



ADDENDUM #1
RFP NUMBER: 2014005-PU-P
North River Pump Station Motor Replacement RFP
PROJECT 473-12-13
CONTRACT 3

DATE: December 20, 2013

TO: All Potential Proposers

City of Harrisonburg's North River Pump Station Motor Replacement RFP (2014005-PU-P), is modified as follows:

Site Meeting and Pre-Bid Questions:

Q1: The requirements on the vertical motor: The specification calls out flood lube bearing and flood lube system. Until we run the design we are not sure this will be needed. The pictures provided we did not see and any indications of the system on the existing motors.

R1: Oil cooled bearings are required for the new motors.

Q2: There is also the requirements of a water cooled bearing with supply from city water system. We also did not see this on the photos they provided.

R2: Bearing oil will be circulated through a heat exchanger cooled by City water supply, refer to proposed installation drawings attached.

Q3: They are requesting an additional cooling fan / Blower on these motors. We have no indication the motor speed range only the motor will be used on a VFD. We would like to have the speed torque curve on the motors and the thrust value the motor will need to handle. It will allow us the properly provided and motor based on this data to offer a motor that will perform in this application.

R3: External motor cooling fan must be sized to cool motor under full load at manufacturer's minimum specified operating speed.

Q4: There is also redolence in the monitoring requirements on the motor. The winding are shown to need winding RTD, Thermistor, and Thermostats. All three are used on the winding. RTD will provide real time temperature of the winding on all three phases, A thermostat will only open and close at 145C and the thermostat will provided a surge in resistance at a certain temperature. Not sure why all three. Most VDF will work of off RTD"s and usually has the as a standard capability.

R4: The motor spec was written for a motor with normal input power and control from a VFD that will use RTD inputs. The VFD also has a manual bypass circuit which will require the thermistors and thermostats for protection while in that mode of operation. Please provide all three temperature control means with the motor.

Q5: There is a request for vibration monitoring at three points on the bracket. We need to know if they would like transducer or vibration switch. We will need to know the output signal they would like and the supply voltage 24 volt DC or 120 volts for the devices. Is there any one they would like us to provide?

R5: Vibration sensor voltage shall match other motor sensors for common voltage, no specific sensor manufacturer is specified, sensors should be as recommended by motor manufacturer (IMI sensors is a typical OEM vendor).

Q6: Insulated bearing are fine but a shaft grounding ring on a vertical is not very common. Our motor comes with a grounding lug in the main terminal box but we would recommend additional grounding on the frame as well.

R6: The specified insulation bearings will block the path of electrical harmonic and carrier frequencies from the drive that are induced on the shaft from the windings. The shaft grounding ring is intended to provide that path to reduce electrical stress across the bearing insulation as well as additional electrical safety to personnel.

Q7: The Efficiency of the motor will fall to the efficiency of the VFD so there is no way to guarantee the efficiency of the motor on a VFD.

R7: The motor for this application may be operated in a bypass mode and is specified to provide premium efficiency during operation independent of the drive.

Q8: The current 350 HP motor that is in place do we know what the BD dimension is to match up and any information on the pump Jack shaft.

R8: Please refer to Page A-2 of the proposal which provides all available dimensions for the existing motors.

Q9: The ceramic insulate bearing are not available for the thrust bearing and can only be installed on the guide bearing. We will insulate the thrust bearing.

R9: Provide ceramic insulated bearings as specified. An insulating the thrust bearing is acceptable.

Q10: Bearing life cannot meet the L-10 of 250,000 service hours Normal L-10 Life is based on the bearing in the motor and thrust requirement. The 250,000 hour requirement exceeds the bearing manufacture guide line as well.

R10: Providers should include a premium bearing product with the longest L-10 life offered up to 250,000 service hours.

Q11: I am writing concerning the North River Pump Station VFD & Electrical Gear, (RFP 2014015-PU-P). Per the RFP Item number 7, (Instructions for Preparing and Submitting Proposals), I am respectfully requesting that Fuji Electric be listed under an addendum as one of the manufactures list as the “basis-of-design” in 4. SPECIFICATIONS, C. I understand you may not be familiar with Fuji but we manufacture the VFDs for TECOWestinghouse and our engineering and support staff for the Americas is located in Roanoke, VA. If you require additional information, I would be more than happy to visit your facilities and provide an over view of our capabilities. Please feel free to give me a call with any questions.

R11: Basis-of-Design Providers listed in the RFP are listed as indicative of manufacturer’s that were known to provide products in the market. Equivalent products meeting project specifications will be considered in technical evaluation of the proposals.

Q12: There are several statements concerning supplying a bypass in the specification but they are followed with “if specified” or “if used” or “as shown on the drawings”. Is there a requirement for a bypass and if so do you want a soft-start bypass due to the size of the motors?

R12: Each VFD unit shall be equipped with across the line bypass capabilities configured to enable operation of the pump motor at full speed using a manual bypass control to ensure pump operability in the event of a fault with the VFD controls. This bypass shall have output controls contact acknowledging bypass switch setting (i.e. switch status reporting).

Q13: Also, with the preliminary installation drawings being released in an addendum, do they include any control diagrams?

R13: Preliminary motor and VFD installation drawings are attached to this addendum for coordination purposes.

Attachments: Preliminary Pump Station Design Drawings

End of Addendum No. 1

All other requirements, terms and conditions of the RFP remain unchanged.

Addendum page must be signed and returned with your proposal to acknowledge receipt of this addendum.

Authorized Signature

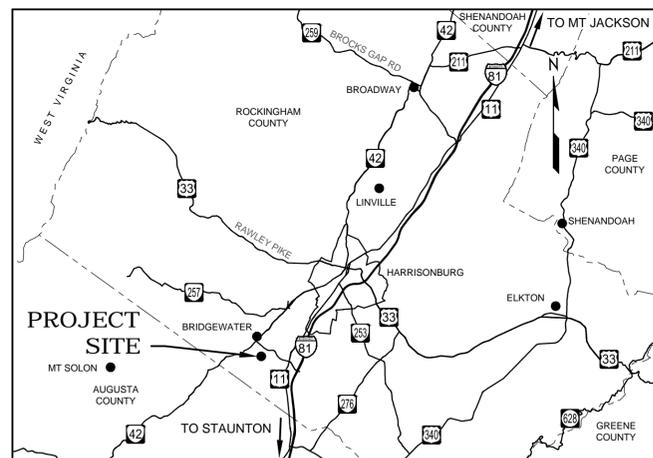
By: Pat Hilliard, CPPB
Purchasing Agent

CITY OF HARRISONBURG

NORTH RIVER PUMP STATION UPGRADE 2013 PROJECT #473-12-13 BRIDGEWATER, VIRGINIA DECEMBER 13, 2013

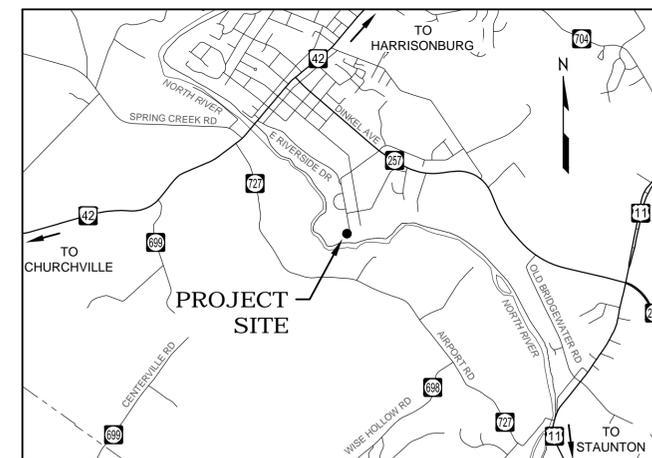
PRE-FINAL REVIEW
NOT FOR
CONSTRUCTION

CITY OF HARRISONBURG
NORTH RIVER PUMP STATION
UPGRADE
BRIDGEWATER, VIRGINIA



VICINITY MAP
NOT TO SCALE

| LIST OF DRAWINGS | |
|------------------|---|
| SHEET NO. | SHEET TITLE |
| G-001 | COVER SHEET |
| C-001 | EXISTING SITE PLAN |
| C-101 | SITE PLAN |
| D-101 | PUMP STATION INTERIOR PLAN |
| D-102 | PUMP STATION VAULTS AND WETWELL MODIFICATIONS |
| D-501 | DETAILS |
| S-001 | STRUCTURAL GENERAL NOTES |
| S-101 | PLANS AND BUILDING SECTIONS |
| S-501 | SECTIONS & DETAILS |
| S-502 | SECTIONS & DETAILS |
| M-101 | FLOOR AND ROOF PLAN - HVAC |
| M-601 | SCHEDULES, DETAILS AND DIAGRAMS |
| E-001 | ELECTRICAL SITE PLAN |
| E-101 | FLOOR PLAN - LIGHTING & INSTRUMENTATION |
| E-102 | FLOOR PLAN - POWER |
| E-601 | ONE-LINE DIAGRAM |
| E-602 | SCHEDULE |



SITE MAP
SCALE: 1" = 3,000'

CONTRACT 1: CONSTRUCTION CONTRACT
CONTRACT 2: MOTOR SUPPLIER CONTRACT
CONTRACT 3: VFD SUPPLIER CONTRACT
CONTRACT 4: SCADA SUPPLIER CONTRACT

REVISION DESCRIPTION

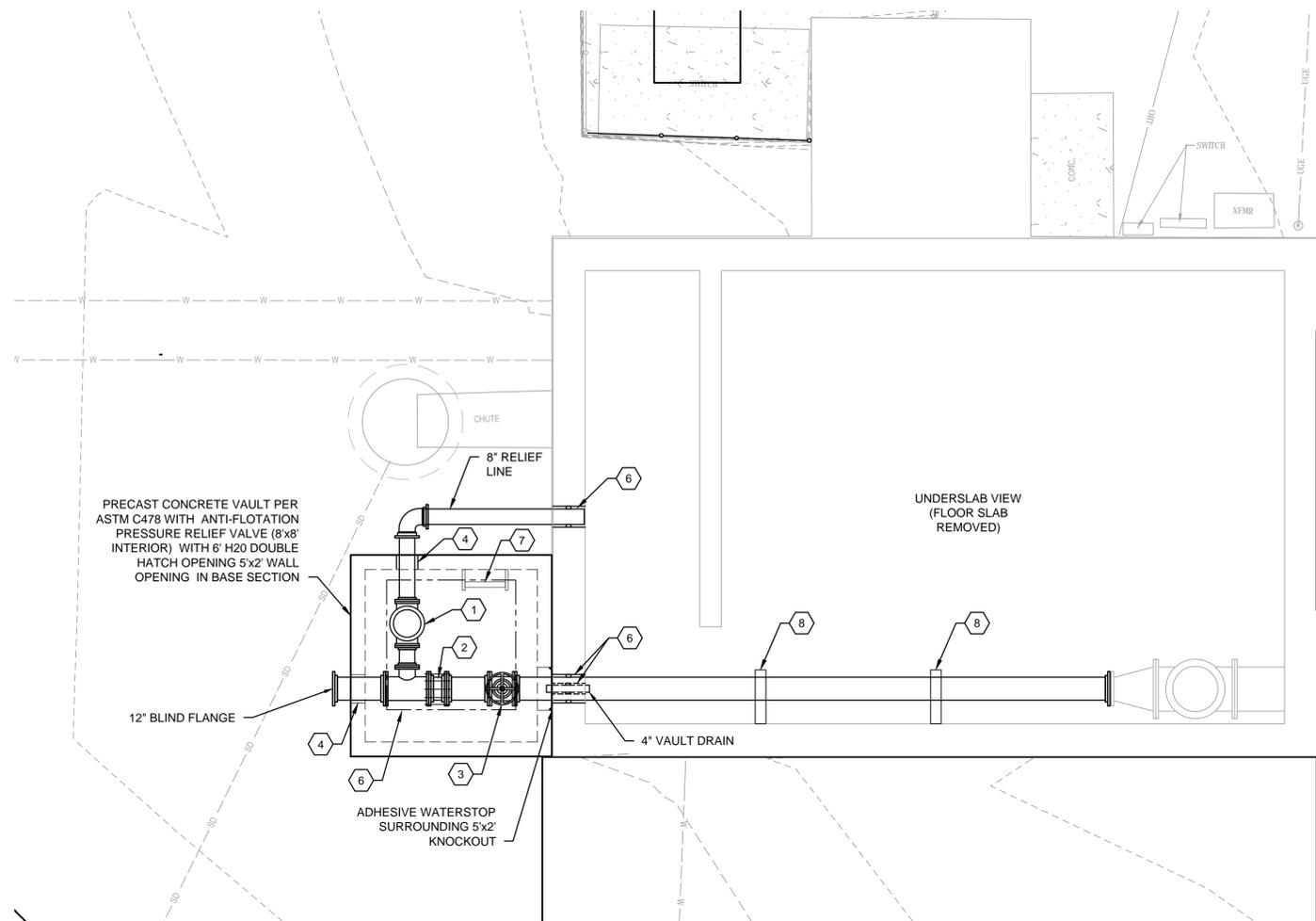
MRK DATE

COMM NO: 213110
DATE: 12/13/2013
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CHECK: TLF

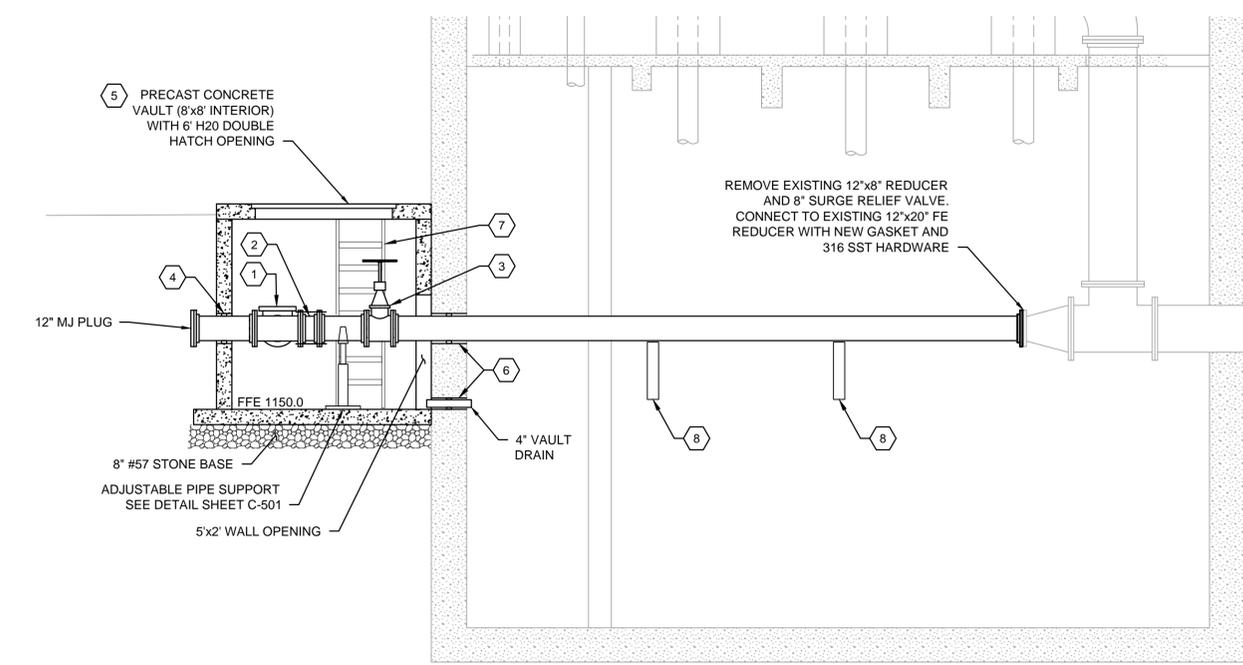
SHEET TITLE

COVER SHEET

SHT. NO. G-001 REV. NO. 0



DETAILED SITE PLAN AND PUMP STATION WETWELL
SCALE: 1/4" = 1'-0"



2 SURGE ANTICIPATION VALVE VAULT PROFILE
D-102 SCALE: 1/4" = 1'-0"

GENERAL NOTES:

- NON-SHRINK GROUT FOR ALL OPENINGS UNLESS INDICATED OTHERWISE. "LINK SEAL" REFERS TO MODULAR WALL SEAL.
- ALL INTERIOR DIP IS FLANGED. ALL BURIED DIP IS RESTRAINED MECHANICAL JOINT WITH POLY WRAP. CLASS 250 DUCTILE IRON PIPE, FITTINGS AND ACCESSORIES AWWA D115/C110, FLANGES 125LB ANSI B 16.1 ALL HARDWARE SHALL BE ASTM A193M TYPE 316 STAINLESS STEEL WITH GRADE B8M HEX HEAD BOLTS AND ASTM A194M GRADE 8M HEX HEAD NUTS.
- ALL MISC. METAL/HARDWARE SHALL BE 304 SS UNLESS OTHERWISE NOTED.
- COAT EXPOSED DIP WITH PAINT SYSTEM AS FOLLOWS: SURFACE PREP SSPC-SP5, PRIME COAT AS RECOMMENDED BY MANUFACTURER, HIGH BUILD EPOXY 16 MDT, MANUFACTURER: TNE MEC OR SHERWIN WILLIAMS.
- ALL PRECAST CONCRETE STRUCTURES SHALL BE COATED WITH EXTERNAL BITUMINOUS WATERPROOFING. SURFACE PREP SSPC-SP12, 2 COATS BITUMINOUS WATERPROOFING 16 MDT, MANUFACTURER: TNE MEC OR SHERWIN WILLIAMS.
- ELECTRICAL/CONTROLS CONDUITS ARE NOT SHOWN. REFER TO SHEET E-101 AND E-502.

