Dort Pump Station Rehabilitation
City of Flint Bid No 21000572

ADDENDUM NO. 2 (11-24-2020)

THIS IS AN ADDENDUM

TO PROSPECTIVE BIDDERS AND OTHERS CONCERNED:

This addendum amends or supplements the Procurement Section, Drawings and other provisions of the Contract Documents as indicated below. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in this Addendum have the meanings stated in the General Conditions. Additional terms used in this Addendum have the meanings stated below, which are applicable to both the singular and plural thereof.

I. PROCUREMENT

A. The Bid date for the City of Flint, Dort Pump Station Rehabilitation project has been changed from December 3, 2020 to December 10, 2020, 3:00 PM local time as changed in Addendum #1.

B. Pre-Bid Information Attached:

1. Agenda
2. Zoom Meeting Invite List
3. Answers to Vendor Questions
4. Vendor email questions
5. Site Visit attendee List

II. DRAWINGS

1. Delete electrical sheets E-01, EL1.0, EL1.1, EL1.2, EP1.1, EP1.3, E6.1, E6.2, ELD1.0,
2. ELD1.1, ELD1.2& ELD1.3 Dated 07/24/20
3. Add electrical sheets E-01, EL1.0, EL1.1, EL1.2, EP1.1, EP1.3, E6.1, E6.2, ELD1.0, ELD1.1, ELD1.2 & ELD1.3 Dated 08/07/2
4. Add sheets G-007 & G-008 Secondary Water Line Interconnect

III. CONTRACT DOCUMENTS

1. Delete Section 01-20-02 Price & Payment Procedures sheets 1 thru 3.
2. Add Section 01-20-02 Price & Payment Procedures sheets 1 thru 5 Addendum #2.
3. Correct Time of Completion Listed in Section 00-41-13, Article 6, Bid Form to the following: Phase 1 Substantial Completion July 1, 2021, Phase 2 Substantial Completion November 30, 2021 and Final Completion December 31, 2021.
4. Specification Sections Changes:
   a. Delete Section 01-04-33, Add new Section 01-04-33 Addendum #2
   b. Delete Section 07-55-01, Add new Section 07-55-01 Addendum #2
   c. Add new Section 08-16-13 Addendum #2
   d. Delete Section 08-71-00, Add new Section 08-71-01 Addendum #2

Prospective bidders shall attach this Addendum page to their proposal and shall sign the Addendum and submit same with bid and shall enter Addendum Number and date on the Bid Form. Failure to include signed Addendum with bid proposal shall be cause for rejection of bid.

_____
(Bidder)

By: _____

Date: _____

Title: _____

AGENDA

City of Flint Dort Pump Station Pre-Bid

November 18, 2020 @ 10:00 AM Local Time

ZOOM Meeting

1. Introductions
   a. City of Flint – Owner
   b. DLZ – Engineer of Record
   c. EGLE – Permitting, contract requirements and Funding
   d. Contractors
2. Project contract requirements
   a. AIS
   b. Davison Bacon
   c. MBE/WBE work sheets
   d. City of Flint work sheets
3. Description of Project
   a. Rehabilitation of the existing Dort Pump Station
      i. Three new 5 MGD pumps with VFD's (480 volt)
      ii. Drive shafts with intermediate supports and bearings
      iii. New pump suction manifold
      iv. New valves
      v. New transformer (4600 to 480 volt)
      vi. Chlorine feed systems
      vii. Lighting
      viii. Complete installation of new existing 15 MGD pump and VFD (4600 volt)
      ix. New roof
      x. Pointing existing brick and masonry
      xi. Install new pass door
      xii. Sidewalk
      xiii. Ships ladders
      xiv. Railing and grating
      xv. Painting
      xvi. Chlorine analyzer
      xvii. Pressure transducers
      xviii. PLC programming
      xix. Arc Flash
      xx. Short circuit analysis
      xxi. Secondary water Line interconnection (to be issued by addendum)
4. Project to be constructed in two phases
   a. Phase one
      i. Complete the pump suction intake manifold
      ii. Complete the new valves on the three new pumps
      iii. Complete checkout of the existing 15 MGD pump, VFD

iv. Roof
v. Phase one PLC programming
vi. Startup of the 15 MGD pump
vii. Secondary water line interconnect

b. Phase two
i. Complete installation of the three 5 MGD pumps and VFD's
ii. Complete the piping and check valves
iii. Complete the Chlorine system
iv. Door installation
v. Lighting
vi. Painting
vii. Brick and masonry repair
viii. Sidewalk
ix. Transformer
x. Phase two PLC programing
xi. Startup of the three 5 MGD pumps

5. Completion time and LD's
   a. Substantial completion for Phase One July 1, 2021
   b. Substantial completion for Phase Two November 30, 2021
   c. Final completion December 31, 2021
   d. LD's Substantial completion $1000/day Final completion $500/day
6. Question are to be in writing submitted to Joyce McClane at the City of Flint email address jmcclane@cityofflint.com by 5:00 PM Friday November 20 2020.
7. Final addendum to be issued Tuesday November 24, 2020
8. Bids are due on December 3, 2020 by 3:00 PM to the City of Flint Purchasing Department.
9. Anticipated Notice to Proceed January 6, 2021.
10. Site visits are to be scheduled in small groups with Gregory Gucwa on Friday November 20, 2020.
11. Comments
    a. Owner – City of Flint
    b. Contractors

ggucwa@dlz.com

DLZ
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES

INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

Client: City of Flint
Project: Dort Pump Station Rehab
Location: Zoom

Date: November 18, 2020
Time: 10:00 AM

MEETING ATTENDANCE

Name	Initials	Organization	Email	Phone Number
Greg Gucwa	GG	DLZ Michigan, Inc.	ggucwa@dlz.com	O: 248-681-7800
Brian Bachler	BB	DLZ Michigan, Inc.	bbachler@dlz.com	O: 248-681-7800
Brendan Wrobel	BW	DLZ Michigan, Inc.	bwrobel@dlz.com	O: 248-681-7800
Terry Biederman	TB	DLZ Michigan, Inc.	tbiederman@dlz.com	O: 248-681-7800
John Florshinger	JF	City of Flint	jflorshinger@cityofflint.com	
John Young	JY	City of Flint	j.young109@comcast.net	
Clyde Edwards	CE	City of Flint	cedwards@cityofflint.com	
		City of Flint	sdungee@cityofflint.com	
Eric Pocan	EP	EGLE	POCANE@michigan.gov	O: 517-284-5416
Joseph P. Mulville	JM	Weiss Construction Company	jmulville@weiss-construction.com	C: 313-550-6851
Matt Spisak	MS	Cross Construction Group	matt@crossconstructiongroup.com	O: 313-293-7046
Lynn Natzic	LN	Reliance Building Company	Lynn@RelianceBC.com	O: 248-374-3210
Blake Zapczynski	BZ	Z Contractors, Inc.	bzap@z-contractors.com	O: 586-625-8899
Kevin Anderson	KA	Z Contractors, Inc.	kanderson@z-contractors.com	O: 586-625-8899
Scott Kelley	SK	Systems Specialties	skelley@sysspec.com	O: 248-332-0099
Dave LaBrun	DL	Brown & Sons Roofing	davelabrun@gmail.com	
Brad Konvolinka	BK	The Garland Company	bkonvolinka@garlandind.com	O: 734-770-4343
Steve Davis	SD	D.C. Byers	sdavis@dcbyersdetroit.com	O: 517-896-3539
Michael Sheahan	MS	Lang Constructors, Inc.	mike@langbuild.com	O: 810-743-6702
Ryan Sly	RS	Sorensen Gross Company	Rsly3@sgcs.net	O: 810-767-4821
Michael D'Agostini	MD	L. D'Agostini & Sons, Inc.	miked@ldagostini.com	O: 586-781-5800
Samuel Long	SL	L. D'Agostini & Sons, Inc.	slong@ldagostini.com	O: 586-781-5800
James Bilicki	JB	L. D'Agostini & Sons, Inc.	jbilicki@ldagostini.com	O: 586-781-5800

Name	Initials	Organization	Email	Phone Number
Joe Felan	JF	L. D'Agostini & Sons, Inc.	jfelan@ldagostini.com	O: 586-781-5800
Chuck Ellingson	CE	Commercial Contracting Corp.	chuck.ellingson@cccnetwork.com	O: 248-209-0532
D'sa Jean	DJ	Commercial Contracting Corp.	jean.dsa@cccnetwork.com	O: 248-209-0532
Chris Alley	CA	Bloom Roofing Systems, Inc.	calley@bloomroofing.com	O: 248-264-7200
Christina Ortega	CO	Bloom Roofing Systems, Inc.	cortega@bloomroofing.com	
Matt Shaeffer	MS	Midwest Power Systems	midwestpower@hotmail.com	O: 248-770-5124
David F. Best	DB	D. F. Best Company, Inc.	dfbest@dfbestco.com	O: 517-548-0612
Richard K. Quinn	RQ	KSB SupremeServ by KSB Dubric, Inc.	Richard.Quinn@ksb.com	O: 616-784-6355
Chad Wiggins	CW	KSB SupremeServ by KSB Dubric, Inc.	Chad.wiggins@ksb.com	
Josh Czajka	JC	CSM Mechanical	josh@csmmechanical.com	
Peter Kropf	PK	J. Ranck Electric, Inc.	pkropf@jranck.com	O: 800-792-3822
Sean Kilgore	SK	Lutz Roofing Company, Inc.	skilgore@lutzroofing.com	O: 586-739-1148
Joyce McClane	JM	City of Flint	Jmcclane@cityofflint.com	O: 810-766-7340
John Fulgenzi	JF	Doublejack Electric Co.	johnf@doublejackelectric.com	
Matt Kemper	MK	Wiess Construction	mkemper@weiss-construction.com	

City of Flint

Dort Pump Station Rehabilitation

Questions form Vendors

Addendum #2 11-24-20

1. DF Best - Question #1
   The conduit for the VFD cable is to be a new 4 inch conduit run under the top floor slab from the electrical room to the motor location. New electrical drawings are being issues.
2. Hamlett Environmental – Question #2
   The butterfly valves are to be flanged.
3. Hamlett Environmental – Question #3
   Flanges are to be 150B
4. Hamlett Environmental – Question #4
   Valmatic butterfly valves are acceptable.
5. Hamlett Environmental – Question #5
   Valmatic silent check valves are acceptable.
6. Weiss Construction – Question #6
   No additional work is required to abandon the chamber.
7. Weiss Construction – Question # 7
   The epoxy anchor detail shown on sheet C-109 refers to the connection of the new manifold header to the existing 48-inch diameter water pipe at the west end of the chamber.
8. Weiss Construction – Question #8
   The 48-inch, 36-inch and 30-inch diameter Carbon steel pipe shall be 0.375 inch thickness.
9. Weiss Construction – Question #9
   The 90 degree elbow shown on sheet C-109 section a-a is to be a 36-inch by 36-inch size.
10. Weiss Construction – Question # 10
    The selected contractor for the project shall provide documentation on delivery of the 48-ich and 30-inch butterfly valves to provide a basis for an extension in time for Phase 1 work.
11. Weiss Construction – Question #11
    Cold process roof vs hot asphalt will be addressed in Addendum #3 next week.
12. Weiss Construction – Question #12
    A wood nailer will be required on top of the stone coping before the meta cap is installed.
13. Weiss Construction – Question #13
    Spec for the metal type and gage on coping and counter flashing will be provided in Addendum #3 next week. Roof drain are internal.
14. CCC – Question #14
    Doors are to be FRP and frames are to be aluminum.
15. KSB – Question #15
    The pumps specified for this project are Patterson pumps Shut with the following requirements:
    a. Horizontal split case installed in the vertical
    b. Pump size is 12 x 10 MAA-C
    c. RPM is 1770
    d. Impeller is C-6072

e. Design point is 3472 GPM @ 185 ft TDH
f. Shut off head is 253 ft
g. Motor HP is 200, 480-volt, 3 phase, 60 Hz designed for VFD rating
h. Include two piece drive shaft, intermediate bearing and support and shaft guard
i. The Patterson pump shall be base bid

16. KSB – Question # 16

Chemical feed pumps shall be the following:

a. Pump shall be a Blue-White peristaltic pump
b. Flex-Pro A2
c. Feed rate up to 17.2 GPH
d. 125 PSI pressure rating
e. 4-20 mA speed input control
f. 100-1 Turndown Ratio
g. Variable speed DC motor
h. NEMA 4X
i. The Blue-White Flex-Pro A2 is to be a base bid pump

Gregory Gucwa

From: Quinn, Richard <Richard.Quinn@ksb.com>
Sent: Monday, November 23, 2020 3:00 PM
To: Brian Bachler
Cc: Gregory Gucwa
Subject: Fwd: Flint MI Dort PS Project - Bids December 3rd 2020

Gentlemen:

Brian Bachler – bbachler@dlz.com

Greg Gucwa – ggucwa@dlz.com

Brendan Wrobel – bwrobel@dlz.com

As you may know by now, I had reached out to last week to both introduce myself plus, convey our interest to be able to propose equipment (pumps, other) on this subjected project as an "or equal".
Below, please see a response from our internal application engineering department. If possible, would one of you be able to respond back to me please?

Regards, RichardK. Quinn, PE

Sent from my iPhone

Begin forwarded

On Nov 23, 2020, at 11:55 AM, Koeper, Jeff <Jeff.Koeper@ksb.com> wrote:

Dick:

I was reviewing this with Jon, and lots of questions:

- First, the bid is for double suction (horizontal split case) pumps.

- Specification questions:
    - There are requests for information referencing Sections 01300, 01-30-00, 01-70,00, 01-60-00 none of which are included.
    - Motors shall have voltage/phase as shown on "plan", we do not have the plan.
    - The pump provided shall be a model with impeller size indicated on plans standard size larger for this model...Have the engineer clarify this for us.
    - Impellers are to have cutters etc.....no reference to the application, but since the pumps are going to the 'Flint *Water Treatment* Plant' I assume they are pumping ambient water somewhere in the water treatment process. Why do they need cutters? Secondly, I am not aware of any manufacturers that that make double suction pumps with cutters, however I may be wrong.
    - The pump shall be designed with a "common pump/motor shaft".....this specification is for a submersible pump, does not apply for double suction pumps.
    - A double mechanical seal with oil barrier and oil reservoir in the pump casing is specified. The only time I have seen this is on self-priming pumps. What are they thinking here? These should have split seals.
    - Motor shall be rated as on drawing, no drawing provided.
    - Motors shall be 3/60/230-460 unless otherwise specified on the pump schedule...we do not have pump schedule.
    - "Each motor shall be fitted with .. seal leak detectors", these are usually for submersible pump motors.
    - All pumps to be field tested...what measures, and to what specification?
    - The Contractor shall furnish the electricity and water needed to conduct test. Please clarify with the engineer.

Jeff Koeper

KSB SupremeServ

by KSB Dubric

https://pumps911.com

Office: 800-848-0022

Cell: 616-460-3479

Email: jeff.koeper@ksb.com

Linkedin: https://www.linkedin.com/in/jeffkoeper/

www.dubric.com

www.ksb.com

From: Couturier, Jon <Jon.Couturier@ksb.com>
Sent: Wednesday, November 18, 2020 3:23 PM
To: Koeper, Jeff <Jeff.Koeper@ksb.com>
Subject: FW: Flint MI Dort PS Project - Bids December 3rd 2020

Kind Regards,

Jon Couturier

Plant Manager

KSB SupremeServ

By KSB Dubric, Inc.

Office: (616) 784-6355

Fax: (616) 784-7134

Email: jon.couturier@ksb.com

Website: www.dubric.com

From: Quinn, Richard
Sent: Wednesday, November 18, 2020 8:39 AM
To: Couturier, Jon <Jon.Couturier@ksb.com>
Subject: Flint MI Dort PS Project - Bids December 3rd 2020

Jon: Please see attachments. Thanks! Regards, DQ

COVID-19 UPDATE: KSB Dubric is exempt and operational during the Michigan Stay Home, Stay Safe Executive Order. The safety of our customers, vendors and employees is our top priority and will continue to be as we deliver critical goods and services.

Regards,

Dick

Richard K. Quinn

Municipal Division Engineer/Director

KSB SupremeServ

By KSB Dubric, Inc.

Office: (616) 784-6355

Mobile: (616) 481-9737

Fax: (616) 784-7134

Email: richard.quinn@ksb.com

Website: https://www.dubric.com

We are proud to be a part of the KSB Group!

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Please see our press release http://empoweringpumps.com/ksb-expands-sales-service-support-ksb-dubric-inc/.

<KSB New Submersible Pump RFQ.XLSM>

<Dort PS Project Centrifugal Pumps.pdf>

<Dort PS Project Pump Design Characteristics.pdf>

Gregory Gucwa

From: Quinn, Richard <Richard.Quinn@ksb.com>
Sent: Tuesday, November 24, 2020 10:55 AM
To: Gregory Gucwa; Brian Bachler; Brendan Wrobel
Subject: Message from Richard K. (Dick) Quinn of KSB Dubric, Inc. - Dort PS Project
Attachments: Dort PS Project Page 603 Hypochlorite System Dwg.pdf

Gentlemen:

Would one of you be so kind to provide me with the sodium hypochlorite chemical feed rate, please? Thank you in advance.

Brian Bachler – bbachler@dlz.com
Greg Gucwa – ggucwa@dlz.com
Brendan Wrobel – bwrobel@dlz.com

COVID-19 UPDATE: KSB Dubric is exempt and operational during the Michigan Stay Home, Stay Safe Executive Order. The safety of our customers, vendors and employees is our top priority and will continue to be as we deliver critical goods and services.

Regards,

Dick

Richard K. Quinn, PE
Municipal Division Engineer/Director

KSB SupremeServ
By KSB Dubric, Inc.
Office: (616) 784-6355
Mobile: (616) 481-9737
Fax: (616) 784-7134
Email: richard.quinn@ksb.com

Website: https://www.dubric.com
We are proud to be a part of the KSB Group!
Follow us socially on:
Twitter: https://twitter.com/pumps911
Facebook: https://facebook.com/pumps911
LinkedIn: https://linkedin.com/company/pumps911

Please see our press release http://empoweringpumps.com/ksb-expands-sales-service-support-ksb-dubric-inc/.

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Gregory Gucwa

From: Joyce McClane <jmcclane@cityofflint.com>
Sent: Monday, November 23, 2020 11:20 AM
To: dfbest@dfbestco.com
Cc: Gregory Gucwa; Danielle Sutton
Subject: Re: Dort Pump Station electrical question

Hello,
I will forward this message to our Engineers.

Thank you for your inquiry.

With thanks,
Joyce

On Mon, Nov 23, 2020 at 10:39 AM <dfbest@dfbestco.com> wrote:

> Joyce,
>
> Note #9 on drawing E6.1 calls for new 350 KCMIL VFD cable installed in the existing 3" conduit. The VFD cable specified requires a 4" conduit.
>
> Should the existing conduit be replaced with 4" conduit?
>
> If you have any questions please feel free to call me at (C) 517-404-7637.
>
> Thank You
>
> David F. Best
>
> D. F. BEST COMPANY, INC.
>
> Electrical Construction Services
>
> Clean Solutions for a changing world.
>
> (O) 517-548-0612, (F) 517-548-0911

--

Joyce A. McClane

Purchasing Manager

Certified Public Buyer

Department of Finance -- Division of Purchasing & Supplies

City of Flint

1101 S Saginaw St

Flint MI 48502

(O) 810 766-7340 ext. 2902

Email address: jmcclane@cityofflint.com

Gregory Gucwa

From: Joyce McClane <jmcclane@cityofflint.com>
Sent: Sunday, November 22, 2020 8:30 AM
To: Matt Kemper
Cc: Gregory Gucwa; Danielle Sutton
Subject: Re: Dort Pump Station Rehabilitation project BID Questions

Hello,
I will forward this to the Engineer.

Thank you,
Joyce

On Fri, Nov 20, 2020 at 4:02 PM Matt Kemper <mkemper@weiss-construction.com> wrote:

Please see below for some bid questions on the Dort Pump Station Rehabilitation project

1. Drawing C-108 indicates the transfer chamber will be abandoned. Besides the installation of the concrete plugs shown on C-108 what other work is 1any will be required to abandon the chamber?

2. What location or locations does the epoxy anchor detail shown on drawing C-109 apply. Please revise drawings accordingly.

3. Please specify wall thickness of Carbon steel piping on the 48" 36" and 30" pipe in inches.

4. Drawing c-109 piping drawing indicates that the 90 degree elbow of the header tee is 36" section a-a indicates it's a reducing elbow 42x36" please confirm if it's a 36" x36 elbow or a 42" x 36" elbow

5. The valve manufacture of the 48" and 30" butterfly valve have given a lead time of 35 to 40 weeks. This would surpass the Phase I completion date. Will the phase II completion date need to change to address the lead times on the material?

6. Specs call for cold process roof can we use the same spec in hot asphalt for winter application?

7. Is there going to be a wood nailer added on top of stone coping before metal cap is installed?

8. There is no spec for metal type and gage on coping and counter flash as well as gutters and down spouts.

Regards,

Matthew Kemper

Sr. Estimator

Weiss Construction Company, LLC
41001 Grand River Ave
Novi, MI 48375
Office: (313) 567 -4500 x 106 Cell (313) 671-5836
www.weiss -construction.com

--

Joyce A. McClane

Purchasing Manager

Certified Public Buyer

Department of Finance – Division of Purchasing & Supplies

City of Flint

1101 S Saginaw St

Flint MI 48502

(O) 810 766-7340 ext. 2902

Gregory Gucwa

From: Joyce McClane <jmcclane@cityofflint.com>
Sent: Friday, November 20, 2020 9:22 AM
To: Gregory Gucwa; Danielle Sutton
Cc: chuck.ellingson@cccnetwork.com
Subject: Fwd: Questions - Dort Pump Station Rehabilitation
Attachments: image001.png

Hello Greg,
Please see questions below.

Have a great day.

Thank you,
Joyce

---------- Forwarded message ---------
From: **Ellingson Chuck** <chuck.ellingson@cccnetwork.com>
Date: Fri, Nov 20, 2020 at 8:53 AM
Subject: Questions - Dort Pump Station Rehabilitation
To: jmcclane@cityofflint.com <jmcclane@cityofflint.com>

Joyce,

CCC would appreciate a response to the following;

1. Completion dates in section 00 52 13 -4.2A conflict with Article 6 on the bid form. Please confirm.
2. Drawings specify FRP doors. Specifications indicate hollow metal. Please clarify.

Thank you,

Chuck Ellingson, P.E.

Senior Estimator

Commercial Contracting Corporation

4260 North Atlantic Boulevard

Consider every angle® Auburn Hills, MI 48326

O: 248.209.0532 I C: 248.866.3047 I chuck.ellingson@cccnetwork.com

www.cccnetwork.com

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Joyce A. McClane

Purchasing Manager

Certified Public Buyer

Department of Finance – Division of Purchasing & Supplies

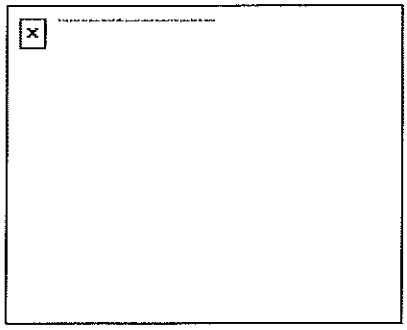
City of Flint

1101 S Saginaw St

Flint MI 48502

(O) 810 766-7340 ext. 2902

Email address: jmcclane@cityofflint.com



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Gregory Gucwa

From: Joyce McClane <jmcclane@cityofflint.com>
Sent: Wednesday, November 18, 2020 4:17 PM
To: jenw@hamlettenvironmental.com
Cc: Gregory Gucwa
Subject: Fwd: FLINT - DORT PUMP STATION REHABILITATION
Attachments: BFV_2000.pdf; SCV_1400_1800.pdf

Hello Jen,
I will forward your questions to our Engineer Consultant.

Thank you.

---------- Forwarded message ---------
From: **Jen Wagner** <jenw@hamlettenvironmental.com>
Date: Wed, Nov 18, 2020 at 3:48 PM
Subject: FLINT - DORT PUMP STATION REHABILITATION
To: jmcclane@cityofflint.com <jmcclane@cityofflint.com>

Good Afternoon-

I was reviewing the plans and specifications for the Dort P.S. Rehab and had some questions regarding the valves.

