

Marathon Cty - NCHC New Adult CBRF & Youth Hospital
2400 Marshall Street
Wausau, WI 54403
Angus Young Associates Project No. 65371

ADDENDUM #01

Friday, August 23, 2019

This addendum is issued to modify, explain or correct the original Drawings, Specifications, and Addenda marked Project Description, **Marathon Cty - NCHC New Adult CBRF & Youth Hospital** dated **8/9/2019** and hereby made part of the contract documents. This addendum consists of **(04)** page(s) of text, **(07)** Specification(s) and **(15)** drawings(s). Please attach his Addendum to the Drawings and Project Manual in your possession.

Bid Date:

All bids must be received on August 29, 2019 02:00 PM (CST)

Attn: Mr. Troy Torgerson, Facility Planner, Marathon County, 1000 Lakeview Drive, Suite 300 Door (#27)Wausau, WI 54401

General Notes:

- A. All contractors are required to submit certain documents with their bids.
 - a. Substitution Listing (if any) Section 00 26 00
 - b. Bid Form Section 00 41 13
 - c. Bid Bond (10%)..... Section 00 43 13
 - d. Subcontractor Listing Section 00 43 36
 - e. Affidavit and Statement on Plans & Specifications Section 00 48 10

Failure to submit all forms, completed in their entirety, shall be grounds for rejection of the bid.

- B. Refer to the attached documents from the pre-bid walk thru.
 - a. Pre-Bid Phasing Plan
 - b. Attendees Sign in Sheet
- C. Each contractor when applicable is responsible for City of Wausau Permit Fees.
- D. Aluminum storefront and windows are to receive a clear anodized finish.
- E. Wide stile aluminum doors will be required at all aluminum storefront systems. Remove all reference to medium stile doors and replace with wide stile. Thermally broken doors required at all exterior.
- F. Aluminum frames located in rated assemblies will be required to meet the rating associated with the assembly in which aluminum frame is located. See life safety plan for rated wall locations. Provide fire rated glass in all rated aluminum frames.
- G. Elevations for Kitchen 1044 are located on sheet FS-100.

Specifications:

A. Section 00 41 13 Bid Form:

- 1. Bid Form document has been updated to include the total lump sum for both Adult CBRF and Youth Hospital bids. Please use the bid form attached in this addendum.

B. Section 00 43 36 Subcontractors List:

1. Subcontractors List Submittal portion has been updated to include the proposed value within the base bid. Please use the updated subcontractors list attached in this addendum.

C. Section 07 31 30 Stone Coated Metal Roof Shingle:

1. Section 2.1.A: Boral Steel Stone Coated Roofing is an approved equivalent manufacturer.

D. Section 08 11 16 Aluminum Doors, Frames:

1. Section 2.06, Subsection B, note 1 is to be revised to read as follows: "Kawneer clear anodized finish coat. Sample is to be submitted to architect for verification"

E. Section 08 70 00 Finish Hardware:

1. Section 2.09: C. Electric Strikes - Provide electric strikes at all locations where card access readers are installed. Refer to addendum regarding updated card access reader locations.
2. Section 2.12: Hardware Set No. 14 - Continuous Hinge shall be anti-ligature continuous hinges (see 2.05 in this section) and the hinges shall be double swing in nature at all patient rooms.

F. Section 08 71 13 Automatic Door Operator:

1. Specification has been added to this addendum below in reference to notes for hardware sets found under 08 11 16.

G. Section 10 51 26 Plastic Lockers:

1. Section 2.1.A: Scranton Products Tufftec Lockers are an approved equivalent manufacturer.

H. Section 22 07 00 Insulation:

1. The exterior SAJ duct insulation shall be 2" thick.

I. Section 26 27 26 Wiring Devices:

1. Added Section 2.01(E)(2) Hospital Grade Receptacles

J. Section 26 32 05 Packaged Generator System

1. Revised section to correspond to one line diagram.

K. Section 26 36 02 Enclosed Transfer Switch

1. Section 2.06, revised L and M.

L. Section 26 43 13 Surge Protective Devices

1. Section 2.01, remove Item No. 5 – No substitutions.
2. Section 2.03, removed C – Current Technology Specification
3. Section 2.04, removed C – Current Technology Specification.
4. Section 2.04, removed C – Current Technology Specification.
5. Section 2.05, added Surge Protective Device – Branch Panel Application Section.