NOTES:

- 8" COMBINATION SURGE ANTICIPATION AND PRESSURE RELIEF VALVE WITH CLASS 250 FLANGES. MANUFACTURER SHALL BE CLA-VAL MODEL 52-03 GLOBE BODY. PROVIDE 1" 316 SS REMOTE SENSING LINES. BALL VALVES AND TAPS AS RECOMMENDED BY MANUFACTURER. REMOTE SENSING LINE SHALL ORIGINATE AT CONNECTION TO EXISTING DISCHARGE HEADER AND BE FIELD ROUTED TO VALVE. PROVIDE SECONDARY 1" 316 SS SENSING TAP AND ISOLATION BALL VALVE IN VAULT. PROVIDE SUBMITTAL FOR APPROVAL.
- 12" RESTRAINED DISMANTLING JOINT ANSI CLASS 250. ROMAC DJ400 OR EQUAL.
- 12" GATE VALVE, ANSI CLASS 250 (NORMALLY OPEN).
- PRECAST PENETRATION WITH LINK SEAL
- HATCH COVER PLACEMENT SHALL ALLOW UNRESTRICTED VERTICAL REMOVAL OF 8" SURGE ANTICIPATION VALVE AND 12" ORIFICE PLATE. HATCH SHALL BE BILCO JDAL-H20 OR HALLIDAY H20 TWO 3'-0" X 6'-0" LEAVES WITH SAFETY GRATING (RETRO GRATE OR EQUAL)
- CORE DRILL EXISTING WET WELL AND PROVIDE MODULAR MECHANICAL SEAL (LINK SEAL OR EQUAL)
- PROVIDE ALUM ACCESS LADDER WITH TELESCOPING SAFETY POST (NOT SHOWN FOR CLARITY) 316 SS SUPPORTS FROM WALL OF VAULT.
- WALL MOUNTED PIPE SUPPORT BRACKET, B-LINE B3067-2, WELDED BRACKET - HEAVY DUTY (TOLCO FIG. 30H) OR EQUAL. BRACKETS SHALL BE SPACED EQUALLY ALONG PIPE LENGTH. MAXIMUM UNSUPPORTED LENGTH 10'.

IF THIS DRAWING IS REDUCED,
GRAPHIC SCALE MUST BE USED.

SCALE: 1" = 4'



**PRE-FINAL REVIEW
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CONSTRUCTION**

**CITY OF HARRISONBURG
NORTH RIVER PUMP STATION
UPGRADE**
BRIDGEWATER, VIRGINIA

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COMM NO: 213110
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SHEET TITLE
PUMP STATION VAULTS
AND WETWELL
MODIFICATIONS

SHT. NO. **D-102** REV. NO. **0**

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STRUCTURAL GENERAL NOTES

STRUCTURAL GENERAL NOTES ARE INTENDED TO HIGHLIGHT OR IN SOME CASES SUPPLEMENT PROJECT SPECIFICATIONS. REFER TO THE PROJECT SPECIFICATIONS FOR COMPLETE WORK COVERAGE.

A. GOVERNING CODES

- 1. VIRGINIA UNIFORM STATEWIDE BUILDING CODE (USBC), 2009 EDITION
2. INTERNATIONAL BUILDING CODE (IBC), 2009 EDITION
3. AMERICAN CONCRETE INSTITUTE (ACI), 318-08
4. AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), 13TH EDITION

B. DESIGN LOADS AND CRITERIA

- 1. GRAVITY LOADS (PSF): ROOF DEAD LOAD: SELF WEIGHT 25 PSF SNOW LOAD: GROUND SNOW LOAD = 35 PSF EXPOSURE FACTOR: Ce = 1.0 THERMAL FACTOR: Ct = 1.0 IMPORTANCE FACTOR: I = 1.0 FLOORS DEAD LOAD: SELF WEIGHT + 10 PSF LIVE LOAD: ELECTRICAL ROOM 150 PSF GRATING PLATFORM AND STAIRS 100 PSF
2. WIND CRITERIA: 3 SEC GUST WIND SPEED = 90 MPH BUILDING CATEGORY: ENCLOSED I = 1.0 / EXPOSURE C INTERNAL PRESSURE COEFFICIENT: ± 0.18
3. SEISMIC CRITERIA SITE CLASS D (ASSUMED, NO GEOTECHNICAL REPORT) SDS = .216 / SD1 = .099 I = 1.0 SEISMIC DESIGN CATEGORY B LATERAL FORCE RESISTING SYSTEM: ORDINARY STEEL CONCENTRICALLY BRACED FRAMES & ORDINARY PRECAST CONCRETE SHEAR BEARING WALLS
4. FOOTING BEARING PRESSURE: 1500 PSF (ASSUMED, NO GEOTECHNICAL REPORT)
5. SOIL FRICTION COEFFICIENT: 0.25
6. LATERAL SOIL PRESSURE: 60 PCF ACTIVE EQUIVALENT FLUID PRESSURE 100 PCF AT-REST EQUIVALENT FLUID PRESSURE
7. FROST DEPTH: 30 INCHES

C. MATERIALS

- 1. CONCRETE: PORTLAND CEMENT ASTM C150 TYPE I/II FLY ASH ASTM C618, 10% - 25% BY WEIGHT OR GROUND GRANULATED BLAST-FURNACE SLAG, ASTM 989 MAX 50% OF CEMENTITIOUS MATERIALS BY WEIGHT WATER / CEMENT + FLY ASH = 0.50 MAXIMUM 28 DAY fc = 3000 PSI AIR CONTENT 4.5% - 7.5% FOUNDATIONS NO AIR ENTRAINMENT IN TOPPING SLAB 3/4" MAX. NORMAL WEIGHT AGGREGATE IN FOUNDATIONS 3/8" MAX. NORMAL WEIGHT AGGREGATE IN TOPPING SLAB
2. REINFORCING BARS: ASTM A615, GRADE 60
3. WELDED WIRE FABRIC: ASTM A185, FLAT SHEET MATERIAL
4. ANCHOR RODS: ASTM F1554 GRADE 36
5. GROUT: ASTM C1107, NON-METALLIC NON-SHRINK, 3 DAY fc = 4000 PSI
6. MASONRY UNITS: ASTM C90, GRADE N, fc = 1900 PSI
7. MORTAR: ASTM C270, TYPE S
8. MASONRY GROUT: ASTM C476 FINE, fc = 2000 PSI WITH 10" SLUMP
9. CMU ASSEMBLIES: 28 DAY fm = 1500 PSI, UNIT STRENGTH METHOD
10. STRUCTURAL STEEL: W SHAPES ASTM A992, Fy = 50 KSI OTHER ROLLED SHAPES ASTM A36, Fy = 36 KSI PLATES ASTM A36, Fy = 36 KSI PIPE ASTM A53 GRADE B, Fy = 35 KSI HSS - SQUARE OR RECT ASTM A500 GRADE B, Fy = 46 KSI HSS - ROUND ASTM A500 GRADE B, Fy = 42 KSI
11. HIGH STRENGTH BOLTS: ASTM A325 TYPE 1 UNCOATED; STEEL TO STEEL CONNECTIONS
12. BOLTS: ASTM A307; WOOD OR WOOD TO STEEL CONNECTIONS FOR ERECTION ONLY
13. HEADED ANCHOR STUDS: ASTM A108 GRADE 1010 - 1020, TYPE B, Fu = 60 KSI (AWS D1.1 TABLE 7.1, TYPE B)
14. WELD METAL: F7X-EXXX OR E70XX
15. EXPANSION ANCHORS: STUD TYPE EXPANSION ANCHOR WITH SINGLE PIECE WEDGE HILTI KWIK BOLT II EXPANSION ANCHOR OR EQUAL W/ COMPRESSION RING, EXPANSION CONE AND EXPANSION SLEEVE
16. ADHESIVE ANCHORS: ASTM A36 SHANK - ALL THREAD TYPE, INJECTABLE ADHESIVE TYPE TO SUIT BASE MATERIAL AS APPROVED BY THE ENGINEER

D. MISCELLANEOUS

- 1. CONTRACTOR SHALL OBTAIN BUILDING PERMIT AND APPROVALS FROM ROCKINGHAM COUNTY.
2. REFERENCE CIVIL DRAWINGS FOR BUILDING LOCATION AND ORIENTATION ON THE SITE. DRAWING ELEVATION REFERENCE 0'-0" = 1165' CIVIL DATUM.
3. COORDINATE OPENINGS AND EMBEDDED ITEMS IN PRECAST CONCRETE WORK WITH ALL TRADES.
4. NOTIFY ENGINEER OF ANY DISCREPANCIES DISCOVERED WITH OTHER TRADES.
5. TEMPORARILY BRACE THE STRUCTURE TO RESIST ALL LOADS OR COMBINATIONS OF LOADS UNTIL ALL PERMANENT ELEMENTS ARE IN PLACE AND ALL CONNECTIONS ARE COMPLETE AS SHOWN.

E. SHOP DRAWINGS:

- 1. SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL ITEMS. CONSTRUCTION DOCUMENTS SHALL NOT BE REPRODUCED FOR USE AS SHOP DRAWINGS.
2. THE GENERAL CONTRACTOR SHALL REVIEW AND STAMP ALL SHOP DRAWINGS AND PRODUCT DATA FOR CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS PRIOR TO SUBMITTAL. ANY SHOP DRAWINGS OR PRODUCT DATA NOT REVIEWED AND STAMPED BY THE GENERAL CONTRACTOR WILL BE RETURNED WITHOUT REVIEW. THE CONTRACTOR SHALL CLOUD OR FLAG ALL ITEMS NOT IN ACCORDANCE WITH CONTRACT DOCUMENTS.
3. ANY CHANGES, SUBSTITUTIONS, OR DEVIATIONS FROM THE ORIGINAL CONTRACT DRAWINGS SHALL BE CLOUDED BY THE MANUFACTURER OR FABRICATOR. ANY CHANGES, SUBSTITUTIONS, OR DEVIATIONS WHICH ARE NOT CLOUDED OR FLAGGED BY SUBMITTING PARTIES, SHALL NOT BE CONSIDERED ALLOWED AFTER THE ENGINEER'S REVIEW, UNLESS NOTED ACCORDINGLY BY THE STRUCTURAL ENGINEER.
4. THE STRUCTURAL ENGINEER RESERVES THE RIGHT TO ALLOW OR NOT ALLOW ANY CHANGES TO THE ORIGINAL CONTRACT DRAWINGS AT ANY TIME BEFORE OF AFTER SHOP DRAWING REVIEW.
5. THE SHOP DRAWINGS DO NOT REPLACE THE ORIGINAL CONTRACT DRAWINGS. ITEMS OMITTED OR SHOWN INCORRECTLY AND WHICH ARE NOT NOTED AS ALLOWED BY THE STRUCTURAL ENGINEER OR ARCHITECT ARE NOT TO BE CONSIDERED CHANGES TO THE ORIGINAL CONTRACT DRAWINGS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ITEMS OMITTED OR SHOWN INCORRECTLY ARE CONSTRUCTED IN ACCORDANCE WITH THE ORIGINAL CONTRACT DRAWINGS.
6. ALL ENGINEERING DESIGNS AND LAYOUTS PERFORMED BY OTHERS SHALL BE SEALED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE IN WHICH THE PROJECT IS LOCATED.
7. REVIEW OF SHOP DRAWINGS IS INTENDED ONLY AS AN AID TO THE CONTRACTOR IN OBTAINING CORRECT SHOP DRAWINGS. RESPONSIBILITY FOR CORRECTNESS AND COMPLETENESS SHALL REST WITH THE CONTRACTOR.
8. SHOP DRAWINGS WILL BE RETURNED FOR RESUBMITTAL IF MAJOR ERRORS ARE FOUND DURING REVIEW.

F. FOUNDATIONS

- 1. FOUNDATIONS HAVE BEEN DESIGNED BASED ON ASSUMED VALUES. NO GEOTECHNICAL REPORT WAS PROVIDED.
2. ALWAYS PROVIDE POSITIVE SURFACE WATER DRAINAGE AWAY FROM THE STRUCTURE.
3. CONTRACTOR SHALL NOTIFY "MISS UTILITY OF VIRGINIA" PRIOR TO BEGINNING EXCAVATION FOR LOCATION OF UNDERGROUND UTILITIES. THE CONTRACTOR SHALL BEAR SOLE RESPONSIBILITY FOR COSTS ASSOCIATED WITH DAMAGE AND REPAIR OF ANY LINE MARKED BY MISS UTILITY.
4. EXTERIOR FOOTINGS AND COLUMN FOOTINGS WERE DESIGNED TO BEAR ON UNDISTURBED SOIL BELOW THE FROST LINE A MINIMUM 2'-6" BELOW EXISTING GRADE WITH A MINIMUM SOIL BEARING PRESSURE OF 1500 PSF. THE OWNER SHALL EMPLOY A GEOTECHNICAL ENGINEER TO VERIFY THAT THIS ALLOWABLE SOIL BEARING PRESSURE IS ATTAINABLE. IF THIS IS NOT ATTAINABLE, THE OWNER/CONTRACTOR SHALL CONTACT THE ENGINEER TO REDESIGN.

G. CONCRETE

- 1. PERFORM CONCRETE WORK IN ACCORDANCE WITH ACI 301-08 "STANDARD SPECIFICATION FOR STRUCTURAL CONCRETE" UNLESS MORE STRINGENT REQUIREMENTS ARE INDICATED.
2. MINIMUM REINFORCING BAR COVER: 3" AT UNFORMED SURFACES EXPOSED TO EARTH 2" AT FORMED SURFACES EXPOSED TO EARTH OR WEATHER FOR #6 AND LARGER 1 1/2" AT FORMED SURFACES EXPOSED TO EARTH OR WEATHER FOR #3-#5 1" AT SLABS AND WALLS NOT EXPOSED TO EARTH OR WEATHER
3. SPLICE REINFORCING BARS BY LAPPING AT LEAST 48 BAR DIAMETERS.
4. SECURE ALL REINFORCING, INCLUDING WWF, IN POSITION WITH CHAIRS BEFORE CONCRETE PLACEMENT. CONCRETE DOBIES MAY BE USED TO POSITION SLAB ON GRADE REINFORCEMENT.
5. TIE DOWELS IN PLACE BEFORE PLACING CONCRETE. DO NOT STAB OR "WET-SET" DOWELS.
6. INSTALL AND SECURE EMBEDMENTS SUCH AS ANCHOR BOLTS AND EMBEDMENT PLATES WITHIN SPECIFIED TOLERANCES BEFORE CONCRETE PLACEMENT.
7. MECHANICALLY VIBRATE ALL CONCRETE PLACEMENTS EXCEPT SLABS LESS THAN 5" THICK.
8. WHERE SLAB CONTRACTION JOINTS ARE SHOWN ON THE DRAWINGS, CONSTRUCTION JOINTS MAY BE SUBSTITUTED TO ACCOMMODATE THE CONTRACTOR'S PLACEMENT STRATEGY.
9. FREE WATER ON THE SLAB SURFACE DURING FINISHING OPERATIONS IS PROHIBITED. SOFT CUT CONTRACTION JOINTS AS SOON AS POSSIBLE - GENERALLY WITHIN 6 HOURS AFTER FINISHING.
10. PROTECT AND CURE ALL CONCRETE SURFACES. BEGIN CURING WALLS IMMEDIATELY AFTER STRIPPING FORMS AND FLATWORK IMMEDIATELY AFTER FINISHING.
11. CONCRETE SURFACES TO RECEIVE GROUT UNDER COLUMN BASEPLATES MUST BE PREPARED BY LIGHT BUSH HAMMERING (1/4" AMPLITUDE) THE GROUTED AREA AND PRE-SOAKING.

