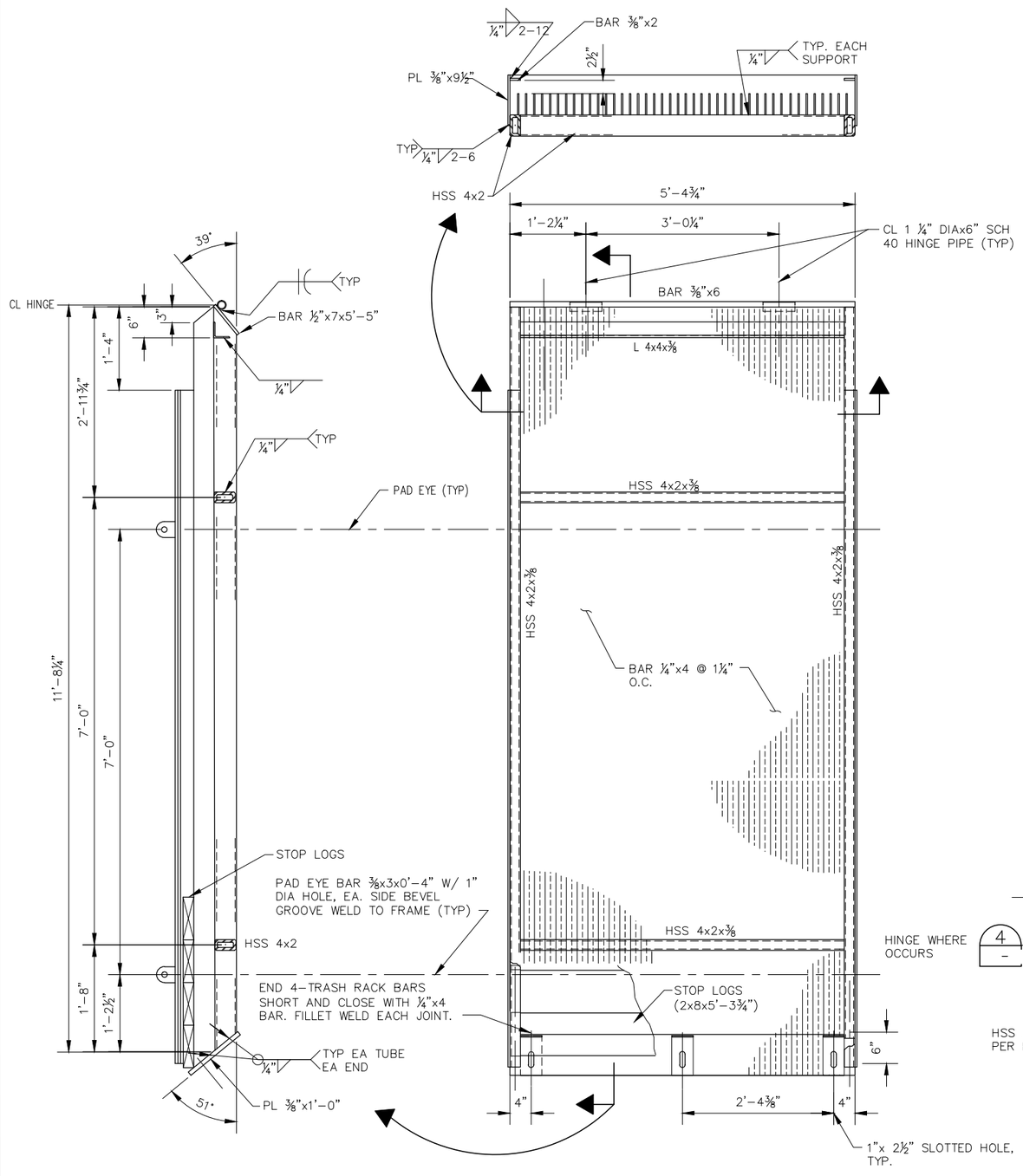
DIVERSION INTAKE & CHECK STRUCTURE SECTIONS AND DETAILS

DESIGN DEVELOPMENT

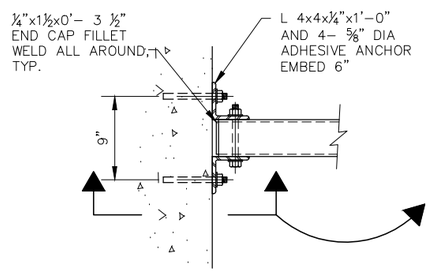
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2016
PROJ	0118.013.00
DWG	BD-S-2
SHEET	of

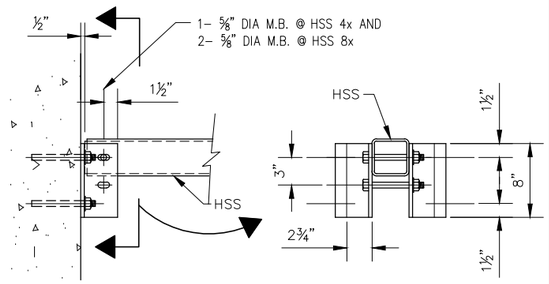
$PWURL $PWPATH FILENAME: PLOT DATE7/19/16 PLOT TIME:15:40

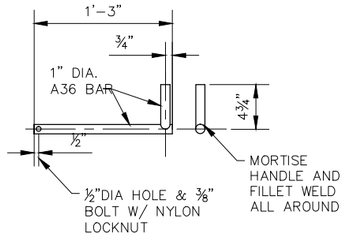


TRASH RACK 1 BD-S-1 (TYP OF 2)
SCALE: 1"=1'-0"

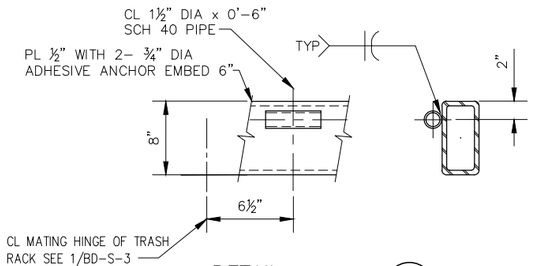


DETAIL 2 VAR
SCALE: 1-1/2"=1'-0"

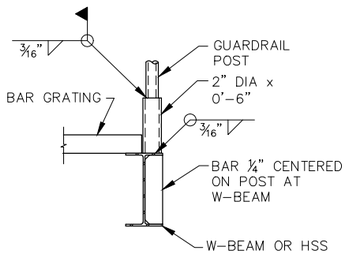




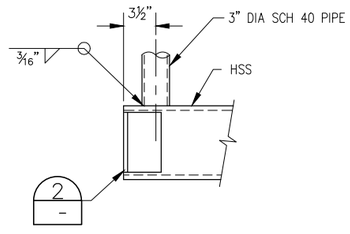
DETAIL 3 -
SCALE: 1-1/2"=1'-0"



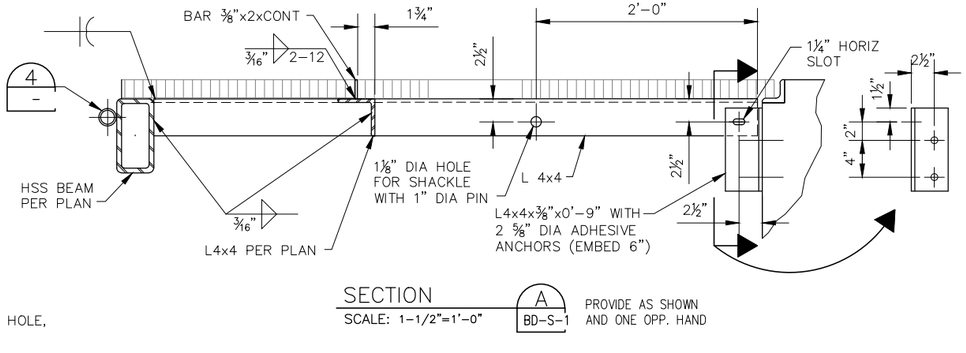
DETAIL 4 -
SCALE: 1-1/2"=1'-0"



DETAIL 5 BD-S-1
SCALE: 1-1/2"=1'-0"



DETAIL 6 BD-S-1
SCALE: 1-1/2"=1'-0"



SECTION A BD-S-1 PROVIDE AS SHOWN AND ONE OPP. HAND
SCALE: 1-1/2"=1'-0"

HOT-DIP GALVANIZE AFTER FABRICATION ALL MATERIAL. DRILL ¼" DIA. AIR RELIEF HOLES IN ALL TUBULAR MATERIAL PRIOR TO GALVANIZING.

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY
DSGN	R. ELDRIDGE	DR P. HUNTER CHK R. ELDRIDGE APVD	APVD

DEERE & AULT CONSULTANTS, INC.

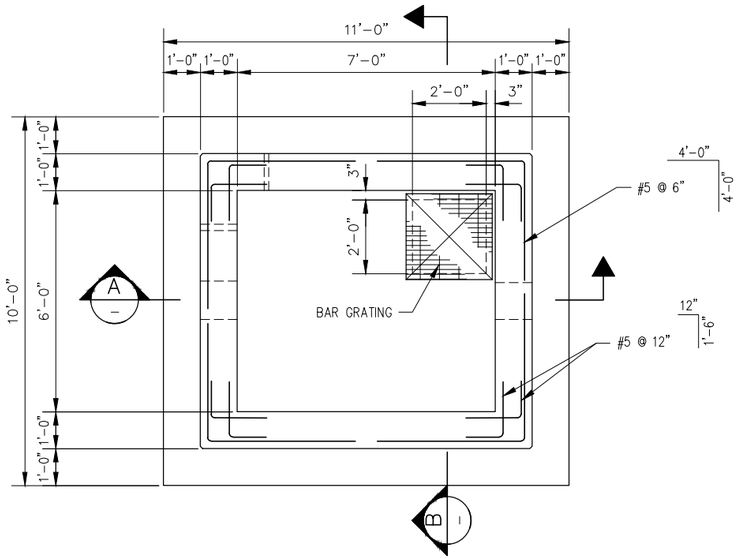
BONUS DITCH COMPANY

TRASH RACK SECTIONS AND DETAILS

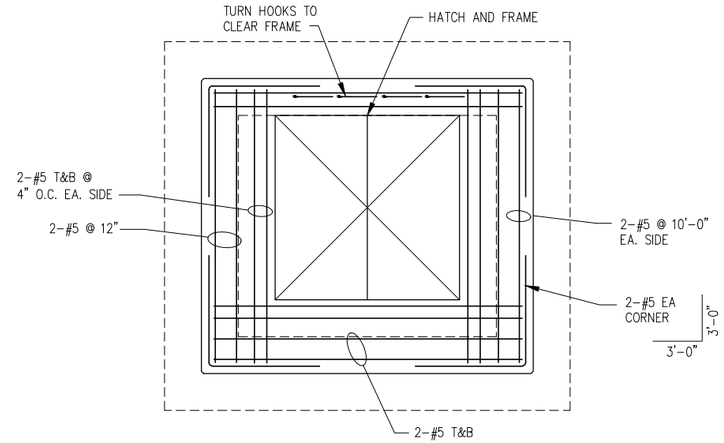
DESIGN DEVELOPMENT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

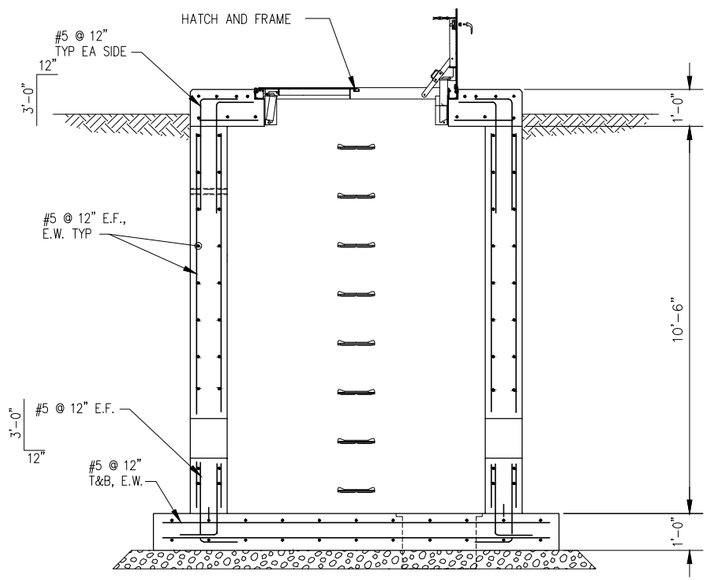
DATE	JUNE 2016
PROJ	0118.013.00
DWG	BD-S-3
SHEET	of



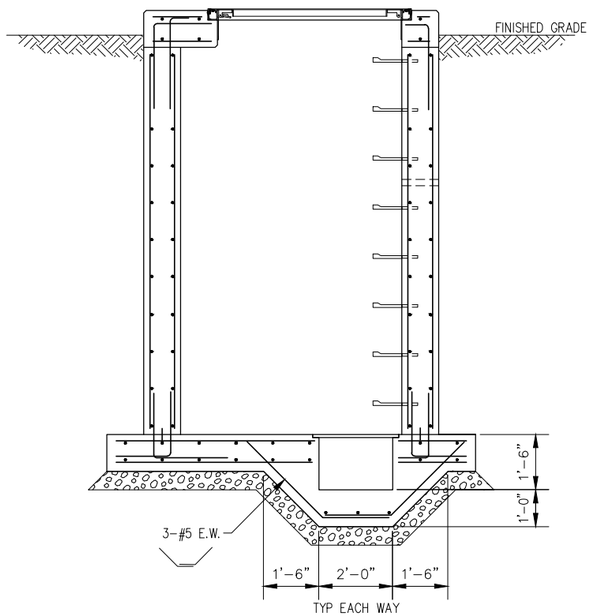
FOUNDATION PLAN
SCALE: 1/2"=1'-0"



DECK PLAN
SCALE: 1/2"=1'-0"



SECTION A
SCALE: 1/2"=1'-0"



SECTION B
SCALE: 1/2"=1'-0"

FOR INFORMATION NOT SHOWN SEE BD-C-09

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	DR	CHK	APVD	BY
DSGN		R. FLORIDGE	P. HUNTER	R. FLORIDGE	APVD	G. CHURCH

DEERE & AULT CONSULTANTS, INC.

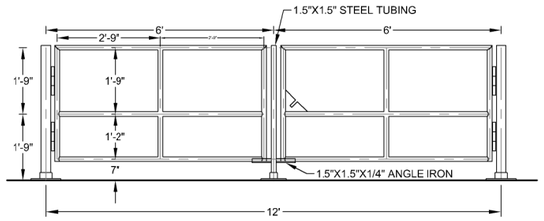
BONUS DITCH COMPANY

DIVERSION INLET AND CHECK STRUCTURE SECTIONS & DETAILS

DESIGN DEVELOPMENT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JUNE 2016
PROJ	0118.013.00
DWG	BD-S-4
SHEET	of

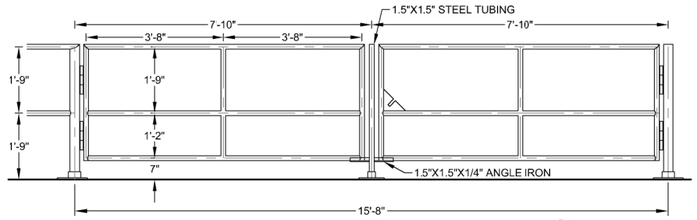


NOTE:

1. CONTRACTOR MAY SUBMIT FOR REVIEW ALTERNATE GATE PLAN.

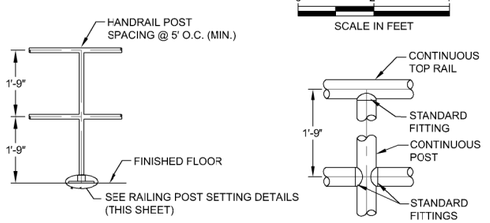
TRASH RACK ACCESS GATE DETAIL

0 2 4
SCALE IN FEET



RIVER SUMP ACCESS GATE DETAIL (A)

0 2 4
SCALE IN FEET



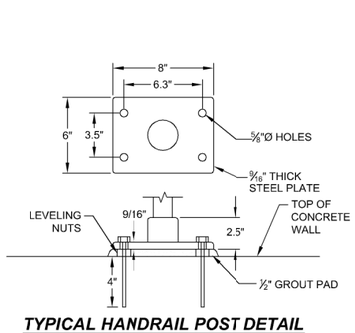
HANDRAIL DETAIL (A)

NTS

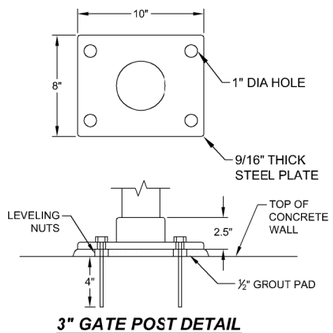
HANDRAIL NOTES:

1. HANDRAIL AND SUPPORTS SHALL ALL BE HOT DIPPED GALVANIZED STEEL CONSTRUCTION.
2. FASTENERS, ANCHORS, BOLTS, NUTS, AND WASHERS FOR GRATING AND SUPPORTS SHALL BE STAINLESS STEEL.
3. FIELD VERIFY ALL MEASUREMENTS ON STRUCTURE PRIOR TO SUBMITTING SHOP DRAWINGS.
4. RAILS AND POSTS EXTRUDED 1 1/2" STEEL THE MAXIMUM POST SPACING IS 5'-6" O.C OR AS APPROVED BY OWNER. SUBMIT SHOP DRAWINGS OF RAILING, GATE, BASE PLATES, ETC. TO OWNER FOR REVIEW BEFORE FABRICATION.

