State of Idaho • Department of Environmental Quality

PLANS & SPECIFICATIONS REVIEW

These plans and/or specifications have been reviewed for compliance with Department of Environmental Quality rules. This review does not relieve the owner, engineer, or the contractor of the responsibility to design or construct these facilities in compliance with all current applicable federal, state, and local laws, rules, regulations, or ordinances. Plans and/or specifications must be resubmitted for review if construction is not completed within one year from approval date.

Tom Burnham, PE — Reviewing DEQ Engineer:

June 22, 2023 — Approval Date:

Refer to approval conditions in letter to: Nathan Stewart, PE

APPROVED FOR CONSTRUCTION
City of McCall

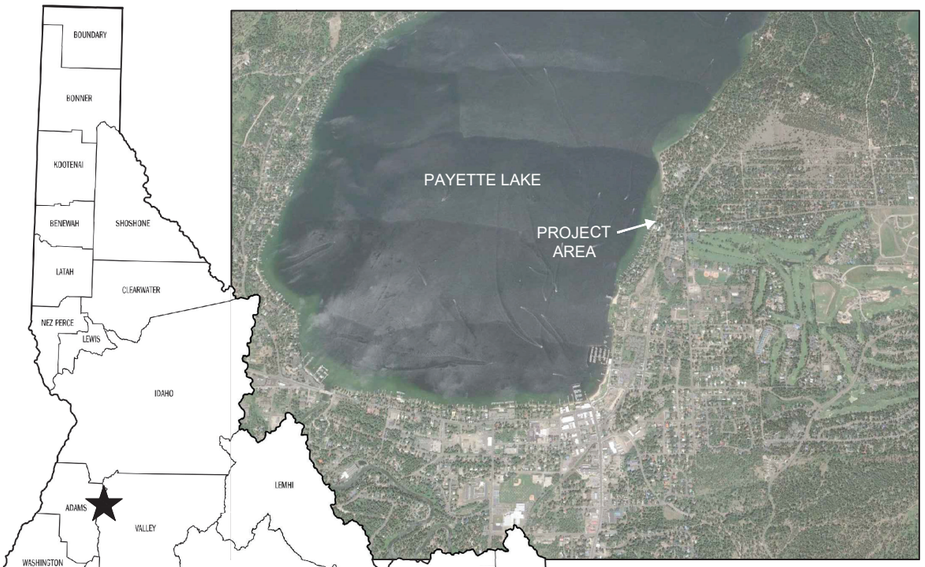
Nathan Stewart
2023.07.26 15:42:03-06'00'

Date: By:

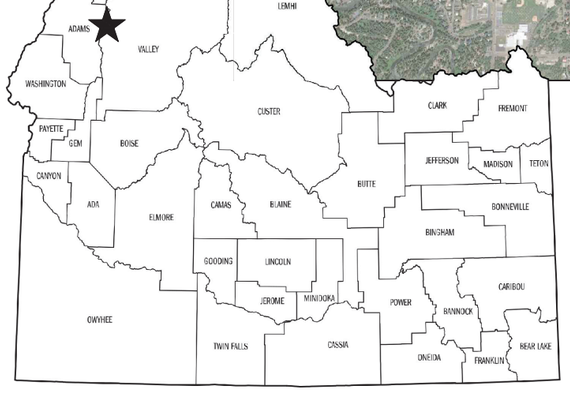
CITY OF MCCALL

VALLEY COUNTY, IDAHO

DAVIS BEACH INTAKE STATION UPGRADES - 2023



VICINITY MAP



PROJECT LOCATION

ABBREVIATIONS

APPROX.	APPROXIMATELY
CF	CUBIC FEET
CLF	CHAIN LINK FENCE
CTR	CENTER
DIA	DIAMETER
DIP	DUCTILE IRON PIPE
EG	EXISTING GRADE
ELEV	ELEVATION
EP	EDGE OF PAVEMENT
E	EXISTING
FG	FINISH GRADE
GB	GRADE BREAK
HP	HIGH POINT
ID	INSIDE DIMENSION
IE	INVERT ELEVATION
ISPWC	IDAHO STANDARDS FOR PUBLIC WORKS
LF	LINEAR FEET
MAX	MAXIMUM
MIN	MINIMUM
P	PROPOSED
PVC	POLYVINYL CHLORIDE
SS	STAINLESS STEEL
TYP	TYPICAL

INDEX OF SHEETS

PROJECT TEAM

OWNER
ATTN: SABRINA SIMS
WATER SYSTEMS MANAGER
1240 BITTERROOT DRIVE
MCCALL, ID 83638
(208) 634-1854
EMAIL: SSIMS@MCCALL.ID.US

CIVIL ENGINEER
CLEAR SOLUTIONS ENGINEERING
ATTN: ERIC LANDSBERG, PE
1151 E. IRON EAGLE DRIVE
EAGLE, ID 83616
PHONE: (208) 608-3080
EMAIL: ERIC@CLEARSOLNS.COM

STRUCTURAL ENGINEER
McCLENDON ENGINEERING
ATTN: SARAH McCLENDON, PE
1412 W IDAHO STREET, SUITE 240
BOISE, ID 83702
PHONE: (208) 342-2919
EMAIL: SARAH@MCCLENDONENGINEERING.COM

ELECTRICAL ENGINEER
DC ENGINEERING
ATTN: JOHN BARRUTIA, PE
440 E CORPORATE DRIVE, #103
MERIDIAN, ID 83642
PHONE: (208) 288-2181
EMAIL: JBARRUTIA@DCENGINEERING.NET

NO.	REVISION	BY	DATE	DESIGN
0	75% REVIEW SET	EL	11/10/2022	EL
1	ISSUED FOR REVIEW	EL	1/13/2023	DRAWN
2	ISSUED FOR BID	EL	3/14/2023	KC
3	ADDENDUM 1	EL	4/7/2023	CHECKED
4	ISSUED FOR DEQ RESUBMITTAL	EL	6/19/2023	EL
				APPROVED
				EL

PROFESSIONAL ENGINEER REGISTERED 11212 6-19-2023 STATE OF IDAHO ERIC A. LANDSBERG

CLEAR SOLUTIONS ENGINEERING
1151 EAST IRON EAGLE DRIVE
EAGLE, ID 83616 (208) 608-3080

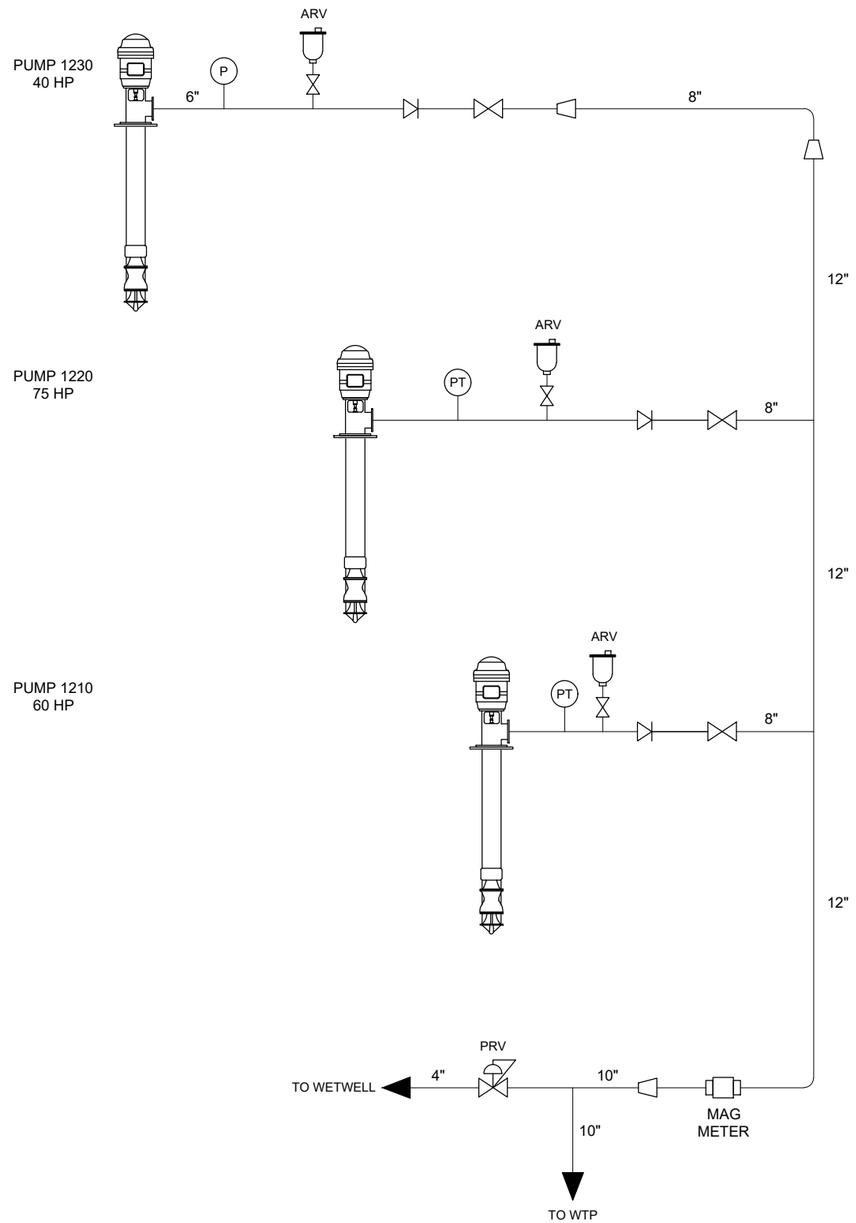
CITY OF MCCALL
DAVIS BEACH INTAKE STATION UPGRADES
COVER SHEET

VERIFY SCALE
BAR IS ONE INCH ON FULL SIZE DRAWING
0 1"

PROJECT : 101.060
DATE : 6/19/2023
SHEET NO.
C001

GENERAL NOTES

1. CONSTRUCTION SHALL BE PER THE LATEST VERSION OF THE ISPWC OR THE PROJECT PLANS/SPECIFICATIONS, WHICHEVER IS MORE STRINGENT.
2. CONTRACTOR SHALL FURNISH AND INSTALL EVERYTHING REQUIRED TO PROVIDE COMPLETE AND OPERABLE FACILITIES AS SHOWN HEREIN. IF THERE IS AN OMISSION ON THE PLANS, SUCH OMISSION SHALL NOT BE CONSTRUED TO MEAN THAT THE CONTRACTOR IS NOT REQUIRED TO FURNISH OR PROVIDE EVERYTHING THAT IS NECESSARY TO PROVIDE COMPLETE AND OPERABLE FACILITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL EXISTING MONUMENTS, OTHER SURVEY MARKERS, STREET SIGNS, UTILITIES, IRRIGATION LINES, PAVEMENT, TREES, FENCES, AND ANY OTHER IMPORTANT OBJECTS ON OR ADJACENT TO THE JOB SITE AS DETERMINED BY THE OWNER'S REPRESENTATIVE OR ENGINEER.
4. CONTRACTOR SHALL CONTACT IDAHO DIG LINE (208) 342-1585 TO MARK AND IDENTIFY UNDERGROUND UTILITIES PRIOR TO EXCAVATION.
5. THE CONTRACTOR SHALL HAVE PLANS STAMPED "ISSUED FOR CONSTRUCTION" ON SITE AT ALL TIMES.
6. CONTRACTOR SHALL PROVIDE, MAINTAIN, AND BE RESPONSIBLE FOR ALL EROSION AND SEDIMENT CONTROL STRUCTURES AND PRACTICES AND MEET THE REQUIREMENTS OF ANY AGENCY HAVING JURISDICTION. AN ESC PERMIT, IF REQUIRED, SHALL BE OBTAINED BY THE CONTRACTOR FROM VALLEY COUNTY.
7. CONTRACTOR TO PROVIDE CONSTRUCTION STAKING.
8. THE LOCATIONS OF EXISTING STRUCTURES AND UTILITIES ARE SHOWN AS AN APPROXIMATE LOCATION ONLY AND ARE BASED UPON THE BEST INFORMATION AVAILABLE, HOWEVER THE COMPLETENESS AND ACCURACY OF SAID INFORMATION CANNOT BE GUARANTEED. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THEIR FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL ABOVE GROUND AND UNDERGROUND STRUCTURES AND UTILITIES WHETHER SHOWN OR NOT SHOWN ON THESE PLANS. CONTRACTOR SHALL CONTACT PROPERTY OWNERS TO GAIN INFORMATION ON PRIVATE UTILITIES. EXISTING STRUCTURES, ASPHALT, GRAVEL ROAD, AND CONCRETE THAT ARE DISTURBED DURING CONSTRUCTION SHALL BE REPLACED BY THE CONTRACTOR TO A CONDITION BETTER THAN OR EQUAL TO THE EXISTING CONDITION.
9. ALL CONTRACTORS WORKING WITHIN THE PROJECT BOUNDARIES ARE RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE SAFETY LAWS OF ANY JURISDICTIONAL BODY.
10. ANY CHANGES TO THE DESIGN AS SHOWN IN THESE CONSTRUCTION DRAWINGS MUST BE REVIEWED AND APPROVED BY THE ENGINEER BEFORE CHANGES ARE MADE. THIS INCLUDES CHANGES REQUESTED BY THE OWNER'S REPRESENTATIVE AND SUBCONTRACTORS.
11. CONTRACTOR SHALL LEGALLY DISPOSE OF ALL EXCESS MATERIAL.
12. ALL "OR EQUAL" ITEMS ARE SUBJECT TO REVIEW AND APPROVAL OF THE ENGINEER.
13. UPON THE COMPLETION OF WORK, THE CONTRACTOR SHALL SUBMIT A SET OF "RED-LINED" RECORD DRAWINGS TO THE ENGINEER.
14. CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE OWNER'S REPRESENTATIVE PRIOR TO, DURING, AND AT THE COMPLETION OF CONSTRUCTION ACTIVITY.
15. IF WITHIN ONE (1) YEAR FROM THE DATE OF COMPLETION, THE SYSTEM IMPROVEMENTS AND ALL APPURTENANCES OR ANY PART THEREOF INSTALLED AS NEW SHALL PROVE TO BE DEFECTIVE IN INSTALLATION, MATERIAL, OR WORKMANSHIP THE CONTRACTOR SHALL WARRANT REPLACEMENT OR REPAIR TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE AT NO EXPENSE TO THE OWNER.
16. ALL PLUMBING SHALL BE INSTALLED IN ACCORDANCE WITH UNIFORM PLUMBING CODE AND ALL APPLICABLE LOCAL AND STATE CODES.
17. CONTRACTOR SHALL VERIFY EXISTING LOCATIONS, ELEVATIONS, AND MATERIAL TYPES OF ALL UTILITIES AND FEATURES WHERE PROPOSED IMPROVEMENTS CONNECT. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
18. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE AND EXPOSE ALL EXISTING UNDERGROUND STRUCTURES AND UTILITIES IN ADVANCE OF EXCAVATION. ANY STRUCTURE OR UTILITIES DAMAGED BY THE WORK SHALL BE REPAIRED AND REPLACED IN A CONDITION EQUAL TO OR BETTER THAN THE CONDITION PRIOR TO THE DAMAGE. SUCH REPAIR OR REPLACEMENT SHALL BE ACCOMPLISHED AT THE CONTRACTOR'S EXPENSE.
19. IF THE CONTRACTOR ENCOUNTERS EXISTING STRUCTURES THAT INTERFERE WITH THE NEW FACILITIES, THEY SHALL NOTIFY THE ENGINEER BEFORE CONTINUING WITH THE CONSTRUCTION IN ORDER THAT THE ENGINEER MAY MAKE SUCH FIELD REVISIONS AS NECESSARY TO AVOID CONFLICT WITH THE EXISTING STRUCTURES. THE COST OF WAITING OR "DOWN" TIME DURING FIELD REVISIONS SHALL BE BORNE BY THE CONTRACTOR.
20. DURING THE PROGRESS OF CONSTRUCTION, IT IS POSSIBLE THAT MINOR RELOCATIONS MAY BE NECESSARY. SUCH RELOCATIONS SHALL BE MADE ONLY BY DIRECTION OF THE ENGINEER OR THE ENGINEER'S REPRESENTATIVE.
21. ALL INSTALLED WATER LINES SHALL BE TESTED FOR LEAKAGE IN ACCORDANCE WITH SECTION 401.3.6 OF THE ISPWC FOLLOWING INSTALLATION OF ALL UTILITIES.
22. ALL INSTALLED WATER LINES SHALL BE FLUSHED, DISINFECTED, AND TESTED FOR BACTERIA IN ACCORDANCE WITH SECTION 401.3.9 OF THE ISPWC.



PROCESS FLOW DIAGRAM

NO.	REVISION	BY	DATE	DESIGN
0	75% REVIEW SET	EL	11/10/2022	EL
1	ISSUED FOR REVIEW	EL	1/13/2023	DRAWN
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3	ADDENDUM 1	EL	4/7/2023	CHECKED
4	ISSUED FOR DEQ RESUBMITTAL	EL	6/19/2023	EL
				APPROVED
				EL

PROFESSIONAL ENGINEER REGISTERED 11212 6-19-2023 STATE OF IDAHO ERIC A. LANDSBERG

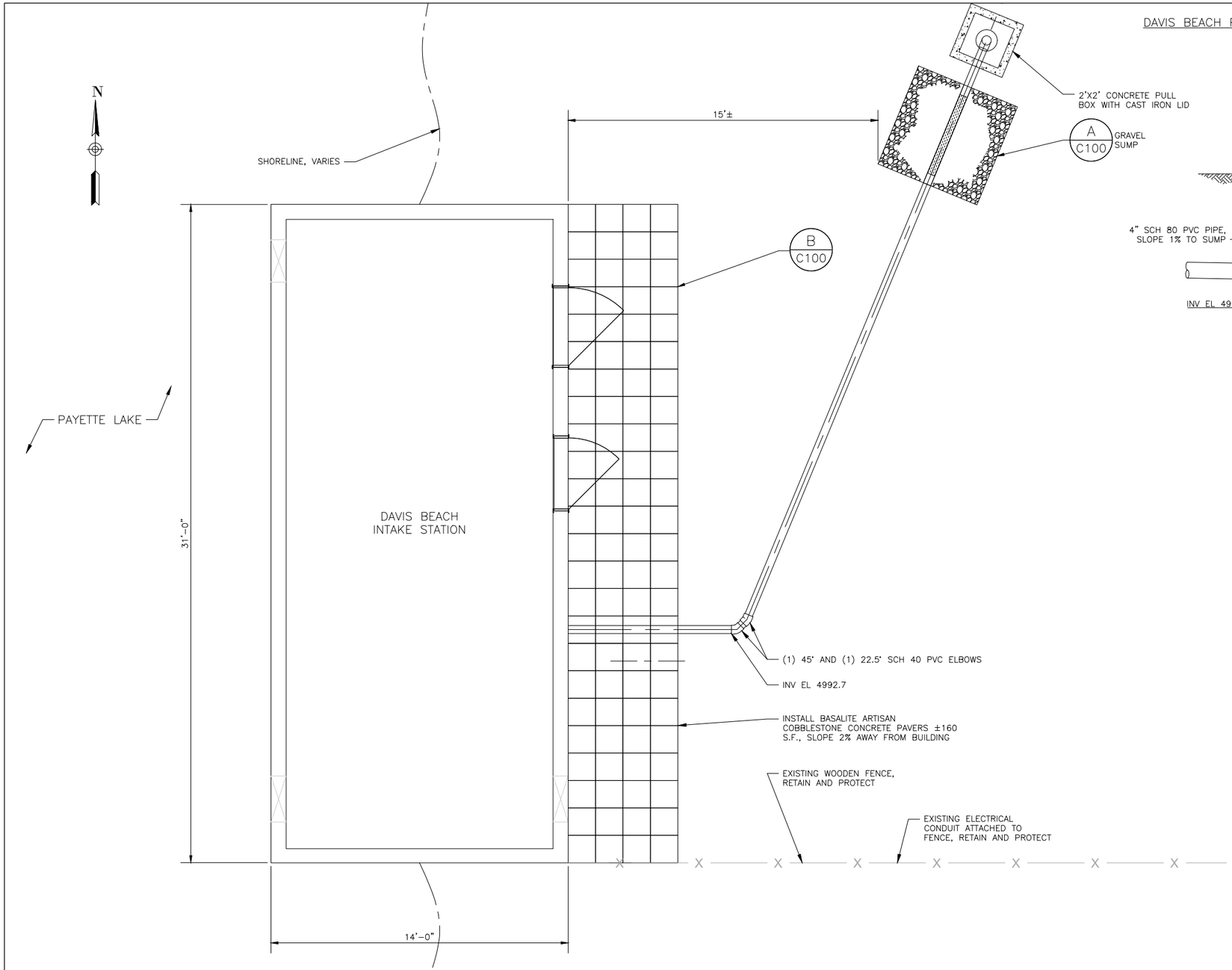
CLEAR SOLUTIONS ENGINEERING
1151 EAST IRON EAGLE DRIVE
EAGLE, ID 83616 (208) 608-3080

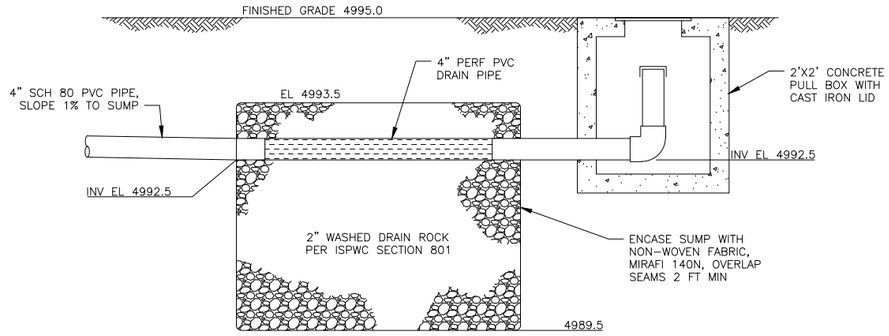
CITY OF MCCALL
DAVIS BEACH INTAKE STATION UPGRADES
GENERAL NOTES & PROCESS FLOW DIAGRAM

VERIFY SCALE
BAR IS ONE INCH ON FULL SIZE DRAWING
0 1"

PROJECT :	101.060
DATE :	6/19/2023
SHEET NO.	C002

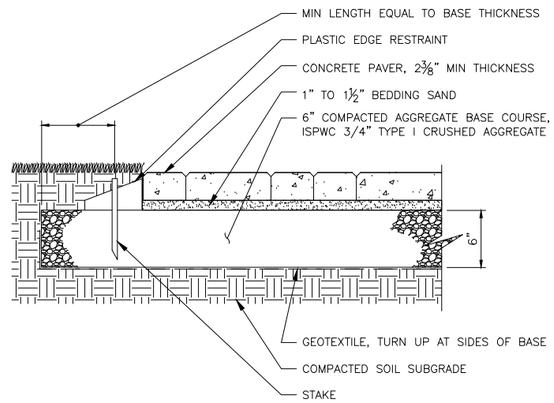
DAVIS BEACH PARK





NOTE:
INSTALL 60 FT HEAT TRACE CABLE IN DRAIN PIPE FROM FLOOR DRAIN TO PULL BOX, 120V, 5W/FT, SELF REGULATING, BRISKHEAT SPEEDTRACE FFSL1-62 OR APPROVED EQUAL.

A C100 GRAVEL SUMP
NOT TO SCALE



B C100 CONCRETE PAVERS

NO.	REVISION	BY	DATE	DESIGN
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				APPROVED
				EL

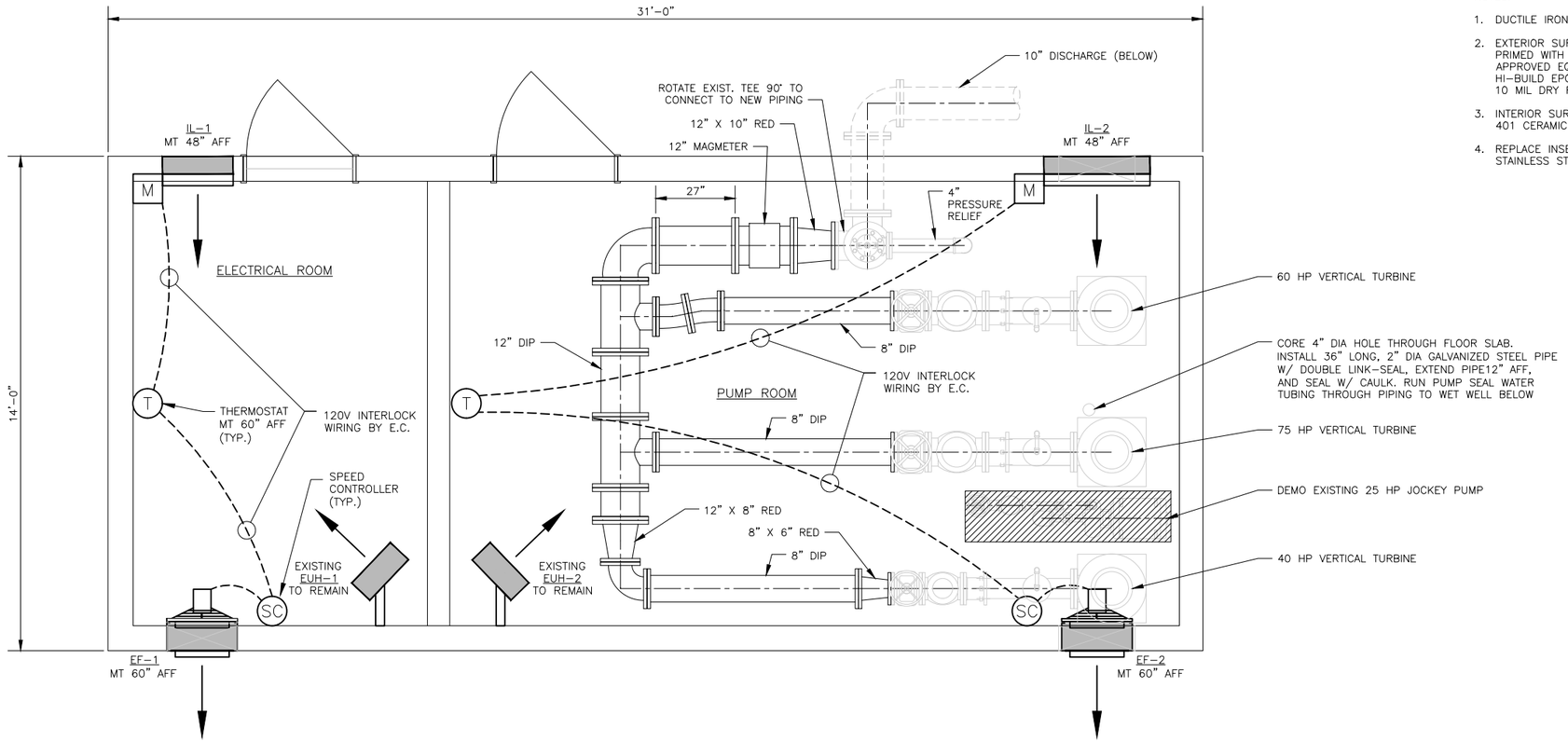
PROFESSIONAL ENGINEER REGISTERED 11212 6-19-2023 STATE OF IDAHO ERIC A. LANDSBERG

CLEAR SOLUTIONS ENGINEERING
1151 EAST IRON EAGLE DRIVE
EAGLE, ID 83616 (208) 608-3080

CITY OF MCCALL
DAVIS BEACH INTAKE STATION UPGRADES
SITE PLAN

VERIFY SCALE
BAR IS ONE INCH ON FULL SIZE DRAWING
0 1"

PROJECT :	101.060
DATE :	6/19/2023
SHEET NO.	C100



NOTES:

1. DUCTILE IRON PIPE AND FITTINGS SHALL BE ANSI/AWWA C150 AND C153.
2. EXTERIOR SURFACES OF ALL EXPOSED DUCTILE IRON PIPE SHALL BE FACTORY PRIMED WITH UNIVERSAL PRIMER, TNEMEC SERIES 27 F.C. TYPOXY, OR APPROVED EQUAL, AND FIELD COATED WITH EPOXY ENAMEL, TNEMEC SERIES 69 HI-BUILD EPOXOLINE, OR APPROVED EQUAL. APPLY TWO COATS WITH A MINIMUM 10 MIL DRY FILM THICKNESS.
3. INTERIOR SURFACES OF DUCTILE IRON PIPE SHALL BE LINED WITH PROTECTO 401 CERAMIC EPOXY.
4. REPLACE INSECT SCREENS ON AIR RELEASE VALVES WITH NEW 24-MESH STAINLESS STEEL SCREENS.

EXHAUST FAN SCHEDULE

TAG	MFG	MODEL	AREA(S) SERVED	CFM	ESP (WC)	HP	BHP	RPM	SONES	DRIVE	ELECTRICAL DATA			UNIT CONTROLLER	UNIT LOCATION	INSTALLED WEIGHT (LBS)	REMARKS
											VLT-PH-HZ	AMPS	MOCP				
EF-1	GREENHECK	SE118429A7XQD	PUMP ROOM	4460	0.25"	3/4	0.75	1800	16.4	DIRECT	115V-1	–	–	WALL T-STAT	SIDEWALL	---	1,2,3,4
EF-2	GREENHECK	SE118429A7XQD	PUMP ROOM	4460	0.25"	3/4	0.75	1800	16.4	DIRECT	115V-1	–	–	WALL T-STAT	SIDEWALL	---	1,2,3,4

REMARKS:

1. PROVIDE WITH WALL SLEEVE AND GRAVITY SHUTTER AT EXTERIOR. SHUTTER TO BE MILL FINISH
2. PROVIDE WITH SPEED CONTROLLER FOR BALANCING. MOUNTED AND WIRED NEAR/AT FAN BY E.C.
3. DISCONNECT BY E.C.
4. PROVIDE WITH 120V LINE VOLTAGE THERMOSTAT. THERMOSTAT MOUNTED AND WIRED BY E.C.

LOUVER SCHEDULE

TAG	MFG	MODEL	SIZE (IN.) W x H	INTERLOCKED FAN	AIR FLOW (CFM)	FREE AREA (SQ FT)	VELOCITY (FPM)	FRAME	DEPTH	MATERIAL	FINISH	COLOR	REMARKS
IL-1	RUSKIN	ELF6350DMP	24 x 36	EF-1	4460	3.72	1199	CHANNEL	6"	ALUMINUM	50% PVDF	TO MATCH	1
IL-2	RUSKIN	ELF6350DMP	36 x 36	EF-2	4460	5.32	838	CHANNEL	6"	ALUMINUM	50% PVDF	TO MATCH	1

REMARKS:

1. PAIR WITH RUSKIN CD60 CONTROL DAMPER SIZED TO MATCH. PROVIDE CONTROL DAMPER WITH 120V ACTUATOR. ACTUATOR INTERLOCK WIRING BY E.C.

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				APPROVED
				EL

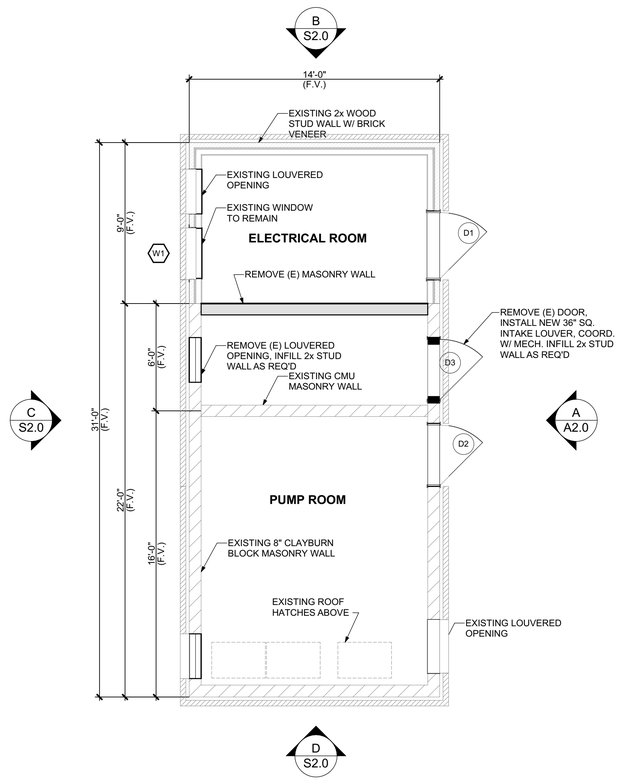
PROFESSIONAL ENGINEER REGISTERED 11212 6-19-2023 STATE OF IDAHO ERIC A. LANDSBERG

CLEAR SOLUTIONS ENGINEERING
1151 EAST IRON EAGLE DRIVE
EAGLE, ID 83616 (208) 608-3080

CITY OF MCCALL
DAVIS BEACH INTAKE STATION UPGRADES
MECHANICAL PLAN AND SCHEDULES

VERIFY SCALE
BAR IS ONE INCH ON FULL SIZE DRAWING
0 1"

PROJECT : 101.060
DATE : 6/19/2023
SHEET NO.
M100



EXISTING FLOOR PLAN

1/4" = 1'-0"

N

EXISTING FLOOR PLAN LEGEND:

INDICATES EXISTING 8" MASONRY WALL.

INDICATES EXISTING 8" MASONRY WALL TO BE REMOVED.

INDICATES EXISTING 2x4 DF-L#2 STUD WALL W/ BRICK VENEER

W1 INDICATES EXISTING WINDOW TO REMAIN.

DEMOLITION NOTES:

1. DEMO SUBCONTRACTOR TO COORDINATE WITH ALL OTHER TRADES AND G.C. TO ENSURE THE REMOVAL OF MATERIALS ARE THE EXACT QUANTITIES AND LOCATIONS.
2. REMOVE ALL EXISTING CONSTRUCTIONS AND FINISHES NECESSARY FOR THE COMPLETION OF THE WORK AS DEPICTED ON THE DRAWINGS. INCLUDING BUT NOT LIMITED TO, ITEMS SHOWN ON THE PLANS WITH DASHED LINES. NECESSARY DISCONNECTS AND ALTERATIONS TO EXISTING MECHANICAL AND ELECTRICAL SYSTEMS SHALL BE INCLUDED. PATCH AS REQUIRED ALL CONSTRUCTIONS TO REMAIN IN ACCORDANCE WITH THE CONTRACT DRAWINGS. WHERE CONTRACTOR IS DESIGNATED TO MAKE REMOVALS, DISPOSITION OF MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR. VERIFY WITH OWNER, THE DISPOSITION AND REMOVAL OF ANY COMPONENTS OF SALVAGEABLE VALUE.
3. REMOVE ONLY NON-LOAD BEARING CONSTRICTION AND PARTITIONS. CONTRACTOR TO VERIFY, PRIOR TO REMOVAL, THAT NO STRUCTURAL COMPONENTS, I.E. BEARING WALLS, BEAMS, HEADERS, ETC.. SUPPORTING FLOOR, ROOF OR CEILING JOISTS ARE DESIGNATED FOR REMOVAL. CONTACT THE ARCHITECT PRIOR TO REMOVAL OF ANY CONSTRUCTION IN QUESTION OR DEVIATING FROM THE DESIGN INTENT. CONTRACTOR'S NON-CONTACT OF ARCHITECT PRIOR TO REMOVAL OF ANY WORK INDICATES HIS COMPLETE UNDERSTANDING THAT NO LOAD BEARING OR STRUCTURAL WORK IS BEING ALTERED UNDER THIS CONTRACT.
4. PATCH ALL FINISHES TO MATCH EXISTING, INCLUDING BUT NOT LIMITED TO, GYPSUM BOARD, PLASTER, ACOUSTIC SYSTEMS, WOOD TRIM, COVERS, BASE, PANELS, RAILS AND WAINSCOT. VERIFY MATCH OF NEW FINISH MATERIALS TO EXISTING IN COLOR, TEXTURE, THICKNESS, CUT, ETC... TO SATISFACTION OF OWNER PRIOR TO INSTALLATIONS. PROVIDE OTHER MATERIALS TO MATCH EXISTING WHEN REQUIRED.
5. PATCH EXISTING WALLS GYPSUM DRYWALL OR PLASTER TO MATCH EXISTING OF SUFFICIENT THICKNESS TO MAINTAIN UNIFORM WALL THICKNESS. ALL EXPOSED PORTIONS OF WALL SHALL BE FINISHED WITH THREE (3) COATES OF SPECKLING, SANDED AND LEFT IN A PAINT READY CONDITION
6. WHERE APPLICABLE LEVEL ALL EXISTING FLOORS AS REQUIRED TO RECEIVE NEW FLOOR FINISHES. INSTALL REQUIRED TRANSITION PIECES BETWEEN VARIOUS FLOOR FINISHES SUITABLE FOR CONDITIONS AND ACCEPTABLE TO THE OWNER. MATCH EXISTING WHEREVER POSSIBLE.
7. ALL DEMOLITION TO BE COORDINATED WITH OWNER'S ACTIVITIES AND SCHEDULE.
8. ALL SURFACES, SYSTEMS, FURNITURE AND FINISHES TO REMAIN SHALL BE PROTECTED AGAINST DAMAGE - REFER TO SPEC BOOK.
9. REMOVE ALL DASHED WALLS AND DOORS. G.C. RESPONSIBLE FOR FIELD VERIFYING ALL NEW OPENING SIZES & LOCATIONS.
10. COORDINATE WITH PLUMBING, HVAC & ELECTRICAL CONTRACTORS FOR ANY SLAB REMOVAL. REFER TO NEW FLOOR PLAN, PLUMBING, HVAC & ELECTRICAL PLANS.
11. REFER TO MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS FOR FURTHER DEMO INSTRUCTIONS.

ELECTRICAL DEMOLITION NOTES:

1. REMOVE LIGHTING AND SWITCHES WHERE WALLS AND CEILINGS ARE CALLED TO BE REMOVED. REFER TO CLEAR SOLUTIONS FOR LOCATIONS OF NEW LIGHTING AND SWITCHES, REUSE EXISTING CIRCUITS AS REQ'D.
2. REMOVE RECEPTACLES IN AREAS WHERE WALLS ARE CALLED TO BE REMOVED. REFER TO CLEAR SOLUTIONS FOR LOCATIONS OF NEW POWER, REUSE EXISTING CIRCUITS AS SHOWN. DEMOLITION NOTES CONTINUED:

PROPOSED FLOOR PLAN LEGEND:

INDICATES EXISTING 8" MASONRY WALL.

INDICATES EXISTING 2x4 DF-L#2 STUD WALL W/ (E) BRICK VENEER

INDICATES 2x6 DF-L #2 STUD WALL INFILL

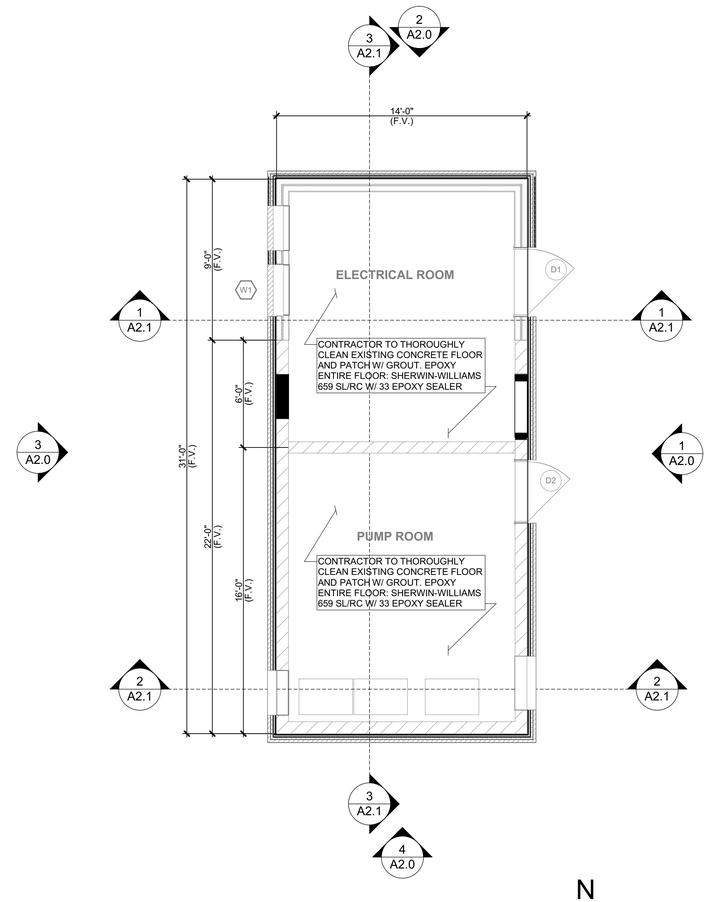
INDICATES STONE VENEER.

DOOR SCHEDULE								
ID	ROOM NAME	WIDTH	HEIGHT	MATERIAL	TYPE	HARDWARE SET	FIRE	REMARKS
D1	ELECTRICAL ROOM	3'-8"	6'-10"	ALUM / GLASS	F	See Notes	1 hour	(F.V.)
D2	PUMP ROOM	3'-4"	6'-10"	ALUM / GLASS	F	See Notes	1 hour	(F.V.)
D3	ELECTRICAL ROOM	3'-4"	6'-10"	<Undefined>		Undefined	<Undefined>	TO BE REMOVED

HARDWARE SET NOTES

(E) Insulated Metal Door W/Weather Stripping (F.V.) - Remove existing hardware and replace as req'd. Both doors keyed alike.