H. PRECAST CONCRETE HOLLOW CORE DECK UNITS

- 1. PRECAST CONCRETE HOLLOW CORE DECK UNITS SHALL BE 6 INCH THICK. DECK UNITS SHALL BE TYPICALLY 48 WIDE (UNCUT) AND SHALL BE GROUTED TOGETHER ALONG EACH JOINT BETWEEN THE UNITS TO PROVIDE LATERAL AND VERTICAL LOAD TRANSFER. CUT UNITS SHALL BE A MINIMUM OF 20 INCHES WIDE AT THE CUT. ALL EDGES SHALL BE FORMED OR NEATLY SAW CUT.
2. PRECAST CONCRETE HOLLOW CORE DECK UNITS SHALL BE DESIGNED TO SUPPORT THE IN-SERVICE CONDITIONS SPECIFIED, IN ADDITION TO ANY OTHER LOADINGS SPECIFIED IN THE DRAWINGS. THE PRECAST CONTRACTOR SHALL SUBMIT COMPLETE DESIGN CALCULATIONS AND SHOP DRAWINGS FOR THE PRECAST MEMBERS TO THE STRUCTURAL ENGINEER FOR REVIEW. THE DESIGN CALCULATIONS AND SHOP DRAWINGS SHALL BEAR THE SEAL OF THE RESPONSIBLE PROFESSIONAL ENGINEER REGISTERED IN STATE WHERE THE CONSTRUCTION TAKES PLACE. THE DESIGN FOR THE UNITS SHALL BE SUBMITTED CLEARLY INDICATING THE DESIGN LOADINGS, PROPERTIES OF THE UNITS, MATERIAL PROPERTIES, CAMBERS, IMMEDIATE AND LONG TERM DEFLECTIONS, WEIGHTS, AND OTHER PERTINENT ASSUMPTIONS AND DESIGN INFORMATION.
3. TENSION STRESSES IN PRECOMPRESSED TENSION ZONES IN CONCRETE AT SERVICE LOADS AFTER ALLOWANCE FOR ALL PRESTRESS LOSSES SHALL NOT EXCEED 7.5 TIMES THE SQUARE ROOT OF FC. WHEN THE TENSION STRESSES EXCEED 6 TIMES THE SQUARE ROOT OF FC, DEFLECTION ANALYSIS OF MEMBERS SHALL BE BASED ON BILINEAR MOMENT-DEFLECTION RELATIONSHIPS.
4. COMPOSITE TOPPING SLAB THICKNESS WHERE NOTED ON PLANS SHALL BE A MINIMUM OF 2 INCHES THICK UNLESS NOTED OTHERWISE IN THE DRAWINGS. THE TOPPING SLAB SHALL BE REINFORCED WITH 6X6-W1.4 X W1.4 WELDED WIRE FABRIC. THE TOP SURFACE OF THE PRECAST CONCRETE HOLLOW CORE DECK UNITS SHALL BE SATURATED WITH WATER PRIOR TO PLACEMENT OF THE COMPOSITE TOPPING.
5. CARE SHALL BE TAKEN IN THE DESIGN AND FABRICATION OF THE PRECAST HOLLOW CORE DECK UNITS TO ENSURE DIFFERENTIAL CAMBERS BETWEEN ADJACENT UNITS DO NOT EXCEED MAGNITUDES THAT MAY BE SAFELY LEVELED USING ADDITIONAL TOPPING CONCRETE. THE USE OF SUCH ADDITIONAL TOPPING CONCRETE SHALL NOT EXCEED THE LOAD CARRYING CAPACITY OF THE FLOOR SYSTEM NOR DAMAGE THE INDIVIDUAL HOLLOW CORE UNITS.
6. THE PRECAST CONCRETE HOLLOW CORE DECK UNIT MANUFACTURER SHALL INVESTIGATE THE HANDLING AND SHIPPING STRESSES THAT THE DECK MEMBERS ARE SUBJECTED TO AND SHALL PROVIDE ADDITIONAL REINFORCEMENT IN UNITS AS REQUIRED. THE PRECAST MANUFACTURER SHALL LOCATE, SIZE, AND DETAIL LIFTING INSERTS FOR THE PRECAST UNITS.
7. ADDITIONAL STRUCTURAL COMPONENTS SUCH AS TEMPORARY BEAMS, COLUMNS OR BRACING SYSTEMS REQUIRED FOR THE ERECTION OF THE PRECAST UNITS SHALL BE DESIGNED AND DETAILED BY THE PRECAST ERECTOR.
8. BEARING PADS SHALL BE STRUCTURAL GRADE MULTIPOLYMER STRIPS 1/8 INCH THICK, MANUFACTURED EXPRESSLY FOR THIS PURPOSE.
9. LIFTING HOLES, VERTICAL JOINTS, HORIZONTAL JOINTS, POCKETS FOR ANCHOR DEVICES AT SHEAR WALLS AND OTHER ELEMENTS ARE TO BE FILLED WITH GROUT AND TROWELED AND FINISHED TO MATCH ADJACENT FINISHES.
10. FIELD CUT HOLES THROUGH PRECAST HOLLOW CORE DECK UNITS SHALL BE REVIEWED BY WILEY|WILSON, INC. AND BY THE PRECAST CONCRETE HOLLOW CORE DECK UNIT ENGINEER PRIOR TO CUTTING OR DRILLING OF THE UNITS.
11. MANUFACTURING CONTROLS, DIMENSIONS, TOLERANCES, ETC. SHALL CONFORM TO THE REQUIREMENTS OF PCI MNL-116 "MANUAL FOR QUALITY CONTROL FOR PLANTS AND PRODUCTION OF PRECAST PRESTRESSED CONCRETE PRODUCTS".
12. INSTALLATION OF THE PRECAST CONCRETE HOLLOW CORE DECK UNITS SHALL CONFORM TO THE RECOMMENDATIONS OF THE MANUFACTURER.

J. PRECAST INSULATED CONCRETE WALL PANELS

- 1. PRECAST CONCRETE HOLLOW CORE DECK UNITS SHALL BE DESIGNED TO SUPPORT THE IN-SERVICE CONDITIONS SPECIFIED, IN ADDITION TO ANY OTHER LOADINGS SPECIFIED IN THE DRAWINGS. THE PRECAST CONTRACTOR SHALL SUBMIT COMPLETE DESIGN CALCULATIONS AND SHOP DRAWINGS FOR THE PRECAST MEMBERS TO THE STRUCTURAL ENGINEER FOR REVIEW. THE DESIGN CALCULATIONS AND SHOP DRAWINGS SHALL BEAR THE SEAL OF THE RESPONSIBLE PROFESSIONAL ENGINEER REGISTERED IN STATE WHERE THE CONSTRUCTION TAKES PLACE. THE DESIGN FOR THE UNITS SHALL BE SUBMITTED CLEARLY INDICATING THE DESIGN LOADINGS, PROPERTIES OF THE UNITS, MATERIAL PROPERTIES, CAMBERS, IMMEDIATE AND LONG TERM DEFLECTIONS, WEIGHTS, AND OTHER PERTINENT ASSUMPTIONS AND DESIGN INFORMATION.
2. MANUFACTURING CONTROLS, DIMENSIONS, TOLERANCES, ETC. SHALL CONFORM TO THE REQUIREMENTS OF PCI MNL-116 "MANUAL FOR QUALITY CONTROL FOR PLANTS AND PRODUCTION OF PRECAST PRESTRESSED CONCRETE PRODUCTS".
3. INSTALLATION OF THE PRECAST CONCRETE HOLLOW CORE DECK UNITS SHALL CONFORM TO THE RECOMMENDATIONS OF THE MANUFACTURER.

K. MASONRY

- 1. ALLOWABLE STRESSES USED IN DESIGN ARE BASED ON QUALITY ASSURANCE PROVISION INDICATED. VERIFY COMPRESSIVE STRENGTH BY THE UNIT STRENGTH METHOD.
2. REINFORCE ALL JAMB CELLS, CORNER CELLS, TEE CELLS, END CELLS AND AT EACH SIDE OF CONTROL JOINTS FULL HEIGHT - MATCH TYPICAL WALL REINFORCING UNLESS SHOWN OTHERWISE.
3. SECURE REINFORCEMENT AGAINST DISPLACEMENT USING BAR POSITIONING DEVICES AT 48".
4. GROUT ALL CELLS THAT INCLUDE REINFORCEMENT, ANCHORS OR STRUCTURAL EMBEDMENTS. PLACE GROUT IN 48" LIFTS. CONSOLIDATE ALL GROUT PLACEMENTS BY MECHANICAL VIBRATION. PROVIDE CLEANOUTS FOR TOTAL GROUT PLACEMENT HEIGHT OVER 60".

L. STRUCTURAL STEEL

- 1. DETAIL, FABRICATE AND ERECT STRUCTURAL STEEL IN ACCORDANCE WITH THE 13th EDITION OF AISC "MANUAL OF STEEL CONSTRUCTION AND AISC CODE OF STANDARD PRACTICE."
2. STEEL TO STEEL BOLTED CONNECTIONS SHALL CONFORM TO THE CURRENT "SPECIFICATIONS FOR STRUCTURAL JOINTS" USING ASTM A325 BOLTS AS ENDORSED BY AISC.
3. ALL EXTERIOR STEEL SHALL BE HOT DIP GALVANIZED.
4. HIGH STRENGTH BOLTS MAY BE INSTALLED TO A "SNUG" TIGHT CONDITION UNLESS INDICATED TO BE FULLY TENSIONED. GENERALLY, BEAM CONNECTIONS HAVE BEEN DESIGNATED AS BEARING TYPE AND MAY BE INSTALLED TO A "SNUG" TIGHT CONDITION. FULLY TENSION BOLTS INDICATED AS SUCH BY EMPLOYING ONE OF THE FOLLOWING METHODS: 4.1. TENSION CONTROLLED BOLTS (TWIST-OFF BOLTS) PREFERRED, DIRECT TENSION INDICATOR (TENSION INDICATING WASHERS), OR TURN-OF-THE-NUT WITH COLOR MATCH-MARKING. COORDINATE BOLT TENSIONING WITH ENGINEER / INSPECTOR.
5. PERFORM SHOP AND FIELD WELDING IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY'S STRUCTURAL WELDING CODE. SHOP OR FIELD WELDS AT NON-BOLTED CONNECTIONS THAT ARE NOT SPECIFICALLY DETAILED SHALL BE 3/16" CONTINUOUS FILLETS AT EACH CONTACT EDGE OR SURFACE.
6. ALL WELDERS SHALL HAVE EVIDENCE OF PASSING THE AWS STANDARD QUALIFICATION TEST FOR THE TYPE OF WORK BEING PERFORMED.
7. NON-DESTRUCTIVE WELD TESTS MAY BE PERFORMED. DEFICIENT WELDS WILL BE CORRECTED BY THE CONTRACTOR AND RE-TESTED AT THEIR EXPENSE.

M. ABBREVIATIONS LIST - (SOME OF THE LISTED ABBREVIATIONS MAY NOT APPEAR ON THE DRAWINGS)

Table with 4 columns: Abbreviation, Description, Abbreviation, Description. Includes terms like ANCHOR BOLT, ALTERNATE, BUILDING BEARING, BETWEEN, CONSTRUCTION JOINT, etc.

Table with 3 columns: APPLICATION, FINISH SCHEDULE, COLOR/FINISH. Includes rows for EXTERIOR PRE-CAST WALL PANELS, EXTERIOR EXPOSED METALS, EXTERIOR CONCRETE AND CMU, etc.



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PRE-FINAL REVIEW NOT FOR CONSTRUCTION

CITY OF HARRISONBURG NORTH RIVER PUMP STATION UPGRADE

BRIDGEWATER, VIRGINIA

Table with 2 columns: MRK, DATE. Includes revision schedule table with columns for MRK, DATE, REVISION DESCRIPTION.

COMM NO: 213110 DATE: 12/13/2013 DRAWN: JWR DESIGN: JWR CHECK: WMD SHEET TITLE

STRUCTURAL GENERAL NOTES

SHT. NO. S-001 REV. NO. 0

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PRE-FINAL REVIEW
NOT FOR
CONSTRUCTION