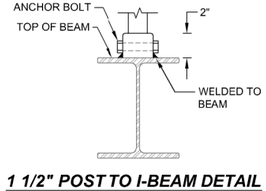
HANDRAIL DETAIL



TYPICAL HANDRAIL POST DETAIL



3" GATE POST DETAIL

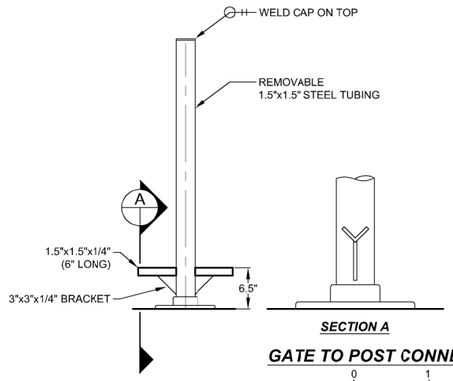


1 1/2" POST TO I-BEAM DETAIL

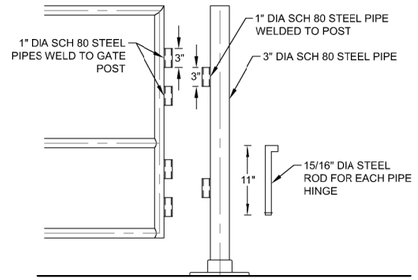
DRAFT

BASE PLATE DETAILS (A)

NTS

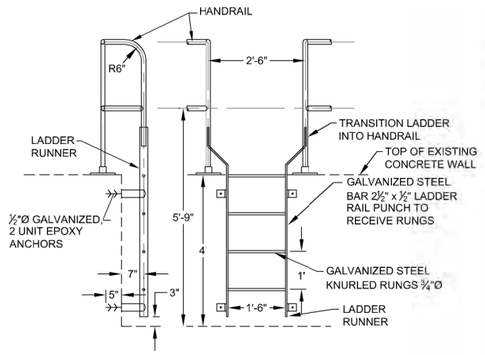


SECTION A



GATE TO POST CONNECTION DETAILS (A)

0 1 2
SCALE IN FEET

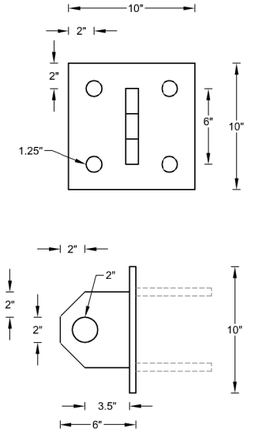


LADDER DETAIL (1 / S1-1)

0 2 4
SCALE N FEET

NOTES:

1. SLOT RAILING FOR LADDER RUNNER AND WELD, GRIND SMOOTH
2. LADDER & ACCESSORIES TO BE HOT-DIPPED GALVANIZED.

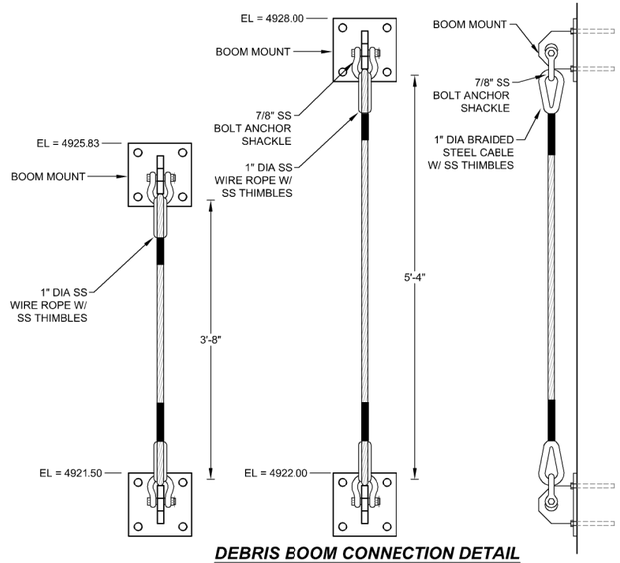


HANDRAIL NOTES:

1. 1" DIA SS ADHESIVE ANCHORS (3" EMBED LENGTH).

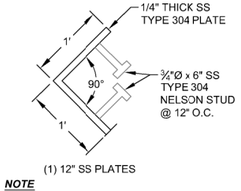
DEBRIS BOOM MOUNTS

0 1 2
SCALE IN FEET



DEBRIS BOOM CONNECTION DETAIL

0 1 2
SCALE IN FEET



NOTE

1. ALL CORNER PLATES ARE 6 FEET TALL. SET ALL PLATES AT INVERT OF DITCH.

STAINLESS STEEL PLATE (SSP) PROTECTION (A)

NTS

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN		DR	CHK	

R HINES, A WOLFEL RECK, B HOGNESS — G CHURCH — APVD — G CHURCH

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

DIVERSION STRUCTURE DETAILS

DESIGN DEVELOPMENT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD–S–5
SHEET	of

NOTES:

GENERAL NOTE
ALTHOUGH SEVERAL PIPE MATERIAL GROUPS MAY BE LISTED ON THIS SHEET FOR A GIVEN FLUID SERVICE, CONTRACTORS SHALL PROVIDE ONLY THE PIPE MATERIAL GROUP SHOWN ON THE DRAWINGS AND SPECIFIED FOR THAT FLUID SERVICE.

NOTE 1
PROPRIETARY NAMES HAVE BEEN QUOTED FOR IDENTIFICATION PURPOSES ONLY. SUBSTITUTIONS WILL BE PERMITTED SUBJECT TO PROVISIONS OF THE SPECIFICATIONS.

NOTE 2
LEAKAGE ALLOWANCE IS AS FOLLOWS:

(A) PIPES SO DESIGNATED SHALL SHOW ZERO LEAKAGE.
(B) PIPES SO DESIGNATED SHALL SHOW ZERO LEAKAGE FOR UNBURIED PIPE AND NOT MORE THAN 0.02 GALLON PER HOUR PER INCH DIAMETER PER 100 FEET OF BURIED PIPE.

NOTE 3
FOR FIELD TEST PROCEDURES AND ADDITIONAL TEST REQUIREMENTS, SEE PIPING SECTION OF SPECIFICATIONS.

NOTE 4
NO SUBSTITUTIONS UNLESS ACCEPTED BY THE ENGINEER PER THE SPECIFICATIONS.

NOTE 5
STATIC WATER TEST WITH SURFACE 5 FEET ABOVE HIGH POINT OF PIPE.

NOTE 6
NO APPARENT LEAKS UNDER NORMAL OPERATING CONDITIONS.

NOTE 7
FOR VALVES 8 INCHES AND LARGER SEE VALVE SCHEDULE. FOR SPECIAL VALVES SEE SPECIFICATIONS.

NOTE 8
CHANGE IN PIPING MATERIAL GROUP NUMBER IS INDICATED THUS: ——◆

NOTE 9
FOR PIPE LINING AND COATING, SEE SPECIFICATIONS.

NOTE 10
EXPOSED PIPING SHALL BE PAINTED IN ACCORDANCE WITH SPECIFICATIONS. COLORS TO BE SELECTED BY ENGINEER.

NOTE 11
FOR VALVE ENDS, SEE SPECIFICATIONS.

PIPING MATERIAL SCHEDULE

GROUP NO	PIPE (SEE NOTE 9)	FITTINGS	VALVES, 6" AND SMALLER (SEE NOTES 1, 7 & 11)
2	STEEL, ASTM A53, SCHEDULE 40, BLACK WELDED, GALVANIZED	2-1/2" AND SMALLER, MALLEABLE IRON, ANSI B16.3, THREADED, BANDED, GALVANIZED 150 PSI. 3" AND LARGER, CAST IRON, ANSI B16.1, 125 PSI FLANGED OR MECHANICAL COUPLINGS.	2-1/2" AND SMALLER ECCENTRIC PLUG, SYNTHETIC RUBBER FACED: DEZURIK 1 S OR KEYSTONE 541. BALL: JAMESBURY FIG 351 OR WATTS #B-6080. 3" AND LARGER, ECCENTRIC PLUG, SYNTHETIC RUBBER FACED: DEZURIK 1 F OR KEYSTONE 580. GATE: AWWA C500. BUTTERFLY: AWWA, FLANGED.
4	WELDED STEEL AWWA C200, COATED & LINED WITH LIFELAST DURASHIELD 210, OR ENGINEER APPROVED EQUAL.	WELDED STEEL AWWA C200 FABRICATED FITTINGS, ANSI B16.5 150 PSI FLANGES	--------
5	DUCTILE IRON, ANSI A21.51, (AWWA C151) OR CAST IRON ANSI A21.6, 150 PSI, BELL AND SPIGOT, MECHANICAL JOINTS, MECHANICAL COUPLINGS, OR 100 PSI FLANGED (TYPICAL SERVICE – WATER LINES)	DUCTILE IRON OR CAST IRON, ANSI A21.10, OR AWWA C110, BELL AND SPIGOT, MECHANICAL COUPLINGS, FLANGED OR MECHANICAL JOINTS, 150 PSI, (PRESSURE RATING) 12" AND SMALLER, 150 PSI, (PRESSURE RATING) 14" AND LARGER, WITH 125 PSI ANSI B16.1 FLANGES.	GATE, AWWA C500, 'O' RING SEALS, MECHANICAL JOINT ENDS, MUELLER A-2380-20, OR CLOW F-5065. BUTTERFLY: AWWA. BALL: PRATT OR APCO-WILLAMETTE.
13	POLYVINYL CHLORIDE PRESSURE PIPE: AWWA C905. BELL AND SPIGOT JOINTS, DIP FITTINGS.	DUCTILE IRON OR CAST IRON 150 PSI FOR POLYVINYL CHLORIDE PIPE AWWA C110 CEMENT MORAR LINED C104 AWWA C905.	POLYVINYL CHLORIDE, BALL DIAPHRAGM, BUTTERFLY, BALL OR LIFT CHECK: NIBCO/CHEMTROL, HILLS-MCCANNIA OR R&G SLOAN MFG
14	COPPER, ASTM B88, TYPE K, SOFT TEMPERED WHERE BURIED, HARD TEMPERED WHERE EXPOSED	WROUGHT COPPER OR CAST BRONZE, ANSI B16.22, SOLDER JOINT, 150 PSI, OR COMPRESSION FITTING.	BALL VALVE: WATTS, NIBCO, OR OTHER APPROVED EQUAL. NSF APPROVED FOR POTABLE WATER SERVICE.
17	HIGH-DENSITY POLYETHYLENE, ASTM D3035 AND AWWA C901.	HIGH-DENSITY POLYETHYLENE, ASTM D3035 AND AWWA C901, HEAT FUSED ASTM D3261.	--------
18	STAINLESS STEEL, TYPE 304, ASTM A312, SCH 40S.	150 PSI, TYPE 304 STAINLESS STEEL, ANSI B16.3 SCREWED OR BUTT-WELDED.	STAINLESS STEEL APOLLO BALL VALVE OR APPROVED EQUAL.

TYPICAL PIPE DESIGNATION:
2" UW ( )
MATERIAL GROUP NUMBER (SEE NOTE 8)
PIPE DIAMETER
FLUID ABBREVIATION

PIPING MATERIALS

FLUID ABBREVIATION	FUNCTION (THIS LIST INCLUDES SOME PIPELINE TYPE NOT USED IN THIS PROJECT)	EXPOSED PIPING (SEE NOTE 10)		BURIED PIPING (SEE NOTE 9)		FIELD TEST REQUIREMENTS (SEE NOTE 3 AND NOTE 4)		
		2" DIA AND SMALLER	2½" DIA AND LARGER	2" DIA AND SMALLER	2½" DIA AND LARGER	MINIMUM TEST PRESSURE PSI	TEST MEDIUM	LEAKAGE ALLOWANCE (SEE NOTE 2)
D	DRAIN	18	5	--	5	100	WATER	(A)
PW	POTABLE WATER	14, 17	--	14, 17	--	100	WATER	(A)
RW	RAW WATER	--	4, 13	--	4, 13	100	WATER	(B)

DESIGN CRITERIA

DESIGN FLOW	5	CFS
NORMAL WSEL IN WET WELL	4923.8	FT
NORMAL WSEL IN CONNECTION MANHOLE	4930 ±	FT

EQUIPMENT SCHEDULE

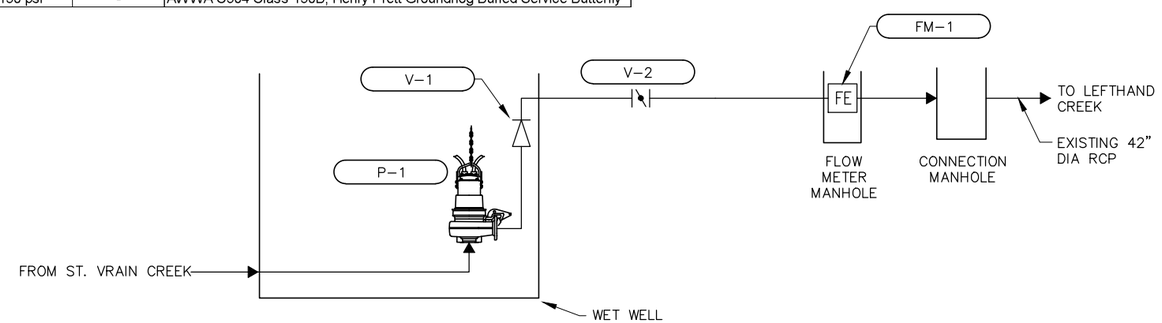
No.	Name	Service	Size	Type	Rated Pressure	Remarks
FM-1	Flow Meter	Raw Water	12" DIA	Magnetic	-	ABB WaterMaster with ScreenMaster RVG Datalogger
I-1	Low Level Alarm	Raw Water	-	Mechanical Float Switch	-	Switch-Tek LV42, or owner approved equal
I-2	Low Level Cutoff	Raw Water	-	Mechanical Float Switch	-	Switch-Tek LV42, or owner approved equal

PUMP SCHEDULE

No.	Name	Location	Service	Type	Design Flow (gpm)	Design TDH (feet)	RPM (motor/pump)	HP	Voltage/Phase	Remarks
P-1	Pump 1	Wet Well	River water, screened	Submersible	2,244	17	1,160	14	208/3	Mody MS-6150

VALVE AND GATE SCHEDULE

No.	Name	Service	Size	Type	Rated Pressure	Operator	Remarks
V-1	Check Valve	River water, screened	12" DIA	Double Disk Wafer	150 psi	-	-
V-2	Butterfly Valve	River water, screened	12" DIA	Buried Butterfly Valve	150 psi	-	AWWA C504 Class 150B, Henry Prett Groundhog Buried Service Butterfly



FLOW SCHEMATIC

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	DR	REVISION	CHK	APVD	BY
DSGN	R. ELDRIDGE	P. HUNTER	R. ELDRIDGE	APVD	G. CHURCH	

DEERE & AULT CONSULTANTS, INC.