Qty.	Description	Mfr.	Model No.	Finish
1	Push Bar w/IC Cylinder	Falcon	F-CD25-R	Dull Chrome 26D
1	Lever Trim w/IC Cylinder	Falcon	510L	Dull Chrome 26D
1	Closer	Falcon	SC70	Dull Chrome 26D
3	4.5 x 4.5 BB Hinges	McKinney	TA2714	Dull Chrome 26D
1	Kick Plates 8" x 34"	Trimco	K0050	630 Stainless St.
1	Wall Stop	Trimco	1270WV	630 Stainless S



PROPOSED FLOOR PLAN

1/4" = 1'-0"

N

ISSUE	
2	ISSUE FOR PERMIT
3	ISSUE FOR BID

PRINT DATE
03/14/2023

DRAWN BY: McE
CHECKED BY: SM

PROJECT #
1016.22

McClendon Engineering Inc
1412 W. Idaho Street
Suite 240
Boise, Idaho 83702
Tel: 208.342.2919
Fax: 208.331.4568

PROFESSIONAL ENGINEER, STRUCTURAL
LICENSED
10722
03/14/23
STATE OF IDAHO
SARAH C. McCLENDON

PROJECT

DAVIS BEACH INTAKE STATION

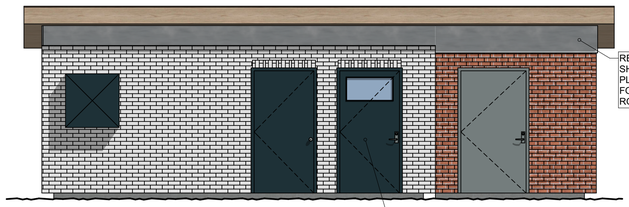
MCCALL, IDAHO 83638

SHEET #

A1.0

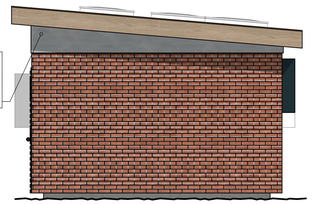
EXISTING & PROPOSED
FLOOR PLANS

PRINT DATE : Wednesday, March 15, 2023 5:34 PM



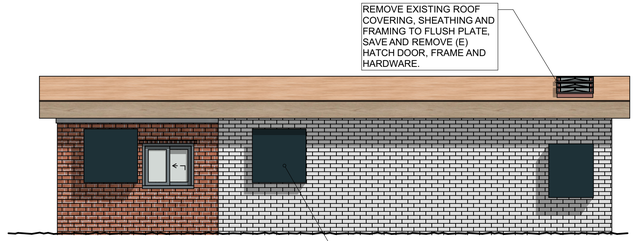
A A2.0 (E) EAST ELEVATION

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



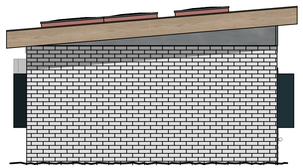
B A2.0 (E) NORTH ELEVATION

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



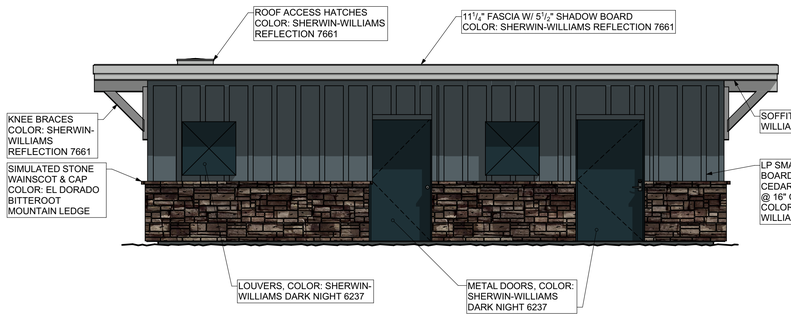
C A2.0 (E) WEST ELEVATION

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



D A2.0 (E) SOUTH ELEVATION

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



1 A2.0 EAST ELEVATION

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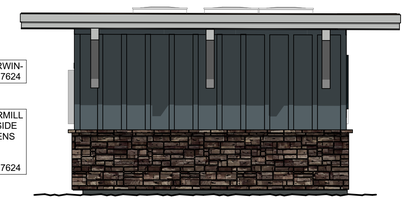
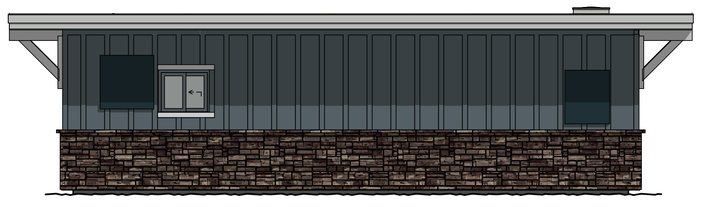


2 A2.0 NORTH ELEVATION

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



3 A2.0 WEST ELEVATION

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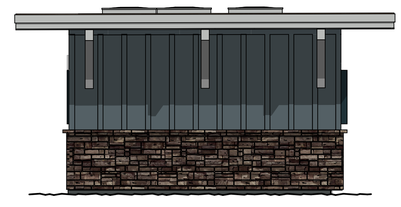

4 A2.0 SOUTH ELEVATION

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

ISSUE

2	ISSUE FOR PERMIT
3	ISSUE FOR BID

PRINT DATE
03/14/2023

DRAWN BY: McE
CHECKED BY: SM

PROJECT #
1016.22

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PROFESSIONAL ENGINEER STRUCTURAL LICENSED 10722 03/14/23 STATE OF IDAHO SARAH C. McCLENDON

PROJECT

DAVIS BEACH INTAKE STATION

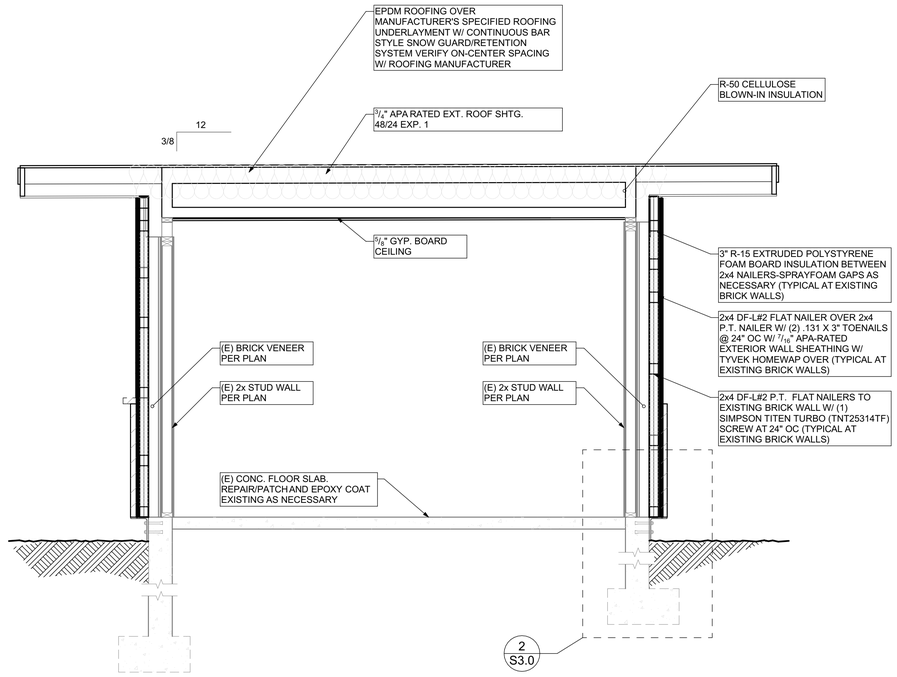
MCCALL, IDAHO 83638

SHEET #

A2.0

EXISTING & PROPOSED ELEVATIONS

PRINT DATE : Wednesday, March 15, 2023 5:34 PM



1 A2.1 BUILDING SECTION

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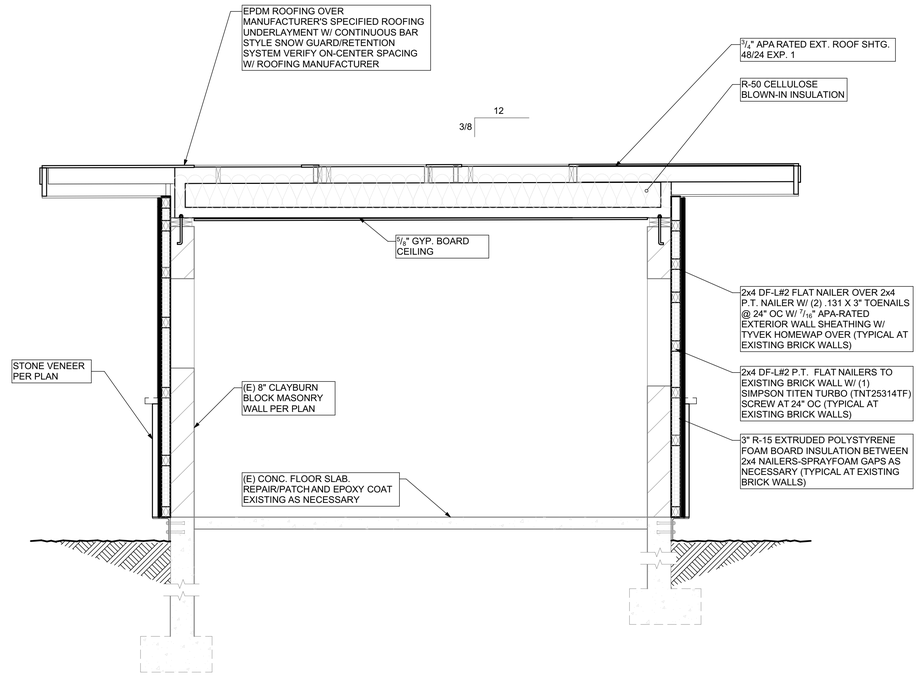

2 A2.1 BUILDING SECTION

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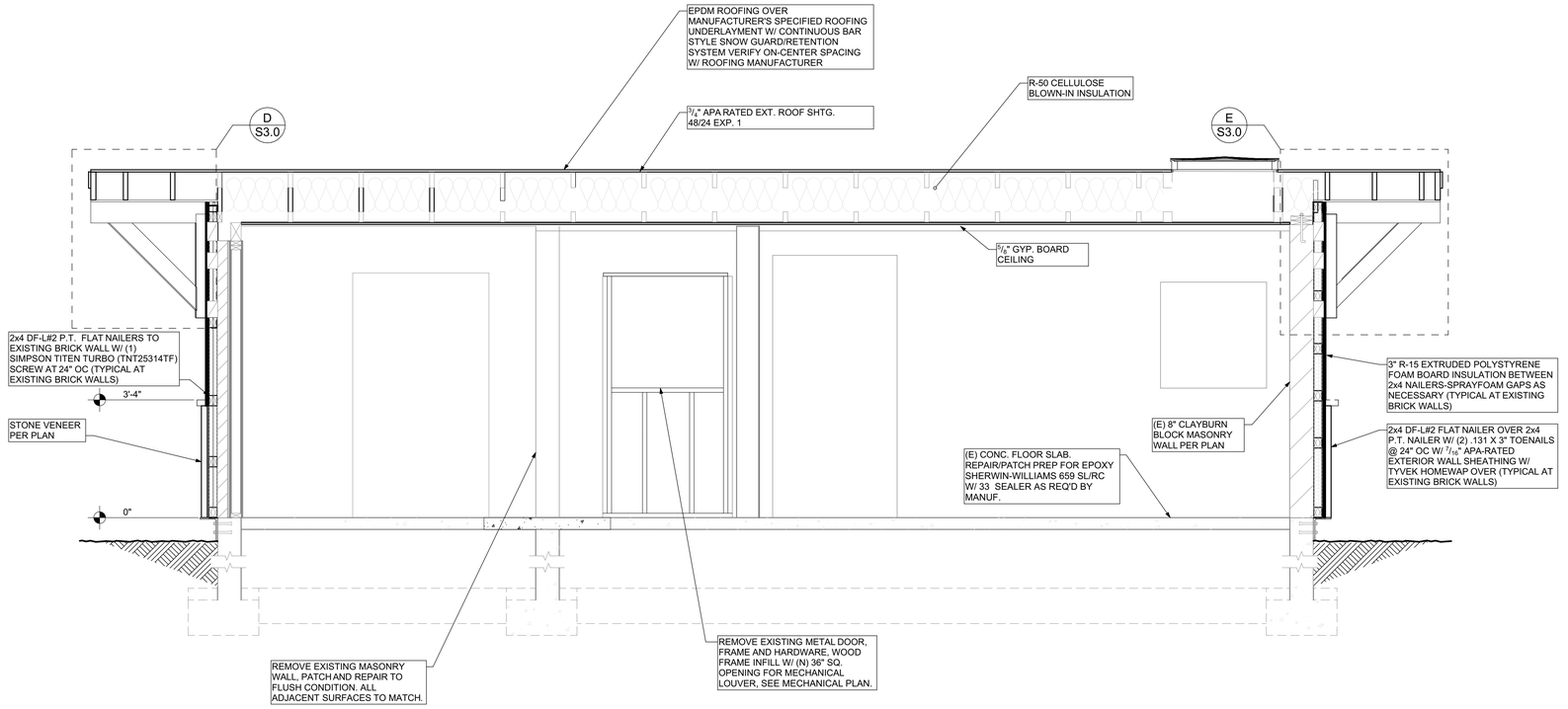

3 A2.1 BUILDING SECTION

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PRINT DATE : Wednesday, March 15, 2023 5:34 PM

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SHEET #

A2.1

BUILDING & WALL SECTIONS

GENERAL NOTES:

A. CONSTRUCTION DOCUMENTS:
1. THE CONTRACTOR SHALL REVIEW THE APPROVED CONSTRUCTION DOCUMENTS AND NOTIFY THE ENGINEER OF ANY ERRORS OR DISCREPANCIES PRIOR TO THE START OF CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR USING QUALIFIED SUB CONTRACTORS EXPERIENCED IN THIS TYPE OF CONSTRUCTION.
3. THE CONTRACTOR SHALL FURNISH AND INSTALL EVERYTHING REQUIRED TO PROVIDE A COMPLETE STRUCTURE AS SHOWN HEREIN. IF THERE IS AN OMISSION ON THE PLANS, SUCH OMISSION SHALL NOT BE CONSTRUED TO MEAN THAT THE CONTRACTOR IS NOT REQUIRED TO FURNISH OR PROVIDE EVERYTHING THAT IS NECESSARY TO COMPLETE THE PROJECT TO THE MINIMUM REQUIREMENTS OF THE 2018 INTERNATIONAL BUILDING CODE AND ALL OTHER SPECIFICATIONS, CODES AND STANDARDS NOTED ON THE APPROVED CONSTRUCTION DOCUMENTS.
4. THE CONTRACTOR SHALL NOTIFY THE OWNER IMMEDIATELY IF ANY UNIDENTIFIED EXISTING UNDERGROUND UTILITIES ARE DISCOVERED. THE ENGINEER IS NOT RESPONSIBLE FOR THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES WHETHER OR NOT SHOWN ON THE DRAWINGS.
5. THE APPROVED STRUCTURAL DRAWINGS ARE PART OF THE OVERALL CONSTRUCTION DOCUMENT SET AND SHALL BE REFERENCED IN CONJUNCTION WITH OTHER APPROVED CONSTRUCTION DOCUMENTS INCLUDING, BUT NOT LIMITED TO, CIVIL, ARCHITECTURAL, MECHANICAL, ELECTRICAL, LANDSCAPE AND GEOTECHNICAL DOCUMENTS.
   a. SEE ARCHITECTURAL DRAWINGS FOR THE FOLLOWING: HORIZONTAL AND VERTICAL DIMENSIONS NOT SHOWN ON THE STRUCTURAL PLANS. SIZE AND LOCATIONS OF DOOR AND WINDOW OPENINGS. SIZE AND LOCATIONS OF ROOF AND FLOOR OPENINGS. SIZE AND LOCATIONS OF INTERIOR NON-BEARING AND NON STRUCTURAL WALLS. CEILING ASSEMBLIES; WALL, FLOOR AND ROOF FINISHES; AND HANDRAILS.
   b. SEE MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS FOR THE FOLLOWING: SIZE AND LOCATION OF PIPES, SLEEVES, AND DUCT PENETRATIONS. EQUIPMENT SIZES AND LOCATION. EQUIPMENT CURBS AND MOUNTING BRACKETS OR ANCHORS.
   c. SEE CIVIL, GEOTECHNICAL, OR LANDSCAPE DRAWINGS AND REPORTS FOR THE FOLLOWING: SITE TOPOGRAPHY, EXCAVATION AND COMPACTION REQUIREMENTS, FINISH GRADE SLOPE AND DRAINAGE, AND SITE ELEVATION.
6. THE STRUCTURAL DRAWINGS REPRESENT THE FINISHED STRUCTURE. THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT ARE NOT LIMITED TO, BRACING AND/OR SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. CONTRACTOR AT HIS/HER OWN EXPENSE SHALL ENGAGE PROPERLY QUALIFIED PERSONS TO DESIGN BRACING, SHORING, ETC. OBSERVATION VISITS TO THE SITE BY THE ENGINEER SHALL NOT INCLUDE OBSERVATION OF THE ABOVE NOTED ITEMS.
7. UNDER NO CIRCUMSTANCES CAN STRUCTURAL COMPONENTS BE SUBSTITUTED, OMITTED, SPLICED, OR ALTERED FROM THE APPROVED SET OF CONSTRUCTION DOCUMENTS WITHOUT WRITTEN APPROVAL FROM THE ENGINEER.

B. DIMENSIONS AND NOTATIONS:
1. WRITTEN DIMENSIONS SHALL TAKE PRECEDENCE OVER SCALED DIMENSIONS. DO NOT SCALE DRAWINGS.
2. FOR ANY MISSING DIMENSIONS REFER TO THE ARCHITECTURAL DRAWINGS OR THE DRAWINGS OF APPLICABLE TRADE.
3. ABBREVIATIONS USED ON THE APPROVED CONSTRUCTION DOCUMENTS SHALL BE CONSIDERED TYPICAL ABBREVIATIONS FOR THE INDUSTRY. THE CONTRACTOR SHALL BE RESPONSIBLE TO NOTIFY THE ENGINEER IMMEDIATELY OF ANY ABBREVIATIONS THAT ARE UNKNOWN TO THE CONTRACTOR.

C. TYPICAL NOTES AND DETAILS:
1. SPECIFIC NOTES AND DETAILS SHALL TAKE PRECEDENCE OVER STANDARD TYPICAL NOTES AND DETAILS.
2. STANDARD TYPICAL NOTES AND DETAILS ARE TO BE USED WHEN REFERRED TO OR WHEN NO OTHER MORE RESTRICTIVE OR DIFFERENT DETAILS ARE SHOWN ON THE DRAWINGS.
3. WORK NOT PARTICULARLY SHOWN OR SPECIFIED SHALL BE THE SAME AS SIMILAR PARTS THAT ARE SHOWN OR SPECIFIED.

D. SHOP DRAWINGS (DEFERRED SUBMITTALS):
1. SHOP DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER IN A TIMELY FASHION PRIOR TO FABRICATION AND CONSTRUCTION. UNLESS OTHERWISE STATED, A MINIMUM OF 5 WORKING DAYS AFTER RECEIPT OF SHOP DRAWINGS SHALL BE CONSIDERED AN ACCEPTABLE TIME PERIOD FOR THE STRUCTURAL ENGINEER REVIEW PROCESS.
2. A MINIMUM OF (2) HARD COPY SETS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW. THE STRUCTURAL ENGINEER WILL MAINTAIN (1) SET FOR REFERENCE PURPOSES. THE CONTRACTOR SHALL MAINTAIN (1) SET AT THE JOB SITE DURING THE DURATION OF CONSTRUCTION.
3. CONTRACTOR SHALL REVIEW AND STAMP SHOP DRAWINGS PRIOR TO SUBMISSION TO THE STRUCTURAL ENGINEER. CONTRACTOR SHALL REVIEW FOR COMPLETENESS AND COMPLIANCE WITH CONTRACT DOCUMENTS.
4. SHOP DRAWINGS ARE NOT A PART OF THE CONSTRUCTION DOCUMENTS. THE STRUCTURAL ENGINEER REVIEW DOES NOT GIVE PERMISSION TO DEVIATE FROM THE APPROVED CONSTRUCTION DOCUMENTS. WHERE THE SHOP DRAWINGS AND THE CONSTRUCTION DOCUMENTS DIFFER, THE MORE STRICT OF THE TWO SHALL GOVERN UNLESS WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER PERMITS OTHERWISE.

E. INSPECTIONS, SPECIAL INSPECTIONS, AND SITE VISITS (STRUCTURAL OBSERVATIONS):
1. INSPECTIONS BY THE BUILDING OFFICIAL ARE REQUIRED FOR CONSTRUCTION WORK FOR WHICH A PERMIT IS REQUIRED PER SECTION 110 OF THE IBC. CONTRACTOR IS REQUIRED TO COORDINATE AND SCHEDULE ALL REQUIRED INSPECTIONS WITH THE BUILDING OFFICIAL. INSPECTIONS PRESUMING TO GIVE AUTHORITY TO VIOLATE OR CANCEL PROVISIONS OF THE IBC OR OF OTHER ORDINANCES OF THE JURISDICTION SHALL NOT BE VALID.
2. SPECIAL INSPECTIONS ARE IN ADDITION TO, AND DO NOT REPLACE, THE INSPECTIONS BY THE BUILDING OFFICIAL PER CHAPTER 17 OF THE IBC. SPECIAL INSPECTIONS SHALL BE PERFORMED BY A QUALIFIED PERSON TO INSPECT AS REQUIRED ON THESE DOCUMENTS THE MATERIALS, INSTALLATION, FABRICATION, ERECTION OR PLACEMENT OF COMPONENTS AND CONNECTIONS REQUIRING SPECIAL EXPERTISE TO ENSURE COMPLIANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS.
3. SITE VISITS OR STRUCTURAL OBSERVATIONS BY THE STRUCTURAL ENGINEER DOES NOT INCLUDE OR WAIVE THE RESPONSIBILITY OF INSPECTIONS OR SPECIAL INSPECTIONS PER SECTION 110 AND CHAPTER 17 OF THE IBC. SITE VISITS ARE NOT CONTINUOUS OR DETAILED. SITE VISITS DO NOT VALIDATE CONTRACTORS PERFORMANCE, MEANS, OR METHODS. SITE VISITS ARE FOR VISUAL OBSERVATION FOR GENERAL CONFORMANCE TO THE APPROVED CONSTRUCTION DOCUMENTS.

F. CODE REQUIREMENTS:
ALL WORK SHALL CONFORM TO THE MINIMUM STANDARDS OF THE FOLLOWING CODES:
1. 2018 INTERNATIONAL BUILDING CODE (IBC)
2. ANY OTHER REGULATING AGENCIES WHICH MAY HAVE AUTHORITY OVER ANY PORTION OF THE WORK, INCLUDING THE STATE OF IDAHO.
3. SPECIFICATIONS, CODES AND STANDARDS NOTED SHALL BE OF THE LATEST APPROVED ISSUE, INCLUDING SUPPLEMENTS, UNLESS NOTED OTHERWISE.
4. CONTRACTOR SHALL BE PROPERLY REGISTERED IN THE STATE OF IDAHO PER IDAHO STATE LAW.
5. ALL STRUCTURAL MATERIAL MUST HAVE CURRENT ICC-ES REPORTS AVAILABLE UPON REQUEST TO PROVE CODE APPROVAL & INDUSTRY TOLERANCES.

DESIGN CRITERIA:

A. 2018 INTERNATIONAL BUILDING CODE (IBC).
1. RISK CATEGORY: IV
2. NATURE OF OCCUPANCY: VACANT/UTILITY

B. DESIGN LOADS:
1. ROOF:
   a. LIVE LOAD = 120 PSF (SNOW)
   b. DEAD LOAD = 18 PSF

C. IBC SEISMIC DESIGN:
1. SEISMIC DESIGN CATEGORY: D
2. IMPORTANCE FACTOR I_E = 1.5
3. SOIL SITE CLASS: D-DEFAULT
4. SEISMIC COEFFICIENTS:
   S_{DS} = 0.410
   S_{D1} = 0.211
5. RESPONSE MODIFICATION: R= 3.5
   SEISMIC FORCE RESISTING SYSTEM: INTERMEDIATE MASONRY SHEAR WALLS

D. IBC WIND LOAD:
1. BASIC DESIGN WIND SPEED = 105 MPH
2. EXPOSURE = C
3. ANALYSIS METHOD= SIMPLE DIAPHRAGM

FOUNDATIONS:

A. MAXIMUM ALLOWABLE FOUNDATION SOIL BEARING PRESSURE:
1. 1500 PSF (DEAD + LIVE LOAD)
2. 2500 PSF (GRAVITY + LATERAL LOAD)

B. THE BOTTOM OF ALL EXTERIOR FOOTINGS SHALL BE 24 INCHES MINIMUM BELOW ADJACENT FINISHED GRADE.

C. THE INTERIOR FOOTINGS SHALL BE 12 INCHES MINIMUM BELOW FINISH FLOOR, U.N.O.

D. STRUCTURAL BACKFILL SHALL BE COMPACTED TO 95 PERCENT OF THE MAXIMUM DENSITY AS DETERMINED BY ASTM D1557. BRACE WALLS AND PIERS AS REQUIRED DURING BACKFILLING OPERATIONS.

E. PRIOR TO CONSTRUCTION, CONTRACTOR SHALL COORDINATE THE CONSTRUCTION DOCUMENTS, INCLUDING THE STRUCTURAL DRAWINGS, WITH THE GEOTECHNICAL REPORT. ANY DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE STRUCTURAL ENGINEER.

F. DEFINITIONS:
1. STRUCTURAL WALLS - ANY LOAD BEARING WALL, SHEAR WALL, AND ANY WALL THAT REQUIRES A FOOTING.

CONCRETE:

A. REFERENCE STANDARDS:
1. ALL CONCRETE WORK SHALL CONFORM TO THE LATEST EDITION OF ACI 301
2. ALL CONCRETE SHALL BE NORMAL WEIGHT CONCRETE
3. CONCRETE MIX DESIGN SHALL BE ESTABLISHED IN ACCORDANCE WITH CHAPTERS 19 AND 26 OF ACI 318
4. USE LATEST EDITION OF ACI 306R WHEN CONCRETING DURING COLD WEATHER

B. DEFERRRED SUBMITTALS:
1. SUPPLY PRODUCT DATA FOR PROPRIETARY MATERIALS AND ITEMS, INCLUDING REINFORCEMENT AND FORMING ACCESSORIES, ADMIXTURES, PATCHING COMPOUNDS, JOINT SYSTEMS, CURING COMPOUNDS AND OTHERS.
2. SHOP DRAWINGS FOR REINFORCEMENT DETAILING, FABRICATING, FOR BENDING, AND PLACING OF CONCRETE REINFORCEMENT SHALL COMPLY WITH ACI 315, MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES. BAR SCHEDULES, STIRRUP SPACING, BENT BAR DIAGRAMS, AND ARRANGEMENT OF CONCRETE REINFORCEMENT SHALL BE SHOWN. INCLUDE SPECIAL REINFORCING REQUIRED FOR OPENINGS THROUGH CONCRETE STRUCTURES.

C. FORMWORK AND FINISHES:
1. FORMWORK: DESIGN, ERECT, SUPPORT, BRACE AND MAINTAIN FORMWORK TO SUPPORT VERTICAL, LATERAL, STATIC AND DYNAMIC LOADS THAT MIGHT BE APPLIED UNTIL STRUCTURE CAN SUPPORT SUCH LOADS.
2. FINAL SLAB SURFACES SHALL RECEIVE A MACHINED STEEL TROWEL FINISH.
3. ANY PROJECTING CORNERS OF COLUMNS, BEAMS, WALLS, PEDESTALS, ETC SHALL BE FORMED WITH A 3/4 INCH CHAMFER.
4. DRY PACK, OR USE NON-SHRINK GROUT, UNDER BASE PLATES, BEARING PLATES, OR SILL PLATES AS REQUIRED FOR A LEVEL AND UNIFORM BEARING SURFACE. MINIMUM GROUT STRENGTH SHALL BE f'c = 7000 PSI, U.N.O.
5. SEPARATE SLABS-ON-GRADE FROM VERTICAL SURFACES WITH JOINT FILLER.

D. MIX DESIGN, STRENGTH, AND ADMIXTURES:
1. 28-DAY COMPRESSIVE STRENGTHS (f'c):
   a. FOUNDATION STEM WALLS = 3500 PSI
   b. FOOTINGS = 3500 PSI
   c. INTERIOR SLABS-ON-GRADE = 4000 PSI
2. CEMENT II OR I/II PER ASTM C-150
3. MAXIMUM SLUMP:
   a. PRIOR TO ADDITION OF WATER-REDUCING ADMIXTURE = 4"
   b. WITH ADDITION OF WATER-REDUCING ADMIXTURE= 10"
4. MAXIMUM SIZE COARSE AGGREGATE: 3/4 INCHES (PER ASTM C-33)
5. APPROVED ADMIXTURES:
   a. FLYASH PER ASTM C-618
   b. AIR ENTRAINING PER ASTM C-260
   c. WATER REDUCING PER ASTM C-494

E. REINFORCEMENT:
1. REINFORCEMENT FOR CONCRETE:
   a. ALL REINFORCING SHALL BE SUPPORTED IN FORMS SPACED WITH NECESSARY ACCESSORIES AND SHALL BE SECURELY WIRED TOGETHER IN ACCORDANCE WITH THE LATEST EDITION OF THE CRSI "MANUAL OF STANDARD PRACTICE"
   b. DEFORMED BARS - ASTM A615, GRADE 60
   c. WELDED WIRE REINFORCEMENT (WWR):
      · PLAIN WIRE - ASTM A1064
      · DEFORMED WIRE - ASTM A1064
      · USE FLAT MATS ONLY. NO ROLLED WWR IS PERMITTED.
2. MINIMUM REINFORCEMENT LAP = 40 BAR DIAMETERS
3. MINIMUM WWR LAP = GRID SPACING PLUS 2 INCHES
4. MINIMUM CONCRETE COVER OVER REINFORCEMENT:
   a. CONCRETE CAST AGAINST EARTH = 3"
   b. CONCRETE EXPOSED TO EARTH OR WEATHER = 1 1/2"
   c. CONCRETE NOT EXPOSED TO EARTH OR WEATHER = 3/4"
5. SLAB-ON-GRADE REINFORCEMENT SHALL BE PLACED AT THE MID-DEPTH OF THE SLAB.

F. COORDINATION:
1. COORDINATE ALL UNDER-SLAB MATERIAL SUCH AS VAPOR BARRIER, INSULATION, AND SUB-BASE WITH ARCHITECTURAL AND GEOTECHNICAL CONSTRUCTION DOCUMENTS. WHERE DOCUMENTS CONFLICT OR DIFFER, THE MORE STRICT OF THE TWO SHALL GOVERN UNLESS WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER PERMITS OTHERWISE.
2. COORDINATE CONCRETE SURFACE FINISHING WITH ARCHITECTURAL FINISH MATERIALS.
3. REPAIR OR REPLACE DEFECTIVE CONCRETE AS DIRECTED BY THE ARCHITECT, ENGINEER, OR TESTING AGENCY.
4. COORDINATE ALL JOINT SPACING, LAYOUT, FILLER AND SEALANTS.
5. COORDINATE WITH ARCHITECTURAL ANY FINISH SURFACES THAT REQUIRE MOCK-UPS AND ACCEPTANCE PRIOR TO CONSTRUCTION.
6. COORDINATE WITH REQUIRED INSPECTORS, SPECIAL INSPECTORS, AND STRUCTURAL OBSERVERS FOR FIELD QUALITY CONTROL ITEMS AND SCHEDULE NOTIFICATIONS IN A TIMELY FASHION.

G. DEFINITIONS:
1. PERFORMANCE DESIGN - A SET OF INSTRUCTIONS THAT OUTLINES THE FUNCTIONAL REQUIREMENTS FOR HARDENED CONCRETE DEPENDING ON THE APPLICATION. PERFORMANCE DESIGN DOES NOT INCLUDE REQUIREMENTS FOR MEANS AND METHODS AND DOES NOT PROVIDE LIMITATIONS ON THE INGREDIENTS OR PROPORTIONS OF THE CONCRETE MIXTURE. SUBMITTALS FOR PERFORMANCE DESIGN WOULD NOT BE A DETAILS LIST OF MIXTURE INGREDIENTS BUT RATHER A CERTIFICATION THAT THE MIX WILL MEET THE SPECIFICATION REQUIREMENTS, INCLUDING PRE-QUALIFICATION TEST RESULTS.
2. DURABILITY DESIGN - DURABILITY IS THE ABILITY OF CONCRETE TO RESIST WEATHERING ACTION, CHEMICAL ATTACK, AND ABRASION WHILE MAINTAINING IT'S DESIRED ENGINEERING PROPERTIES.
3. STRENGTH DESIGN- BASED ON THE ULTIMATE COMPRESSIVE STRENGTH OF THE CONCRETE NEEDED TO RESIST THE CALCULATED DESIGN LOADS. ANY ADDITIONAL STRENGTH THAT MAY BE PRESENT DUE TO STEEL REINFORCING IS NOT PERMITTED TO BE INCLUDED IN THE CONCRETE STRENGTH DESIGN.

WOOD:

A. REFERENCE STANDARDS AND GOVERNING AGENCIES:
1. NDS FOR WOOD CONSTRUCTION
2. APA PANEL DESIGN SPECIFICATION
3. AWPA U1 - USE CATEGORY SYSTEM: USER SPECIFICATION FOR TREATED WOOD
4. TPI 1 NATIONAL DESIGN STANDARD FOR METAL PLATE CONNECTED WOOD TRUSS CONSTRUCTION
5. WWPA - WESTERN WOOD PRODUCTS ASSOCIATION

B. DEFERRED SUBMITTALS:
1. ENGINEERED WOOD PRODUCTS:
   a. ANY ALTERNATE PROPRIETARY FRAMING SYSTEM(S) SHALL BE OF THE SAME DEPTH AND LOAD CARRYING CAPACITY AS THE TRUS-JOIST SYSTEM(S) SHOWN ON THE DRAWINGS. ICC REPORTS FOR THE ALTERNATE PROPRIETARY FRAMING SYSTEM(S) SHALL BE SUBMITTED SHOWING TESTING APPROVAL AND MATERIAL STRENGTH EQUIVALENCY.
   b. ALL SUBMITTED ENGINEERED WOOD PRODUCTS CALCULATIONS SHALL BE STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF IDAHO.
2. FABRICATED WOOD TRUSSES:
   a. ALL ROOF TRUSSES SHALL BE DESIGNED, STAMPED, AND SIGNED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF IDAHO.
   b. TRUSS MANUFACTURER SHALL PROVIDE PROOF OF APPROVED THIRD PARTY INSPECTION AS REQUIRED BY THE 2018 IBC, SECTION 1704.2.5.
   c. SUBMIT SHOP DRAWINGS OF PRE MANUFACTURED WOOD TRUSS LAYOUT FOR REVIEW BY THE ENGINEER PRIOR TO FABRICATION. TRUSS DESIGN DRAWINGS AND CALCULATIONS SHALL CONFORM TO THE REQUIREMENTS FROM SECTION 2303.4 OF THE IBC.

C. CARPENTRY
1. WOOD FRAMING MEMBERS SHALL HAVE THE FOLLOWING GRADES, OR BETTER, UNLESS NOTED OTHERWISE (U.N.O.):
   a. BLOCKING: DOUGLAS FIR LARCH NO. 2, OR BETTER
   b. BRIDGING: DOUGLAS FIR LARCH NO. 2, OR BETTER
   c. STUD FRAMING: DOUGLAS FIR LARCH NO. 2, OR BETTER
   d. BEAMS/HEADERS/JOISTS: DOUGLAS FIR LARCH NO. 2, OR BETTER
   e. POSTS/BUILT-UP COLUMNS: DOUGLAS FIR LARCH NO. 2, OR BETTER
   f. TOP AND BOTTOM PLATES: DOUGLAS FIR LARCH NO. 2, OR BETTER
2. MAXIMUM MOISTURE CONTENT OF ALL LUMBER AT THE TIME OF CLOSURE SHALL BE 19%.
3. SPLICING OF WOOD MEMBERS, UNLESS SHOWN ON THE DRAWINGS, IS PROHIBITED WITHOUT WRITTEN APPROVAL OF THE PROJECT ENGINEER.
4. HOLES MAY BE DRILLED IN JOIST/BEAM IF SPECIFICALLY INDICATED ON THESE DRAWINGS. ANY OTHER HOLES OR NOTCHES ARE NOT ALLOWED.
5. ALL WOOD IN CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESSURE TREATED OR REDWOOD.

D. PANEL SHEATHING:
1. STRUCTURAL WOOD SHEATHING AS SPECIFIED ON THESE DRAWINGS AT ROOF/FLOOR DIAPHRAGMS, SHEAR WALLS, AND BUILT-UP BLOCKING LOCATIONS SHALL BE STAMPED WITH THE SPECIFIED APA RATING.
2. STRUCTURAL WOOD SHEATHING MAY BE EITHER PLYWOOD OR ORIENTED STRAND BOARD (OSB) AS LONG AS THE PANEL MEETS OR EXCEEDS THE CRITERIA LISTED BELOW.
3. WALL SHEATHING SHALL BE, U.N.O.:
   a. THICKNESS: MATCH EXISTING
   b. NAILING: 8d @ 6" O.C.
   c. BLOCKED AT ALL UNSUPPORTED EDGES
   d. MAXIMUM DISTANCE BETWEEN SUPPORT MEMBERS: 16"
4. ROOF SHEATHING SHALL BE, U.N.O.:
   a. THICKNESS: PER PLAN
   d. NAILING: PER PLAN
   e. PLY CLIPS AT ALL UNSUPPORTED EDGES
   f. MAXIMUM DISTANCE BETWEEN SUPPORT MEMBERS: 24"

E. ACCESSORIES AND FASTENERS:
1. ALL WOOD CONNECTORS SHALL BE SIMPSON STRONG-TIE OR APPROVED EQUAL AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
2. NAILING SHALL BE IN ACCORDANCE WITH THE 2018 IBC TABLE 2304.10.1, UNLESS NOTED OTHERWISE.
3. NAILS SHALL BE COMMON WIRE NAILS (EXCEPT 16d NAILS MAY BE BOX WIRE NAILS).
4. METAL FINISH MATERIAL:
   a. HIGH HUMIDITY AND PRESERVATIVE TREATED WOOD LOCATIONS: HOT DIPPED GALVANIZED STEEL PER ASTM A 153.
   b. INTERIOR AND DRY LOCATIONS: STANDARD PAINTED OR ZINC GALVANIZED COATING.

F. DEFINITIONS:
1. APA RATED SHEATHING: A COMMON TRADE NAME THAT APPLIES TO A GRADE OR PANEL FOR USE AS SUBFLOORING, WALL SHEATHING, AND ROOF SHEATHING. PANELS ARE MADE WITH RESIN ADHESIVES THAT PROVIDE A MOISTURE RESISTANT BOND AND ARE DESIGNATED AS: EXPOSURE 1. PANELS CAN BE MANUFACTURED AS EITHER: PLYWOOD OR OSB.
2. APA STRUCTURAL 1 RATED SHEATHING: A SPECIAL SHEATHING GRADE DESIGNED FOR USE WHERE SHEAR AND/OR CROSS PANEL STRENGTH PROPERTIES ARE OF MAXIMUM IMPORTANCE. PANELS ARE MADE WITH RESIN ADHESIVES THAT PROVIDE A MOISTURE RESISTANT BOND AND ARE DESIGNATED AS: EXPOSURE 1. PANELS CAN BE MANUFACTURED AS EITHER: PLYWOOD OR OSB.

MASONRY:

A. REFERENCE STANDARDS:
1. ACI 530 - SPECIFICATION FOR MASONRY STRUCTURES

B. DEFERRED SUBMITTALS:
1. SUPPLY PRODUCT DATA FOR PROPRIETARY MATERIALS AND ITEMS INCLUDING REINFORCEMENT AND FORMING ACCESSORIES, ADMIXTURES, PATCHING COMPOUNDS, JOINT SYSTEMS, CURING COMPOUNDS AND OTHERS.
2. SHOP DRAWINGS FOR TYPICAL MASONRY WALL REINFORCEMENT DETAILING, FABRICATING, BENDING, AND PLACING SHALL COMPLY WITH THE LATEST EDITION OF THE ACI 315, MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES.
3. SHOP DRAWINGS FOR MASONRY WALL OPENING AND CORNER BAR SCHEDULES, STIRRUP SPACING, BENT BAR DIAGRAMS, AND ARRANGEMENT OF MASONRY REINFORCEMENT SHALL BE SHOWN.