CITY OF HARRISONBURG
NORTH RIVER PUMP STATION
UPGRADE

BRIDGEWATER, VIRGINIA

REVISION DESCRIPTION

| MRK | DATE | REVISION DESCRIPTION |
|-----|------------|----------------------|
| 0 | 12/13/2013 | |

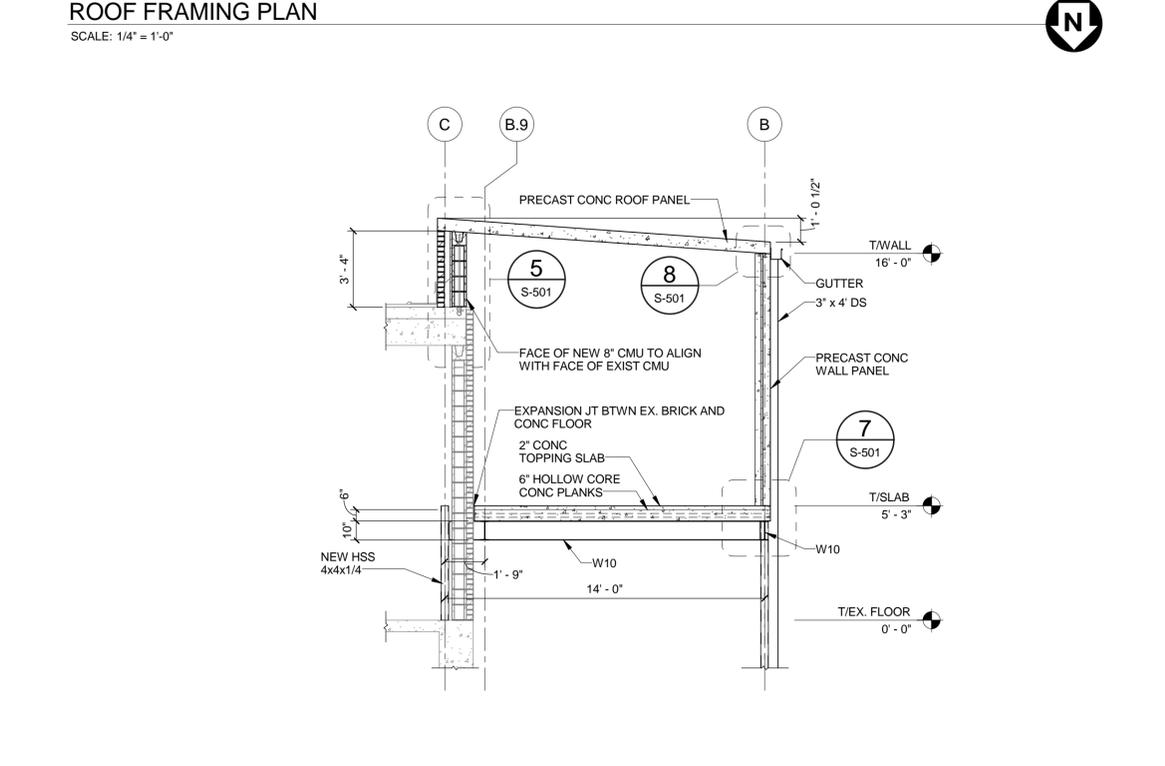
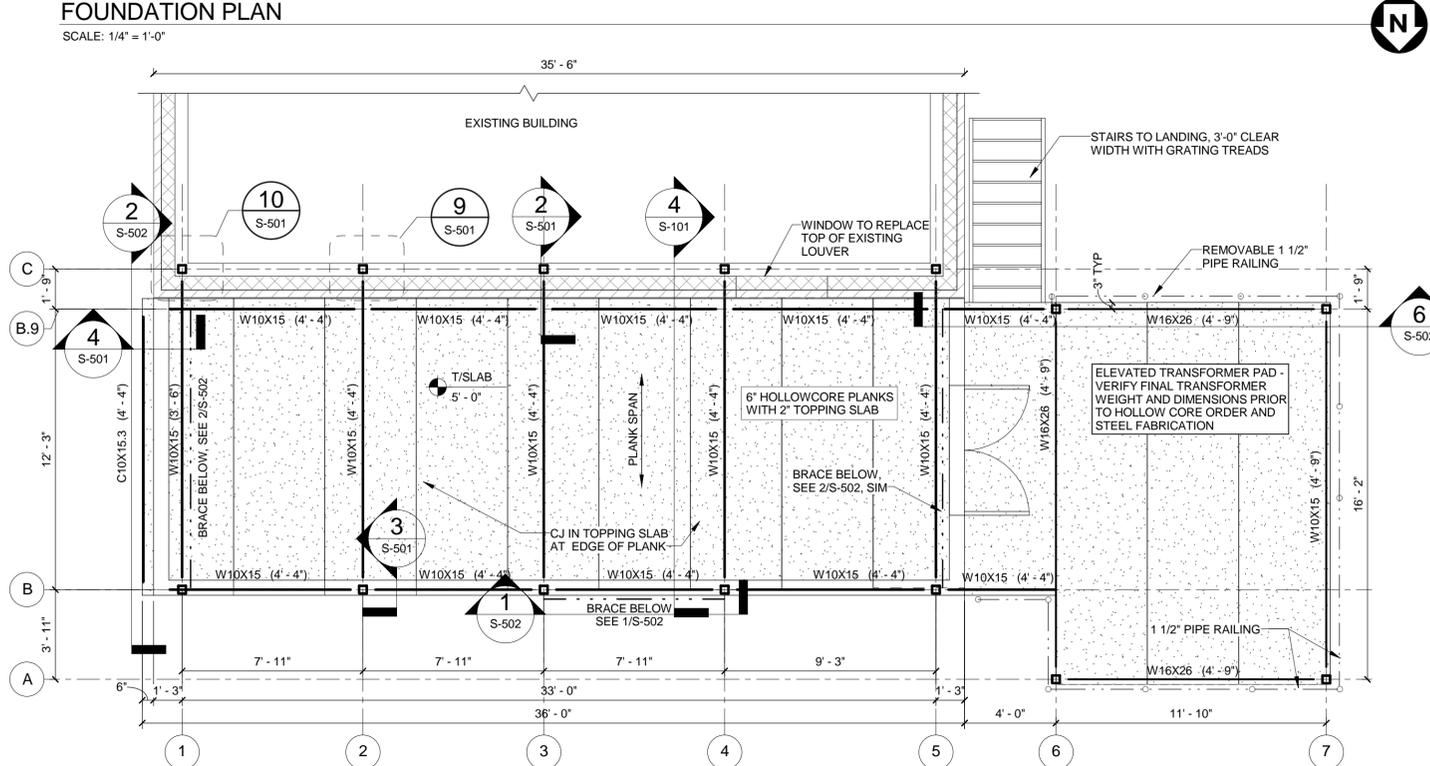
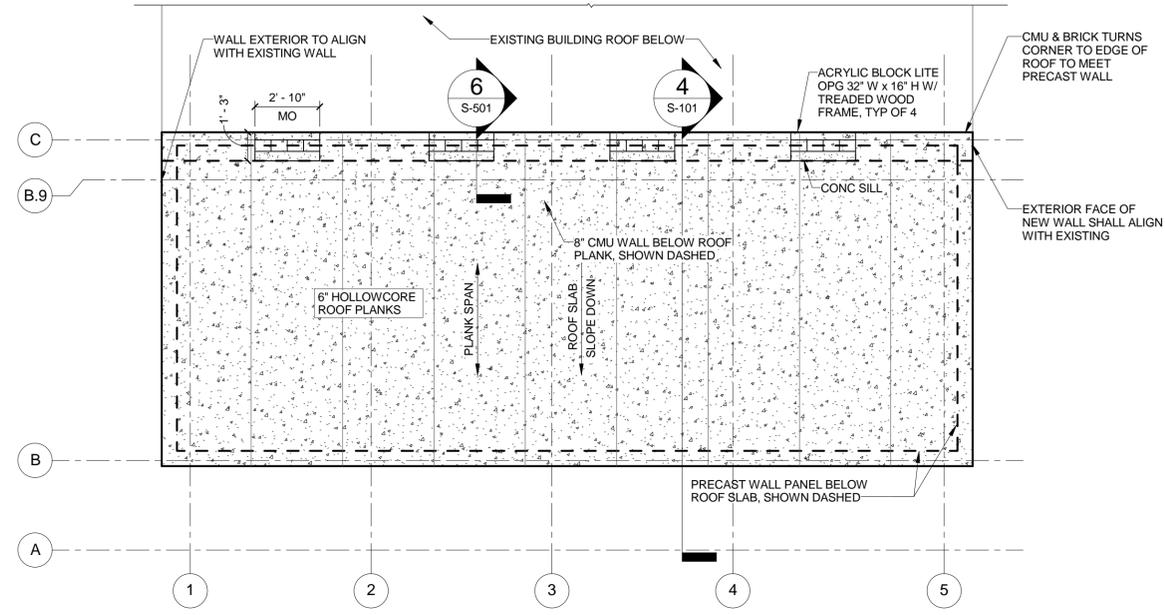
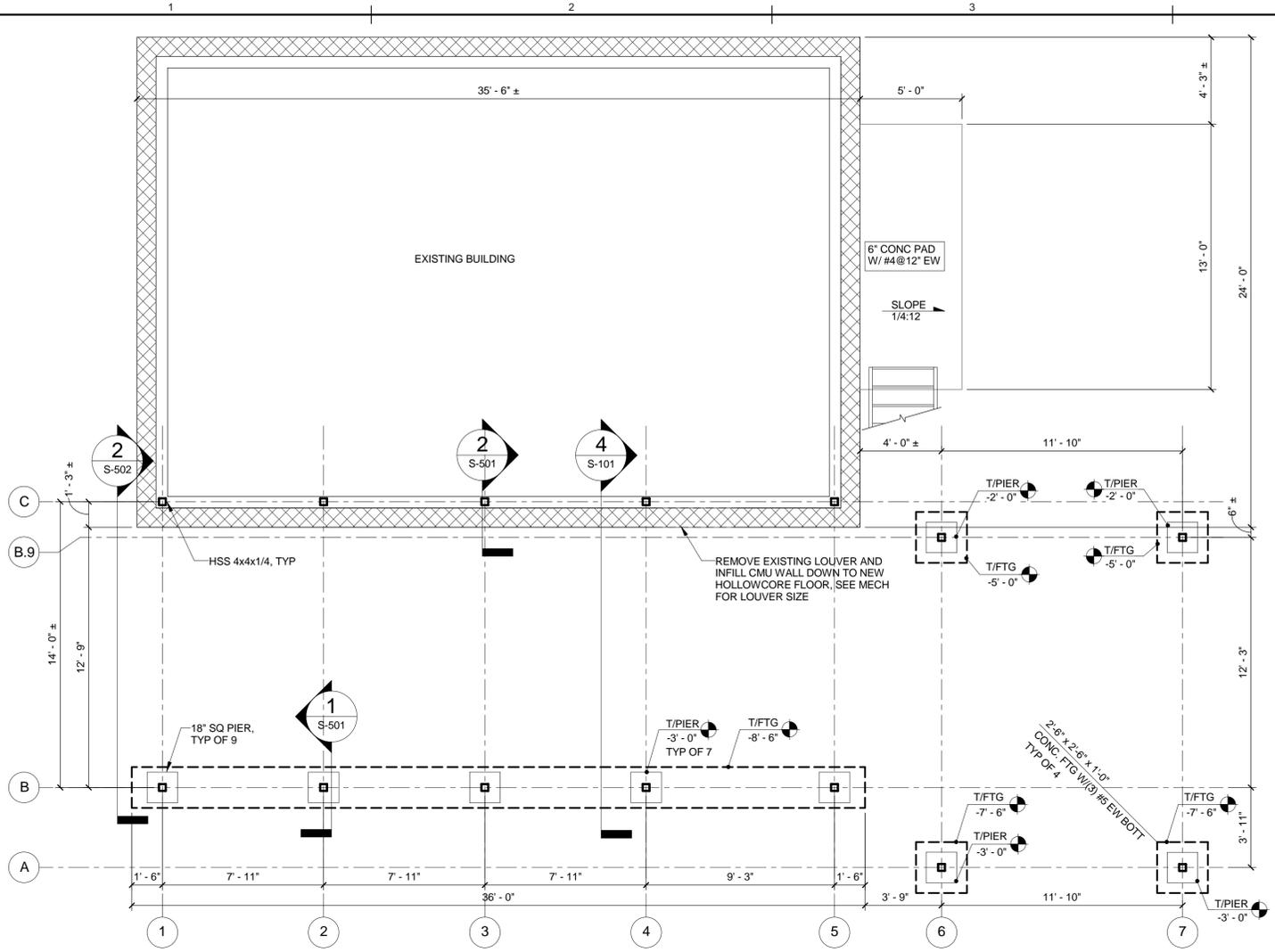
COMM NO: 213110
DATE: 12/13/2013
DRAWN: JWR DESIGN: JWR
CHECK: WMD

SHEET TITLE
PLANS & BUILDING SECTION

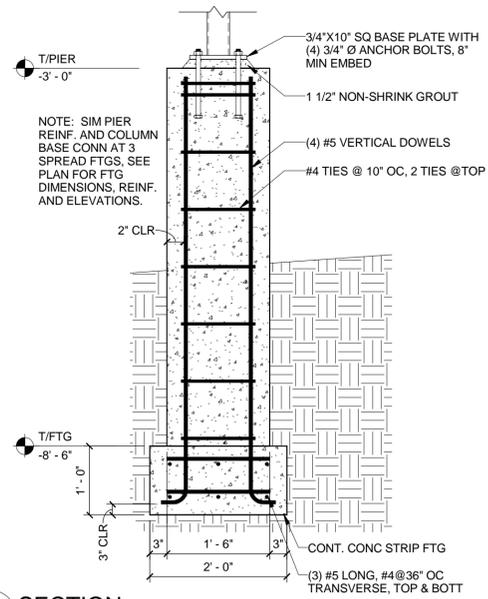
SHT. NO: S-101 REV. NO: 0

PLAN NOTES:

- FIELD VERIFY ALL EXISTING DIMENSIONS AND CONSTRUCTION PRIOR TO START OF CONSTRUCTION. NOTIFY ENGINEER IMMEDIATELY OF ANY DISCREPANCIES.
- (X' - X') INDICATES ELEVATION ABOVE EXISTING FLOOR. REFERENCE 0' - 0" = 1165.0 DATUM POINT.
- COORDINATE FLOOR OPENINGS WITH MECHANICAL AND ELECTRICAL DRAWINGS.
- TRANSFORMER PLATFORM DESIGN BASED ON APPROXIMATE TRANSFORMER SIZE OF 7' - 7" x 7' - 8" WITH 30" METERING CABINET AND APPROXIMATE WEIGHT OF 16,000 LBS INCLUDING OIL. COORDINATE FINAL PLATFORM DIMENSIONS WITH DOMINION POWER TRANSFORMER SELECTION. IF WEIGHT EXCEEDS 16,000 LBS, NOTIFY STRUCTURAL ENGINEER TO VERIFY STRUCTURAL CAPACITY OF PLATFORM. COORDINATE FINAL PLATFORM WITH DOMINION POWER STANDARDS.
- OPENINGS IN HOLLOW CORE PLANKS LARGER THAN 10 INCHES IN ANY DIRECTION SHALL BE COORDINATED WITH THE HOLLOW CORE MANUFACTURER AND SHOWN ON SHOP DRAWINGS.
- EXISTING BUILDING: REMOVE WOOD PARTITION WALL. PATCH AS NECESSARY. CLEAN AND PAINT INTERIOR WALLS, FLOOR, PIPING, SCREEN WASH UNIT AND CEILING.

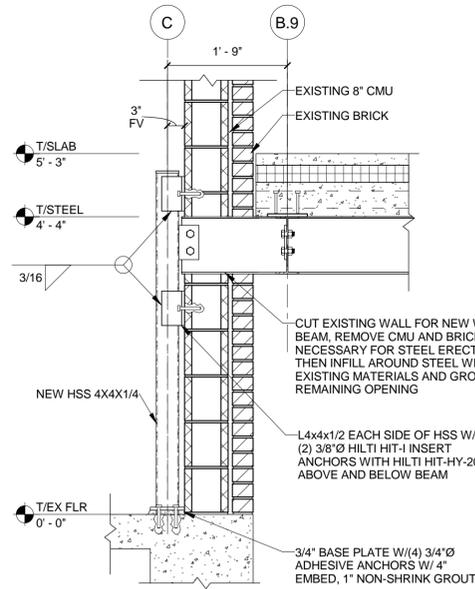


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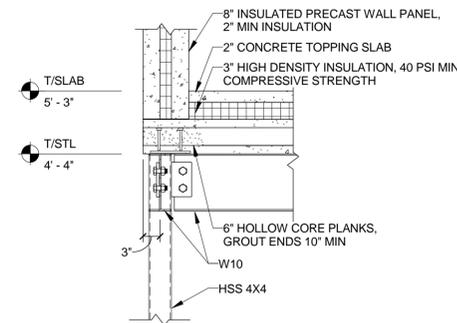
1 SECTION

S-101 SCALE: 3/4" = 1'-0"



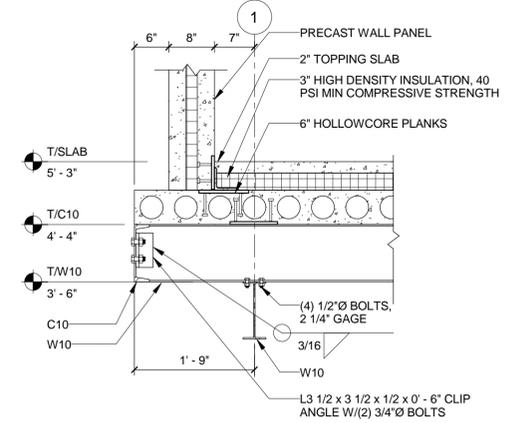
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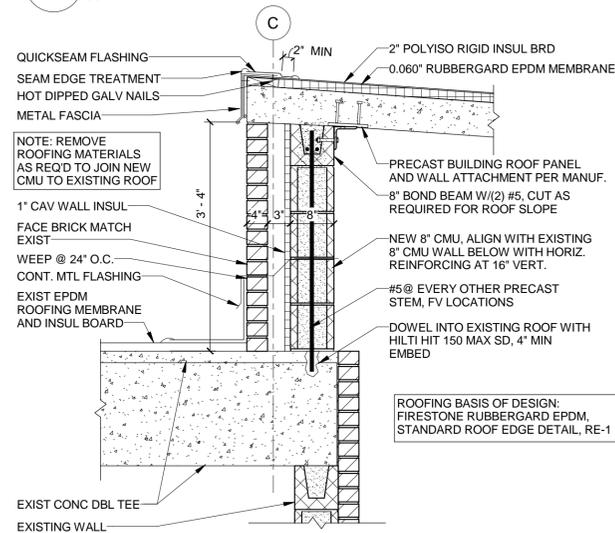
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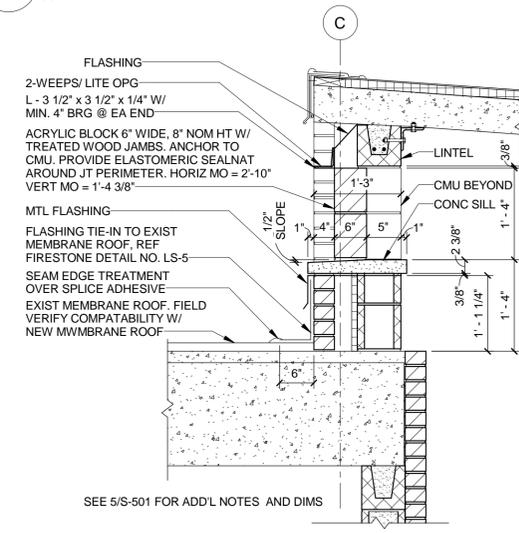
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S-101 SCALE: 3/4" = 1'-0"