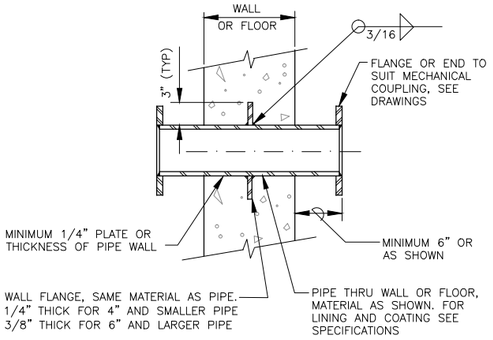
BONUS DITCH COMPANY

FLOW SCHEMATIC, DESIGN CRITERIA, AND SCHEDULES

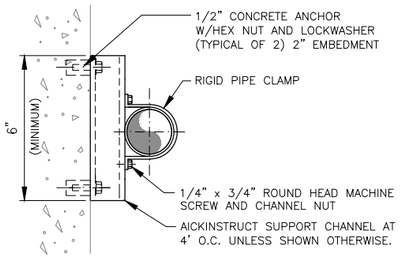
DESIGN DEVELOPMENT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-GM-1
SHEET	of



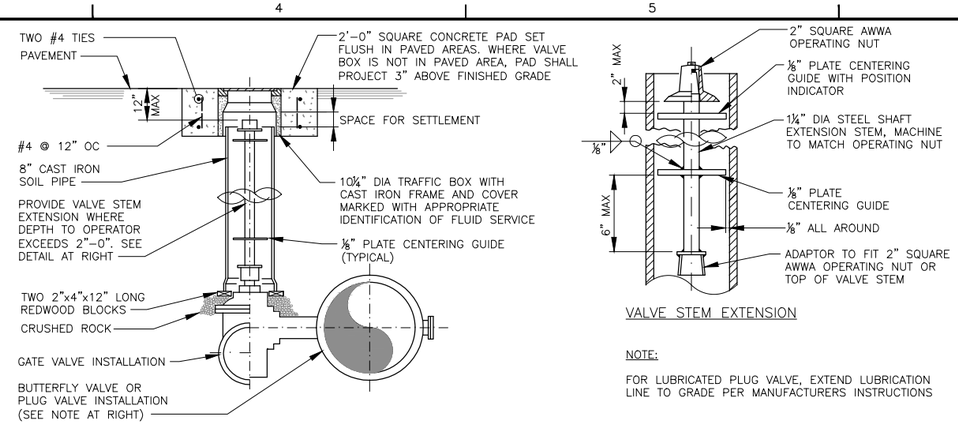
FABRICATED PIPE THIMBLE 1 BD-M-1



NOTES:

1. FOR ADDITIONAL REQUIREMENTS SEE SPECIFICATIONS SECTION 'PIPE SUPPORTS'.
2. THIS TUBING CLAMP IS LIMITED TO TUBING SIZES 1/4" THRU 1".
3. ALL HARDWARE AND ANCHORS SHALL BE STAINLESS STEEL.

TUBING CLAMP (FOR PIPE 1" DIAMETER AND SMALLER) 2 BD-M-1



VALVE STEM EXTENSION

NOTE:

FOR LUBRICATED PLUG VALVE, EXTEND LUBRICATION LINE TO GRADE PER MANUFACTURERS INSTRUCTIONS

BURIED VALVE 3 BD-M-1

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN	R. ELDRIDGE	DR P. HUNTER	CHK R. ELDRIDGE	APVD G. CHURCH

DEERE & AULT CONSULTANTS, INC.

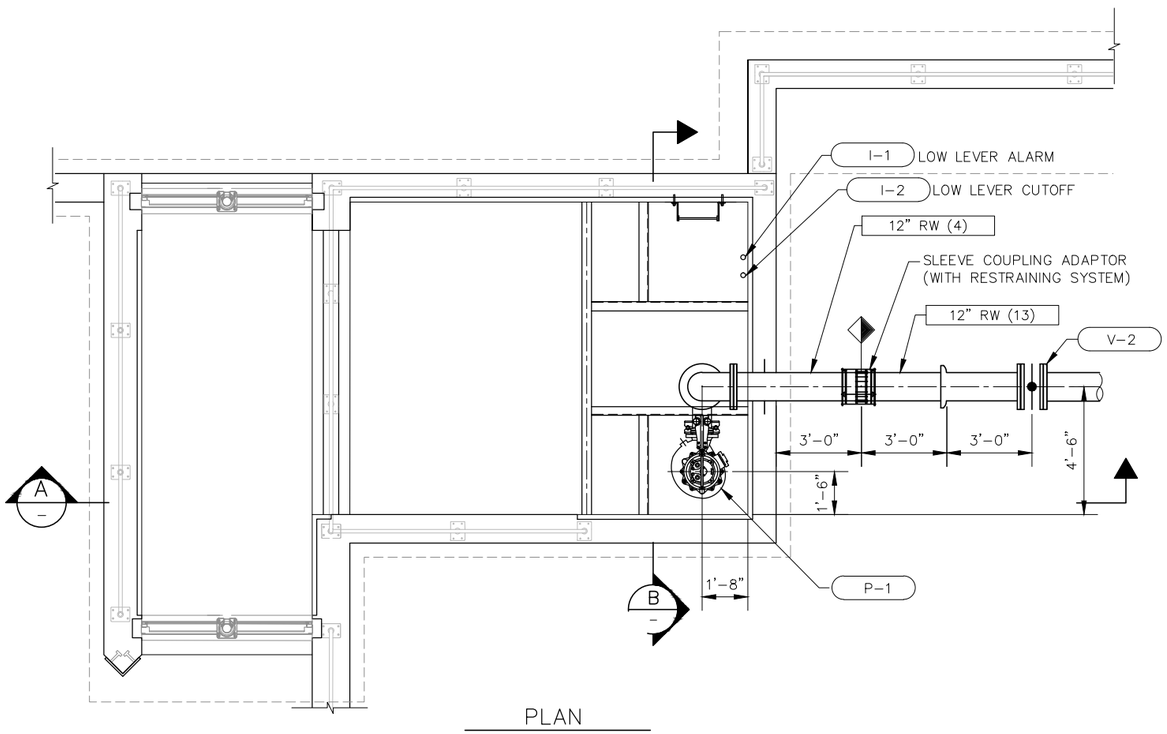
BONUS DITCH COMPANY

GENERAL MECHANICAL DETAILS

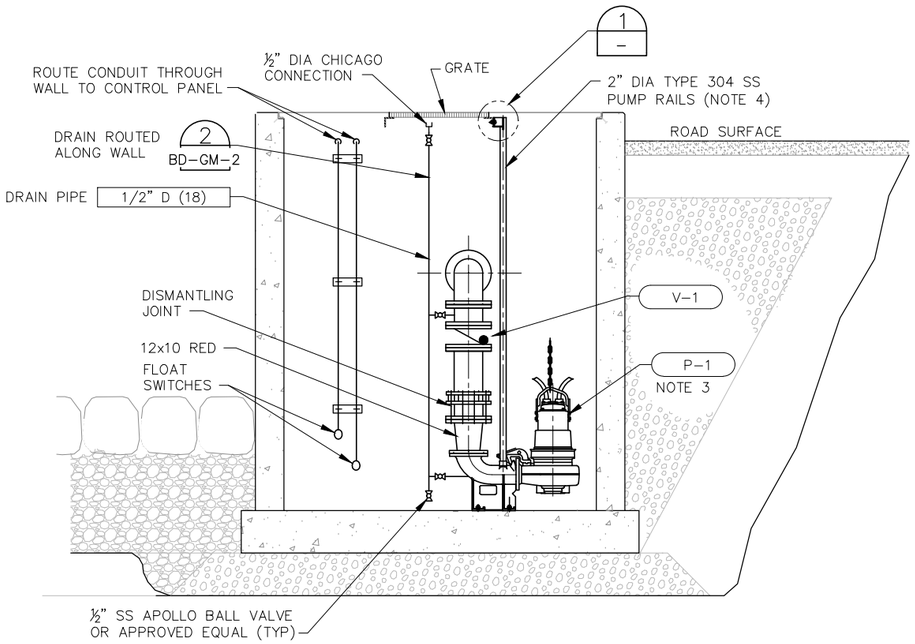
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-GM-2
SHEET	of

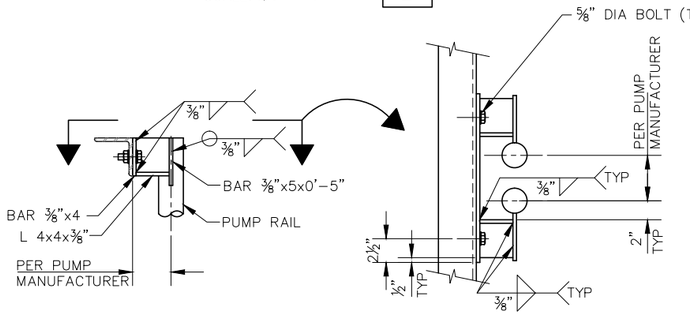
DESIGN DEVELOPMENT



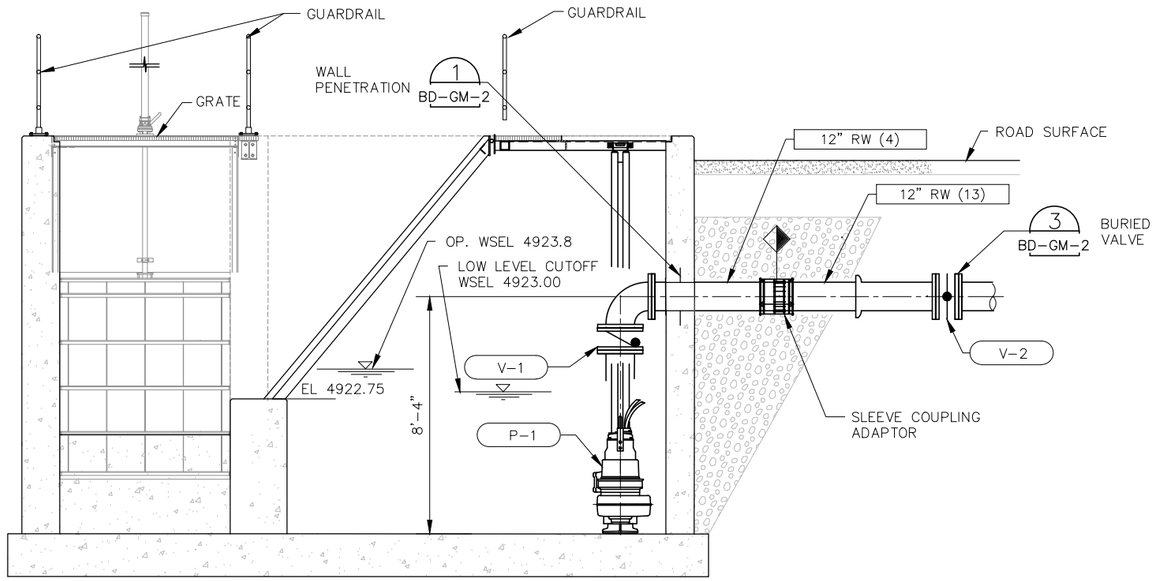
PLAN
SCALE: 3/8"=1'-0"



SECTION
SCALE: 3/8"=1'-0"
B



DETAIL
SCALE: 1 1/2"=1'-0"
1



SECTION
SCALE: 3/8"=1'-0"
A

NOTES:

1. FOR ELEVATIONS OF SLABS SEE STRUCTURAL SHEETS.
2. FOR EQUIPMENT AND PIPING SCHEDULE SEE BD-GM-1.
3. INSTALL PUMP IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS, INCLUDING SIDE AND BOTTOM CLEARANCES.
4. PUMP RAIL DIAMETER AND SIZE SHALL BE PER THE PUMP MANUFACTURER'S RECOMMENDATION.

DRAFT

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN	R. ELDRIDGE	DR P. HUNTER	CHK R. ELDRIDGE	APVD G. CHURCH

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

SUBMERSIBLE PUMP PLAN AND SECTIONS

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	APR 2016
PROJ	0118.013.00
DWG	BD-M-1
SHEET	of

DESIGN DEVELOPMENT

ELECTRICAL LEGEND

A-1	BRANCH CIRCUIT HOMERUN. DESTINATION SHOWN. (CROSSHATCHES: SHORT=HOT; LONG=NEUTRAL; OPPOSITE=GROUND)
	EXPOSED CONDUIT AND CONDUCTOR
	CONDUIT AND/OR CONDUCTOR CONCEALED IN CEILING OR WALL
	CONDUIT AND/OR CONDUCTOR CONCEALED IN FLOOR, SLAB, OR BELOW GRADE
GFCI 42"	GFCI – GROUND FAULT CIRCUIT INTERRUPTING WP – WEATHERPROOF 42" – HEIGHT ABOVE FINISHED FLOOR (GRADE) AC – ABOVE COUNTER UC – UNDER COUNTER
J	JUNCTION BOX
	BRANCH CIRCUIT PANELBOARD– NEMA 1 ENCLOSURE UNLESS OTHERWISE NOTED. REFER TO PANEL SCHEDULE FOR SIZE AND SPECIFICATION
25KVA	DRY–TYPE TRANSFORMER. PHASE AND KVA INDICATED
M	EQUIPMENT MOTOR
	TRANSFORMER, POLE OR PAD MOUNTED
OR OR	DISCONNECT SWITCH
M	FRACTIONAL HORSEPOWER MOTOR
	FUTURE LIGHT FIXTURE
	EMERGENCY LIGHT FIXTURE
1	POWER CABLE DESIGNATION (SEE SCHEDULE)
1	ELECTRICAL FLAG NOTE
	MAGNETIC MOTOR STARTER; 1= NEMA SIZE; Ⓗ = HOA SWITCH; Ⓖ = GREEN LIGHT (RUN); Ⓨ = ETM ⊙ = ON/OFF SWITCH Ⓡ = RED LIGHT(STOP) Ⓐ = AMBER LIGHT
VFD	VARIABLE FREQUENCY DRIVE

AFF	ABOVE FINISHED FLOOR	LEL	POWER EXPLOSION LIMIT	LIT	LEVEL INDICATING TRANSMITTER
AFG	ABOVE FINISHED GRADE	LPG	LIQUID PROPANE GAS	LE	LEVEL ELEMENT
BFF	BELOW FINISHED FLOOR	MCC	MOTOR CONTROL CENTER		
BFG	BELOW FINISHED GRADE	MCIP	MAIN CONTROL INSTRUMENT PANEL		
CKT	CIRCUIT	N	NEUTRAL		
CT	CURRENT TRANSFORMER	OHD	OVERHEAD DOOR		
G	GROUND	PC	PHOTOCELL		
GC	GROUNDING CONDUCTOR	PLC	PROGRAMMABLE CONTROLLER		
GRD	GROUNDING CONDUCTOR	PVC	POLYVINYL CHLORIDE		
GFCI	GROUND FAULT CIRCUIT INTERRUPT	SSRV	SOLID STATE REDUCED VOLT.		
GRC	GALVANIZED RIGID CONDUIT	UG	UNDERGROUND		
HP	HORSEPOWER	VFD	VARIABLE FREQUENCY DRIVE		
IC	INTERRUPTING CAPACITY	XFMR	TRANSFORMER		
C	CONDUIT	MDP	MAIN DISTRIBUTION PANEL		
AC	ABOVE COUNTER	MDB	MAIN DISTRIBUTION SWITCHBOARD		
UC	UNDER COUNTER	4PSN	FOUR POLE SWITCHED NEUTRAL		