Drawings:

A. Sheet S101 Foundation And Slab Plan – Youth Hospital:

1. Revised sheet with updated note callouts.

B. Sheet S201 Roof Framing Plan – Youth Hospital:

1. Revised sheet with updated wall notes.
2. Added truss types.

C. Sheet A-111b First Floor Architectural Plans – Youth Hospital:

1. Add: Ligature Alarm (note 26.07b) is to be added above doors 1042, 1041, 1037, 1036, 1034, 1033, 1030, and 1029. See electrical plans for power locations.
2. Add: note 26.01 is to be added in the following locations:
 - a) Door 1008B pull side
 - b) Door 1008A push side
 - c) Door 1008B both (push & pull) sides
 - d) Door 1052 exterior latch pull side
3. Remove: Note 10.09 is to be removed entirely. Equipment screen will not be required around exterior equipment.

4. Clarification: Window "G" is 36" wide by 40" high. Sill height is 3'-6" A.F.F. Window is to be hollow metal frame with security glazing.
- D. Sheet A-513 Interior Finish Details/Typicals – Youth Hospital:**
1. Clarification: see attached drawing for clarification of detail 16/A-513 for slab recess and shower flooring.
- E. Sheet A-601b Door Schedule/Details - Youth Hospital**
1. Include door and hardware for the exterior patio egress door. Door shall be **3'-8" x 7'-0" x 1 3/4"**. Door Type: **F**; Door Material: **HM**; Door Finish: **PT**; Frame Type: **1**; Frame Material: **HM**; Frame Finish; **PT**; Notes: Hardware Set 3, delayed, provide surface mounted door contact, set for egress, exit only and alarm/alerts if opened, no entry from exterior side of the patio.
- F. Sheet M301 Mechanical Schedules and Details:**
1. The external static pressure listed on the roof-top unit (RTU) schedule shall be adjusted to indicate 1.7" w.c.
 2. The horsepower on the RTU schedule shall be adjusted from 5 to 7.5. The electrical contractor shall modify the feeder and breaker size from a 35 circuit to a 50 amp circuit.
- G. Sheet E-000b - Symbols, Abbreviations & Index**
1. Added Fire Alarm Basis of Design description.
- H. Sheet E-010b - Partial Site Plan Electrical - Youth Hospital**
1. Added location of site equipment for reference (generator, transformer, meter ect).
 2. Added Keyed notes 6-16 and Sheet Note 1 for references.
- I. Sheet E-121b First Floor Power Plan - Youth Hospital**
1. Added Keyed Note 1.
 2. Added connections to Plumbing equipment.
 3. Added connection at exterior gate.
- J. Sheet E-131b – First Floor Technology Plan – Youth Hospital**
1. Added fire alarm annunciator panel within Vestibule 1050.
 2. Adjusted fire alarm devices.
 3. Added fire alarm connection to exterior gate.
 4. Added camera within exterior courtyard for view of gate.
 5. Added control modules to electrified doors.
 6. Adjustments to card access.
 7. Added information for ligature alarming at Patient Rooms.
- K. Sheet E-300b - Enlarged Plans - Youth Hospital**
1. Added receptacle and fire alarm within Detail 4.
 2. Added ligature alarm system to Detail 3.
 3. Added low profile nurse call device within Toilet and Shower Room within Detail 3.
 4. Added ground bar and fire alarm device within Detail 5.
 5. Added ligature control panel and moved fire alarm control panel within Detail 7.
- L. Sheet E-410b - One Line Diagram – Youth Hospital**
1. Revised One Line.
 - a) Moved SPD from external to internal devices.
 2. Added equipment labels.
- M. Sheet E-510b - Power Details – Youth Hospital**
1. Revised details.
- N. Sheet E-520b - Youth Hospital**
1. Added ligature alarm Detail 4.
- O. Sheet E-521b**
1. Revised Detail 5, Keyed Note 5 and 7.
- P. Sheet E610b - Power Schedules – Youth Hospital**

1. Revised Schedules.

Q. Sheet E611b – Power Schedules Youth Hospital

1. Revised Schedule.

R. Sheet E620b – Power Schedules Youth Hospital

1. Revised Schedules.

End of Addendum

**SECTION 00 41 13
BID FORM**

Marathon Cty - NCHC New Adult CBRF & Youth Hospital
Bids Due: **August 29, 2019 02:00 PM**

To: Mr. Troy Torgerson, Facility Planner
Marathon County
1000 Lakeview Drive, Suite 300 Door (#27)
Wausau, WI 54401

We _____ (a corporation)
_____ (a partnership)
(cross out inapplicable) (an individual)

of _____
Street City

State Zip Code Area Code Telephone No.

hereby agree to execute the proposed Contract specified herein and to furnish all labor and materials required to complete this Project in accordance with the Drawings and Project Manual and other Contract Documents, dated 8/9/2019, prepared by Angus-Young Associates, Inc., 555 South River Street, Janesville, Wisconsin 53548-4783.