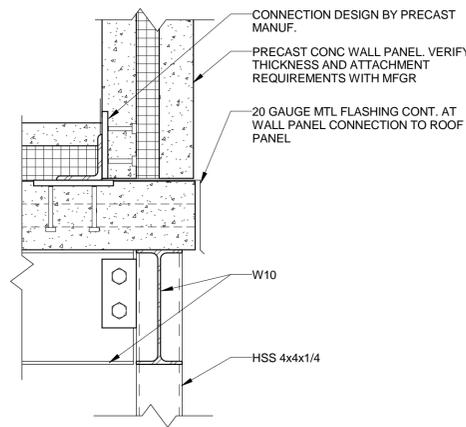
5 DETAIL

S-101 SCALE: 3/4" = 1'-0"



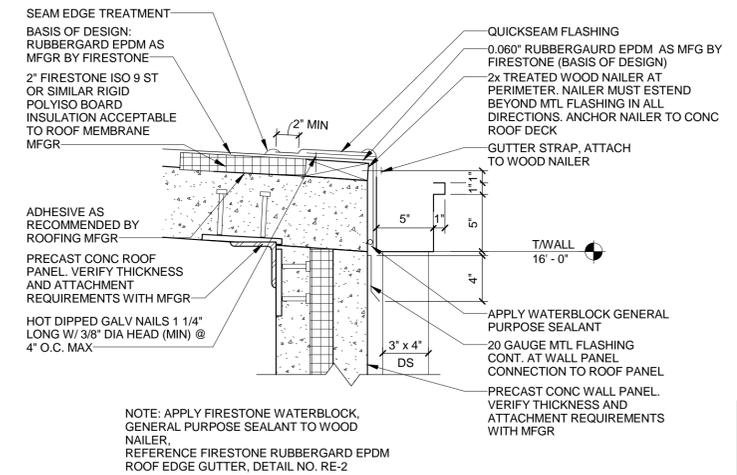
6 SECTION

S-101 SCALE: 3/4" = 1'-0"



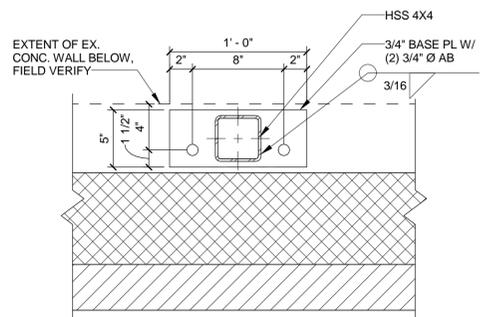
7 DETAIL

S-101 SCALE: 1 1/2" = 1'-0"



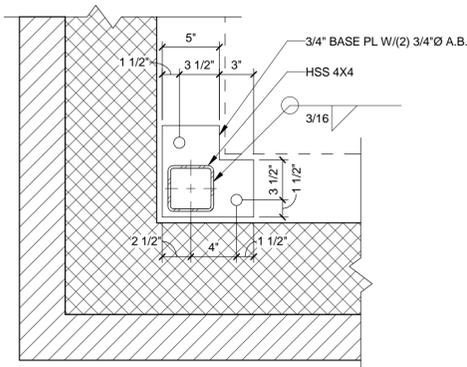
8 DETAIL

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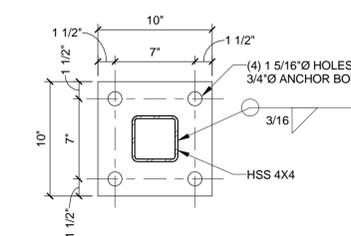
9 TYP INTERIOR BASE PLATES

S-101 SCALE: 1 1/2" = 1'-0"



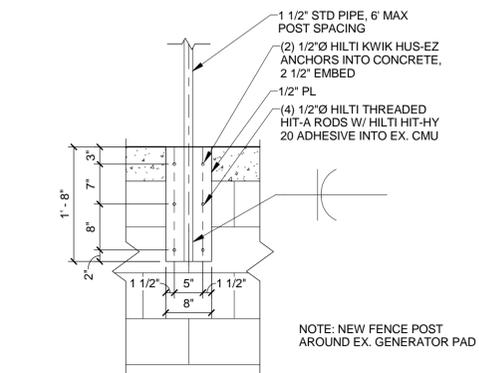
10 CORNER BASE PLATES

S-101 SCALE: 1 1/2" = 1'-0"



11 BASE PLATE AT PIER

S-101 SCALE: 1 1/2" = 1'-0"

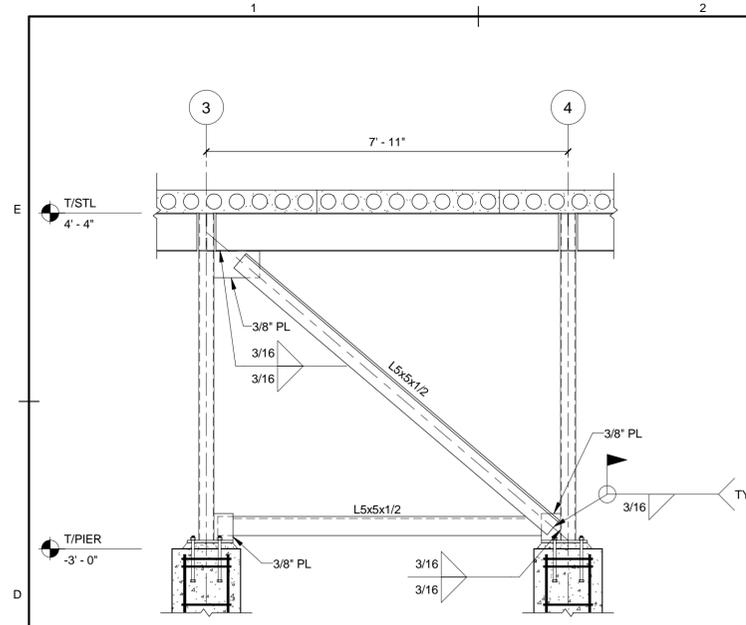


12 FENCE POST

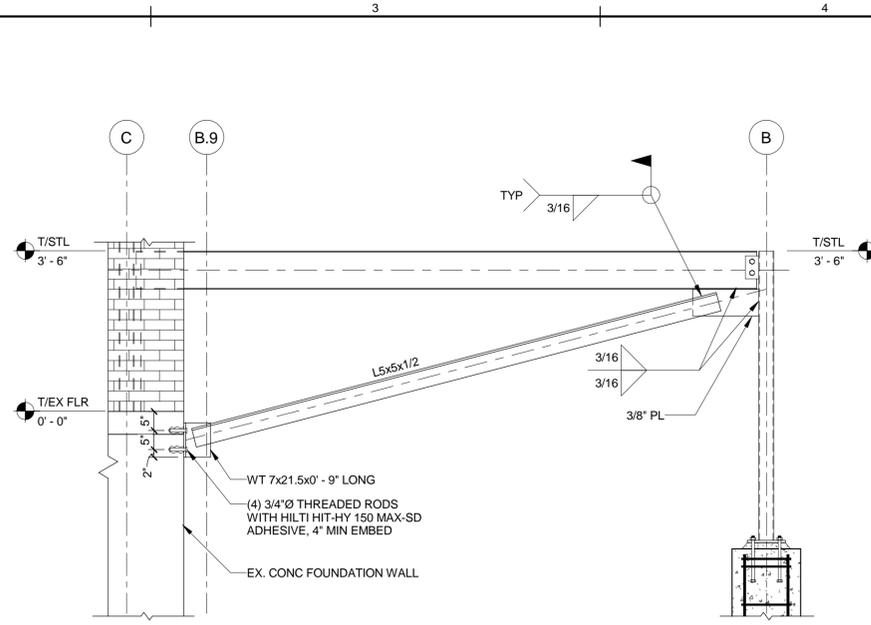
S-101 SCALE: 3/4" = 1'-0"

| REV | DATE | DESCRIPTION |
|-----|------------|-------------|
| 0 | 12/13/2013 | |

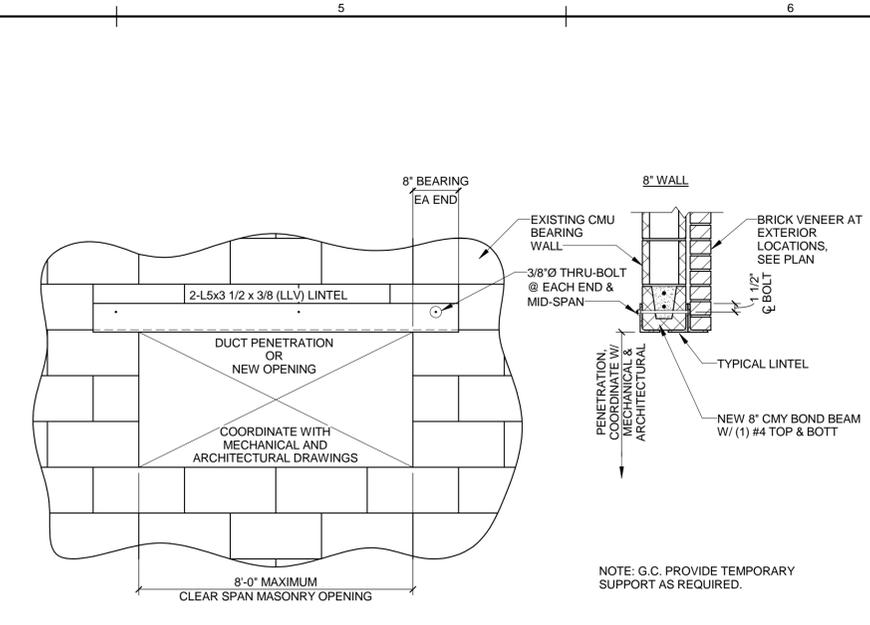
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| SHEET TITLE: | |



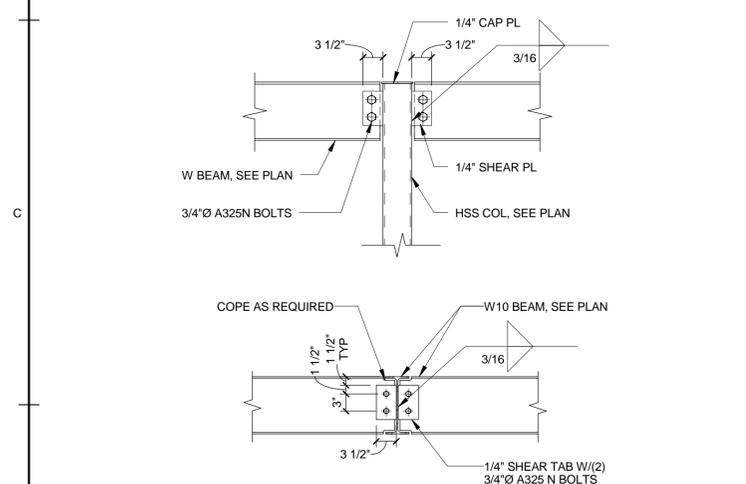
1 BRACE @ CL A
S-101 SCALE: 1/2" = 1'-0"



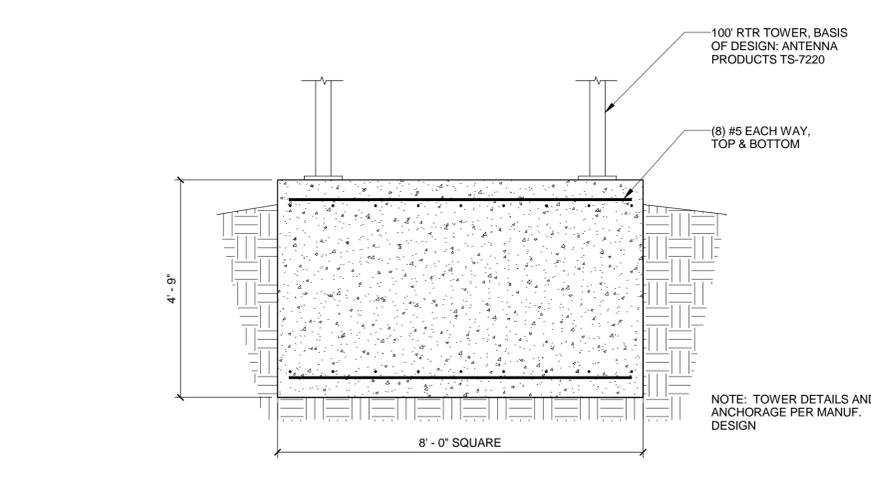
2 BRACE @ CL 1 & CL 5
S-101 SCALE: 1/2" = 1'-0"



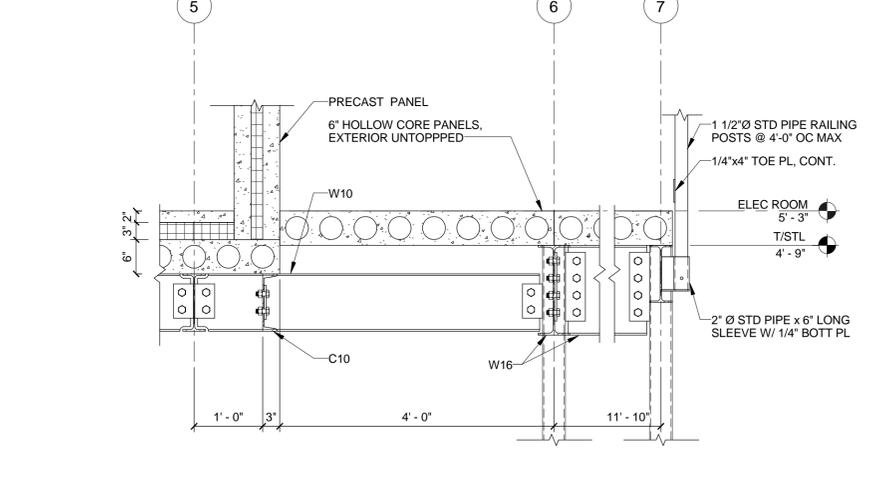
3 TYP ANGLE LINTEL
SCALE: 3/4" = 1'-0"



4 TYP BEAM CONN
SCALE: 3/4" = 1'-0"



5 TOWER BASE
SCALE: 1/2" = 1'-0"



6 SECTION
S-101 SCALE: 3/4" = 1'-0"

PRE-FINAL REVIEW
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CITY OF HARRISONBURG
NORTH RIVER PUMP STATION
UPGRADE
BRIDGEWATER, VIRGINIA

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|-----|------------|----------------------|
| 0 | 12/13/2013 | |

COMM NO: 213110
DATE: 12/13/2013
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CHECK: WMD