Section 40-05-23 Process Equipment Valves & Accessories Part 2.02C Butterfly Valves

1. Specification calls for "lugged" but the pipe is flanged. Would you please confirm that flanged ends are acceptable?
2. Specification does not call out if 150B or 250B are required. Based on the materials, it would appear to be 150B but we would like confirmation, please.
3. Specification lists "Dezurik Fig. BIF Keystone Bray equivalent or as approved by the Engineer". DeZurik, Keystone, and Bray do not supply a mechanically retained seat. BIF no longer manufactures butterfly valves. Would you please consider adding Valmatic as being acceptable for the Butterfly Valves? They are able to fully comply with your specification.

Section 40-05-23 Process Equipment Valves & Accessories Part 2.0A3A Silent Check Valves

1. Acceptable manufacturers listed are APCO and GA. Would you please consider adding Valmatic as being acceptable? They are able to fully comply with your specification.

I have attached information on the Valmatic AWWA Butterfly and Silent Check valve. Valmatic has been manufacturing these valves for decades. Their AWWA butterfly valves with mechanically retained seat as well as meet the specification for the other components. We have numerous large diameter (as well as smaller) references locally and nationally. Similarly, for the check valves, we have numerous reference installations and experience. They are also fully compliant with your specification. I've attached information for your review.

Please let me know if you have any questions. Thank you for the time. I hope you are staying safe & healthy!

Sincerely,

Jennifer Wagner

Hamlett Environmental Tech. Co.

Cell 517-294-7512

Hamlett Environmental
Technologies

--

CITY OF FLINT
Joyce McClane, CPPB
Purchasing Manager
1101 S. Saginaw Street
Flint, MI 48502
Phone: 810.766.7340

Johnson&Anderson

By_____ Date_____ Job Description_____ Job No._____

Subject_____ Sheet_____ of_____

11-20-20 Sign In Sheet City of Flint Dept P.S

Name	Company	Email
David Best	D. F. BEST CO.	dfbest@dfbestco.com
Jeff LANG	LANG Investments	office@langbuild.com
Randy Lown	Lang Construction	Randy@Langbuild
Mike Shedrow	LANG Const	Mike@LANGBuild
Dan Shmidt	Newkirk	ddshmidt@newkirkelectric.com
Henry Traylor	Newkirk	hbtraylor@newkirk-electric.com
MICHAEL DAGOSTINI	LDAGOSTINI	MIKED@LDAGOSTINI.COM
Dan Chenoweth	Reliance Bldg Co.	dan@reliancebc.com
Steve Davis	D. C. Byers Co	sdavis@dcbyersco.com
Brent Cantrell	midwestPower(sy)	midwestpower@Hotmail
BOB HIGGS	PLATINUM MECHANICAL	BOBH@PLATINUMMECHANICAL INC.COM
JOEL VANDOUSER	SUPERIOR ELEC. GREAT LAKES	jvandouser@segle.com
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Johnson&Anderson

By_____ Date_____ Job Description_____ Job No._____

Subject_____ Sheet_____ of_____

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PART 1 – GENERAL

1.01 SUMMARY

A. Section includes Manufacturer's field services for roofing assemblies.

B. Related Sections:
   1. Section 07 05 00 – Common Work Results for Thermal and Moisture Protection.

C. Related Work Specified Elsewhere:
   1. Roofing Material: Section 07 55 00- Protected Membrane Roofing

D. Related documents
   a. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 07 Specification Sections apply to this Section.

1.02 SUBMITTALS FOR REVIEW

A. Product Data: Provide manufacturer's technical product data for each type of roofing product specified. Include data substantiating that materials comply with specified requirements.

B. Specimen Warranty: Provide an unexecuted copy of the warranty specified for this Project, identifying the terms and conditions required of the Manufacturer and the Owner.

C. Roofing System Manufacture's Evaluation: Provide a comprehensive written assessment comparing available roofing solutions with validation of why the roofing system selection for the specific project is suitable and appropriate.

D. Roofing System Manufacturer's Report Form: Provide a copy of the report form utilized by the roofing system manufacturer for progress inspections to monitor installation and quality.

E. Online Reporting Capabilities: Provide a sample of the roofing system manufacturer's online roof inspection report as well as information about how long inspection reports are available to owner.

1.03 SUBMITTALS FOR INFORMATION

A. Manufacturer's Installation Instructions: Submit installation instructions and recommendations indicating special precautions required for installing the membrane.

B. Manufacturer's Certificate: Certify that roof system furnished is approved by Factory Mutual Global, Underwriters Laboratories, Warnock Hersey or approved third party testing facility.

C. Manufacturer's Certificate: Certify that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

D. Manufacturer's Certificate: Submit a certified copy of the roofing manufacturer's ISO 9001 compliance certificate.

E. Written certification from the roofing system manufacturer certifying the applicator is currently authorized for the installation of the specified roof system.

F. Design Loads: Submit copy of manufacturer's minimum design load calculations according to ASCE 7, Method 2 for Components and Cladding. In no case shall the design loads be taken to be less than those detailed in Design and Performance Criteria article of this specification.

G. Qualification data for firms and individuals identified in Quality Assurance Article below.

H. Test Reports: Submit ANSI/SPRI ES-1 Testing and Certification Listing of Shop Fabricated Edge Metal Products.

I. Substitutions: Products proposed as equal to the products specified for this project shall meet all of the requirements in the appropriate Division 7 specifications and shall be submitted for consideration at least 7 days prior to the date that bids must be submitted.
   1. Proposals shall be accompanied by a copy of the manufacturer's standard specification Section. That specification Section shall be signed and sealed by a professional engineer licensed in the state in which the installation is to take place. Substitution requests containing specifications without licensed engineer certification shall be rejected for non-conformance.
   2. Manufacturer's checklist will be accompanied with any substitution to verify equal performance characteristics to those specified in Division 7 specification.
   3. The Owner's decision regarding substitutions will be considered final.

1.04 CONTRACT CLOSEOUT SUBMITTALS

A. Project Warranty: Provide specified warranty for the Project, executed by the authorized agent of the Manufacturer.
B. Roofing Maintenance Instructions: Provide a roof care and maintenance manual of manufacturer's recommendations for maintenance of installed roofing systems.
C. Insurance Certification: Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.
D. Inspection Logs: Copy of inspection reports as performed by the manufacturer shall be submitted at project closeout and include photographic documentation of installation progress, weather conditions, and personnel on the project at the time of every inspection.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this Section with not less than [12] years documented experience and have ISO 9001 certification.
B. Installer Qualifications: Company specializing in specified roofing installation with not less than [5] years experience and authorized by roofing system manufacturer as qualified to install manufacturer's roofing materials.
C. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress. Maintain proper supervision of workmen.
D. Maintain a copy of the roof plans, details, and specifications in the possession of the Supervisor/Foreman and on the roof at all times.
E. Source Limitations: Obtain all primary components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer.
   1. The manufacturer providing the roofing system warranty must verify that they manufacture a minimum of 75% of the products utilized in the roofing system of this project. Products that are private labeled shall not be considered as manufactured by the roofing system supplier.
   2. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.
F. Source Quality Control: Manufacturer shall have in place a documented, standardized quality control program such as ISO-9001.

1.06 PRE-INSTALLATION CONFERENCE

A. Pre-Installation Roofing Conference: Convene a pre-roofing conference approximately two (2) weeks before scheduled commencement of roofing system installation and associated work.

B. Require attendance of installer of each component of associated work: installers of deck or substrate construction to receive roofing work: installers of rooftop units and other work in and around roofing that must precede or follow roofing work (including mechanical work if any): architect and/or engineer: owner: roofing system manufacturer's full time employee: and other representatives directly concerned with performance of the Work, including (where applicable) owner's insurers, testing agencies and governing authorities. Objectives of conference include:
   1. Review foreseeable methods and procedures related to roofing work, including set up and mobilization areas for stored material and work area.
   2. Tour representative areas of roofing substrates (decks), inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work performed by others.
   3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
   4. Review roofing system requirements (drawings, specifications and other contract documents).
   5. Review required submittals both completed and yet to be completed.
   6. Review and finalize construction schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
   7. Review required inspection, testing, certifying and material usage accounting procedures.
   8. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing (if not a mandatory requirement).
   9. Record discussion of conference including decisions and agreements (or disagreements) reached and furnish a copy of record to each party attending. If substantial disagreements exist at conclusion of conference, determine how disagreements will be resolved and set date for reconvening conference.

C. The Owner's Representative will designate one of the conference participants to record the proceedings and promptly distribute them to the participants for record.

D. The intent of the conference is to resolve issues affecting the installation and performance of roofing work. Do not proceed with roofing work until such issues are resolved to the satisfaction of the owner and Architect of record. This shall not be construed as interference with the progress of Work on the part of the owner or Architect of Record.

1.07 MANUFACTURER'S INSPECTIONS

A. When the Project is in progress, a full-time employee of the roofing system manufacturer must provide the following:
   1. Report progress and quality of the work as observed.
   2. Provide periodic (3-5 days per week) roofing installation inspections: Inspections must include; photographic documentation of work in-progress and written statements of compliance with details/shop drawings.
   3. Report to the owner, architect and/or engineer in writing any failure or refusal of the contractor to correct unacceptable practices called to the contractor's attention.
   4. Confirm after project completion that the manufacturer has observed no application procedures in conflict with the specifications other than those that may have been previously reported and corrected.

1.08 WARRANTY

A. Upon completion of installation, and acceptance by the owner and architect and/or engineer, the manufacturer will supply to the owner the specified warranty.
B. Installer will submit a two (2)- year workmanship warranty to the membrane manufacturer with a copy directly to the owner.
C. The roofing system manufacturer must have been in continuous business operation for a period of time at least as long as the length of the roof system warranty provided for this project.

1.09 DESIGN AND PERFORMANCE CRITERIA

A. Uniform Wind Uplift Load Capacity (required for each roof section)
   1. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
      Attachment shall be installed exactly as given in Part 3.
      a. Design Code: ASCE 7-05, Method 2 for Components and Cladding
      b. Wind Up-Lift calculations provided.
B. Snow Load: 25 psf.
C. Live Load: 20 psf, or not to exceed original building design.
D. Drainage Calculations: Drainage shall be calculated for all roof areas to determine suitability of all plumbing and gutter accommodations are sized appropriately to manage storm water runoff.

PART 2 – PRODUCTS (NOT USED)
PART 3 – EXECUTION

3.001 EXECUTION, GENERAL

A. Comply with requirements of related Division 07 Section.

3.002 GENERAL INSTALLATION REQUIREMENTS

A. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
B. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.

3.003 FIELD QUALITY CONTROL

A. Roofing Manufacturer Representative shall perform field inspection as specified in Article titled: MANUFACTURER'S INSPECTIONS above. Inspections must include photographic documentation of installation progress, weather conditions, and personnel on the project at the time of inspection.
B. Correct defects or irregularities discovered during field inspection. Issues deemed defective must be re-inspected and determined suitable by the roofing manufacturer.
C. Require attendance of roofing materials manufacturers' representatives at site during installation of the roofing system. A copy of the specification shall also be on site at all times.
D. Frequent progress meetings shall be conducted during the performance of roof system installation and must be attended by the owner, architect or engineer, roofing system manufacturer's full time employee, and other representatives directly concerned with performance of the work.

3.004 FINAL INSPECTION

A. At the completion of the roofing installation and associated work, meet with contractor, architect or engineer, installer, installer of associated work, owner, roofing system manufacturer's representative, and other representatives directly concerned with performance of roofing system.
B. Walk roof surface areas of the building, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.
C. Notify the Architect upon completion of corrections.
D. The roofing system manufacturer reserves the right to request a thermographic scan of the roof during final inspection to determine if any damp or wet materials have been installed. The thermographic scan shall be provided by the roofing contractor.
E. If core cuts verify the presence of damp or wet materials, the roofing contractor shall be required to replace the damaged areas at his own expense.
F. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.
G. Immediately correct roof leakage during construction. If the contractor does not respond within twenty four (24) hours, the owner may exercise right to correct the Work under the terms of the Conditions of the Contract.

END OF SECTION

PART 1 GENERAL

1.01 SUMMARY

A. Cold Applied 2-Ply Asphalt Roofing (StressPly, OptiMax, or Versiply). (2.2.)(3.4)

1.02 RELATED SECTIONS

A. Section 06100 - Rough Carpentry.
B. Section 06114 - Wood Blocking and Curbing: Wood nailers and cant strips.
C. Section 07220 - Insulation Board: Insulation and fastening.
D. Section 07620 - Sheet Metal Flashing and Trim: Weather protection for base flashings.
E. Section 07710 - Manufactured Roof Specialties: Counter flashing gravel stops, and fascia.
F. Section 08620 - Unit Skylights: Skylight frame and integral curb and counter flashing.
G. Section 08630 - Metal-Framed Skylights: Skylight frame and integral curb and counter flashing.

1.03 REFERENCES

A. ASTM D 312 - Standard Specification for Asphalt used in Roofing.
B. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.
C. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.
D. ASTM D 1227 Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
E. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.
F. ASTM D 2178 Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
G. ASTM D 2824 Standard Specification for Aluminum-Pigmented Asphalt Roof Coating.
H. ASTM D 4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.
I. ASTM D 4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.
J. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
K. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
L. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings
M. Factory Mutual Research (FM): Roof Assembly Classifications.
N. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.
O. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
P. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.
Q. Warnock Hersey (WH): Fire Hazard Classifications.
R. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.
S. ASCE 7, Minimum Design Loads for Buildings and Other Structures
T. UL - Fire Resistance Directory.
U. FM Approvals - Roof Coverings and/or RoofNav assembly database.

1.04 SUBMITTALS

A. Submit under provisions of Section 01300.
B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation instructions.

C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.

D. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins.

E. Recycled or Bio-Based Materials: Provide third party certification through UL Environment of roof System membranes containing recycled or bio based materials.

F. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

G. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.

H. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77 deg. F. Tests at 0 deg. F will not be considered.

I. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147.

1.05 CLOSEOUT SUBMITTALS

A. Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work

1.06 DESIGN / PERFORMANCE REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Exterior Fire Test Exposure: Roof system shall achieve a UL, FM or WH Class rating for roof slopes indicated on the Drawings as follows:
   1. Factory Mutual Class A Rating.
   2. Warnock Hersey Class A Rating.

C. Design Requirements:
   1. Uniform Wind Uplift Load Capacity
      a. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
         1) Design Code: ASCE 7, Method 2 for Components and Cladding.
         2) Importance Category:
            a) IV
         3) Importance Factor of:
            a) 2.0
         4) Wind Speed: 120 mph
         5) Ultimate Pullout Value: Adhered
         6) Exposure Category:
            a) B.
         7) Design Roof Height: 20 feet.
         8) Minimum Building Width: 30 feet.
         9) Roof Pitch: 1/2 :12.
   2. Snow Load: 25 psf.
   3. Live Load: 20 psf, or not to exceed original building design.
   4. Dead Load:
      a. Installation of new roofing materials shall not exceed the dead load capacity of the existing roof structure.

D. Roof System membranes containing recycled or bio-based materials shall be third party certified through UL Environment.

1.07 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
B. Manufacturer Qualifications: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.
C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.
D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.
E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.08 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to commencing Work of this section.
B. Review installation procedures and coordination required with related Work.
C. Inspect and make notes of job conditions prior to installation:
    1. Record minutes of the conference and provide copies to all parties present.
    2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
    3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.
C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface except store KEE-Stone FB 60 rolls flat on a clean flat surface. No wet or damaged materials will be used in the application.
D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.
E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.010 COORDINATION

A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.011 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.012 WARRANTY

A. Upon completion of the work, provide the Manufacturer's written and signed Edge-To-Edge NDL System Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installer, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition including Garland Metal Components.
   1. Warranty Period:
      a. 30 + 10 years from date of acceptance. Requires mid period inspection.

B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
   1. Warranty Period:
      a. 2 years from date of acceptance.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acceptable Manufacturers:
   1. Garland Company, Inc. (The)
   2. SR Products
   3. Ecology
   4. Firestone
   5. Viking Products Group

B. Or approved equal provided all sections of the specifications are met.

C. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.
   1. Bidder will not be allowed to change materials after the bid opening date.
   2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Architect/ Owner for approval prior to acceptance.
   3. Substitution request must:
      a. Be submitted no less than (7) days prior to bid due date.
      b. Include a list of nearby installations more than (2) years old.
      c. Include sample warranty.
      d. Be accompanied by third-party testing reports which indicate equal or great performance characteristics.
   4. In making a request for substitution, the General Contractor, Bidder/Roofing Contractor represents that it has:
      a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
      b. Will provide the same guarantee for substitution as for the product and method specified.
      c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.

d. Will waive all claims for additional cost related to substitution, which consequently become apparent.
e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
f. Will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitution.

5. Architect/ Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.
6. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractors' request for manufacturer substitution.

2.02 COLD APPLIED 2-PLY ROOF SYSTEM – BASES OF DESIGN

A. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
1. StressBase 80:

B. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
1. OptiMax FR Mineral:

C. Interply Adhesive: (1 and 2)
1. Weatherking :

D. Flashing Base Ply: One ply bonded to the prepared substrate with Interply Adhesive:
1. HPR Tri-Base Premium:

E. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
1. OptiMax FR Mineral:

F. Flashing Ply Adhesive:
1. Flashing Bond:

G. Surfacing: Requires 30 day wait before applying.
1. Surface Coatings:
a. Garla-Brite:

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.
B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.
C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.
D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. General: Clean surfaces thoroughly prior to installation.
1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.

3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
6. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.

3.03 INSTALLATION - GENERAL

A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.

B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:
1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.

C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

D. All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1 inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

3.04 INSTALLATION COLD APPLIED ROOF SYSTEM

A. Base Ply: Cut base ply sheets into 18 foot lengths and allow plies to relax before installing. Install base sheet in Interply Adhesive: applied at the rate required by the manufacturer. Shingle base sheets uniformly to achieve one ply throughout over the prepared substrate. Shingle in proper direction to shed water on each large area of roofing.
1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
2. Solidly bond to the substrate and adjacent ply with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Use care to eliminate air entrapment under the membrane.
4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
5. Extend plies 2 inches beyond top edges of cants at wall and projection bases.

6. Install base flashing ply to all perimeter and projection details.
7. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

B. Modified Cap Ply(s): Cut cap ply sheets into 18 foot lengths and allow plies to relax before installing. Install in interplay adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plys specified. Shingle in proper direction to shed water on each large area of roofing.
   1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
   2. Solidly bond to the base layers with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
   3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.
   4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
   5. Allow cold adhesive to set for 5 to 10 minutes before installing the top layer of modified membrane.
   6. Extend membrane 2 inches beyond top edge of all cants in full moppings of the cold adhesive as shown on the Drawings.

C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.

D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06114.
   1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
   2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
   3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
   4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.

E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07620 or Section 07710. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.

F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.

G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.
   1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
   2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
   3. Adhere to the underlying base ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
   4. Solidly adhere the entire flashing ply to the substrate. Secure the tops of all flashings that are not run up and over curb through termination bar fastened at 6 inches (152 mm) O.C. and

sealed at top.

5. Seal all vertical laps of flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.
6. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

H. Flashing Cap Ply:
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
6. All stripping shall be installed prior to flashing cap sheet installation.
7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

I. Surface Coatings: Apply roof coatings in strict conformance with the manufacturer's recommended procedures.

J. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.05 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.
B. Remove asphalt markings from finished surfaces.
C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.06 PROTECTION

A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.
B. Protect exposed surfaces of finished walls with tarps to prevent damage.
C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.
D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.
E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.07 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations at start-up and at intervals of approximately 30 percent, 60 percent and 90 percent completion. Provide a final inspection upon completion of the Work.
   1. Warranty shall be issued upon manufacturer's acceptance of the installation.
   2. Field observations shall be performed by a Sales Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
   3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
   4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.08 SCHEDULES

A. Base (Ply) Sheet:
   1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
      a. Tensile Strength, ASTM D 5147
         1) 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
         2) 50mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
      b. Tear Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf
         2) 50mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1) 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
         2) 50mm/min@ -17.78 +/- 2 deg. C MD 4 % XD 4 %
      d. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

B. Thermoplastic/Modified Cap (Ply) Sheet:
   1. OptiMax FR Mineral: 145 mil mineral surfaced, polyurethane modified roofing membrane with fire retardant characteristics, and dual fiberglass reinforced scrim. ASTM D 6163, Type III Grade G
      a. Tensile Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 205 lbf/in XD 215 lbf/in
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 36.0 kN/m XD 38 kN/m
      b. Tear Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 1334 N XD 1334 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4.7% XD 5.0%
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 4.7% XD 5.0%
      d. Low Temperature Flexibility, ASTM D 5147, Passes 0 deg. F (-18 deg. C)

C. Interply Adhesive:
   1. Weatherking:Rubberized, polymer modified cold process asphalt roofing bitumen V.O.C. compliant ASTM D 3019. Performance Requirements:
      a. Non-Volatile Content ASTM D 4479 70%
      b. Density ASTM D1475 8.9 lbs./gal.
      c. Viscosity Stormer ASTM D562 400-500 grams
      d. Flash Point ASTM D 93 100 deg. F min. (37 deg. C)
      e. Slope: up to 3:12

D. Flashing Base Ply:
1. HPR Tri-Base Premium: 60 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass and polyester composite scrim, performance requirements according to ASTM D 5147.
   a. Tensile Strength, ASTM D 5147:
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F: MD 330 lbf/in XD 330 lbf/in
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 57.5 kN/m XD 57.5 kN/m
   b. Tear Strength, ASTM D5147:
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 550 lbf XD 550 lbf
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 2446 N XD 2446 N
   c. Elongation at Maximum Tensile, ASTM D 5147:
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 7% XD 9%
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 7% XD 9%

E. Flashing Ply Adhesive:
1. Flashing Bond: Asphalt roofing mastic V.O.C. compliant, ASTM D 4586, Type II trowel grade flashing adhesive.
   a. Non-Volatile Content ASTM D 4479 70 min.
   b. Density ASTM D 1475 8.3 lbs./gal. (1kg/l)
   c. Flash Point ASTM D 93 103 deg. F (39 deg. C)

F. Surfacing:
1. Flashing Cap (Ply) Sheet:
   a. OptiMax FR Mineral: 145 mil mineral surfaced, polyurethane modified roofing membrane with fire retardant characteristics, and dual fiberglass reinforced scrim. ASTM D 6163, Type III Grade G
      1) Tensile Strength, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 205 lbf/in XD 215 lbf/in
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 36.0 kN/m XD 39 kN/m
      2) Tear Strength, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 1334 N XD 1334 N
      3) Elongation at Maximum Tensile, ASTM D 5147
         a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4.7% XD 5.0%
         b) 50 mm/min. @ 23 +/- 2 deg. C MD 4.7% XD 5.0%
      4) Low Temperature Flexibility, ASTM D 5147, Passes 0 deg. F (-18 deg. C)
2. Surface Coatings:
   a. Surfacing:
      1) Garla-Brite: ASTM D 2824 aluminum coating non-fibered aluminum roof coating non-fibered aluminum roof coating having the following characteristics:
         a) Flash Point 103 deg. F (39 deg. C) min.
         b) Weight/Gallon 7.9 lbs./gal. (1.0 g/cm3)

PART 4 END OF SECTION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section Includes The Following:
   1. Fiberglass Reinforced Plastic (FRP) Doors
   2. Fiberglass Resin Transfer Molded Door Frames

1.02 REFERENCE STANDARDS

A. Door Properties
   1. Standard test method for steady state thermal transmission properties by means of the heat flow meter apparatus.
   2. Successfully completed 1,000,000 cycles test in accordance with:
   3. AAMA 920-03 – Specification for Operating Cycle Performance of Side-Hinged Exterior Door Systems.
   4. ANSI A250.4-2001 – Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frame Anchors and Hardware Reinforcings.
   5. NWWDA TM-7 Test Method to Determine the Physical Endurance of Wood Doors and Associated Hardware Under Accelerated Operating Conditions.
   6. Florida Building Code
   7. SFBC PA 201 Impact Procedures for Large Missile Impact
   8. SFBC PA 202 Uniform Static Load on Building Components
   9. SFBC PA 203 Products Subjected to Cycle Wind Pressure
   10. SFBC 3603.2 Forced Entry Test
   11. ASTM E 1886 Impact and Cycling, Large Missile Impact
   12. ASTM E 1996 Specifications for Performance of Exterior Doors
   13. ASTM C 518 Heat Transfer
   14. ASTM D 1761 Mechanical Fasteners

B. Laminate Properties
   1. Door face plate is a minimum of 0.125 inch thick fiberglass reinforced plastic molded into one continuous sheet starting with a 25 mil resin-rich gelcoat layer resin integrally molded with multiple layers of 1.5 oz. sq ft fiberglass mat and one layer of 18 oz per square yard fiberglass woven roving saturated with special resin. Door plate weight shall not be less than 0.97 lbs per square foot at a ratio of 30/70 glass resin.
   2. Laminated plate by itself evaluated in accordance with Florida Building Code TAS 201 Large Missile Impact Test as per ASTM-1996-05b, Standard Specification for Performance of Exterior Windows, Curtain Wall, Doors and Storm Shutters Impacted by Windborne Debris in Hurricanes. The missile (a 2 x 4 with a weight of 9 lbs shot from a cannon at a velocity of 50 ft/sec) did not penetrate the door face plate.
      i. ASTM D 638 Tensile Strength Properties of Plastic
      ii. ASTM D 790 Flexural Strength Properties of Plastic
      iii. ASTM D 2583 Indention Hardness of Plastics
      iv. ASTM D 256 Izod Pendulum Impact Resistance
      v. ASTM D 792 Density/Specific Gravity Of Plastics
      vi. ASTM D 1761 Mechanical Properties of Fasteners
      vii. ASTM E 84 Surface Burning Characteristics of Materials
      viii. ASTM G 155 Xenon Light Exposure of Non Metallic Materials
      ix. ASTM D 635 Method For Rate of Burning
      x. ASTM D 2843 Smoke Density
      xi. ASTM D 1929 Self Ignition Temperature Properties
      xii. SFBC PA 201 Impact Procedures for Large Missile Impact

C. Core Properties
   a) ASTM C 177 Thermal Properties of Materials
   b) ASTM D 1622 Density and Specific Gravity
   c) ASTM E 84 Surface Burning Characteristics of Materials
   d) WDMA TM-10 and TM-5 Firestop ASTM E 152 U.L 10(b)
   e) ASTM E90-04- Sound Transmission Loss
   f) ASTM E413-04- Classification for Rating Sound Insulation
   g) ASTM E1332-90- Standard Classification for Determination of Outdoor-Indoor Transmission Class
   h) ASTM E2235-04- Standard Test for Determination of Decay Rates for Use in Sound Insulation Methods

D. Qualifications
   1. Manufacturer Qualifications: A company specialized in the manufacture of fiberglass reinforced plastic (FRP) doors and frames as specified herein with a minimum of 30 years documented experience and with a record of successful in-service performance for the applications as required for this project.
   2. Installer Qualifications: An experienced installer who has completed fiberglass door and frame installations similar in material, design, and extent to those indicated and whose work has resulted in construction with a record of successful in-service performance.
   3. Source limitations: Obtain fiberglass reinforced plastic doors and resin transfer molded fiberglass frames through one source fabricated from a single manufacturer, including fire rated fiberglass frames. This ensures complete uniformity of physical properties and consistency in the resin chemistry tailored for this application.
   4. Source limitations: Hardware and accessories for all FRP doors as specified in Section 08710 shall be provided and installed by the fiberglass door and frame manufacturer.
   5. Source Limitations: Glass for windows in doors shall be furnished and installed by door and frame manufacturer in accordance with related section, Division 8, Glazing.