C. MORTAR AND GROUT:
1. WALLS SHALL BE:
   a. PARTIAL GROUTED - GROUT ALL REINFORCED CELLS
2. MORTAR:
   a. ASTM C270 FOR JOB MIXED MORTAR
   b. TYPE S, COMPRESSIVE STRENGTH = 2000 PSI
3. GROUT:
   a. ASTM C476, 28-DAY COMPRESSIVE STRENGTH = 2000 PSI
   b. MAXIMUM GROUT LIFT WITHOUT CLEANOUTS: 60"
4. GROUT SHALL BE A WORKABLE MIXTURE SUITABLE FOR PUMPING WITHOUT SEGREGATION AND SHALL BE THOROUGHLY MIXED.
5. GROUT SHALL BE CONSOLIDATED BY PUDDLING OR MECHANICAL VIBRATION DURING PLACING AND SHALL BE RECONSOLIDATED AFTER EXCESS MOISTURE HAS BEEN ABSORBED, BUT BEFORE WORKABILITY IS LOST.
6. GROUTING OF ANY WALL SHALL BE COMPLETED IN ONE DAY WITH NO INTERRUPTIONS OF MORE THAN ONE HOUR.

D. REINFORCEMENT AND ANCHORAGE:
1. WALL REINFORCEMENT:
   a. ASTM A615, DEFORMED, GRADE 60.
   b. Frs = 32,000 PSI
   c. MINIMUM REINFORCEMENT LAP = 48 BAR DIAMETERS, U.N.O.
2. ALL REINFORCING SHALL BE PLACED PRIOR TO GROUTING.
3. VERTICAL BARS SHALL BE HELD IN POSITION AT THEIR TOP AND BOTTOM AND AT INTERVALS OF NOT MORE THAN 200 BAR DIAMETERS.
   a. NO "STABBING - IN" OF REINFORCING IS PERMITTED AFTER GROUT HAS BEEN PLACED.
4. TYPICAL VERTICAL REINFORCEMENT, U.N.O
   a. 8 INCH CMU WALLS:
      · (1) #5 @ 32" - FULL HEIGHT AT ALL WALLS, UNO
      · (2) #5 @ EACH END OF EACH WALL
      · (2) #5 @ EACH SIDE OF EACH WALL OPENING JAM (CONT. FROM FOOTING TO TOP OF WALL, LAP WALL REINFORCING WITH FOOTING DOWEL AS REQUIRED) U.N.O.
5. TYPICAL HORIZONTAL REINFORCEMENT, U.N.O
   a. 8 INCH CMU WALLS:
      · (1) #5 @ 48" O.C. - MAXIMUM, UNO
      · (2) #5 @ ROOF DIAPHRAGM LEVEL (OR TOP COURSE)
      · (2) #5 @ FLOOR DIAPHRAGM LEVEL(S)
      · (1) #5 TOP & BOTTOM @ EA WALL OPENING(EXTEND REINFORCING 24" BEYOND EACH SIDE OF OPENING, U.N.O.)
      · PROVIDE (1) #5 HORIZONTAL CORNER BAR AT ALL WALL CORNERS AT ALL BOND BEAM LEVELS. LAP CORNER BARS WITH TYPICAL HORIZONTAL REINFORCEMENT, AND DEVELOP 48 BAR DIAMETERS IN BOTH DIRECTIONS FROM CORNER.

E. CONCRETE MASONRY UNITS (CMU):
1. ASTM C90
2. WALL COMPRESSIVE STRENGTH: (f'm)=1500 PSI
3. UNIT COMPRESSIVE STRENGTH = 1900 PSI
4. WEIGHT CLASSIFICATION: MEDIUM WEIGHT
5. PROVIDE GRADE N, TYPE 1, MOISTURE CONTROLLED UNITS
   a. 8" NOMINAL (16"x8"x8")
      7 $^5/_8$" ACTUAL (15$^5/_8$" x 7$^5/_8$" x 7$^5/_8$")
6. LAYING CMU WALLS:
   a. BOND PATTERN: ONE-HALF RUNNING BOND
   b. LAY WALLS WITH 3/8 INCH JOINTS
   c. TOOL JOINTS SLIGHTLY CONCAVE

F. BRICK UNITS:
1. BRICK CLAY VENEER: ASTM C216 OR C652, GRADE SW, TYPE FBX.
2. MORTAR: ASTM C270, TYPE S, MINIMUM COMPRESSIVE STRENGTH OF 1800 PSI AT 28 DAYS.
3. BRICK VENEER TIES: USE 'DUR-O-WAL-D/A213 HOT DIPPED GALVANIZED W/ $^3/_{16}$" WIRE PINTLE. INSTALL @ 4" VENEERS SPACED @ 16" O.C. MAX VERTICAL AND 24" O.C. MAX HORIZONTAL. USE (2)-D/A807 CO-POLYMER COATED SCREWS OR (2) 10d COATED NAILS PER ANCHOR.

G. COORDINATION:
1. COORDINATE COURSING PATTERNS AND TOOLED JOINTS WITH ARCHITECTURAL.
2. COORDINATE LOCATIONS OF CONTROL JOINTS WITH OPENINGS, WALL CORNERS, AND ARCHITECTURAL.
3. COORDINATE MASONRY REINFORCEMENT LAPS WITH FOUNDATION REINFORCEMENT.
4. COORDINATE MASONRY REINFORCEMENT ANCHORAGE WITH FLOOR/ROOF ANCHORAGE.
5. COORDINATE ANY AND ALL MOCK-UP PANELS REQUIRED PER ARCHITECTURAL.

H. DEFINITIONS:
1. VENEER - RELATIVELY THIN MASONRY THAT IS EITHER ADHERED OR ANCHORED TO THE MAIN STRUCTURAL WALL SYSTEM. VENEER IS PART OF THE WALL FINISH SYSTEM BUT IS NOT CONSIDERED TO ADD LOAD RESISTING CAPACITY TO THE STRUCTURAL WALL.

SPECIAL INSPECTION STATEMENT:

A. TO BE USED IN CONJUNCTION WITH CHAPTER 17 OF THE 2018 IBC

POST INSTALLED ANCHORS IN CONCRETE:

A. POST INSTALLED EXPANSION OR EPOXY ANCHORS SHALL BE PREAPPROVED BY THE STRUCTURAL ENGINEER PRIOR TO CONSTRUCTION UNLESS SPECIFICALLY DETAILED ON THE DRAWINGS.

B. HOLES MUST BE DRILLED AND CLEANED PER MANUFACTURER'S INSTRUCTIONS. ANCHORS MUST BE INSTALLED AND SPECIAL INSPECTED PER MANUFACTURER'S INSTRUCTIONS.

C. ANCHORS SHALL NOT BE INSTALLED WITHIN 1 ½" OF MASONRY HEAD JOINTS.

D. IF NO OTHER MORE STRICT SPECIFICATION IS DETAILED THEN THE EPOXY USED SHALL BE: SIMPSON 'SET-XP' AND INSTALLED PER MANUFACTURER'S INSTRUCTIONS. USE A SIMPSON 'IXP' ANCHOR, THREADED ROD, OR REBAR AS APPLICABLE.

E. UNDER NO CIRCUMSTANCES WILL AN EXPANSION BOLT AND/OR EPOXY SYSTEM BE APPROVED WITHOUT A CURRENT ICC ES REPORT THAT MEETS THE REQUIREMENTS OF THE GOVERNING JURISDICTION AND IS IN ACCORDANCE WITH ACI 318 AS ADOPTED BY THE IBC.

SPECIAL INSPECTION PROGRAM:

A. THE OWNER SHALL EMPLOY AN APPROVED AGENCY FOR SPECIAL INSPECTION SERVICES TO PERFORM SPECIAL INSPECTIONS IN ACCORDANCE WITH CHAPTER 17 OF THE IBC.

B. AN APPROVED AGENCY SHALL BE AN ESTABLISHED AND RECOGNIZED AGENCY REGULARLY ENGAGED IN CONDUCTING TESTS OR FURNISHING INSPECTION SERVICES.

C. A SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL SHOW COMPETENCE TO THE SATISFACTION OF THE BUILDING OFFICIAL FOR THE INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION. A SPECIAL INSPECTOR SHALL ALSO DEMONSTRATE A THOROUGH WORKING KNOWLEDGE OF CHAPTER 17 OF THE IBC AS SUMMARIZED BELOW. IF THERE IS ANY OMISSION ON THE SUMMARIZED LIST BELOW, SUCH OMISSION SHALL NOT BE CONSTRUED TO MEAN THAT THE SPECIAL INSPECTOR IS NOT REQUIRED TO INSPECT EVERYTHING THAT IS NECESSARY TO MEET THE MINIMUM REQUIREMENTS OF THE IBC.

D. SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL SUBMIT INSPECTION REPORTS TO THE BUILDING OFFICIAL AND THE ENGINEER FOR REVIEW IN A TIMELY FASHION.

E. SPECIAL INSPECTION REPORTS SHALL INDICATE THAT WORK INSPECTED WAS DONE IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THE DISCREPANCIES ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE BUILDING OFFICIAL AND THE ENGINEER.

SPECIAL INSPECTION:

A. SPECIAL INSPECTION AS HEREIN REQUIRED OF THE FOLLOWING MATERIALS, INSTALLATION, FABRICATION, ERECTION OR PLACEMENT OF COMPONENTS AND CONNECTIONS REQUIRING SPECIAL EXPERTISE TO ENSURE COMPLIANCE WITH APPROVED CONSTRUCTION DOCUMENTS AND REFERENCED STANDARDS.

B. STRUCTURAL OBSERVATION OF THE STRUCTURAL SYSTEM BY THE ENGINEER OF RECORD DOES NOT INCLUDE OR WAIVE THE RESPONSIBILITY FOR THE SPECIAL INSPECTION REQUIRED BY SECTION 110, 1704, 1705, OR OTHER SECTIONS OF THE INTERNATIONAL BUILDING CODE.

C. THE SPECIAL INSPECTION STATEMENT ON THIS SHEET LISTS THE ITEMS THAT REQUIRE SPECIAL INSPECTION AND VERIFICATION, THE CODE SECTION- REFERENCE FOR ADDITIONAL INFORMATION, AND THE REQUIRED FREQUENCY OF INSPECTION.

STRUCTURAL OBSERVATIONS:

A. STRUCTURAL OBSERVATION IS THE VISUAL OBSERVATION OF THE STRUCTURAL SYSTEMS BY A REGISTERED DESIGN PROFESSIONAL FOR GENERAL CONFORMANCE TO THE APPROVED CONSTRUCTION DOCUMENTS.

B. THE STRUCTURAL OBSERVER SHALL BE EITHER THE ENGINEER OF RECORD OR A REGISTERED DESIGN PROFESSIONAL APPROVED BY THE ENGINEER OF RECORD.

C. THE REGISTERED DESIGN PROFESSIONAL RESPONSIBLE FOR STRUCTURAL OBSERVATION, THE CONTRACTOR, AND APPROPRIATE SUBCONTRACTORS SHALL HOLD A PRE-CONSTRUCTION MEETING TO REVIEW THE DETAILS OF THE STRUCTURAL SYSTEMS TO BE STRUCTURALLY OBSERVED.

D. THE REGISTERED DESIGN PROFESSIONAL RESPONSIBLE FOR STRUCTURAL OBSERVATION SHALL SUBMIT SEPARATE WRITTEN OBSERVATION REPORTS FOR EACH REQUIRED SIGNIFICANT CONSTRUCTION STAGE TO BE OBSERVED. THIS WRITTEN REPORT, INCLUDING ANY OBSERVED DEFICIENCIES, SHALL BE SUBMITTED TO THE ENGINEER OF RECORD, THE OWNER'S REPRESENTATIVE, THE CONTRACTOR, AND THE BUILDING OFFICIAL.

S.I. TABLE 6

MASONRY - LEVEL 2: SECTION 1705.4 AND TMS 402 & TMS 602	
REQUIRED VERIFICATION & INSPECTION	FREQUENCY
1. COMPLIANCE WITH REQUIRED INSPECTION PROVISIONS OF THE CONSTRUCTION DOCUMENTS AND THE APPROVED SUBMITTALS SHALL BE VERIFIED	PERIODIC
2. VERIFICATION OF f'm AND f'AAC PRIOR TO CONSTRUCTION AND FOR EVERY 5,000 SQUARE FEET DURING CONSTRUCTION.	PERIODIC
3. VERIFICATION OF PROPORTIONS OF MATERIALS IN PREMIXED OR PREBLENDED MORTAR AND GROUT AS DELIVERED TO THE SITE.	PERIODIC
4. VERIFICATION OF SLUMP FLOW AND VSI AS DELIVERED TO THE SITE FOR SELF-CONSOLIDATING GROUT.	CONTINUOUS
5. THE INSPECTION PROGRAM SHALL VERIFY:	
a. PROPORTIONS OF SITE-PREPARED MORTAR, GROUT AND PRE-STRESSING GROUT FOR BONDED TENDONS	PERIODIC
b. PLACEMENT OF MASONRY UNITS AND CONSTRUCTION OF MORTAR JOINTS	PERIODIC
c. PLACEMENT OF REINFORCEMENT, CONNECTORS AND PRE-STRESSING TENDONS AND ANCHORAGES	PERIODIC
d. GROUT SPACE PRIOR TO GROUTING	CONTINUOUS
e. PLACEMENT OF GROUT	CONTINUOUS
f. PLACEMENT OF PRE-STRESSING GROUT	CONTINUOUS
g. SIZE AND LOCATION OF STRUCTURAL ELEMENTS	PERIODIC
h. TYPE, SIZE AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION	CONTINUOUS
i. SPECIFIED SIZE, GRADE AND TYPE OF REINFORCEMENT, ANCHOR BOLTS, PRE-STRESSING TENDONS, AND ANCHORAGES	PERIODIC
j. WELDING OF REINFORCING BARS	CONTINUOUS
k. PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40° F) OR HOT WEATHER (TEMPERATURE ABOVE 90°F)	PERIODIC
l. APPLICATION AND MEASUREMENT OF PRE-STRESSING FORCE	CONTINUOUS
6. PREPARATION OF ANY REQUIRED GROUT SPECIMENS, MORTAR SPECIMENS AND/OR PRISMS SHALL BE OBSERVED	CONTINUOUS

S.I. TABLE 2

SPECIAL CASES: SECTION 1705.1.1	
INSPECTION OF MECHANICAL ANCHORS IN CONCRETE OR MASONRY:	
REQUIRED VERIFICATION & INSPECTION	FREQUENCY
1. THE SPECIAL INSPECTOR MUST BE ON THE JOB SITE CONTINUOUSLY DURING ANCHOR INSTALLATION TO VERIFY ANCHOR TYPE, ANCHOR DIMENSIONS, CONCRETE TYPE, CONCRETE INTEGRITY, HOLE DIMENSIONS, HOLE CLEANING PROCEDURES, ANCHOR SPACING, EDGE DISTANCES, CONCRETE THICKNESS, ANCHOR EMBEDMENT AND TIGHTENING TORQUE.	CONTINUOUS
INSPECTION OF ADHESIVE ANCHORS IN CONCRETE OR MASONRY:	
REQUIRED VERIFICATION & INSPECTION	FREQUENCY
1. VERIFY HOLE DRILLING METHOD; HOLE LOCATION, DIAMETER AND DEPTH; HOLE CLEANING; ANCHORAGE ELEMENT TYPE, MATERIAL, DIAMETER AND LENGTH; ADHESIVE BRAND, TYPE AND EXPIRATION DATE; CONTINUOUS INSPECTION OF ADHESIVE MIXING AND INSTALLATION	CONTINUOUS
2. PROOF LOAD TESTING (INCLUDE TESTING INSTRUCTIONS OF THE PLANS)	DEPENDS

SHEET INDEX	
S1.0	GENERAL STRUCTURAL NOTES
A1.0	EXISTING & PROPOSED FLOOR PLANS
A2.0	EXISTING & PROPOSED ELEVATIONS
A2.1	BUILDING & WALL SECTIONS
S2.0	FOUNDATION & ROOF FRAMING PLANS
S3.0	TYPICAL DETAILS

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2 ISSUE FOR PERMIT
3 ISSUE FOR BID

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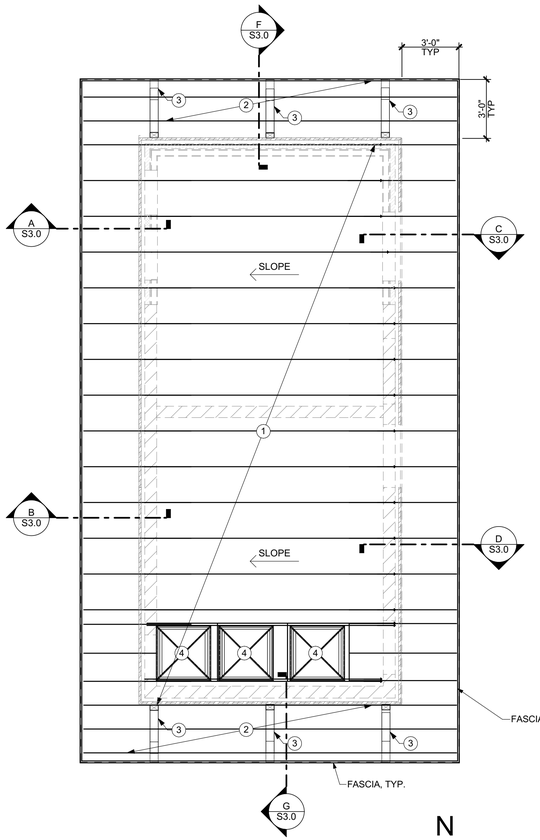
SHEET # S1.0
GENERAL STRUCTURAL NOTES

PRINT DATE : Wednesday, March 15, 2023 5:34 PM



ROOF FRAMING PLAN

1/4" = 1'-0"

ROOF FRAMING PLAN NOTES:

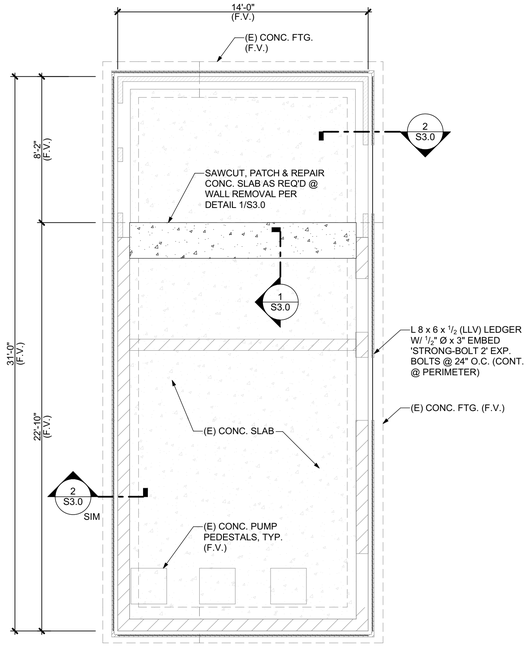
1. FOR ANY ADDITIONAL DIMENSIONS NOT SHOWN, SEE ARCH PLANS. NOTIFY THE ARCHITECT OR ENGINEER IMMEDIATELY IF ANY DISCREPANCIES ARE FOUND.
2. STRUCTURAL WALLS ARE CONSIDERED TO BE ALL LOAD BEARING WALLS, SHEAR WALLS AND ANY WALL THAT REQUIRES A FOOTING.
3. FOR GENERAL STRUCTURAL NOTES SEE SHEET S1.0.
4. FOR TYPICAL FRAMING DETAILS SEE SHEET S3.0.
5. T.O.W. = TOP OF WALL ELEVATION
6. EXTERIOR WALL SHEATHING: $^{3}/_{8}$" APA RATED SHTG W/ 8d @ 6" O.C. EDGE NAIL (EN) & 8d @ 12" O.C. FIELD NAIL (FN).
7. 2x FASCIA BOARD SHALL BE PROVIDED @ ALL ROOF EDGE CORNERS FOR A CONT. SPAN OF 8'-0" (MIN.) W/ (2) $^{1}/_{4}$"Ø LAG SCREWS INTO EA. RAFTER END.
8. ROOF SHEATHING: $^{19}/_{32}$" APA RATED SHTG W/ 10d @ 6" O.C. EDGE NAIL (EN) & 10d @ 12" O.C. FIELD NAIL (FN).
9. METAL ROOF DECK: $1^{1}/_{2}$" DEEP x 18 GA TYPE "HSB-36" METAL DECK @ 3-SPAN CONDITION. PROVIDE (7) $^{1}/_{2}$"Ø PUDDLE WELDS PER PANEL @ EA SUPPORT & BUTTON PUNCH @ 24" O.C. @ SEAMS.
10. DIMENSIONS ON EXISTING MEMBERS SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
11. (E) = EXISTING FRAMING MEMBER
12. (F.V.) = FIELD VERIFY DIMENSION OR EXISTING FRAMING CONDITION

ROOF FRAMING PLAN LEGEND:

- INDICATES EXISTING MASONRY WALL BELOW.
- INDICATES EXISTING BRICK VENEER BELOW.
- INDICATES EXISTING WOOD STUD WALL BELOW.
- INDICATES STONE VENEER BELOW.

ROOF FRAMING PLAN KEYNOTES:

1. INDICATES SINGLE PITCH WOOD ROOF TRUSSES @ 24" O.C.
2. INDICATES 2x10 DF-L#2 ROOF JOISTS @ 16" O.C.
3. INDICATES ROOF KNEE BRACE, SEE DETAILS D&E/S3.0.
4. INDICATES 3'-0" x 3'-0" ROOF HATCH, CENTERED OVER PUMPS. SEE DETAIL C/S3.0.



FOUNDATION & SLAB PLAN

1/4" = 1'-0"

FOUNDATION PLAN NOTES:

1. FOR ANY ADDITIONAL DIMENSIONS NOT SHOWN, SEE ARCH PLANS. NOTIFY THE ARCHITECT OR ENGINEER IMMEDIATELY IF ANY DISCREPANCIES ARE FOUND.
2. FOR ANY DIMENSION DISCREPANCIES FOUND BETWEEN THE ARCH. PLANS AND THESE PLANS USE THE DIMENSIONS FROM THE ARCH. PLANS. NOTIFY THE ARCHITECT OR ENGINEER IMMEDIATELY.
3. STRUCTURAL WALLS ARE CONSIDERED TO BE ALL LOAD BEARING WALLS, SHEAR WALLS AND ANY WALL THAT REQUIRES A FOOTING.
4. CONTRACTOR TO REVIEW GEOTECH REPORT FOR SPECIAL REQUIREMENTS PRIOR TO POURING CONCRETE.
5. FOR GENERAL STRUCTURAL NOTES SEE SHEET S1.0.
6. FOR TYPICAL FOUNDATION DETAILS SEE SHEET S3.0.
7. T.O.SLAB = TOP OF CONCRETE SLAB ELEVATION (F.V.)
8. B.O. FTG. = BOTTOM OF FOOTING ELEVATION (F.V.)
9. EXTERIOR WALL SHEATHING: $^{3}/_{8}$" APA RATED SHTG W/ 8d @ 6" O.C. EDGE NAIL (EN) & 8d @ 12" O.C. FIELD NAIL (FN).
10. DIMENSIONS ON EXISTING MEMBERS SHALL BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
11. (E) = EXISTING FRAMING MEMBER
12. (F.V.) = FIELD VERIFY DIMENSION OR EXISTING FRAMING CONDITION

FOUNDATION PLAN LEGEND:

- INDICATES EXISTING MASONRY WALL BELOW.
- INDICATES EXISTING BRICK VENEER BELOW.
- INDICATES EXISTING WOOD STUD WALL BELOW.
- INDICATES STONE VENEER BELOW.

FOUNDATION PLAN KEYNOTES:

1. SLOPED SLAB: SLAB SLOPES TO FLOOR DRAIN COORD. W/ CIVIL.

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STATE OF IDAHO
SARAH C. McCLENDON

PROJECT

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SHEET #
S2.0
FOUNDATION & ROOF FRAMING PLANS

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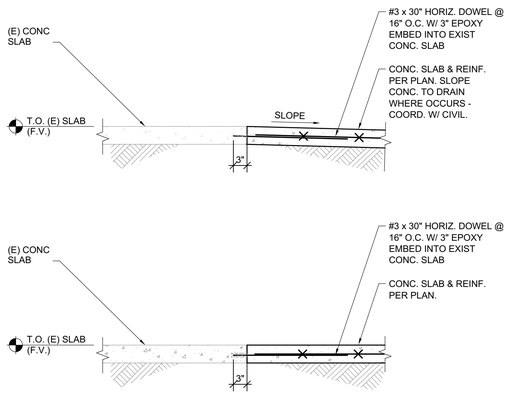
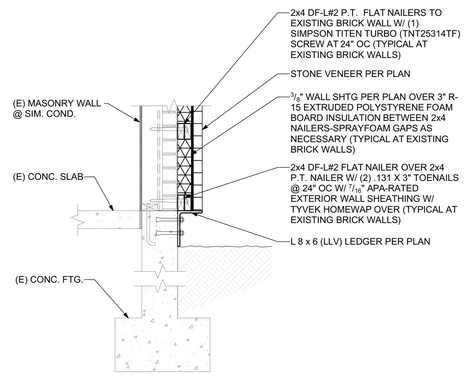


1 S3.0 SECTION @ CONC. SLAB JOINT

SCALE: N.T.S.



2 S3.0 SECTION @ EXISTING FOUNDATION

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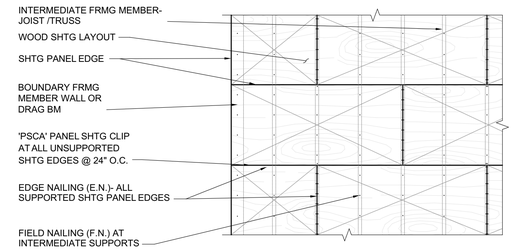


NAILING NOTES:

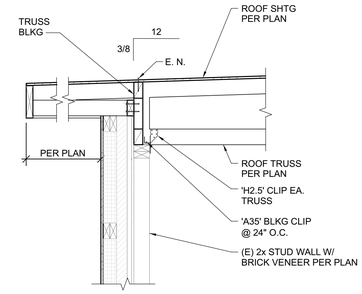
1. MIN. EDGE DISTANCE FOR NAILS SHALL BE 3/8"
2. NAIL HEAD SHALL NOT BREAK OUTER PLY OF SHEATHING
3. NAILS SHALL BE COMMON WIRE TYPE.
4. PNEUMATIC DRIVEN FASTENERS MAY BE USED W/ ENGINEER APPROVAL
5. BOUNDARY NAILING = EDGE NAILING, U.N.O.

SHEATHING NOTES:

1. SEE PLAN AND STRUCTURAL NOTES FOR SHTG THICKNESS, GRADE, AND NAILING.
2. SHTG PANELS SHALL BE APPLIED WITH LONG DIMENSION ACROSS JOISTS/TRUSSES
3. MIN. SHTG SHEET SIZE SHALL BE 2'-0"x4'-0"
4. WOOD SHTG MAY BE EITHER OSB OR PLYWOOD- SEE STRUCTURAL NOTES

3 S3.0 UNBLOCKED DIAPHRAGM - ROOF FRMG

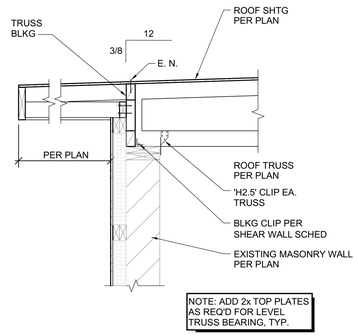
SCALE: N.T.S.



NOTE: ADD 2x TOP PLATES AS REQ'D FOR LEVEL TRUSS BEARING, TYP.

A S3.0 ROOF JOIST @ EXISTING WOOD WALL

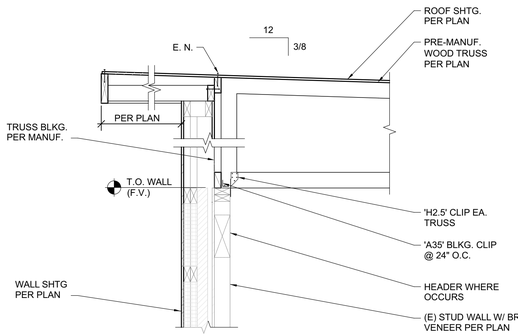
SCALE: 3/4"=1'-0"



NOTE: ADD 2x TOP PLATES AS REQ'D FOR LEVEL TRUSS BEARING, TYP.

B S3.0 ROOF JOIST @ EXISTING MASONRY WALL

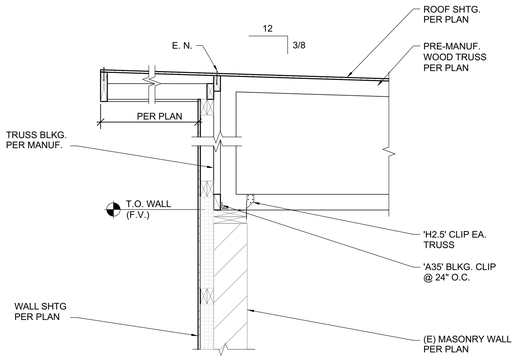
SCALE: 3/4"=1'-0"



NOTE: TRUSS BLKG IS TO OCCUR BETWEEN EA. TRUSS AT STRUCT WALLS AS SHOWN, TYP.

C S3.0 ROOF TRUSS @ EXISTING WOOD WALL

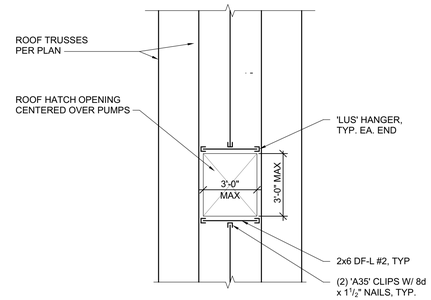
SCALE: 3/4"=1'-0"



NOTE: TRUSS BLKG IS TO OCCUR BETWEEN EA. TRUSS AT STRUCT WALLS AS SHOWN, TYP.

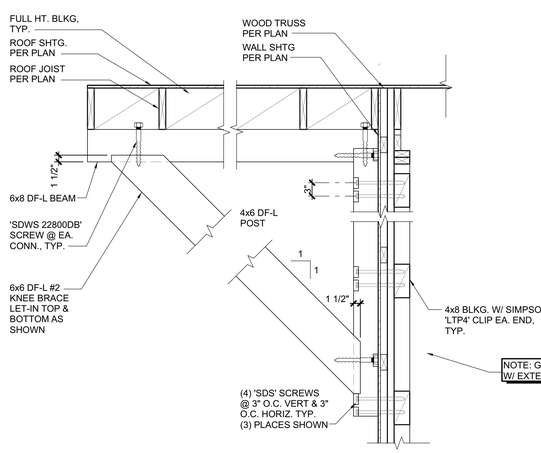
D S3.0 ROOF TRUSS @ EXISTING MASONRY WALL

SCALE: 3/4"=1'-0"



E S3.0 ROOF OPENING FRAMING (PLAN VIEW)

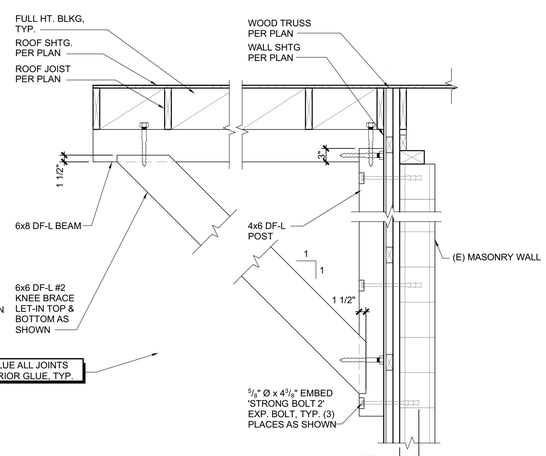
SCALE: N.T.S



NOTE: GLUE ALL JOINTS W/ EXTERIOR GLUE, TYP.

F S3.0 LOW ROOF OUTRIGGER @ (E) WOOD WALL

SCALE: 3/4"=1'-0"



G S3.0 LOW ROOF OUTRIGGER @ (E) MASONRY WALL

SCALE: 3/4"=1'-0"

ISSUE	
2	ISSUE FOR PERMIT
3	ISSUE FOR BID

PRINT DATE 03/14/2023

DRAWN BY McE | CHECKED BY SM

PROJECT # 1016.22

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PROFESSIONAL ENGINEER STRUCTURAL LICENSED 10722 03/14/23 STATE OF IDAHO SARAH C. McCLENDON

PROJECT

DAVIS BEACH INTAKE STATION

MCCALL, IDAHO 83638

SHEET #

S3.0

TYPICAL DETAILS

PRINT DATE: Wednesday, March 15, 2023 5:34 PM

ELECTRICAL LEGEND

(LEGEND IS GENERAL IN NATURE. NOT ALL OF THE SYMBOLS SHOWN ARE USED IN THIS PROJECT.)

POWER

- DUPLEX AFCI OUTLET. +18" AFF UNO.
- DUPLEX AFCI OUTLET. ABOVE COUNTER.
- SIMPLEX OUTLET. +18" AFF UNO.
- DUPLEX OUTLET. +18" AFF UNO.
- DUPLEX OUTLET. MOUNTED ABOVE COUNTER UNO.
- DUPLEX OUTLET. +18" AFF UNO WITH GROUND FAULT INTERRUPTION PROTECTION.
- DUPLEX OUTLET. MOUNTED ABOVE COUNTER UNO WITH GROUND FAULT INTERRUPTION PROTECTION.
- SWITCHED DUPLEX OUTLET. +18" AFF UNO.
- FOURPLEX OUTLET. +18" AFF UNO.
- SPECIAL PURPOSE OUTLET. VERIFY SIZE AND TYPE WITH EQUIPMENT SUPPLIER.
- CONNECTION POINT TO EQUIPMENT SPECIFIED, FURNISHED AND INSTALLED UNDER OTHER SECTIONS. ELECTRICAL CONTRACTOR TO SUPPLY RACEWAY, CONDUCTORS AND MAKE FINAL CONNECTION TO EQUIPMENT UNDER THIS SECTION, UNO.
- (M) MOTOR CONNECTION. RE: MECHANCIAL EQUIPMENT SCHEDULE
- PAD MOUNT TRANSFORMER.

CIRCUITING SYMBOLS

- CONDUIT STUBBED, CAPPED, AND MARKED WITH PULL CORD.
- CONDUIT UP.
- CONDUIT DOWN.
- X-# HOMERUN. PANEL AND CIRCUIT AS INDICATED.
- CIRCUIT CONCEALED IN CEILING OR WALL. 3/4"-2#12,1#12G UNO.
- CIRCUIT CONCEALED IN FLOOR OR UNDERGROUND. 3/4"-2#12,1#12G UNO.

X"-X#X,X#XG — RACEWAY SIZE; CONDUCTOR QUANTITY; CONDUCTOR SIZE; GROUNDING CONDUCTOR SIZE

MISCELLANEOUS

- (J) JUNCTION BOX.
- (J) JUNCTION BOX, WALL MOUNTED.
- SURFACE MOUNTED PANELBOARD/ENCLOSURE. SEE SCHEDULE FOR TYPE.
- FLUSH MOUNTED PANELBOARD/ENCLOSURE. SEE SCHEDULE FOR TYPE.
- NAME # MECHANICAL EQUIPMENT SYMBOL (RE: MECHANICAL DRAWINGS FOR EXACT LOCATION OF UNITS).
- ### INDICATES FIXTURE TYPE. REFER TO LUMINARE SCHEDULE.

SWITCHES

$S^a_\#$ SWITCH. TYPE AS INDICATED. +46"AFF, UNO.

2	DOUBLE POLE
3	3-WAY
4	4-WAY
D	DIMMER
HP	HORSEPOWER RATED
K	KEYED
LV	LOW VOLTAGE
M	MOMENTARY CONTACT
MM	MANUAL MOTOR STARTER
OS	OCCUPANCY SENSOR
P	PILOT LIGHT
T	TIMER
TO	THERMAL OVERLOAD
V	VOLUME CONTROL
VS	VACANCY SENSOR
a	SUPERSCRIPT INDICATES LIGHTS TO BE SWITCHED TOGETHER

LIGHTING

- 4' STRIP LIGHT
- 4' STRIP LIGHT W/ EMERGENCY BATTERY PACK
- WALLPACK
- WALLPACK W/ EMERGENCY BATTERY PACK

ONE LINE

- BRANCH PANEL ****** — BRANCH PANEL.
- A — CIRCUIT BREAKER. SIZE AND TYPE AS SPECIFIED.
- 30AF/30AT — CIRCUIT BREAKER. FRAME SIZE (AF) AND TRIP PLUG/RATING (AT), 3 POLE, UNO.
- 15A — FUSE. SIZE AND TYPE AS SPECIFIED, PROVIDE FUSE FOR EACH POLE, 3 POLE, UNO.
- 30A — INTERRUPTER SWITCH. SIZE AS INDICATED, 3 POLE, UNO.
- 30AS/30AF — FUSED SWITCH. SWITCH SIZE (AS) & FUSE SIZE (AF) AS INDICATED, 3 POLE, UNO.
- DRAW OUT CIRCUIT BREAKER FRAME (AF) SIZE AND TRIP PLUG RATING (AT), 3 POLE, UNO.
- INDIVIDUAL BREAKER FRAME (AF) SIZE AND TRIP PLUG RATING (AT), NEMA 1 UNO, 3 POLE UNO.
- GFP — GROUND FAULT PROTECTION.
- SPD — SURGE PROTECTION DEVICE.
- AFM — ARC FLASH MITIGATION.
- VFD — VARIABLE FREQUENCY DRIVE.
- TRANSFER SWITCH.
- GUTTER.
- (M) METER AND BASE.
- NEUTRAL — NEUTRAL.
- TRANSFORMER
- POLE-MOUNTED TRANSFORMER
- GROUND

GENERAL DEMOLITION NOTES:

1. COORDINATE DEMOLITION REQUIREMENTS WITH GENERAL CONTRACTOR.
2. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR DISPOSAL OF ALL ELECTRICAL EQUIPMENT DEMOLISHED WITH THIS PROJECT UNLESS OTHERWISE NOTED TO BE RETURNED TO OWNER.
3. CONCEALED CONDUIT MAY BE ABANDONED IN PLACE. SURFACE CONDUIT NO LONGER USED SHALL BE REMOVED.
4. SEE ARCHITECTURAL PLANS FOR AREAS OF GENERAL DEMOLITION. REMOVE ELECTRICAL EQUIPMENT, OUTLETS, LIGHTING FIXTURES, ETC. IN AREAS OF GENERAL DEMOLITION.
5. SEE MECHANICAL PLANS FOR MECHANICAL EQUIPMENT DEMOLITION. REMOVE CONDUIT, WIRING, CONTROLS, ETC. ASSOCIATED WITH MECHANICAL EQUIPMENT BEING DEMOLISHED. REMOVE EXPOSED CONDUIT. REMOVE WIRING BACK TO PANELBOARD(S). CAP UNUSED CONCEALED CONDUIT.
6. PROVIDE EXTENSION RINGS, COVER PLATES OR ACCESS DOORS AS NECESSARY TO MAINTAIN ACCESS TO EXISTING WIRING, WHERE REQUIRED BY NEW CONSTRUCTION.
7. FIELD VERIFY LOCATIONS OF EXISTING OUTLETS. WHERE NEW CONSTRUCTION CONFLICTS WITH EXISTING OUTLETS, REMOVE WIRING DEVICES OR RELOCATE DEVICES AS REQUIRED, WHETHER OR NOT SPECIFICALLY INDICATED.
8. PROVIDE BLANK COVER PLATES ON JUNCTION BOXES WHICH ARE NOT REUSED.
9. PROVIDE CUTTING AND PATCHING AS REQUIRED, WHETHER OR NOT SPECIFICALLY INDICATED.
10. FIELD VERIFY EXISTING CIRCUITING AND MAKE ADJUSTMENTS AS NECESSARY TO THE CIRCUITING SHOWN ON THE PLANS, AS REQUIRED BY FIELD CONDITIONS.
11. IF AN ITEM IS TO BE REPLACED, THE CONTRACTORS SHALL RECONNECT ALL EXISTING CONNECTIONS.
12. SOME EXISTING MECHANICAL EQUIPMENT WILL BE REUSED. REUSE EXISTING CIRCUITS AS REQUIRED. RE: POWER PLANS FOR EXISTING MECHANICAL EQUIPMENT TO BE REUSED.