SHEET TITLE
SECTIONS & DETAILS

SHT. NO: **S-502** REV. NO: **0**

LEGEND

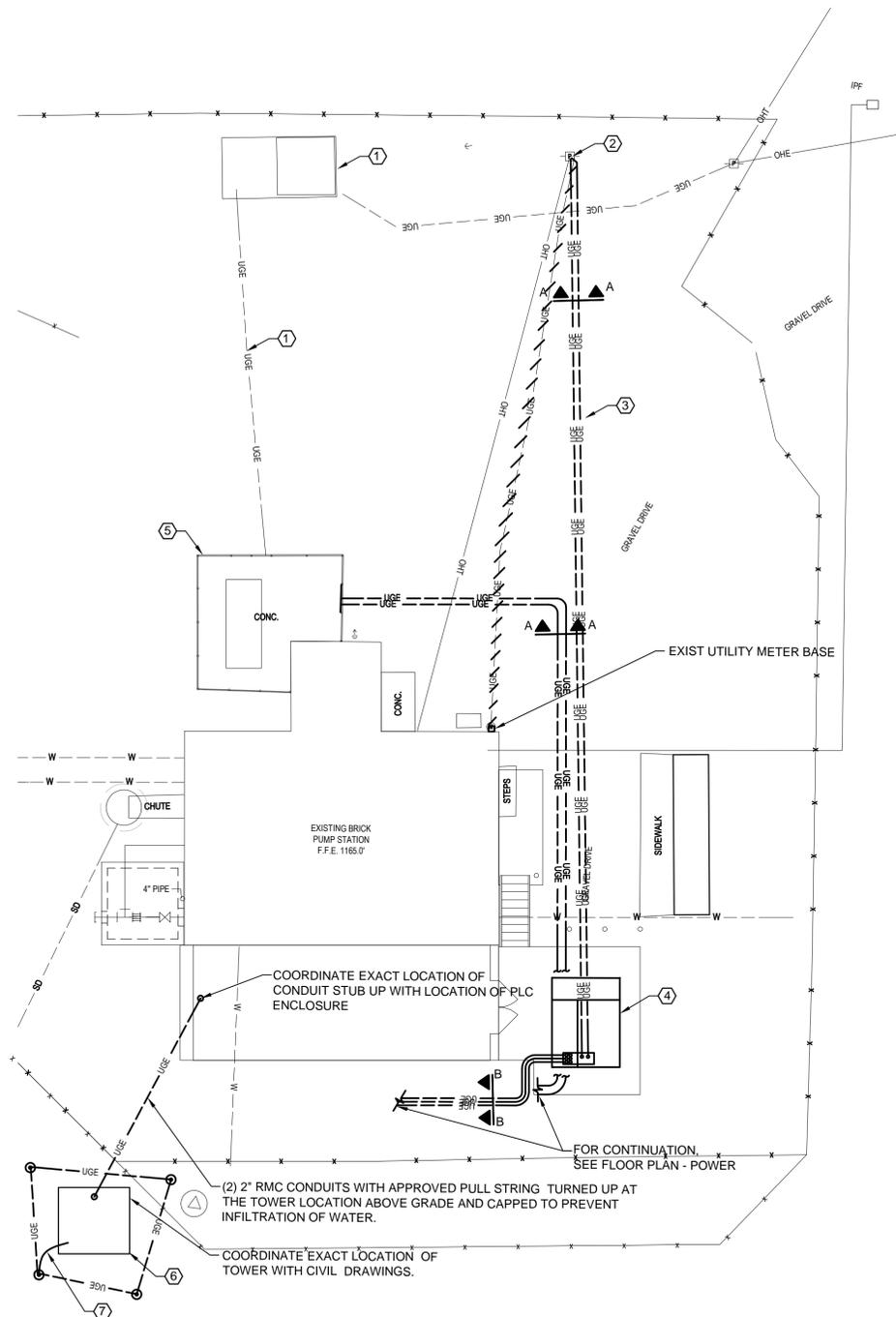
- CONDUIT RUN CONCEALED IN FINISHED AREAS AND EXPOSED IN UNFINISHED AREAS.
- - - CONDUIT RUN BELOW GRADE OR IN SLAB AS INDICATED
- UGE — UTILITY POWER SERVICE CONDUCTORS RUN BELOW GRADE
- OHE — OVERHEAD UTILITY POWER LINE
- OHT — UTILITY TELEPHONE SERVICE CONDUCTORS RUN OVERHEAD
- CONDUIT TURNING UP
- CONDUIT TURNING DOWN
- /// TICK MARKS: INDICATE NUMBER OF CONDUCTORS IN A CONDUIT IN ADDITION TO EGC. NO TICK MARKS INDICATE TWO CONDUCTORS IN ADDITION TO EGC
- P1-1 CONDUIT HOMERUN TO PANEL, NO. OF ARROWS INDICATE NUMBER OF CIRCUITS, TEXT INDICATES PANEL AND CIRCUIT NUMBER
- A 1'X4' LIGHTING FIXTURE, LETTER INDICATES TYPE
- B WALL MOUNTED FIXTURE, LETTER INDICATES TYPE
- EM BATTERY EMERGENCY LIGHT, LETTER INDICATES TYPE
- X1 WALL MOUNTED EXIT LIGHT WITH DIRECTIONAL ARROWS AS INDICATED, LETTER INDICATES TYPE
- S SINGLE POLE SWITCH
- 208/120V, 3PH, 4W PANELBOARD
- XXX NEMA 5-20R DUPLEX RECEPTACLE, ABBREVIATION AS APPLICABLE
- TELECOM WALL OUTLET
- DATA AND TELECOM WALL OUTLET
- M MOTOR
- NON-FUSIBLE DISCONNECT SWITCH, 30A, UNLESS NOTED OTHERWISE. 2 OR 3 POLE, AS APPLICABLE
- COMBINATION MOTOR STARTER
- VFD VARIABLE FREQUENCY DRIVE
- FACP FIRE ALARM CONTROL PANEL
- 15 FIRE ALARM SYSTEM COMBINATION HORN AND STROBE LIGHT- NUMBER INDICATES MINIMUM ALLOWABLE CANDELA RATING OF STROBE LIGHT
- 15 FIRE ALARM SYSTEM STROBE LIGHT- NUMBER INDICATES MINIMUM ALLOWABLE CANDELA RATING
- FIRE ALARM SYSTEM MANUAL PULL STATION
- FIRE ALARM SYSTEM SMOKE DETECTOR
- FIRE ALARM SYSTEM HEAT DETECTOR

ONE LINE DIAGRAM

- FUSE
- NORMALLY OPEN CONTACT
- MOLDED CASE CIRCUIT BREAKER
- SWITCH
- POWER TRANSFORMER
- OVERLOAD RELAY
- CURRENT TRANSFORMER
- AUTOMATIC TRANSFER SWITCH
- EQUIPMENT/MATERIAL TO BE DEMOLISHED

GENERAL NOTES:

1. PROVIDE HANDLE LOCKS ON ALL CIRCUIT BREAKERS SERVING NIGHT LIGHTS, EXIT LIGHTS, EMERGENCY BATTERY LIGHTS, SECURITY AND FIRE ALARM SYSTEM, AND TELECOMMUNICATION ROOM RECEPTACLES.
2. UNLESS NOTED OTHERWISE, MOUNTING HEIGHTS GIVEN ABOVE FINISHED FLOOR ARE TO THE CENTER OF THE DEVICE OR EQUIPMENT, EXCEPT FOR LIGHTING FIXTURES, WHERE MOUNTING HEIGHTS SHALL BE TO THE BOTTOM OF THE FIXTURE.



ELECTRICAL SITE PLAN

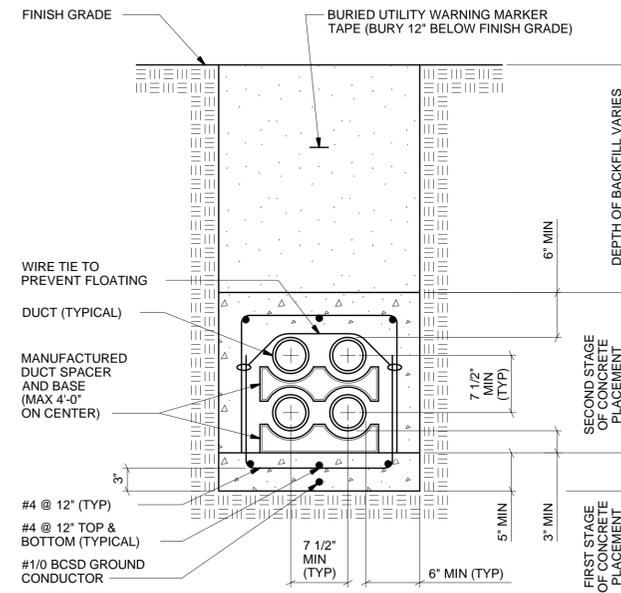
SCALE: 1" = 10'

ABBREVIATIONS

| | | | | |
|--------|--|-------------------------------------|------|--|
| A | AMP | AMPERES OR AMPLIFIER, AS APPLICABLE | MAX | MAXIMUM |
| ATS | AUTOMATIC TRANSFER SWITCH | | MIN | MINIMUM |
| AWG | AMERICAN WIRE GAUGE | | | |
| BCSD | BARE COPPER, SOFT DRAWN | | NEMA | NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION |
| BKR | BREAKER | | NFD | NON-FUSED DISCONNECT |
| BLDG | BUILDING | | NO. | NUMBER |
| CFCI | CONTRACTOR FURNISHED, CONTRACTOR INSTALLED | | OFCI | OWNER FURNISHED CONTRACTOR INSTALLED |
| CKT | CIRCUIT | | P | POLE |
| COND | CONDUIT | | PNL | PANEL |
| DWG(S) | DRAWING(S) | | RMC | RIGID METAL CONDUIT |
| EGC | EQUIPMENT GROUNDING CONDUCTOR | | RMS | ROOT MEAN SQUARE, AS APPLICABLE |
| EXIST | EXISTING | | SWBD | SWITCHBOARD |
| FACP | FIRE ALARM CONTROL PANEL | | SYM | SYMMETRICAL |
| HP | HORSEPOWER | | TYP | TYPICAL |
| HZ | HERTZ | | | |
| kcmil | THOUSAND CIRCULAR MILS | | V | VOLT(S) |
| kVA | KILOVOLT AMPERES | | VFD | VARIABLE FREQUENCY DRIVE |
| kW | KILOWATTS | | W | WATTS |
| LED | LIGHT EMITTING DIODE | | W/ | WITH |
| | | | XFMR | TRANSFORMER |

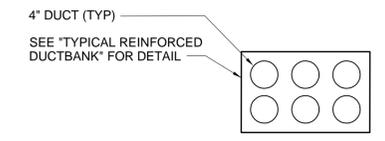
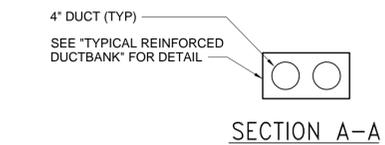
NOTES:

1. COORDINATE WITH UTILITY COMPANY FOR THE REMOVAL OF EXISTING 19.2/2300V PAD MOUNTED TRANSFORMER AND SWITCH. REMOVE EXISTING SECONDARY CONDUCTORS BACK TO EXISTING SWITCHGEAR IN PUMP STATION.
2. COORDINATE WITH UTILITY COMPANY FOR THE REMOVAL OF EXISTING 19.2/480V POLE MOUNTED TRANSFORMER. REMOVE EXISTING SECONDARY CONDUCTORS BACK TO EXISTING UTILITY METER BASE.
3. PROVIDE REINFORCED DUCTBANK FROM EXISTING UTILITY POLE TRANSITION TO VERTICAL RIGID CONDUIT TO NEW UTILITY PROVIDED TRANSFORMER. MOUNT ON ELEVATED CONCRETE PLATFORM. SEE "TYPICAL REINFORCED DUCTBANK" THIS SHEET FOR FURTHER INFORMATION.
4. COORDINATE WITH UTILITY COMPANY FOR SIZING OF CONDUCTOR OPENINGS BELOW TRANSFORMER AND MEDIUM VOLTAGE TERMINATIONS.
5. REMOVE EXISTING 480/2400V TRANSFORMER MOUNTED ON CONCRETE SLAB. INSTALL EXISTING OWNER FURNISHED PORTABLE GENERATOR IN LOCATION SHOWN. CONTRACTOR SHALL REMOVE PORTABLE GENERATOR FROM TRAILER. SEE DWG E-102 FOR FURTHER INFORMATION.
6. CONTRACTOR IS TO PROVIDE A UL LABELED LIGHTNING PROTECTION SYSTEM. THE TOWER AND BUILDING IS TO BE EVALUATED FOR LIGHTNING PROTECTION BASED ON THE GUIDANCE PROVIDED BY RISK ASSESSED BY THE LATEST NFPA STANDARD 780. LIGHTNING PROTECTION CODE. LIGHTNING PROTECTION SYSTEMS SHALL MEET THE MOST RESTRICTIVE REQUIREMENTS OF THE FOLLOWING: NFPA 780, LP1-175, OR UL. THE TOWER AND ADJACENT BUILDING SHALL RECEIVE THE MASTER C LABEL FROM UL AFTER LIGHTNING PROTECTION SYSTEM IS EVALUATED BY UL AND FOUND TO BE ACCEPTABLE. ALL LIGHTNING PROTECTION DEVICES ARE TO BE EXOTHERMALLY CONNECTED TO THE GROUND RING ADJACENT TO THE TOWER. LIGHTNING PROTECTION SYSTEMS SHALL BE INSTALLED IN NON-METALLIC CONDUIT.
7. PROVIDE A GROUND RING AROUND THE TOWER COORDINATE WITH EXISTING AND NEW UTILITIES FOR EXACT LOCATION OF GROUND RING AND GROUND RODS. COORDINATE EXACT LOCATION OF TOWER WITH CIVIL DRAWINGS. GROUND RING TO CONSIST OF FOUR 10' X 3/4" COPPER CLAD GROUND RODS AND A LOOP OF 4/0 AWG BARE COPPER EXOTHERMALLY CONNECTED TO ALL FOUR GROUND RODS. ALSO PROVIDE A 4/0 AWG BARE CONDUCTOR EXOTHERMALLY CONNECTED FROM THE GROUND RING TO ALL THE STEEL SUPPORTS OF THE TOWER.



TYPICAL REINFORCED DUCTBANK

NOT TO SCALE



DUCTBANK SECTION

NOT TO SCALE

IF THIS DRAWING IS A REDUCTION, GRAPHIC SCALE MUST BE USED.



Wiley Wilson
Constant Progress

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**PRE-FINAL REVIEW
NOT FOR
CONSTRUCTION**