GENERAL NOTES

1. COORDINATE FINAL EQUIPMENT LOCATIONS WITH OWNER PRIOR TO ROUGH–INS.
2. ALL ELECTRICAL INSTALLATIONS LESS THAN 1000V SHALL BE IN ACCORDANCE WITH NFPA–70. ALL ELECTRICAL INSTALLATIONS ABOVE 1000V SHALL BE IN ACCORDANCE WITH NESC.
3. THE OWNER AND ENGINEER ARE NOT RESPONSIBLE FOR THE CONTRACTORS SAFETY PRECAUTIONS OR TO MEANS, METHODS TECHNIQUES CONSTRUCTION SEQUENCES OR PROCEDURES REQUIRED TO PERFORM HIS WORK.
4. THE INTENT OF THE DRAWINGS IS TO PROVIDE AND INSTALL NEW COMPONENTS IN THE AREA OF CONSTRUCTION. CONTRACTOR SHALL PROVIDE A COMPLETE AND OPERABLE SYSTEM AFTER ALL CONNECTIONS TO NEW AND EXISTING EQUIPMENT ARE COMPLETED.
5. DIMENSIONS – CONTRACTOR/CUSTOMER TO VERIFY ALL DIMENSIONS AND REPORT ANY DISCREPANCIES TO OWNER IMMEDIATELY.
6. ALL ELECTRICAL COMPONENTS TO BE UL LISTED FOR THEIR USE AND INSTALLED PER LOCAL ELECTRICAL CODE.
7. ALL ELECTRICAL DEVICES ARE PER SCHEDULE AND DRAWINGS OR OWNER APPROVED EQUAL.
8. FLOOR AND SITE PLAN MAY NOT REFLECT FINAL LAYOUT. COORDINATE WITH OWNER.
9. ALL ELECTRICAL CIRCUITS TO BE ROUTED TO MINIMIZE VOLTAGE DROP AS POSSIBLE.
10. CONTRACTOR TO PROVIDE GROUNDING ELECTRODES (3 – 3/4" X 10' COPPER CLAD STEEL GROUND RODS) SPACED 1 ROD LENGTH APART AT SERVICE ENTRANCE TO BUILDING. THESE GROUNDING ELECTRODES TO BE CONNECTED TO UFER WITHIN SLAB OF BUILDING AND TO SERVICE PIPING. GROUNDING ELECTRODES TO BE CONNECTED WITH #4/0 CU GROUND CONDUCTOR. ADDITIONAL GROUNDS DUE TO SOIL CONDITIONS AT FACILITY AND EXPECTED REDUCED CONDUCTIVITY.
11. ALL GROUNDING INCLUDING GROUND RODS AND UFER GROUNDS TO MEET NFPA–70 REQUIREMENTS.
12. ALL EXTERIOR CONDUIT TERMINATIONS TO BE GASKETED TYPE TO MAINTAIN NEMA RATING ON EQUIPMENT.
13. CONTRACTOR TO PROVIDE CABLE FROM METER TO LOADS. UTILITY TO PROVIDE CONNECTION AT METER.
14. CONTRACTOR TO PROVIDE CONDUIT AND CONDUCTORS FOR CONNECTION TO REACH TOP OF POLE. CONNECTION TO BE MADE BY LONGMONT POWER UTILITY. COORDINATE WITH UTILITY FOR DETAIL REQUIREMENTS.
15. ALL MEASUREMENTS ARE APPROXIMATE, CONTRACTOR TO CONFIRM LENGTHS IN FIELD.
16. CONDUITS BELOW GROUND SHALL BE PVC SCHEDULE 80 WHERE VEHICULAR TRAFFIC WILL OCCUR. ALL CONDUITS OUTSIDE CONTROL CABINET TO HAVE A MINIMUM SIZE OF 3/4". CONDUITS COMPLETELY WITHIN CONTROL CABINET TO BE EMT WITH MINIMUM 1/2" SIZE.
17. ALL PUMPING EQUIPMENT AND ACTUATORS TO BONDED AND GROUNDED PER NFPA–70 (NEC).
18. CONTROLS SCHEMATICS AND DETAILS TO BE PROVIDED AT A LATER PHASE OF PROJECT.
19. ALL CONDUCTORS TO BE COPPER UNLESS EXPLICITLY CALLED OUT OTHERWISE. ALL CONDUCTORS ROUTED EXTERIOR TO CONTROL CABINET TO BE WET RATED.
20. CONTRACTOR TO PROVIDE LABELS FOR ALL EQUIPMENT AS CALLED OUT ON NAMEPLATE SCHEDULE.

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	DSGN	DR	CHK	APVD
		R HINES, A WOLFE	RECK, B HOGNESS	G CHURCH	G CHURCH

REVISION BY APVD

BONUS DITCH COMPANY

DEERE & AULT CONSULTANTS, INC.

ELECTRICAL NOTES AND LEGEND

DESIGN DEVELOPMENT

ESC engineering
FORT COLLINS (970) 224–9100 COLORADO esc@thinkESC.COM

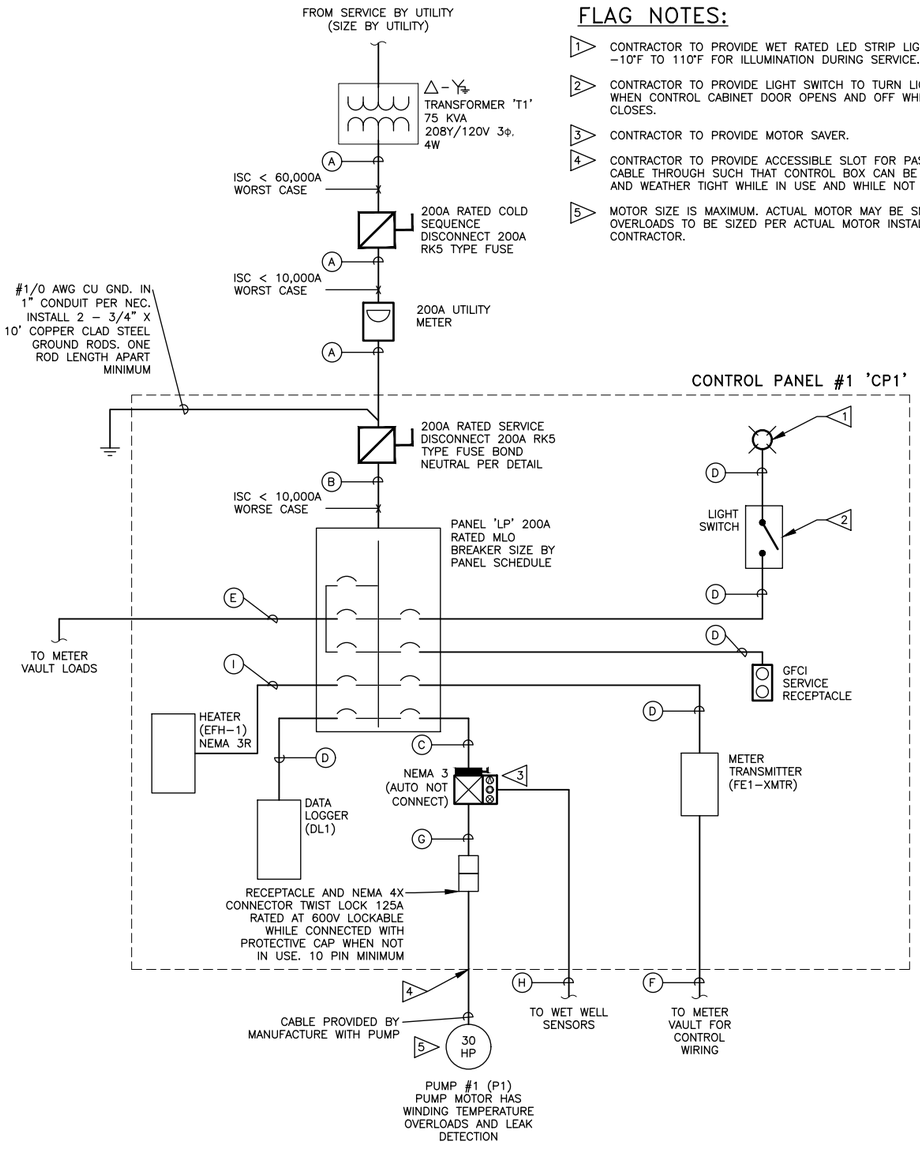
811 Know what's below. Call before you dig.

DRAWN BY: _____ CHK. BY: _____
DESIGN BY: _____ APP. BY: _____

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

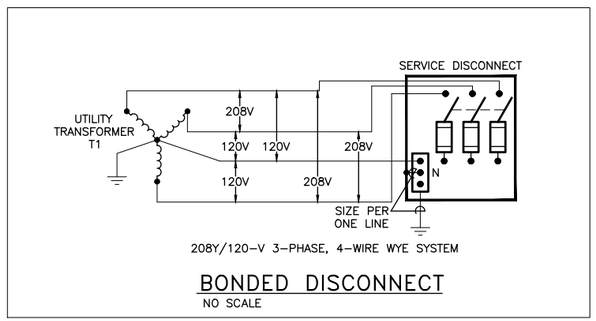
DATE	JULY 2016
PROJ	215-363
DWG	BD-E-01
SHEET	E1of 7

$PWURL $PWPATH P:\200's\215\363-Deere and Ault Consultants, Inc.-Bonus Ditch\ESC Drawings FILENAME: E01-LEGEND AND GENERAL NOTE.dwg PLOT DATE: 7/19/16 PLOT TIME: 11:15



FLAG NOTES:

1. CONTRACTOR TO PROVIDE WET RATED LED STRIP LIGHT RATED –10°F TO 110°F FOR ILLUMINATION DURING SERVICE.
2. CONTRACTOR TO PROVIDE LIGHT SWITCH TO TURN LIGHT ON WHEN CONTROL CABINET DOOR OPENS AND OFF WHEN DOOR CLOSES.
3. CONTRACTOR TO PROVIDE MOTOR SAVER.
4. CONTRACTOR TO PROVIDE ACCESSIBLE SLOT FOR PASSING PUMP CABLE THROUGH SUCH THAT CONTROL BOX CAN BE LOCKED AND WEATHER TIGHT WHILE IN USE AND WHILE NOT IN USE
5. MOTOR SIZE IS MAXIMUM. ACTUAL MOTOR MAY BE SMALLER. OVERLOADS TO BE SIZED PER ACTUAL MOTOR INSTALLED BY CONTRACTOR.



208Y/120–V 3–PHASE, 4–WIRE WYE SYSTEM

BONDED DISCONNECT

NO SCALE

BONUS DITCH

CONDUIT AND FEEDER SCHEDULE

SECTION	# RUNS	POWER CONDUCTORS # CONDUCTOR	POWER CONDUCTORS SIZE (AWG/KCMIL)	POWER CONDUCTORS METAL	POWER CONDUCTORS INSUL.	POWER CONDUCTORS L (FT)	POWER CONDUCTORS %VD	GROUND CONDUCTOR # CONDUCTOR	GROUND CONDUCTOR SIZE (AWG/KCMIL)	GROUND CONDUCTOR METAL	GROUND CONDUCTOR INSUL.	CONDUIT MIN SIZE (INCHES)	CONDUIT TYPE	CONDUIT L (FT)	NOTES
A	1	4	4/0	CU	XHHW	26	0.26%	0	2	CU	XHHW	3	PVC UNDERGROUND RGS ABOVE	16	–
B	1	4	4/0	CU	THWN	8	0.08%	0	2	CU	THWN	3	EMT	1	–
C	1	3	1	CU	THWN	8	0.21%	0	6	CU	THWN	1–1/2	EMT	4	–
D	1	3	12	CU	THWN	12	2.47%	0	12	CU	THWN	3/4	EMT	2	–
E	CIRCUITS SIZED PER PANEL SCHEDULE TO BE RAN TO METER VAULT IN SINGLE 2" CONDUIT.														
F	CONTRACTOR TO PROVIDE 2" CONDUITS WITH CABLES AS SPECIFIED ON THE CONTROLS ONE LINE TO METER VAULT.														
G	SEE CONTROLS ONE LINE.														
H	CONTRACTOR TO PROVIDE 1" CONDUIT WITH CABLES AS SPECIFIED ON THE CONTROLS ONE LINE TO METER VAULT														
I	1	3	10	CU	THWN	12	0.27%	1	10	CU	THWN	3/4	EMT	2	–

NOTES:
1. ALL MEASUREMENTS ARE APPROXIMATE, CONTRACTOR TO CONFIRM LENGTHS IN FIELD
2. CONDUCTOR SIZED ASSUMING SINGLE LOAD PER CONDUIT AND WITH AMBIENT TEMPERATURE 100 DEGREES F.
3. # RUNS SIGNIFIES THE NUMBER OF PARALLEL RUNS OF CONDUIT AND CONDUCTORS PER SECTION
4. CABLE TO BE BELDEN 29507 OR APPROVED EQUAL.

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	DR	REVISION	CHK	BY	APVD
DSGN	R HINES, A WOLFE	RECK, B HOGNESS		G CHURCH		G CHURCH

DESIGN DEVELOPMENT

BONUS DITCH COMPANY

ELECTRICAL ONE LINE DIAGRAM

DEERE & AULT CONSULTANTS, INC.

ESC engineering
FORT COLLINS (970) 224–9100
COLORADO esc@thinkESC.com

811 Know what's below. Call before you dig.

DRAWN BY: CHK. BY:
DESIGN BY: APP. BY:

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

DATE	JULY 2016
PROJ	215-363
DWG	BD-E-02
SHEET	E2of 7

PROJECT BONUS DITCH PUMP STATION — PANEL: **"LP"**

208Y/120 VOLT — BUS: **200A CU**

3 PHASE 4 W — MAIN: **200A MAIN LUGS ONLY** — LOCATION: **PUMP STATION**

Fault Current Rating: 10K AIC

FED FROM: **MDP**

NOTE: **ALL " * " BREAKERS TO BE GFCI RATED** — MOUNTING: **SURFACE MOUNT**

VOLTAGE DROP	BRANCH CIRCUIT DESCRIPTION	ID	BREAKER	DESCRIPTION	V - A	CIRCUIT	PHASE	CIRCUIT	V - A	DESCRIPTION	BREAKER	ID	BRANCH CIRCUIT DESCRIPTION	VOLTAGE DROP
0.16%	C12008008	H	35	EH-1 HEATER	3000	1	A	2	0	BLANK		+	C12012012	0.00%
0.02%	C12012012	G	20	CONTROL CABINET SERVICE RECEPTACLE	180	3	B	4	180	METER VAULT SERVICE GFCI	20	G	C12010010	0.47%
0.01%	C12012012	D	20	DL1 DATALOGGER	100	5	C	6	100	METER VAULT FUTURE LIGHT	20	L	C12010010	0.26%
0.00%		+	----	BLANK	0	7	A	8	0	BLANK		+		0.00%
0.00%		+	----	BLANK	0	9	B	10	742	METER VAULT SUMP PUMP	20	D	C12010010	1.92%
0.01%	C12012012	L	20	CONTROL CABINET LIGHT	100	11	C	12	120	FE1 FLOWMETER	20	D	C12010010	0.31%
0.02%	C12012012	D	20	FE1 XMTR METER TRANSMITTER	120	13	A	14	9607	PUMP P1	40/3	B	SEE	1.10%
0.00%		+	----	BLANK	0	15	B	16	9607		|	B	FEEDER	
0.00%		+	----	BLANK	0	17	C	18	9607		|	B	SCHED. C	

CONNECTED LOAD (Downstream Loads Included)	TOTALS
Phase A	**12727**
Phase B	**10709**
Phase C	**10027**

LOAD SUMMARY

CATEGORY	CONNECTED	FACTOR	CALCULATED V - A	AMPS
LIGHTING	200	125%	250	0.7
GENERAL RECEPTACLE	360	100%	360	1.0
REMAINING GENERAL REC.	0	50%	0	0.0
DEDICATED RECEPTACLE	1082	100%	1,082	3.0
MOTOR	0	100%	0	0.0
B - LARGEST MOTOR	28821	125%	36,026	100.0
+ MISCELLANEOUS	0	100%	0	0.0
KITCHEN	0	65%	0	0.0
ELECTRIC HEAT	0	125%	0	0.0
Total Demand:			37,718	**105**

NOTES

* = GFCI PROTECTED BREAKER REQUIRED

BRANCH CIRCUIT DESCRIPTION ABCDDDEEE = A-B-C-DDD-EEE

A 1 DIGIT CONDUCTOR METAL (A FOR ALUMINUM AND C FOR COPPER)

B # PARALLEL RUNS

C # NON-GROUND CONDUCTORS (INCLUDE POWER AND NEUTRALS)

DDD 3 DIGIT SIZING OF NON-GROUNDED CONDUCTORS

EEE 3 DIGIT SIZING OF GROUND

EXAMPLE: C12010010C = C-1-2-010-010 = CU 1 RUN OF 2 #10AWG W/ #10AWG GROUND

NAMEPLATE SCHEDULE
COLOR OF NAME PLATE WHITE WITH BLACK TEXT

ITEM NO.	FIRST LINE 1/2" LETTER HT.	SECOND LINE 1/4" LETTER HT
1	CP1	PUMP STATION CONTROL PANEL #1
2	DL1	DATA LOGGER
3	LCS #1	LOCAL CONTROL STATION #1
4	LCS #2	LOCAL CONTROL STATION #2
5	I-1	WET WELL LEVEL
6	I-2	WET WELL LOW LEVEL PUMP SHUT OFF
7	FE1	MAGNETIC FLOW METER
8	FE1 XMTR	FLOW METER TRANSMITTER
9	OIT	OPERATOR INTERFACE TERMINAL
10	P1	PUMP #1
11	PANEL LP	PANEL 'LP' 208Y/120V, 3 PHASE, 4 WIRE
12	PLC	PROGRAMMABLE LOGIC CONTROLLER
13	T1	TRANSFORMER #1
14	EH-1	CABINET HEATER #1

NOTE:
1. Labels are phenolic labels.