1.04 SUBMITTALS

A. Product Technical Data Including:
   1. Acknowledgment that products submitted meet requirements of standards referenced.
   2. Manufacturer shall provide certificate of compliance with current local and federal regulations as it applies to the manufacturing process.
   3. Manufacturer's installation instructions.
   4. Schedule of doors and frames indicating the specific reference numbers used on the owner's project documents, noting door type, frame type, size, handing and applicable hardware.
   5. Details of core and edge construction. including factory construction specifications.
   6. Certification of manufacturer's qualifications.

B. Submittal Drawings for Customer Approval Shall be Submitted Prior to Manufacture and Will Include the Following Information and Formatting:
   1. Summary door schedule indicating the specific reference numbers as used on owner's drawings, with columns noting door type, frame type, size, handing, accessories and hardware.
   2. A drawing depicting front and rear door elevations showing hardware with bill of material for each door.
   3. Drawing showing dimensional location of each hardware item and size of each door.
   4. Individual part drawing and specifications for each hardware item and FRP part or product.
   5. Construction and mounting detail for each frame type.

C. Samples:
   1. Provide one complete manufactured door sample which represents all aspects of the typical manufacturing process, including molded in gelcoat color and face plate construction. One edge should expose the interior of the door depicting the unique u-shaped continuous piece stile and rail, hardware reinforcement and core material.

D. Operation and Maintenance Manual
   1. Include recommended methods and frequency for maintaining optimum condition of fiberglass doors and frames under anticipated traffic and use condition.
   2. Include one set of final as built drawings with the same requirements as mentioned in Section B above.
   3. Include certificate of warranty for door and frame listing specific door registration numbers.
   4. Include hardware data sheets and hardware manufacturer's warranties.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Each door and frame shall be delivered individually crated for protection from damage in cardboard containers, clearly marked with project information, door location, specific reference number as shown on drawings, and shipping information. Each crate shall contain all fasteners necessary for installation as well as complete installation instructions.
   1. Doors shall be stored in the original container on edge, out of inclement weather for protection against the elements.
   2. Handle doors pursuant to the manufacturer's recommendations as posted on outside of crate.

1.06 WARRANTY

A. All fiberglass doors and frames have a lifetime guarantee against failure due to corrosion. Additionally, fiberglass doors and fiberglass frames are guaranteed for ten years against failure due to materials and workmanship, including warp, separation or delamination, and expansion of the core.
B. On site assistance available.

PART 2 – PRODUCTS

2.01 EQUIPMENT

A. FRP DOORS
   1. Doors shall be made of fiberglass reinforced plastic (FRP) using Class 1 premium resin with no fillers that is specifically tailored to resist chemicals and contaminants typically found in environment for which these specifications are written. Doors shall be 1 ¾ inch thick and of flush construction, having no seams or cracks. For consistency in the resin chemistry tailored for this application and to maintain the same physical properties throughout the structure, all fiberglass components including face plates, stiles and rails and frames must be fabricated by the same manufacturer. Components obtained through various outside sources for plant assembly will not be accepted.
   2. Door Plates shall be 0.125 inch thick minimum, molded in one continuous piece, starting with 25 mil gelcoat of the color specified, integrally molded with multiple layers of 1.5 ounces per square foot fiberglass mat and one layer of 18 ounce per square yard fiberglass woven roving. Each layer shall be individually laminated with resin as mentioned above. Door plate weight shall not be less than 0.97 lbs per square foot at a ratio of 30/70 glass to resin. Plate alone to withstand Large Missile Impact per FBC TAS 201. Face plates manufactured using the pultrusion process does not allow for a smooth molded gelcoat finish, the use of woven roving for adequate plate thickness, strength and weight, or the appropriate glass to resin ratio and will not meet the quality standards of this project.
   3. Stiles and Rails shall be constructed starting from the outside toward the inside, with a matrix of at least three layers of 1.5 ounce per square foot of fiberglass mat. The stile and rail shall be molded in one continuous piece to a U-shaped configuration and to the exact dimensions of the door. In this manner there will be no miter joints and disparate materials used to form the one-piece stile and rail.

4. Core material shall be Polypropylene plastic honeycomb core with a non woven polyester veil for unparalleled plate bonding, 180 PSI typical compression range unless otherwise requested.
5. Internal Reinforcement shall be #2 SPF of sufficient amount to adequately support required hardware and function of same.
6. Finish of door frame shall be identical with 25 mil resin-rich gelcoat of the specified color integrally molded in at time of manufacture resulting in a smooth gloss surface that is dense and non-porous. To achieve optimum surface characteristics, the gelcoat shall be cured within a temperature range of 120F to 170F creating an impermeable outer surface, uniform color throughout, and a permanent homogeneous bond with the resin/fiberglass substrate beneath. Only the highest quality gelcoat will be used to ensure enduring color and physical properties. Paint and/or post application of gelcoat results in poor mechanical fusion and will be deemed unacceptable for this application. The finish of the door and frame must be field repairable without compromising the integrity of the original uniform composite structure, function or physical strength.

A. FRP FRAMES
1. Frames (rated and non-rated) shall be fiberglass and manufactured using the resin transfer method creating one solid piece (no voids) with complete uniformity in color and size. Beginning with a minimum 25 mil gelcoat layer molded in and a minimum of two layers of continuous strand fiberglass mat saturated with resin, the frame will be of one-piece construction with molded stop. All frame profiles shall have a core material of 2 psf polyurethane foam. Metal frames or pultruded fiberglass frames will not be accepted.
2. Finish of frame shall be identical to the door with 25 mil resin-rich gelcoat of the specified color integrally molded in at time of manufacture. To achieve optimum surface characteristics, the gelcoat shall be cured within a temperature range of 120F to 170F creating an impermeable outer surface, uniform color throughout, and a permanent homogeneous bond with the resin/fiberglass substrate beneath. Only the highest quality gelcoat will be used to ensure enduring color and physical properties. Paint and/or post application of gelcoat result in poor mechanical fusion and will be deemed unacceptable for this application. The finish of the door and frame must be field repairable without compromising the integrity of the original uniform composite structure, function or physical strength.
3. Jamb/Header connection shall be mitered for tight fit.
4. Internal Reinforcement shall be continuous within the structure to allow for mounting of specified hardware. Reinforcing material shall be a dense matrix of cloth glass fibers and premium resin with a minimum hinge screw holding value of 1000 lbs per screw. All reinforcing materials shall be completely encapsulated. Documented strength of frame screw holding value after third insert must be submitted. Dissimilar materials, such as steel, will be deemed unacceptable as reinforcement for hardware attachment.
5. Mortises for hardware shall be accurately machined by CNC to hold dimensions to +/- 0.010 inch in all three axis.
6. Hinge pockets shall be accurately machined by CNC to facilitate heavy duty hinges at all hinge locations, using shims when standard weight hinges are used.

2.04 HARDWARE

A. See Section 08710
B. The special nature of this material requires that all related hardware as specified must be furnished and installed by the door frame manufacturer to maintain product quality and function as well as to ensure sufficient support/reinforcement, precision tooling and proper sealing methods are provided.

2.05 QUALITY ASSURANCE

Test certification by an independent and accredited laboratory is required for the properties listed in this Quality Assurance section. Reports shall be made available upon request for each of the standards and certifications described below.

PART 3 – EXECUTION

3.01 INSTALLATION CONDITIONS

A. Verification of Conditions
   1. Verify openings are correctly prepared to receive doors and frames.
   2. Verify openings are correct size and depth in accordance with submittal drawings.
B. Installer's Examination
   1. Door installer shall examine conditions under which construction activities of this section are to be performed and submit a written report to general contractor if conditions are unacceptable.
   2. General Contractor shall submit two copies of the installer's report to the architect within 24 hours of receipt.
   3. Installer shall not proceed with installation until all unacceptable conditions have been corrected.

3.02 INSTALLATION

A. Doors shall be delivered at job site individually crated. Each crate to be clearly marked with the specific opening information for quick and easy identification.
B. All single doors to be shipped completely assembled in the frame with hardware installed. Double doors to be prehung at the factory to ensure a proper fit and that hardware functions properly, then disassembled for shipping purposes.
C. Install door opening assemblies in accordance with shop drawings and manufacturer's printed installation instructions, using installation methods and materials specified in installation instructions.
D. Field alteration of doors or frames to accommodate field conditions is strictly prohibited.
E. Site tolerances: Maintain plumb and level tolerance specified in manufacturer's printed installation instructions.
F. Fire labeled doors, frames and any associated hardware must be installed by qualified professional installers in strict accordance with manufacturer's instructions and the latest revision of NFPA 80.

3.03 ADJUSTING

A. Adjust doors in accordance with the door manufacturer's maintenance instructions to swing open and shut without binding and to remain in place at any angle without being moved by gravitational influence.
B. Adjust door hardware to operate correctly in accordance with hardware manufacturer's maintenance instruction.

3.04 CLEANING

A. Clean surfaces of door opening assemblies and exposed door hardware in accordance with respective manufacturer's maintenance instructions.

3.05 PROTECTION OF INSTALLED PRODUCTS

A. Protect door opening assemblies and door hardware from damage by subsequent construction activities until final inspection.

End of Section

PART 1 - GENERAL

1.01 REFER TO "GENERAL AND SPECIAL CONDITIONS", AND "INSTRUCTIONS TO BIDDERS", DIVISION 1 OF SPECIFICATIONS. REQUIREMENTS OF THESE SECTIONS AND THE PROJECT DRAWINGS SHALL GOVERN WORK IN THIS SECTION.

1.02 SUMMARY

A. Furnish all items of Finish Hardware specified, scheduled, shown or required herein except those items specifically excluded from this section of the specification.

B. Related Sections:
1. Section 06 10 00 – Rough Carpentry.
2. Section 06 20 00 – Finish Carpentry: Installation of finish hardware.
3. Section 08 11 13 – Hollow Metal Doors and Frames
4. Section 08 14 16 – Flush Wood doors.
5. Section 08 41 00 – Aluminum Doors and Frames
6. Section 28 31 00 – Fire Detection and Alarm
7. Section 28 10 00 – Electronic Access Control and Intrusion Detection
8. Electrical rough-in, conduit junction boxes, wiring, primary power and final hook-up of all finish hardware components requiring electrical connections.

1.03 SUBMITTALS:

A. Hardware Schedule

1. Submit proper number of Hardware Schedules to allow the Architect to retain two copies for his use, plus the number of copies required by the Contractor for his distribution and use. But, in any event, do not submit more than six copies.
2. Include the following:

Preface sheet listing category only and manufacturer's names of items being furnished as follows:

CATEGORY	SPECIFIED	SCHEDULED
Hinges	Manufacturer A	Manufacturer B
Lock sets	Manufacturer X	Manufacturer X
Kick Plates	Open	Manufacturer Z

3. Hardware Locations: Refer to Article 3.1 B.2 Locations.
4. Opening Description: Single or pair, number, room locations, hand, active leaf, degree of swing, size, door material, frame material, and UL listing.
5. Hardware Description: Quantity, category, product number, fasteners, and finish.
6. Headings that refer to the specified Hardware Set Numbers.
7. Scheduling Sequence shown in Hardware Sets.
8. Product data of each hardware item, and shop drawings where required, for special conditions and specialty hardware.
9. Riser drawings, wiring drawings and system operation description.
10. "Vertical" scheduling format only. "Horizontal" schedules will be returned "Not Approved."

11. Typed Copy.
12. Double Spacing.
13. 8-1/2 x 11 inch sheets
14. U.S. Standard finish symbols or BHMA Finish symbols.
15. Generally, follow guidelines established in Door & Hardware Institute Handbook" Sequence and Format for the Hardware Schedule". Modified as above

B. Product Data:

1. Submit, in booklet form using supplier's schedule covers as binders, Product Data of items of hardware listed in supplier's schedule.
2. Submit Product Data concurrently with hardware schedule.
3. Provide Elevation and Riser Diagrams for all Electrical openings being furnished. Coordinate operational descriptions with Security and Access Control providers. Provide proper documentation to Security and Access Control Provider for their wiring of the system.

C. Inspection Report:

1. Submit inspection report specified in 3.1.C.2. for locksets, exit devices, ADA special closers, door closers and all electrical hardware.

D. Key Schedule: Provide Key Schedule with submitted Hardware Schedule
E. Submit System Operation Description as part of the original hardware schedule submittal. Failure to include will result in the schedule being returned not reviewed and not approved.
F. Submit to general contractor/construction manager, two copies each of parts and service manuals and two each of any special installation or adjustment tools. Include for locksets, exit devices, door closers and any electrical products.

1.04 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:

1. Furnish finish hardware to comply with the requirements of laws, codes, ordinances, and regulations of the governmental authorities having jurisdiction where such requirements exceed the requirements of the Specifications.
2. Furnish finish hardware to comply with the requirements of the regulations for public building accommodations for physically handicapped persons of the governmental authority having jurisdiction and to comply with Americans with Disabilities Act.
3. Provide hardware for fire-rated openings in compliance with NFPA 80 and State local building code requirements. Provide only hardware that has been tested and listed by UL for types and sizes of doors required and complies with requirements of door and door frame labels.
4. Where emergency exit devices are required on fire-rated doors that carry supplementary marking on the doors UL labels indicating "fire door to be equipped with fire exit hardware" provide UL label on exit devices indicating "Fire Exit Hardware".

B. Hardware Supplier:

Shall be an established firm dealing in contract builder's hardware. He must have an adequate inventory and qualified personnel on staff. Only domestic manufacturers are acceptable. The distributor must be a factory-authorized dealer for all materials required. Supplier shall be or have in employment an Architectural Hardware Consultant. (AHC)

1. Prior to Bidding all suppliers and Contractors may meet at the jobsite to verify all work that is to be performed and to coordinate efforts with Access Control work., Review specification requirements for hardware schedule, doors, and labor to be performed.

C. Hardware installer shall be a an experienced hardware Specialist
D. Pre-installation Meeting:

1. Before hardware installation, general contractor/construction manager shall request a hardware installation seminar be conducted on the installation of hardware; specifically of locksets, closers, exit devices, overhead stops and coordinators. The hardware supplier for the project shall present seminar. Seminar to be held at job site and attended by installers of hardware for aluminum, hollow metal and wood doors. Seminar to address proper coordination and installation of hardware, per finish hardware schedule for this specific project by using installation manuals, hardware schedule, templates and physical product samples Manufacturer's representative, hardware supplier, Hardware installers, and owner's representatives shall attend the Pre-installation meeting. Arrangements for this meeting shall be made 2 weeks prior to convening. Only qualified installers who attend this meeting shall be allowed to perform hardware installation.
2. When any electrical or pneumatic hardware is specified this meeting shall also include the following trades/installers: Electrical, Security, Alarm systems and Architect.
   a. Convene one week prior to commencing work of this Section.
   b. Coordinate with section 01039
3. The hardware supplier shall include the cost of this seminar in his proposal.

E. Manufacturer:

1. Obtain each type of hardware (latch and lock sets, hinges, closers, etc.) from a single manufacturer, although several may be indicated as offering products complying with requirements.
2. Provide electrified door hardware from same manufacturer as mechanical door hardware, unless otherwise indicated.

1.05 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Label each item of hardware with the appropriate door number and Hardware Schedule heading number, and deliver to the installer so designated by the Contractor.

1.06 WARRANTIES

A. Cylindrical locksets shall carry manufacturer's 7-year warranty against manufacturing defects and workmanship.
B. Closers shall carry manufacturer's 30-year warranty against manufacturing defects and workmanship.
C. ADA Power operators shall carry manufacturer's 2 year warranty against manufacturing defects and workmanship
D. Exit devices shall carry manufacturer's 3-year warranty against manufacturing defects and workmanship.
E. Balance of items shall carry a manufacturer's 1-year warranty against manufacturing defects and workmanship.
F. During the warranty period, replace defective work, including labor, materials and other costs incidental to the work. Inspect the work within 24 hours after receipt of notice from the Owner. Replace work found to be defective as defined in the Contract Documents.

PART 2 - PRODUCT

2.01 FURNISH EACH CATEGORY WITH THE PRODUCTS OF ONLY ONE MANUFACTURER UNLESS SPECIFIED OTHERWISE; THIS REQUIREMENT IS MANDATORY WHETHER VARIOUS MANUFACTURERS ARE LISTED OR NOT.

2.02 PROVIDE THE PRODUCTS OF MANUFACTURER DESIGNATED OR IF MORE THAN ONE MANUFACTURER IS LISTED, THE COMPARABLE PRODUCT OF ONE OF THE OTHER MANUFACTURERS LISTED. WHERE ONLY ONE MANUFACTURER OR PRODUCT IS LISTED, "NO SUBSTITUTION" IS IMPLIED.

A. Hinges:

1. Unless specified otherwise in sets furnish hinges of class and size as follows:
2. Furnish class 5BB1 and size 4-1/2 x 4-1/2 inches unless otherwise specified. Provide HW hinges where shown in HW Sets.
3. Numbers used are IVES. Equal products of Hager, McKinney and Stanley are acceptable.

B. Continuous Hinges shall be Ives 112/224 XY series. Equivalent by Pemko or Select is acceptable.

C. Mortise Locksets: Schlage L Series. Trim to be 03

1. Acceptable Equivalent to be Sargent 8200, or Best 45H Series
2. Verify all lock functions with owner prior to ordering.

D. Closers:

1. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder. Cylinder body shall be 1 ½" in diameter, and double heat treated pinion shall be 11/16"in diameter with double D slab drive arm connection.
2. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force for the physically handicapped. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed, and backcheck.
3. All closers shall have solid forged steel main arms (and forged forearms for parallel arm closers).
4. Refer to door and frame details and furnish accessories such as drop plates, panel adapters, spacers and supports as required to correctly install door closers. State degree of door swing in the hardware schedule. No extras will be allowed for these accessory items.
5. Provide Special Templates as required.
   LCN 4000 Series and 4640 Series Power Operators. Size of Closers:
   a. Closing power of sized closers shall be adjustable to increase closing power fifty 50% percent.
   b. Closing power of non-sized cylinders shall be adjustable over a range of sizes.
6. Barrier Free Manual Closers:
   a. All closers for openings that must meet the minimum requirements of the 1990 ADA act, in lieu of ANSI Standard A156.4, shall be sized in accordance with the applicable Reduced Opening Force table in the current LCN General Catalog.
   b. All size 1 manual closers shall provide less than 5 pounds opening force on a 36" door leaf and delay closing time in accordance with the 1990 ADA requirements.

E. Overhead Holders and Stops:

1. Type, function and fasteners must be same as Glynn-Johnson specified. Size per manufacturer's selector chart. Plastic end caps, hold open mechanisms and shock blocks are not allowed. End caps must be finished same as balance of unit.
2. Manufacture products using base material of Brass/Bronze for US3, US4, & US10B finished products and 300 Stainless Steel for US32 & US32D finished products.
3. Type, function, and fasteners must be the same as Glynn-Johnson specified. Size per manufacturer's selector chart.
   a. Glynn-Johnson or equivalent by ABH or Rixson

F. Kick Plates:

1. Furnish .050 inches thick 10" high x door width less 2" at single doors, and less 1" at pairs. Where glass or louvers prevent this height, supply with height equal to height of bottom rail less
2. Kickplates shall be drilled and counter sunk for oval head, counter sunk screws. Pan head not acceptable.
   a. Equivalent by Rockwood or Trimco

G. Bumpers and Wall Stops

1. Ives: Bumpers to be WS407CVX or CCV.
2. B.H.M.A. L02101. Wrought, forged, or cast, approximately 2-1/2 inch diameter, convex or concave rubber center, concealed fasteners.

H. Thresholds to be saddle type 5" wide by length of opening. Minimum wall thickness to be .244. Zero as shown. Equivalent by Pemko is acceptable.

I. Door bottoms shall be Zero.

J. Jamb and Head Seal for Hollow metal Frames shall be Zero 429A. Mount Weatherstripping prior to mounting closers or Exit Devices. Notching of Weatherseal is not acceptable. Mounting holes drilled due to mounting weatherstripping after closers and exit devices must be patched to original condition of door and frame or door and frame must be replaced at no cost to the owner.

K. Intumescent Seals for wood fire rated doors shall be by Dr Supplier based on Category A Doors. Coordinate with Wood Door specification. Use National Guard 9850C if Category B Doors are specified.

L. Fasteners:

1. Furnish fasteners of the proper type, size, quantity, and finish. Use machine screws and expansion shields for attaching hardware to concrete or masonry, and wall grip inserts at hollow wall construction. Furnish machine screws for attachment to reinforced hollow metal frames and reinforced aluminum frames.. "TEK" type screws are not acceptable.

M. Miscellaneous:

Furnish items not categorized in the above descriptions but specified by manufacturers names in Hardware Sets.

2.03 FINISHES:

A. Generally, Dull Chrome, US26D / BHMA 626 or 652 for steel based products
B. Exit device touchbars, push/pull bars, pull, push plates, kick plates, overhead holders and stops and wrought bumpers, Dull Stainless Steel, US32D / BHMA 630.
C. Closers: Powder Coat. Finish to be Aluminum BHMA 689
D. Thresholds: Aluminum extrusion

2.04 TEMPLATES AND HARDWARE LOCATION:

A. Furnish hardware made to template. Supply required templates and hardware locations to the door and frame manufacturers.
B. Refer to Article 3.1 B.2, Locations, and coordinate with templates.