ABBREVIATIONS & DESCRIPTIONS

A	AMPERES
AC	ABOVE COUNTER; REFER TO ARCHITECTURAL ELEVATIONS FOR REQUIRED HEIGHT.
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AF	AMPERE FRAME
AFCI	ARC FAULT CIRCUIT INTERRUPT
AHF	ACTIVE HARMONIC FILTER
AHJ	AUTHORITY HAVING JURISDICTION
AT	AMP TRIP
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BW	BLANKET WARMER
C	CONDUIT
CB	CIRCUIT BREAKER
CC	CRASH CART
CKT	CIRCUIT
CL	CRITICAL LOAD
CM	CEILING MOUNTED
CO	CONDUIT ONLY, PROVIDE PULL-LINE
CT	CURRENT TRANSFORMER
D	MECHANICAL DUCT-MOUNTED DEVICE
DC	DIRECT CURRENT
DET	DETAIL
E	EMERGENCY/CRITICAL CARE
(E)	EXISTING
EF	EXHAUST FAN
EL	EMERGENCY LIGHT
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
F	FUSE
FACP	FIRE ALARM CONTROL PANEL
FVNR	FULL VOLTAGE NON-REVERSING
G/GND	GROUND
GFI	GROUND FAULT INTERRUPTION
GFP	GROUND FAULT PROTECTION
H	HEAT
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND OFF AUTO
HP	HOUSE PHONE
HVAC	HEATING, VENTILATING, & AIR CONDITIONING
I	IONIZATION
ID	IN-DUCT
IC	INTERRUPTING CAPACITY
IG	ISOLATED GROUND
INT	INTERCOM
J/JB	JUNCTION BOX
KW	KILOWATT
KWH	KILOWATT HOUR
M	MAGNETIC CONTACTOR COIL
MB	MAIN BREAKER
MCC	MOTOR CONTROL CENTER
MLO	MAIN LUGS ONLY
MS	MOTOR STARTER
MTS	MANUAL TRANSFER SWITCH
MH	MANHOLE
MW	MICROWAVE
N	NEUTRAL
NC	NORMALLY CLOSED
NCL	NON CRITICAL LOAD
NEC	NATIONAL ELECTRICAL CODE
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OL	OVERLOAD
OS	OCCUPANCY SENSOR
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
P	PHOTO
PC	PHOTOCELL
PVC	POLYVINYL CHLORIDE
RCPT	RECEPTACLE
(R)	RELOCATED
(RE)	REPLACED
REF	REFRIGERATOR
RVSS	REDUCED VOLTAGE SOFT START
SER	SERVICE ENTRANCE RATED
SPST	SINGLE POLE SINGLE THROW
TC	TIME CLOCK
TDR	TIME DELAY RELAY
TJB	TERMINAL JUNCTION BOX
TSP	TWISTED SHIELDED PAIR
TTB	TELEPHONE TERMINAL BOARD
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSER
TYP	TYPICAL
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UPS	UNINTERRUPTIBLE POWER SUPPLY
V	VOLT
VA	VOLT AMPERE
VFD	VARIABLE FREQUENCY DRIVE
WG	PROVIDE PROTECTIVE WIRE GUARD
WP	WEATHER PROOF/NEMA 3R
XFMR	TRANSFORMER

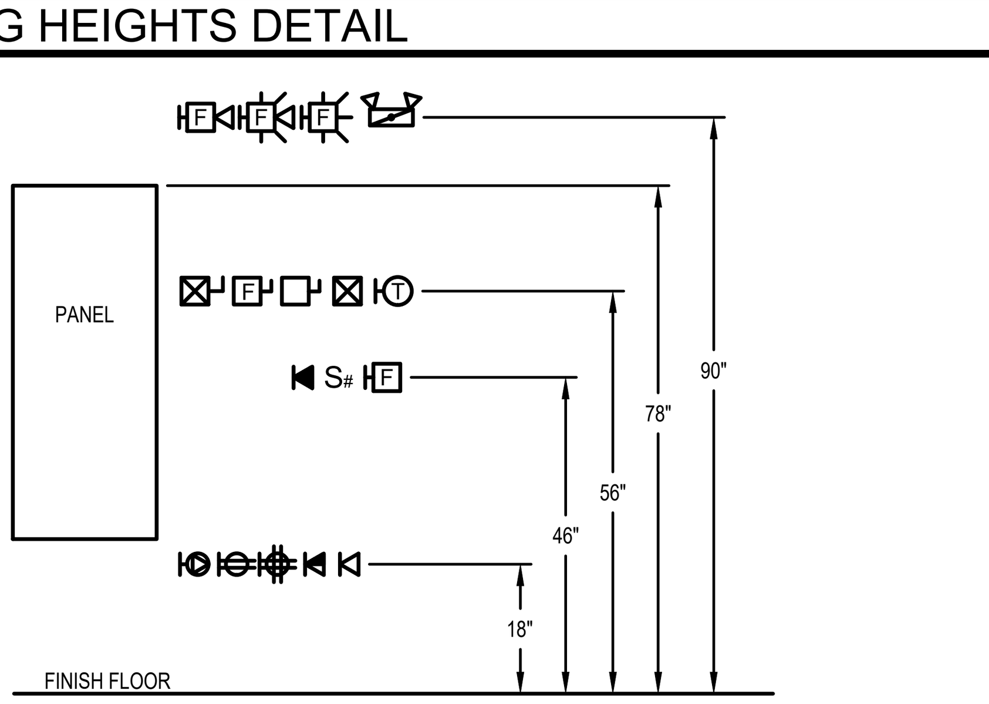
SHEET INDEX

GENERAL ELECTRICAL NOTES

(RE: ALL ELECTRICAL SHEETS)

1. ALL ELECTRICAL EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, INTERNATIONAL FIRE CODE, AND ALL OTHER STATE AND LOCAL CODES. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER IN WRITING IF PORTIONS OF THE DESIGN SET OR FIELD CONDITIONS DO NOT MEET REQUIRED CODES.
2. PROVIDE FIRESTOPPING FOR ALL FLOOR, CEILING AND FIREWALL PENETRATIONS FROM ELECTRICAL FIXTURE, DEVICE, RACEWAY, AND CABLE PENETRATIONS. SEE ARCHITECTURAL DRAWINGS FOR FIREWALL ASSEMBLY LOCATIONS.
3. ELECTRICAL DEVICES AND LINEWORK ARE SHOWN BOLD FOR NEW, BOLD/DASHED FOR DEMO AND SCREENED FOR EXISTING.
4. DESIGN OF ELECTRICAL REQUIREMENTS, FOR MECHANICAL EQUIPMENT, IS BASED ON MECHANICAL EQUIPMENT SPECIFIED. MECHANICAL CONTRACTOR SHALL COORDINATE WITH ELECTRICAL CONTRACTOR IF EQUIPMENT PURCHASED IS DIFFERENT FROM THAT SPECIFIED STILL MEETS DESIGN INTENT, INCLUDING BUT NOT LIMITED TO OVERCURRENT PROTECTION, LOCAL DISCONNECTING MEANS, WIRE SIZING AND DESIGN COSTS.
5. PROVIDE ACCURATE AS-BUILT DRAWINGS TO OWNER UPON PROJECT COMPLETION.
6. NAMEPLATES SHALL BE PROVIDED ON ALL ELECTRICAL DEVICES, INCLUDING BUT NOT LIMITED TO VFD'S, PANELBOARDS, DISCONNECT SWITCHES, RECEPTACLE FACEPLATES, AND ALL ELECTRICAL EQUIPMENT AND CONTROLS ENCLOSURES. NAMEPLATES SHALL BE MADE OF 1/16" THICK MACHINE ENGRAVED LAMINATED PHENOLIC WITH BLACK LETTERS (NOT LESS THAN 1/8" HIGH FOR PUSH-BUTTONS/SELECTOR SWITCHES, AND 3/16" HIGH FOR OTHER ELECTRICAL EQUIPMENT) ON WHITE BACKGROUND. NAMEPLATES ON DISCONNECT SWITCHES SHALL CONTAIN EQUIPMENT NAME/NUMBER AND THE VOLTAGE, PHASES, AND COLORS OF CONDUCTORS.
7. ALL POWER JUNCTION BOXES TO BE MARKED WITH PANEL NAME AND CIRCUIT NUMBER WITH PERMANENT BLACK MARKER. PROVIDE WARNING NAMEPLATE ON ALL EQUIPMENT THAT CONTAINS MULTIPLE POWER SOURCES. LETTERING TO BE WHITE ON RED BACKGROUND.
8. PROVIDE ARC FLASH WARNING SIGNS ON PANELBOARDS, VFD'S, AND DISCONNECT SWITCHES TO WARN QUALIFIED PERSONS OF POTENTIAL ARC FLASH HAZARDS. LOCATE SO AS TO BE CLEARLY VISIBLE TO PERSONS BEFORE WORKING ON ENERGIZED EQUIPMENT.
9. ALL WIRE TERMINATIONS SHALL BE SUITABLE FOR USE WITH 75°C OR GREATER WIRE INSULATION SYSTEMS AT NEC 75°C CONDUCTOR AMPACITY AND SHALL BE IN ACCORDANCE WITH UL 486E.

MOUNTING HEIGHTS DETAIL



ELECTRICAL SPECIFICATIONS

PART 1 - GENERAL

1.01 SUBMITTALS

A. ACTION SUBMITTALS
1. PANELBOARDS.
2. CIRCUIT BREAKERS, FUSES, AND SWITCHES.
3. SUPPORT AND FRAMING CHANNELS.
4. NAMEPLATES.
5. CONDUIT, FITTINGS, AND ACCESSORIES.
6. CONDUCTORS, CABLE, AND ACCESSORIES.
7. DRY-TYPE TRANSFORMERS.
8. WIRING DEVICES.
9. ACTIVE HARMONIC FILTER.
10. GROUNDING MATERIALS.
11. VARIABLE FREQUENCY DRIVES: SHOP DRAWINGS THAT INDICATE DIMENSIONS, WEIGHTS, CLEARANCES, AND FIELD CONNECTIONS; RATINGS; SCHEMATIC AND WIRING DIAGRAMS; BILL OF MATERIAL; NAMEPLATE AND MANUFACTURER INFORMATION ON COMPONENTS.

B. INFORMATION SUBMITTALS:
1. FACTORY TEST REPORTS.
2. FIELD TEST REPORTS.
3. SIGNED PERMITS INDICATING WORK IS ACCEPTABLE TO REGULATORY AUTHORITIES HAVING JURISDICTION.
4. OPERATION MAN MAINTENANCE DATA:
   a. PROVIDE FOR ALL EQUIPMENT, AS WELL AS EACH DEVICE HAVING FEATURES THAT CAN REQUIRE ADJUSTMENT, CONFIGURATION, OR MAINTENANCE.
   b. MINIMUM INFORMATION SHALL INCLUDE MANUFACTURER'S PREPRINTED INSTRUCTION MANUAL, ONE COPY OF THE APPROVED SUBMITTAL INFORMATION FOR THE ITEM, TABULATION OF ANY SETTINGS, AND COPIES OF ANY TEST REPORTS.
5. WARRANTY DETAILS.

1.02 APPROVAL BY AUTHORITY HAVING JURISDICTION

A. PROVIDE THE WORK IN ACCORDANCE WITH NFPA 70, NATIONAL ELECTRICAL CODE (NEC). WHERE REQUIRED BY THE AUTHORITY HAVING JURISDICTION (AHJ), MATERIAL AND EQUIPMENT SHALL BE LABELED OR LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY OR OTHER ORGANIZATION ACCEPTABLE TO THE AHJ, IN ORDER TO PROVIDE A BASIS FOR APPROVAL UNDER THE NEC.

B. MATERIALS AND EQUIPMENT MANUFACTURED WITHIN THE SCOPE OF STANDARDS PUBLISHED BY UNDERWRITERS LABORATORIES, INC. (UL) SHALL CONFORM TO THOSE STANDARDS AND SHALL HAVE AN APPLIED UL LISTING MARK OR LABEL.

1.03 ENVIRONMENTAL CONDITIONS

A. UNLESS OTHERWISE SPECIFIED, EQUIPMENT AND MATERIALS SHALL BE SIZED AND DE-RATED FOR THE AMBIENT CONDITIONS BUT NOT LESS THAN AN AMBIENT TEMPERATURE OF 40 DEGREES C AT AN ELEVATION OF 5,100 FEET WITHOUT EXCEEDING THE MANUFACTURER'S STATED TOLERANCES.

B. ALL OUTDOOR AREAS OR AREAS OPEN TO ATMOSPHERE ARE CLASSIFIED WET. USE MATERIALS AND METHODS REQUIRED FOR SUCH AREAS.

PART 2 - PRODUCTS

2.01 GENERAL

A. PRODUCTS SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF NFPA 70.

B. LIKE ITEMS OF EQUIPMENT: END PRODUCTS OF ONE MANUFACTURER IN ORDER TO ACHIEVE STANDARDIZATION FOR APPEARANCE, OPERATION, MAINTENANCE, SPARE PARTS, AND MANUFACTURER'S SERVICE.

C. EQUIPMENT FINISH:
1. MANUFACTURER'S STANDARD FINISH COLOR, EXCEPT WHERE SPECIFIC COLOR IS INDICATED.

2.02 ENCLOSURES

A. FINISH: SHEET METAL STRUCTURAL AND ENCLOSURE PARTS SHALL BE COMPLETELY PAINTED USING AN ELECTRODEPOSITION PROCESS SO INTERIOR AND EXTERIOR SURFACES AS WELL AS BOLTED STRUCTURAL JOINTS HAVE A COMPLETE FINISH COAT ON AND BETWEEN THEM.

B. COLOR: MANUFACTURER'S STANDARD COLOR (GRAY) BAKED-ON ENAMEL, UNLESS OTHERWISE SHOWN.

C. BARRIERS: PROVIDE METAL BARRIERS WITHIN ENCLOSURES TO SEPARATE WIRING OF DIFFERENT SYSTEMS AND VOLTAGE.

D. ENCLOSURE SELECTIONS: EXCEPT AS SHOWN OTHERWISE, PROVIDE ELECTRICAL ENCLOSURES ACCORDING TO THE FOLLOWING:
1. INDOOR - DRY ENVIRONMENT - FINISHED - NEMA 1 TYPE
2. INDOOR - INDUSTRIAL USE - UNFINISHED - NEMA 12 TYPE
3. OUTDOOR - DENOTED AS 'WP' - ANY FINISH - NEMA 3R TYPE

2.03 LIGHTING AND POWER DISTRIBUTION PANELBOARD

A. MATERIALS, EQUIPMENT, AND ACCESSORIES SPECIFIED IN THIS SECTION SHALL BE PRODUCTS OF:
1. SCHNEIDER ELECTRIC CO.
2. GENERAL ELECTRIC CO.
3. EATON.
4. OR EQUIVALENT.

B. PROVIDE EQUIPMENT IN ACCORDANCE WITH NEMA PB 1, NFPA 70, AND UL 67.

C. WIRE TERMINATIONS:
1. PANELBOARD ASSEMBLIES, INCLUDING PROTECTIVE DEVICES, SHALL BE SUITABLE FOR USE WITH 75 DEGREE C OR GREATER WIRE INSTALLATION SYSTEMS AT NEC 75 DEGREES C CONDUCTOR AMPACITY.
2. IN ACCORDANCE WITH UL 486E.

D. LOAD CURRENT RATINGS:
1. UNLESS OTHERWISE INDICATED, LOAD CURRENT RATINGS FOR PANELBOARD ASSEMBLIES, INCLUDING BUS AND CIRCUIT BREAKERS, ARE NON-CONTINUOUS AS DEFINED BY NEC. CONTINUOUS RATINGS SHALL BE 80 PERCENT OF NON-CONTINOUS RATING.
2. WHERE INDICATED 'CONTINOUS', '100 PERCENT', ETC., SELECTED COMPONENTS AND PROTECTIVE DEVICES SHALL BE RATED FOR CONTINUOUS LOAD CURRENT AT VALUE SHOWN.

E. SHORT CIRCUIT CURRENT RATING (SCCR): INTEGRATED EQUIPMENT SHORT CIRCUIT RATING FOR EACH PANELBOARD ASSEMBLY SHALL BE NO LESS THAN THE FOLLOWING:
1. MINIMUM SCCR AT 208Y/120 VOLTS SHALL BE 18,000 AMPERES RMS SYMMETRICAL.
2. MINIMUM SCCR AT 480 VOLTS SHALL BE 42,000 AMPERES RMS SYMMETRICAL.

F. OVERCURRENT PROTECTIVE DEVICES:
1. IN ACCORDANCE WITH NEMA AB 1, NEMA KS 1, UL 98, AND UL 489.
2. PROTECTIVE DEVICES SHALL BE ADAPTED TO PANELBOARD INSTALLATION:
   a. CAPABLE OF DEVICE REPLACEMENT WITHOUT DISTURBING ADJACENT DEVICES AND WITHOUT REMOVING MAIN BUS.
   b. SPACES: COVER OPENINGS WITH EASILY REMOVABLE COVER.
3. DEVICES SHALL BE FULLY RATED: SERIES-CONNECTED RATINGS UNACCEPTABLE.

G. CIRCUIT BREAKERS:
1. GENERAL: THERMAL-MAGNETIC UNLESS OTHERWISE INDICATED, QUICK-MAKE, QUICK-BREAK, MOLDED CASE, OF INDICATED TYPE SHOWING ON/OFF AND TRIPPED POSITIONS OF OPERATING HANDLE.
2. NON-INTERCHANGABLE: IN ACCORDANCE WITH NEC.
3. BUS CONNECTION: BOLT-ON CIRCUIT BREAKERS.
4. TRIP MECHANISM:
   a. INDIVIDUAL PERMANENT THERMAL AND MAGNETIC TRIP ELEMENTS IN EACH POLE.
   b. VARIABLE MAGNETIC TRIP ELEMENTS WITH A SINGLE CONTINUOUS ADJUSTMENT 3X TO 10X FOR FRAMES GREATER THAN 100 AMPS.
   c. TWO OR THREE POLE, COMMON TRIP.
   d. AUTOMATICALLY OPENS ALL POLES WITH OVERCURRENT OCCURS ON ONE POLE.
   e. TEST BUTTON ON COVER.
   f. CALIBRATED FOR 40 DEGREES C AMBIENT, UNLESS SHOWN OTHERWISE.
5. UNACCEPTABLE SUBSTITUTION:
   a. DO NOT SUBSTITUTE SINGLE-POLE CIRCUIT BREAKERS WITH HANDLE TIES FOR MULTI-POLE BREAKERS.
   b. DO NOT USE TANDEM OF DUAL CIRCUIT BREAKERS IN NORMAL SINGLE-POLE SPACES.

H. CABINET:
1. NEMA 250, TYPE 1.
2. MATERIAL: CODE-GAUGE, HOT-DIP GALVANIZED SHEET STEEL WITH REINFORCED STEEL FRAME.
3. WIRING GUTTER: MINIMUM 4 INCH SQUARE: BOTH SIDES, TOP AND BOTTOM.
4. FRONT: FASTENED WITH ADJUSTABLE CLAMPS.
   a. TRIM SIZE: AS REQUIRED BY MOUNTING.
   b. FINISH: MANUFACTURER'S STANDARD.
5. INTERIOR:
   a. FACTORY ASSEMBLED: COMPLETE WITH CIRCUIT BREAKERS.
   b. SPACES: COVER OPENINGS WITH EASILY REMOVABLE METAL COVER.
6. DOOR HINGES: CONCEALED.
7. LOCKING DEVICE:
   a. FLUSH TYPE.
   b. DOORS OVER 30 INCHES IN HEIGHT: MULTIPOINT.
   c. IDENTICAL KEYLOCKS, WITH TWO MILLED KEYS EACH LOCK.
8. CIRCUIT DIRECTORY: METAL FRAME WITH TRANSPARENT PLASTIC FACE AND ENCLOSED CARD ON INTERIOR OF DOOR.

I. BUS:
1. MATERIAL: TIN-PLATED COPPER FULL SIZED THROUGHOUT.
2. PROVIDE FOR MOUNTING OF FUTURE PROTECTIVE DEVICES ALONG FULL LENGTH OF BUS REGARDLESS OF NUMBER OF UNITS AND SPACES SHOWN. MACHINE, DRILL, AND TAP AS REQUIRED FOR CURRENT AND FUTURE POSITIONS.

J. FEEDER LUGS: MAIN, FEED-THROUGH, AND NEUTRAL SHALL BE REPLACEABLE, BOLTED MECHANICAL OR CRIMP COMPRESSION TYPE.

K. EQUIPMENT GROUND TERMINAL BUS: COPPER WITH SUITABLY SIZED PROVISIONS FOR TERMINATION OF GROUND CONDUCTORS, AND BONDED TO BOX.
1. PROVIDE INDIVIDUAL MECHANICAL TERMINATION POINTS NO LESS THAN THE QUANTITY OF BREAKER POSITIONS.
2. PROVIDE INDUSTRIAL TERMINATION POINTS FOR ALL OTHER GROUNDING CONDUCTORS SUCH AS FEEDER, GROUNDING ELECTRODE, ETC.

L. NEUTRAL TERMINAL BUS: COPPER WITH SUITABLY SIZED PROVISIONS FOR TERMINATION OF NEUTRAL CONDUCTORS, AND ISOLATED FROM BOX.
1. PROVIDE INDUSTRIAL MECHANICAL TERMINATION POINTS NO LESS THAN THE QUANTITY OF BREAKER POLE POSITIONS.
2. PROVIDE INDIVIDUAL TERMINATION POINTS FOR ALL OTHER NEUTRAL CONDUCTORS.

M. PROVISION FOR FUTURE DEVICES: EQUIP WITH MOUNTING BRACKETS, BUS CONNECTIONS, AND NECESSARY APPURTENANCES FOR FUTURE PROTECTIVE DEVICE AMPERE RATINGS INDICATED.

N. SPECIAL FEATURES:
1. SERVICE EQUIPMENT APPROVAL: LISTED FOR USE AS SERVICE EQUIPMENT FOR PANELBOARDS HAVING SERVICE DISCONNECTING MEANS.
2. ARC FLASH: PROVIDE ARC FLASH REDUCTION MAINTENANCE SYSTEM ON SERVICE ENTRANCE MAIN BREAKERS.
   a. SYSTEM SHALL NOT COMPROMISE BREAKER PHASE PROTECTION WHEN ENABLED.
   b. CLEARING TIME OF 0.04 SECONDS, ADJUSTABLE 2.5X TO 10X OF THE SENSOR VALUE.
   c. ENABLED VIA DOOR MOUNTABLE LOCKABLE LOCKOUT/TAGOUT SELECTOR SWITCH WITH CONFIRMATION VIA A BLUE LED INDICATION LAMP.
   d. ALL INDICATING LAMPS SHALL HAVE AN INTEGRATED LAMP-TEST FUNCTION OR A COMMON LAMP TEST SWITCH FOR ALL LAMPS.
   e. PROVIDE ASSOCIATED CONTROL POWER TRANSFORMER AS REQUIRED.

2.04 WIRING DEVICES

A. SWITCHES:
1. NEMA WD 1 AND FS W-S-896.
2. INDUSTRIAL GRADE, TOTALLY ENCLOSED, AC TYPE, WITH QUIET TUMBLER SWITCHES AND SCREW TERMINALS.
3. CAPABLE OF CONTROLLING 100 PERCENT OF LIGHTING LOADS AS SPECIFIED ON PLANS.
4. RATING: 20 AMPS, 120/277 VOLTS.
5. COLOR: BROWN.
6. AUTOMATIC GROUNDING CLIP AND INTEGRAL GROUNDING TERMINAL ON MOUNTING STRAP.
7. MANUFACTURERS AND PRODUCTS:
   a. LEVITON: 1221 SERIES.
   b. BRYANT: 4901 SERIES.
   c. HUBBELL: 1221 SERIES.

B. RECEPTACLE, SINGLE AND DUPLEX:
1. NEMA WD 1 AND FS W-C-596.
2. SPECIFICATION GRADE, TWO-POLE, THREE WIRE GROUNDING TYPE WITH SCREW TYPE WIRE TERMINALS SUITABLE FOR NO. 10 AWG.
3. HIGH STRENGTH, THERMOPLASTIC BASE COVER.
4. COLOR: BROWN
5. CONTACT ARRANGEMENT: CONTACT TO BE MADE ON TWO SIDES OF EACH INSERTED BLADE WITHOUT DETENT.
6. RATING: 125 VOLTS, NEMA WD 1, CONFIGURATION 5-20R, 20 AMPS.
7. ONE-PIECE MOUNTING STRAP WITH INTEGRAL GROUND CONTACT (RIVETLESS CONSTRUCTION).
8. MANUFACTURERS AND PRODUCTS:
   a. ARROW HART: 5262 SERIES.
   b. LEVITON: 5262/5362 SERIES.
   c. BRYANT: 5262/5362 SERIES.
   d. HUBBELL: 5262/5362 SERIES.

2.05 SUPPORT AND FRAMING CHANNELS.

A. CARBON STEEL FRAMING CHANNEL:
1. MATERIAL: ROLLED, MILD STRIP STEEL, 12 GAUGE, ASTM A1011/A1011M, GRADE 33.
2. FINISH: HOT-DIP GALVANIZED AFTER FABRICATION.

B. STAINLESS STEEL FRAMING CHANNEL: ROLLED, ASTM A167, TYPE 316 STAINLESS STEEL, 12 GAUGE.

C. MANUFACTURERS:
1. B-LINE SYSTEMS, INC.
2. UNISTRUT CORP.

2.06 CONDUIT AND FITTINGS

A. RIGID GALVANIZED STEEL CONDUIT (RGS):
1. MEET REQUIREMENTS OF NEMA C80.1 AND UL 6.
2. MATERIAL: HOT-DIP GALVANIZED, WITH CHROMATED PROTECTIVE LAYER.

B. ELECTRICAL METAL TUBING (EMT):
1. MEET REQUIEMENTS OF NEMA C80.3 AND UL 797.
2. MATERIAL: HOT-DIP GALVANIZED, WITH CHROMATED AND LACQUERED PROTECTIVE LAYER.

C. PVC SCHEDULE 40 CONDUIT:
1. MEET REQUIREMENTS OF NEMA TC 2 AND UL 651.
2. UL LISTED FOR CONCRETE ENCASEMENT, UNDERGROUND DIRECT BURIAL, CONCEALED, OR DIRECT SUNLIGHT EXPOSURE, AND 90 DEGREE C INSULATED CONDUCTORS.

D. FLEXIBLE METAL, LIQUID-TIGHT CONDUIT:
4. UL 360 LISTED FOR 105 DEGREES C INSULATED CONDUCTORS.
5. MATERIAL: GALVANIZED STEEL, WITH AN EXTRUDED PVC JACKET.

E. FITTINGS:
1. PROVIDE BUSHINGS, GROUNDING BUSHINGS, CONDUIT HUBS, CONDUIT BODIES, COUPLINGS, UNIONS, EXPANSION FITTINGS, AND CABLE SEALING FITTINGS, AS APPLICABLE.
2. RIGID GALVANIZED STEEL:
   a. MEET REQUIREMENTS OF UL 514B.
   b. TYPE: THREADED, GALVANIZED.
3. ELECTRICAL METALLIC TUBING:
   a. MEET REQUIREMENTS OF UL 514B.
   b. TYPE: STEEL BODY AND LOCKNUTS WITH STEEL OR MALLEABLE IRON COMPRESSION NUTS. SETSCREW AND DRIVE-ON FITTINGS NOT PERMITTED.
   c. ELECTRO ZINC-PLATED INSIDE AND OUT.
   d. RAINTIGHT.
4. PVC CONDUIT:
   a. MEET REQUIREMENTS OF NEMA TC 3.
   b. TYPE: PVC, SLIP-ON.
5. FLEXIBLE METAL, LIQUID-TIGHT CONDUIT:
   a. METAL INSULATED THROAT CONNECTORS WITH INEGRAL NYLON OR PLASTIC BUSHING RATED FOR 105 DEGREE C.
   b. INSULATED THROAT AND SEALING O-RINGS.

2.07 CONDUCTORS AND CABLE

A. CONDUCTORS 600 VOLTS AND BELOW:
1. CONFORM TO APPLICABLE REQUIREMENTS OF NEMA WC 71, WC 72, AND WC 74.
2. CONDUCTOR TYPE:
   a. LIGHTING, 10 AWG, AND SMALLER: SOLID COPPER.
   b. 120V RECEPTACLE CIRCUITS, 10 AWG AND SMALLER: SOLID COPPER.
   c. ALL OTHER CIRCUITS: STRANDED COPPER.
3. INSULATION: TYPE THHN/THWN, EXCEPT FOR SIZES NO. 6 AND LARGER, WITH XHHW-2 INSULATION.

B. VARIABLE FREQUENCY DRIVE POWER CABLE:
1. CONDUCTORS:
   a. CLASS B, STRANDED COATED COPPER.
   b. INSULATION: 600-VOLT CROSS-LINKED POLYETHYLENE, UL TYPE XHHW-2.
   c. GROUNDING CONDUCTORS: INSULATED STRANDED COPPER.
2. SHEATH:
   a. UL 1277 TYPE TC, 90°C.
   b. CONTINUOUS SHIELD, A1/POLYESTER FOIL, DRAIN WIRES, OVERALL COPPER BRAID.
3. OUTER JACKET: POLYVINYL CHLORIDE (PVC) PER UL 1569.
4. MANUFACTURERS AND PRODUCTS:
   a. BELDEN; SERIES 29500.
   b. ALPHA WIRE; SERIES V.
   c. LAPP USA; OLFLEX VFD SLIM.

C. TYPE TSP, NO. 16 AWG, TWISTED, SHIELDED PAIR, INSTRUMENTATION CABLE: SINGLE PAIR, DESIGNED FOR NOISE REJECTION FOR PROCESS CONTROL, COMPUTER, OR DATA LOG APPLICATIONS MEETING NEMA WC 55 REQUIREMENTS.
1. OUTER JACKET: 45MILS NOMINAL THICKNESS.
2. INDIVIDUAL PAIR SHIELD: 1.35 MILS, DOUBLE-FACED ALUMINUM/SYNTHETIC POLYMER OVERLAPPED TO PROVIDE 100% COVERAGE.
3. DIMENSIONS: 0.31 INCH NOMINAL DIAMETER.
4. CONDUCTORS:
   a. BARE SOFT ANNEALED COPPER, CLASS B, SEVEN-STRAND CONCENTRIC, MEETING REQUIREMENTS OF ASTM B8.
   b. 20 AWG, SEVEN-STRAND TINNED COPPER DRAIN WIRE.
   c. INSULATION: 15 MILS NOMINAL PVC.
   d. JACKET: 4 MILS NOMINAL NYLON.
   e. COLOR CODE: PAIR CONDUCTORS BLACK AND RED.
5. MANUFACTURERS:
   a. OKONITE CO.

D. ACCESSORIES:
1. TAPE:
   d. GENERAL PURPOSE, FLAME RETARDANT: 7 MILS, VINYL PLASTIC, SCOTCH BRAND 33, RATED FOR 90 DEGREES C MINIMUM, MEETING REQUIREMENTS OF UL 510.
   e. FLAME RETARDANT, COLD AND WEATHER RESISTANT: 8.5 MILS, VINYL PLASTIC, SCOTCH BRAND 88.
   f. ARC AND FIREPROOFING:
      f.a. 30 MILS, ELASTOMER.
      f.b. MANUFACTURERS AND PRODUCTS:
         f.b.a. 3M: SCOTCH BRAND 77, WITH SCOTCH BRAND 69 GLASS CLOTH TAPEBINDER.
         f.b.b. PLYMOUNT: PLYARC 53, WITH PLYGLAS 77 GLASS CLOTH TAPEBINDER.
2. IDENTIFICATION DEVICES:
   a. SLEEVE-TYPE, PERMANENT, PVC, YELLOW OR WHITE, WITH LEGIBLE MACHINE-PRINTED BLACK MARKINGS.
   b. MANUFACTURER AND PRODUCTS: RAYCHEM: TYPE D-SCE OR ZH-SCE.
3. CONNECTORS AND TERMINATIONS:
   a. NYLON, SELF-INSULATED CRIMP CONNECTORS:
      a.a. MANUFACTURERS AND PRODUCTS:
         a.a.a. THOMAS & BETTS: STA-KON.
         a.a.b. BURNDY: INSULUG.
         a.a.c. ILSCO.
4. SELF-INSULATED, FREESPRING WIRE CONNECTOR (WIRE NUTS):
   a. PLATED STEEL, SQUARE WIRE SPRINGS.
   b. UL STANDARD 486C.
   c. MANUFACTURERS AND PRODUCTS:
      c.a. THOMAS & BETTS.
      c.b. IDEAL: TWISTER.
5. CABLE LUGS:
   a. IN ACCORDANCE WITH NEMA CC 1.
   b. RATED 600 VOLTS OF SAME MATERIAL AS CONDUCTOR METAL.
   c. UN-INSULATED CRIMP CONNECTORS AND TERMINATORS:
      c.a. SUITABLE FOR USE WITH 75 DEGREES C WIRE AT FULL NFPA 70, 75 DEGREES C AMPACITY.
      c.b. MANUFACTURERS AND PRODUCTS:
         c.b.a. THOMAS & BETTS: COLOR-KEYED.
         c.b.b. BURNDY: HYDENT.
         c.b.c. ILSCO.
   d. UN-INSULATED, BOLTED, TWO-WAY CONNECTORS AND TERMINATORS:

NO.	REVISION	BY	DATE
	100% REVIEW		02/15/23

DESIGN CB · DRAWN CB · CHECKED JB · APPROVED JB

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CITY OF MCCALL
DAVIS BEACH INTAKE STATION UPGRADES
ELECTRICAL COVER SHEET AND SPECIFICATIONS

VERIFY SCALE — BAR IS ONE INCH ON FULL SIZE DRAWING 0 — 1"

PROJECT : 101.060
DATE : 2/15/2023
SHEET NO. E0.00

ELECTRICAL SPECIFICATIONS CONT.

d.a. MANUFACTURES AND PRODUCTS:
d.a.a. THOMAS & BETTS: LOCKTITE.
d.a.b. BURNDY: QUIKLUG.
d.a.c. ILSCO.
6. CABLE TIES:
a. NYLON, ADJUSTABLE, SELF-LOCKING, AND REUSABLE.
b. MANUFACTURER AND PRODUCT: THOMAS & BETTS: TY-RAP.

2.08 NONFUSED SWITCH, INDIVIDUAL, 0 TO 600 VOLTS

A. NEMA KS 1.

B. QUICK-MAKE, QUICK-BREAK, MOTOR RATED, LOAD-BREAK, HEAVY-DUTY (HD) TYPE WITH EXTERNAL MARKINGS CLEARLY INDICATING ON/OFF POSITIONS.

C. SUITABLE FOR USE WITH 75°C WIRE AT FULL NFPA 70, 75°C AMPACITY.

D. INTERLOCK: ENCLOSURE AND SWITCH TO PREVENT OPENING COVER WITH SWITCH IN THE ON POSITION.

E. MANUFACTURERS:
1. EATON.
2. GENERAL ELECTRIC CO.
3. SQUARE D CO.

2.09 DRY TYPE TRANSFORMER (0 TO 600 VOLT PRIMARY).

A. TYPE: SELF-COOLED, TWO-WINDING.

B. UL 1561 AND NEMA ST 20.

C. EFFICIENCY: COMPLY WITH DOE 10 CFR PART 431.

D. INSULATION CLASS, TEMPERATURE RISE, AND IMPEDANCE: MANUFACTURER'S STANDARD.

E. CORE AND COIL:

1. 30 kVA OR LESS: ENCAPSULATED.
2. 37.5 kVA AND LARGER: VARNISH IMPREGNATED.

F. ENCLOSURE:

1. 30 kVA OR LESS: NEMA 250, TYPE 3R, NON-VENTILATED.
2. 37.5 kVA AND LARGER: NEMA 250, TYPE 2, VENTILATED.

G. VOLTAGE TAPS: FULL CAPACITY, 2-1/2 PERCENT, TWO ABOVE AND TWO BELOW NORMAL VOLTAGE RATING.

H. SOUND LEVEL: NOT TO EXCEED NEMA ST 20 LEVELS.

I. VIBRATION ISOLATORS TO MINIMIZE AND ISOLATE SOUND TRANSMISSION.

J. MANUFACTURERS:

1. GENERAL ELECTRIC.
2. EATON.
3. SQUARE D.

2.10 FUSE, 0 TO 600 VOLTS

A. CURRENT-LIMITING, WITH 200,000 AMPERE RMS INTERRUPTING RATING.

B. PROVIDE TO FIT MOUNTINGS SPECIFIED WITH SWITCHES AND FEATURES TO REJECT CLASS H FUSES.

2.11 VARIABLE FREQUENCY DRIVES.

A. OPERATION: ACCOMPLISH SPEED CONTROL BY ADJUSTING THE OUTPUT FREQUENCY ACCORDING TO THE DESIRED REFERENCE SPEED. ADJUST AC VOLTAGE AND FREQUENCY SIMULTANEOUSLY TO PROVIDE THE CONSTANT VOLTS/HERTZ NECESSARY TO OPERATE THE MOTOR AT THE DESIRED SPEED. THE VFD MUST USE PULSE WIDTH MODULATION TECHNOLOGY.

B. RATING:

1. LINE VOLTAGE: 480 VOLTS, -5 PERCENT CONTINUOUS, -10 PERCENT MOMENTARY, +10 PERCENT, 3 PHASE.
2. LINE FREQUENCY: 60 Hz, +/- 2 Hz.
3. AMBIENT TEMPERATURE: 5 DEGREE C TO 40 DEGREE C.
4. ALTITUDE: UP TO 5,100 FEET ABOVE SEA LEVEL.
5. POWER FACTOR: ABOVE 0.95 AT FULL SPEED AND RATED LOAD.

C. PERFORMANCE:

1. EFFICIENCY: ABOVE 95 PERCENT AT 100 PERCENT FULL SPEED, ABOVE 93 PERCENT AT 70 PERCENT FULL SPEED.
2. VFD INRUSH CURRENT: LIMITED TO LESS THAN 100 PERCENT OF MOTOR FULL LOAD.
3. DUTY CYCLE: 6 STARTS PER HOUR.

D. FEATURES:

1. PROVISIONS TO ACCEPT THE FOLLOWING CONTROL SIGNALS FOR AUTOMATIC AND MANUAL OPERATION:
a. FWD & REV RUN SIGNAL FROM A SINGLE REMOTE CONTACT CLOSURE WHEN SPECIFIED.

2. A 4-20mA DC SIGNAL FOR SPEED CONTROL. THE VFD SHALL PROVIDE LINEAR SPEED CONTROL OF THE MOTOR FROM ZERO TO FULL SPEED AS THE VARIABLE SPEED INPUT SIGNAL VARIES FROM ITS MINIMUM TO MAXIMUM. INPUT IMPEDANCE SHALL BE 250 OHMS RESISTIVE.
3. A 4-20mA DC SIGNAL FOR REMOTE SPEED INDICATION TO A LOCAL PLC. THE VFD SHALL PROVIDE LINEAR SPEED INDICATION OF THE MOTOR SPEED FROM ZERO TO FULL SPEED. INPUT IMPEDANCE SHALL BE 250 OHMS RESISTIVE.
4. A 4-20mA DC SIGNAL FOR REMOTE MOTOR CURRENT INDICATION TO A LOCAL PLC. THE VFD SHALL PROVIDE LINEAR CURRENT INDICATION OF THE MOTOR FROM ZERO TO FULL CURRENT. INPUT IMPEDANCE SHALL BE 250 OHMS RESISTIVE.
5. VARIABLE TIME DELAY FOR DELAYING MOTOR DRIVE RESTART AFTER POWER FAILURE: TIMER RANGE SHALL BE 0 TO 120 SECONDS, WITH INITIAL SETTINGS DIFFERING BY 10 SECONDS FOR EACH DRIVE: PROVIDE MODULE WHICH CAUSES MULTIPLE ATTEMPTS TO RESTART.
6. PROVISION FOR AUTOMATIC EMERGENCY SHUTDOWN IN ANY MODE, ACTIVATED BY THE FOLLOWING:
b. MOTOR THERMAL PROTECTION.
c. ANY ADDITIONAL ABNORMAL CONDITIONS AS SHOWN ON THE DRAWINGS. PROVIDE FOR MANUAL RESTART.
7. AUXILIARY CONTACTS FOR REMOTE INDICATION OF "RUN" AND "VFD FAULT".
8. VFD ABLE TO WITHSTAND HARMONIC DISTORTION AND NOTCHING AS DEFINED IN IEEE-519 FOR DEDICATED SYSTEM (10 PERCENT VOLTAGE DISTORTION FACTOR AND 36,500 VOLT-MICROSECONDS COMMUTATION NOTCH AREA).
9. VFD OPERABLE WITH MOTOR DISCONNECTED, IN ORDER TO TEST VFD.
10. LINEARITY AND REPEATABILITY ACCURACY OF 3 PHASE OUTPUT OF 1 PERCENT OF ANALOG INPUT CONTROL SIGNAL REGARDLESS OF INPUT POWER VOLTAGE FLUCTUATIONS BETWEEN 437 AND 505 VOLTS.
11. INDEPENDENT ACCELERATION AND DECELERATION CONTROLS, ADJUSTABLE FROM 2 TO 30 Hz PER SECOND.