LABEL STYLE 1

FIRST LINE

LABEL STYLE 2

FIRST LINE
SECOND LINE

PRELIMINARY
NOT FOR
CONSTRUCTION

NO.	DATE	REVISION	CHK	APVD
DSGN	R HINES, A WOLFE	DR	RECK, B HOGNESS	BY	G CHURCH	APVD	G CHURCH

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

ELECTRICAL SCHEDULES

DESIGN DEVELOPMENT

ESC engineering
FORT COLLINS COLORADO
(970) 224-9100 esc@thinkESC.COM

811 Know what's below. Call before you dig.

DRAWN BY: _____ CHK. BY: _____
DESIGN BY: _____ APP. BY: _____

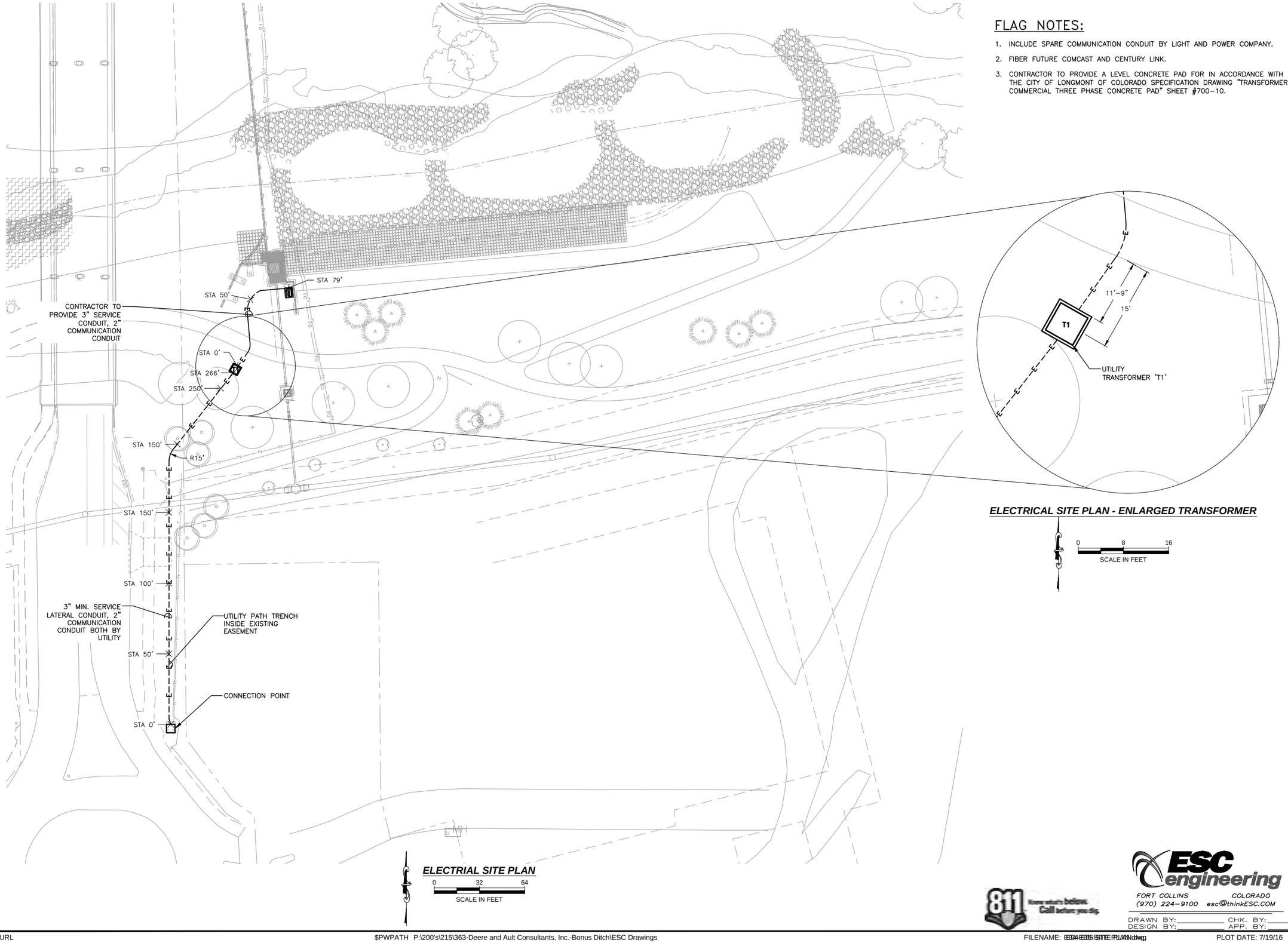
VERIFY SCALE

BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2016
PROJ	215-363
DWG	BD-E-03
SHEET	E3 of 7

FLAG NOTES:

1. INCLUDE SPARE COMMUNICATION CONDUIT BY LIGHT AND POWER COMPANY.
2. FIBER FUTURE COMCAST AND CENTURY LINK.
3. CONTRACTOR TO PROVIDE A LEVEL CONCRETE PAD FOR IN ACCORDANCE WITH THE CITY OF LONGMONT OF COLORADO SPECIFICATION DRAWING "TRANSFORMER COMMERCIAL THREE PHASE CONCRETE PAD" SHEET #700–10.



ELECTRICAL SITE PLAN - ENLARGED TRANSFORMER

0 8 16
SCALE IN FEET

ELECTRIAL SITE PLAN

0 32 64
SCALE IN FEET

811 Know what's below. Call before you dig.

ESC engineering
FORT COLLINS (970) 224–9100 COLORADO esc@thinkESC.COM

DRAWN BY: _____ CHK. BY: _____
DESIGN BY: _____ APP. BY: _____

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	DR	CHK	APVD	BY	APVD
DSGN	R HINES, A WOLFE		RECK, B HOGNESS	G CHURCH	APVD	G CHURCH	

DEERE & AULT CONSULTANTS, INC.

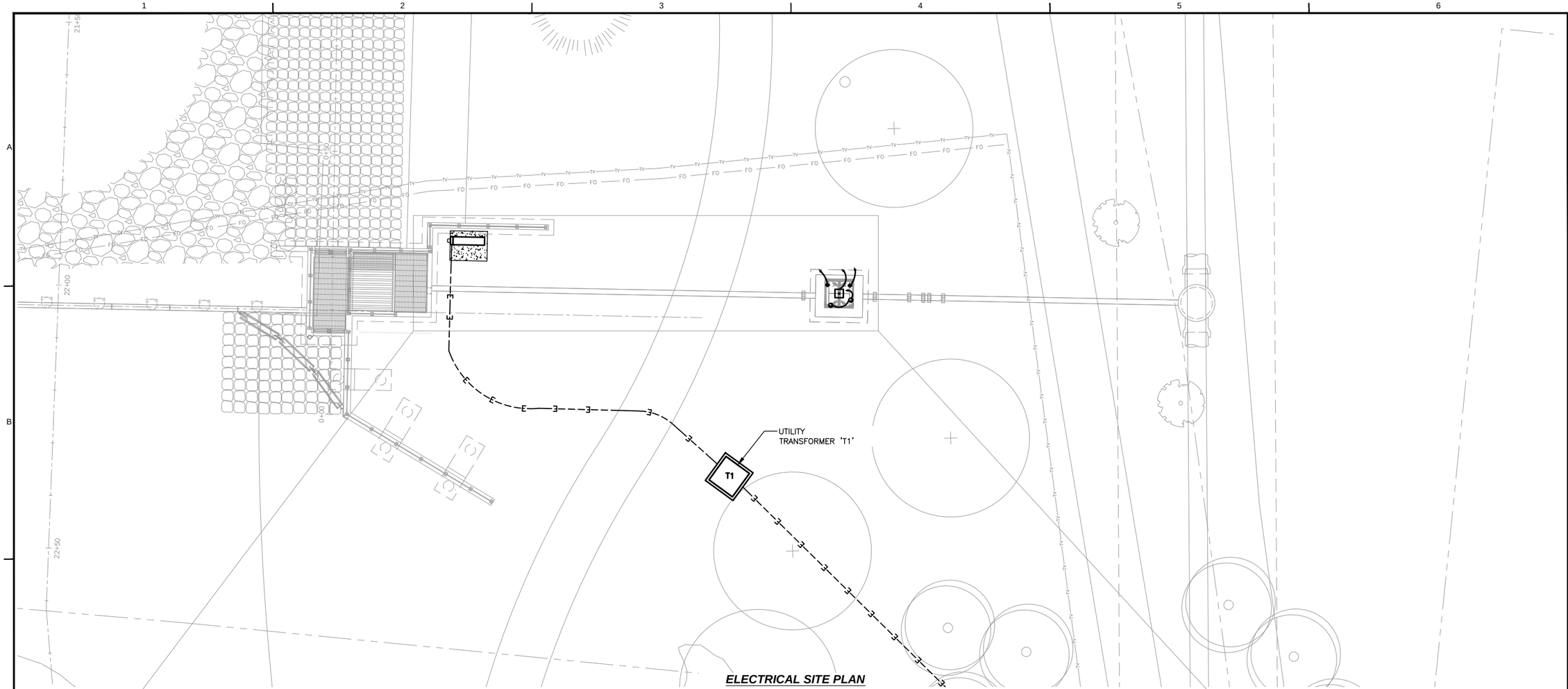
BONUS DITCH COMPANY

ELECTRICAL SITE PLAN

DESIGN DEVELOPMENT

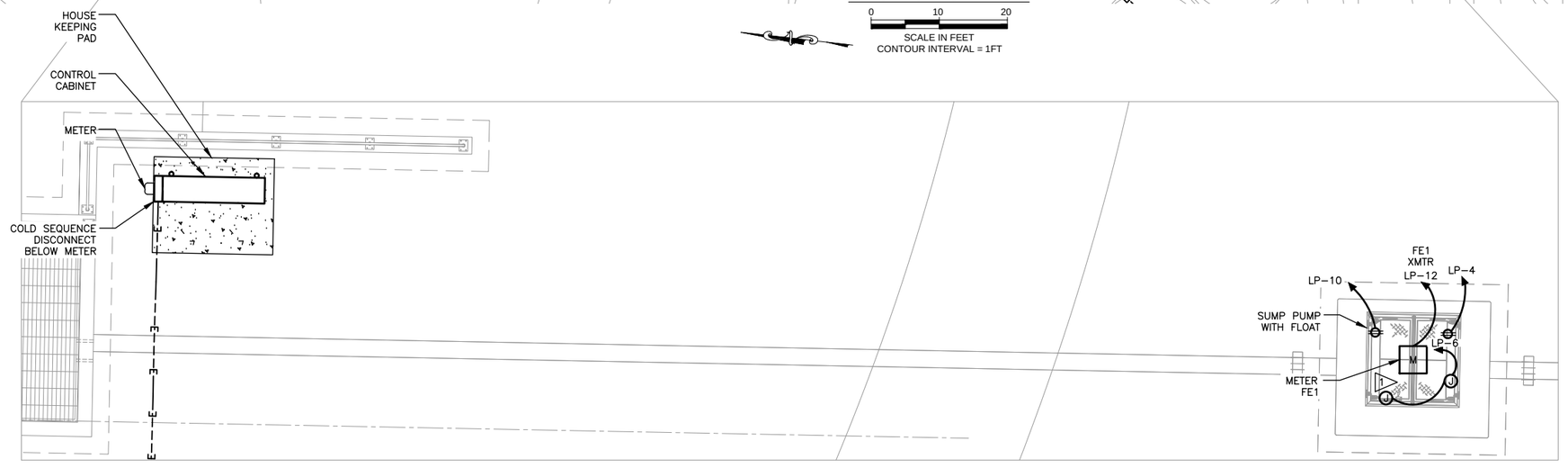
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2016
PROJ	215-363
DWG	BD-E-04
SHEET	E4 of 7



ELECTRICAL SITE PLAN

0 10 20
SCALE IN FEET
CONTOUR INTERVAL = 1FT



ELECTRICAL - ENLARGED METER VAULT

0 4 8
SCALE IN FEET

FLAG NOTES:

1. ALL RECEPTACLES, SWITCHES, FIXTURES AND CORDS TO BE IP67 RATED.

PRELIMINARY
NOT FOR
CONSTRUCTION

NO.	DATE	REVISION	BY	APVD
DSGN	R HINES, A WOLFE	DR	RECK, B HOGNESS	CHK	G CHURCH	APVD	G CHURCH

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

LIGHTING AND POWER PLANS

DESIGN DEVELOPMENT

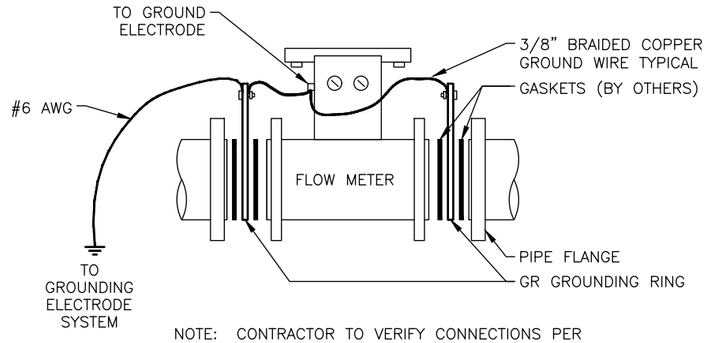
ESC engineering
FORT COLLINS COLORADO
(970) 224-9100 esc@thinkESC.COM

811 Know what's below. Call before you dig.

DRAWN BY: _____ CHK. BY: _____
DESIGN BY: _____ APP. BY: _____

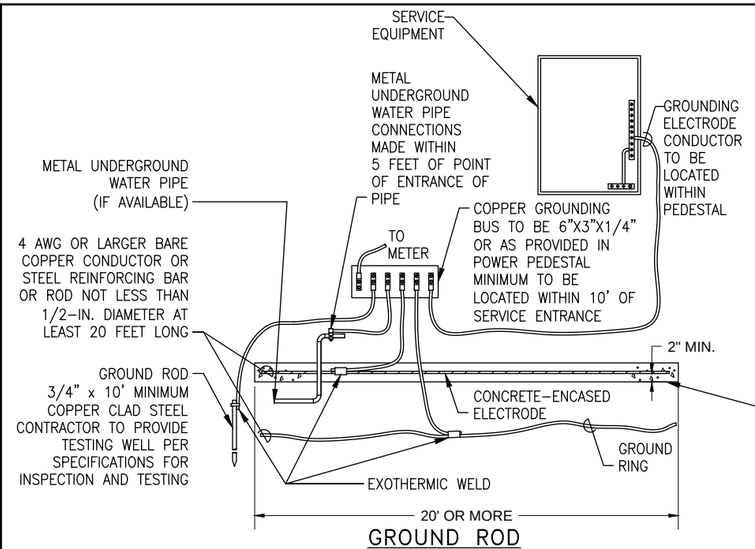
VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

DATE	JULY 2016
PROJ	215-363
DWG	BD-E-05
SHEET	E5 of 7



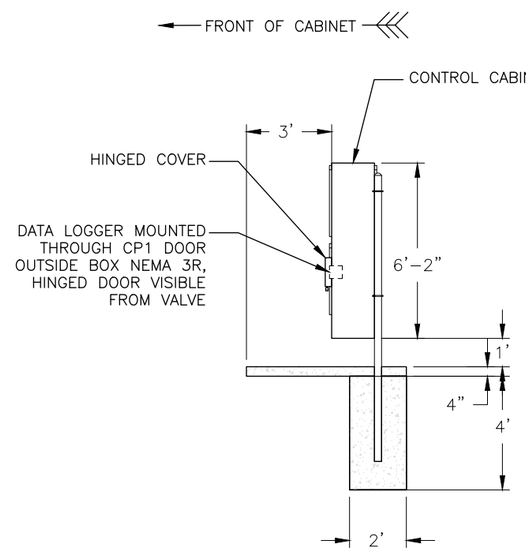
NOTE: CONTRACTOR TO VERIFY CONNECTIONS PER MANUFACTURER DETAILS

FLOW METER GROUNDING DETAIL
N.T.S.