2.05 CYLINDERS KEY CONTROL AND KEYING:

A. Key to owners existing key system. Key as directed by owner.
B. Provide 2 Change Keys per locked cylinder. Keys to be nickel silver.
C. Provide 8 Masterkeys
D. Provide Temporary cylinders during construction as needed

PART 3 - EXECUTION

3.01 INSTALLATION

A. General:

1. Install hardware according to manufacturers installations and to manufacturers template dimensions. Attach all items of finish hardware to doors, frames, walls, etc. with fasteners furnished and required by the manufacture of the item.
2. Reinforced hollow metal doors and frames and reinforced aluminum door and frames: drilled and tapped machine screws.
3. Solid wood doors and frames: full thread wood screws. Drill pilot holes before inserting screws.

B. Locations:
1. Dimensions are from finish floor to center line of items.
2. Include this list in Hardware Schedule.

CATEGORY	DIMENSION
Hinges	Door Manufacturer's Standard
Levers	Door Manufacturer's Standard
Exit Device Touchbar	Per Template

C. Final Adjustment:

1. Provide the services of a factory representative to inspect material furnished and its installation and adjustment, to make final hardware adjustment, and to instruct the Owner's personnel in adjustment, care and maintenance of hardware.

2. Locksets, closers and exit devices shall be inspected by the factory representative and adjusted after installation and after the HVAC system is in operation, to insure correct installation and proper adjustment in operation. The manufacturer's representative shall prepare a written report stating compliance, and also recording locations and kinds of noncompliance. The original report shall be forwarded to the Architect with copies to the Contractor, hardware distributor, hardware installer and building owner

END OF SECTION

01 22 00 **UNIT PRICE** **01 22 00**
01 22 13 METHOD OF MEASUREMENT 01 22 13

A. General
Quantities of work completed under the contract will be measured by the Engineer according to United States standard measures unless otherwise noted.

Quantities of materials furnished and of work performed under the contract will be determined by methods of measurement and computations that are generally recognized as conforming to good engineering practice.

1. Aggregates furnished and measured by weight will paid including an allowance for moisture of up to six [6%] percent moisture. Where aggregate field tests indicate moisture content is greater than 6%, a payment adjustment shall be made. The excess weight above 6% moisture shall be deducted from the scale weights.
2. In-place cubic yard (ICY) shall be the volume based on field survey data and the "average end area" methods.
3. Truck cubic yard (TCY) shall be the volume of each specific truck bed by design. Based on the full volume of each truck bed level with the top rail.
   a. Each truck removing material from the site shall:
      1) _____ mark designation
      2) _____ Owner
      3) _____ Bed volume struck
4. Tons: (2,000 pounds) as recorded on weight scales having a "Department of Agriculture" certificate valid for one year at the time of weighing. Payment for this Work shall be made on the basis of weight tickets noting project, contractor, time, date, gross, tare and net weights.

All items of work for this contract will be measured in units as indicated on the Proposal and as noted herein. CF, cubic feet; CYD, cubic yard; EA, each; LS., lump sum; LF., linear feet; SYD, square yard; SF., square feet; T, Ton (2000 lb.); AC, acre 43560 sf; ICY, in-place cubic yard; TCY, truck cubic yard.

01 22 16 UNIT PRICE PAY ITEMS **01 22 16**

Item No. 1 Remove and Replace Roof

Payment for this item shall include all labor, material and equipment necessary to remove the existing roof and supports and construction of the new proposed roof that includes the support and painting of the roof.

Item No. 2 Demo for Access Hatches and Two New Hatches

Payment for this item shall include all labor, material and equipment necessary to remove the proposed access hatches and replace them with new access hatches. This includes any gaskets and fasteners associated with the work.

Item No. 3 Demo of Wall Section Influent Channel

Payment for this item shall include all labor, material and equipment necessary to complete the proposed demo of the wall section influent channel. This includes any removal of the support bars, concrete, insulation, and proper disposal of the material.

Item No. 4 48" Influent Manifold

Payment for this item shall include all labor, material, cleaning and equipment to remove any existing pipe and replace it with the proposed 48" Influent Manifold. This includes joints, lubricant, fasteners, and disposal of material during construction.

Item No. 5 48" Butterfly Valve and Operator

Payment for this item shall include all labor, material, cleaning and equipment to install the proposed 48" Butterfly Valve and Operator. This includes any joints, lubricant, and fasteners required for its installation.

Item No. 6 30" Butterfly Valve

Payment for this item shall include all labor, material, cleaning and equipment to install the proposed 30" Butterfly Valves. This includes any joints, lubricant, and fasteners required for its installation.

Item No. 7 10" Check Valve

Payment for this item shall include all labor, material, cleaning and equipment to install the proposed 10" Check Valves. This includes any joints, lubricant, and fasteners required for its installation.

Item No. 8 Three Horizontal Split Case Pumps with Motors and Shafts.

Payment for this item shall include all labor, material, cleaning and equipment necessary to install the three proposed horizontal split case pumps. This includes wiring, conduit, motor installation, shafts, joints, and fasteners.

Item No. 9 Intermediate Bearing Supports

Payment for this item shall include all labor, material, cleaning and equipment necessary to erect the 3 intermediate bearing supports. This includes any welding, fasteners, and bolts used to install the supports.

Item No. 10 Grating on Existing Intermediate Bearing Supports

Payment for this item shall include all labor, material, cleaning and equipment necessary to complete grating on the existing intermediate bearing supports. Payment for this item does not include the three proposed in item #9.

Item No. 11 Reagent less Cl_2 Analyzer

Payment for this item shall include all labor, material, cleaning and equipment necessary to install the proposed Reagent less Cl_2 Analyzer. This item includes piping, conduit, valves, wiring, and the chemicals required to operate the system at startup.

Item No. 12 Pressure Transducer

Payment for this item shall include all labor, material, cleaning and equipment necessary to install the proposed pressure transducer. This item includes clamps, joints, fasteners, wiring, conduit, and labeling required to operate the transducer.

Item No. 13 Cl_2 Feed Systems Complete with Injection Piping

Payment for this item shall include all labor, material, cleaning and equipment necessary to install the Cl_2 Feed System. This item includes storage, pumps, piping, conduits, and chemicals required to operate the system at startup.

Item No. 14 Handrailing

Payment for this item shall include all labor, material, cleaning and equipment necessary to install all proposed handrailing. This includes fasteners and welding for all proposed sections.

Item No. 15 Ships Ladder

Payment for this item shall include all labor, material, cleaning and equipment necessary to install the proposed ships ladders. Payment for this item will be for each ladder and the additional equipment needed for the complete install.

Item No. 16 Masonry Repair

Payment for this item shall include all labor, material, cleaning and equipment necessary to repair masonry around the building. This item includes joints, removal and structural support to insure the proper masonry repair.

Item No. 17 Sidewalk Replacement

Payment for this item shall include all labor, material, cleaning and equipment necessary to remove, replace or both for the sidewalk. This item includes joints and concrete. It must maintain ADA compliance and will be subject to repair at the cost of the contractor if compliance is not met.

Item No. 18 Lighting

Payment for this item shall include all labor, material, cleaning and equipment necessary to install the lighting fixtures. Payment for this item includes wiring, conduit, switches, and fasteners required to mount and operate the proposed fixtures.

Item No. 19 Transformer

Payment for this item shall include all labor, material, cleaning and equipment necessary to install the proposed transformer. This item includes wiring, conduit, and mounting for proper install.

Item No. 20 200 HP 480V VFDs

Payment for this item shall include all labor, material, cleaning and equipment necessary to furnish and install VFD's for the three new pumps. This item shall include wiring, testing and equipment check out to complete the VFD installation as shown on the plans.

Item No. 21 Electrical Equipment Demo

Payment for this item shall include all labor, material, cleaning and equipment necessary to complete the demolition of the electrical equipment and items shown on the plans.

Item No. 22 New Pass Door

Payment for this item shall include all labor, material, cleaning and equipment necessary to remove existing masonry, sills, door frames, hardware masonry work to complete the installation of the new door as shown on the plans.

Item No. 23 Rest Room Rehabilitation

Payment for this item shall include all labor, material, cleaning and equipment necessary to complete the rehabilitation of the rest room as shown on the plans.

Item No. 24 Painting

Payment for this item shall include all labor, material, cleaning and equipment necessary to paint all piping, concrete walls, ceilings, handrail, structural steel, doors and frames.

Item No. 25 Piping, Fittings

Payment for this item shall include all labor, material, cleaning and equipment necessary to complete the piping and fittings in the existing dry well as shown on the plans.

Item No. 26 PLC Programming Allowance

Payment for this item shall include all labor, material, cleaning and equipment necessary to complete the programming of the existing PLC for the proposed operation of the new pumping scheme.

Item No. 27 Remove & Plug Sluice Gate

Payment for this item shall include all labor, material, cleaning and equipment necessary to remove the existing sluice gates and plug the openings as shown on the plans.

Item No. 28 Check Wiring for Existing VFD For Pump #1 and Complete Wiring

Payment for this item shall include all labor, material, cleaning and equipment necessary to review the wiring that has been completed for the existing 15 MGD pump and VFD previously installed and complete and necessary wiring for a complete and operational pump and VFD installation. Plans for the existing VFD are included in the plan set.

Item No. 29 Mobilization

Payment for this item shall include all labor, material, cleaning and equipment necessary to cover general project mobilization cost up to 10% of the contract amount.

Item No. 30 Start Up

Payment for this item shall include all labor, material, cleaning and equipment necessary to complete two start up operations. The first start up is to bring the existing 15 MGD pump and VFD on line and operational to allow pumping from the Dort reservoir to the City of Flint water distribution system. The second start up is to bring the three new pumps on line.

Item No. 31 Arc Flash Analysis

Payment for this item shall include all labor, material, cleaning and equipment necessary to complete the arc flash analysis and provide the proper labeling for the equipment.

Item No. 32 Short Circuit Calculation

Payment for this item shall include all labor, material, cleaning and equipment necessary to complete the specified short circuit calculations and provide the report for the analysis.

Item #33 Contingency Allowance

Payment for this item shall be determined by the cost for additional work authorized by the Owner.

Item #34 Building Permit Allowance

Payment for this item will be the actual cost to obtain the building permits from the City of Flint.

Item #35 Secondary Water Supply Interconnection

Payment for this item shall include the 48 inch tapping sleeve and valve, the 36 inch tapping sleeve and valve, connecting piping, concrete vaults for both taps, all labor , material, dewatering and equipment necessary to complete the installation as shown on the plans.

01 26 00 CONTRACT MODIFICATIONS 01 26 00

1.01 SUMMARY

A. This Section includes forms/documents to be used for modifying/changing this Contract.
1. Forms shall be used by the Contractor or Engineer as needed.
2. Pay Application Forms should be submitted on EJCDC form C-620
3. Field Orders (FO) shall be submitted on EJCDC Form C-942
4. Change Order (CO) shall be submitted on EJCDC Form C-941

1.02 REFERENCES

A. Definitions:

RFI: Request for Interpretation
Initiated by Contractor and processed by the Engineer.

FO: Field Order (EJCDC Form C-942)
Initiated by Engineer for Contractor's immediate action (variance from contact, future actions, impacting this project)

Bulletin: Proposal Request
Initiated by Engineer requesting new/additional pricing for an anticipated/changing of the Contract Work

CO: Change Order (EJCDC Form C-941)
This document changes the Contract/Agreement Amount. All other forms can be supporting documents especially FO and Bulletins.

SMS: Stored Material Summary
Part of the Contractor's Pay application form EJCDC C-620

01 29 00 **PAYMENT PROCEDURES** **01 29 00**

01 29 73 PAYMENT SUBDIVISIONS 01 29 73

A. Payment application shall be supported by Work subdivisions:
1. Unit prices as noted in the proposal/ agreement or
2. Schedule of Values. Shall be a subdivision of cost of Work, listed in the Proposal, and/or the further subdividing of the proposal cost by technical specifications categories; agreed between the Contractor and the Engineer.

01 29 76 PAYMENT PROCEDURES 01 29 76

A. Payment Application shall be submitted on the "Contractor's Application for Payment" form EJCDC- C-620. The Application shall list the 'Unit Prices' or 'Schedule of Values'. The sum of the extended 'unit prices' or the 'schedule of values' shall equal the agreed "Contract Prices".

B. Other Attachments to the "Contractors Application for Payment" shall be as listed"
1. Noted in the Supplementary Conditions art .SC- 6.00 'Contractors Responsibilities
2. Required by Funding Agencies.

C. Contractual Payment and Retainage Procedure are further delineated.

00 55 00 – Agreement, article (retainage)
00 72 13 – General Conditions, Article 14
00 73 16 – Supplementary Conditions: SC 14.02c (time)

LIGHTING FIXTURE SCHEDULE

[LIGHTING FIXTURE TYPES]

TYPE	DESCRIPTION	MOUNTING	WATTS
"LA"	8' LONG VOLUMETRIC LED LIGHTING FIXTURE, STEEL HOUSING, 8,800 LUMENS, MVOLT, 3500K COLOR TEMPERATURE, SNAP ON FROSTED DIFFUSER, WHITE PAINT FINISH, 80CRI COLOR RENDERING INDEX, WHITE FINISH. LITHONIA: ZL-1N-L96-10,000L-FST-MVOLT-35K-80CRI-WH	PENDANT OR SURFACE (AS INDICATED)	68 WATTS
"LB"	SAME AS "LA", EXCEPT 6,700 LUMENS.	PENDANT OR SURFACE	48 WATTS
"LC"	SAME AS "LA" EXCEPT 4'-0" LONG AND 3000 LUMENS.	SURFACE	25 WATTS
"LD"	4' LONG VOLUMETRIC LED LIGHTING FIXTURE, GASKETED, FIBERGLASS HOUSING, 3000 LUMENS, MVOLT, 3500K COLOR TEMPERATURE, 80CRI, ACRYLIC LOW PROFILE CLEAR LENS, WHITE PAINT FINISH, 80CRI COLOR RENDERING INDEX. FEM-L48-3000LM-LPAFL-MD-35K-80CRI, WLF END2	PENDANT 10'-0"	18 WATTS
"LE"	SURFACE MOUNTED VAPOR TIGHT LED LIGHTING FIXTURE, SUITABLE FOR WET LOCATION, CAST ALUMINUM HOUSING, SEALED GASKET, 4000K COLOR TEMPERATURE, FROSTED GLASS DIFFUSER, 600LUMENS, 15 WATTS, GOTHAM CATALOG NUMBER: OLV-TCM (CEILING MOUNT), OLV-TWM (WALL MOUNT)	SURFACE	15 WATTS
"LF"	WALL MOUNTED LED LIGHTING FIXTURE WITH TWO ENGINES, 700MA DRIVE CURRENT, 4000K, TYPE 4 MEDIUM DISTRIBUTION, 7000 LUMENS, 30 LED'S LITHONIA DSXW2-LED-30C-700-40K-T4M-MVOLT-DDBXD	SURFACE WALL MOUNTED	71 WATTS
"LG"	SAME AS "LF" EXCEPT ONE ENGINE (20 LED'S). AND 5000 LUMENS	SURFACE WALL MOUNTED	47 WATTS
"OLA"	OUTDOOR WALL MOUNTED LED LIGHTING FIXTURE,ONE ENGINE (10 LED'S), 5000K COLOR TEMPERATURE, TYPE T4M DISTRIBUTION, MVOLT, PHOTOELECTRIC CELL, DARK BRONZE, 2,500 LUMENS. LITHONIA, CATALOG NUMBER: DSX-W1-LED-10C-700MA-50K-T4M-MVOLT-PE-DDBXD	SURFACE	26 WATTS
"X"	EXIT SIGN WITH 6" HIGH RED LETTERS, BRUSHED ALUMINUM STENCIL FACE, DIE-CAST HOUSING, L.E.D. LAMPS, SEALED MAINTENANCE-FREE NICKEL CADMIUM BATTERY, (SINGLE OR DOUBLE FACE WITH DIRECTIONAL ARROWS, AND MOUNTING AS INDICATED ON DRAWING). 1WATT LITHONIA CAT. # LQM-S-W-R-120/277-ELN-SD	UNIVERSAL	1 WATT
"EBU"	EMERGENCY BATTERY LIGHTING UNIT WITH WHITE THERMOPLASTIC HOUSING, TWO (2) 3.3W HIGH PERFORMANCE LED LAMPS, 640 LUMENS, MULTI VOLTAGE, 9.6 VOLT LITHIUM ION PHOSPHATE MAINTENANCE-FREE BATTERY, SELF-DIAGNOSTIC SYSTEM AND FULLY AUTOMATIC SOLID STATE CHARGER, IMPACT RESISTANT, CORROSION PROOF, BACK LIT TEST SWITCH, LED STATUS INDICATOR, UNIVERSAL J-BOX MOUNTING PATTERN. THE LAMP HEADS HAVE A UNIQUE TRACK AND SWIVEL ARRANGEMENT PERMITTING FULL RANGE OF DIRECTION OF OPTICAL AIMING. LITHONIA CAT. # ELM4L-UVOLT-LTP	UNIVERSAL MOUNTING	(2) 3.3 WATTS
"EBUX"	COMBINATION EXIT SIGN AND EMERGENCY BATTERY UNIT WITH 6" HIGH RED LETTERS, BRUSHED ALUMINUM STENCIL FACE, DIE-CAST HOUSING, L.E.D. LAMPS, SEALED MAINTENANCE-FREE NICKEL CADMIUM BATTERY, (SINGLE OR DOUBLE FACE WITH DIRECTIONAL ARROWS, AND MOUNTING AS INDICATED ON DRAWING). 1W LITHONIA CAT. # LHQM-LED-R-HO-N-SD	UNIVERSAL	1 WATT
"EBUX1"	REMOTE EMERGENCY LIGHTING UNIT WITH BRONZE POLYCARBONATE HOUSING, ONE (1) 1.5W LINEAR PATTERN LED LAMPS, 9.6 VOLT, SELF-DIAGNOSTIC SYSTEM, WEATHER PROOF, CAST ALUMINUM. SUITABLE WITH USE WITH TYPE "EBUX" (SEE ABOVE), 1.5W LITHONIA CAT. # ELA-QWP-L0309-SD	UNIVERSAL	1.5 WATTS

ELECTRICAL SYMBOL LIST

SYMBOL	DESCRIPTION
	STRIP LED LIGHT FIXTURE (TYPICAL FOR 2', 4', 6' AND 8' LENGTHS)
	WALL MOUNTED LED LIGHT FIXTURE
	WALL MOUNTED LIGHT FIXTURE ON NIGHT LIGHT CIRCUIT
	SURFACE LIGHT FIXTURE
	PENDANT MOUNTED LIGHT FIXTURE
	WALL MOUNTED LIGHT FIXTURE
	SINGLE HEAD SITE / PARKING LOT LIGHTING FIXTURE
	EMERGENCY LIGHTING UNIT
	EXIT LIGHT, CEILING MOUNTED - ARROW AS INDICATED
	EXIT LIGHT, WALL MOUNTED - ARROW AS INDICATED
	DIRECTION ARROW
	DIRECTION ARROW
S	SINGLE POLE SWITCH
S_2	DOUBLE POLE SWITCH
S_3	THREE WAY SWITCH
S_T	MANUAL MOTOR STARTER WITH THERMOL PROTECTION
	DISCONNECT SWITCH, FUSED (NF = NON FUSED)
	COMBINATION MAGNETIC STARTER / DISCONNECT SWITCH (FUSED)
	CONTROL PANEL BY MECHANICAL TRADES
	CONTROL PANEL BY MECHANICAL TRADES WITH INTEGRAL DISCONNECT SWITCH
	DISTRIBUTION PANEL
	LIGHTING / RECEPTACLE / EQUIPMENT PANEL (TYPICAL FOR 12, 30, 42, 60 AND 84 SLOT)
	SINGLE PHASE MOTOR
	THREE PHASE MOTOR
	MAGNETIC STARTER
T	TRANSFORMER
P	PULLBOX
	DUPLEX RECEPTACLE (48" A.F.F. OR AS NOTED)
	GROUND ROD
	OCCUPANCY SENSOR - CEILING / WALL MOUNTED (TYPE AS NOTED)
	EXISTING TO BE DEMOLISHED
	EXISTING TO REMAIN
	NEW INSTALLATION
AFF	ABOVE FINISHED FLOOR
(E)	EXISTING INSTALLATION TO REMAIN
EM	EMERGENCY
GFI	GROUND FAULT INTERRUPTER
UNO	UNLESS NOTED OTHERWISE

ELECTRICAL SHEET INDEX

OVERVIEW OF ELECTRICAL SCOPE

THIS OVERVIEW OF SCOPE IS INCLUDED TO GIVE THE CONTRACTOR A GENERAL OVERVIEW OF THE PROJECT REQUIREMENTS. THE OVERVIEW IS NOT ALL INCLUSIVE AND IS NOT INTENDED TO, AND SHOULD NOT BE USED TO, ESTABLISH CONTRACT LIMITS OR PRICING INCLUSIONS. THE CONTRACT DOCUMENTS SHALL BE USED TO ESTABLISH CONSTRUCTION CONTRACT SCOPE.

THIS OVERVIEW OF SCOPE INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

ELECTRICAL:

1. REMOVE AND DISPOSE OF EXISTING LIGHTING, EMERGENCY EGRESS/EXIT LIGHTING, POWER DISTRIBUTION EQUIPMENT, VFD'S, DATA/COMMUNICATION SYSTEMS/EQUIPMENT AS INDICATED.
2. PROVIDE LIGHTING, EMERGENCY EGRESS/EXIT LIGHTING AND SITE/BUILDING LIGHTING SYSTEMS, INCLUDING CONTROLS AND EXTENSION/CONNECTION TO EXISTING BUILDING SERVICES.
3. PROVIDE POWER DISTRIBUTION SYSTEMS, EQUIPMENT INCLUDING PRIMARY FEEDER, OUTDOOR PAD MOUNTED TRANSFORMER, ALLEN BRADLEY VFD'S, VFD CABLING, STARTERS, DISCONNECTS, RECEPTACLES AS INDICATED.
4. PROVIDE DATA/COMMUNICATION SYSTEM RACEWAYS AS INDICATED.
5. PROVIDE GROUNDING SYSTEM AS INDICATED / REQUIRED.
6. PROVIDE A SHORT CIRCUIT ANALYSIS, PROTECTIVE DEVICE COORDINATION STUDY AND ARC FLASH HAZARD CALCULATIONS AND LABELING.

PROJECT REQUIREMENTS

PROVIDE ALL NECESSARY PERMITS. ALL WORK SHALL BE INSTALLED TO COMPLY WITH THE OWNER'S STANDARDS, STATE AND LOCAL CODES INCLUDING, BUT NOT LIMITED TO, THE FOLLOWING CODES AND THEIR RELATED REFERENCES.

2017 NATIONAL ELECTRICAL CODE AS AMENDED BY THE MICHIGAN CONSTRUCTION CODE PART 8, ELECTRICAL CODE RULES.

NFPA 101 LIFE SAFETY CODE 2012 (AS REFERENCED)

2015 MICHIGAN ENERGY CODE

2015 INTERNATIONAL FIRE CODE (AS REFERENCED)

2015 MICHIGAN BUILDING CODE

2015 MICHIGAN MECHANICAL CODE

2015 MICHIGAN PLUMBING CODE

2015 INTERNATIONAL FUEL GAS CODE

2013 NFPA 110 AND NFPA 111

MANUFACTURER AND MODEL NUMBER LISTED REPRESENTS THE BASIS OF DESIGN FOR THIS PROJECT. THE ELECTRICAL CONTRACTOR SHALL BEAR ALL ADDITIONAL COST ASSOCIATED WITH USING EQUIPMENT BY OTHER APPROVED MANUFACTURERS INCLUDING ADDITIONAL COSTS BY OTHER TRADES.

ALL EQUIPMENT INSTALLED SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. WHERE FIELD OR PROJECT CONDITIONS DO NOT ALLOW ALL MANUFACTURER'S RECOMMENDATIONS TO BE MET, THE INSTALLING CONTRACTOR SHALL SUBMIT IN WRITING TO THE ENGINEER THE PROPOSED DEVIATION, IN A SKETCH FORM, ACCOMPANIED BY THE MANUFACTURER'S CONCURRENCE.