E. PROTECTION: PROTECT VFD AGAINST THE FOLLOWING CONDITIONS:

1. REVERSE PHASE SEQUENCE AND SINGLE PHASING OF INPUT POWER.
2. INPUT POWER FAILURE.
3. INPUT TRANSIENT VOLTAGES, INCLUDING PEAK SUPPRESSION AND SNUBBERS, IN ACCORDANCE WITH ANSI C37.90.
4. TRANSMISSION SIGNAL INTERFERENCE.
5. OUTPUT OVERCURRENT.
6. INPUT OVERCURRENT.

7. MOTOR OVER TEMPERATURE.
8. CABINET OVER TEMPERATURE.
9. UNDER VOLTAGE: VFD SHALL AUTOMATICALLY SHUT DOWN IF INPUT VOLTAGE FALLS BELOW PRESET LIMIT WITH AUTOMATIC RESTART UPON RETURN TO A STABLE SUPPLY.

F. MANUFACTURER: ABB.

2.12 JUNCTION AND PULL BOXES

A. OUTLET BOXES USED AS JUNCTION OR PULL BOXES: AS SPECIFIED UNDER ARTICLE OUTLET AND DEVICE BOXES.

B. CONDUIT BODIES USED AS JUNCTION BOXES: AS SPECIFIED UNDER ARTICLE CONDUIT AND FITTINGS.

C. SHEET STEEL BOX:
1. NEMA 250, TYPE 1.
2. BOX: CODE-GAUGE, GALVANIZED STEEL.
3. COVER: HINGED WITH CLAMPS.
4. MACHINE SCREWS: CORROSION-RESISTANT.

D. STAINLESS STEEL BOX:
1. NEMA 250, TYPE 4X.
2. BOX: 14-GAUGE, ASTM A240, TYPE 304 STAINLESS STEEL.
3. COVER: HINGED WITH CLAMPS.
4. HARDWARE AND MACHINE SCREWS: ASTM A167, TYPE 304 STAINLESS STEEL.
5. MANUFACTURERS:
a. HOFFMAN ENGINEERING CO.
b. ROBROY INDUSTRIES.

2.13 GROUNDING

A. GROUND RODS: PROVIDE COPPER WITH MINIMUM DIAMETER OF 5/8 INCH AND LENGTH OF 10 FEET.

B. GROUND CONDUCTORS: AS SPECIFIED IN ARTICLE CONDUCTORS AND CABLE.

C. CONNECTORS:

1. EXOTHERMIC WELD TYPE:
a. OUTDOOR WELD: SUITABLE FOR EXPOSURE TO ELEMENTS OR DIRECT BURIAL.
b. INDOOR WELD: UTILIZE LOW-SMOKE, LOW-EMISSION PROCESS.
c. MANUFACTURERS:
c.a. ERICO PRODUCTS, INC: CADWELD AND CADWELD EXOLON.
c.b. THERMOWELD.
2. COMPRESSION TYPE:
a. COMPRESS-DEFORMING TYPE: WROUGHT COPPER EXTRUSION MATERIAL.
b. SINGLE INDENTION FOR CONDUCTORS 6 AWG AND SMALLER.
c. DOUBLE INDENTION WITH EXTENDED BARREL FOR CONDUCTORS 4 AWG AND LARGER.
d. SINGLE BARRELS PRE-FILLED WITH OXIDE-INHIBITING AND ANTI-SEIZING COMPOUND.
e. MANUFACTURERS:
e.a. BURNDY CORP.
e.b. THOMAS & BETTS CO.
e.c. ILSCO.
3. MECHANICAL TYPE:
a. SPLIT-BOLT, SADDLE, OR CONE SCREW TYPE: COPPER ALLY MATERIAL.
b. MANUFACTURERS:
b.a. BURNDY CORP.
b.b. THOMAS & BETTS CO.

D. VARIABLE FREQUENCY DRIVE POWER CABLE SHIELD GROUNDING:

1. COLD-SHRINKABLE SEAL WITH COPPER BRAID AND FULL DIAMETER CONSTANT FORCE SPRING.
2. SIZE RANGE AS REQUIRED FOR JACKET DIAMETER.
3. MANUFACTURER: SOUTHWIRE, SPEC 85451.

2.14 ELECTRICAL SYSTEM ANALYSIS

A. THE CONTRACTOR SHALL COMPLETE AN ARC FLASH STUDY IN ACCORDANCE WITH NFPA70E, OSHA 29 CFR, PART 1910 SUBPART S, AND IEEE 1584 BASED ON THE FOLLOWING:

1. INSTALLED EQUIPMENT TYPES AND NAMEPLATE DATA.
2. SIZE AND TYPES OF CONDUCTOR, CONDUIT TYPES, AND LENGTHS.
3. OVERCURRENT PROTECTIVE DEVICE INFORMATION INCLUDING ACTUAL CATALOG NUMBERS, RATINGS, AND AVAILABLE TRIP SETTINGS.
4. TRANSFORMER INFORMATION INCLUDING TYPE, CONNECTIONS, POWER RATINGS, IMPEDANCE.
5. LOAD NAMEPLATE DATA.

B. PERFORM STUDIES USING ONE OF THE FOLLOWING ELECTRICAL ENGINEERING SOFTWARE PACKAGES:

1. SKM POWER TOOLS FOR WINDOWS.
2. ETAP.
3. EDSA.
4. EASY POWER.

C. BASE CALCULATIONS:

1. FLASH HAZARD PROTECTION BOUNDARY.
2. LIMITED APPROACH BOUNDARY.
3. RESTRICTED APPROACH BOUNDARY.
4. PROHIBITED APPROACH BOUNDARY.
5. INCIDENT ENERGY LEVEL.
6. PERSONAL PROTECTION EQUIPMENT (PPE) HAZARD/RISK CATEGORY.
7. TYPE OF PPE REQUIRED.

D. PRODUCE ADHESIVE BACKED ARC FLASH WARNING LABELS THAT LIST ITEMS IN BASE CALCULATIONS, AND THE FOLLOWING ADDITIONAL ITEMS:

1. BUS NAME.
2. BUS VOLTAGE.

E. INSTALL ARC FLASH WARNING LABELS ON PANELBOARDS, VFD'S, DISCONNECT SWITCHES, MOTOR STARTERS, AND OTHER APPLICABLE NEW POWER SYSTEM ELEMENTS PRIOR TO SUBSTANTIAL COMPLETION.

PART 3 - EXECUTION

3.01 GENERAL

A. INSTALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

B. WORK SHALL COMPLY WITH ALL APPLICABLE PROVISION OF NECA 1.

C. ELECTRICAL DRAWINGS SHOW GENERAL LOCATION OF EQUIPMENT, DEVICES, AND RACEWAYS, UNLESS SPECIFICALLY DIMENSIONED.

3.02 DEMOLITION

A. GENERAL DEMOLITION:

1. WHERE SHOWN, DE-ENERGIZE AND DISCONNECT NON-ELECTRICAL EQUIPMENT FOR REMOVAL BY OTHERS.
2. WHERE SHOWN, DE-ENERGIZE, DISCONNECT, AND REMOVE ELECTRICAL EQUIPMENT.

3.03 PROTECTION FOLLOWING INSTALLATION

A. PROTECT MATERIALS AND EQUIPMENT FROM CORROSION, PHYSICAL DAMAGE, AND EFFECTS OF MOISTURE ON INSULATION.

B. CAP CONDUIT RUNS DURING CONSTRUCTION WITH MANUFACTURED SEALS.

C. CLOSE OPENINGS IN BOXES OR EQUIPMENT DURING CONSTRUCTION.

3.04 PANELBOARDS

A. INSTALL SECURELY, PLUMP, IN-LINE AND SQUARE WITH WALLS.

B. INSTALL TOP OF CABINET 6 FEET ABOVE FLOOR, UNLESS OTHERWISE SHOWN.

C. PROVIDE TYPEWRITTEN CIRCUIT DIRECTORY FOR EACH PANELBOARD.

D. CABINET LOCATION/TYPE: NEMA 250, TYPE 12, UNLESS OTHERWISE SHOWN.

3.05 DRY TYPE POWER TRANSFORMERS (0 TO 600 VOLTS PRIMARY)

A. LOAD EXTERNAL VIBRATION ISOLATOR SUCH THAT NO DIRECT TRANSFORMER UNIT METAL IS IN DIRECT CONTACT WITH THE MOUNTING SURFACE.

B. PROVIDE MOISTURE-PROOF FLEXIBLE CONDUIT FOR ELECTRICAL CONNECTIONS.

C. CONNECT VOLTAGE TAPS TO ACHIEVE (APPROXIMATELY) RATED OUTPUT VOLTAGE UNDER NORMAL LOAD CONDITIONS.

D. PROVIDE WALL BRACKETS WHERE REQUIRED.

3.06 SUPPORT AND FRAMING CHANNELS

A. INSTALL WHERE REQUIRED FOR MOUNTING AND SUPPORTING ELECTRICAL EQUIPMENT AND RACEWAY SYSTEMS.

B. CHANNEL TYPE:

1. INTERIOR, WET OR DRY NON-CORROSIVE LOCATIONS: CARBON STEEL.
2. OUTDOOR, NON-CORROSIVE LOCATIONS: CARBON STEEL.

C. PAINT CARBON STEEL CHANNEL CUT ENDS PRIOR TO INSTALLATION WITH ZINC-RICH PRIMER.

3.07 NAMEPLATES

A. PROVIDE IDENTIFYING NAMEPLATE ON ALL EQUIPMENT.

3.08 CONDUIT AND FITTINGS

A. GENERAL:

1. CRUSHED OR DEFORMED RACEWAYS NOT PERMITTED.
2. MAINTAIN RACEWAY ENTIRELY FREE OF OBSTRUCTIONS AND MOISTURE.
3. IMMEDIATELY AFTER INSTALLATION, PLUG AND CAP RACEWAY ENDS WITH WATERTIGHT AND DUST-TIGHT SEALS UNTIL TIME FOR PULLING IN CONDUCTORS.
4. SEALING FITTINGS: PROVIDE DRAIN SEAL IN VERTICAL RACEWAYS WHERE CONDENSATE MAY COLLECT ABOVE SEALING FITTINGS.
5. AVOID MOISTURE TRAPS WHERE POSSIBLE. WHERE UNAVOIDABLE IN EXPOSED CONDUIT RUNS, PROVIDE JUNCTION BOX AND DRAIN FITTING AT CONDUIT LOW POINT.
6. GROUP RACEWAYS INSTALLED IN SAME AREA.
7. FOLLOW STRUCTURAL SURFACE CONTOURS WHEN INSTALLING EXPOSED RACEWAYS. AVOID OBSTRUCTION OF PASSAGEWAYS.
8. RUN EXPOSED RACEWAYS PARALLEL OR PERPENDICULAR TO WALLS, STRUCTURAL MEMBERS, OR INTERSECTIONS OF VERTICAL PLANES.
9. BLOCK WALLS: DO NOT INSTALL RACEWAYS IN SAME HORIZONTAL COURSE WITH REINFORCING STEEL.
10. INSTALL WATERTIGHT FITTINGS IN OUTDOOR, UNDERGROUND, OR WET LOCATIONS.
11. PAINT THREADS AND CUT ENDS, BEFORE ASSEMBLY OF FITTINGS, GALVANIZED CONDUIT, PVC-COATED GALVANIZED CONDUIT, OR IMC INSTALLED IN EXPOSED OR DAMP LOCATIONS WITH ZINC-RICH PAINT OR LIQUID GALVANIZING COMPOUND.
12. METAL CONDUIT TO BE REAMED, BURRS REMOVED, AND CLEANED BEFORE INSTALLATION OF CONDUCTORS, WIRES, OR CABLES.
13. DO NO INSTALL RACEWAYS IN CONCRETE EQUIPMENT PADS, FOUNDATIONS, OR BEAMS.
14. HORIZONTAL RACEWAYS INSTALLED UNDER FLOOR SLABS SHALL LIE COMPLETELY UNDER SLAB, WITH NO PART EMBEDDED WITHIN SLAB.
15. INSTALL CONCEALED, EMBEDDED, AND BURIED RACEWAYS SO THAT THEY EMERGE AT RIGHT ANGLES TO SURFACE AND HAVE NO CURVED PORTION EXPOSED.

B. CONDUIT APPLICATION:

1. MINIMUM DIAMETER 3/4 INCH.
2. OUTDOOR, EXPOSED: RIGID GALVANIZED STEEL.
3. INDOOR, EXPOSED:
a. RIGID GALVANIZED STEEL.
4. INDOOR, CONCEALED (NOT EMBEDDED IN CONCRETE):
a. ELECTRIC METALLIC TUBING.
b. PVC SCHEDULE 40.
5. ABOVE GROUND, EMBEDDED IN CONCRETE WALLS, CEILING, OR FLOORS:
a. PVC SCHEDULE 40.
b. ELECTRIC METALLIC TUBING FOR LIGHTING AND RECEPTACLE CIRCUITS ONLY.
6. DIRECT EARTH BURIAL: PVC SCHEDULE 40.

C. CONNECTIONS:

1. FOR MOTORS, WALL, OR CEILING MOUNTED FANS AND UNIT HEATERS, DRY TYPE TRANSFORMERS, ELECTRICALLY OPERATED VALVES, INSTRUMENTATION, AND OTHER EQUIPMENT WHERE FLEXIBLE CONNECTION IS REQUIRED TO MINIMIZE VIBRATION:
a. GENERAL: FLEXIBLE METAL, LIQUID-TIGHT CONDUIT.
b. WET OR CORROSIVE AREAS: FLEXIBLE METAL LIQUID-TIGHT.
c. LENGTH: 18 INCHES MINIMUM, 60 INCHES MAXIMUM, SUFFICIENT TO ALLOW MOVEMENT OR ADJUSTMENT OF EQUIPMENT.
2. LIGHTING FIXTURES IN DRY AREAS: FLEXIBLE METAL, LIQUID-TIGHT CONDUIT.
3. OUTDOOR AREAS: FLEXIBLE METAL, LIQUID-TIGHT CONDUIT.
4. TRANSITION FROM UNDERGROUND OR CONCRETE EMBEDDED TO EXPOSED: PVC-COATED RIGID STEEL CONDUIT.
5. UNDER EQUIPMENT PADS: PVC-COATED RIGID STEEL CONDUIT.

D. PENETRATIONS:

1. MAKE AT RIGHT ANGLES, UNLESS OTHERWISE SHOWN.
2. NOTCHING OR PENETRATION OF STRUCTURAL MEMBERS, INCLUDING FOOTINGS AND BEAMS NOT PERMITTED.
3. FIRE-RATED WALLS, FLOORS, OR CEILINGS: FIRESTOP OPENINGS AROUND PENETRATIONS TO MAINTAIN FIRE-RESISTANCE RATING.
4. CONCRETE WALLS, FLOORS, OR CEILINGS (ABOVE GROUND): PROVIDE NON-SHRINK GROUT DRY-PACK.
5. ENTERING STRUCTURES:
a. GENERAL: SEAL RACEWAY AT THE FIRST BOX OR OUTLET WITH OAKUM OR EXPANDABLE PLASTIC COMPOUND TO PREVENT THE ENTRANCE OF GASES OR LIQUIDS FROM ONE AREA TO ANOTHER.
b. CONCRETE ROOF OR MEMBRANE WATERPROOFED WALL OR FLOOR: PROVIDE WATERTIGHT SEAL.
c. HEATING, VENTILATION, AND AIR CONDITIONING (HVAC) EQUIPMENT:
c.a. PENETRATE EQUIPMENT IN AREA ESTABLISHED BY MANUFACTURER.
c.b. TERMINATE CONDUIT WITH FLEXIBLE METAL CONDUIT AT JUNCTION BOX OR CONDULET ATTACHED TO EXTERIOR SURFACE OF EQUIPMENT PRIOR TO PENETRATING EQUIPMENT.
c.c. SEAL PENETRATION WITH JOINT SEALANT.
d. EXISTING OR PRECAST WALL (UNDERGROUND): CORE DRILL WALL AND INSTALL WATERTIGHT ENTRANCE SEAL DEVICE.
e. NON-WATERPROOFED WALL OR FLOOR (UNDERGROUND, WITHOUT CONCRETE ENCASEMENT):
e.a. PROVIDE SCHEDULE 40 GALVANIZED PIPE SLEEVE OR WATERTIGHT ENTRANCE SEAL DEVICE.
e.b. FILL SPACE BETWEEN RACEWAY AND SLEEVE WITH EXPANDABLE PLASTIC COMPOUND OR OAKUM AND LEAD JOINT ON EACH SIDE.

E. SUPPORT:

1. SUPPORT FROM STRUCTURAL MEMBER ONLY, AT INTERVALS NOT EXCEEDING NFPA 70 REQUIREMENTS, AND IN ANY CASE NOT EXCEEDING 8 FEET. DO NOT SUPPORT FROM PIPING, PIPE SUPPORTS, OR OTHER RACEWAYS.
2. APPLICATION/TYPE OF CONDUIT STRAP:
a. STEEL CONDUIT: ZINC-COATED STEEL, PRE-GALVANIZED STEEL, OR MALLEABLE IRON.
b. PVC-COATED RIGID STEEL CONDUIT: PVC-COATED METAL.
c. NONMETALLIC CONDUIT: NONMETALLIC OR PVC-COATED METAL.
3. PROVIDE AND ATTACH WALL BRACKETS, STRAP HANGERS, OR CEILING TRAPEZE AS FOLLOWS:
a. WOOD: WOOD SCREWS.
b. HOLLOW MASONRY UNITS: TOGGLE BOLTS.
c. CONCRETE OR BRICK: EXPANSION SHIELDS, OR THREADED STUDS DRIVEN IN BY POWDER CHARGE, WITH LOCK WASHERS AND NUTS.
d. STEELWORK: MACHINE SCREWS.
e. LOCATION/TYPE OF HARDWARE:
e.a. DRY, NON-CORROSIVE AREAS: GALVANIZED.
e.b. WET, NON-CORROSIVE AREAS: STAINLESS STEEL.
e.c. CORROSIVE AREAS: STAINLESS STEEL.

F. BENDS:

1. INSTALL CONCEALED RACEWAYS WITH A MINIMUM OF BENDS IN THE SHORTEST PRACTICAL DISTANCE.
2. MAKE BENDS AND OFFSETS OF LONGEST PRACTICAL RADIUS. BENDS IN CONDUITS AND DUCTS BEING INSTALLED FOR FIBER OPTIC CABLES SHALL BE NOT LESS THAN 20 TIMES CABLE DIAMETER, 15 INCHES MINIMUM.
3. INSTALL WITH SYMMETRICAL BENDS OR CAST METAL FITTINGS.
4. AVOID FIELD-MADE BENDS AND OFFSETS, BUT WHERE NECESSARY, MAKE WITH ACCEPTABLE HICKEY OR BENDING MACHINE. DO NOT HEAT METAL RACEWAYS TO FACILITATE BENDING.
5. MAKE BENDS IN PARALLEL OR BANKED RUNS FROM SAME CENTER OR CENTERLINE WITH SAME RADIUS SO THAT BENDS ARE PARALLEL.
6. FACTORY ELBOWS MAY BE INSTALLED IN PARALLEL OR BANKED RACEWAYS IF THERE IS CHANGE IN PLANE OF RUN AND RACEWAYS ARE SAME SIZE.
7. PVC CONDUIT:
a. BENDS 30 DEGREES AND LARGER: PROVIDE FACTORY-MADE ELBOWS.
b. 90-DEGREE BENDS: PROVIDE RIGID STEEL ELBOWS, PVC-COATED WHERE DIRECT BURIED.
c. USE MANUFACTURER'S RECOMMENDED METHOD FOR FORMING SMALLER BENDS.
8. FLEXIBLE CONDUIT: DO NOT MAKE BENDS THAT EXCEED ALLOWABLE CONDUCTOR BENDING RADIUS OF CABLE TO BE INSTALLED OR THAT SIGNIFICANTLY RESTRICTS CONDUIT FLEXIBILITY.

G. EXPANSION AND DEFLECTION FITTINGS: PROVIDE ON ALL RACEWAYS AT STRUCTURAL EXPANSION JOINTS AND IN LONG TANGENTIAL RUNS.

H. PVC CONDUIT

1. SOLVENT WELDING:
a. PROVIDE MANUFACTURER RECOMMENDED SOLVENT: APPLY TO ALL JOINTS.
b. INSTALL SUCH THAT JOINT IS WATERTIGHT.
2. ADAPTERS:
a. PVC TO METALLIC FITTINGS: PVC TERMINAL TYPE.
b. PVC TO RIGID METAL CONDUIT: PVC FEMALE ADAPTER.
3. BELLED-END CONDUIT: BEVEL THE UNBELLED END OF THE JOINT PRIOR TO JOINING.

I. TERMINATION AT ENCLOSURES:

1. CAST METAL ENCLOSURE: PROVIDE MANUFACTURER'S PRE-MOLDED INSULATION SLEEVE INSIDE METALLIC CONDUIT TERMINATING IN THREADED HUBS.
2. SHEET METAL BOXES, CABINETS, AND ENCLOSURES:
a. RIGID GALVANIZED CONDUIT:
a.a. PROVIDE ONE LOCK NUT EACH ON INSIDE AND OUTSIDE OF ENCLOSURE.
a.b. INSTALL GROUNDING BUSHING.
a.c. PROVIDE BONDING JUMPER FROM GROUNDING BUSHING TO EQUIPMENT GROUND BUS OR GROUND PAD. IF NEITHER GROUND BUS NOR PAD EXISTS, CONNECT JUMPER TO LAG BOLT ATTACHED TO METAL ENCLOSURE.
a.d. INSTALL INSULATED BUSHING ON ENDS OF CONDUIT WHERE GROUNDING IS NOT REQUIRED.
a.e. PROVIDE INSULATED THROAT WHEN CONDUIT TERMINATES IN SHEET METAL BOXES HAVING THREADED HUBS.
a.f. UTILIZE SEALING LOCKNUTS OR THREADED HUBS ON OUTSIDE OF NEMA 3R AND NEMA 12 ENCLOSURES.
b. ELECTRIC METALLIC TUBING: PROVIDE GLAND COMPRESSION, INSULATED CONNECTORS.
c. FLEXIBLE METAL CONDUIT: PROVIDE TWO-SCREW TYPE, INSULATED, MALLEABLE IRON CONNECTORS.
d. PVC SCHEDULE 40 CONDUIT: PROVIDE PVC TERMINAL ADAPTOR WITH LOCKNUT.
3. FREE-STANDING ENCLOSURES:
a. TERMINATE METAL CONDUIT ENTERING BOTTOM WITH GROUNDING BUSHING. PROVIDE A GROUNDING JUMPER EXTENDING TO EQUIPMENT GROUND BUS OR GROUNDING PAD.
b. TERMINATE PVC CONDUIT ENTERING BOTTOM WITH BELL END FITTINGS.

J. EMPTY RACEWAYS:

1. PROVIDE PERMANENT, REMOVABLE CAP OVER EACH END.
2. PROVIDE NYLON PULL CORD.
3. IDENTIFY WITH WATERPROOF TAGS ATTACHED TO PULL CORD AT EACH END, AND AT INTERMEDIATE PULL POINT.

3.09 CONDUCTORS AND CABLE

A. CONDUCTOR STORAGE, HANDLING, AND INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

B. DO NOT EXCEED MANUFACTURER'S RECOMMENDATIONS FOR MAXIMUM PULLING TENSIONS AND MINIMUM BENDING RADII.

C. CONDUIT SYSTEM SHALL BE COMPLETE PRIOR TO DRAWING CONDUCTORS. LUBRICATE PRIOR TO PULLING INTO CONDUIT. LUBRICATION TYPE SHALL BE APPROVED BY CONDUCTOR MANUFACTURER.

D. TERMINATE ALL CONDUCTORS AND CABLES UNLESS OTHERWISE SHOWN.

E. DO NOT SPLICE CONDUCTORS, UNLESS SPECIFICALLY INDICATED OR APPROVED BY ENGINEER.

F. BUNDLING: WHERE SINGLE CONDUCTORS AND CABLES IN MANHOLES, HAND HOLES, VAULTS, CABLE TRAYS, AND OTHER INDICATED LOCATIONS ARE NOT WRAPPED TOGETHER BY SOME OTHER MEANS, BUNDLING CONDUCTORS FROM EACH CONDUIT THROUGHOUT THEIR EXPOSED LENGTH WITH CABLE TIES PLACED AT INTERVALS NOT EXCEEDING 12 INCHES.

G. WIRING WITHIN EQUIPMENT AND LOCAL CONTROL PANELS: REMOVE SURPLUS WIRE, DRESS, BUNDLE, AND SECURE.

H. POWER CONDUCTOR COLOR CODING:

1. NO. 6 AWG AND LARGER: APPLY GENERAL PURPOSE, FLAME RETADANT TAPE AT EACH END, AND AT ACCESSIBLE LOCATIONS WRAPPED AT LEAST SIX FULL OVERLAPPING TURNS, COVERING AN AREA 1-1/2 TO 2 INCHES WIDE.
2. NO. 8 AWG AND SMALLER: PROVIDE COLORED CONDUCTORS.
3. COLORS:
a. NEUTRAL WIRE: WHITE
b. LIVE WIRES, 120/240 VOLT, SINGLE PHASE SYSTEM: BLACK AND RED.
c. LIVE WIRES, 277/480 VOLT, THREE PHASE SYSTEM: BROWN, ORANGE, AND YELLOW.
d. GROUND WIRE: GREEN.

I. CIRCUIT IDENTIFICATION:

1. ASSIGN CIRCUIT NAME BASED ON DEVICE OR EQUIPMENT AT LOAD END OF CIRCUIT. WHERE THIS WOULD RESULT IN SAME NAME BEING ASSIGNED TO MORE THAN ONE CIRCUIT, ADD NUMBER OR LETTER TO EACH OTHERWISE IDENTICAL CIRCUIT NAME TO MAKE IT UNIQUE.
2. METHOD: IDENTIFY WITH THE SLEEVES. TAPED-ON MARKERS OR TAGS RELYING ON ADHESIVES NOT PERMITTED.

J. CONNECTIONS AND TERMINATIONS:

1. INSTALL WIRE NUTS ONLY ON SOLID CONDUCTORS.
2. INSTALL NYLON SELF-INSULATED CRIMP CONNECTORS AND TERMINATORS FOR INSTRUMENTATION AND CONTROL CIRCUIT CONDUCTORS.
3. TAPE INSULATE ALL UN-INSULATED CONNECTIONS.
4. INSTALL CRIMP CONNECTORS AND COMPRESSION LUGS WITH TOOLS APPROVED BY CONNECTOR MANUFACTURER.

3.10 WIRING DEVICES

A. SWITCHES:

1. MOUTING HEIGHT: SEE MOUNTING HEIGHT DETAIL.
2. INSTALL WITH SWITCH OPERATION IN VERTICAL POSITION.
3. INSTALL SINGLE-POLE, TWO-WAY SWITCHES SUCH THAT TOGGLE IS IN UP POSITION WHEN SWITCH IS ON.

B. RECEPTACLES:

1. INSTALL WITH GROUNDING SLOT DOWN EXCEPT WHERE HORIZONTAL MOUNTING IS SHOWN, IN WHICH CASE INSTALL WITH NEUTRAL SLOT UP.
2. GROUND RECEPTACLES TO BOXES WITH GROUNDING WIRE ONLY.
3. WEATHERPROOF RECEPTACLES:
a. INSTALL IN CAST METAL BOX.
b. INSTALL SUCH THAT HINGE FOR PROTECTIVE COVER IS ABOVE RECEPTACLE OPENING.

3.11 VARIABLE FREQUENCY DRIVES

A. PROPERLY LEVEL AND PLUMB VFD'S SO THAT DOORS WILL OPEN AND CLOSE FREELY.

B. CLEAN AND REPAIR SCRATCHED OR DAMAGED SURFACES TO "NEW" CONDITION.

C. PROVIDE THE SERVICES OF A FACTORY TRAINED SERVICE TECHNICIAN TO INSPECT AND CHECK OUT EACH SYSTEM BEFORE ENERGIZING.

D. PER MANUFACTURER'S INSTRUCTIONS, LACE POWER CONDUCTORS TO RESIST SHORT CIRCUIT FORCES.

E. OPERATE EACH DRIVE FROM NO LOAD TO FULL LOAD AND PERFORM A SPECTRUM ANALYSIS TO VERIFY THAT THE WAVEFORM ON THE LINE SIDE OF THE VFD IS IN COMPLIANCE WITH IEEE 519 FOR GENERAL SYSTEMS.

3.12 ACTIVE HARMONIC FILTER

A. THE FOLLOWING INSPECTIONS AND TEST PROCEDURES SHALL BE PERFORMED BY FACTORY TRAINED FIELD SERVICE PERSONNEL DURING STARTUP:

1. VISUAL INSPECTION:
a. INSPECT EQUIPMENT FOR SIGNS OF DAMAGE.
b. VERIFY INSTALLATION PER DRAWINGS.
c. VERIFY GROUND CONDUCTORS ARE PROPERLY SIZED AND CONFIGURED.
d. VERIFY CURRENT TRANSDUCER ORIENTATION AND WIRING TO POWER CORRECTION SYSTEM.
2. MECHANICAL INSPECTION:
a. CHECK ALL CONTROL WIRING CONNECTIONS FOR TIGHTNESS.
b. CHECK ALL POWER WIRING CONNECTIONS FOR TIGHTNESS.
c. CHECK ALL TERMINAL SCREWS, NUTS, AND/OR SPADE LUGS FOR TIGHTNESS.
3. ELECTRICAL INSPECTION:
a. CHECK ALL FUSES FOR CONTINUITY.
b. CONFIRM INPUT VOLTAGE AND VERIFY UNIT MATCH.
c. CHECK CURRENT TRANSDUCERS FOR PROPER PHASE LOCATION AND ORIENTATION.

B. PROVIDE TRAINING OF OWNER'S PERSONNEL.

C. STARTUP AND SITE TESTING: THE MANUFACTURER SHALL PROVIDE FIELD TEST PERSONNEL TO INITIALIZE ALL EQUIPMENT. A 3-PHASE HARMONIC ANALYZER SHALL BE USED TO MEASURE TOTAL DEMAND DISTORTION (TDD) AND TOTAL HARMONIC DISTORTION (THD) LEVELS TO VERIFY TDD IS LIMITED TO LESS THAN 5 PERCENT AND THAT THD IS LIMITED TO LESS THAN OR EQUAL TO 5 PERCENT. FIELD TEST PERSONNEL SHALL ALSO VERIFY A DISPLACEMENT POWER FACTOR OF NO LESS THAN 0.95 LAGGING. TEST REPORTS SHALL BE PREPARED FOR EACH POINT OF TEST. TEST REPORTS SHALL BE DOCUMENTED, SIGNED, AND DATED. ALL TESTS SHALL BE SUBMITTED TO THE SITE MANAGER.

3.13 JUNCTION AND PULL BOXES

A. INSTALL WHERE SHOWN AND/OR WHERE NECESSARY TO TERMINATE, TAP-OFF OR REDIRECT MULTIPLE CONDUIT RUNS.

B. INSTALL PULL BOXES WHERE NECESSARY IN RACEWAY SYSTEM TO FACILITATE CONDUCTOR INSTALLATION.

C. INSTALL IN CONDUIT RUNS AT LEAST EVERY 150 FEET OR AFTER THE EQUIVALENT OF THREE RIGHT-ANGLE BENDS.

D. USE OUTLET BOXES AS JUNCTION AND PULL BOXES WHEREVER POSSIBLE AND ALLOWED BY APPLICABLE CODES.

E. USE CONDUIT BODIES AS JUNCTION AND PULL BOXES WHERE NO SPLICES ARE REQUIRED AND THEIR USE IS ALLOWED BY APPLICABLE CODES.

F. INSTALLED BOXES SHALL BE ACCESSIBLE.

G. INSTALL EMBEDDED TO FINISHED SURFACES.

H. INSTALL PLUMB AND LEVEL.

I. SUPPORT BOXES INDEPENDENTLY OF CONDUIT BY ATTACHMENT TO BUILDING STRUCTURE OR STRUCTURAL MEMBER.

J. AT OR BELOW GRADE:
1. INSTALL BOXES FOR BELOW GRADE CONDUIT FLUSH WITH FINISHED GRADE IN LOCATIONS OUTSIDE OF PAVED AREAS, ROADWAYS, OR WALKWAYS.
2. IF ADJACENT STRUCTURE IS AVAILABLE, BOX MAY BE MOUNTED ON STRUCTURE JUST ABOVE FINISHED GRADE IN ACCESSIBLE BUT UNOBTRUSIVE LOCATION.
3. OBTAIN OWNER'S WRITTEN ACCEPTANCE PRIOR TO INSTALLATION IN PAVED AREAS, ROADWAYS, OR WALKWAYS.
4. USE BOXES AND COVERS SUITABLE TO SUPPORT ANTICIPATED WEIGHTS.

K. FLUSH MOUNTED:
1. INSTALL WITH CONCEALED CONDUIT.
2. HOLES IN SURROUNDING SURFACE SHALL BE NO LARGER THAN REQUIRED TO RECEIVE BOX.
3. MAKE EDGES FLUSH WITH FINAL SURFACE.

L. MOUNTING HARDWARE:
1. NON-CORROSIVE INDOOR DRY AREAS: GALVANIZED.
2. OUTDOOR OR NON-CORROSIVE INDOOR WET AREAS: STAINLESS STEEL.
3. CORROSIVE AREAS: STAINLESS STEEL.

3.14 LUMINAIRES AND ACCESSORIES

A. INSTALL PER MANUFACTURER'S RECOMMENDATIONS.
B. INSTALL PLUMB AND LEVEL AT MOUNTING HEIGHTS SHOWN.
C. PROVIDE PROPER HANGERS, PENDANTS, AND CANOPIES AS NECESSARY FOR COMPLETE INSTALLATION.
D. UNFINISHED AREAS: LOCATE LUMINAIRES TO AVOID CONFLICT WITH OTHER BUILDING SYSTEMS OR BLOCKAGE OF LUMINAIRE LIGHT OUTPUT.
E. BUILDING EXTERIOR: PROVIDE FLUSH-MOUNTED BACK BOX AND CONCEALED CONDUIT, UNLESS OTHERWISE SHOWN.

3.15 GROUNDING

A. GROUNDING SHALL BE IN COMPLIANCE WITH NFPA 70 AND AS SHOWN.

B. GROUND ELECTRICAL SERVICE NEUTRAL AT SERVICE ENTRANCE EQUIPMENT TO SUPPLEMENTARY GROUNDING ELECTRODES.

C. GROUND EACH SEPARATELY DERIVED SYSTEM NEUTRAL TO NEAREST EFFECTIVELY GROUNDED BUILDING STRUCTURAL STEEL MEMBER OR SEPARATE GROUNDING ELECTRODE.

D. BOND TOGETHER SYSTEM NEUTRALS, SERVICE EQUIPMENT ENCLOSURES, EXPOSED NON-CURRENT-CARRYING METAL PARTS OF ELECTRICAL EQUIPMENT, METAL RACEWAYS, GROUND CONDUCTOR IN RACEWAYS AND CABLES, RECEPTACLE GROUND CONNECTIONS, AND METAL PIPING SYSTEMS.

E. SHIELDED INSTRUMENTATION CABLES:

1. GROUND SHIELD TO GROUND BUS AT POWER SUPPLY FOR ANALOG SIGNAL.
2. EXPOSE SHIELDED MINIMUM 1 INCH AT TERMINATION TO FILED INSTRUMENT AND APPLY HEAT SHRINK TUBE.
3. DO NOT GROUND INSTRUMENTATION CABLE SHIELD AT MORE THAN ONE POINT.

F. EQUIPMENT GROUNDING CONDUCTORS: PROVIDE IN ALL CONDUITS CONTAINING POWER CONDUCTORS AND CONTROL CIRCUITS ABOVE 50 VOLTS.

G. GROUND RODS: INSTALL FULL LENGTH WITH CONDUCTOR CONNECTION AT UPPER END.

3.16 FIELD QUALITY CONTROL

A. GENERAL:

1. TEST EQUIPMENT SHALL HAVE AN OPERATION ACCURACY EQUAL TO, OR GREATER THAN, REQUIREMENTS ESTABLISHED BY NETA ATS.
2. TEST INSTRUMENT CALIBRATION SHALL BE IN ACCORDANCE WITH NETA ATS.
3. PERFORM INSPECTION AND ELECTRICAL TESTS AFTER EQUIPMENT HAS BEEN INSTALLED.
4. PERFORM TESTS WITH APPARATUS DE-ENERGIZED WHENEVER FEASIBLE.
5. INSPECTION AND ELECTRICAL TESTS ON ENERGIZED EQUIPMENT ARE TO BE:
a. SCHEDULED WITH ENGINEER PRIOR TO DE-ENERGIZATION.
b. MINIMIZED TO AVOID EXTENDED PERIOD OF INTERRUPTION TO THE OPERATION OF FACILITY.

B. TESTS AND INSPECTION SHALL ESTABLISH THAT:

1. ELECTRICAL EQUIPMENT IS OPERATIONAL WITHIN INDUSTRY AND MANUFACTURER'S TOLERANCES.
2. INSTALLATION OPERATES PROPERLY.
3. EQUIPMENT IS SUITABLE FOR ENERGIZATION.
4. INSTALLATION CONFORMS TO REQUIREMENTS OF CONTRACT DOCUMENTS AND NFPA 70.

C. PERFORM INSPECTION AND TESTING IN ACCORDANCE WITH NETA ATS, INDUSTRY STANDARDS, AND MANUFACTURER'S RECOMMENDATIONS.

D. ADJUST MECHANISMS AND MOVING PARTS FOR FREE MECHANICAL MOVEMENT.

E. VERIFY NAMEPLATE DATA FOR CONFORMANCE TO CONTRACT DOCUMENTS.

F. REALIGN EQUIPMENT NO PROPERLY ALIGNED AND CORRECT UNLEVELNESS.

G. PROPERLY ANCHOR ELECTRICAL EQUIPMENT FOUND TO BE INADEQUATELY ANCHORED.

H. TIGHTEN ACCESSIBLE BOLTED CONNECTIONS, INCLUDING WIRING CONNECTIONS, WITH CALIBRATED TORQUE WRENCH TO MANUFACTURER'S RECOMMENDATIONS, OR AS OTHERWISE SPECIFIED.

I. CLEAN CONTAMINATED SURFACES WITH CLEANING SOLVENTS AS RECOMMENDED BY MANUFACTURER.

J. PROVIDE PROPER LUBRICATION OF APPLICABLE MOVING PARTS.

K. INVESTIGATE AND REPAIR OR REPLACE:

1. ELECTRICAL ITEMS THAT FAIL TESTS.
2. ACTIVE COMPONENTS NOT OPERATING IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
3. DAMAGED ELECTRICAL EQUIPMENT.

L. ELECTRICAL ENCLOSURES:

1. REMOVE FOREIGN MATERIAL AND MOISTURE FROM ENCLOSURE INTERIOR.
2. VACUUM AND WIPE CLEAN ENCLOSURE INTERIOR.
3. REMOVE CORROSION FOUND ON METAL SURFACES.
4. REPAIR OR REPLACE, AS DETERMINED BY ENGINEER, DOOR AND PANEL SECTIONS HAVING DAMAGED SURFACES.
5. REPLACE MISSING OR DAMAGED HARDWARE.

M. PROVIDE CERTIFIED TEST REPORT(S) DOCUMENTING THE SUCCESSFUL COMPLETION OF SPECIFIED TESTING. INCLUDE FIELD TEST MEASURING DATA.

N. TEST THE FOLLOWING EQUIPMENT AND MATERIALS:

1. CONDUCTORS: INSULATION AND RESISTANCE, NO. 4 AND LARGER ONLY.
2. PANELBOARDS, SWITCHES, AND CIRCUIT BREAKERS.
3. MOTOR CONTROLS.
4. GROUNDING ELECTRODES.

O. CONTROLS:

1. TEST CONTROL AND SIGNAL WIRING FOR PROPER TERMINATION AND FUNCTION.
2. TEST LOCAL CONTROL PANELS AND OTHER CONTROL DEVICES FOR PROPER TERMINATIONS, CONFIGURATION AND SETTINGS, AND FUNCTIONS.
3. DEMONSTRATE CONTROL, MONITORING, AND INDICATION FUNCTIONS IN PRESENCE OF OWNER AND ENGINEER.

P. BALANCE ELECTRICAL LOAD BETWEEN PHASES ON PANELBOARDS AFTER INSTALLATION.

Q. VOLTAGE TESTING:

1. WHEN INSTALLATION IS COMPLETE AND FACILITY IS IN OPERATION, CHECK VOLTAGE TO PROJECT.
2. CHECK VOLTAGE AMPLITUDE AND BALANCE BETWEEN PHASES FOR LOADED AND UNLOADED CONDITIONS.

R. EQUIPMENT LINE CURRENT:

1. CHECK LINE CURRENT IN EACH PHASE FOR EACH PIECE OF EQUIPMENT.

END OF SECTION

NO.	REVISION	BY	DATE	
	100% REVIEW		02/15/23	DESIGN CB
				DRAWN CB
				CHECKED JB
				APPROVED JB

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CITY OF MCCALL
DAVIS BEACH INTAKE STATION UPGRADES
ELECTRICAL SPECIFICATIONS CONT.