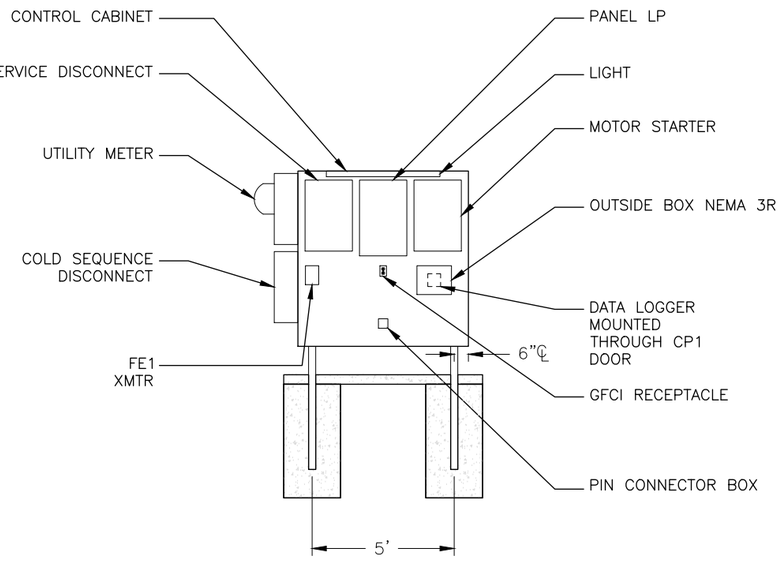


NOTE:
1. CONTRACTOR TO PROVIDE GROUNDING USING A MINIMUM OF TWO MEANS. IF WATER PIPE IS PRESENT, IT HAS TO BE GROUNDED IF PIPE IS METAL.
2. ALL GROUNDING CONNECTIONS HAVE TO BE ACCESSIBLE FOR INSPECTION AND MAINTENANCE.
3. ALL CABLES AND CONDUITS TO BE LABELED PER SPECIFICATIONS WITH FROM/TO INFORMATION.
4. CONTACTOR TO CONFIRM ALL METAL PIPING SYSTEMS ARE BONDED PER NEC.

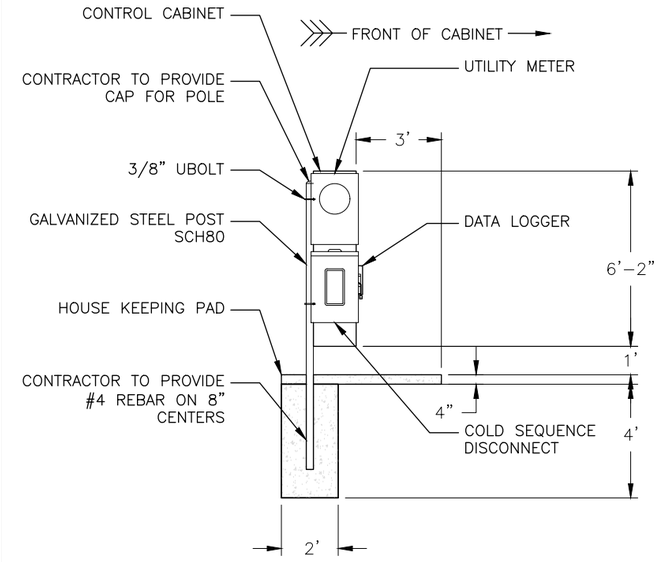
GROUND ROD
N.T.S.



CONTROL CABINET SIDE VIEW
SCALE: N.T.S.



ELEVATION CONTROL CABINET DETAIL
SCALE: N.T.S.



CONTROL CABINET PEDESTAL DETAIL
SCALE: N.T.S.

PRELIMINARY NOT FOR CONSTRUCTION

NO	DATE	REVISION	DR	CHK	APVD	BY	APVD
DSGN		R HINES, A WOLFE, RECK, B HOGNESS	G CHURCH				G CHURCH

DEERE & AULT CONSULTANTS, INC.

BONUS DITCH COMPANY

ELECTRICAL DETAILS

DESIGN DEVELOPMENT

ESC engineering
FORT COLLINS COLORADO
(970) 224-9100 esc@thinkESC.COM

DRAWN BY: CHK. BY:
DESIGN BY: APP. BY:

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING.
0 1"

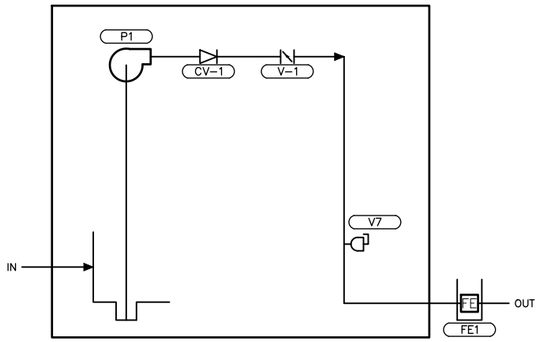
DATE	JULY 2016
PROJ	215-363
DWG	BD-E-06
SHEET	E6of7

ABBREVIATIONS

AI	ANALOG INPUT
AO	ANALOG OUTPUT
CP	CONTROL PANEL
DI	DIGITAL INPUT
DO	DIGITAL OUTPUT
FS	FLOW SWITCH
G	SLIDE GATE VALVE
FE	FLOW TRANSMITTER
I	LEVEL TRANSMITTER
MS	MOTOR STARTER
V	BUTTERFLY VALVE
PB	PUSH BUTTON
UPS	UNINTERRUPTIBLE POWER SUPPLY
VFD	VARIABLE FREQUENCY DRIVE
YS	EVENT/STATUS

LEGEND

(V)	VENDOR SUPPLIED EQUIPMENT SYSTEMS



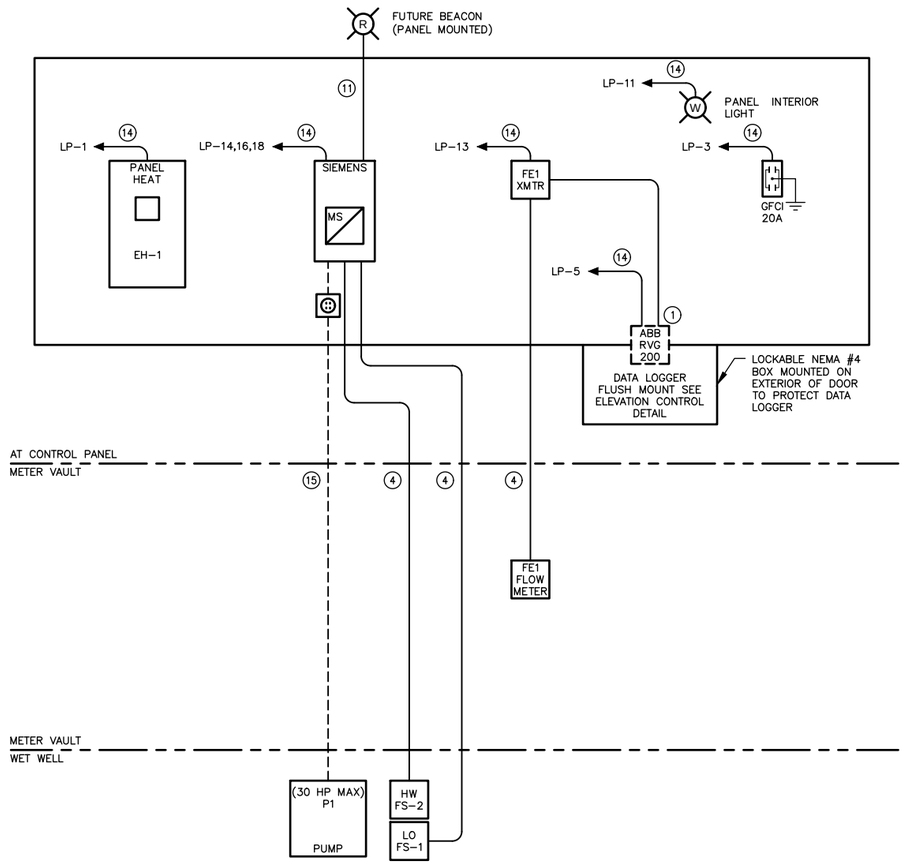
FLOW SCHEMATIC
SCALE: NOT TO SCALE

CONTROL AND INSTRUMENT CABLE

MARK	CONDUCTORS	CONDUIT	DESCRIPTION
(1)	1-SHIELDED TWISTED PAIR INSTRUMENT CABLE	3/4"	INSTRUMENT TO SCADA
(4)	MANUFACTURER SUPPLIED	1	ELEMENT TO TRANSMITTER
(11)	2-# 12 THHN,1-# 12 AWG GND	3/4"	120VAC/POWER
(12)	2-# 12 THHN,1-# 12 AWG GND	N/A	120VAC/POWER
(13)	2-# 14 THHN,1-#14 GND	N/A	24VDC POWER
(14)	SEE PANEL SCHEDULE		
(15)	SEE ELECTRICAL ONE LINE		
(16)	2-# 14 THHN,1-# 14 AWG GND	3/4"	24 VDC
(17)	POWER: 3-# 1 THHN,1-# 6 THHN GND CONTROLS: 6-#14 THHN	2"	24 VDC
(E)	CAT 5e ETHERNET	N/A	CP INTERNAL COMMUNICATIONS

(*) WIRING TO BE PROVIDED BY ELECTRICAL CONTRACTOR AFTER REVIEW OF VENDOR DOCUMENTS. WIRE QUANTITY AND SIZE TO BE DETERMINED AFTER REVIEW OF SUBMITTAL

PUMP STATION CONTROL CABINET
RECOMMENDED SIZE 74"X72"X18"



CONTROL AND INSTRUMENT ONE-LINE DIAGRAM
SCALE: NOT TO SCALE

NOTES:
1 – ACTIVE ON LOSS OF CONTROL POWER
2 – TST1 MOUNTED TO EXTERNAL OF CP-1

PRELIMINARY NOT FOR CONSTRUCTION

NO.	DATE	REVISION	CHK	DR	DSGN
		APVD	BY	G CHURCH	R HINES, A WOLFE
		APVD		G CHURCH	R RECK, B HOGNESS

BONUS DITCH COMPANY

DEERE & AULT CONSULTANTS, INC.

CONTROLS ONE LINE DIAGRAM AND DETAILS

DESIGN DEVELOPMENT

ESC engineering
FORT COLLINS COLORADO
(970) 224-9100 esc@thinkESC.COM

811 Know what's below. Call before you dig.

DRAWN BY: _____ CHK. BY: _____
DESIGN BY: _____ APP. BY: _____

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING. 0 1"

DATE	JULY 2016
PROJ	215-363
DWG	BD-E-07
SHEET	E7 of 7

DRAFT

BONUS DITCH

Engineers Opinion of Probable Construction Costs
Intake Structure and Pump Station

8/5/2016
Preliminary Design

	Construction Item	*Quantity*	*Unit*		*Cost*		*Extension*
1	**Mobilization, Demobilization, & General Conditions (10%)**	1	LS	$	94,000	$	94,000
					Subtotal	**$**	**94,000**
2	**Care of the River / Dewatering**	1	LS	$	75,000	$	75,000
					Subtotal	**$**	**75,000**
3	**Earthwork**						
	a. Site access	1	LS	$	15,000	$	15,000
	b. Structural Excavation and subgrade preparation	1	LS	$	45,000	$	45,000
	c. Soil Export	1000	CY	$	20	$	20,000
					Subtotal	**$**	**80,000**
3	**Diversion & Inlet Structure**						
	a. Inlet Structure Concrete with Transition Walls	135	CY	$	1,300	$	175,500
	b. 4" Leveling Gravel and 4" compressible board (Inlet Structure)	550	SF	$	25	$	13,750
	c. 6' x 6' SS Self Contained Fabricated Slide Gate	2	EA	$	40,000	$	80,000
	d. Trash Rack, Grating, and Miscellaneous Metals	1	LS	$	85,000	$	85,000
	e. Drilled Piers	1	LS	$	100,000	$	100,000
	f. Concrete pile cap	3	EA	$	4,000		12,000
	g. Submersible Pump	1	LS	$	32,000	$	32,000
	h. Discharge Piping	1	LS	$	43,000	$	43,000
	i. Road base working area	50	CY	$	60		3,000
	j. Bollards	6	EA	$	500	$	3,000
					Subtotal	**$**	**547,250**
4	**Flow Meter Vault & 12" Discharge Pipeline**						
	a. 9'x8' concrete vault w/ hatch	20	CY	$	1,300	$	26,000
	b. 12" Dia. C900 PVC Discharge Pipeline	145	LF	$	175	$	25,375
	c. Sump pump	1	LS	$	1,200	$	1,200
	d. Flowmeter and data logger	1	EA	$	20,000	$	20,000
	e. Pipe & fittings	1	LS	$	5,000	$	5,000
					Subtotal	**$**	**77,575**
5	**Bonus Ditch Connection Manhole**						
	a. 72" Precast Manhole	1	LS	$	12,000	$	12,000
	b. Connection to Existing 42" Dia. RCP Pipeline	1	LS	$	5,000	$	5,000
					Subtotal	**$**	**17,000**
6	**Electrical**						
	a. Utility Transformer	1	LS		28,800		28,800
	b. Service to Meter	1	LS		14,095		14,095
	c. Panel and equipment	1	LS		23,801		23,801
	d. Service to flow meter vault	1	LS		5,526		5,526
					Subtotal	**$**	**72,222**
6	**Miscellaneous**						
	a. Tracking Pad	1	LS	$	3,000	$	3,000
	b. Tree Removal	1	LS	$	12,000	$	12,000
	c. Concrete trail demolition	1	LS	$	15,000	$	15,000
	d. Revegetation / Seeding	2	Acre	$	3,000	$	6,000
	e. Surveying / Quality Control	1	LS	$	30,000	$	30,000
					Subtotal	**$**	**66,000**
					Total Construction Items (Items 1 through 6)	**$**	**1,029,000**
					Miscellaneous Unlisted Items @ 5%	**$**	51,450
					Subtotal	**$**	**1,080,450**
					Contingency @ 20%	$	216,090
					Estimated Total (rounded to nearest $1,000)	**$**	**1,297,000**