DLZ
ARCHITECTURE • ENGINEERING • PLANNING
SURVEYING • CONSTRUCTION SERVICES
Select DLZ Company

NO.	REVISION	DATE
	OWNER REVIEW	05/13/20
	PROGRESS REVIEW	07/21/20
	FINAL OWNER REVIEW	07/24/20
	BIDS	08/07/20

DRAWN: ACC | CHK'D: SM
DESIGNED: SMD
APPRV'D: SM
DATE: 08/07/20
PROJECT NUMBER 1949-0188-00

Flint Michigan

CITY OF FLINT
DORT PUMP STATION RENOVATIONS

ELECTRICAL GENERAL INFORMATION

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Engineering and Architecture
28105 Greenfield Road, Southfield, Michigan 48076-3046
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Project No. 19-1304

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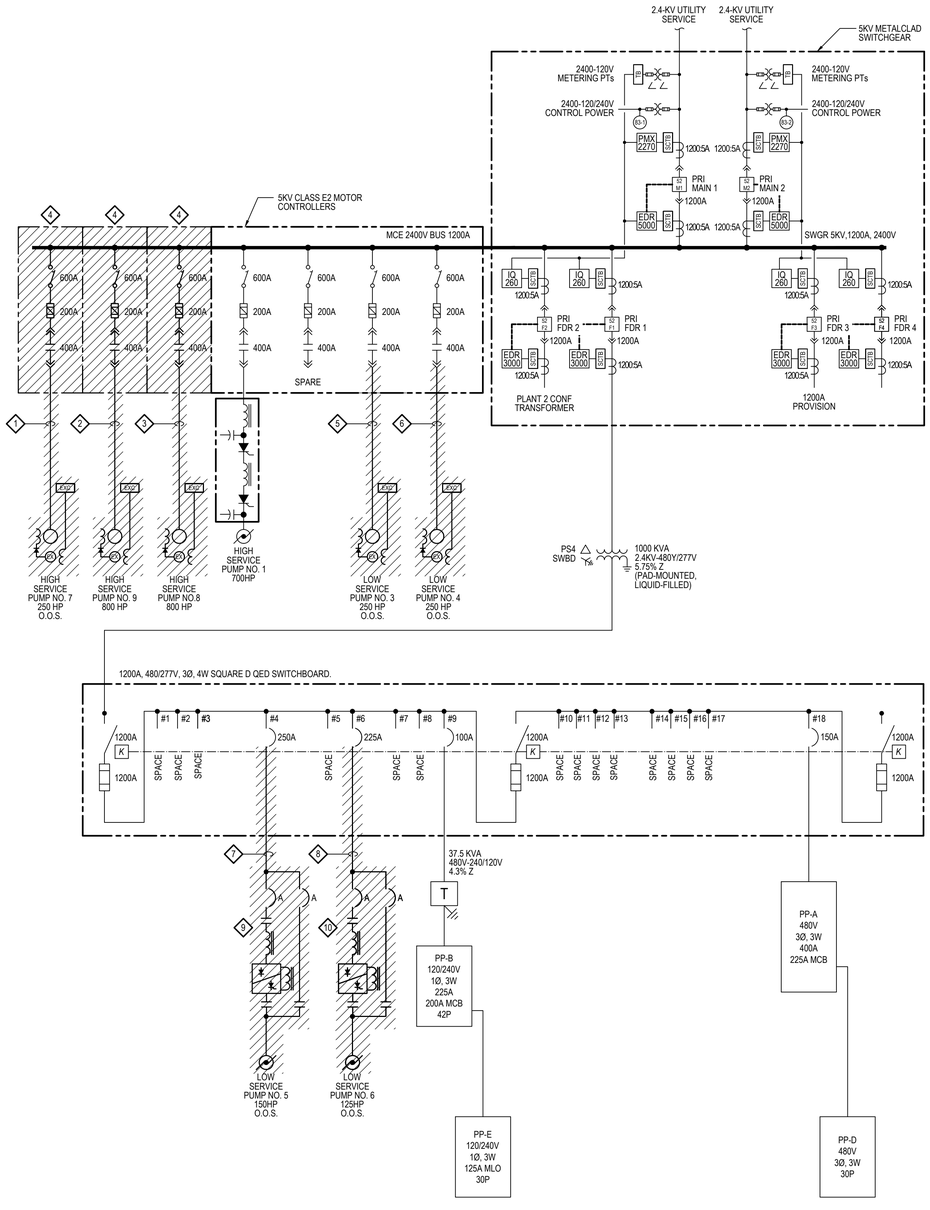
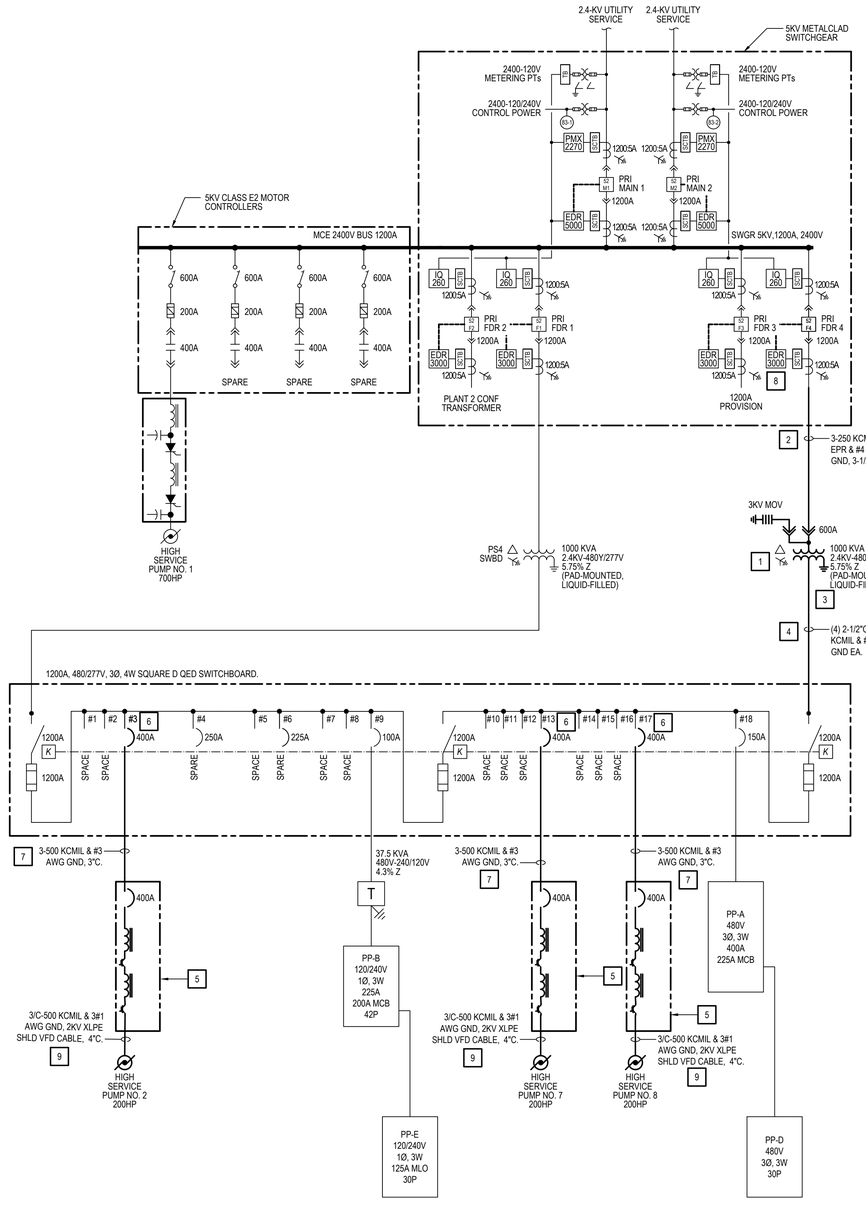
DRAWING NUMBER E-01 ELECTRICAL



DORT PUMPING STATION
ONE-LINE DIAGRAM - DEMOLITION
NO SCALE



DORT PUMPING STATION
ONE-LINE DIAGRAM - NEW WORK
NO SCALE

SHEET NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRICAL CODE AS AMENDED BY THE MICHIGAN CONSTRUCTION CODE, ELECTRICAL CODE RULES, PART 8.

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. DISCONNECT AND REMOVE 2400V SERVICE TO HIGH SERVICE PUMP HSP-7.
2. DISCONNECT AND REMOVE 2400V SERVICE TO HIGH SERVICE PUMP HSP-9.
3. DISCONNECT AND REMOVE 2400V SERVICE TO HIGH SERVICE PUMP HSP-8.
4. DISCONNECT AND REMOVE MEDIUM VOLTAGE STARTERS SERVING HSP-7, HSP-8, AND HSP-9.
5. DISCONNECT AND REMOVE 2400V SERVICE TO LOW SERVICE PUMP LSP-3.
6. DISCONNECT AND REMOVE 2400V SERVICE TO LOW SERVICE PUMP LSP-4.
7. DISCONNECT AND REMOVE 480V SERVICE TO LOW SERVICE PUMP LSP-5.
8. DISCONNECT AND REMOVE 480V SERVICE TO LOW SERVICE PUMP LSP-6.
9. DISCONNECT AND REMOVE VFD SERVING LOW SERVICE PUMP LSP-5.
10. DISCONNECT AND REMOVE VFD SERVING LOW SERVICE PUMP LSP-6.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. FURNISH AND INSTALL 1000KVA, 2400-480/277V, PAD-MOUNTED TRANSFORMER FOR SERVICE TO EXISTING 1200A, 480/277V SWITCHBOARD.
2. PROVIDE PRIMARY FEEDER FROM EXISTING PLANT SERVICE METAL-CLAD SWITCHGEAR TO PAD-MOUNTED TRANSFORMER.
3. PROVIDE TRANSFORMER SECONDARY NEUTRAL GROUNDING TO PLANT GROUNDING ELECTRODE SYSTEM.
4. PROVIDE 1200A SECONDARY FEEDER FROM PAD-MOUNTED TRANSFORMER SECONDARY TO EXISTING 1200A, 480/277V SWITCHBOARD.
5. PROVIDE 200HP ADJUSTABLE SPEED DRIVES (ASDs) AND PUMP MOTORS FOR NEW HIGH SERVICE PUMPS HSP-2, HSP-7 AND HSP-8.
6. PROVIDE 400A MOLDED CASE CIRCUIT BREAKERS FOR SERVICE TO 200HP HIGH SERVICE PUMP ASDs. IN EXISTING SQUARE D QED SWITCHBOARD.
7. PROVIDE FEEDERS FROM 480/277V SWITCHBOARD TO HIGH SERVICE PUMP ASDs.
8. ADJUST EXISTING EATON EDR3000 FEEDER DISTRIBUTION RELAY SETTINGS FOR FEEDER NO. 4 FOR PROTECTION OF PAD-MOUNTED TRANSFORMER. MATCH SETTINGS OF FEEDER NO. 2 SERVING EXISTING SWITCHBOARD TRANSFORMER.
9. PROVIDE MOTOR FEEDERS FROM ASD TO MOTOR.

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DRAWN: JCO
DESIGNED: JCO
APPRV'D: SM
DATE: 08/07/20
CHK'D: SM
PROJECT NUMBER 1949-0188-00

Michigan
Flint

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DORT PUMP STATION RENOVATIONS

ONE-LINE DIAGRAMS

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DRAWING NUMBER E6.1 ELECTRICAL

480-VOLT - 3-PHASE - 3-WIRE + GND PANELBOARD SCHEDULE

PANELBOARD DESIGNATION PP-A LOCATION SWITCHGEAR ROOM
400 AMP BUS 225 M.C.B. __ M.L.O. MOUNTING: FLUSH __ SURFACE X
SPECIAL REQUIREMENTS

CKT NO.	VA	LOAD TYPE	A B C	LOAD TYPE	VA	CKT No.
1	.		20A		.	2
3	.	SCALE ROOM EXHAUST FAN		MID-POINT 7-1/2 HP #1	.	4
5	.		20A		.	6
7	.				.	8
9	.	PUMP ROOM EXHAUST FAN	20A	MID-POINT 7-1/2 HP #2	.	10
11	.				.	12
13	.		20A		.	14
15	.	TRAVELING SCREEN - NORTH		CHAPMAN VALVE PLANT #2	.	16
17	.		20A		.	18
19	.				.	20
21	.	TRAVELING SCREEN - SOUTH	20A	UNIDENTIFIED	.	22
23	.				.	24
25	.		20A		.	26
27	.	CONDENSATE PUMP		CHLORINE EVAPORATOR	.	28
29	.		20A		.	30
31	.				.	32
33	.	AIR COMPRESSOR	20A	CHLORINE EVAPORATOR	.	34
35	.				.	36
37	.		20A		.	38
39	.	PUMP ROOM CRANE		PS4 3MG WELL 5HP #1	.	40
41	.		20A		.	42
43	.				.	44
45	.	DUPLEX SUMP PUMPS	20A	POWER PANEL D	.	46
47	.				.	48
49	.		20A		.	50
51	.	CHLORINE HOIST		PS4 3MG WELL 5HP #2	.	52
53	.				.	54

LIGHTING ____. VA AT 100 % = ____. VA
RECEPTACLE____. VA AT 100 % = 10000 VA (FIRST 10,000 VA AT 100%)
RECEPTACLE____. VA AT 50 % = ____. VA
MISC. ____. VA AT ____ % = ____. VA
TOTAL ____. VA TOTAL DEMAND = ____. VA 831 V = ____. A

120/240-VOLT - 1-PHASE - 3-WIRE + GND PANELBOARD SCHEDULE

PANELBOARD DESIGNATION PP-B LOCATION MOTOR ROOM
225 AMP BUS 200A M.C.B. ____ M.L.O. MOUNTING: FLUSH __ SURFACE X
SPECIAL REQUIREMENTS

CKT NO.	VA	LOAD TYPE	L1 L2	LOAD TYPE	VA	CKT No.
1	.	SCALE ROOM HEATER	20A	SCREEN ROOM	.	2
3	.	LIGHTS - SO_2 TANK ROOM LIGHTS - SO_2 CONTROL ROOM	20A 20A	CHLORINE STORAGE RM LIGHTS SO_2 STORAGE EMERG LIGHT	.	4
5	.	SE PUMP ROOM	20A	NE PUMP ROOM	.	6
7	.	SW PUMP ROOM	20A	GAGE BOARD	.	8
9	.	LOW LIFT BASEMENT - WEST END	20A	SPARE	.	10
11	.	EAST ENTRY & CHLORINE RM	20A	EAST BALCONY	.	12
13	.	SUBSTATION & SWITCHBOARD	20A	SPARE	.	14
15	.	CL_2 SSOV SYSTEM	20A	SWITCH ROOM PLUGS	.	16
17	.	SPARE	20A 15A	BASEMENTS STROBES	.	18
19	.	SPARE	20A	LOW LIFT BASEMENT, EAST END	.	20
21	.	COACH LIGHTS & WEST HEATER FAN	20A	PUMP ROOM - NW SIDE	.	22
23	.	HIGH LIFT BASEMENT, FRONT ENT., TRANS, LOCKER RM	20A	NW SWITCH ROOM PLUGS	.	24
25	.	SWITCHGEAR LIGHTING & EMERG. LIGHT	20A	SPARE	.	26
27	.	WEST BALCONY	20A 60A	POWER PANEL PP-E	.	28
29	.	RESERVE PLUGS	20A		.	30
31	.	BOILER ROOM SUBPANEL	60A	SPARE	.	32
33	.		20A	CHLORINE ROOM EXHAUST FAN	.	34
35	.	UNKNOWN	50A 20A	CHLORINE ROOM HEATER	.	36
37	.		20A	CHLORINE ALRM & PANEL ALRM	.	38
39	.	WATER HEATER	20A	DAMPERS	.	40
41	.		20A	EXIT & EMERGENCY LIGHTS	.	42

LIGHTING ____. VA AT 100 % = ____. VA
RECEPTACLE____. VA AT 100 % = 10000 VA (FIRST 10,000 VA AT 100%)
RECEPTACLE____. VA AT 50 % = ____. VA
MISC. ____. VA AT ____ % = ____. VA
TOTAL ____. VA TOTAL DEMAND = ____. VA 240 V = ____. A

ALL CIRCUIT BREAKERS ARE 20A-1P, UNLESS NOTED OTHERWISE.

480-VOLT - 3-PHASE - 3-WIRE+GND PANELBOARD SCHEDULE

PANELBOARD DESIGNATION PP-D LOCATION SWITCHGEAR ROOM
150 AMP BUS ____ M.C.B. 150A M.L.O. MOUNTING: FLUSH __ SURFACE X
SPECIAL REQUIREMENTS

CKT NO.	VA	LOAD TYPE	A B C	LOAD TYPE	VA	CKT No.
1	.		15A		.	2
3		SO_2 EF-2		MIXING CHAMBER CHLOR-A-VAC PUMP		4
5			15A			6
7						8
9		SO_2 EVAPORATOR	20A	CHLORINE HOIST FEED		10
11			20A			12
13		SPACE				14
15		SPACE		SPARE		16
17		SPACE				18
19		SPACE		SPACE		20
21		SPACE		SPACE		22
23		SPACE		SPACE		24
25		SPACE		SPACE		26
27		SPACE		SPACE		28
29		SPACE		SPACE		30

LIGHTING ____. VA AT 100 % = ____. VA
RECEPTACLE____. VA AT 100 % = 10000 VA (FIRST 10,000 VA AT 100%)
RECEPTACLE____. VA AT 50 % = ____. VA
MISC. ____. VA AT ____ % = ____. VA
TOTAL ____. VA TOTAL DEMAND = ____. VA 831 V = ____. A

120/240-VOLT - 1-PHASE - 3-WIRE + GND PANELBOARD SCHEDULE

PANELBOARD DESIGNATION PP-E LOCATION SWITCHGEAR ROOM
125 AMP BUS ____ M.C.B. 125A M.L.O. MOUNTING: FLUSH __ SURFACE X
SPECIAL REQUIREMENTS

CKT NO.	VA	LOAD TYPE	L1 L2	LOAD TYPE	VA	CKT No.	
1	.	MAIN CONTROL PANEL	15A	UNIT HEATER & VALVE HEATERS SO_2 TANK ROOM	.	2	
3	.	LIGHTS - SO_2 TANK ROOM LIGHTS - SO_2 CONTROL ROOM	15A 20A	SO_2 PROCESS CONTROL PANEL	.	4	
5	.	PUMP #9 HEATER	20A	UNIT HEATER SO_2 CONTROL ROOM	.	6	
7	.	SAMPLE PUMP AT MIXING CHAMBER	20A	SO_2 SULFONATORS	.	8	
9	.	MIXING CHAMBER CONTROL PANEL - RECPT & HEATER	20A	SO_2 DETECTORS	.	10	
11	.	FLOWMETER	20A	PUMP #9-8 HEATER	.	12	
13	.	CL_2 ANALYZER	20A	UNIDENTIFIED	.	14	
15	.	RECEPT BELOW PANEL	20A	5-20R QUAD RECEPTACLE (HYPOCHLORITE SYSTEM)	.	16	*
17	.		30A	5-20R QUAD RECEPTACLE (HYPOCHLORITE SYSTEM)	.	18	*
19	.	SOUTH GUARD SHACK		SPACE	.	20	
21	.		30A	SPACE	.	22	
23	.	BATTERY CHARGER		SPACE	.	24	
25	.	SPACE		SPACE	.	26	
27	.	SPACE		SPACE	.	28	
29	.	SPACE		SPACE	.	30	

LIGHTING ____. VA AT 100 % = ____. VA
RECEPTACLE____. VA AT 100 % = 10000 VA (FIRST 10,000 VA AT 100%)
RECEPTACLE____. VA AT 50 % = ____. VA
MISC. ____. VA AT ____ % = ____. VA
TOTAL ____. VA TOTAL DEMAND = ____. VA 240 V = ____. A

ALL CIRCUIT BREAKERS ARE 20A-1P, UNLESS NOTED OTHERWISE.
* PROVIDE 20A, 1P CIRCUIT BREAKER IN EXISTING SPACE IN SIEMENS PANEL

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DESIGNED: JCO
APPRVD: SM
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PROJECT NUMBER 1949-0188-00

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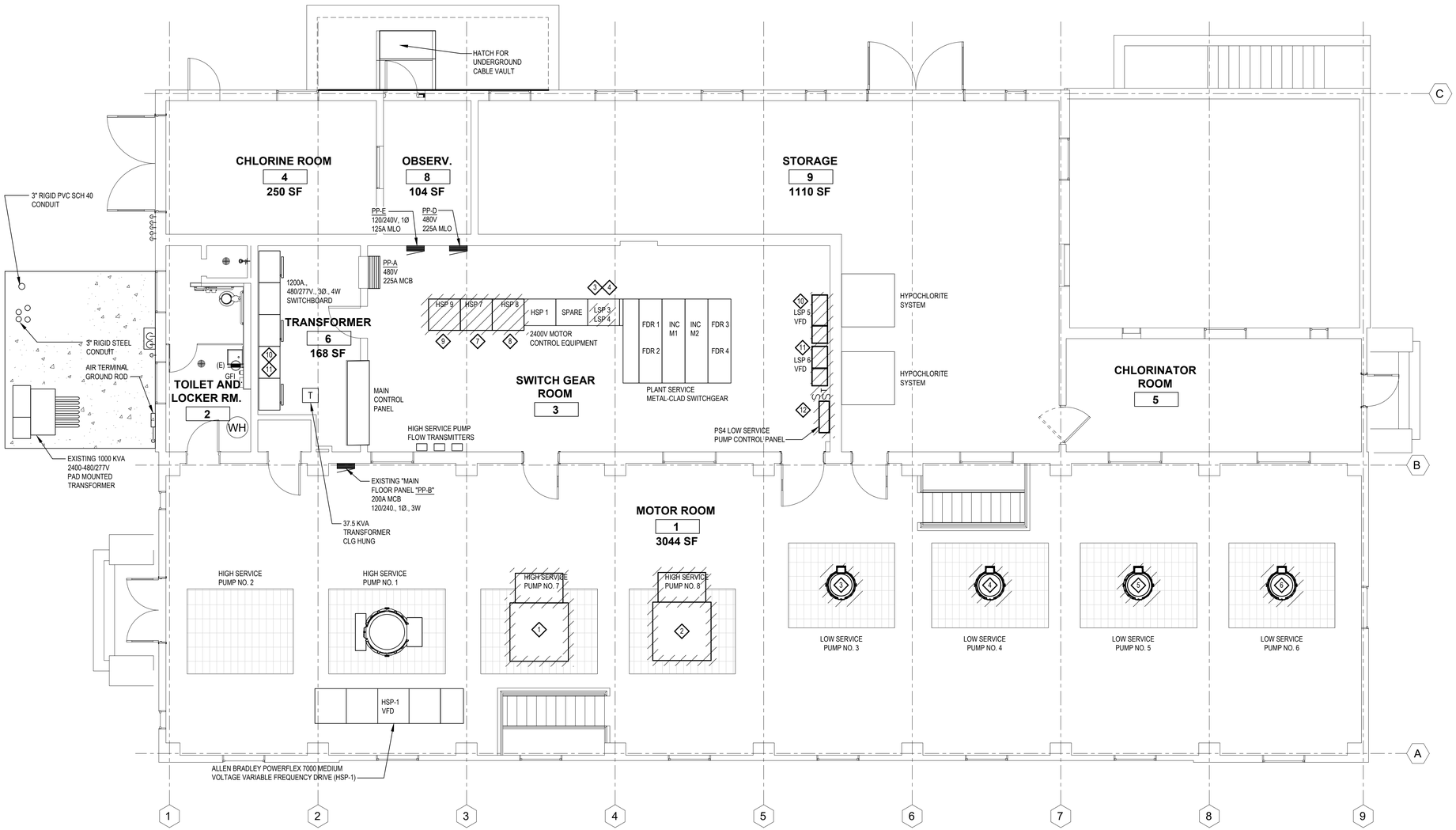
SCHEDULES



1 GROUND FLOOR PLAN - POWER DEMOLITION
SCALE: 3/16" = 1'-0"

NORTH

SCALE: 3/16" = 1'-0"

0 2 4 8 16

SHEET NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRICAL CODE AS AMENDED BY THE MICHIGAN CONSTRUCTION CODE, ELECTRICAL CODE RULES, PART 8.