**CITY OF HARRISONBURG
NORTH RIVER PUMP STATION
UPGRADE**

BRIDGEWATER, VIRGINIA

| DATE | REVISION DESCRIPTION |
|--------------|----------------------|
| 0 12/13/2013 | PRE-FINAL REVIEW |

COMM NO: 213110
DATE: 12/13/2013
DRAWN: TFB DESIGN: TFB
CHECK: WPM

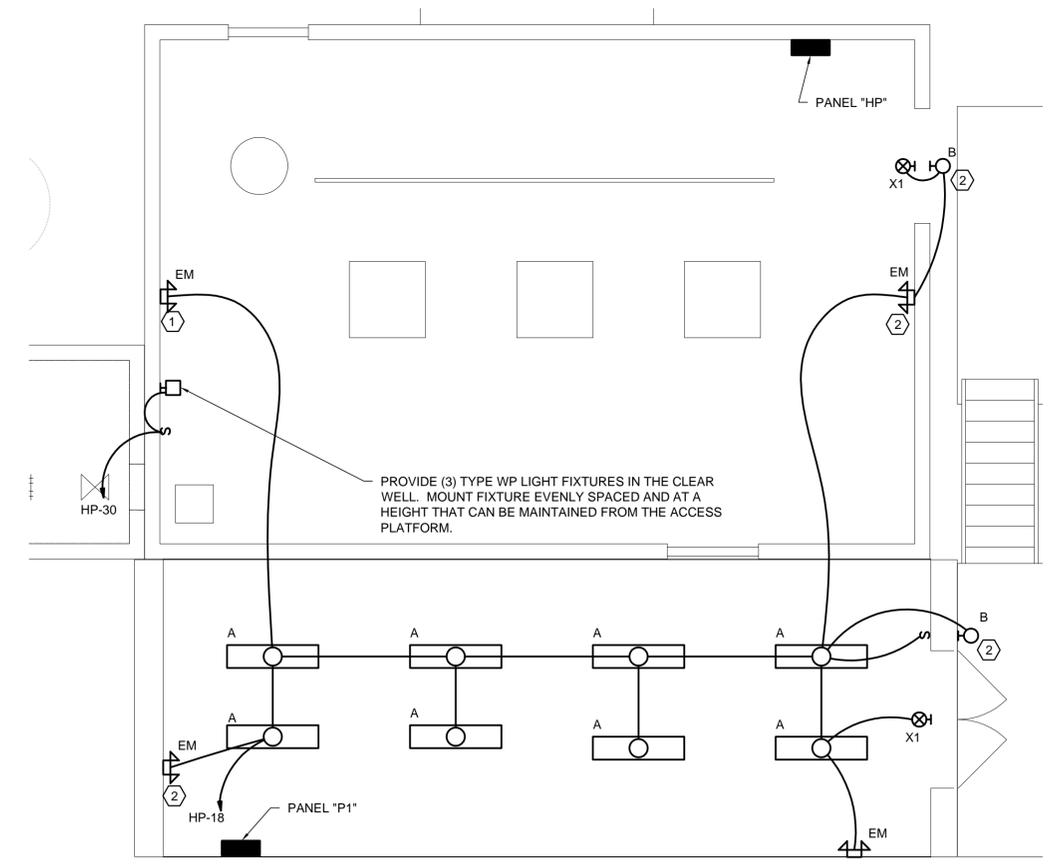
ELECTRICAL SITE PLAN

SHT. NO. **E-001** REV. NO. **0**

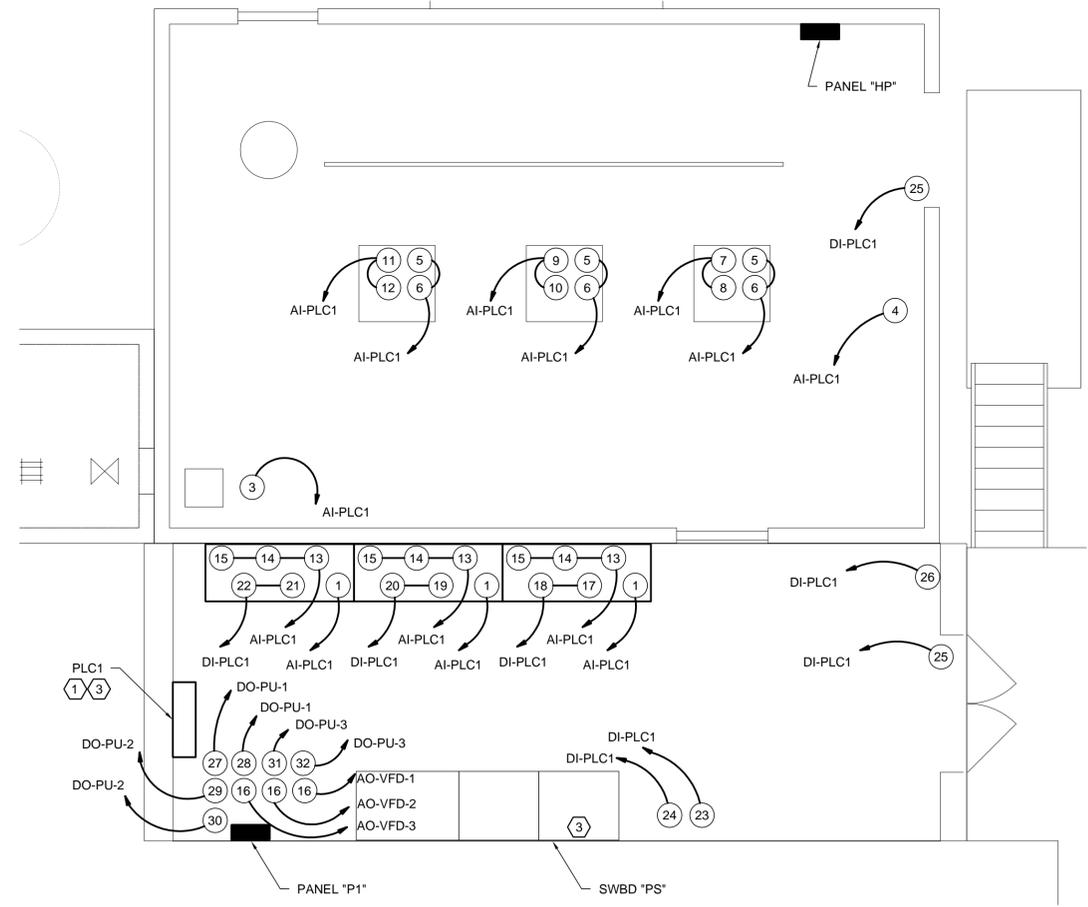
PLC1 I/O SCHEDULE

| I/O No. | I/O TYPE | DESCRIPTION | INSTRUMENT TYPE | MOUNTING | CONDUCTOR | QTY | CONDUIT | QTY | OFCL/CFCL |
|---------|----------|----------------------------------|-------------------------------|----------------|-----------|-----|---------|-----|-----------|
| 1 | AI | VFD-1, 2, 3 SPEED | VFD ANALOG OUTPUT | N/A | 14AWG TSP | 3 | 3/4" | 3 | OFCL |
| 2 | AI | DISCHARGE PRESSURE | ROSEMOUNT 2088 | DISCHARGE PIPE | 14AWG TSP | 1 | 3/4" | 1 | CFCL |
| 3 | AI | CLEARWELL TURBULANCE | HACH (#2983500) | CLEAR WELL | 14AWG TSP | 1 | 3/4" | 1 | CFCL |
| 4 | AI | STATION TEMPERATURE | ECE FAST (#TS-W1P-CAT) | WALL 80" AFF | 14AWG TSP | 1 | 3/4" | 1 | CFCL |
| 5 | AI | PU-1, 2, 3 MTR BEARING TEMP | SHIPPED WITH MOTOR | N/A | 14AWG TSP | 3 | 3/4" | 3 | OFCL |
| 6 | AI | PU-1, 2, 3 MTR OIL LEVEL | SHIPPED WITH MOTOR | N/A | 14AWG TSP | 3 | 3/4" | 3 | OFCL |
| 7 | AI | PU-1 LOWER AXIS VIBRATION | SHIPPED WITH MOTOR | N/A | 14AWG TSP | 1 | 3/4" | 1 | OFCL |
| 8 | AI | PU-1 LOWER AXIS 90 DEG VIBRATION | SHIPPED WITH MOTOR | N/A | 14AWG TSP | 1 | 3/4" | 1 | OFCL |
| 9 | AI | PU-2 LOWER AXIS VIBRATION | SHIPPED WITH MOTOR | N/A | 14AWG TSP | 1 | 3/4" | 1 | OFCL |
| 10 | AI | PU-2 LOWER AXIS 90 DEG VIBRATION | SHIPPED WITH MOTOR | N/A | 14AWG TSP | 1 | 3/4" | 1 | OFCL |
| 11 | AI | PU-3 LOWER AXIS VIBRATION | SHIPPED WITH MOTOR | N/A | 14AWG TSP | 1 | 3/4" | 1 | OFCL |
| 12 | AI | PU-3 LOWER AXIS 90 DEG VIBRATION | SHIPPED WITH MOTOR | N/A | 14AWG TSP | 1 | 3/4" | 1 | OFCL |
| 13 | AI | PU-1, 2, 3 RUNNING AMPS | VFD ANALOG OUTPUT | N/A | 14AWG TSP | 3 | 3/4" | 3 | OFCL |
| 14 | AI | PU-1, 2, 3 RUNNING KW | VFD ANALOG OUTPUT | N/A | 14AWG TSP | 3 | 3/4" | 3 | OFCL |
| 15 | AI | PU-1, 2, 3 PHASE MONITORING | VFD ANALOG OUTPUT | N/A | 14AWG TSP | 3 | 3/4" | 3 | OFCL |
| 16 | AO | VFD-1, 2, 3 SPEED OUTPUT | VFD ANALOG INPUT | N/A | 14AWG TSP | 3 | 3/4" | 3 | OFCL |
| 17 | DI | VFD-1 IN AUTOMATIC CONTROL | VFD DIGITAL OUTPUT | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 18 | DI | VFD-1 IN MANUAL CONTROL | VFD DIGITAL OUTPUT | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 19 | DI | VFD-2 IN AUTOMATIC CONTROL | VFD DIGITAL OUTPUT | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 20 | DI | VFD-2 IN MANUAL CONTROL | VFD DIGITAL OUTPUT | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 21 | DI | VFD-3 IN AUTOMATIC CONTROL | VFD DIGITAL OUTPUT | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 22 | DI | VFD-3 IN MANUAL CONTROL | VFD DIGITAL OUTPUT | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 23 | DI | GENERATOR RUNNING | AUX CONTACT IN ATS | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 24 | DI | STATION POWER | AUX CONTACT IN MAIN SWBD | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 25 | DI | DOOR ENTRY INTRUSION | GE SENTROL 2500 SERIES | DOOR | (2) 14AWG | 4 | 3/4" | 2 | CFCL |
| 26 | DI | ARMED | AUX CONTACT IN SECURITY PANEL | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 27 | DO | PU-1 START COMMAND | VFD DIGITAL INPUT | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 28 | DO | PU-1 STOP COMMAND | VFD DIGITAL INPUT | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 29 | DO | PU-2 START COMMAND | VFD DIGITAL INPUT | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 30 | DO | PU-2 STOP COMMAND | VFD DIGITAL INPUT | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 31 | DO | PU-3 START COMMAND | VFD DIGITAL INPUT | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |
| 32 | DO | PU-3 STOP COMMAND | VFD DIGITAL INPUT | N/A | (2) 14AWG | 1 | 3/4" | 1 | OFCL |

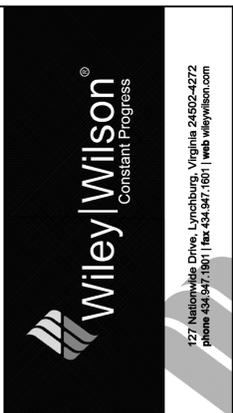
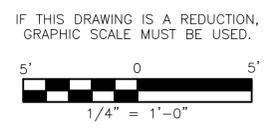
- NOTES**
- PROVIDE ENCLOSURE FOR PLC AND ASSOCIATED EQUIPMENT (PLC1). ENCLOSURE SHALL BE 30" X 40" NEMA 3R WITH A HINGED COVER. ENCLOSURE SHALL BE EQUIPPED WITH BACK PLATE MOUNTING STUDS FOR BACK PLATE. DELIVER BACK PLATE TO THE OWNER REPRESENTATIVE FOR OWNER REPRESENTATIVE TO MOUNT OWNER FURNISHED EQUIPMENT. OWNER REPRESENTATIVE WILL COORDINATE RETURN OF THE BACK PLATE. PROVIDE ALL TERMINATIONS OF CONDUCTORS AT ALL FIELD DEVICES AND AT THE OWNER FURNISHED TERMINAL BLOCKS LOCATED IN THE AFOREMENTIONED ENCLOSURE.
 - FIXTURE IS NOT TO BE CONTROLLED VIA LOCAL SWITCH OR ANY OTHER DEVICE.
 - PROVIDE COMMUNICATION CABLE PER MANUFACTURER'S SPECIFICATIONS BETWEEN MAIN CABINET IN SWITCHBOARD TO PLC CABINET FOR METERING.



FLOOR PLAN - LIGHTING
SCALE: 1/4" = 1'-0"



FLOOR PLAN - INSTRUMENTATION
SCALE: 1/4" = 1'-0"



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CONSTRUCTION

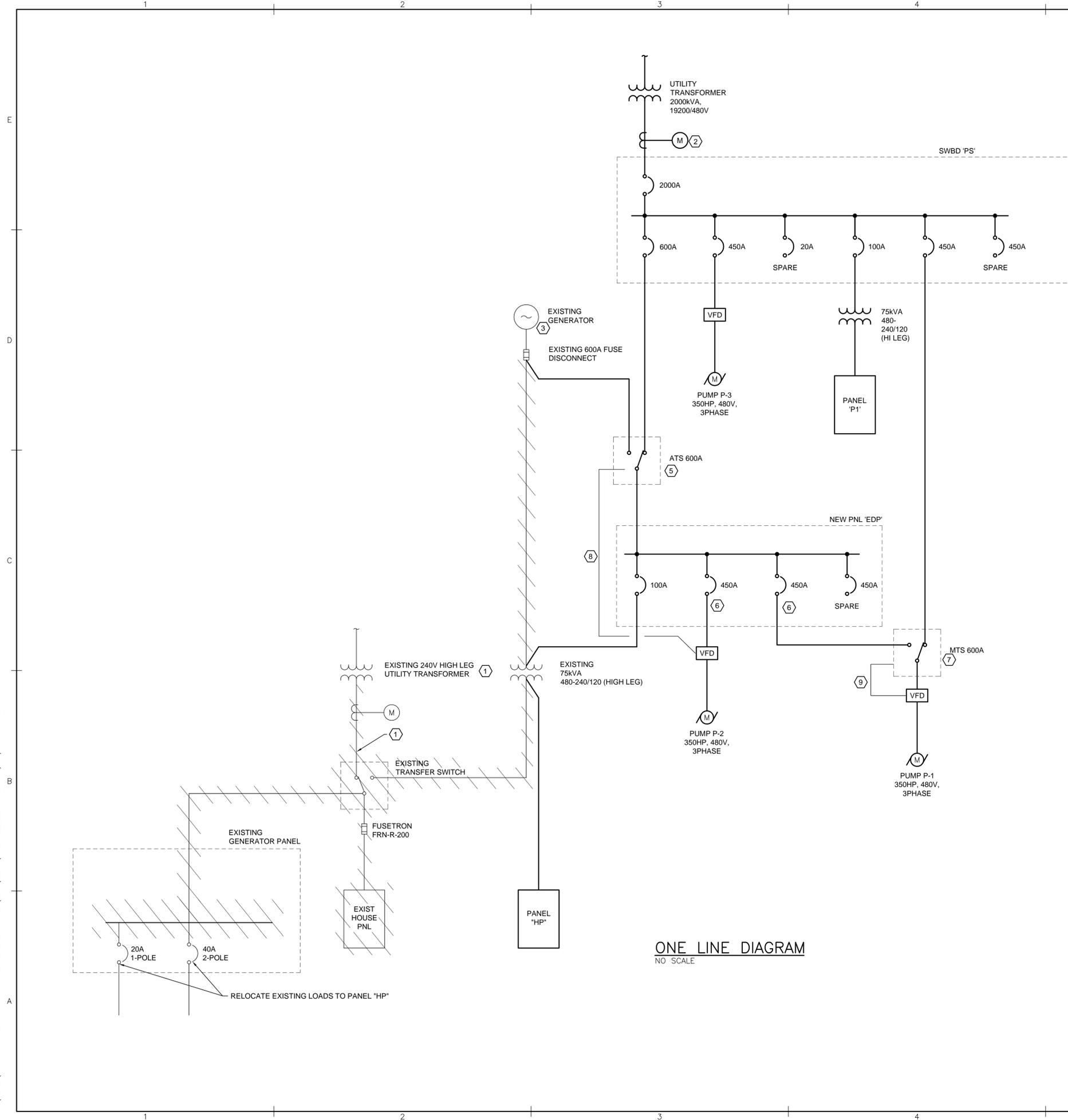
CITY OF HARRISONBURG
NORTH RIVER PUMP STATION
UPGRADE
BRIDGEWATER, VIRGINIA

| MRK | DATE | PRE-FINAL REVIEW | REVISION DESCRIPTION |
|-----|------------|------------------|----------------------|
| 0 | 12/13/2013 | PRE-FINAL REVIEW | |

| | |
|--------------|---|
| COMM NO: | 213110 |
| DATE: | 12/13/2013 |
| DRAWN: | TFB |
| DESIGN: | TFB |
| CHECK: | WPM |
| SHEET TITLE: | FLOOR PLAN - LIGHTING & INSTRUMENTATION |
| SHT. NO.: | E-101 |
| REV. NO.: | 0 |

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ONE LINE DIAGRAM
NO SCALE

NOTES:

- 1 COORDINATE WITH THE LOCAL UTILITY COMPANY TO REMOVE EXISTING POLE MOUNTED TRANSFORMER AND SECONDARY CONDUCTORS TO EXISTING METER BASE.
- 2 INSTALL UTILITY SUPPLIED CTs IN THE NEW UTILITY TRANSFORMER. PROVIDE CONDUIT FROM CTs TO METER CABINET. CONDUIT SIZE, METER CABINET LOCATION, AND COMPLETE INSTALLATION TO MEET THE UTILITY'S SPECIFICATIONS.
- 3 EXISTING GENERATOR TO BE MODIFIED AND RELOCATED, SEE SITE DRAWINGS FOR EXACT LOCATION. PROVIDE A DETAILED SERVICE REPORT FROM THE GENERATOR MANUFACTURE APPROVED REPRESENTATIVE PRIOR TO RELOCATION OF GENERATOR. SERVICE REPORT TO INCLUDE LOAD TEST AND OIL ANALYSIS. OWNER REPRESENTATIVE IS TO RECEIVE AND REVIEW REPORT 14 DAYS PRIOR TO GENERATOR MODIFICATIONS AND RELOCATION. PROVIDE A SECOND DETAILED SERVICE REPORT FROM THE GENERATOR MANUFACTURE APPROVED REPRESENTATIVE AFTER MODIFICATION AND RELOCATION IS COMPLETE. ANY VARIANCES IN THE REPORT MUST BE REVIEWED WITH THE OWNER REPRESENTATIVE. ANY CORRECTIONS TO VARIANCES THAT OCCUR AS FAULT OF THE MODIFICATION AND RELOCATION WILL NOT BE THE RESPONSIBILITY OF THE OWNER OR THE OWNER REPRESENTATIVE.
- 4 PROVIDE A COMBINATION STARTER, SIZE OVERLOAD PROTECTION AND FUSE SIZE PER MOTOR MANUFACTURE'S RECOMMENDATIONS.
- 5 PROVIDE WITH ATS MULTIPLE AUX CONTACTS FOR PLC INPUTS AND ALSO FOR INPUTS TO THE VFD FOR PUMP P-2. CONTACTS ARE TO VERIFY POSITION OF ATS AND VERIFICATION OF GENERATOR VOLTAGE.
- 6 PROVIDE A KIRK KEY INTERLOCK ON THE TWO BREAKERS LOCATED IN PANEL 'EDP' SERVING PUMP P-1 AND PUMP P-2. THE ORDER OF OPERATION SHOULD OPERATE IN SUCH THAT ONLY ONE OF THE BREAKERS THAT IS INTERLOCKED IS ALLOWED TO CLOSE WHILE THE OPPOSING IS LOCKED IN THE OPEN POSITION PREVENTING BOTH BREAKERS FROM BEING CLOSED AT THE SAME TIME.
- 7 PROVIDE MTS WITH AN AUX CONTACT FOR INPUT TO VFD. VFD TO REQUIRE A DIGITAL INPUT FROM MTS FOR OPERATION OF MOTOR WHILE ON GENERATOR POWER.
- 8 PROVIDE 2 #14 AWG THHN FROM THE AUX CONTACT LOCATED IN THE ATS TO THE VFD FOR A DIGITAL INPUT OF ATS POSITION. COORDINATE TERMINAL LOCATION WITH VFD MANUFACTURE PROVIDED DRAWINGS.
- 9 PROVIDE 2 #14 AWG THHN FROM THE AUX CONTACT LOCATED IN THE MTS TO THE VFD FOR A DIGITAL INPUT OF MTS POSITION. COORDINATE TERMINAL LOCATION WITH VFD MANUFACTURE PROVIDED DRAWINGS.

PRE-FINAL REVIEW
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CITY OF HARRISONBURG
NORTH RIVER PUMP STATION
UPGRADE
BRIDGEWATER, VIRGINIA

| MRK | DATE | REVISION DESCRIPTION |
|-----|------------|----------------------|
| 0 | 12/13/2013 | PRE-FINAL REVIEW |

COMM NO: 213110
DATE: 12/13/2013
DRAWN: TFB DESIGN: TFB
CHECK: WPM

SHEET TITLE
ONE LINE DIAGRAM

SHT. NO. E-601 REV. NO. 0

SWITCHBOARD PS SCHEDULE

SWBD RATING: 480 VOLTS, 3 PHASE, 4 WIRE
 MINIMUM BUS BRACING & OVERCURRENT DEVICE
 INTERRUPTING RATING: 65,000 SYM RMS AMPS
 BUS RATING:

| SPACE CKT NO. | LOAD DESCRIPTION | CONNECTED KVA | | | POLES | OVERCURRENT DEVICE RATING | | OVERCURRENT DEVICE SETTING | | | | | FEEDER CIRCUIT | | | | | | |
|---------------------|------------------|---------------|-------|-------|-------|------------------------------|------|----------------------------|--------------|-----------|------------|---------|----------------|------|-------|---------|-----|---------|--------|
| | | A | B | C | | FRAME | TRIP | PHASE | GROUND FAULT | LONG TIME | SHORT TIME | INSTANT | PICKUP | TIME | PHASE | NEUTRAL | EGC | CONDUIT | |
| 0 | MAIN BREAKER | 460.8 | 455.1 | 458.8 | 3 | 2000 | 2000 | - | - | - | - | - | - | - | - | - | - | - | |
| 1 | PUMP P-3 | 110.0 | 110.0 | 110.0 | 3 | 600 | 600 | - | - | - | - | - | - | (2) | 350 | - | 2/0 | (2) 4" | |
| 2 | SPARE | - | - | - | 3 | 100 | 20 | - | - | - | - | - | - | - | - | - | - | - | |
| 3 | PNL EDP VIA ATS | 240.8 | 235.1 | 238.8 | 3 | 1000 | 1000 | - | - | - | - | - | - | (4) | 250 | (4) | 250 | 1/0 | (4) 3" |
| 4 | SPARE | - | - | - | 3 | 600 | 600 | - | - | - | - | - | - | - | - | - | - | - | - |
| 5 | SPARE | - | - | - | 3 | 600 | 450 | - | - | - | - | - | - | - | - | - | - | - | - |
| 6 | PUMP P1 MTS | 110.0 | 110.0 | 110.0 | 3 | 600 | 600 | - | - | - | - | - | - | (2) | 350 | - | 2/0 | (2) 4" | |

TOTAL PHASE AMPS: A: 1663.5 B: 1643.0 C: 1656.3
 TOTAL CONNECTED LOAD: 1374.7 KVA 1655.5 A

PANEL P1 SCHEDULE

| 175A MCB, 240/120, 3 PHASE, 4W, SN, GROUND BUS | | | | | | | | | | | | MOUNT: SURFACE | | 65.0 KAIC | | | |
|--|-----|-----|----------|-----------|-----------|--|-------------|---------|--|-----------|----------|-----------------------|------|------------|-------------|------------|--|
| LOAD DESCRIPTION | | | | | | | | | | | | LOAD (KVA) | | LOAD (KVA) | | LOAD (KVA) | |
| A | B | C | BKR TRIP | WIRE SIZE | COND SIZE | CKT NO. | PHASE A B C | CKT NO. | COND SIZE | WIRE SIZE | BKR TRIP | A | B | C | DESCRIPTION | | |
| 0.9 | | | 20 | 12 | 1/2" | 1 | A | 2 | 1/2" | 12 | 20 | 0.5 | | | RECEPTS | | |
| | 1.0 | | 20 | 12 | 3/4" | 3 | B | 4 | 3/4" | 10 | 30 | 12.5 | | | AHU-1 | | |
| | | 1.0 | | | | | C | | | | | | 12.5 | | | | |
| | 1.0 | | | | | 9 | B | 10 | | | | 2.2 | | | SPARE | | |
| | | 1.0 | | | | | C | | | | | | 2.2 | | SPARE | | |
| | | | 20 | | | 15 | B | 16 | | | 20 | | | | SPARE | | |
| | | | 20 | | | 17 | C | 18 | | | 20 | | | | SPARE | | |
| | | | 20 | | | 19 | A | 20 | | | 20 | | | | SPARE | | |
| | | | 20 | | | 21 | B | 22 | | | 20 | | | | SPARE | | |
| | | | 20 | | | 23 | C | 24 | | | 20 | | | | SPARE | | |
| | | | 20 | | | 25 | A | 26 | | | 20 | | | | SPARE | | |
| | | | 20 | | | 27 | B | 28 | | | 20 | | | | SPARE | | |
| | | | 20 | | | 29 | C | 30 | | | 20 | | | | SPARE | | |
| 2.9 | 2.0 | 2.0 | | | | | | | | | | 15.2 | 14.7 | 14.7 | TOTAL | | |
| CONN. LOAD: 51.5 KVA | | | 124.0 A | | | TOTAL PHASE KVA: A: 18.1 B: 16.7 C: 16.7 | | | TOTAL PHASE AMPS: A: 150.8 B: 139.2 C: 139.2 | | | DEMAND LOAD: 51.5 KVA | | | 124.0 A | | |

PANEL EDP SCHEDULE

| 1200A MLO, 480V/277V, 3 PHASE, 4W, SN, GROUND BUS | | | | | | | | | | | | MOUNT: SURFACE | | 0.0 KAIC | | | |
|---|-------|-------|----------|-----------|-----------|---|-------------|---------|--|-----------|----------|------------------------|-------|------------|-----------------|------------|--|
| LOAD SERVED | | | | | | | | | | | | LOAD (KVA) | | LOAD (KVA) | | LOAD (KVA) | |
| A | B | C | BKR TRIP | WIRE SIZE | COND SIZE | CKT NO. | PHASE A B C | CKT NO. | COND SIZE | WIRE SIZE | BKR TRIP | A | B | C | DESCRIPTION | | |
| 110.0 | | | 600 | (2)350 | 3" | 1 | A | 2 | 3" | (2)350 | 600 | 110.0 | | | PUMP P-1 MTS | | |
| | 110.0 | | | | | | B | | | | | | 110.0 | | PUMP P-2 | | |
| | | 110.0 | | | | | C | | | | | | | 110.0 | | | |
| 15.1 | | | 100 | 2 | 1 1/4" | 7 | A | 8 | 1/2" | 12 | 20 | 1.9 | | | EXIST HOUSE PNL | | |
| | 9.4 | | | | | | B | | | | | | 1.9 | | EF-1 | | |
| | | 13.1 | | | | | C | | | | | | | 1.9 | | | |
| 1.9 | | | 20 | 12 | 1/2" | 13 | B | 14 | 1/2" | 12 | 20 | 1.9 | | | EF-2 | | |
| | 1.9 | | | | | | C | | | | | | 1.9 | | SF-1 | | |
| | | 1.9 | | | | | A | | | | | | | 1.9 | | | |
| | | | | | | | B | | | | | | | | | | |
| | | | | | | | C | | | | | | | | | | |
| | | | | | | | A | | | | | | | | | | |
| | | | | | | | B | | | | | | | | | | |
| | | | | | | | C | | | | | | | | | | |
| 127.0 | 121.3 | 125.0 | | | | | | | | | | 113.8 | 113.8 | 113.8 | TOTAL | | |
| CONN. LOAD: 714.7 KVA | | | 860.7 A | | | TOTAL PHASE KVA: A: 240.8 B: 235.1 C: 238.8 | | | TOTAL PHASE AMPS: A: 869.3 B: 848.7 C: 862.1 | | | DEMAND LOAD: 797.2 KVA | | | 960.0 A | | |

PANEL HP SCHEDULE

| 175A MCB, 240/120, 3 PHASE, 4W, SN, GROUND BUS | | | | | | | | | | | | MOUNT: SURFACE | | 65.0 KAIC | | | |
|--|-----|-----|----------|-----------|-----------|---|-------------|---------|---|-----------|----------|-----------------------|-----|------------|----------------------|------------|--|
| LOAD DESCRIPTION | | | | | | | | | | | | LOAD (KVA) | | LOAD (KVA) | | LOAD (KVA) | |
| A | B | C | BKR TRIP | WIRE SIZE | COND SIZE | CKT NO. | PHASE A B C | CKT NO. | COND SIZE | WIRE SIZE | BKR TRIP | A | B | C | DESCRIPTION | | |
| 1.4 | | | 20 | 12 | 1/2" | 1 | A | 2 | 1/2" | 12 | 20 | 1.4 | | | LIGHTS | | |
| | 0.0 | | | | | 3 | B | 4 | | | | 0.0 | | | BLANK | | |
| | | 1.4 | | | | 5 | C | 6 | 1/2" | 12 | 20 | | 1.4 | | RECEPTS | | |
| 1.4 | | | 20 | 12 | 1/2" | 7 | A | | | | | 1.4 | | | LOW WATER CUTOFF | | |
| | 0.0 | | | | | 9 | B | | | | | | 1.4 | | BLANK | | |
| | | 1.4 | | | | 11 | C | 12 | 1" | 8 | 40 | | 0.0 | | SCREEN CONTROLS | | |
| 1.0 | | | 20 | 12 | 1/2" | 13 | A | | | | | 0.0 | | | LOUVER | | |
| | 3.2 | | 30 | 10 | 3/4" | 15 | B | 16 | | | | 0.0 | | | AHU INDOOR UNIT | | |
| | | 3.2 | | | | 17 | C | 18 | 1/2" | 12 | 20 | | 1.4 | | AHU-2 | | |
| 3.2 | | | | | | 21 | A | 20 | 1/2" | 12 | 20 | 0.5 | | | LIGHTS VFD ROOM | | |
| | 2.4 | | 20 | 12 | 3/4" | 21 | B | 22 | | | | 0.0 | | | AHU OUTDOOR UNIT | | |
| | | 2.4 | | | | 27 | C | 24 | 3/4" | 12 | 20 | | 0.0 | | RECEPTS GENERATOR | | |
| | | | | | | 27 | A | 26 | 1/2" | 12 | 20 | 0.9 | | | RECEPTS VFD ROOM | | |
| | 0.0 | | | | | 29 | B | 28 | | | | 0.0 | | | BLANK | | |
| | | 0.5 | 20 | 12 | 1/2" | 29 | C | 30 | 1/2" | 12 | 20 | | 1.4 | | DAMPER D-1 | | |
| | | | 20 | 12 | 1/2" | 31 | A | 32 | | | 20 | | | | DAMPERS D-2 THRU D-4 | | |
| | 2.4 | | 20 | 12 | 1/2" | 33 | B | 34 | | | | 0.0 | | | TRASH PUMP | | |
| | | | 20 | | | 35 | C | 36 | | | 20 | | | | SPARE | | |
| | | | 20 | | | 37 | A | 38 | | | 20 | | | | SPARE | | |
| | 0.0 | | | | | 39 | B | 40 | | | | 0.0 | | | BLANK | | |
| | | | 20 | | | 41 | C | 42 | | | 20 | | | | SPARE | | |
| 10.9 | 8.0 | 8.9 | | | | | | | | | | 4.2 | 1.4 | 4.2 | TOTAL | | |
| CONN. LOAD: 37.6 KVA | | | 90.6 A | | | TOTAL PHASE KVA: A: 15.1 B: 9.4 C: 13.1 | | | TOTAL PHASE AMPS: A: 125.8 B: 78.3 C: 109.2 | | | DEMAND LOAD: 25.9 KVA | | | 62.4 A | | |

LIGHTING FIXTURE SCHEDULE

| SYMBOL | MANUFACTURER | CATALOG NUMBER | LAMPS | | VOLTAGE | MOUNTING | NOTES |
|--------|--------------|-------------------------------|-------|---------------------|---------|----------|-------------------------------|
| | | | NO. | TYPE | | | |
| A | LITHONIA | L 2 32 MVOLT GEB10IS | 2 | 32W T8 | 120 | PENDANT | |
| B | LITHONIA | TWH 70M 120 QRS PE VG DBL LPI | 1 | INCLUDED W/ FIXTURE | 120 | WALL | |
| EM | LITHONIA | ELM SD | 2 | LED | 120 | WALL | |
| X1 | LITHONIA | LE S W 1 R 120 ELN | 1 | LED | 120 | WALL | |
| WP | HUBBELL | PGM2-H178 | 1 | METAL HALIDE | 120 | WALL | INSTALL ON WALL IN CLEAR WELL |

NOTES:

- ① RELOCATED CIRCUIT FROM EXISTING HOUSE PANEL.

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CITY OF HARRISONBURG
 NORTH RIVER PUMP STATION
 UPGRADE
 BRIDGEWATER, VIRGINIA

REVISION DESCRIPTION
 DATE

0 12/13/2013 PRE-FINAL REVIEW
 COMM NO: 213110
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 DRAWN: TFB DESIGN: TFB
 CHECK: WPM

SHEET TITLE
 SCHEDULE

SHT. NO. E-602
 REV. NO. 0