Notes:
1. Federal, State, or local permitting costs are not included.
2. Assumes construction will be completed in the late fall and winter months when creek flows are low.
3. Engineering costs not included.
4. Cost Estimate assumes City will provide power to new transformer.
5. Costs not included for land acquisition, easements, or right of way.
6. Communications or SCADA costs not included.
7. Construction costs may vary depending on the final alignment, shape, width, etc. of St. Vrain Creek.
8. Cost estimate for diverting St. Vrain creek, grade control wall, sandout channel, grouted boulders, riprap, etc. are to be included in the Creek project.
9. Cost estimate for reconstruction of greenway trail is not included.
10. Erosion control BMP's are not included

Bonus Ditch Company

Total Project Cost	$1,297,000
O&M	34%
Insurance	7%
Administration	36%
Replacement	22%
Total - Based on Historical Bonus Ditch Costs	100%
Number of Shares in Company	100
FEMA Match -Year 3 Principal Reduction	$ 771,750
Inflation	3%
Interest on Reserves	1%

Financing

Source	Share	Principal	Interest	Years	Payment
CWCB Loan	90%	$ 1,167,300	1.75%	30	$ 55,939
Special Assessment	10%	$129,700			

SCHEDULE OF REVENUE AND EXPENDITURES

Annual Revenue

Year of Operation	Assessment	Other Revenue	Total Revenue	Assessment Per Share
1	$ 83,977		$ 83,977	$ 840
2	$ 84,596		$ 84,596	$ 846
3	$ 85,235	$ 771,750	$ 856,985	$ 852
4	$ 44,678		$ 44,678	$ 447
5	$ 45,411		$ 45,411	$ 454
6	$ 46,167		$ 46,167	$ 462
7	$ 46,945		$ 46,945	$ 469
8	$ 47,746		$ 47,746	$ 477
9	$ 48,572		$ 48,572	$ 486
10	$ 49,423		$ 49,423	$ 494
11	$ 49,868		$ 49,868	$ 499
12	$ 50,775		$ 50,775	$ 508
13	$ 51,710		$ 51,710	$ 517
14	$ 52,672		$ 52,672	$ 527
15	$ 53,663		$ 53,663	$ 537
16	$ 54,684		$ 54,684	$ 547
17	$ 55,736		$ 55,736	$ 557
18	$ 56,819		$ 56,819	$ 568
19	$ 57,935		$ 57,935	$ 579
20	$ 59,084		$ 59,084	$ 591
21	$ 60,268		$ 60,268	$ 603
22	$ 61,487		$ 61,487	$ 615
23	$ 62,743		$ 62,743	$ 627
24	$ 64,036		$ 64,036	$ 640
25	$ 65,368		$ 65,368	$ 654
26	$ 66,740		$ 66,740	$ 667
27	$ 68,154		$ 68,154	$ 682
28	$ 69,609		$ 69,609	$ 696
29	$ 71,109		$ 71,109	$ 711
30	$ 72,653		$ 72,653	$ 727
	$ 1,787,864	$ 771,750	$ 2,559,614	

Annual Expenditures

Operation, Maintenance, Replacement	CWCB Loan Reserve Fund	Annual Accum.	Payments on CWCB Loan	Interest on Reserve Funds	Total Expenditures
$ 22,500	$ 5,594	$ 5,594	$ 55,939	$ 55.94	$ 83,977
$ 23,175	$ 5,594	$ 11,188	$ 55,939	$ 111.88	$ 84,596
$ 23,870	$ 5,594	$ 16,782	$ 827,689	$ 167.82	$ 856,985
$ 24,586	$ 435	$ 17,217	$ 19,829	$ 172.17	$ 44,678
$ 25,324	$ 435	$ 17,652	$ 19,829	$ 176.52	$ 45,411
$ 26,084	$ 435	$ 18,088	$ 19,829	$ 180.88	$ 46,167
$ 26,866	$ 435	$ 18,523	$ 19,829	$ 185.23	$ 46,945
$ 27,672	$ 435	$ 18,958	$ 19,829	$ 189.58	$ 47,746
$ 28,502	$ 435	$ 19,394	$ 19,829	$ 193.94	$ 48,572
$ 29,357	$ 435	$ 19,829	$ 19,829	$ 198.29	$ 49,423
$ 30,238		$ 19,829	$ 19,829	$ 198.29	$ 49,868
$ 31,145		$ 19,829	$ 19,829	$ 198.29	$ 50,775
$ 32,080		$ 19,829	$ 19,829	$ 198.29	$ 51,710
$ 33,042		$ 19,829	$ 19,829	$ 198.29	$ 52,672
$ 34,033		$ 19,829	$ 19,829	$ 198.29	$ 53,663
$ 35,054		$ 19,829	$ 19,829	$ 198.29	$ 54,684
$ 36,106		$ 19,829	$ 19,829	$ 198.29	$ 55,736
$ 37,189		$ 19,829	$ 19,829	$ 198.29	$ 56,819
$ 38,305		$ 19,829	$ 19,829	$ 198.29	$ 57,935
$ 39,454		$ 19,829	$ 19,829	$ 198.29	$ 59,084
$ 40,638		$ 19,829	$ 19,829	$ 198.29	$ 60,268
$ 41,857		$ 19,829	$ 19,829	$ 198.29	$ 61,487
$ 43,112		$ 19,829	$ 19,829	$ 198.29	$ 62,743
$ 44,406		$ 19,829	$ 19,829	$ 198.29	$ 64,036
$ 45,738		$ 19,829	$ 19,829	$ 198.29	$ 65,368
$ 47,110		$ 19,829	$ 19,829	$ 198.29	$ 66,740
$ 48,523		$ 19,829	$ 19,829	$ 198.29	$ 68,154
$ 49,979		$ 19,829	$ 19,829	$ 198.29	$ 69,609
$ 51,478		$ 19,829	$ 19,829	$ 198.29	$ 71,109
$ 53,023		$ 19,829	$ 19,829	$ 198.29	$ 72,653
$ 1,070,447	$ 19,829		$ 1,474,937	$ 5,598	$ 2,559,614

KNOW ALL MEN BY THESE PRESENTS, That we R. C. Dickens, C. W. Pace and Roy R. Murchison, residents of the state of Colorado, have associated ourselves together for the purpose of becoming a body corporate and politic under the name of THE BONUS DITCH COMPANY under and by virtue of the laws of the state of Colorado, and in accordance with the provisions of said laws, we do hereby make, execute and acknowledge in triplicate this certificate in writing so to become a body corporate under and by virtue of the said laws.

I.

The name and style of our said Company shall be, "THE BONUS DITCH COMPANY."

II.

The object for which our said company is formed and incorporated is for the purpose of digging, constructing, building, acquiring and operating a ditch or ditches for the purpose of supplying water to its stockholders and others for irrigation and domestic purposes; said water to be taken out of the Left Hand creek, a natural stream in Boulder County, state of Colorado, at a point about one-fourth mile distant from the juncture of said Left Hand creek with St. Vrain creek in the S.E. ¼ of N.W. ¼ of Sec. 11, in twp. 2, N.R. 69, West, thence extending southerly through, over and in the E. ½ of said Sec. 11 to the section line, thence southeasterly through and over the S.W. ¼ of Sec. 12 and the N. ½ of Sec. 13, all in twp. 2, N.R. 69, W., thence after leaving said sec. 13, easterly for about 80 rods terminating in the S.W. ¼ of N.W. ¼ of Sec. 18, twp. 2, N. R. 68, W., in Weld County, state of Colorado, being a total distance of about two miles in length: also, for the purpose of acquiring a ditch now built or constructed along the line as above described being known as the Bonus Lateral ditch, together with all decrees, appropriations or priorities of water for irrigation and domestic purposes of the said Bonus Lateral ditch, from the owners thereof, by purchase or otherwise, and all rights, rights-of-way and franchises of whatsoever nature thereunto belonging or appertaining.

III.

The capital stock of our said Company shall be Two Thousand Five Hundred Dollars, ($2,500.00) to be divided into Fifty shares of the par value of Fifty ($50.00) Dollars, each.

IV.

Our said company is to exist for a term of Twenty (20) years.

V.

The affairs and management of our said Company are to be in the control of a Board of Three Directors, and R. C. Dickens, C. W. Pace and Roy R. Murchison are hereby selected and designated to act as said Directors to manage the affairs and concerns of our said Company for the first year, and until their successors are elected and qualified.

VI.

The operations of our said Company will be carried on in the county of Boulder, state of Colorado, and the principal office and place of business of our said Company shall be located in the city of Longmont, in the aforesaid county, and state.

VII.

The Board of Directors shall have power to make such prudential by-laws as they may deem proper from time to time for the management and control of our said Company not inconsistent with the laws relative to incorporations, as the statute in such case made and provided.

IN WITNESS WHEREOF, We have hereunto set our hands and seals this 5th day of Sept, A. D. 1908.

R. C. Dickens (Seal)

C. W. Pace (Seal)

Roy R. Murchison (Seal)

STATE OF COLORADO, }
County of Boulder. } ss:

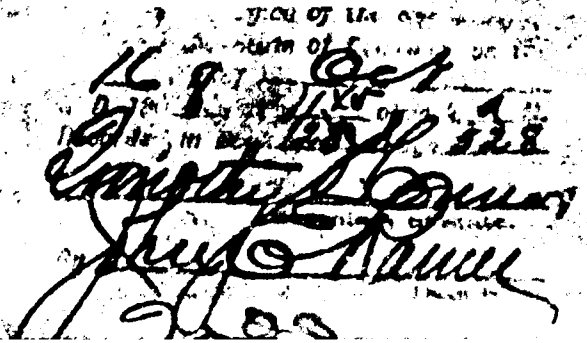
I, Grant E. Halderman, a Notary Public within and for the county, in the state aforesaid, do hereby certify that R. C. Dickens, C. W. Pace and Roy R. Murchison, who are personally known to me to be the persons who signed the foregoing Certificate of Incorporation, appeared before me this day in person, and acknowledged that he they signed, sealed and delivered the foregoing instrument of writing as their free and voluntary act and deed for the uses and purposes therein set forth.

GIVEN under my hand and notarial seal, at my office in Longmont, Colorado, this 5th day of Sept., A. D. 1908. I further certify that my commission as Notary Public will expire, January 26th, 1909.

Grant E. Halderman,
Notary Public.

Articles
— of —
Incorporation.

The Bonus Dried
Company.



Slip of C

Boulder, Colo. Feb 26 1915

THIS IS TO CERTIFY That I have carefully searched the records in my office and do not find that the Benus Ditch Company is assessed for any taxes in Boulder County, Colorado.

Chas. M. Coleman
Assessor of Boulder County

4-45-5-

Assessors Certificate
of
The Barnes Ditch
Company

FILED IN THE OFFICE OF THE
SECRETARY OF STATE, OF THE
STATE OF COLORADO, ON

FEB 2 PM 3 34

RECORDED IN BOOK.....PAGE.....
JOHN E. RALLER SEC'Y OF STATE
FEE.....DEPUTY
By.....CLERK

Entered on Old tax roll
2-2-15
Barnes

Boulder, Colo. Jan 26th, 1916.

TO WHOM IT MAY CONCERN:

This is to certify that I have carefully examined the records in my office and do not find that THE BONUS DITCH COMPANY is assessed for any taxes in Boulder County.

Chas. M. Chaney
Assessor of Boulder County

ancorn Certificate
& Re

lue Bonnet Ditch Company

This document has been Inspected and properly Entered on the Records of The Flat Tax Department

Date Feb. 1 - 1916

By Chas Clerk

FILED IN THE OFFICE OF THE SECRETARY OF STATE, OF THE STATE OF COLORADO, ON

1916 FEB 1 AM 9 08

RECORDED IN BOOK ... PAGE ... THE JOHN E. ... SEC'Y. OF ...

FEES ... CLERK ...

Indexed by

No. 15G. CERTIFICATE OF RENEWAL OF THE CERTIFICATE OF INCORPORATION.

To Whom It May Concern:

This is to certify that a special meeting of the stockholders of

THE BONUS DITCH COMPANY

a Colorado corporation, was held at Longmont, Colo., on the 25th day of March, A. D. 1960, such meeting having been called by the stockholders representing at least 10 per cent (10%) of the entire capital stock of the company outstanding. Notice of such meeting as provided by law, was published at least once not more than 2 weeks days and at least ten days prior to the date fixed for said meeting in a newspaper printed at Longmont, State of Colorado, and notice of said meeting was delivered personally or mailed to each stockholder at least thirty (30) days prior to the date of such meeting, there being represented at such meeting 91 shares of the capital stock of said company out of a total of 100 shares outstanding. At said meeting a resolution was passed to extend the corporate existence of the said corporation *in perpetuity, from and after the date of the expiration of its corporate life,† the resolution received a MAJORITY vote of all the outstanding stock of the corporation. The president and secretary were authorized and directed to file under the corporate seal of the company, a certificate of renewal with the Secretary of State of Colorado, and to file a duplicate certificate in the office of the Recorder of Deeds in each county wherein the company may do business in the State of Colorado.

Fred C. Pace
President.

SEAL

Elmer Byler
Secretary.

*Corporate existence may be renewed perpetually or for any specified number of years.

†This certificate of renewal shall be filed before or within one year after the expiration of the charter.

Fee for filing certificate of renewal is $10.00 for property or less and twenty cents for each additional hundred dollars or fractional part of one thousand dollars of authorized capital stock.

300

147485

CERTIFICATE OF RENEWAL

OF THE

CERTIFICATE OF INCORPORATION

OF

THE ROMUS DITCH COMPANY.

DOMESTIC

NOT FOR PROFIT

FILED in the office of the Secretary of State, of the State of Colorado, on the 28th day of March A.D. 1960

GEORGE J. BAKER
Secretary of State

Filing Clerk Crouter Fees $3.50

Old Age Pension Fund

RECORDED
ROLL 26 PAGE 816

Return to:
Dozer, McCarty & Flanders,
P. O. Box 207,
Longmont, Colorado.

88431

SECRETARY OF STATE

DMC04803

79 NOV 7 AM 10:18

7 NOV 79

STATE OF COLORADO
SEC. OF STATE

(Rev 6/73)

STATEMENT OF CHANGE OF REGISTERED OFFICE OR REGISTERED AGENT, OR BOTH,

To the Secretary of State
of the State of Colorado

Pursuant to the provisions of the Colorado Corporation Act, the undersigned corporation, organized under the laws of the State of Colorado submits the following statement for the purpose of changing its registered office or its registered agent, or both, in the State of Colorado:

First: The name of the corporation is The Bonus Ditch Company DC 605

Second: The address of its REGISTERED OFFICE is 735 Bowen Street, Longmont, Colorado 80501

Third: The name of its REGISTERED AGENT is Richard L. Frisk, Secretary-Treasurer

Fourth: The address of its registered office and the address of the business office of its registered agent, as changed, will be identical.

Fifth: The address of its place of business in Colorado is 735 Bowen Street, Longmont, Colorado 80501

THE BONUS DITCH COMPANY (Note 1)

By Sam Tanaka (Note 2)
Its President

STATE OF COLORADO
County of Boulder

Before me, Marsha K. Peterson, a Notary Public in and for the said County and State, personally appeared Sam Tanaka who acknowledged before me that he is the President (President)-(Vice-President) of The Bonus Ditch Company a Colorado (State of Incorporation) corporation, that he signed the foregoing, and that the statements contained therein are true.

In witness whereof I have hereunto set my hand and seal this 3rd day of November, A. D. 19 79.

My commission expires July 20th, 1982.

Marsha K. Peterson
Notary Public

Notes. 1. Exact corporate name of corporation making the statement.
2. Signature and title of officer signing for the corporation -- must be President or Vice-President except for nonprofit.
3. Signature of Notary Public must be exactly as shown on Notarial Seal, and must agree with notarial commission.
4. This document must be typewritten.

SUBMIT ONE
Filing fee $4.00

COMPUTER UPDATE COMPLETE
YA

RECORDED

FILED

THE BONUS DITCH COMPANY

BY - LAWS

June 1, 1993

ARTICLE I.

The officers of this Company shall be a President, Vice-President, Secretary and Treasurer.

The President and Vice-President shall be elected by the Board of Directors, from one of their number, at the first meeting after the annual election, and shall hold office for one year, and until their successors are chosen.

ARTICLE II.