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. DISCONNECT AND REMOVE HIGH SERVICE PUMP HSP-7, AND ASSOCIATED FEEDER BACK TO SOURCE.
2. DISCONNECT AND REMOVE HIGH SERVICE PUMP HSP-8, AND ASSOCIATED FEEDER BACK TO SOURCE.
3. DISCONNECT AND REMOVE LOW SERVICE PUMP LSP-3, AND ASSOCIATED FEEDER BACK TO SOURCE.
4. DISCONNECT AND REMOVE LOW SERVICE PUMP LSP-4, AND ASSOCIATED FEEDER BACK TO SOURCE.
5. DISCONNECT AND REMOVE LOW SERVICE PUMP LSP-5, AND ASSOCIATED FEEDER BACK TO SOURCE.
6. DISCONNECT AND REMOVE LOW SERVICE PUMP LSP-6, AND ASSOCIATED FEEDER BACK TO SOURCE.
7. DISCONNECT AND REMOVE MEDIUM VOLTAGE STARTER SERVING HIGH SERVICE PUMP HSP-7.
8. DISCONNECT AND REMOVE MEDIUM VOLTAGE STARTER SERVING HIGH SERVICE PUMP HSP-8.
9. DISCONNECT AND REMOVE MEDIUM VOLTAGE STARTER SERVING HIGH SERVICE PUMP HSP-9.
10. DISCONNECT AND REMOVE VARIABLE FREQUENCY DRIVE AND ASSOCIATED FEEDER SERVING LOW SERVICE PUMP LSP-5, BACK TO 1200A, 480/277V SWITCHBOARD.
11. DISCONNECT AND REMOVE VARIABLE FREQUENCY DRIVE AND ASSOCIATED FEEDER SERVING LOW SERVICE PUMP LSP-6, BACK TO 1200A, 480/277V SWITCHBOARD.
12. DISCONNECT AND REMOVE LOW SERVICE PUMP CONTROL PANEL AND ASSOCIATED WIRING IN ITS ENTIRETY.

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DESIGNED: JCO
APPRV'D: SM
DATE: 08/07/20
CHK'D: SM
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GROUND FLOOR PLAN - POWER DEMOLITION

DRAWING NUMBER ED1.3

ELECTRICAL

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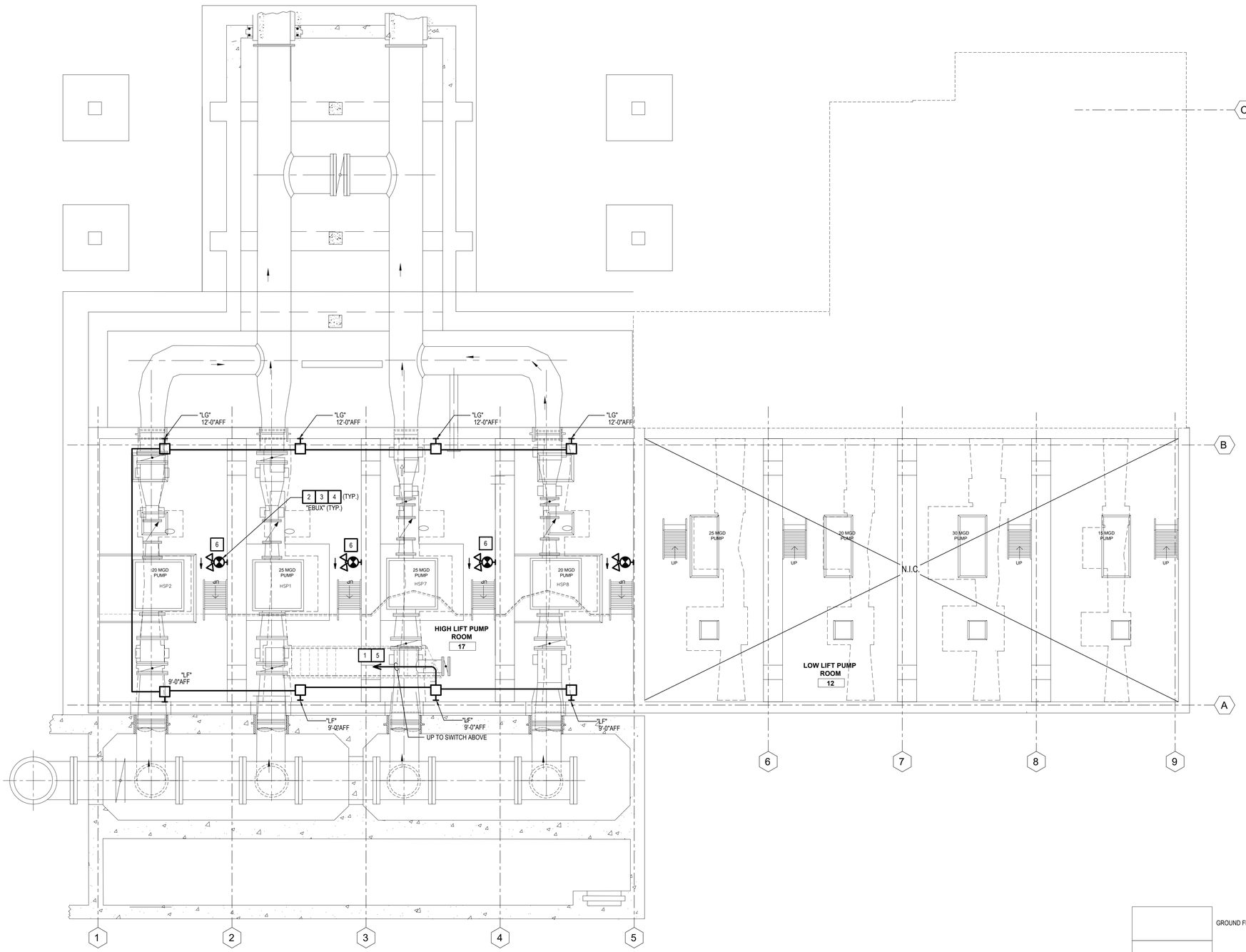

1 LOWER LEVEL 3 (PUMP ROOMS) - LIGHTING
SCALE: 3/16" = 1'-0"

NORTH

SCALE: 3/16" = 1'-0"

0 2 4 8 16

GROUND FLOOR

LOWER LEVEL 1 (MEZZANINE)

LOWER LEVEL 3 (PUMP ROOMS)

ELEVATION
NOT TO SCALE

SHEET NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRICAL CODE AS AMENDED BY THE MICHIGAN CONSTRUCTION CODE, ELECTRICAL CODE RULES, PART 8.
2. REFER TO LIGHTING FIXTURE SCHEDULE ON SHEET EL1.0.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. EXTEND EXISTING BRANCH CIRCUIT TO NEW LIGHTING. BASE BID, EXISTING CONDUIT AND NEW WIRING. ALTERNATE BID, NEW CONDUIT / WIRING.
2. CONNECT EMERGENCY AND EXIT LIGHTING AHEAD OF LOCAL AREA SWITCH.
3. REFER TO LIGHTING FIXTURE SCHEDULE ON SHEET E-01.
4. AIM EMERGENCY LIGHTING HEADS IN FIELD FOR MAXIMUM COVERAGE.
5. UTILIZE CIRCUIT TRACER TO VERIFY ALL BRANCH CIRCUITS, UPDATED PANELBOARD DIRECTORY. REFER TO PANEL SCHEDULE ON SHEET E6.2. THE BRANCH CIRCUITS ARE BASED ON EXISTING PANELBOARD DIRECTORY.
6. PROVIDE GALVANIZED UNISTRUT STRUCTURE ON LOW WALL TO INSTALL EXIT/EBU COMBINATION UNIT, BOTTOM OF THE UNIT TO BE AT 8'-0" AFF. PROVIDE DOUBLE UNISTRUT ON BOTH SIDES OF THE UNIT, SECURE TO CONCRETE WALL WITH GALVANIZED HARDWARE.

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PROJECT NUMBER 1949-0188-00

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LOWER LEVEL 3 (PUMP ROOMS) PLAN
-LIGHTING

DRAWING NUMBER EL1.0

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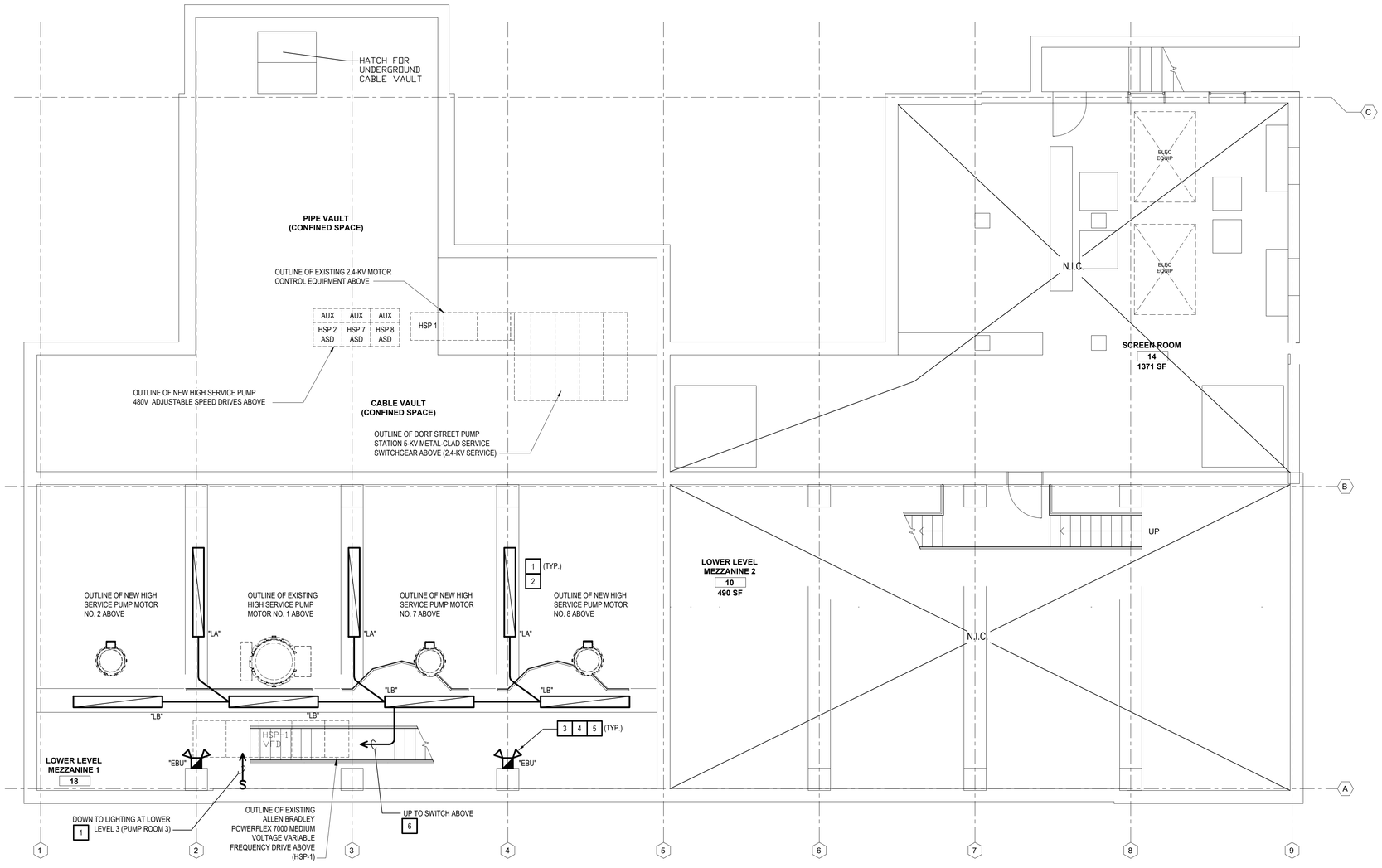

1 LOWER LEVEL 1 (MEZZANINE) - LIGHTING

SCALE: 3/16" = 1'-0"

NORTH

SCALE: 3/16" = 1'-0"

0 2 4 8 16

GROUND FLOOR

LOWER LEVEL 1 (MEZZANINE)

LOWER LEVEL 3 (PUMP ROOMS)

ELEVATION
NOT TO SCALE

SHEET NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRICAL CODE AS AMENDED BY THE MICHIGAN CONSTRUCTION CODE, ELECTRICAL CODE RULES, PART 8.
2. REFER TO LIGHTING FIXTURE SCHEDULE ON SHEET EL1.0.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. BASE BID, REMOVE WIRING BACK TO SOURCE, PULL NEW WIRES IN EXISTING CONDUIT.
   ALTERNATE BID (IF EXISTING CONDUIT IS NOT USABLE) INSTALL SURFACE MOUNTED RGS CONDUIT BACK TO SOURCE.
2. MOUNT LIGHTING FIXTURE TO BOTTOM OF BEAM.
3. CONNECT EMERGENCY AND EXIT LIGHTING AHEAD OF LOCAL AREA SWITCH.
4. REFER TO LIGHTING FIXTURE SCHEDULE ON SHEET E-01.
5. AIM EMERGENCY LIGHTING HEADS IN FIELD FOR MAXIMUM COVERAGE.
6. UTILIZE CIRCUIT TRACER TO VERIFY ALL BRANCH CIRCUITS, UPDATED PANELBOARD DIRECTORY. REFER TO PANEL SCHEDULE ON SHEET E6.2. THE BRANCH CIRCUITS ARE BASED ON EXISTING PANELBOARD DIRECTORY.

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LOWER LEVEL 1 (MEZZANINE) PLAN - LIGHTING

DRAWING NUMBER EL1.1

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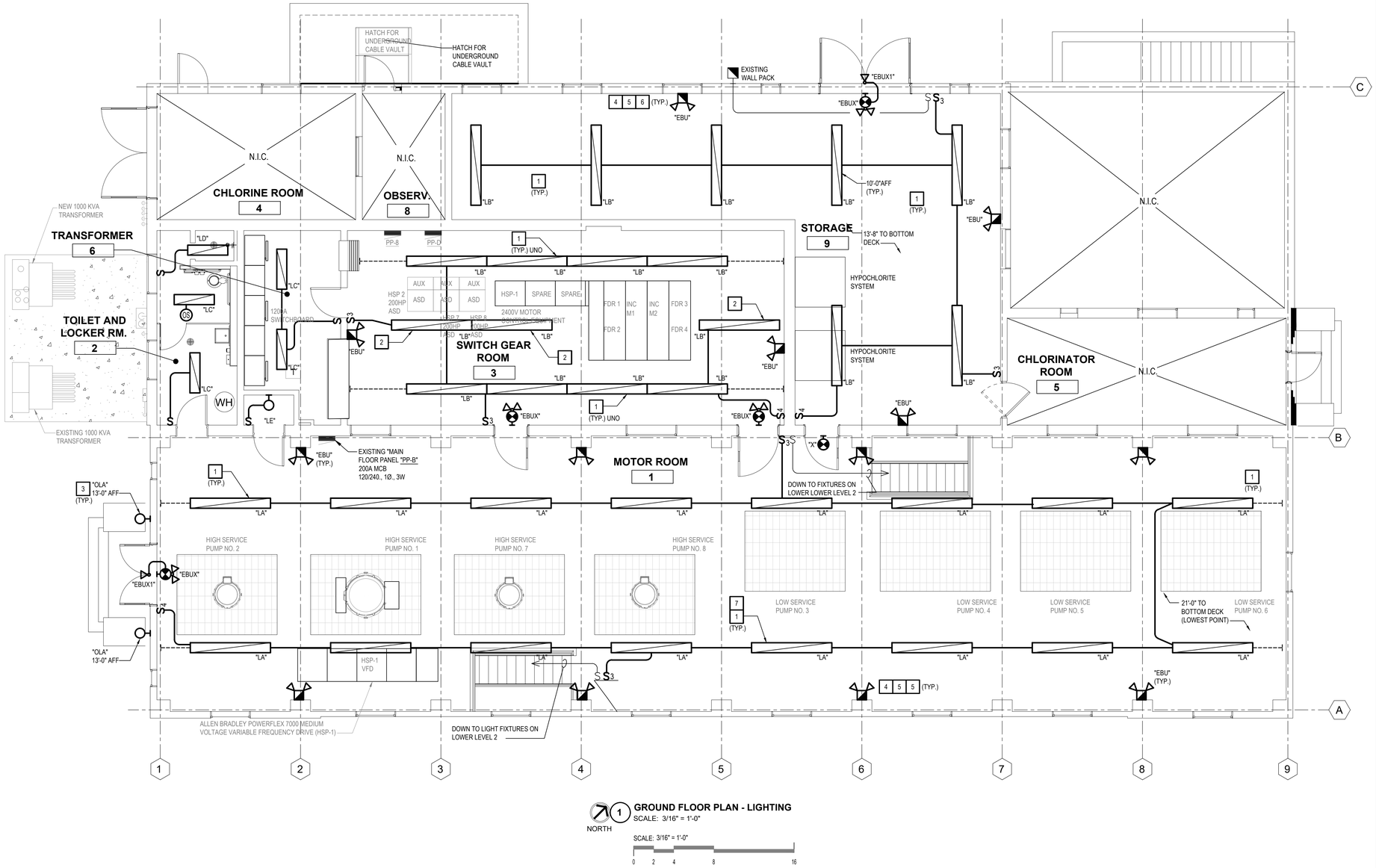

GROUND FLOOR PLAN - LIGHTING

SCALE: 3/16" = 1'-0"

NORTH

SCALE: 3/16" = 1'-0"

0 2 4 8 16

GROUND FLOOR

LOWER LEVEL 1 (MEZZANINE)

LOWER LEVEL 3 (PUMP ROOMS)

ELEVATION
NOT TO SCALE

SHEET NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRICAL CODE AS AMENDED BY THE MICHIGAN CONSTRUCTION CODE, ELECTRICAL CODE RULES, PART 8.
2. REFER TO LIGHTING FIXTURE SCHEDULE ON SHEET EL1.0.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. PROVIDE CONTINUOUS UNISTRUT AT BOTTOM OF BEAM (19-0" AFF., MOTOR ROOM AND 11'-0" SWITCHGEAR ROOM), SUPPORT UNISTRUT FROM ROOF BEAM AND FROM BOTH WALLS, PAINT TO MATCH CEILING COLOR (PRIOR TO INSTALLATION.) ROUTE BRANCH CIRCUIT CONDUIT ABOVE UNISTRUT
2. PENDANT MOUNT AT 11'-0"AFF.
3. ROUTE VIA PHOTO CELL ON TIME CLOCK OFF. TIMECLOCK SHALL BE DIGITAL, AND PROGRAMMABLE.
4. CONNECT EMERGENCY AND EXIT LIGHTING AHEAD OF LOCAL AREA SWITCH.
5. REFER TO LIGHTING FIXTURE SCHEDULE ON SHEET E-01.
6. AIM EMERGENCY LIGHTING HEADS IN FIELD FOR MAXIMUM COVERAGE.
7. UTILIZE CIRCUIT TRACER TO VERIFY ALL BRANCH CIRCUITS, UPDATED PANELBOARD DIRECTORY. REFER TO PANEL SCHEDULE ON SHEET E6.2. THE BRANCH CIRCUITS ARE BASED ON EXISTING PANELBOARD DIRECTORY.

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GROUND FLOOR PLAN - LIGHTING

DRAWING NUMBER EL1.2

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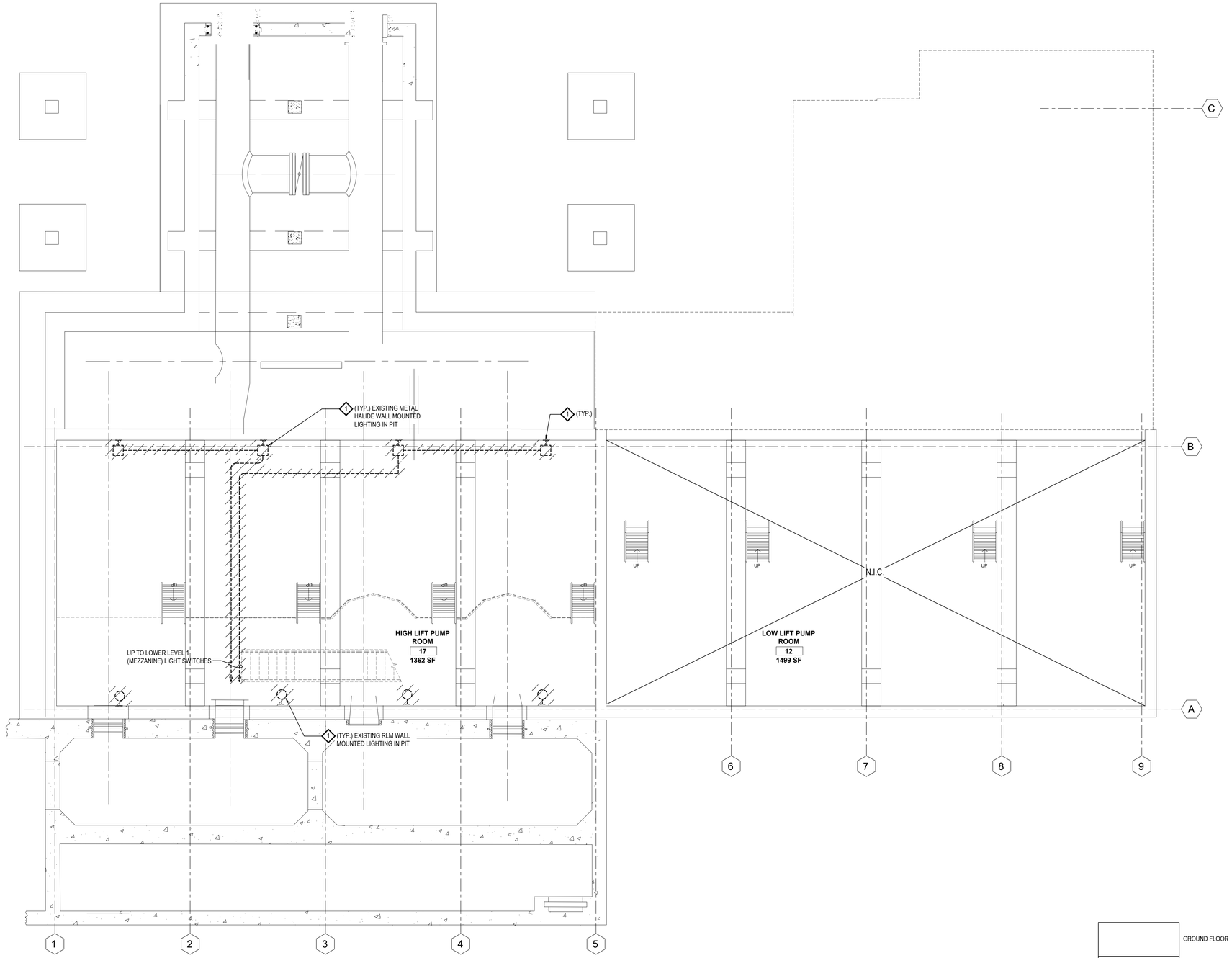
SHEET NOTES:

1. UTILIZE CIRCUIT TRACE TO VERIFY ALL BRANCH CIRCUITS PRIOR TO DEMOLITION.

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. DISCONNECT, REMOVE, AND PROPERLY DISPOSE WALL MOUNTED LIGHTING FIXTURE.