VERIFY SCALE
BAR IS ONE INCH ON FULL SIZE DRAWING
0 1"

PROJECT : 101.060
DATE : 2/15/2023
SHEET NO. E0.01

PANELBOARD SCHEDULE

PANEL: (N) DBH
VOLTAGE: 480V | PHASE: 3 | WIRE: 3 | AMPERE RATING: 400A | SC RATING: RE:SPECIFICATIONS | MAIN: MLO
ENTRY: | MOUNTING: SURFACE

LOADS:	Amps	VA	LOAD TYPES:		REMARKS:
PHASE A:	343	94993		1 = LIGHTING	
PHASE B:	342	94814		2 = RECEPTACLES	
PHASE C:	340	94055		3 = MISC	
TOTAL:		283862		4 = MOTOR	
				5 = KITCHEN	

LOAD (VA)	LOAD SERVED	NOTE	LOAD TYPE	AMPS/	POLES	CKT NO	PHASE	CKT NO	AMPS/	POLES	LOAD TYPE	NOTE	LOAD SERVED	LOAD (VA)
26605	VFD-01		3	150	3	1	A	2	150	3	3		VFD-02	26605
26605	---		3	-	-	3	B	4	-	-	3		---	26605
26605	---		3	-	-	5	C	6	-	-	3		---	26605
26605	VFD-03		3	150	3	7	A	8	20	3	3		(E) EUH-1	1000
26605	---		3	-	-	9	B	10	-	-	3		---	1000
26605	---		3	-	-	11	C	12	-	-	3		---	1000
1167	ACTIVE HARMONIC FILTER		3	125	3	13	A	14	20	3	3		(E) EUH-2	1000
1167	---		3	-	-	15	B	16	-	-	3		---	1000
1167	---		3	-	-	17	C	18	-	-	3		---	1000
9423	P-104		4	70	3	19	A	20					SPACE	
9423	---		4	-	-	21	B	22					SPACE	
9423	---		4	-	-	23	C	24					SPACE	
	SPACE					25	A	26	30	3	3	S	DBL	2588
	SPACE					27	B	28	-	-	3	-	---	2409
	SPACE					29	C	30	-	-	3	-	---	1650

LOADING BY TYPE			CONNECTED	NEC CODE	DEMAND FACTOR	DEMAND	NOTES:
LIGHTING			0 VA	210-19	125%	0 VA	S- SUBFEED BREAKER
RECEPTACLES			0 VA	220-44	10kVA @ 100%, ELSE @ 50%	0 VA	
MISC.			255593 VA	220-60	100%	255593 VA	
MOTOR	LARGEST MOT.:	28268	28269 VA	220-50	100% + LARGEST x 25%	35336 VA	
KITCHEN	# OF KIT. UNITS:	0	0 VA	220-56		0 VA	
TOTAL			341 A			350 A	

PANELBOARD SCHEDULE

PANEL: (N) DBL
VOLTAGE: 208/120V | PHASE: 3 | WIRE: 4 | AMPERE RATING: 125A | SC RATING: | MAIN: 40A MAIN BREAKER
ENTRY: | MOUNTING: SURFACE

LOADS:	Amps	VA	LOAD TYPES:		REMARKS:
PHASE A:	22	2588		1 = LIGHTING	
PHASE B:	20	2409		2 = RECEPTACLES	
PHASE C:	14	1650		3 = MISC	
TOTAL:		6647		4 = MOTOR	
				5 = KITCHEN	

LOAD (VA)	LOAD SERVED	NOTE	LOAD TYPE	AMPS/	POLES	CKT NO	PHASE	CKT NO	AMPS/	POLES	LOAD TYPE	NOTE	LOAD SERVED	LOAD (VA)
212	INTERIOR LIGHTING		1	20	1	1	A	2	20	1	2		REC - NORTH ROOM	720
33	EXTERIOR LIGHTING		1	20	1	3	B	4	20	1	2		REC - SOUTH ROOM	720
1200	CONTROL PANEL		3	20	1	5	C	6	20	1	3		FIT-101	150
	SPARE			20	1	7	A	8	30	1	4		EF-1	1656
	SPARE			20	1	9	B	10	30	1	4		EF-2	1656
300	DAMPER ACTUATORS		4	20	1	11	C	12	20	1			SPARE	
	SPARE			20	1	13	A	14					SPACE	
	SPARE			20	1	15	B	16					SPACE	
	SPARE			20	1	17	C	18					SPACE	
	SPACE					19	A	20					SPACE	
	SPACE					21	B	22					SPACE	
	SPACE					23	C	24					SPACE	

LOADING BY TYPE			CONNECTED	NEC CODE	DEMAND FACTOR	DEMAND	NOTES:
LIGHTING			245 VA	210-19	125%	306 VA	
RECEPTACLES			1440 VA	220-44	10kVA @ 100%, ELSE @ 50%	1440 VA	
MISC.			1350 VA	220-60	100%	1350 VA	
MOTOR	LARGEST MOT.:	1656	3612 VA	220-50	100% + LARGEST x 25%	4026 VA	
KITCHEN	# OF KIT. UNITS:	0	0 VA	220-56		0 VA	
TOTAL			18 A			20 A	

KEY NOTES: (#)

1. FURNISH AND INSTALL LITHONIA CSS L48 4000LM MVOLT 40K 80CRI OR APPROVED EQUIVALENT. TYPICAL FOR 4' STRIP LIGHTS SHOWN. PROVIDE IE7WCP EMERGENCY BATTERY PACK WHERE INDICATED.
2. REMOVE ALL ELECTRICAL EQUIPMENT, DEVICES, AND LIGHT FIXTURES WITHIN THIS ROOM UNLESS NOTED OTHERWISE.
3. FURNISH AND INSTALL LITHONIA WPX1 LED P1 40K MVOLT PE DBLXD OR APPROVED EQUIVALENT. TYPICAL FOR WALLPACKS SHOWN. PROVIDE E14WC EMERGENCY BATTERY PACK WHERE INDICATED.
4. SCHNEIDER ELECTRIC I-LINE HCJ NEMA TYPE 1 DISTRIBUTION PANELBOARD OR APPROVED EQUIVALENT. PANELBOARD SHALL BE 400A, 480V 3-PHASE, 3-WIRE WITH A MINIMUM SCCR OF 42kA. SEE PANEL SCHEDULE, THIS SHEET, FOR CIRCUIT BREAKER SIZES. MAIN PROTECTIVE DEVICE SHALL INCLUDE LSIG SOLID STATE TRIP UNIT AND RATING PLUG.
5. SCHNEIDER ELECTRIC NF NEMA TYPE 1 PANELBOARD OR APPROVED EQUIVALENT. PANELBOARD SHALL BE 125A, 208Y/120V 3-PHASE, 4-WIRE WITH NON-INTERCHANGEABLE BOLT-ON CIRCUIT BREAKERS AND A MINIMUM SCCR OF 18kA. SEE PANEL SCHEDULE, THIS SHEET, FOR CIRCUIT BREAKER SIZES.
6. VFD SHALL BE ABB ACS880-01, TYPICAL OF ALL NEW VFD'S.
7. REMOVE ALL EXTERIOR LIGHTING, INCLUDING CIRCUITS AND RACEWAYS.
8. DISCONNECTS SHALL BE NEMA TYPE 1, 200A, 3-POLE. PROVIDE DISCONNECT SWITCH MOUNTING PROVISIONS AS REQUIRED. PROVIDE MAKE BEFORE POWER CONTACTS MAKE AND BREAK BEFORE POWER CONTACTS BREAK AUXILIARY CONTACTS IN DISCONNECT SWITCHES FOR EARLY VFD SHUTDOWN. SEE CABLE SCHEDULE.
9. EXTEND EXISTING CONDUIT AS NEEDED TO LOCATION OF NEW 480V PANEL, 'DBH' FROM EXISTING DISCONNECT SWITCH.
10. FLOW METER LOCATED ON ADJACENT PROPERTY. VERIFY EXACT LOCATION WITH OWNER.
11. REPLACE EXISTING 300A FUSES WITH BUSSMAN KTS-R-400 FUSES OR APPROVED EQUIVALENT.
12. TCI HGA 100A ACTIVE HARMONIC FILTER FOR A 480V, 3-PHASE, 3-WIRE PLUS GROUND SYSTEM IN NEMA TYPE 1 GASKETED ENCLOSURE, OR APPROVED EQUIVALENT. PROVIDE JUNCTION BOX UPSTREAM OF PANELBOARD FOR FILTER CT's.
13. REMOVE CONDUCTORS AND RETAIN CONDUIT.
14. EXISTING EUH TO REMAIN. REMOVE CONDUIT AND CONDUCTORS TO UNIT. VERIFY THAT UNIT HAS A DISCONNECT. IF NONE, PROVIDE NEMA TYPE 1, 30A, 3-POLE DISCONNECT.
15. LINE VOLTAGE THERMOSTAT AND SPEED CONTROLLER PROVIDED BY MECHANICAL CONTRACTOR FOR EXHAUST FAN. PROVIDE CONDUCTORS AS RECOMMENDED BY THE MANUFACTURER IN 3/4"C FOR A COMPLETE INSTALLATION AND INTERLOCK EXHAUST FAN OPERATION WITH DAMPER ACTUATOR IN ROOM. SEE MECHANICAL PLANS AND COORDINATE WITH MECHANICAL CONTRACTOR.

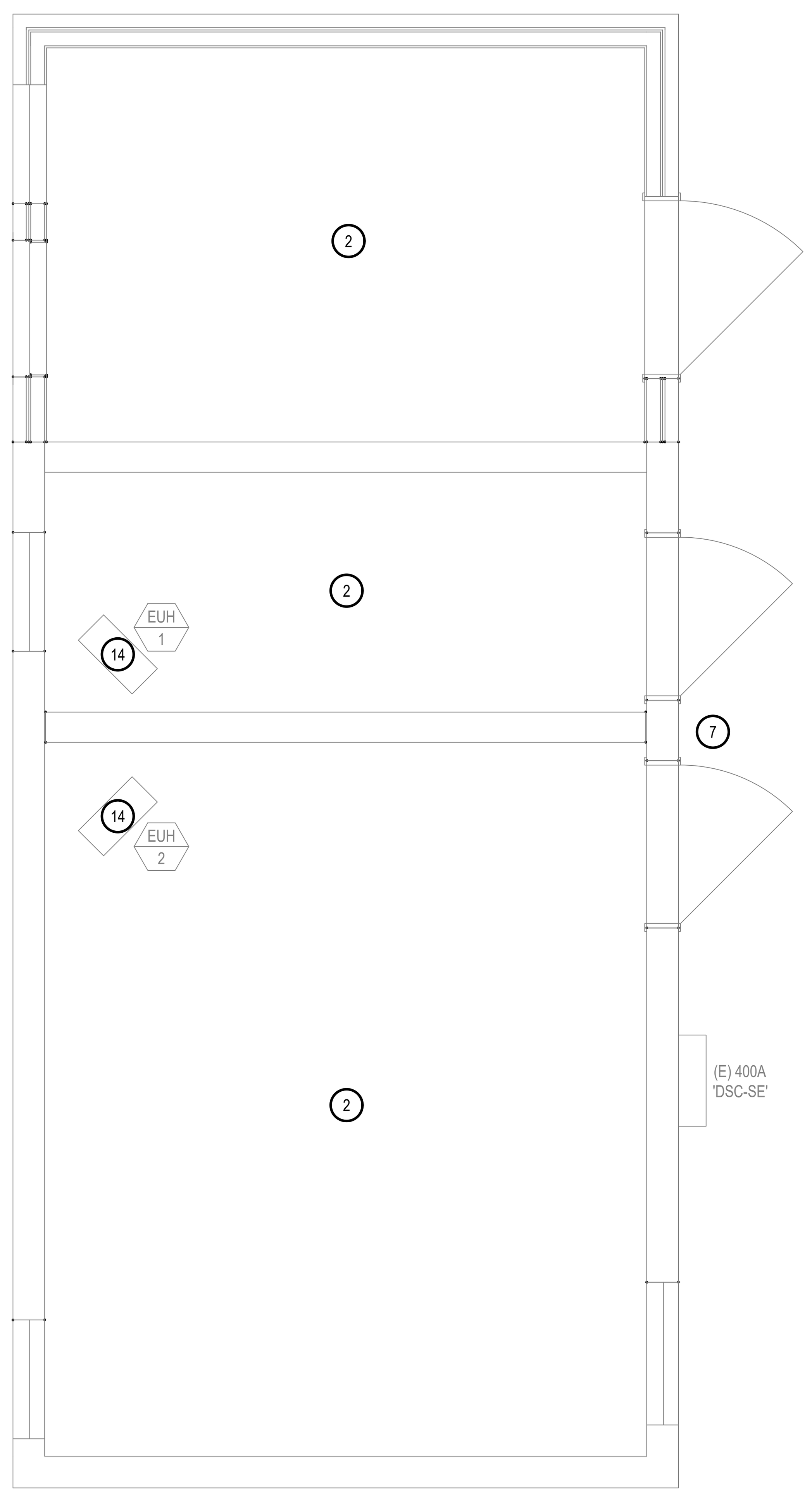
KEY NOTES CONTINUED:

16. FIELD VERIFICATION OF CIRCUIT LENGTH IS REQUIRED FOR BIDDING PURPOSES.
17. VERIFY RELOCATED ANTENNA LOCATION WITH OWNER. PROVIDE COPPER ETHERNET IN 3/4"C AS REQUIRED.
18. DISCONNECT SHALL BE NEMA TYPE 1, 100A, 3-POLE. PROVIDE MOUNTING PROVISIONS AS NEEDED.
19. ENCLOSED FULL VOLTAGE, NON-REVERSING COMBINATION STARTER, NEMA SIZE 2.

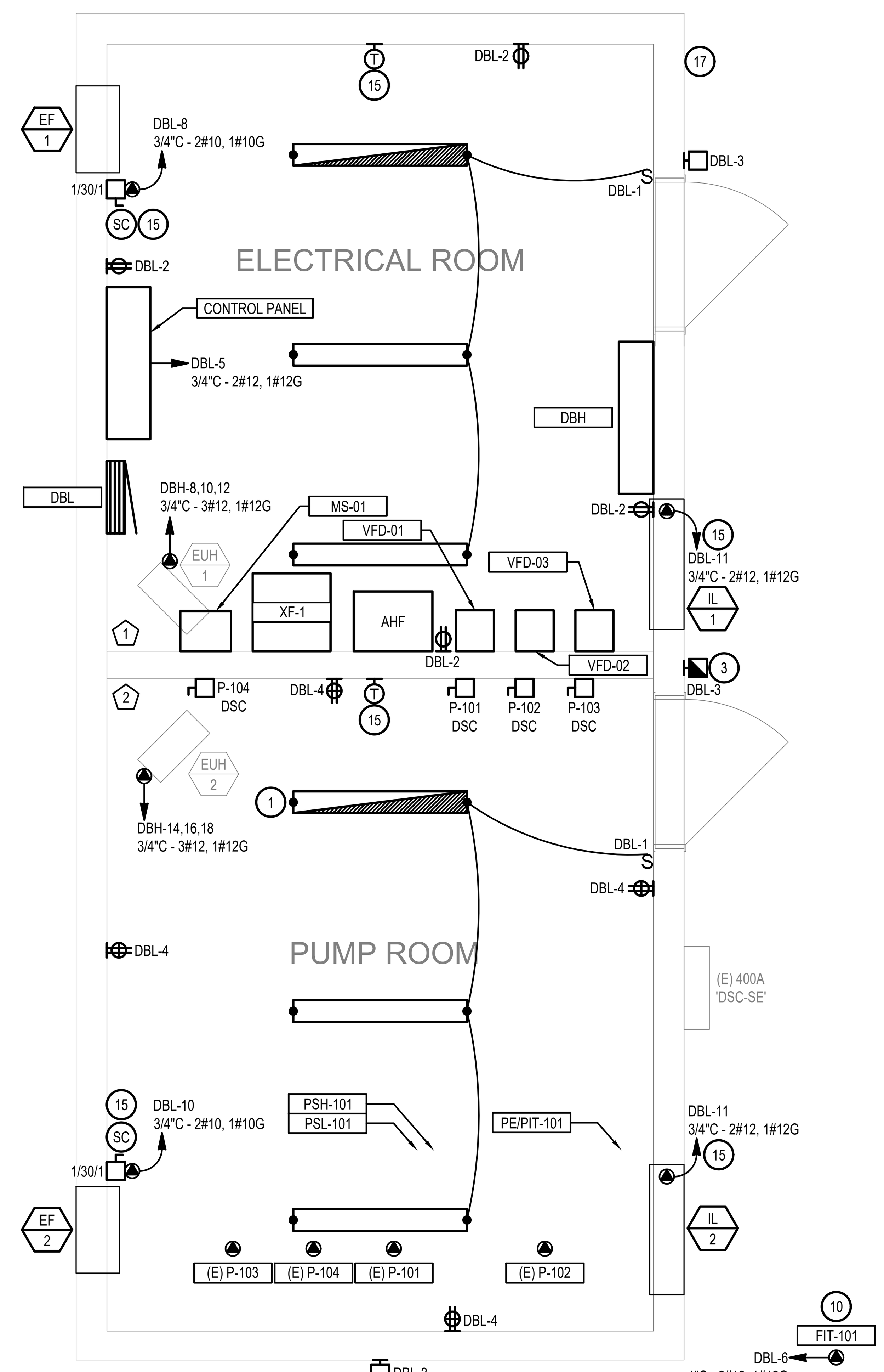
GENERAL NOTES:

1. NUMBER ADJACENT TO HOME RUN OR DEVICE INDICATES POLE POSITION WITHIN PANEL TO WHICH DEVICES SHALL BE CIRCUITED.
2. SEE SHEET E0.00 FOR GENERAL DEMOLITION NOTES.
3. VERIFY INSTRUMENT LOCATIONS PRIOR TO INSTALLATION.
4. DESIGNED UNDER THE ASSUMPTION THAT ALL MOTORS WILL BE 75HP IN THE FUTURE.

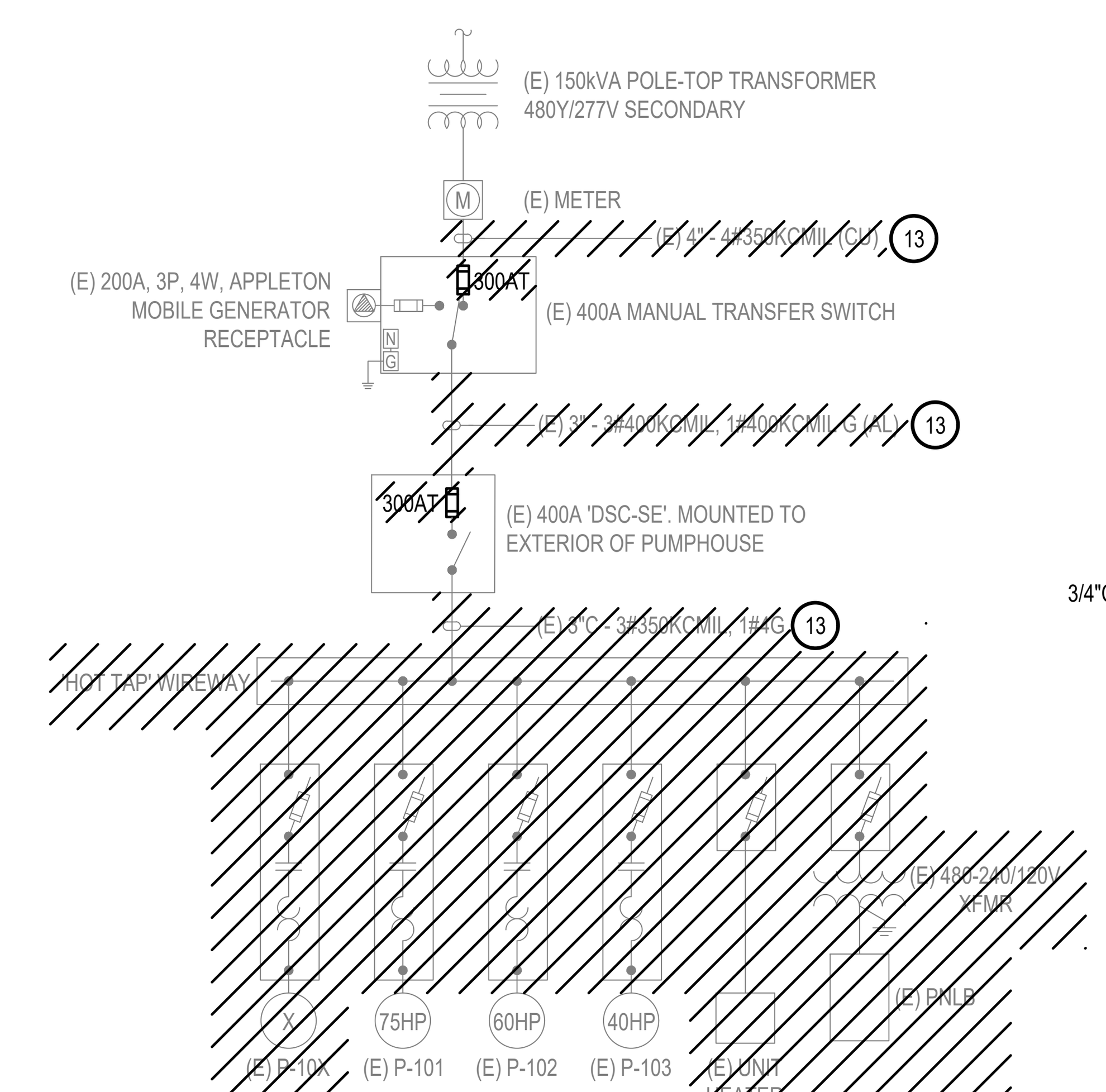
	LOCATION	CLASSIFICATION
1	NORTH ROOM	DRY ENVIRONMENT
2	SOUTH ROOM	DAMP ENVIRONMENT. PROVIDE WIRING METHODS AND MATERIALS SUITABLE FOR THE ENVIRONMENT.



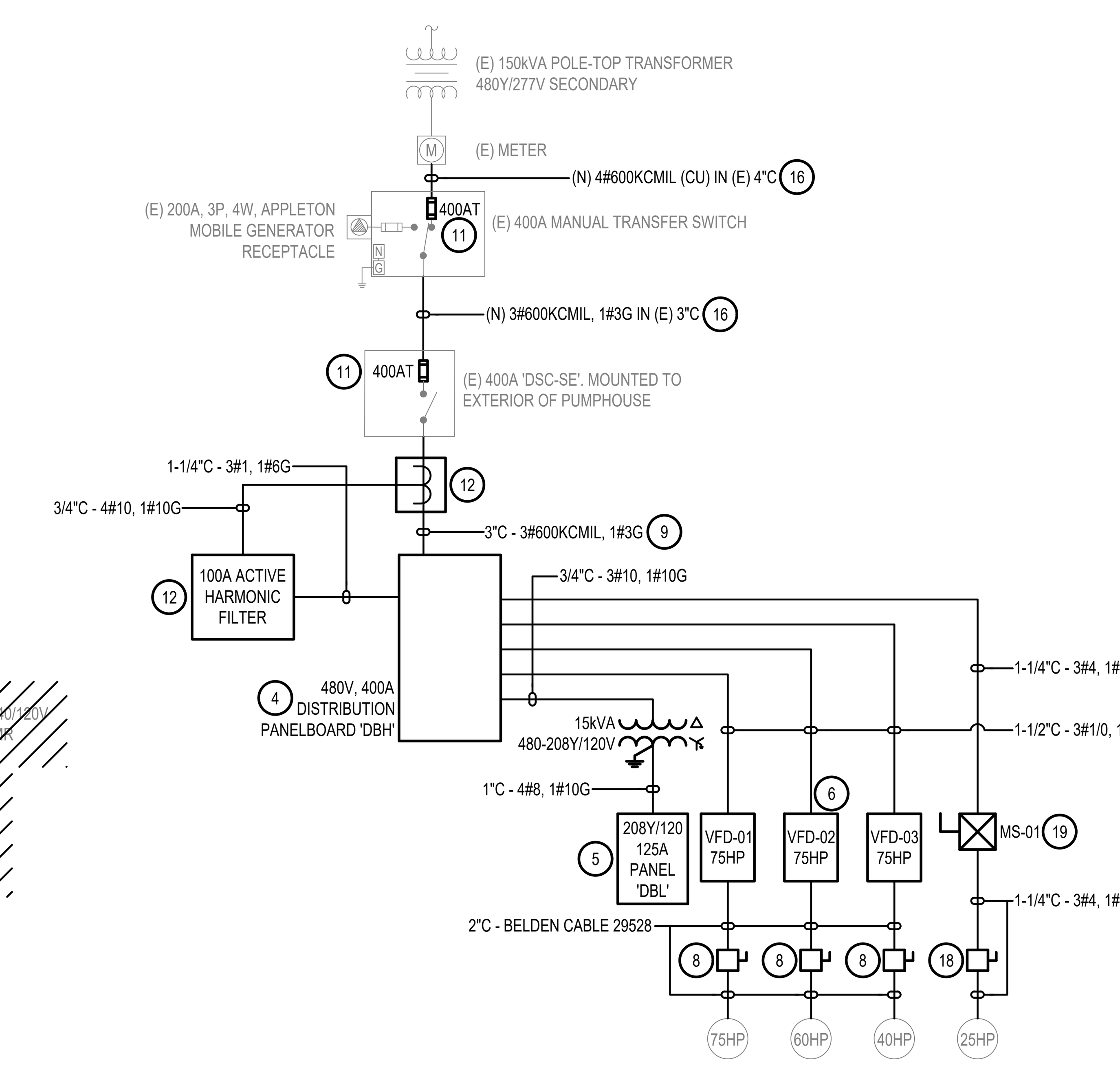
ELECTRICAL DEMOLITION PLAN
SCALE: 3/8" = 1'-0"



(N) ELECTRICAL PLAN
SCALE: 3/8" = 1'-0"



(E) ONE-LINE DIAGRAM
SCALE: N.T.S.



(N) ONE-LINE DIAGRAM
SCALE: N.T.S.

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CITY OF MCCALL
DAVIS BEACH INTAKE STATION UPGRADES
ELECTRICAL PLANS AND ONE-LINE DIAGRAMS

VERIFY SCALE
BAR IS ONE INCH ON FULL SIZE DRAWING
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DATE : 2/15/2023
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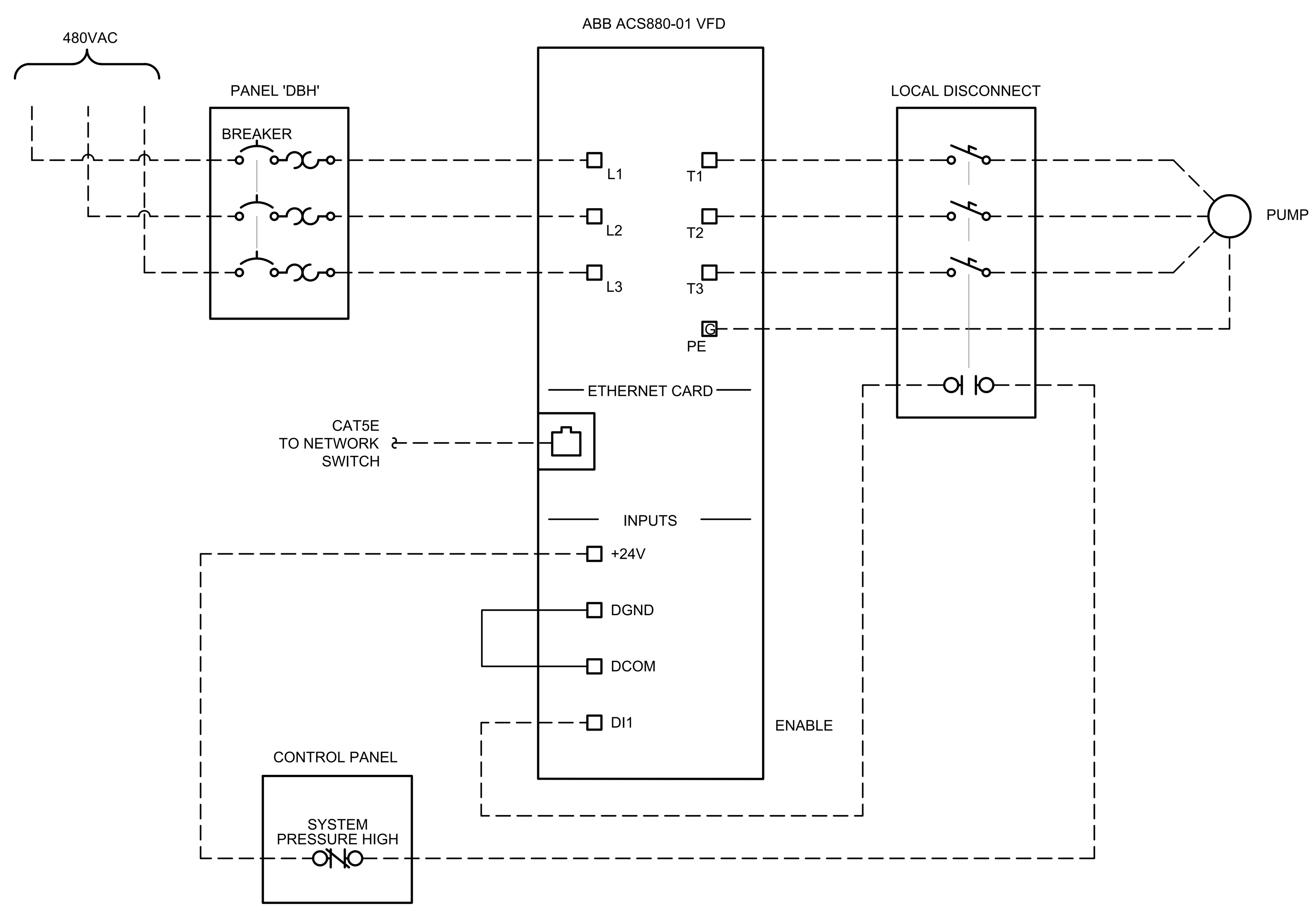
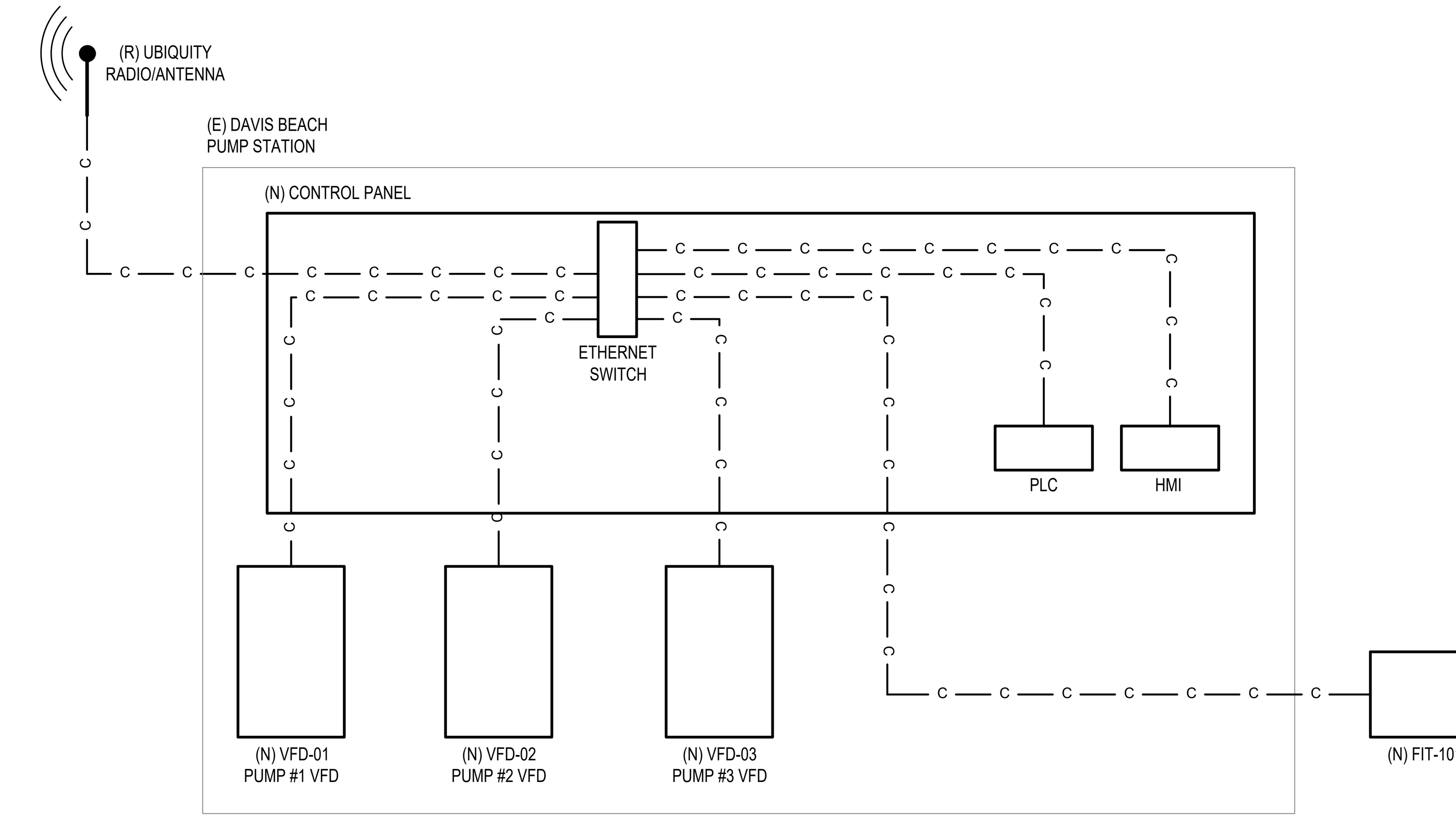
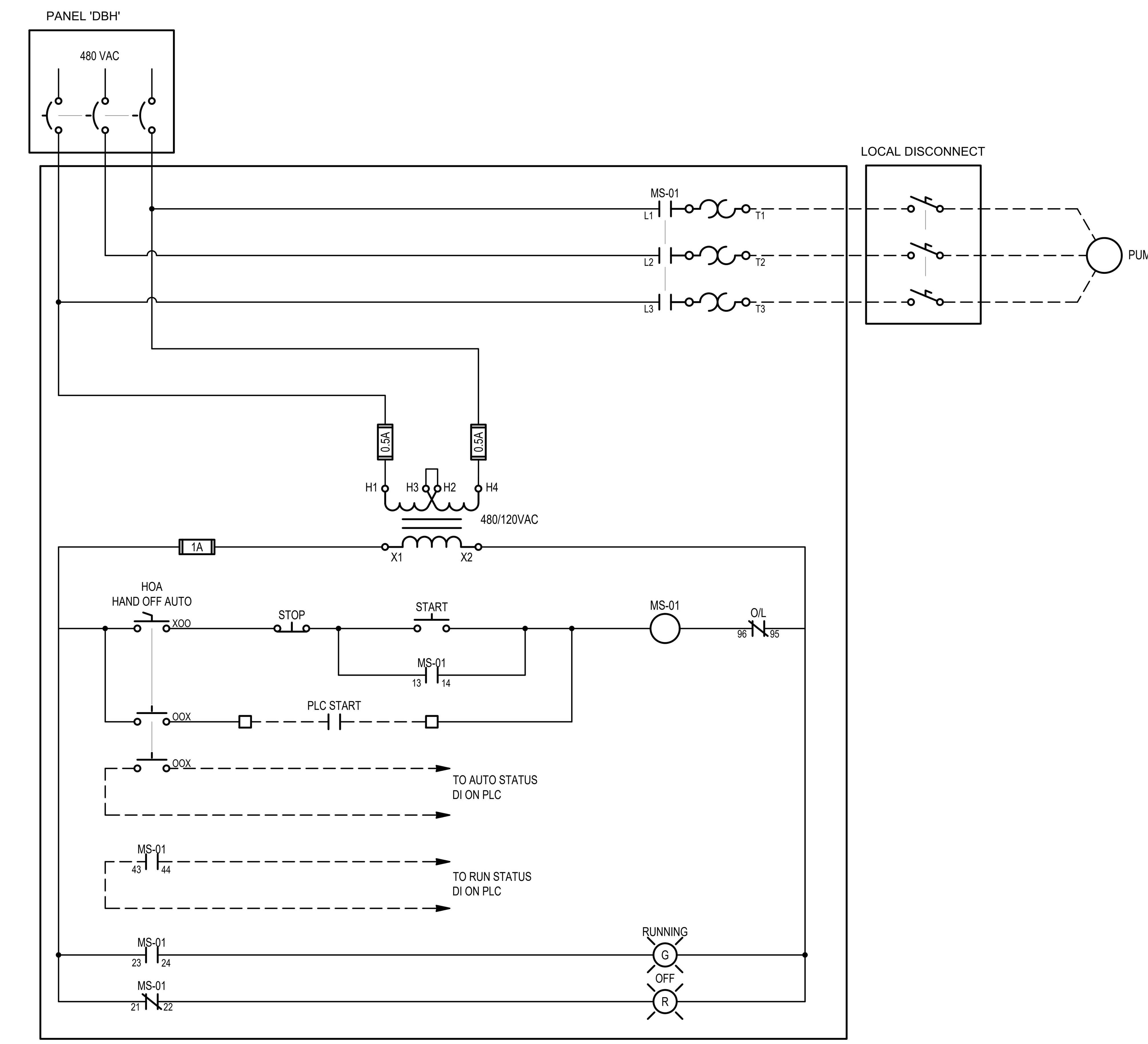


1 VFD SCHEMATIC
SCALE: NTS

LEGEND	
— C — C — C —	(E) COPPER ETHERNET
— C — C — C —	(N) COPPER ETHERNET



2 NETWORK DIAGRAM
SCALE: NTS



3 ENCLOSED NON-REVERSING STARTER SCHEMATIC
SCALE: NTS

	CABLE SCHEDULE		
INSTRUMENT/EQUIPMENT TAG	SERVICE	CONNECTION TO	CONDUCTORS / CABLE
PSH-101	**SYSTEM DISCHARGE PRESSURE HIGH**		
	HIGH PRESSURE	CONTROL PANEL	2#14
PSL-101	**SYSTEM DISCHARGE PRESSURE LOW**		
	LOW PRESSURE	CONTROL PANEL	2#14
PIT-101	**SYSTEM DISCHARGE PRESSURE**		
	PRESSURE	CONTROL PANEL	1#18TSP
FE-101	**SYSTEMP FLOW ELEMENT**		
	FLOW SIGNAL	FIT-101	MFR. POWER & SIG
FIT-101	**SYSTEM FLOW TRANSMITTER**		
	INSTANTANEOUS FLOW & FLOW TOTAL	CONTROL PANEL	1#CAT5E
P-101 DISCONNECT	**PUMP 1 DISCONNECT**		
	EARLY BREAK	CONTROL PANEL	2#14
VFD-01	**PUMP 1 VFD**		
	CONTROL/STATUS	CONTROL PANEL	1#CAT5E
	OVERPRESSURE	CONTROL PANEL	2#14
P-102 DISCONNECT	**PUMP 2 DISCONNECT**		
	EARLY BREAK	CONTROL PANEL	2#14
VFD-02	**PUMP 2 VFD**		
	CONTROL/STATUS	CONTROL PANEL	1#CAT5E
	OVERPRESSURE	CONTROL PANEL	2#14
P-103 DISCONNECT	**PUMP 3 DISCONNECT**		
	EARLY BREAK	CONTROL PANEL	2#14
VFD-03	**PUMP 3 VFD**		
	CONTROL/STATUS	CONTROL PANEL	1#CAT5E
	OVERPRESSURE	CONTROL PANEL	2#14
MS-01	**JOCKEY PUMP MOTOR STARTER**		
	CONTROL/STATUS	CONTROL PANEL	8#14

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CITY OF MCCALL
DAVIS BEACH INTAKE STATION UPGRADES
ELECTRICAL DETAILS

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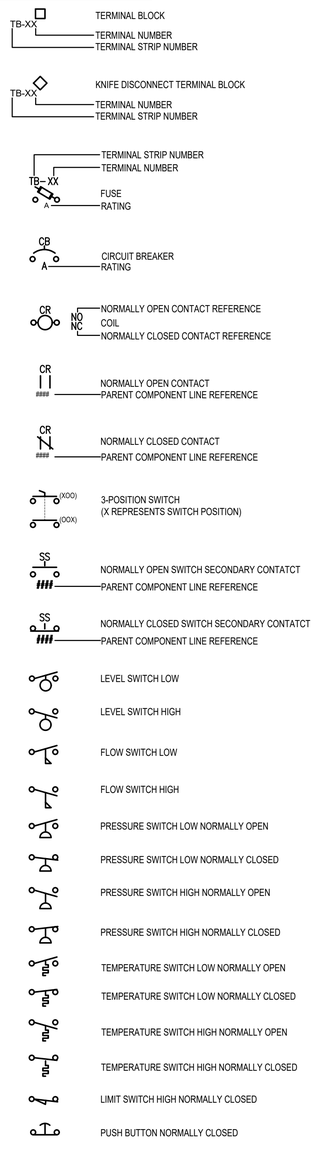
CONTROL SYMBOL LEGEND

LEGEND IS GENERAL IN NATURE. NOT ALL OF THE SYMBOLS SHOWN ARE USED IN THIS PROJECT.