The President shall preside at all meetings of the Company and at all Directors meetings. He shall be the chief executive officer and shall have general oversight over the affairs of the Company. He shall sign all orders onto the Treasurer and all instruments of writing drawn by the Company, including stock certificates, deeds, bonds, notes contracts and mortgages.

ARTICLE III.

The Vice President shall perform all the duties of the President during his absence, inability or refusal to act.

ARTICLE IV.

The office of the Secretary and Treasurer shall be held by one person who need not be a member of the Board of Directors or a stockholder in the corporation. It shall be the duty of

the Secretary and Treasurer to collect all moneys due the company, keep a correct account of the same and pay them out only on the order of the President. He shall also be custodian of the books and papers of the company and shall countersign all certificates of stock and other instruments of writing drawn by the company. He shall be present at all meetings of the stockholders and of the Directors and shall keep a correct record of all the proceedings thereof.

ARTICLE V.

The Directors shall at their first meeting in each fiscal year appoint a superintendent for the next ensuing year, whose duty it shall be to have general supervision of the ditch and the distribution of water therefrom and to see to it that said ditch is kept in repair and in proper running order; provided however, before he can incur any expense he shall consult and obtain the permission of the Board of Directors. The said superintendent may or may not be a stockholder in said corporation. He shall be entitled to such compensation as the Directors shall determine upon.

ARTICLE VI.

The Officers of this company shall be entitled to such compensation for their services as shall be fixed by the Board of Directors, said compensation to be determined upon and fixed at the last Directors meeting in the year and shall apply only to the next ensuing year.

ARTICLE VII.

The Secretary and Treasurer may be required to give such bond for the faithful

performance of his duties as may be deemed fit by the Board of Directors, to be approved by the President.

ARTICLE VIII.

The annual meeting of the stockholders shall be held at some suitable place in Boulder County, Colorado during the last week of January or the first week of February of each and every year. At such meetings of the Company each person shall be entitled to as many votes as he represents shares of stock, either as owner or as proxy provided that the appointment as proxy must be in writing.

Notice of the annual meeting shall be published in a newspaper of general circulation in Boulder County at least one week prior to the meeting. This notice shall identify the time, location and the agenda of the annual meeting.

Special meetings of the stockholders shall be called in a manner provided by law for annual meetings. The object of such special meetings shall be specified in the call.

ARTICLE IX.

The Board of Directors shall meet at least once a year, after the annual Stockholders meeting. The President and Secretary may call additional meetings as needed after notice has been given to each Director. The Board of Directors may meet and conduct business by means of a telephone conference call.

At all meetings of the Board of Directors, two Directors shall constitute a quorum.

Whenever a vacancy shall occur in the Board of Directors, the remaining Directors shall fill such vacancy by appointment until the next annual meeting.

ARTICLE X.

Shares of stock may be transferred by the holder by surrendering the certificate thereof to the Secretary accompanied by an order of transfer therefor, which shall also designate the Post Office address of the Transferee.

The Secretary may receive compensation for the transfer of stock certificates as determined by the Board of Directors.

No stock certificate shall be transferred on the stock book while any assessment on such stock is unpaid.

No Stockholder shall transfer less than one/half (0.5) share of stock. Any fractional shares that exist on June 1, 1993, can not be further divided. The stock certificate shall contain the following restriction:

> The stock of this Company shall not be transferred in less than one/half (0.5) share. Fractional shares that existed as of June 1, 1993 can not be further divided.

ARTICLE XI.

The transfer books of the Company shall be closed for ten days next preceding the annual election.

ARTICLE XII.

It shall be the duty of the Board of Directors by majority vote, and they are hereby authorized to make all contracts that may be deemed necessary for the carrying on of all kinds of business within the objects and purposes of the Company. They shall make a memorandum of such contracts on the minutes of the meeting, and all such contracts when so entered of record shall be signed by the President on behalf of the Company, and when so executed, shall be binding upon the Company.

ARTICLE XIII.

The Company adopts as its corporate seal a circular disk with the name "THE BONUS DITCH COMPANY" on the outer edge, and the word "SEAL" in the center.

ARTICLE XIV.

Each shareholder upon receiving his certificate of stock shall sign a copy of these By-Laws and give his full Post Office Address, and in so doing shall waive all irregularities in adopting by-laws, and ratify all acts heretofore had by the Directors and stockholders, and upon changing such Post Office Address, shall at once notify the Secretary, for the purpose of giving all notices to members of meetings and other matters pertaining to the Company. The address as shown upon the books of the Company shall be deemed the correct address.

ARTICLE XV.

Whenever at any regular or special meeting of the Directors, all or a majority of the

Directors are present or shall sign the minutes of the meeting, however, called, the acts and proceedings of the meeting shall be legal and binding the same as if the meeting was regularly called and held.

ARTICLE XVI.

These By-Laws or any of them may be amended, changed, added to or revoked at any meeting of the Board of Directors by majority vote.

ARTICLE XVII.

At the annual meeting of the stockholders, the stockholders shall levy an assessment on the capital stock to defray the expenses of the ditch for the ensuing year. No water to be turned into any gates or the stockholder to be entitled to any water until all assessments are paid in full. Stockholders shall be given until the first day of April each year to pay all assessments.

The Bonus Ditch Company shall have a first lien on the rights and shares of the registered holder thereof. Each stock certificate shall be endorsed as follows:

> The Company has a first lien on all shares for payment of any indebtedness due the Company by the Stockholder and this stock and all rights thereunder shall not be transferred until such indebtedness shall be paid.

The Secretary shall notify the Stockholder of any failure to pay within the time allotted. If the Stockholder fails to pay all outstanding assessments after this notice, the Company may proceed with foreclosure, as authorized under the laws of the State of Colorado.

ARTICLE XVIII.

Except to the extent that such sums are covered by insurance, the Company and its Stockholders shall indemnify any person who is a party or is threatened to be made a party to any threatened or pending civil action, suit, or proceeding, by reason of the fact that such person is or was a Director, officer, or employee of this Company, against expenses (including attorney's fees), judgments and amounts paid in settlement actually and reasonably incurred by such person in connection with such action, suit, or proceeding, unless such person's acts or omissions were dishonest, fraudulent, malicious, criminal, ultra vires or the result of gross negligence.

ARTICLE XIV.

No water shall be deliverable to any stockholder except through existing headgates or additional headgates authorized specifically by the Board of Directors as to engineering feasibility, location and purpose of use. This By-law shall not be construed to prohibit plans of augmentation, changes in the nature of the use, exchanges, time of use, return flow patterns, purpose of use, point of diversion or other extended uses or changes in water rights, provided the same are allowable under Colorado Law and provided there is no damage to any vested rights of any other stockholder by virtue of any such plan. The Board of Directors shall have discretionary authority to approve or disapprove such changes in the event there might be damage to a Stockholders' vested interest. No such change shall be valid unless the same has been previously submitted to the Board of Directors.

Each Certificate of stock hereinafter transferred shall contain the following endorsement

thereon:

> Plans of augmentation, changes in nature of use, time of use, return flow patterns, purpose of use or changes in point of diversion or other extended uses or changes in the water rights appertaining to these shares are subject to the approval of the Board of Directors, as provided in the By-Laws of the Company.

The Applicant for a change in use shall reimburse the Company for all of its reasonable costs and expenses in connection therewith, including, but not limited to:

A. Attorney's fees.

B. Engineering fees.

C. Court Costs.

D. Additional fees and costs for the Ditch Superintendent to administer the changes.

E. Cost of measuring devices, additional or new headgates, division boxes, flumes and outlet structures.

F. Storage and carrying fees and water to convert a direct flow water right into a storage right to pay and compensate Stockholders and the Company for seepage, shrinkage, evaporation, return flows, and additional maintenance.

G. Any other reasonable expenses that are necessitated by hearings, contract negotiations, objections or protests to a water application and trials involving shares of the Company, so that the owner of stock being changed does not cause a disproportionate burden on the other Stockholders' assessments or usage of water.

For any application submitted to the Board, the Board may obtain estimates of the above

costs. If an estimate is obtained, the Board must submit this estimate to the Applicant. The Applicant then has thirty (30) days in which to deposit a check with the Secretary of the Company in the amount of the estimate. After the Applicant has made the deposit, the Company shall take final action on the application. If the estimate and deposit needs to be adjusted by further payment or reimbursement, the adjustment shall be made upon the completion of the analysis. In no event shall the Company be required to finally approve or disapprove the application until all fees incurred by the Company are reimbursed.

ARTICLE XX.

If any portion of these By-Laws are declared void by a court of law, the remaining portions of these By-Laws remain in full force and unaffected.

ARTICLE XXI.

The masculine gender is used in these By-Laws as a matter of convenience only and shall be interpreted to include the female and neuter genders as the circumstances indicate.

RESOLUTION OF THE BOARD OF DIRECTORS OF
THE BONUS DITCH COMPANY

At the Annual Stockholders meeting of The Bonus Ditch Company, held on March 11, 1993, following full discussion, upon motion duly made, seconded and unanimously adopted it was resolved that the Board of Directors of The Bonus Ditch Company had the authority to meet, discuss and adopt amendments to the By-Laws.

As a result of these meetings and discussions, upon motion duly made, seconded and unanimously adopted, it was resolved by the Board of Directors that :

1. The By-Laws existing as of March 11, 1993 are hereby repealed.

2. The By-Laws dated June 1, 1993 are hereby adopted as the By-Laws of The Bonus Ditch Company.

Dated this 30th day of JULY 1993.

Director

Director

Director

Secretary

COLORADO
Colorado Water Conservation Board
Department of Natural Resources

Water Project Loan Program

Application Type

☑ Prequalification *(Attach 3 years of financial statements)* ☑ Loan Approval *(Attach Loan Feasibility Study)*

Agency/Company Information

Company / Borrower Name: The Bonus Ditch Company

Authorized Agent &Title: Reginald Golden, President

Address: 7899 St. Vrain Rd., Longmont, CO 80503 PO Box 771, Longmont, CO 80502

Phone: (303) 702-0708 | Email: reggieg@dgmllc.com

Organization Type: ☑ Ditch Co, ☐ District, ☐ Municipality ☐ other:_____ | Incorporated? ☑ YES ☐ NO

County: Boulder | Number of Shares/Taps: 100

Water District: St. Vrain & Left Hand Water Cons. | Avg. Water Diverted/Yr 2221 acre-feet

Number of Shareholders/Customers Served: 8 | Current Assessment per Share $ 250.00 (Ditch Co)

Federal ID Number: 74-1896530 | Average monthly water bill $ 0.00 (Municipality)

Contact Information

Project Representative: Resource Conservation Partners, LLC - Barb Brunk

Phone: (303) 775-6180 | Email: barbb@dgmllc.com

Engineer: Deere & Ault Consultants Inc. - Branden Effland

Phone: (303) 651-1468 | Email: branden.effland@deereault.com

Attorney: Lyons Gaddis - Wally Grant

Phone: (303) 776-9900 | Email: wgrant@lgkhlaw.com

Project Information

Project Name: Bonus Ditch Company - Intake Structure and Pump Station

Brief Description of Project: (Attach separate sheets if needed)

Replacing and repairing the St. Vrain Creek diversion dam for the Bonus Ditch that was destroyed in the September 2013 flood event.

General Location: (Attach Map of Area)

North of Ken Pratt Blvd and East of Martin St, Longmont, CO GPS 40.15465, -105.09245

Estimated Engineering Costs: paid by others | Estimated Construction Costs: $1,297,000

Other Costs (Describe Above): NA | Estimated Total Project Costs: $1,297,000

Requested Loan Amount: 1,167,300 | Requested Loan Term (10, 20, or 30 years): _____ Years

Project Start Date(s) Design: complete Construction: fall 2017

Signature

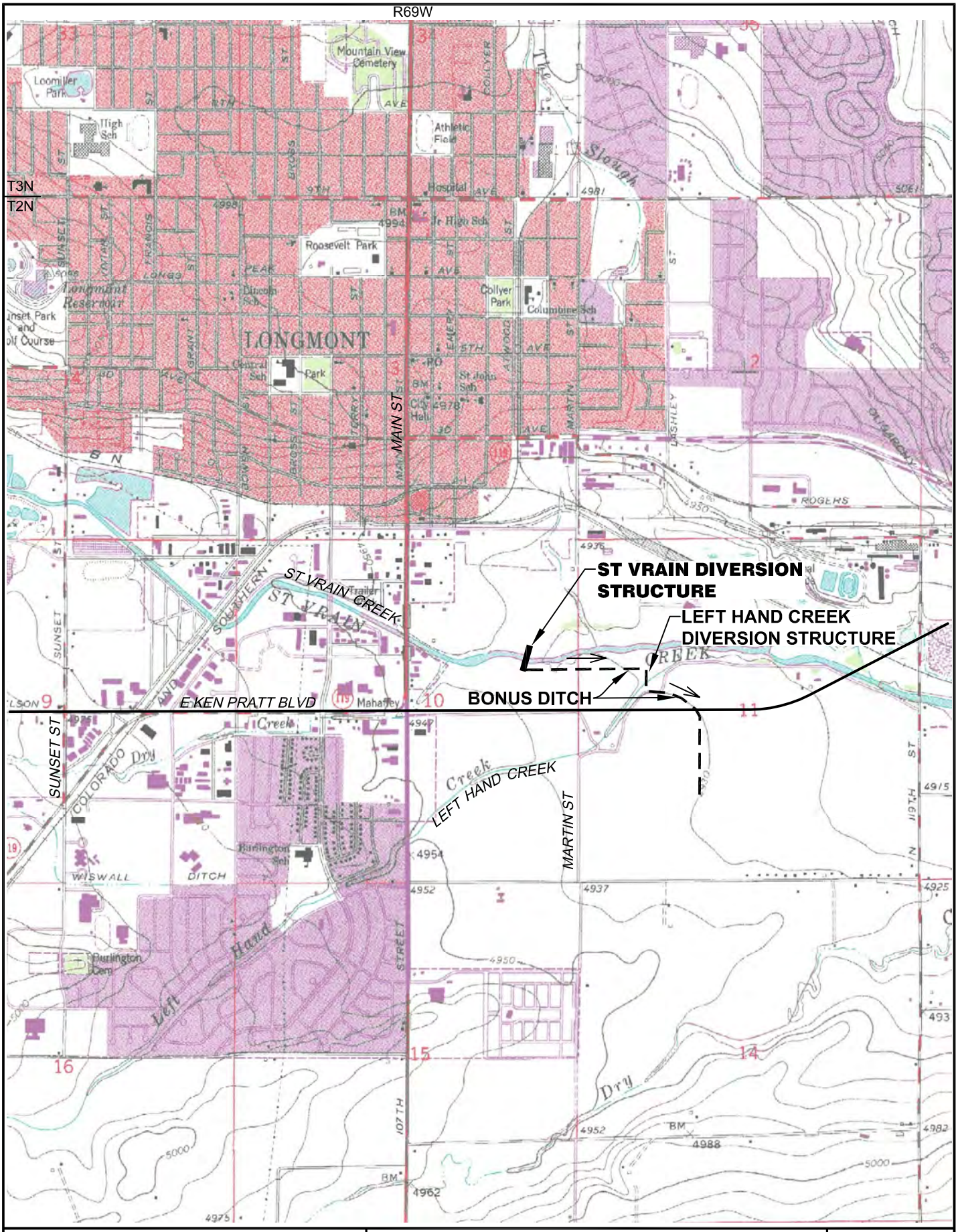
Bonus Ditch Company

By: _____

President 8/1/2017

Signature / Title Date

Return to: Finance Section Attn: Anna Mauss
1313 Sherman St #718
Denver, CO 80203
Ph. 303/866.3449
e-mail: anna.mauss@state.co.us



DEERE & AULT CONSULTANTS, INC.

BONUS DITCH - ST VRAIN DIVERSION STRUCTURE

Vicinity Map

FIGURE NO. 1

JOB NO. 0118.013.00

SCALE: 1"=2000'

DRAWING: P:\0118 CH2M Hill\0118.013.00 COL Bonus Ditch\CAD\DAC-Drawings\SV_Bonus Vicinity.DWG

Friday, May 29, 2015 4:16:58 PM