1 LOWER LEVEL 3 (PUMP ROOMS) - LIGHTING DEMOLITION
SCALE: 3/16" = 1'-0"

NORTH

SCALE: 3/16" = 1'-0"

0 2 4 8 16

GROUND FLOOR

LOWER LEVEL 1 (MEZZANINE)

LOWER LEVEL 3 (PUMP ROOMS)

ELEVATION
NOT TO SCALE

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	PROGRESS REVIEW	07/21/20
	FINAL OWNER REVIEW	07/24/20
	BIDS	08/07/20

DRAWN: ACC
DESIGNED: SMD
APPRV'D: SM
DATE: 08/07/20
CHK'D: SM
PROJECT NUMBER 1949-0188-00

Flint, Michigan

CITY OF FLINT
DORT PUMP STATION RENOVATIONS

LOWER LEVEL 3 (PUMP ROOMS) PLAN - LIGHTING DEMOLITION

DRAWING NUMBER ELD1.0

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Project No. 19-1304

ACADFile 19-1304-ELD1.0.dwg

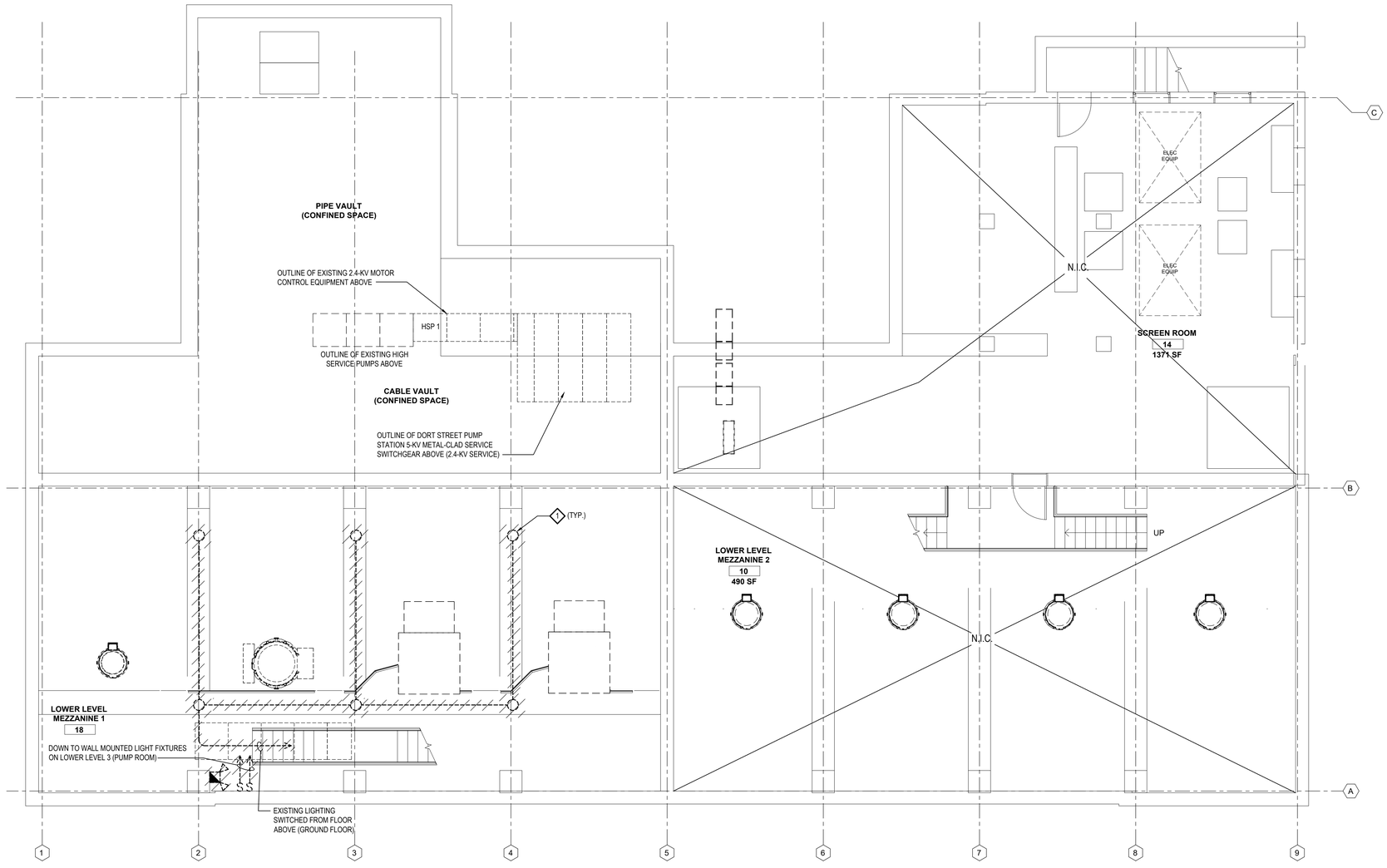
SHEET NOTES:

1. UTILIZE CIRCUIT TRACER TO VERIFY ALL BRANCH CIRCUITS PRIOR TO DEMOLITION.

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. DISCONNECT, REMOVE, AND PROPERLY DISPOSE OF EXISTING SURFACE/CEILING MOUNTED RLM LIGHTING FIXTURE.



1 LOWER LEVEL 1 (MEZZANINE) - LIGHTING DEMOLITION
SCALE: 3/16" = 1'-0"

NORTH

SCALE: 3/16" = 1'-0"

0 2 4 8 16

GROUND FLOOR

LOWER LEVEL 1 (MEZZANINE)

LOWER LEVEL 3 (PUMP ROOMS)

ELEVATION
NOT TO SCALE

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DRAWING NUMBER: ELD1.1

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	FINAL OWNER REVIEW	07/24/20
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DESIGNED: SMD
APPRV'D: SM
DATE: 08/07/20
PROJECT NUMBER 1949-0188-00

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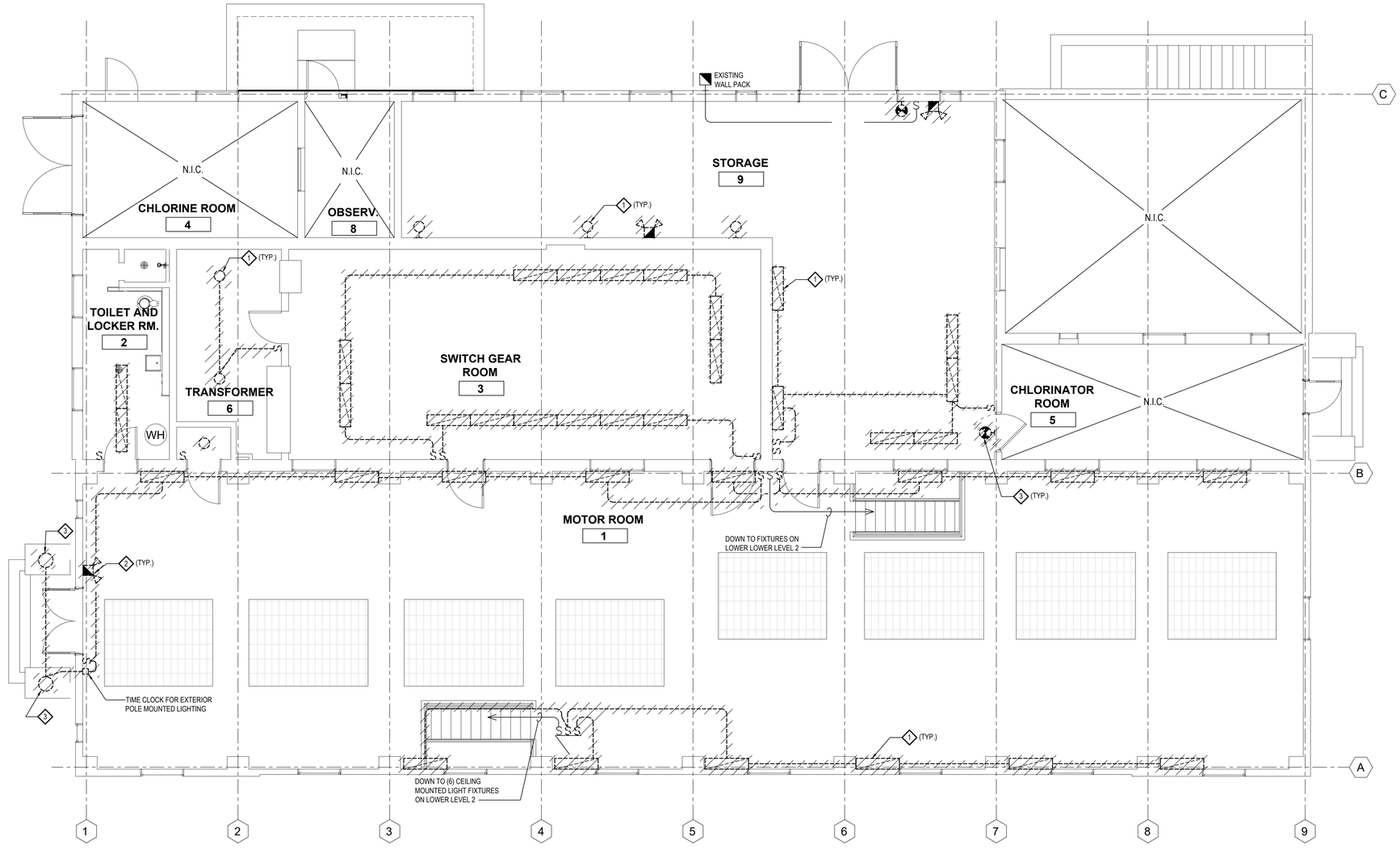
LOWER LEVEL 1 (MEZZANINE) - LIGHTING DEMOLITION



1 **GROUND FLOOR PLAN - LIGHTING DEMOLITION**
SCALE: 3/16" = 1'-0"

NORTH

SCALE: 3/16" = 1'-0"

0 2 4 8 16

GROUND FLOOR

LOWER LEVEL 1 (MEZZANINE)

LOWER LEVEL 3 (PUMP ROOMS)

ELEVATION
NOT TO SCALE

SHEET NOTES:

1. UTILIZE CIRCUIT TRACER TO VERIFY ALL BRANCH CIRCUITS PRIOR TO DEMOLITION.

DEMOLITION KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. DISCONNECT, REMOVE, AND PROPERLY DISPOSE OF EXISTING WALL MOUNTED LIGHTING FIXTURE.
2. DISCONNECT, REMOVE, AND PROPERLY DISPOSE EMERGENCY BATTERY UNITS AND EXIT SIGNS, REMOVE BRANCH CIRCUIT (CONDUIT / WIRING) BACK TO SOURCE.
3. DISCONNECT, REMOVE, AND PROPERLY DISPOSE LIGHTING POLE, AND LUMINAIRE. REMOVE WIRING ENTIRELY BACK TO SOURCE, SEAL OPENING THRU GROUND WITH RIGID GALVANIZED STEEL PLATE AND MAKE WATER TIGHT.

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	BIDS	08/07/20

DRAWN: ACC CHK'D: SM
DESIGNED: SMD
APPRV'D: SM
DATE: 08/07/20
PROJECT NUMBER 1949-0188-00

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GROUND FLOOR PLAN - LIGHTING DEMOLITION

DRAWING NUMBER E1D1.2

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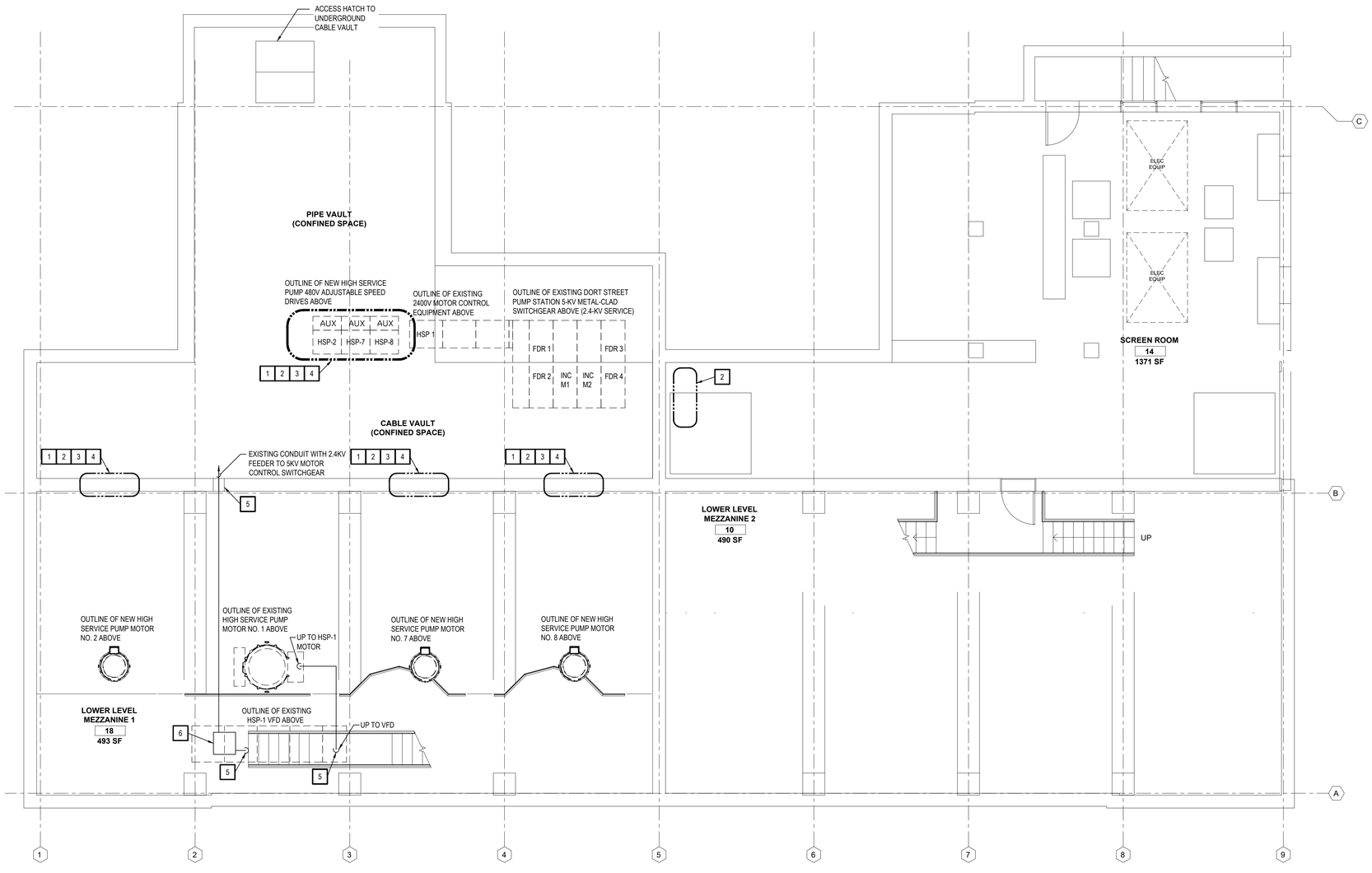
Project No. 19-1304

ACADFile 19-1304-ELD1.2.dwg



NORTH

1 LOWER LEVEL 1 (MEZZANINE) - POWER
SCALE: 3/16" = 1'-0"

SHEET NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRICAL CODE AS AMENDED BY THE MICHIGAN CONSTRUCTION CODE, ELECTRICAL CODE RULES, PART 8.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. RE-USE EXISTING FLOOR AND WALL PENETRATIONS FOR CONDUITS SUPPLYING NEW HIGH SERVICE WHERE POSSIBLE. GROUT EXISTING PENETRATIONS FOR CONDUITS BEING DEMOLISHED, WHERE PENETRATIONS ARE NOT BEING REUSED.
2. GROUT UNUSED FLOOR (ABOVE) AND WALL PENETRATIONS.
3. CORE DRILL NEW FLOOR AND WALL PENETRATIONS REQUIRED FOR NEW HIGH SERVICE PUMP FEEDERS FROM ASD TO ASSOCIATED PUMP MOTOR FOR HIGH SERVICE PUMPS HSP-2, HSP-7 AND HSP-8.
4. FIRESTOP WALL PENETRATIONS AFTER INSTALLING NEW CONDUITS.
5. FIRESTOP ALL WALL AND FLOOR PENETRATIONS FOR EXISTING HSP-1 CONDUITS.
6. PROVIDE AND INSTALL COVER AT EXISTING PULL BOX FOR HSP-1 2.4KV FEEDER.

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NO.	REVISION	DATE
	PROGRESS REVIEW	07/21/20
	FINAL OWNER REVIEW	07/24/20
	BIDS	08/07/20

DRAWN: JCO
DESIGNED: JCO
CHK'D: SM
APPR'VD: SM
DATE: 08/07/20
PROJECT NUMBER 1949-0188-00

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DORT PUMP STATION RENOVATIONS

LOWER LEVEL 1 (MEZZANINE) PLAN - POWER

DRAWING NUMBER EP1.1

ELECTRICAL

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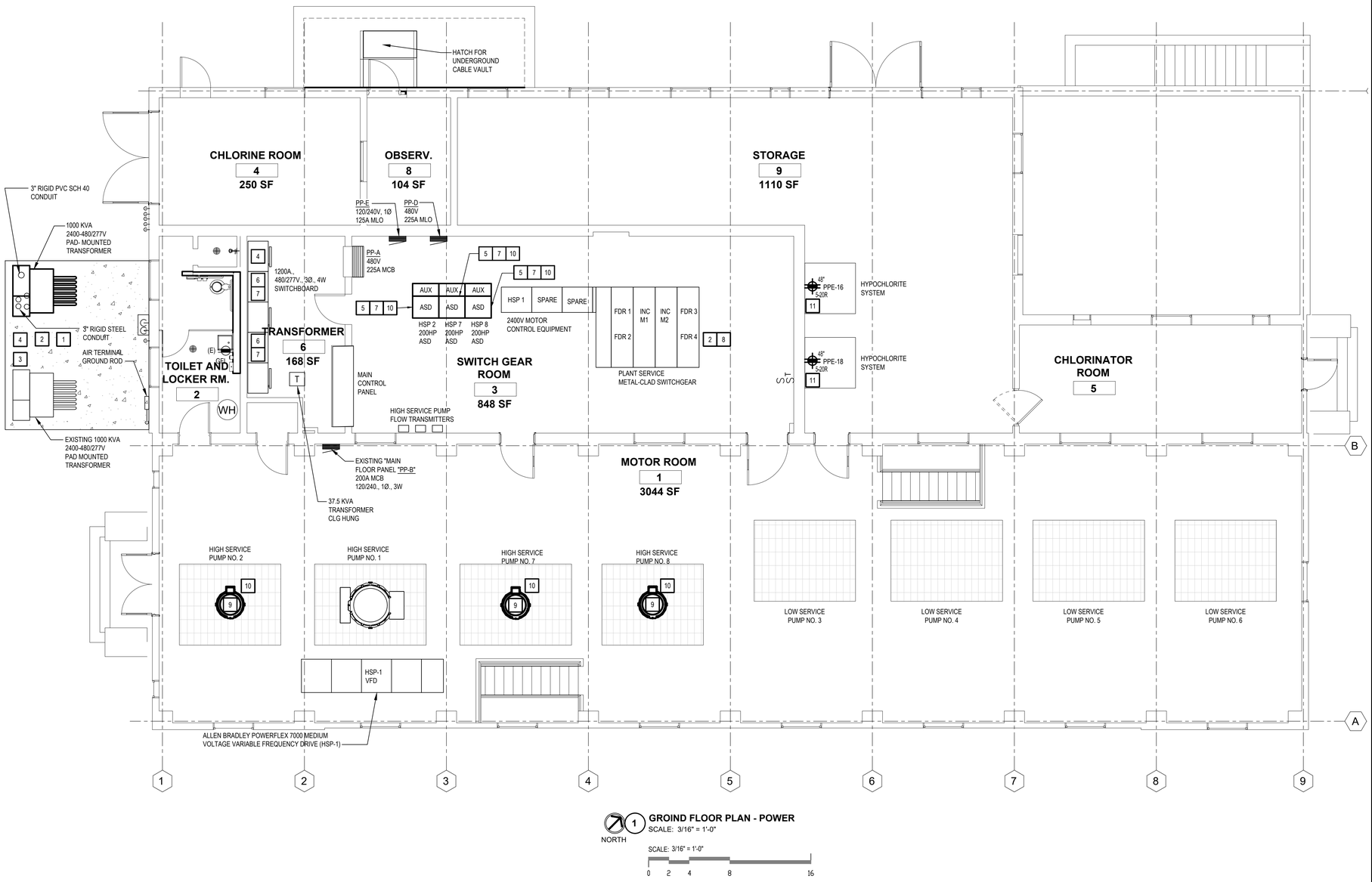
Project No. 19-1304
ACADFile 19-1304-EP1.1.dwg



1 GROIND FLOOR PLAN - POWER

SCALE: 3/16" = 1'-0"

NORTH

SCALE: 3/16" = 1'-0"

0 2 4 8 16

SHEET NOTES:

1. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE 2017 NATIONAL ELECTRICAL CODE AS AMENDED BY THE MICHIGAN CONSTRUCTION CODE, ELECTRICAL CODE RULES, PART 8.

NEW WORK KEYED NOTES:

(APPLICABLE THIS SHEET ONLY)

1. FURNISH AND INSTALL 1000KVA, 2400-480/277V, PAD-MOUNTED TRANSFORMER FOR SERVICE TO EXISTING 1200A, 480/277V SWITCHBOARD.
2. PROVIDE PRIMARY FEEDER FROM EXISTING PLANT SERVICE METAL-CLAD SWITCHGEAR TO PAD-MOUNTED TRANSFORMER. REFER TO SHEET E-6.1.
3. PROVIDE TRANSFORMER SECONDARY NEUTRAL GROUNDING TO PLANT GROUNDING ELECTRODE SYSTEM.
4. PROVIDE 1200A SECONDARY FEEDER FROM PAD-MOUNTED TRANSFORMER SECONDARY TO EXISTING 1200A, 480/277V SWITCHBOARD. REFER TO SHEET E-6.1.
5. PROVIDE 200HP ADJUSTABLE SPEED DRIVES (ASDs) FOR HIGH SERVICE PUMPS HSP-2, HSP-7 AND HSP-8.
6. PROVIDE 400A MOLDED CASE CIRCUIT BREAKERS FOR SERVICE TO 200HP HIGH SERVICE PUMP ASDs. IN EXISTING SQUARE D QED SWITCHBOARD.
7. PROVIDE FEEDERS FROM 480/277V SWITCHBOARD TO HIGH SERVICE PUMP ASDs. REFER TO SHEET E-6.1.
8. ADJUST EXISTING EATON EDR3000 FEEDER DISTRIBUTION RELAY SETTINGS FOR FEEDER NO. 4 FOR PROTECTION OF PAD-MOUNTED TRANSFORMER. MATCH SETTINGS OF FEEDER NO. 2 SERVING EXISTING SWITCHBOARD TRANSFORMER.
9. PROVIDE 200HP, 460V, 3-PHASE VERTICAL SOLID SHAFT INVERTER DUTY INDUCTION MOTORS FOR HIGH SERVICE PUMPS HSP-2, HSP-7, AHD HSP-8.
10. PROVIDE MOTOR FEEDERS FROM ASD TO MOTOR. REFER TO SHEET E-6.1.
11. PROVIDE 5-20R QUAD OUTLET, 48: A.F.F. FOR SERVICE TO HYPOCHLORITE SYSTEM TRANSFER PUMP, METERING PUMPS, AND SCALE. PROVIDE 20A DEDICATED CIRCUIT (2#12 & #12 GND, 3/4" GRS) AND A NEW 20A, 1P CIRCUIT BREAKER IN EXISTING PANEL PP-E AS INDICATED.

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	PROGRESS REVIEW	07/21/20
	FINAL OWNER REVIEW	07/24/20
	BIDS	08/07/20

DRAWN: JCO
DESIGNED: JCO
CHK'D: SM
APPR'D: SM
DATE: 08/07/20
PROJECT NUMBER 1949-0188-00

Michigan
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GROUND FLOOR PLAN - POWER

DRAWING NUMBER EP1.3

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Project No. 19-1304

ACADFile 19-1304-EP1.3.dwg

GENERAL NOTES:
THE HORIZONTAL PROJECT CONTROL IS BASED ON THE MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE, INTERNATIONAL FEET, 2013 ADJUSTMENT YEAR AND ESTABLISHED UTILIZING MSRN.

THE VERTICAL CONTROL IS BASED ON NAVD 1988. A LEVEL LOOP WAS COMPLETED FROM PUBLISHED BENCHMARK DL4945 TO THE SITE TO ESTABLISH THE VERTICAL CONTROL.