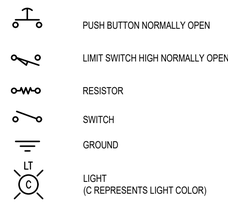
ABBREVIATIONS

A	AMPERES
AHJ	AUTHORITY HAVING JURISDICTION
AM	AMBER
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
CB	CIRCUIT BREAKER
CO	CONDUIT ONLY, PROVIDE PULL-LINE
CR	CONTROL RELAY
CV	CONTROL VALVE
DC	DIRECT CURRENT
DET	DETAIL
E	EMERGENCY/CRITICAL CARE
(E)	EXISTING
F	FUSE
FVNR	FULL VOLTAGE NON-REVERSING
G/GND	GROUND
GN	GREEN
HH	HANDHOLE
HMI	HUMAN MACHINE INTERFACE
HOA	HAND OFF AUTO
HVAC	HEATING, VENTILATING, & AIR CONDITIONING
I	IONIZATION
ID	IN-DUCT
IC	INTERRUPTING CAPACITY
IG	ISOLATED GROUND
I/O	INPUT/OUTPUT
IP	INTERNET PROTOCOL ADDRESS
J/JB	JUNCTION BOX
KW	KILOWATT
KWH	KILOWATT HOUR
LOC	LOCATION
LT	LIGHT
M	MAGNETIC CONTACTOR COIL
MB	MAIN BREAKER
MCC	MOTOR CONTROL CENTER
MFG	MANUFACTURER
MS	MOTOR STARTER
MH	MANHOLE
N	NEUTRAL
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NET	NETWORK
NIC	NOT IN CONTRACT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
O/L	OVERLOAD
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
PE	PHOTO EYE
PC	COMPUTER
PLC	PROGRAMMABLE LOGIC CONTROLLER
P/N	PART NUMBER
PS	POWER SUPPLY
PVC	POLYVINYL CHLORIDE
QTY	QUANTITY
(R)	RELOCATED
RE	RED
SCADA	SUPERVISORY CONTROL AND DATA AQUISITION
SPST	SINGLE POLE SINGLE THROW
SS	SOFT START
SU	SURGE SUPPRESOR
TB	TERMINAL BLOCK/STRIP
TDR	TIME DELAY RELAY
TJB	TERMINAL JUNCTION BOX
TSP	TWISTED SHIELDED PAIR
TTB	TELEPHONE TERMINAL BOARD
TYP	TYPICAL
UH	UNIT HEATER
UNO	UNLESS NOTED OTHERWISE
UPS	UNIVERSAL POWER SUPPLY
V	VOLT
VA	VOLT AMPERE
VAC	ALTERNATING CURRENT VOLTAGE
VDC	DIRECT CURRENT VOLTAGE
VFD	VARIABLE FREQUENCY DRIVE
WG	PROVIDE PROTECTIVE WIRE GUARD
WP	WEATHER PROOF/NEMA 3R
XFMR	TRANSFORMER

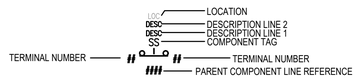
CONTROL SCHEMATIC SYMBOLS



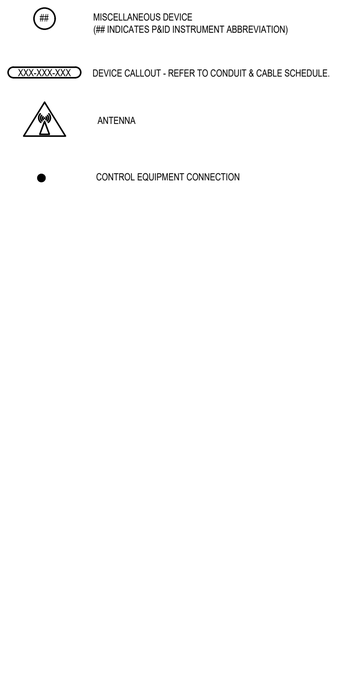
CONTROL SCHEMATIC SYMBOLS CONTINUED



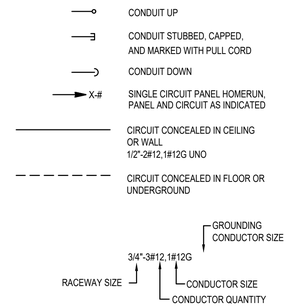
CONTROL SCHEMATIC SYMBOL TYPICAL ATTRIBUTE DEFINITIONS



PLAN SYMBOLS

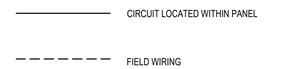


CIRCUITING SYMBOLS



- HOMERUNS SHALL HAVE 3/4" RACEWAY MIN, UNO
- WIRE SIZE SHALL BE #12(CU) UNO.

PANEL CIRCUITING SYMBOLS



PROJECT GENERAL NOTES

1. ALL CONTROL EQUIPMENT AND SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, UNIFORM FIRE CODE, AND ALL OTHER STATE AND LOCAL CODES. CONTRACTOR SHALL IMMEDIATELY NOTIFY ENGINEER IN WRITING IF PORTIONS OF THE DESIGN SET OR FIELD CONDITIONS DO NOT MEET REQUIRED CODES.
2. PLC AND HMI SOFTWARE PROGRAMMING IS PROVIDED BY THE OWNER UNDER A SEPARATE CONTRACT. THE CONTRACTOR SHALL INCLUDE A MINIMUM OF 6 HOURS START UP ASSISTANCE TO THE PROGRAMMER TO RESOLVE CONFLICTS BETWEEN EXISTING HARDWARE AND HARDWARE PROVIDED UNDER THIS PROJECT. THE CONTRACTOR SHALL BE ON SITE AND AVAILABLE TO WORK WITH THE PROGRAMMER TO PERFORM SYSTEM TESTING, CALIBRATIONS AND COMMISSIONING ASSISTANCE DURING THIS TIME.
3. INSTRUMENTATION DEVICES, WIRING, TERMINATIONS AND LOOP TESTING WILL BE CONDUCTED BY THE CONTRACTOR AND VERIFIED BY THE ENGINEER OR HIS REPRESENTATIVE PRIOR TO START UP. PROVIDE THE ENGINEER A MINIMUM OF TWO DAYS NOTICE PRIOR TO TESTING SO ARRANGEMENTS CAN BE MADE FOR VERIFICATION PERSONNEL TO BE ON SITE.

SHEET INDEX

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CITY OF MCCALL
DAVIS BEACH INTAKE STATION UPGRADES
CONTROLS COVER SHEET & SYMBOL LEGEND

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PROJECT : 101.060
DATE : 2/15/2023
SHEET NO. EI0.00

CONTROL SYMBOL LEGEND

LEGEND IS GENERAL IN NATURE. NOT ALL OF THE SYMBOLS SHOWN ARE USED IN THIS PROJECT.

HMI/SCADA POINT
1 - INSTRUMENT TAG
2 - LOOP
3 - FUNCTION
4 - DESCRIPTION
5 - POINT NUMBER
6 - LOCATION

PLC I/O POINT
1 - INSTRUMENT TAG
2 - LOOP
3 - I/O TYPE
4 - ADDRESS
5 - DESCRIPTION
6 - DESCRIPTION

PRIMARY POWER DEVICE
1 - DEVICE TAG
2 - LOOP
3 - TYPE
4 - DESCRIPTION
5 - VOLTAGE
6 - LOCATION

INSTRUMENT/CONTROL ELEMENT PRIMARY OPERATED
1 - INSTRUMENT TAG
2 - LOOP
3 - FUNCTION
4 - DESCRIPTION
5 - DESCRIPTION
6 - LOCATION

FIELD INSTRUMENT PRIMARY ELEMENT
1 - INSTRUMENT TAG
2 - LOOP
3 - FUNCTION
4 - DESCRIPTION
5 - DESCRIPTION
6 - LOCATION

PRIMARY FIELD EQUIPMENT POWERED
1 - INSTRUMENT TAG
2 - LOOP
3 - FUNCTION
4 - DESCRIPTION
5 - FURNISHED BY
6 - LOCATION

INSTRUMENT LINE SYMBOLS
COPPER ETHERNET
DATA LINK
DEVICENET
FIBER
MODBUS
HYDRAULIC
PNEUMATIC
PROFIBUS
WIRELESS
ELECTRIC CONNECT
CHANNEL - PRIMARY
CHANNEL - SECONDARY
PIPE - PRIMARY
PIPE - SECONDARY

PROCESS & INSTRUMENTATION SYMBOLS

VALVES
GATE VALVE
BALL VALVE
BUTTERFLY VALVE
THREE WAY VALVE
FOUR WAY VALVE
AIR RELIEF VALVE
ANGLE VALVE
DIAPHRAGM VALVE
GLOBE VALVE
SWING CHECK VALVE
GENERAL SPRING LOADED VALVE
BACKPRESSURE REG EXTERNAL TAP
BACKPRESSURE REG SELF CONTAINED
PRESSURE REDUCING EXTERNAL PRESSURE TAP
PRESSURE REDUCING SELF CONTAINED
PRESSURE REGULATOR VALVE
PRESSURE RELIEF VALVE
KNIFE GATE
SLIDE GATE
STOP GATE
SLUICE GATE
WEIR GATE

LEVEL INSTRUMENTS
FLOAT SWITCH
ULTRASONIC
BUBBLER
CAPACITANCE
ELECTRODE

PROCESS & INSTRUMENTATION SYMBOLS

PUMPS
PUMP
SUBMERSIBLE PUMP
CHEMICAL METERING PUMP
GEAR PUMP
DIAPHRAGM PUMP
RECIPROCATING PUMP
POSITIVE CAVITY/ POSITIVE DISPLACEMENT
VERTICAL TURBINE PUMP

MISCELLANEOUS
BLOWER FAN
CENTRIFUGAL SINGLE-STAGE
CENTRIFUGAL MULTI-STAGE
RECIPROCATING COMPRESSOR
COMPRESSOR SCREW
HEAT EXCHANGER
HORN
MIXER
GAUGE
THERMOMETER

FLOW METERS
MAGNETIC FLOW METER
PROPELLER FLOW METER
VORTEX FLOW METER
V-CONE FLOW METER
FLOW NOZZLE
PADDLE WHEEL FLOW METER

PROCESS & INSTRUMENTATION SYMBOLS

ACTUATOR SYMBOLS
ACTUATOR DIAPHRAGM
ELECTRIC DISCRETE
ELECTRIC MODULATING
PNEUMATIC DISCRETE
PNEUMATIC MODULATING
SOLENOID

TEMPERATURE INSTRUMENTS
TEMPERATURE SWITCH
TEMPERATURE TRANSMITTER

PRESSURE INSTRUMENTS
PRESSURE SWITCH
PRESSURE TRANSMITTER

MISCELLANEOUS INSTRUMENTS
SELECTOR SWITCH
E-STOP
LIGHT, C INDICATES COLOR.
R - RED
A - AMBER

MISCELLANEOUS SYMBOLS

REVISION TAG
REVISION NUMBER

CONTINUATION TAG
I-2.2 | A
CONTINUED ON SHEET
UNIQUE IDENTIFIER

P&ID ABBREVIATIONS

A
AAH ANALYSIS ALARM HIGH
AAL ANALYSIS ALARM LOW
ACV ANALOG CONTROL VALVE
AE ANALYSIS ELEMENT
AI ANALYSIS INDICATION
AIT ANALYSIS TRANSMITTER
ASDH ANALYSIS SHUTDOWN HIGH
ASDL ANALYSIS SHUTDOWN LOW
ASH ANALYSIS SWITCH HIGH
ASL ANALYSIS SWITCH LOW

B
BC BURNER CONTROLLER
BAH BURNER ALARM HIGH
BAL BURNER ALARM LOW
BS BURNER SWITCH
BSH BURNER SWITCH HIGH
BSL BURNER SWITCH LOW

C
CFA COMMON FAULT ALARM
COR CORROSIMETER
CV CONTROL VALVE

E
ES ELECTRICAL SWITCH
ESD EMERGENCY SHUTDOWN STATION
ESDV EMERGENCY SHUTDOWN VALVE

F
FAH FLOW ALARM HIGH
FAHH FLOW ALARM HIGH HIGH
FAL FLOW ALARM LOW
FALL LOW ALARM LOW LOW
FC FAIL CLOSE
FCV FLOW CONTROL VALVE
FE FLOW ELEMENT
FFA FLAME FAILURE ALARM
FFSD FLAME FAILURE SHUTDOWN
FI FLOW INDICATOR
FIC FLOW INDICATOR CONTROLLER
FIT FLOW INDICATOR TRANSMITTER
FO FAIL OPEN
FQ FLOW INDICATOR TOTAL
FQI FLOW INDICATOR WITH TOTALIZER
FR FLOW RECORDER
FRC FLOW RECORDER CONTROLLER
FRT FLOW RECORDER TRANSMITTER
FS FLOW SWITCH
FSDH FLOW SHUTDOWN HIGH
FSDL FLOW SHUTDOWN LOW
FSH FLOW SWITCH HIGH
FSL FLOW SWITCH LOW
FT FLOW TRANSMITTER

H
H HYDRAULIC
HAA SCADA HAND/OFF/REMOTE
HAO SCADA OPEN/CLOSE
HAP SCADA EMERGENCY STOP
HAR SCADA RESET
HAS SCADA SPEED SETPOINT
HAT SCADA START/STOP
HMV HYDRAULIC MOTOR OPERATED VALVE
HS HAND SWITCH
HSA LOCAL/OFF/REMOTE SWITCH
HSLR LOCAL-OFF-REMOTE SWITCH
HSS START-STOP SWITCH

I
I CURRENT SIGNAL
I/F INTERFACE
I/I CURRENT INDICATOR
IIT CURRENT INDICATING TRANSMITTER
IT CURRENT TRANSMITTER
IS CURRENT SWITCH
ISL CURRENT SWITCH LOW
ISH CURRENT SWITCH HIGH
IY CURRENT TRANSDUCER

K
KI CLOCK/TIMER/ELAPSED TIME

L
LA LEVEL ALARM
LAH LEVEL ALARM HIGH
LAHH LEVEL ALARM HIGH HIGH
LAL LEVEL ALARM LOW
LALL LEVEL ALARM LOW LOW
LC LEVEL CONTROLLER
LCV LEVEL CONTROL VALVE
LE LEVEL ELEMENT
LI LEVEL INDICATOR
LIC LEVEL INDICATOR CONTROLLER
LIT LEVEL INDICATOR TRANSMITTER
LLH LIQUID LEVEL HIGH
LLL LIQUID LEVEL LOW
LS LEVEL SWITCH
LSDH LEVEL SHUTDOWN HIGH
LSDL LEVEL SHUTDOWN LOW
LSH LEVEL SWITCH HIGH
LSL LEVEL SWITCH LOW
LSHH LEVEL SWITCH HIGH HIGH
LSLL LEVEL SWITCH LOW LOW
LT LEVEL TRANSMITTER

M
MAH MOISTURE ALARM HIGH
MAHH MOISTURE ALARM HIGH HIGH
MAL MOISTURE ALARM LOW
MALL MOISTURE ALARM LOW LOW
ME MOISTURE ELEMENT
MT MOISTURE TRANSMITTER
MIT MOISTURE INDICATING TRANSMITTER
MS MOTOR STARTER
MSH MOISTURE SWITCH HIGH

N
NC NORMALLY CLOSED
NO NORMALLY OPEN

P
P PNEUMATIC SIGNAL
PAH PRESSURE ALARM HIGH
PAHH PRESSURE ALARM HIGH HIGH
PAL PRESSURE ALARM LOW
PALL PRESSURE ALARM LOW LOW
PB PUSHBUTTON
PBST START PUSH BUTTON
PBSP STOP PUSH BUTTON
PBOP OPEN PUSH BUTTON
PBCL CLOSE PUSH BUTTON
PBON ON PUSH BUTTON
PBOF OFF PUSH BUTTON
PBES EMERGENCY STOP PUSH BUTTON
PBR RESET PUSH BUTTON
PC PRESSURE CONTROLLER
PCV PRESSURE CONTROL VALVE
PDA PRESSURE DIFFERENTIAL ALARM
PDAH PRESSURE DIFFERENTIAL ALARM HIGH
PDAL PRESSURE DIFFERENTIAL ALARM LOW
PDI PRESSURE DIFFERENTIAL INDICATOR
PDIC PRESSURE DIFFERENTIAL INDICATOR CONTROLLER
PDS PRESSURE DIFFERENTIAL SWITCH
PDSH PRESSURE DIFFERENTIAL SWITCH HIGH
PDSL PRESSURE DIFFERENTIAL SWITCH LOW
PE PRESSURE ELEMENT
PI PRESSURE INDICATOR
PIC PRESSURE INDICATOR CONTROLLER
PIT PRESSURE INDICATOR TRANSMITTER
PJI MULTIPOINT PRESSURE INDICATOR
PJR MULTIPOINT PRESSURE RECORDER
PL PILOT LIGHT
POV PNEUMATICALLY OPERATED VALVE
PRV PRESSURE REGULATING VALVE
PSDH PRESSURE SHUTDOWN HIGH
PSDL PRESSURE SHUTDOWN LOW
PSH PRESSURE SWITCH HIGH
PSHH PRESSURE SWITCH HIGH HIGH
PSL PRESSURE SWITCH LOW
PSLL PRESSURE SWITCH LOW LOW
PSP SCADA PRESSURE SETPOINT
PT PRESSURE TRANSMITTER

R
RTD RESISTANCE TEMPERATURE DETECTOR
RTU REMOTE TERMINAL UNIT

S
S SOLENOID
SAH SPEED ALARM HIGH
SAL SPEED ALARM LOW
SC SAMPLE CONNECTION
SD SHUTDOWN PANEL
SI SPEED INDICATOR
SR SPEED RECORDER
SS SOFT START
ST SPEED TRANSMITTER
SSH SPEED SWITCH HIGH
SSL SPEED SWITCH LOW
SV SOLENOID VALVE

T
TAH TEMPERATURE ALARM HIGH
TAHH TEMPERATURE ALARM HIGH HIGH
TAL TEMPERATURE ALARM LOW
TALL TEMPERATURE ALARM LOW LOW
TC TEMPERATURE CONTROLLER
TCV TEMPERATURE CONTROL VALVE
TD TIME DELAY
TDT DIFFERENTIAL TEMPERATURE TRANSMITTER
TDIT DIFFERENTIAL TEMPERATURE INDICATING TRANSMITTER
TDI DIFFERENTIAL TEMPERATURE INDICATOR
TDS DIFFERENTIAL TEMPERATURE SWITCH
TDSL DIFFERENTIAL TEMPERATURE SWITCH LOW
TDSH DIFFERENTIAL TEMPERATURE SWITCH HIGH
TDAL DIFFERENTIAL TEMPERATURE ALARM LOW
TDAH DIFFERENTIAL TEMPERATURE ALARM HIGH
TDCV DIFFERENTIAL TEMPERATURE CONTROL VALVE
TE TEMPERATURE MEASURING ELEMENT
TH THERMOSTAT
TI TEMPERATURE INDICATOR
TIC TEMPERATURE INDICATOR CONTROLLER
TIT TEMPERATURE INDICATOR TRANSMITTER
TJI MULTIPOINT TEMPERATURE INDICATOR/THERMOCOUPLE
TR TEMPERATURE RECORDER
TRC TEMPERATURE RECORDER CONTROLLER
TRT TEMPERATURE RECORDER TRANSMITTER
TSDH TEMPERATURE SHUTDOWN HIGH
TSDL TEMPERATURE SHUTDOWN LOW
TSH TEMPERATURE SWITCH HIGH
TSL TEMPERATURE SWITCH LOW
TSP SCADA TEMPERATURE SETPOINT
TT TEMPERATURE TRANSMITTER
TW THERMOWELL

V
VAH VIBRATION ALARM HIGH
VE VIBRATION ELEMENT
VFD VARIABLE FREQUENCY DRIVE
VSDH VIBRATION SHUTDOWN HIGH
VSH VIBRATION SWITCH HIGH
VT VIBRATION TRANSMITTER

W
WAH WEIGHT ALARM HIGH
WAHH WEIGHT ALARM HIGH HIGH
WAL WEIGHT ALARM LOW
WALL WEIGHT ALARM LOW LOW
WE WEIGHT ELEMENT
WI WEIGHT INDICATOR
WIT WEIGHT INDICATING TRANSMITTER
WS WEIGHT SWITCH
WSH WEIGHT SWITCH HIGH
WSHH WEIGHT SWITCH HIGH HIGH
WSL WEIGHT SWITCH LOW
WSLL WEIGHT SWITCH LOW LOW
WT WEIGHT TRANSMITTER

Y
YA STATUS ALARM
YR STATUS RUNNING

Z
ZCL POSITION CLOSED
ZE POSITION ELEMENT
ZIT POSITION INDICATING TRANSMITTER
ZI POSITION INDICATOR
ZL POSITION LIGHT
ZOP POSITION OPEN
ZS POSITION SWITCH
ZSP SCADA POSITION SETPOINT
ZT POSITION TRANSMITTER

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DESIGN EK
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CITY OF MCCALL
DAVIS BEACH INTAKE STATION UPGRADES
CONTROLS LEGEND CONTINUED

VERIFY SCALE
BAR IS ONE INCH ON FULL SIZE DRAWING
0 1"
PROJECT : 101.060
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SHEET NO.
EI0.01

PART 1 GENERAL

1.01 SUBMITTALS

A. ACTION SUBMITTALS:
1. ENCLOSURES.
2. TERMINAL JUNCTION BOX.
3. CONDUCTORS, CABLES AND ACCESSORIES
4. PUSHBUTTONS, INDICATING LIGHTS, AND SELECTOR SWITCHES.
5. PRESSURE MEASUREMENT
6. LEVEL MEASUREMENT
7. FLOW MEASUREMENT
8. LIQUID ANALYTIC MEASUREMENT
9. CONTROL PANELS
10. SCADA SOFTWARE AND HARDWARE

B. INFORMATIONAL SUBMITTALS:
1. FACTORY TEST REPORTS.
2. FIELD TEST REPORTS.
3. OPERATION AND MAINTENANCE DATA:
a. PROVIDE FOR ALL EQUIPMENT, AS WELL AS EACH DEVICE HAVING FEATURES THAT CAN REQUIRE ADJUSTMENT, CONFIGURATION, OR MAINTENANCE.
b. MINIMUM INFORMATION SHALL INCLUDE MANUFACTURER'S PREPRINTED INSTRUCTION MANUAL, ONE COPY OF THE APPROVED SUBMITTAL INFORMATION FOR THE ITEM, TABULATION OF ANY SETTINGS, AND COPIES OF ANY TEST REPORTS.

1.02 APPROVAL BY AUTHORITY HAVING JURISDICTION

A. PROVIDE THE WORK IN ACCORDANCE WITH NFPA 70, NATIONAL ELECTRICAL CODE (NEC). WHERE REQUIRED BY THE AUTHORITY HAVING JURISDICTION (AHJ), MATERIAL AND EQUIPMENT SHALL BE LABELED OR LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY OR OTHER ORGANIZATION ACCEPTABLE TO THE AHJ, IN ORDER TO PROVIDE A BASIS FOR APPROVAL UNDER THE NEC.
B. MATERIALS AND EQUIPMENT MANUFACTURED WITHIN THE SCOPE OF THE STANDARDS PUBLISHED BY THE UNDERWRITERS LABORATORIES, INC. SHALL CONFORM TO THOSE STANDARDS AND SHALL HAVE AN APPLIED UL LISTING MARK OR LABEL.

1.03 ENVIRONMENTAL CONDITIONS

A. UNLESS OTHERWISE SPECIFIED, EQUIPMENT AND MATERIALS SHALL NOT BE SIZED AND DE-RATED FOR THE AMBIENT CONDITIONS BUT NOT LESS THAN AN AMBIENT TEMPERATURE OF 40 DEGREES C AT AN ELEVATION OF 3000 FEET WITHOUT EXCEEDING THE MANUFACTURER'S STATED TOLERANCES.
B. PROVIDE INSTRUMENTS SUITABLE FOR THE INSTALLED SITE CONDITIONS INCLUDING, BUT NOT LIMITED TO, MATERIAL COMPATIBILITY, SITE ALTITUDE, PROCESS AND AMBIENT TEMPERATURE AND HUMIDITY CONDITIONS.

1.05 FUNCTIONAL SYSTEM

A. FURNISH AND INSTALL A COMPLETE CONTROL SYSTEM AS DEPICTED ON THE CONTROLS DRAWINGS. NOT ALL APPURTENANCES ARE INDICATED FOR A COMPLETE AND FUNCTIONAL SYSTEM AND THIS MUST BE INCLUDED IN THE CONTRACTOR'S BID.
B. IF THERE APPEARS TO BE IN CONFLICT WITH THE DRAWINGS, INCONSISTENCIES WITH DESIGN OR INTENT, OR NEED FOR CLARIFICATIONS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REQUEST CLARIFICATIONS IN WRITING PRIOR TO BID. IF THE CONTRACTOR FAILS TO CLARIFY QUESTIONS OR INCONSISTENCIES THEY ACCEPT RESPONSIBILITY TO CORRECT AT THEIR COST ANY SUCH ITEM TO MEET PROJECT INTENT.

1.06 EXTRA MATERIALS

A. FURNISH, TAG, AND BOX FOR SHIPMENT AND STORAGE THE FOLLOWING SPARE PARTS AND SPECIAL TOOLS:
1. FUSES, 0 TO 10 AMPS: FIVE OF EACH TYPE AND EACH CURRENT RATING INSTALLED.
2. DESSICANT FILTERS: TWO SPARE FILTER SETS FOR EACH TRANSMITTER WHERE FILTERS ARE USED.

PART 2 PRODUCTS

2.01 GENERAL

A. PRODUCTS SHALL COMPLY WITH ALL APPLICABLE PROVISIONS OF NFPA 70.
B. LIKE ITEMS OF EQUIPMENT: END PRODUCTS OF ONE MANUFACTURER IN ORDER TO ACHIEVE STANDARDIZATION FOR APPEARANCE, OPERATION, MAINTENANCE, SPARE PARTS, AND MANUFACTURER'S SERVICE.
C. EQUIPMENT FINISH:
1. MANUFACTURER'S STANDARD FINISH COLOR, EXCEPT WHERE SPECIFIC COLOR IS INDICATED.

2.02 ENCLOSURES

A. FINISH: SHEET METAL STRUCTURAL AND ENCLOSURE PARTS SHALL BE COMPLETELY PAINTED USING AN ELECTRODEPOSITION PROCESS SO INTERIOR AND EXTERIOR SURFACES AS WELL AS BOLTED STRUCTURAL JOINTS HAVE A COMPLETE FINISH COAT ON AND BETWEEN THEM.
B. COLOR: MANUFACTURER'S STANDARD COLOR (GRAY) BAKED-ON ENAMEL, UNLESS OTHERWISE SHOWN.
C. ENCLOSURE SELECTIONS: EXCEPT AS SHOWN OTHERWISE, PROVIDE ELECTRICAL ENCLOSURES ACCORDING TO THE FOLLOWING:
1. INDOOR – DRY ENVIRONMENT – FINISHED – NEMA 250, TYPE 12
2. INDOOR – INDUSTRIAL USE – UNFINISHED – NEMA 250, TYPE 12
3. OUTDOOR – ANY FINISH – NEMA 250, TYPE 3R
4. INDOOR AND OUTDOOR – WET AND/OR CORROSIVE – WHERE APPLICABLE – TYPE 4X: 304 STAINLESS STEEL.
D. MANUFACTURERS:
1. HOFFMAN
2. RITTAL

2.03 TERMINAL JUNCTION BOX

A. COVER: HINGED, UNLESS NOTED OTHERWISE.
B. INTERIOR FINISH: PAINT WITH WHITE ENAMEL OR LACQUER.
C. TERMINAL BLOCKS:
1. SEPARATE CONNECTION POINT FOR EACH CONDUCTOR ENTERING OR LEAVING BOX.
2. SPARE TERMINAL POINTS: 25 PERCENT MINIMUM.

2.04 TERMINAL BLOCKS

A. TYPE: UL 1059. IEC COMPRESSION SCREW CLAMP, WITH CURRENT BAR PROVIDING DIRECT CONTACT WITH WIRE AND YOKE, WITH INDIVIDUAL RAIL MOUNTED TERMINALS. MARKING SYSTEM SHALL PERMIT USE OF PREPRINTED OR FIELD-MARKED TAGS.
B. YOKES AND CLAMPING SCREWS: ZINC-PLATED, HARDENED STEEL.
C. RATING: 600VAC.
D. MANUFACTURERS:
1. ALLEN BRADLEY.
2. WEIDMULLER, INC.
3. ENTRELEC.

2.05 CONDUCTORS, CABLES, AND ACCESSORIES

A. CONDUCTORS 600 VOLTS AND BELOW:
1. CONFORM TO APPLICABLE REQUIREMENTS OF NEMA WC 71, WC 72 AND WC 74.
2. CONDUCTOR TYPE:
a. ALL CIRCUITS STRANDED COPPER.
3. INSULATION: TYPE THHN/THWN
4. SUITABLE FOR INSTALLATION IN OPEN AIR, IN CABLE TRAYS OR CONDUIT
5. MINIMUM TEMPERATURE RATING: 90 DEGREES C DRY LOCATIONS, 75 DEGREES C WET LOCATIONS.
6. OVERALL OUTER JACKET: PVC, FLAME-RETARDENT, SUNLIGHT AND OIL RESISTANT.
7. TYPE TSP, NO. 18 AWG, TWISTED, SHIELDED PAIR, INSTRUMENTATION CABLE: SINGLE PAIR, DESIGNED FOR NOISE REJECTION FOR PROCESS CONTROL, COMPUTER OR DATA LOG APPLICATIONS MEETING NEMA WC 55 REQUIREMENTS.
a. OUTER JACKET: 45 MILS NOMINAL THICKNESS.
b. INDIVIDUAL PAIR SHIELD: 1.35 MILS, DOUBLE-FACED ALUMINUM/SYNTHETIC POLYMER OVERLAPPED TO PROVIDE 100 PERCENT COVERAGE.
c. DIMENSION: 0.31-INCH NOMINAL OUTSIDE DIAMETER.
d. CONDUCTORS:
1) BARE SOFT ANNEALED COPPER, CLASS B, SEVEN-STRAND CONCENTRIC, MEETING REQUIREMENTS OF ASTM B8.
2) 20 AWG, SEVEN-STRAND TINNED COPPER DRAIN WIRE
3) INSULATION: 15 MILS NOMINAL PVC.
4) JACKET: 4 MILS NOMINAL NYLON.
5) COLOR CODE: PAIR CONDUCTORS BLACK AND RED.
e. MANUFACTURERS:
1) BELDEN
2) OKONITE CO.
B. ACCESSORIES:
1. IDENTIFICATION DEVICES:
a. SLEEVE-TYPE, PERMANENT, PVC, WHITE, WITH LEGIBLE MACHINE-PRINTED BLACK MARKINGS.
b. MANUFACTURER AND PRODUCTS: RAYCHEM; TYPE TMS-SCE.
2. CABLE TIES:
a. NYLON, ADJUSTABLE, SELF-LOCKING AND REUSABLE.
b. MANUFACTURER AND PRODUCT: THOMAS & BETTS; TY-RAP.
3. HEAT SHRINKABLE INSULATION:
a. THERMALLY STABILIZED, CROSSLINKED POLYOLEFIN.
b. MANUFACTURER AND PRODUCT: BRADY, THOMAS & BETTS; SHRINK-KON.

2.06 PUSHBUTTONS, INDICATING LIGHTS, AND SELECTOR SWITCHES

A. TYPE: HEAVY-DUTY, OILTIGHT. PROVIDE CONTACT ARRANGEMENTS, COLORS, INSCRIPTIONS, AND FUNCTIONS AS SHOWN.
B. CONTACT RATING: NEMA ICS 2, TYPE A600.
C. UNLESS OTHERWISE SHOWN, PROVIDE THE FOLLOWING FEATURES:
1. SELECTOR SWITCH OPERATING LEVER: STANDARD.
2. INDICATING LIGHTS: PUSH-TO-TEST, LED-TYPE.
3. PUSHBUTTON COLOR:
a. ON OR START: BLACK.
b. OFF OR STOP: RED.
4. PUSHBUTTONS AND SELECTOR SWITCHES LOCKABLE IN OFF POSITION WHERE INDICATED.
D. LEGEND PLATE:
1. MATERIAL: LAMINATED PLASTIC.
2. ENGRAVING: INDICATING SPECIFIC FUNCTION, OR AS SHOWN.
3. LETTER HEIGHT: 7/64 INCH.
E. MANUFACTURERS AND PRODUCTS:
1. ALLEN BRADLEY; TYPE 800H.
2. GENERAL ELECTRIC CO.; TYPE CR 104P.
3. SQUARE D CO.; TYPE T.
4. EATON; TYPE 10250T.

2.07 NAMEPLATES

A. MATERIAL: LAMINATED PLASTIC.
B. ATTACHMENT: ADHESIVE.
C. COLOR: BLACK, ENGRAVED TO A WHITE CORE, OR AS SHOWN.
D. NAMEPLATES SHALL BE PROVIDED ON ALL ELECTRICAL DEVICES, INCLUDING BUT NOT LIMITED TO CONTROL STATIONS, JUNCTION BOXES, PANELS, MOTOR STARTERS, INSTRUMENTS, DISCONNECT SWITCHES, INDICATING LIGHTS, METERS, AND ALL ELECTRICAL EQUIPMENT ENCLOSURES.
E. NAMEPLATES SHALL ALSO BE PROVIDED ON ALL ELECTRICAL PANEL INTERIOR EQUIPMENT, INCLUDING BUT NOT LIMITED TO RELAYS, CIRCUIT BREAKERS, POWER SUPPLIES, TERMINALS, CONTRACTORS, AND OTHER DEVICES.
F. EQUIPMENT NAMEPLATES SHALL HAVE BOTH THE EQUIPMENT NAME AND TAG NUMBER.
G. LETTER HEIGHT:
1. PUSHBUTTONS, SELECTOR SWITCHES, AND OTHER DEVICES: 1/8 INCH.
2. EQUIPMENT AND PANELBOARDS: ¼ INCH.

2.08 PRESSURE MEASUREMENT

A. THE PRESSURE SENSOR SHALL BE AN EXTERNAL DEVICE MOUNTED AS RECOMMENDED BY THE MANUFACTURER'S INSTALLATION INSTRUCTIONS FOR OPTIMUM ACCURACY.
B. DIAPHRAGM SEAL: WHERE INDICATED ON DRAWINGS OR AS THE PROCESS REQUIRES, TRANSMITTERS SHALL BE EQUIPPED WITH DIAPHRAGM SEALS, OR EQUAL PROTECTIVE PRESSURE OR VACUUM SENSING DEVICES. UNLESS OTHERWISE SHOWN, DIAPHRAGM SEALS SHALL BE PROVIDED ON ALL TRANSMITTERS WHERE MEDIUM FLUID HAS SOLIDS (I.E. MIXED LIQUOR), HIGH ACID CONTENT OR HIGH TEMPERATURES THAT MIGHT AFFECT ACCURACY OF PRESSURE TRANSMITTER.
C. ACCURACY REQUIREMENTS: UNLESS OTHERWISE INDICATED, PRESSURE TRANSMITTERS SHALL BE GUARANTEED TO REGISTER PRESSURE TO AN ACCURACY OF +/-1% OF ACTUAL PRESSURE THROUGHOUT THE RANGE INDICATED.
D. THE PRESSURE TRANSMITTER SHALL BE PIPE OR FLANGE MOUNTED GAUGE PRESSURE TRANSMITTER. THE MATERIALS IN CONTACT WITH THE PROCESS SHALL BE 316L STAINLESS STEEL. THE ELECTRONICS HOUSING SHALL BE PAINTED ALUMINUM, IP65 NEMA 4X ENCLOSURE.
E. PROCESS CONNECTIONS SHALL BE AN ASME 1/2" MNPT FEMALE PORT OR 1"-3" FLANGE DEPENDENT ON APPLICATION.
F. TRANSMITTER ELECTRONICS SHALL BE A 2 WIRE LOOP POWERED 4-20MA OUTPUT DEVICE WITH BUILT IN NOISE IMMUNITY, THERMAL COMPENSATION AND TRANSIENT PROTECTION.
G. TRANSMITTER SHALL HAVE A STATIC PRESSURE LIMIT AT LEAST 1.5 TIMES THE NOMINAL PRESSURE RANGE.
H. DISPLAY SHALL BE AN INTEGRALLY MOUNTED 4-LINE LCD SCALED WITH ENGINEERING UNITS.
I. THE UNIT SHALL BE RATED FOR PROCESS TEMPERATURE OF -40°F TO 212°F AND AN AMBIENT ENVIRONMENT OF -4°F TO 158°F. CONTRACTOR TO VERIFY ENVIORMENTAL RATINGS FOR SPECIFIC PROJECT CONDITIONS PRIOR TO ORDERING.
J. CONTRACTOR IS TO VERIFY REQUIRED PRESSURE RANGES OF PRESSURE MEASURING DEVICES WITH PROCESS ENGINEER PRIOR TO ORDERING.
K. UNIT SHALL HAVE ATEX, FM, CSA OR IECEX APPROVALS AS REQUIRED.
L. MANUFACTURERS
1. ENDRESS & HAUSER

2.09 ADJUSTABLE PRESSURE SWITCH

A. ADJUSTABLE PRESSURE SWITCHES SHALL BE DIAPHRAGM-ACTUATED, DUAL ADJUSTMENT PRESSURE SWITCHES SPDT CONTACTS RATED FOR A MINIMUM OF 5A AT 24VDC OR 120VAC. THE DEAD BAND SHALL BE ADJUSTABLE UP TO 60 PERCENT OF FULL SCALE. SET POINTS SHALL FALL BETWEEN 20 AND 80 PERCENT OF THE ADJUSTABLE RANGE. THE DIAPHRAGM SHALL BE BUNA-N, AND THE LOWER HOUSING SHALL BE BRASS WITH A ¼-INCH BOTTOM SENSING CONNECTION, UNLESS OTHERWISE INDICATED.
B. PRESSURE SWITCH SHALL BE PROVIDED WITH PUSHBUTTON LCD DISPLAY FOR SETPOINT ADJUSTMENT.
C. MANUFACTURERS
1. DWYER
2. ASHCROFT
3. APPROVED EQUAL

2.10 FLOW MEASUREMENT

A. EACH ELECTROMAGNETIC FLOWMETER SHALL BE CALIBRATED AT A FACILITY WHICH IS TRACEABLE TO THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGIES OR ISO.
B. ACCURACY REQUIREMENTS: UNLESS OTHERWISE INDICATED, FLOW METERS SHALL BE GUARANTEED TO REGISTER FLOW TO AN ACCURACY OF PLUS AND MINUS .5 PERCENT OF ACTUAL FLOW THROUGHOUT THE RANGE INDICATED.
C. METER TUBE: THE TUBE SHALL BE CONSTRUCTED OF 304 OR 316 STAINLESS STEEL TUBE WITH DUCTILE IRON FLANGED CONNECTIONS AND INCLUDE A MINIMUM OF TWO (2) SELF-CLEANING ELECTRODES. THE ELECTRODES SHALL BE CONSTRUCTED OF MATERIALS CONFORMING TO THE MANUFACTURER'S RECOMMENDATION FOR THE INTENDED SERVICE. THE METER HOUSING SHALL BE RATED NEMA 4X.
D. GROUNDING RINGS SHALL CONFORM TO THE MANUFACTURER'S BORE AND MATERIAL RECOMMENDATION FOR THE INTENDED SERVICE. GROUNDING RINGS SHALL BE PROVIDED AND DESIGNED TO PROTECT AND SHIELD THE LINER'S EDGE INTERFACE FROM ABRASION AT THE METER END.
E. SENSOR/TRANSMITTER
1. OUTPUT: 4-20MA INTO 700 OHMS MAX. (1) RELAY RATED AT 1A, 24VDC. TWO EIGHT DIGIT TOTALIZERS FOR FORWARD, NET OR REVERSE FLOW.
2. ETHERNET/IP COMMUNICATIONS: WHERE INDICATED ON PLANS PROVIDE TRANSMITTER CAPABLE OF ETHERNET/IP COMMUNICATIONS.
3. LCD DISPLAY FOR FLOWRATE, PERCENT OF SPAN, AND TOTALIZATION. AN OPERATOR INTERFACE WITH KEYPAD WHICH RESPONDS TO ENGLISH TEXT ENTRY.
4. INTEGRAL LOW FLOW CUTOFF AND ZERO RETURN TO PRODUCE A CONSISTENT ZERO OUTPUT SIGNAL IN RESPONSE TO AN EXTERNAL DRY CONTACT CLOSURE.
5. AUTOMATIC RANGE CHANGE AND CAPABILITY TO MEASURE FLOW IN BOTH DIRECTIONS.
6. PROGRAMMABLE PARAMETERS INCLUDING METER SIZE, FULL SCALE Q, MAGNETIC FIELD FREQUENCY, PRIMARY CONSTANT, TIME CONSTANT.
7. DATA RETENTION FOR A MINIMUM OF FIVE (5) YEARS WITHOUT AUXILIARY POWER (MAIN OR BATTERY).
8. SELF-DIAGNOSTICS AND AUTOMATIC DATA CHECKING.
9. PROTECTED TERMINALS AND FUSES IN A SEPARATE COMPARTMENT WHICH ISOLATES FIELD CONNECTION FROM ELECTRONICS.
10. THE TRANSMITTER SHALL CARRY THE MINIMUM RATING IP65 FOR INDOOR INSTALLATIONS, IP67 FOR OUTDOOR INSTALLATIONS, IP68 IN AREAS PRONE TO FLOODING OR WHERE THE TRANSMITTER WILL BE MOUNTED IN A VAULT.
F. MANUFACTURERS
1. ENDRESS & HAUSER
2. SIEMENS
3. ROSEMOUNT
4. APPROVED EQUAL