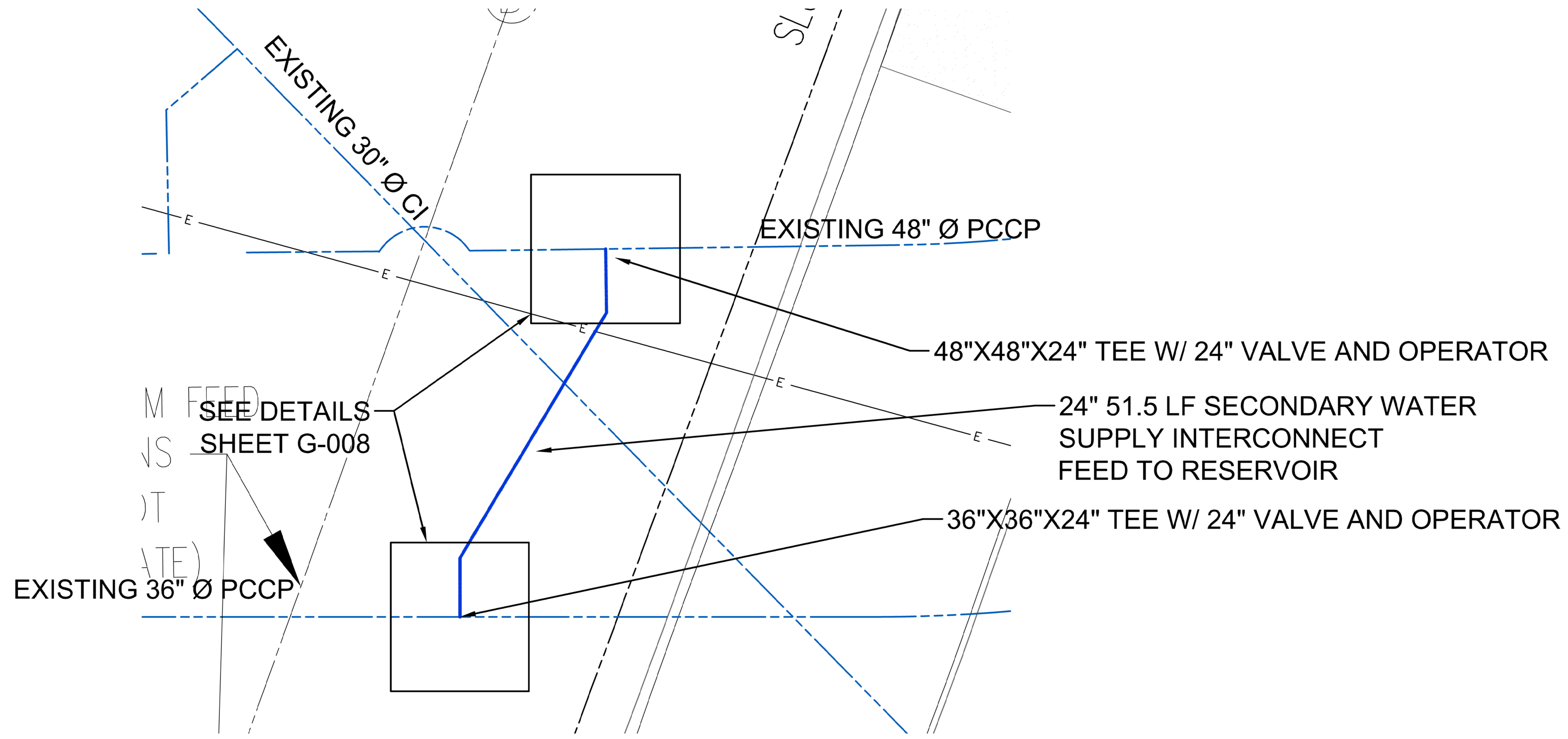
NO BOUNDARY WORK WAS COMPLETED AS PART OF THIS PROJECT

UTILITIES SHOWN ARE BASED ON ABOVE GROUND FEATURES AND PROVIDED PLANS. NO UNDERGROUND OBSERVATIONS WERE CONDUCTED

CONSTRUCTION NOTES:
CONTRACTOR IS TO FIELD LOCATE UTILITIES PRIOR TO EXCAVATION

SITE IS SATURATED AND WELL POINT DEWATERING IS EXPECTED

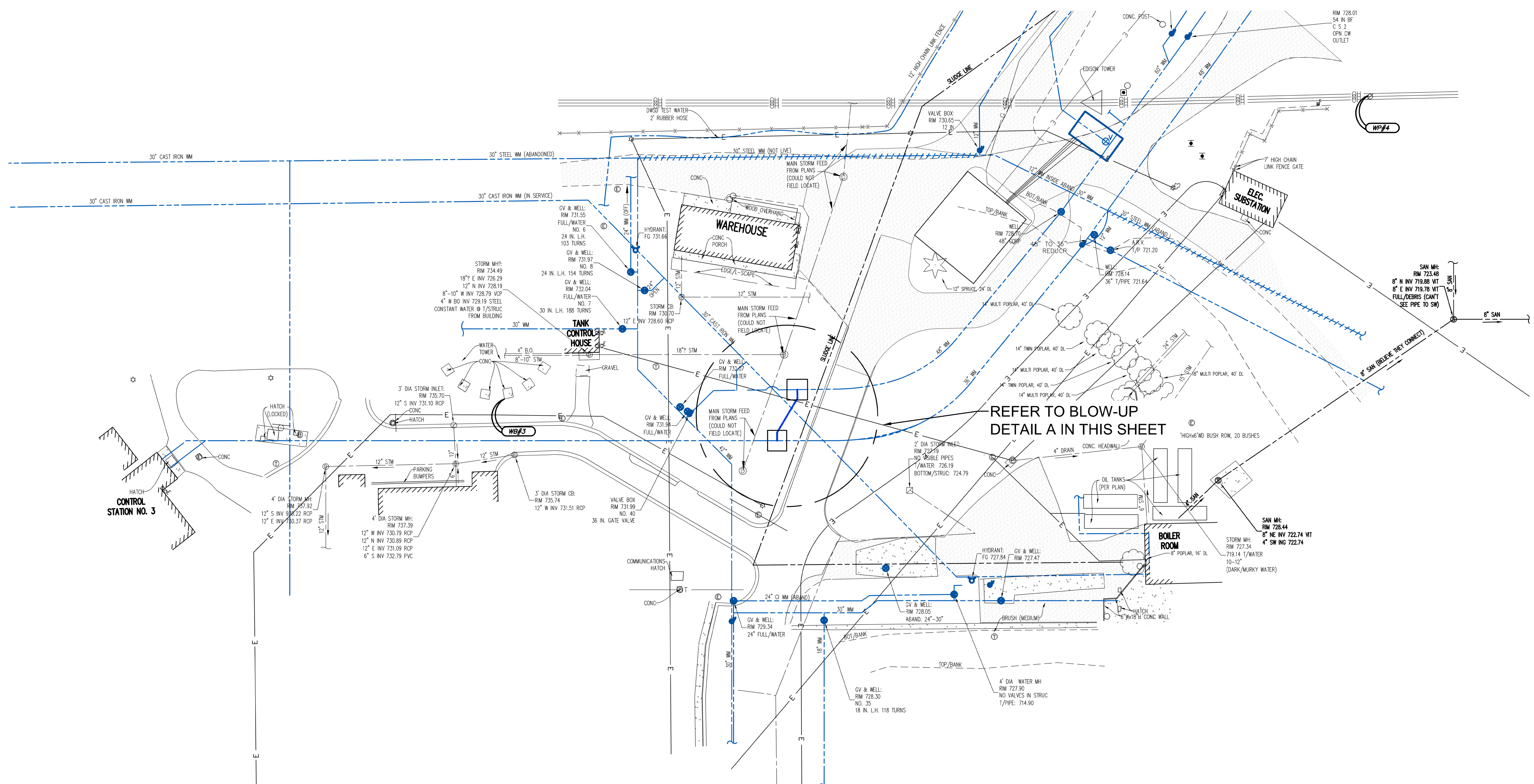
EACH TAP IS TO BE FIELD LOCATED TO AVOID A PIPE JOINT. ADJUST LOCATION & 45° BEND FOR TAP LOCATIONS.



BLOW-UP DETAIL A
SCALE: 1" = 10'

B.M. WP#3 ELEV. = 737.62 NAVD 1988
CHISELED + TOP/SOUTH BOLT OF S'LY MOST LEG OF WATER TOWER

B.M. WP#4 ELEV. = 725.62 NAVD 1988
MAG. SPIKE IN WEST FACE OF POWER POLE 40'± N OF PWR SUB STATION FENCE



LEGEND

EXISTING
- WATER MAIN
- SANITARY SEWER
- STORM SEWER
- GAS MAIN
- UNDERGROUND ELECTRIC
- UNDERGROUND CABLE
- UNDERGROUND TELEPHONE/CONDUIT
- UNDERGROUND FIBER OPTIC
- BITUMINOUS PAVEMENT
- CONCRETE PAVEMENT
- GRAVEL DRIVE/SHOULDER
- LIGHT POLE
- GUY ANCHOR
- GUY POLE
- POWER POLE
- TELEPHONE MANHOLE
- U/G TELEPHONE BOX
- U/G CABLE TV BOX
- U/G ELECTRIC BOX
- GAS METER
- ELECTRIC METER
- ELECTRIC MANHOLE
- ELECTRIC OUTLET
- MAILBOX
- SIGN
- POST
- CONCRETE FILLED POST
- GUARD POST
- WATER SERVICE - SHUT OFF
- GATE VALVE IN WELL
- SPRINKLER VALVE
- SPRINKLER HEAD
- FIRE HYDRANT
- FIRE HYDRANT VALVE
- STORM MANHOLE
- CATCH BASIN
- SANITARY MANHOLE
- CLEAN OUT
- FOUND IRON/RE-ROD/PIPE
- FOUND MONUMENT
- ELEVATION TAKEN HERE
- ELECTRIC MARKER
- GAS MARKER
- MONITORING WELL
- DECIDUOUS TREE W/DRIPLINE
- CONIFEROUS TREE W/DRIPLINE
- BUSH

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City of Flint
1101 S. Saginaw Street
Flint, Michigan 48502

ELECTRICAL DESIGN
Dort Pump Station Rehab

N

SCALE 1" = 40'
0 20 40 80

MARK	ISSUED FOR	DATE

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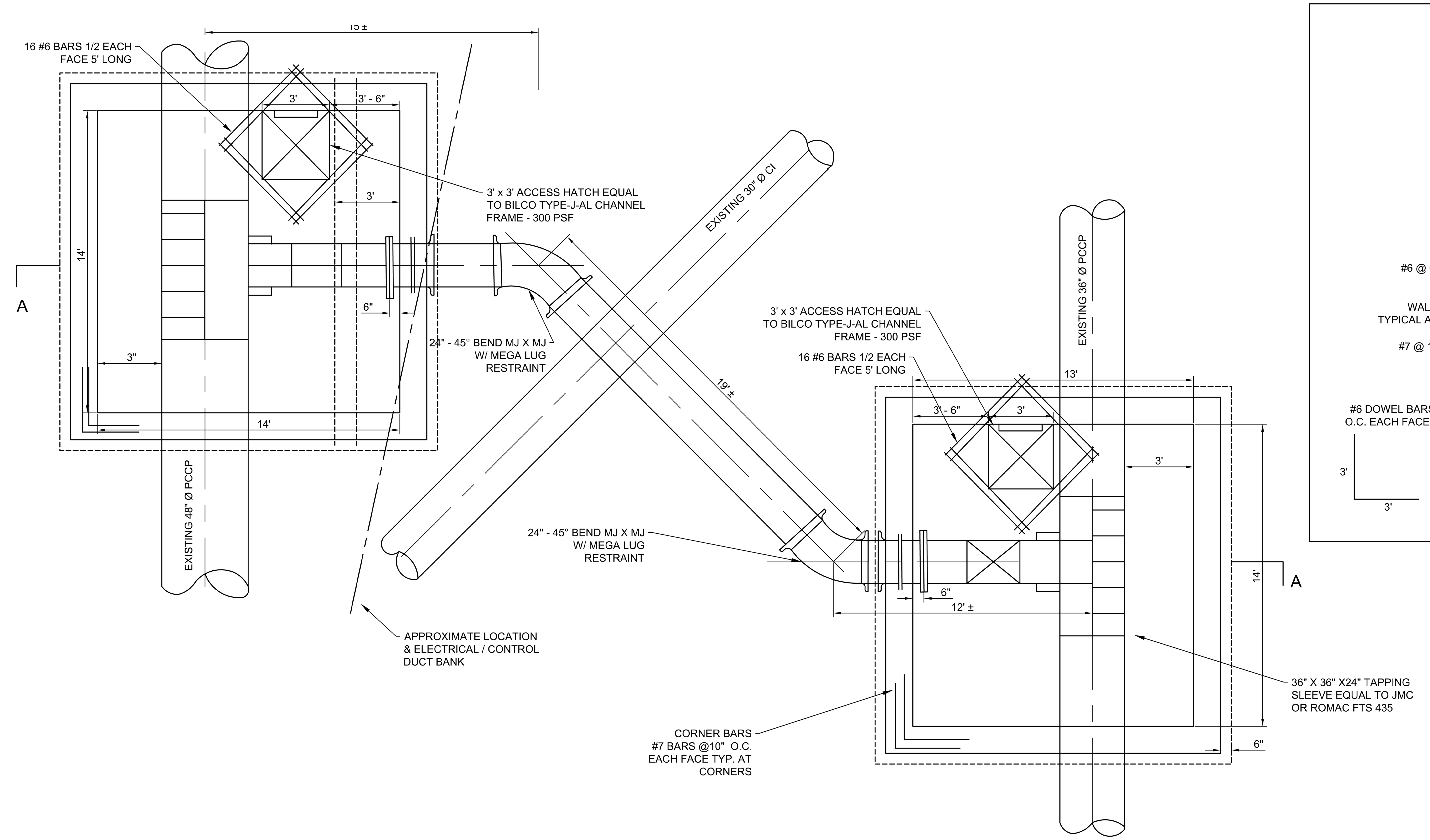
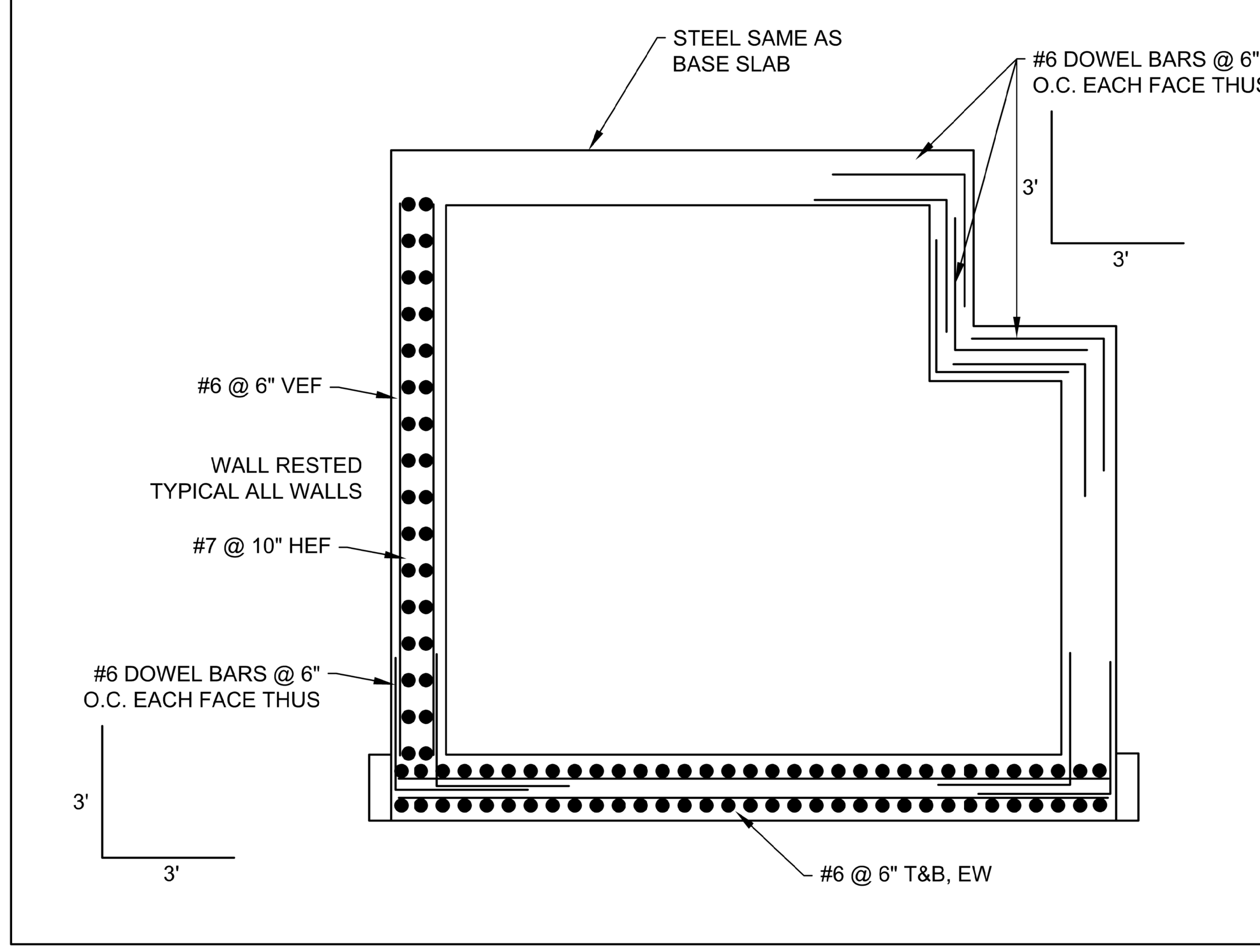
DESIGN BY: DLZ
CHECKED BY: DLZ

DLZ JOB NUMBER: 1945689300

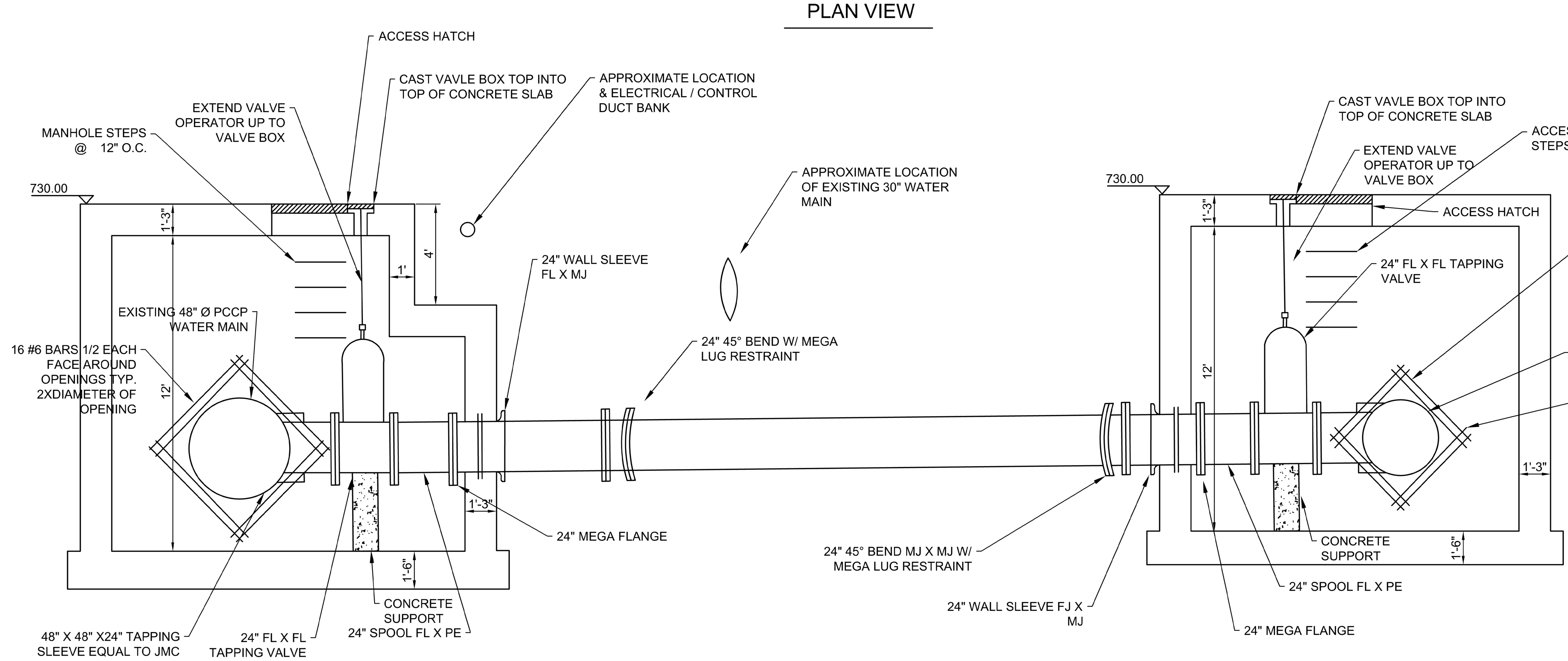
SHEET NO.
G-007



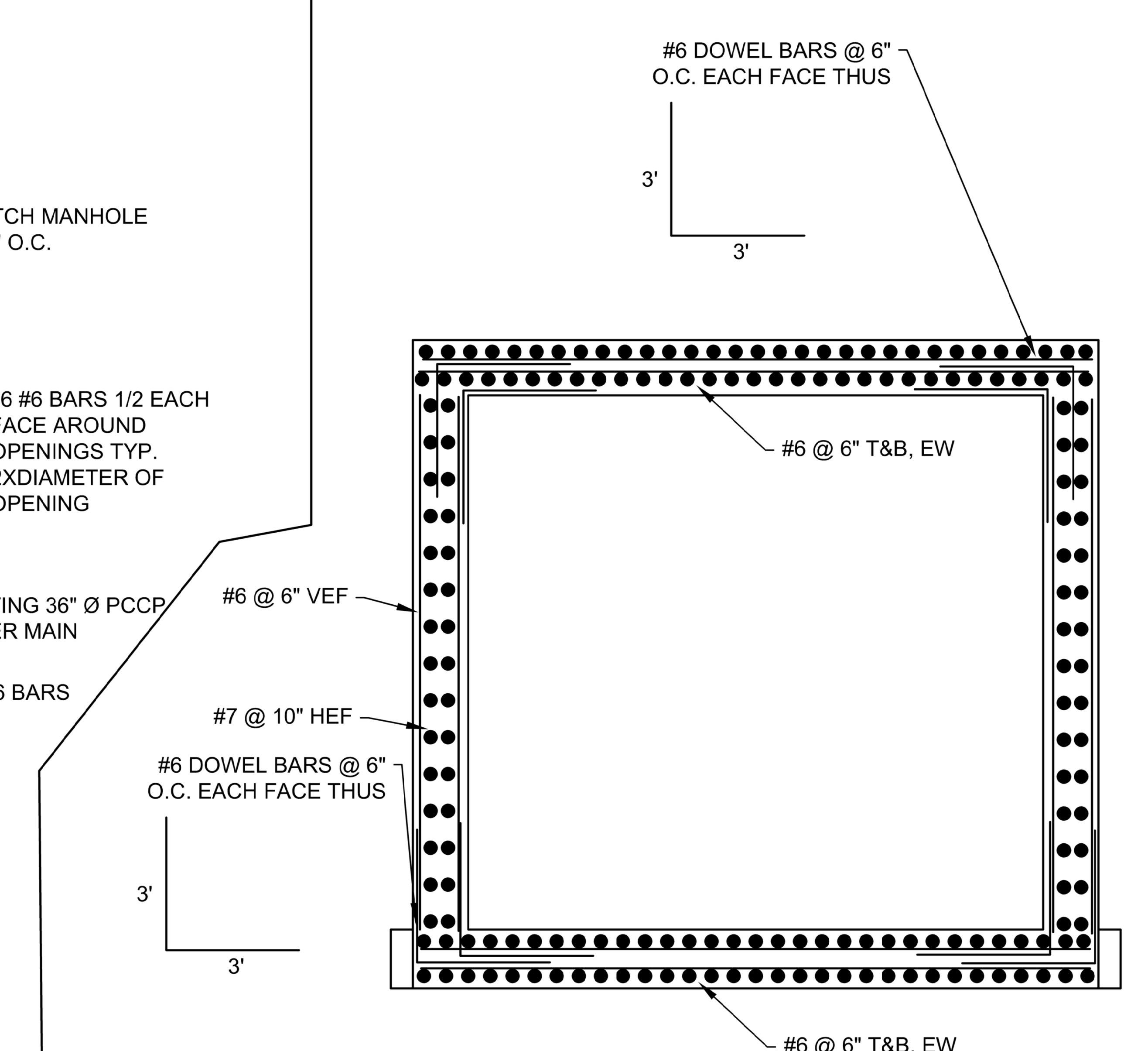
PLAN VIEW



REINFORCEMENT DETAIL



PROFILE VIEW A-A



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PLAN AND PROFILE VIEW
Dort Pump Station Rehab

N

SCALE 1" = 3'
0 1.5 3 6

MARK	ISSUED FOR	DATE
	-	-
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