2.11 PROCESS CONTROL PANELS

A. ALL CONTROL PANELS AND ASSEMBLIES SHALL BE FABRICATED BY A UL 508A CERTIFIED PANEL SHOP.
B. ENVIRONMENTAL SUITABILITY:
1. ALL INDOOR AND OUTDOOR CONTROL PANELS AND INSTRUMENT ENCLOSURES SHALL BE SUITABLE FOR OPERATION IN THE AMBIENT CONDITIONS ASSOCIATED WITH THE LOCATIONS DESIGNATED IN THE CONTRACT DOCUMENTS.
A. UNLESS OTHERWISE SPECIFIED OR INDICATED ON THE DRAWINGS, ENCLOSURES SHALL BE. DRY, INDOOR LOCATIONS: NEMA 12.
B. CORROSIVE LOCATIONS: NEMA 4X 304 STAINLESS STEEL.
C. HOSE DOWN LOCATIONS: NEMA 4X 304 STAINLESS STEEL WITH SLOPPED TOP.
D. OUTDOOR INSTALLATIONS: NEMA 4
2. ENCLOSURES ARE TO BE PROVIDED WITH AN EQUIVALENTLY SIZED AND COMPATIBLE BACK PANEL AS MANUFACTURED BY THE SAME MANUFACTURER OF THE ENCLOSURE.
3. ENCLOSURES, PANELS, AND ENCLOSURE ACCESSORIES SHALL BE LABELED WITH A SERIALIZED LABEL AND LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY
4. HEATING, COOLING, AND DEHUMIDIFYING DEVICES SHALL BE PROVIDED IN ORDER TO MAINTAIN ALL INSTRUMENTATION DEVICES TO WITHIN A RANGE EQUAL TO 20 PERCENT ABOVE THE MINIMUM AND 20 PERCENT BELOW THE MAXIMUM OF THE RATED ENVIRONMENTAL OPERATING RANGES. PROVIDE ALL POWER WIRING FOR THESE DEVICES.
5. ALL CONTROL PANEL INSTRUMENTATION AND ENCLOSURES IN HAZARDOUS AREAS SHALL BE SUITABLE FOR USE IN THE PARTICULAR HAZARDOUS OR CLASSIFIED LOCATION IN WHICH IT IS TO BE INSTALLED.
C. REQUIREMENTS FOR ENCLOSURE ACCESSORIES:
1. LIGHTING: SHALL BE LED AS SUPPLIED BY THE PANEL MANUFACTURER.
2. PANEL LIGHTING SHOULD BE MOUNTED ABOVE THE DOOR ON THE FRONT EDGE OF THE ENCLOSURE OR MAGNETICALLY HELD IN A MANUFACTURER APPROVED METHOD.
3. LIGHTING SHALL BE ACTIVATED WITH A DOOR SWITCH OR SENSOR AND SHALL TURN ON WHEN THE DOOR IS OPENED.
4. LIGHTING SHALL BE ABLE TO BE SWITCHED OFF WHEN THE DOOR IS OPEN.
D. INTERNAL CONTROL COMPONENTS SHALL BE MOUNTED ON AN INTERNAL BACK-PANEL.
E. PROGRAMMABLE LOGIC CONTROLLER:
1. FURNISH AND INSTALL ALLEN BRADLEY 1769-L30ER WITH 1769-PA4 POWER SUPPLY AND I/O MODULES IN THE QUANTITIES REQUIRED TO ACCOMMODATE FIELD I/O PLUS 20% SPARE CAPACITY.
2. THE PLC I/O SHALL BE WIRED PER THE REQUIREMENTS OF THIS SPECIFICATION SECTION.
3. THE PLC SHALL BE POWERED FROM A 120VAC UPS BACKED CONTROL POWER BUS.
4. FOR PLC I/O MODULES REQUIRING EXTERNAL 24V DC POWER, A FUSED CIRCUIT SHALL BE PROVIDED (ONE COMMON FUSED CIRCUIT FOR EACH PLC I/O MODULE).
5. PROVIDE PANEL AND DIN RAIL SPACE FOR MOUNTING A MINIMUM OF TWO ADDITIONAL I/O MODULES FOR FUTURE EXPANSION. PROVIDE DIN RAIL SPACE FOR THE ASSOCIATED FUTURE I/O FIELD WIRING TERMINALS.
6. THE PLC SHALL BE CONNECTED TO THE INDUSTRIAL NETWORK SWITCH FOR SYSTEM COMMUNICATIONS VIA MANUFACTURER TERMINATED AND TESTED ETHERNET PATCH CABLE.
E. I/O:
1. I/O POINTS SHALL BE CONNECTED TO TERMINAL BLOCKS LOCATED WITHIN THE PANEL.
2. I/O CONNECTIONS SHALL NOT BE MADE DIRECTLY TO THE PLC OR PLC MODULES.
3. DIGITAL INPUTS:
a. SHALL BE 24V DC SINKING TYPE INPUTS.
b. AN INDIVIDUALLY FUSED TERMINAL BLOCK SHALL BE PROVIDED FROM THE POSITIVE 24VDC BUS FOR EACH GROUP OF DIGITAL INPUTS. NO MORE THAN 8 SHALL BE ALLOWED PER GROUP.
c. A KNIFE DISCONNECT TERMINAL BLOCK SHALL BE USED FOR THE FIELD SUPPLY OF EACH DIGITAL INPUT
d. A PASS-THRU TERMINAL CONNECTION SHALL BE USED FOR THE RETURN VOLTAGE TO THE INPUT.
e. ALL DIGITAL INPUTS SHALL BE GROUPED TOGETHER ON THE DIN RAIL WITH 24VDC SUPPLY FUSE TERMINAL BLOCK PRECEDING EACH GROUP IT FEEDS.
f. PROVIDE SPACE FOR FUTURE TERMINAL BLOCKS. PROVIDE ENOUGH SPACE FOR AN ADDITIONAL 25% OF REQUIRED I/O.
4. DIGITAL OUTPUTS:
a. INTERPOSING RELAYS SHALL BE PROVIDED FOR ALL DIGITAL OUTPUT POINTS.
b. DIGITAL OUTPUTS SHOULD ACTIVATE THE COIL OF THE CONTROL RELAY.
c. FIELD WIRING SHALL TERMINATE AT THE CONTACTS OF THE CONTROL RELAY.
d. DIGITAL OUTPUT CONTROL RELAYS SHOULD BE GROUPED TOGETHER ON THE DIN RAIL.
e. PROVIDE SPACE FOR FUTURE DIGITAL OUTPUT CONTROL RELAYS. PROVIDE ENOUGH SPACE FOR AN ADDITIONAL 25% OF REQUIRED I/O.
5. ANALOG INPUTS:
a. SHALL BE CAPABLE OF SINGLE ENDED OR DIFFERENTIAL CURRENT (4-20MA) INPUT TYPES.
b. AN INDIVIDUALLY FUSED TERMINAL BLOCK SHALL BE PROVIDED FROM THE POSITIVE 24VDC BUS FOR SINGLE ENDED LOOP POWERED CIRCUIT.
c. A PASS-THRU TERMINAL CONNECTION SHALL BE USED FOR THE RETURN VOLTAGE TO THE INPUT ON A SINGLE ENDED LOOP POWERED CIRCUIT.
d. TWO PASS-THRU TERMINAL CONNECTIONS SHALL BE USED FOR A DIFFERENTIAL CIRCUIT.
e. A GROUNDING TERMINAL BLOCK SHALL BE USED FOR CONNECTING ANALOG CABLE SHIELD DRAIN WIRE.
f. ANALOG INPUT WIRING SHALL BE SHIELDED TWISTED PAIR CABLE WITH THE CABLE SHIELD GROUNDED ONLY AT THE GROUNDING TERMINAL BLOCK INSIDE THE PROCESS CONTROL PANEL.
g. THE SHIELD DRAIN WIRE SHALL NOT BE CONNECTED AT THE TRANSMITTER OR FIELD END OF THE CIRCUIT.
h. ALL ANALOG INPUTS SHALL BE GROUPED TOGETHER ON THE DIN RAIL.
i. PROVIDE SPACE FOR FUTURE TERMINAL BLOCKS. PROVIDE ENOUGH SPACE FOR AN ADDITIONAL 25% OF REQUIRED I/O.
6. ANALOG OUTPUTS:
a. SHALL BE CURRENT (4-20MA) OUTPUT TYPE.
b. TWO PASS-THRU TERMINAL CONNECTIONS SHALL BE USED FOR OUTPUT CIRCUITS.
c. A GROUNDING TERMINAL BLOCK SHALL BE USED FOR CONNECTING ANALOG CABLE SHIELD DRAIN WIRE.
d. THE SHIELD DRAIN WIRE SHALL NOT BE CONNECTED AT THE TRANSMITTER OR FIELD END OF THE CIRCUIT.
e. ALL ANALOG OUTPUTS SHALL BE GROUPED TOGETHER ON THE DIN RAIL.
F. UNINTERRUPTABLE POWER SUPPLY:
1. PROVIDE DIN RAIL MOUNT UPS CAPABLE OF MAINTAINING PLC BACKUP OVER A PERIOD OF 15 MINUTES DURING A POWER OUTAGE.
2. UPS IS TO PROVIDE THE FOLLOWING PROVIDE I/O:
a. BATTERY FAIL
b. UPS FAULT
c. LOSS OF LINE
G. INDUSTRIAL NETWORK SWITCH:
1. PROVIDE 8 PORT INDUSTRIAL ETHERNET SWITCH.

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7051
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2. ETHERNET PATCH CABLES SHALL BE PROVIDED FOR CONNECTION BETWEEN ALL ETHERNET CONNECTED DEVICES AND INSTRUMENTS WITHIN CONTROL PANEL.
3. MANUFACTURER SHALL BE ALLEN BRADLEY.

H. 24VDC POWER SUPPLY:
1. PROVIDE (2) 24VDC POWER SUPPLIES FOR POWERING THE CONTROL PANEL COMPONENTS AND FIELD INSTRUMENTS.
2. THE POWER SUPPLIES SHALL BE CONFIGURED AS REDUNDANT, SO THAT THE FAILURE OF ONE WILL NOT AFFECT THE OPERATION OF THE CONNECTED COMPONENTS.
3. THE POWER SUPPLIES SHALL HAVE THE "POWER SUPPLY OK" SIGNALS WIRED FOR INDICATION.
4. THE POWER SUPPLIES SHALL BE POWERED FROM THE 120 VAC UPS BACKED CONTROL POWER CIRCUIT.
5. THE INPUT SHALL BE FUSE PROTECTED PER MANUFACTURER RECOMMENDATIONS.
6. THE OUTPUTS OF EACH POWER SUPPLY SHALL BE FUSE PROTECTED.
7. THE NEGATIVE OR COM OF 24VDC SUPPLY SHALL BE GROUNDED.

I. HMI:
1. TOUCH SCREEN PANEL MOUNT MONITOR: AB PANELVIEW 5510 2715P-T9WD.
2. THE TOUCH SCREEN OPERATOR INTERFACE SHALL BE MOUNTED THROUGH THE ENCLOSURE DOOR AND SEALED WITH THE PROPER MANUFACTURER GASKETS AND HARDWARE IN ORDER TO MAINTAIN THE PANEL ENCLOSURE RATING.

J. PANEL HVAC EQUIPMENT:
1. PANELS MOUNTED OUTDOORS, OR IN HIGH HUMIDITY AREAS SHALL HAVE THE FOLLOWING ACCESSORIES: THERMOSTATICALLY CONTROLLED HEATERS THAT SHALL MAINTAIN THE INSIDE TEMPERATURE ABOVE 40 DEGREES FAHRENHEIT.

K. CONTROL POWER REQUIREMENTS:
1. SOURCE POWER FOR CONTROL PANELS: SUPPLY ALL TRANSFORMERS, PROTECTION, AND POWER SUPPLIES NEEDED TO CONVERT THE SUPPLY VOLTAGE TO THE NEEDED UTILIZATION VOLTAGE WITHIN EACH CONTROL PANEL.
2. THE CONTROL POWER SHALL BE TERMINATED WITHIN THE PROCESS CONTROL PANEL AT A MAIN CIRCUIT BREAKER RATED FOR THE INTERNAL AND EXTERNAL CONTROL LOADS.
3. SURGE PROTECTIVE DEVICES SHALL BE INSTALLED ON THE 120 VAC CIRCUIT AND SHALL PROVIDE LINE AND NEUTRAL PROTECTION.
4. WHERE THE SUPPLY VOLTAGE TO THE CONTROL PANEL IS 480 OR 240VAC AS INDICATED ON THE ELECTRICAL PLANS THE CONTROL PANEL IS TO BE FURNISHED WITH A FRONT MOUNTED PAD LOCKABLE INTEGRAL DISCONNECT.
5. THE PROCESS CONTROL PANEL CONTROL POWER SHALL BE THE SOURCE OF POWER FOR ALL CONTROL INSTRUMENTS CONNECTED TO THE PROCESS CONTROL PANEL, UNLESS OTHERWISE INDICATED ON THE DRAWINGS.
   a. ALL CIRCUITS BEING USED TO POWER FIELD DEVICES FROM THE CONTROL PANEL 120 VAC BUS ARE TO BE CONNECTED TO A FUSED TERMINAL BLOCK ADEQUATELY SIZED FOR THE DEVICE IT SERVES.
   b. TERMINAL BLOCKS SHALL BE PROVIDED FOR ALL INTERNAL AND FIELD INSTALLED EQUIPMENT BEING POWERED FROM CONTROL PANEL 120 VAC POWER BUS.
   c. PROVIDE A MINIMUM OF 30% SPARE TERMINAL BLOCKS FOR FUTURE 120 VAC POWERED EQUIPMENT.

L. WIRING REQUIREMENTS:
1. WIRING METHODS AND MATERIALS FOR ALL PANELS SHALL BE IN ACCORDANCE WITH THE NEC REQUIREMENTS FOR GENERAL PURPOSE (ALL WIRING SHALL BE FINGER SAFE).
2. EACH TERMINAL CONNECTION SHALL HAVE A TERMINAL NUMBER.
3. SIGNAL WIRING:
   a. WIRING SHALL BE UL TYPE, SIS, OR MTW, FLEXIBLE STRANDED COPPER, CONTROL WIRE WITH 90°C, 600V INSULATION.
   b. ANALOG SIGNAL WIRING SHALL BE SHIELDED, TWISTED, PAIR.
   c. AC POWER CIRCUITS: #14 AWG MINIMUM.
   d. DIGITAL DC CIRCUITS: #16 AWG MINIMUM.
   e. INSTRUMENT AND COMMUNICATION CIRCUITS: #16 AWG MINIMUM.
4. MULTI-CONDUCTOR CABLES, WIRE WAYS AND CONDUIT SHALL BE SIZED TO ALLOW FOR 20 PERCENT SPARE SIGNAL WIRE.
5. WIRE MARKING: ALL WIRES SHALL BE LABELED AT BOTH ENDS WITH UNIQUE WIRE LABELS AND SHALL BE IDENTIFIED ON PANEL SHOP DRAWINGS.
6. WIRE WAYS: WHERE POSSIBLE, WIRING SHALL BE RUN IN PLASTIC WIRE DUCT WITH COVERS. WHERE IT IS NOT POSSIBLE TO CONTAIN THE WIRING IN THE DUCT, THE WIRING SHALL BE WRAPPED WITH PLASTIC SPIRAL BINDING.
7. SIGNAL AND LOW VOLTAGE CONTROL WIRING SHALL BE RUN SEPARATELY FROM 480 VAC WIRING:
8. 480 & 240 VAC CIRCUITS SHALL BE RUN THROUGH GRAY COLORED PLASTIC WIRE WAYS.
9. 120VAC & 24VDC CIRCUITS SHALL BE RUN THROUGH WHITE COLORED PLASTIC WIRE WAYS.

M. MINIATURE CIRCUIT BREAKERS
1. MINIATURE CIRCUIT BREAKERS SHALL BE THERMAL-MAGNETIC, CURRENT-LIMITING TYPE. BREAKER HOUSING SHALL SATISFY INSULATION GROUP II/RAL 7035, SHALL HAVE IP20 FINGER-SAFE DESIGN, SHALL BE SUITABLE FOR DIN RAIL MOUNTING AND SHALL INCLUDE STATUS INDICATOR WINDOW AND SCRATCH- AND SOLVENT-RESISTANT PRINTING.
2. CIRCUIT BREAKERS SHALL BE ALLEN BRADLEY 1489-M

N. SURGE PROTECTOR
1. SURGE PROTECTORS SHALL USE AN MOV TO CLAMP HIGH VOLTAGE SURGES. THE SURGE PROTECTIVE DEVICE SHALL PROVIDE VISUAL INDICATION, INTERNAL THERMAL DISCONNECTING AS WELL AS REMOTE MONITORING OF EVENT AND END OF LIFE FAILURE. THE SURGE PROTECTOR SHALL BE UL 1449 CERTIFIED.
2. SURGE PROTECTIVE DEVICES SHALL BE ALLEN BRADLEY 4983-DS

O. CONTROL RELAYS - MINIATURE
1. MINIATURE RELAYS SHALL BE, 2-POLE, PLUG-IN TYPE WITH BLADE-STYLE TERMINALS AND ON/OFF FLAG INDICATORS. MINIATURE RELAYS SHALL HAVE AN ELECTRICAL SCHEMATIC ON THE FACEPLATE AND A CLEAR COVER FOR VISUAL INSPECTION.
2. MINIATURE RELAYS SHALL BE ALLEN BRADLEY BULLETIN 700-HK OR APPROVED EQUAL.
3. SHALL BE FURNISHED WITH A PLUG-IN, LATCHING, FINGER SAFE, DIN RAIL MOUNTED TYPE SOCKET WITH COIL AND CONTACT SEPARATION.
4. COILS SHALL BE RATED FOR THE VOLTAGE APPLIED.
5. MINIATURE RELAY CONTACTS SHALL BE SILVER NICKEL AND HAVE 8A MINIMUM, DPDT RATINGS.
6. SHALL BE ALLEN BRADLEY 700-HK

P. WIRE TERMINATING COMPONENTS
1. FEED-THROUGH AND FUSED TERMINAL BLOCKS FOR CONTROL WIRING SHALL BE MOLDED TYPE, SCREW COMPRESSION CLAMP, DIN RAIL MOUNTED WITH BARRIERS RATED NOT LESS THAN 300V, 25A, SUITABLE FOR CONDUCTOR RANGING BETWEEN NO. 22 AND NO. 14.
2. TERMINAL BLOCKS SHALL BE ALLEN BRADLEY BULLETIN 1492-J4 OR APPROVED EQUAL.
3. GROUNDING TERMINAL BLOCKS SHALL PROVIDE DIN RAIL GROUNDING CLAMP. GROUNDING TERMINAL BLOCKS SHALL BE ALLEN BRADLY 1492-JG4 OR APPROVED EQUAL.
4. FUSE BLOCKS SHALL BE ALLEN BRADLEY 1492-WFB4 OR APPROVED EQUAL

Q. ALL FUSE HOLDERS SHALL BE POPULATED WITH FUSES AND 100% SPARE FUSES SHALL BE SUPPLIED.

R. FUSES SHALL BE APPROPRIATELY SIZED FOR THE APPLICATION AND POWER REQUIREMENTS OF THE LOAD.
1. TERMINAL BLOCK END ANCHORS SHALL BE USED TO SECURE ALL COMPONENTS ONTO THE DIN RAIL AT BOTH ENDS OF THE DIN RAIL. END ANCHORS SHALL BE 1492-EAJ35 OR APPROVED EQUAL.

S. IF UL508A CONTROL PANEL SHOP DRAWINGS WERE PROVIDED AS PART OF THE CONTRACT DOCUMENTS THESE DOCUMENTS SHALL BE USED BY THE CONTRACTOR FOR PANEL CONSTRUCTION.
1. ANY PANEL SHOP MODIFICATIONS OR VARIATIONS ARE TO BE PROVIDED TO THE ENGINEER FOR APPROVAL.
2. PRIOR TO SHIPPING THE CONTRACTOR IS TO PROVIDE A SET OF REDLINED SHOP DRAWINGS TO THE ENGINEER AT COMPLETION OF FACTORY ACCEPTANCE TESTING TO BE INCORPORATED INTO THE CONFORMED DOCUMENTS.
3. CONFORMED DOCUMENTS SHALL BE PROVIDED WITH THE PANEL PRIOR TO SHIPPING/DELIVERY TO THE PROJECT SITE.

PART 3 EXECUTION

3.01 GENERAL

A. INSTALL MATERIALS AND EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

B. COORDINATE LAYOUT AND INSTALLATION OF INSTRUMENTS AND INSTALLATION EQUIPMENT SUCH AS SUPPORT RACKS WITH PIPING, ELECTRICAL, SITE GRADING AND SURFACE FEATURES AS DETERMINED IN THE FIELD.

C. PROVIDE ADEQUATE CLEARANCES FOR MAINTENANCE, REPAIR AND REPLACEMENT FOR ALL INSTRUMENTS AND PROCESS CONTROL EQUIPMENT.

D. EACH INSTRUMENT SHALL BE CHECKED AGAINST THE LATEST VERSION OF THE DESIGN DOCUMENTS FOR TAGGING, MANUFACTURER, MODEL NUMBER, RANGE, ACTION, ETC., BEFORE FUNCTIONAL TESTING OR CALIBRATION.

E. CARE SHALL BE OBSERVED WHEN CONNECTING ELECTRIC POWER SUPPLIES TO THE INSTRUMENTATION. INSURE CORRECT VOLTAGE AND FREQUENCY ON AC POWER SUPPLIES. INSURE CORRECT VOLTAGE, POLARITY, AND SUPERIMPOSED RIPPLE ON DC POWER SUPPLIES. INSURE CORRECT POLARITY OF THE SUPPLY AND PROPER GROUNDING BEFORE CONNECTING INSTRUMENTS.

F. HARDWARE COMMONALITY: INSTRUMENTS WHICH UTILIZE A COMMON MEASUREMENT PRINCIPLE (FOR EXAMPLE, DIP CELLS, PRESSURE TRANSMITTERS, LEVEL TRANSMITTERS THAT MONITOR HYDROSTATIC HEAD) SHALL BE FURNISHED BY A SINGLE MANUFACTURER. PANEL MOUNTED INSTRUMENTS SHALL HAVE MATCHING STYLE AND GENERAL APPEARANCE. INSTRUMENTS PERFORMING SIMILAR FUNCTIONS SHALL BE OF THE SAME TYPE, MODEL, OR CLASS, AND SHALL BE FROM A SINGLE MANUFACTURER.

3.02 SUPPORT AND FRAMING CHANNELS

A. INSTALL WHERE REQUIRED FOR MOUNTING AND SUPPORTING ELECTRICAL EQUIPMENT AND RACEWAY SYSTEMS.

B. CHANNEL TYPE:
1. INTERIOR, DRY NONCORROSIVE LOCATIONS: CARBON STEEL.
2. INTERIOR, WET OR DRY CORROSIVE LOCATIONS: TYPE 316 STAINLESS STEEL.
3. OUTDOOR LOCATIONS: TYPE 316 STAINLESS STEEL.

C. PAINT CARBON STEEL CHANNEL CUT ENDS PRIOR TO INSTALLATION WITH ZINC-RICH PRIMER.

3.03 NAMEPLATES, SIGNS, AND LABELS

A. EQUIPMENT NAMEPLATES:
1. ALL INSTRUMENTATION SHALL BE PROVIDED WITH MANUFACTURER APPLIED STAINLESS STEEL TAG DENOTING EQUIPMENT UNIQUE IDENTIFIER AND DESCRIPTION.
2. ALL POWER MONITORING WIRING, ETHERNET CABLES, ANALOG WIRES, ETC. WHERE THIS WOULD RESULT IN SAME NAME BEING ASSIGNED TO MORE THAN ONE CIRCUIT, ADD NUMBER OR LETTER TO EACH OTHERWISE IDENTICAL CIRCUIT NAME TO MAKE IT UNIQUE.
3. METHOD: IDENTIFY WITH SLEEVES. TAPED-ON MARKERS OR TAGS RELYING ON ADHESIVES NOT PERMITTED.

B. CONNECTIONS AND TERMINATIONS:
1. INSTALL NYLON SELF-INSULATED CRIMP CONNECTORS AND TERMINATORS FOR INSTRUMENTATION CONTROL CIRCUIT CONDUCTORS.
2. TAPE INSULATE ALL UNINSULATED CONNECTIONS.

3.04 I/O TESTING

A. ALL I/O SHALL BE TESTED PRIOR TO THE PROGRAMMER ARRIVING TO THE SITE FOR FUNCTIONAL TESTING.

B. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY LABOR, TOOLS, AND EQUIPMENT TO FIELD TEST, INSPECT AND ADJUST EACH INSTRUMENT INSTALLED UNDER THIS CONTRACT TO ITS SPECIFIED PERFORMANCE REQUIREMENT IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND INSTRUCTIONS.

C. THE CONTRACTOR SHALL TEST ALL WIRING AND PRIMARY CONTROL DEVICES. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION TO THE OWNER OF THE TESTING PROCEDURES AND RESULTS OF THE FOLLOWING:

D. ALL PROCESS CONTROL PANELS ARE INSTALLED, CONNECTED TO POWER, AND FULLY WIRED FOR ALL I/O POINTS SHOWN ON THE PROCESS CONTROL PANEL SHOP DRAWINGS.

E. ALL FIELD INSTRUMENTS ARE INSTALLED, WIRED, POWERED AND PRODUCE THE APPROPRIATE SIGNAL AT THE PROCESS CONTROL PANEL.

F. ALL PANELS AND DEVICES CAPABLE OF BEING POWERED ON AND OFF HAVE HAD POWER CYCLED FOR VERIFICATION AND HAVE BEEN DOCUMENTED AS FUNCTIONAL.

G. WHEN POSSIBLE, THE CONTRACTOR SHALL SIMULATE EVENTS OF ACTUAL PROCESSES DURING TESTING.

H. ALL I/O POINTS SHALL BE TESTED. THE RESULTS OF THE TEST SHALL BE DOCUMENTED.

I. ANY I/O POINT THAT IS NOT TESTED SHALL BE DOCUMENTED AS WELL AS THE REASON FOR NOT BEING TESTED.

J. IF SYSTEM MALFUNCTIONS ARE FOUND DURING I/O LOOP TESTING, EFFORTS TO CORRECT MALFUNCTIONS MUST BE MADE. ANY MALFUNCTION NOT CAPABLE OF BEING CORRECTED PRIOR TO SUBMITTING I/O LOOP TESTING DOCUMENTATION TO THE OWNER SHALL BE DOCUMENTED INCLUDING THE PROCEDURES AND ACTIONS TAKEN ATTEMPTING TO CORRECT THE MALFUNCTION.

K. LOOP TESTING SHALL BE PERFORMED ON ALL DIGITAL INPUTS, DIGITAL OUTPUTS, ANALOG INPUTS, AND ANALOG OUTPUTS. TESTING SHALL BE PERFORMED WITHOUT UNWIRING AND REWIRING WHEN POSSIBLE.

L. DIGITAL INPUT TESTING SHALL BE PERFORMED AND COMPLETED BY EXERCISING THE FIELD INSTRUMENT OR DEVICE. CONTINUITY BETWEEN THE FIELD SIDE OF THE DISCONNECT TERMINAL BLOCK AND INPUT FIELD WIRING TERMINAL BLOCK SHALL BE VERIFIED. RESULTS OF THE TESTS SHALL BE DOCUMENTED WITH FIELD DEVICE NAME AND INPUT NUMBER.

M. ANALOG INPUTS SHALL BE VERIFIED AND DOCUMENTED FOR PROPER CURRENT /VOLTAGE RANGE RECEIVED AT THE PLC PANEL FROM THE POWERED FIELD INSTRUMENT. DOCUMENT THE RESULTS OF THE TESTS. IF THE FIELD INSTRUMENT IS UNAVAILABLE, VERIFY WIRING IS CORRECT AND PROPER CURRENT/VOLTAGE RANGE IS RECEIVED AT THE PANEL USING A SIGNAL GENERATING DEVICE SUCH AS A PROCESS METER OR OTHER LOOP CALIBRATOR.

N. DIGITAL OUTPUT CIRCUITS SHALL BE TESTED BY JUMPING THE DIGITAL OUTPUT RELAY CONTACTS IN THE PROCESS CONTROL PANEL. THE PROPER RESPONSE SHOULD BE OBSERVED AND VERIFIED AT THE FIELD INSTRUMENT OR DEVICE. DOCUMENT THE RESULTS OF THE TESTS.

O. ANALOG OUTPUTS SHOULD BE TESTED USING A PROCESS STYLE TEST METER THAT CAN PROVIDE A 4-20MA SIMULATED SOURCE. AN APPROPRIATE RESPONSE SHOULD BE OBSERVED AND VERIFIED AT THE FIELD DEVICE. DOCUMENT THE RESULTS OF THE TESTS.

P. ALL MOTORS AND VALVES WITH AUTOMATED CONTROLS AND A HAND-OFF-AUTO SWITCH SHALL BE OPERATED IN HAND TO VERIFY FUNCTIONALITY. RESULTS OF THE TEST SHALL BE DOCUMENTED.

3.05 FUNCTIONAL TESTING

A. FUNCTIONAL TESTING SHALL PROVE OUT THE CONTROL SYSTEM OPERATION AS OUTLINED IN THE CONTRACT DOCUMENTS AND THE PROCESS CONTROL DESCRIPTION.

B. ALL ALARM CONDITIONS SHALL BE SIMULATED AND VERIFIED THAT ALARMS ARE GENERATED AND PROPERLY NOTIFIED THROUGH THE SCADA SYSTEM.

C. THE TOUCH SCREEN OPERATOR INTERFACE SHALL BE CAPABLE OF SYSTEM NAVIGATION AND ADJUSTMENT OF ALL OPERATOR ADJUSTABLE SET POINTS.

D. PROVIDE DOCUMENTATION OF ALL CONDITIONS AND ALARMS TESTED AND PROVIDED WITH PROJECT CLOSEOUT MATERIAL.

E. TESTING SHALL BE COMPLETED WHEN THE SYSTEM IS CAPABLE OF BEING AUTOMATICALLY OPERATED (WITHOUT MANUAL OPERATOR INTERVENTION) FOR A PERIOD OF APPROXIMATELY ONE WEEK. AT THE END OF THIS TIME PERIOD, THE OWNER SHALL SIGN-OFF AS TESTING COMPLETE AND SYSTEM OPERATIONAL. ALTERNATIVELY, THE OWNER MAY SIGN-OFF BEFORE THE ONE-WEEK TIME PERIOD IF COMPLETELY SATISFIED AND WILLING TO SIGN OFF EARLY.

END OF SECTION

NO.	REVISION	BY	DATE
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CITY OF MCCALL
DAVIS BEACH INTAKE STATION UPGRADES
CONTROLS SPECIFICATIONS

VERIFY SCALE
BAR IS ONE INCH ON FULL SIZE DRAWING
0 1"
PROJECT : 101.060
DATE : 2/15/2023
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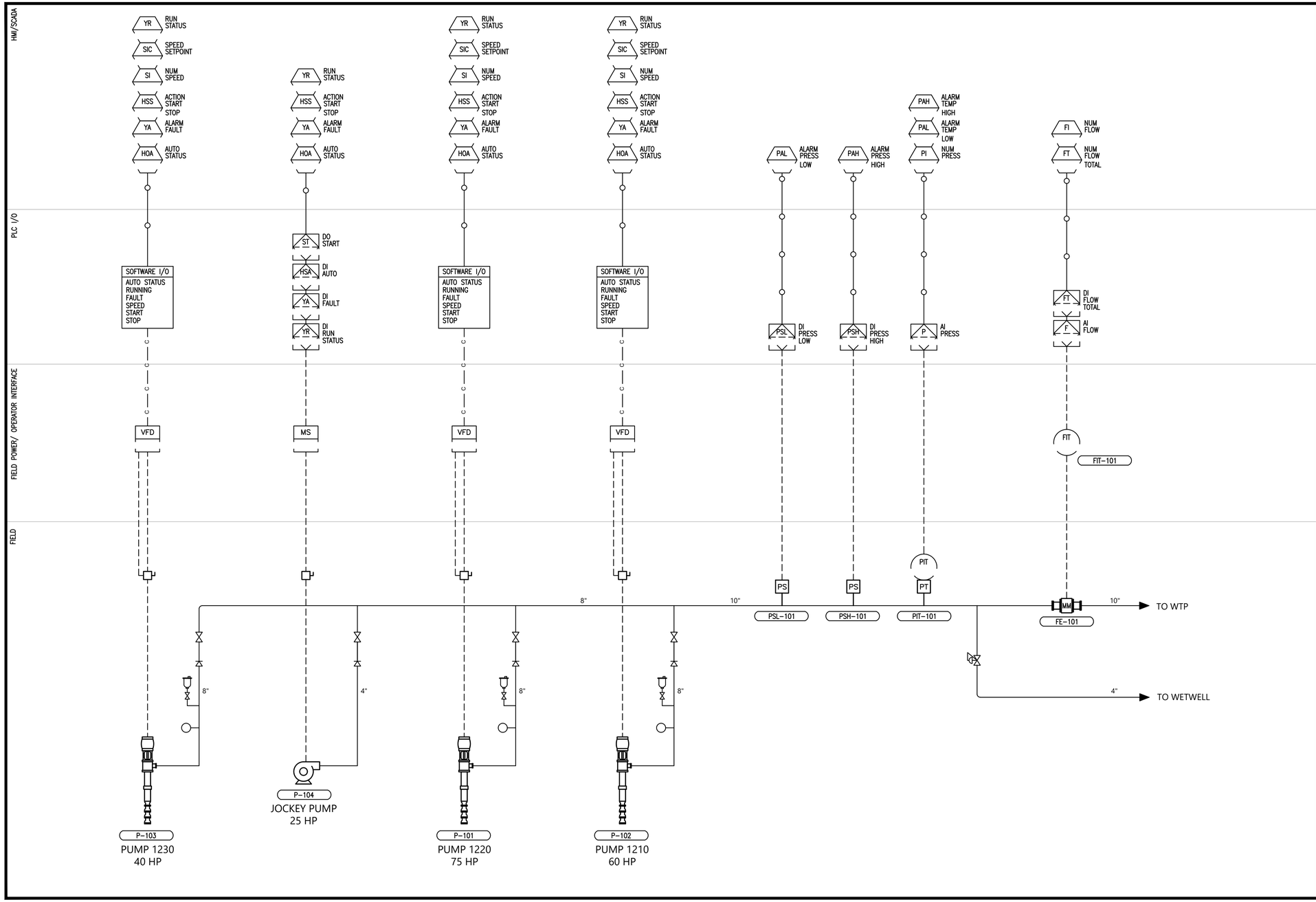

FUNCTIONAL DESCRIPTION:

SYSTEM DESCRIPTION

EXISTING BOOSTER PUMPS P-01, P-02 & P-03 HELP MAINTAIN WATER PRESSURE IN THE DISTRIBUTION SYSTEM IN A LEAD-LAG CONFIGURATION BASED ON DEMAND AND SHALL HAVE THE FOLLOWING MODES OF CONTROL:

1. REMOTE SCADA AUTO MODE: PRIMARY MODE WHEN SYSTEM IS IN AUTO AND CONTROLLED FROM SCADA.
2. LOCAL AUTO MODE: SYSTEM DEFAULTS TO THIS MODE WHEN IT LOOSES COMMS WITH SCADA.
3. LOCAL MODE: OPERATOR CAN DISABLE ALL AUTO CONTROLS AND CONTROL PUMPS MANUALLY.

COMM LOSS / LOCAL AUTO MODE FEATURE:
HEARTBEAT COMM LOGIC TO BE ADDED BETWEEN DAVIS BEACH PLC AND MAIN PLC. IF HEARTBEAT IS LOST FOR LONGER THAN 30 SECONDS, PRESSURE CONTROL PID (LOGIC TO BE ADDED TO MICOLOGIX DAVIS BEACH PLC LOGIC) WITH TAKE OVER UNTIL COMMS ARE ESTABLISHED WITH MAIN PLC AGAIN.

COMPLIANCE WITH EXISTING SCADA:
SCADA CONTROLS AND VISIBILITY WILL MATCH CONTROLS ENGINEERS SCADA AND WILL UTILIZE CONTROLS ENGINEERS AOIs TO INTEGRATE WITH CURRENT SCADA SYSTEM.

BOOSTER PUMP #1 (P-101)

AUTO CONTROL: P-101 BOOSTS WATER BASED ON LOCAL SYSTEM PRESSURE AND IS CONTROLLED VIA A NEW VFD (VFD-01). THE VFD WILL INCREASE AND DECREASE SPEED TO REACH THE TARGET PRESSURE SETPOINT (OPERATOR ADJUSTABLE) AS INDICATED BY THE EXISTING PRESSURE TRANSMITTER PIT-01.

HAND CONTROLS: THE PUMP CAN BE OPERATED FROM THE KEYPAD MOUNTED TO THE FRONT OF THE VFD AND PLACING THE VFD IN HAND AND RAMPING THE SPEED UP OR DOWN.

BOOSTER PUMP #2 (P-102)

AUTO CONTROL: P-102 BOOSTS WATER BASED ON LOCAL SYSTEM PRESSURE AND IS CONTROLLED VIA A NEW VFD (VFD-02). THE VFD WILL INCREASE AND DECREASE SPEED TO REACH THE TARGET PRESSURE SETPOINT (OPERATOR ADJUSTABLE) AS INDICATED BY THE EXISTING PRESSURE TRANSMITTER PIT-01. BOOSTER PUMP 2 WILL RAMP UP ONLY WHEN BOOSTER PUMP 1 IS UNABLE TO MAINTAIN SYSTEM PRESSURE.

HAND CONTROLS: THE PUMP CAN BE OPERATED FROM THE KEYPAD MOUNTED TO THE FRONT OF THE VFD AND PLACING THE VFD IN HAND AND RAMPING THE SPEED UP OR DOWN.

BOOSTER PUMP #3 (P-103)

AUTO CONTROL: P-103 BOOSTS WATER BASED ON LOCAL SYSTEM PRESSURE AND IS CONTROLLED VIA A NEW VFD (VFD-03). THE VFD WILL INCREASE AND DECREASE SPEED TO REACH THE TARGET PRESSURE SETPOINT (OPERATOR ADJUSTABLE) AS INDICATED BY THE EXISTING PRESSURE TRANSMITTER PIT-01. BOOSTER PUMP 3 WILL RAMP UP ONLY WHEN BOOSTER PUMP 2 IS UNABLE TO MAINTAIN SYSTEM PRESSURE.

HAND CONTROLS: THE PUMP CAN BE OPERATED FROM THE KEYPAD MOUNTED TO THE FRONT OF THE VFD AND PLACING THE VFD IN HAND AND RAMPING THE SPEED UP OR DOWN.

JOCKEY PUMP (P-104)

AUTO CONTROL: P-104 PUMPS WATER BASED ON LOCAL SYSTEM PRESSURE AND IS CONTROLLED VIA A NEW MOTOR STARTER (MS-01).

HAND CONTROLS: THE PUMP CAN BE OPERATED FROM THE CONTROLS MOUNTED TO THE FRONT OF THE STARTER AND PLACING THE HOA IN HAND.

SCADA/HMI MONITORING AND CONTROL

P-101: RUN COMMAND, RUN STATUS, SPEED CONTROL, SPEED FEEDBACK, AUTO STATUS, FAULT STATUS

P-102: RUN COMMAND, RUN STATUS, SPEED CONTROL, SPEED FEEDBACK, AUTO STATUS, FAULT STATUS

P-103: RUN COMMAND, RUN STATUS, SPEED CONTROL, SPEED FEEDBACK, AUTO STATUS, FAULT STATUS

P-104: START COMMAND, RUN STATUS, AUTO STATUS, FAULT STATUS

PIT-01: SYSTEM PRESSURE, LOW PRESSURE ALARM, HIGH PRESSURE ALARM

PSL-01: SYSTEM LOW PRESSURE ALARM

PSH-01: SYSTEM HIGH PRESSURE ALARM

FIT-01: FLOW, FLOW TOTAL, LOW FLOW ALARM

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