BID NO. 1 – Adult CBRF - DRAWINGS AND DIVISIONS 0 - 33 OF THE PROJECT MANUAL

For the sum of _____
_____ Dollars (\$ _____)

BID NO. 2 – Youth Hospital - DRAWINGS AND DIVISIONS 0 - 33 OF THE PROJECT MANUAL

For the sum of _____
_____ Dollars (\$ _____)

TOTAL LUMP SUM OF BIDS (BID NO. 1 + BID NO. 2) -

For the sum of _____
_____ Dollars (\$ _____)

Change Order Percentage:

Contractor to provide the cost established by payroll plus fringes, material invoices and equipment costs or rentals to include a percentage of _____% on the established costs accumulated, to cover overhead and profit. Refer to Section 00 21 13 Instructions to Bidders.

ADDENDUM RECEIPT

We acknowledge receipt of the following Addenda:

Number & date

inclusively.

COMMENCEMENT AND SUBSTANTIAL COMPLETION OF CONTRACT WORK

The undersigned agrees, if awarded the Contract, to commence the Contract upon execution of the agreement, and to complete the Work within the time stated below by the Bidder.

This Project shall be completed within _____ (insert no.) calendar days.

INSTRUCTION TO BIDDER

The undersigned understands and agrees to comply with and be bound by Section 00 21 13, Instruction to Bidders issued for this Work.

If a Corporation, name the State of Incorporation

_____.

If a Partnership, state full names of all partners.

Firm Name:

Area Code & Telephone Number: _____

By: _____ Notary Seal

Title: _____

By: _____ Name:

Title: _____ Commission Expires:

Dated: _____

END OF SECTION

**SECTION 00 43 36
SUBCONTRACTORS LIST**

GENERAL

A list of subcontractors will be required to be submitted with the bid; bidders shall submit in writing the names of subcontractors and material suppliers for the owner's approval, as outlined in the Instructions to Bidders. The owner will review, approve or disapprove all subcontractors for prime contractors.

Use subcontractors who have adequate numbers of skilled workman that are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the Work.

SUBMITTAL

Each Prime Contractor shall submit a complete listing of subcontractors and product suppliers to be used, for each item specified in each section indicated below. **Enter the proposed value included in base bid.**

SUBCONTRACTOR / SUPPLIER

SECTION	NAME & CITY
3 Concrete Work	_____
5 Metal Support Assemblies	_____
5 Structural Steel	_____
7 Sheet Metal Flashing	_____
7 Roofing	_____
9 Finish Flooring	_____
9 Gypsum Wall Board	_____
21 Fire Protection	_____
22 Plumbing	_____
23 Mechanical	_____
23 Controls	_____
26 Electrical	_____

END OF SECTION

**SECTION 08 71 13
AUTOMATIC DOOR OPERATOR**

PART 1 - GENERAL

1.01 DESCRIPTION

- A. Work Included:
 - 1. Work in this Section includes but is not limited to: Complete Electro-mechanical swing door operating equipment system, as specified, that has been manufactured, fabricated and installed to maintain performance criteria stated by manufacturer without defects, damage or failure.
 - 2. Related work specified elsewhere:
 - a. Division 7 Sections 07 92 00: Sealants
 - b. Division 8 Sections 08 11 00: Steel Doors and Frames
 - c. Division 8 Sections 08 11 16: Aluminum Doors Frames & Windows
 - d. Division 8 Sections 08 14 00: Wood Doors
 - e. Division 26 - Electrical

1.02 REFERENCES

- A. American Association of Automatic Door Manufacturers (AAADM)
- B. American National Standards Institute (ANSI):
 - 1. ANSI Z97.1: Safety Glazing Materials Used in Buildings - Methods of Test.
 - 2. ANSI A156.10: For Power Operated Pedestrian Doors; Sliding Doors section.
- C. American Society for Testing and Materials (ASTM):
 - 1. ASTM B 221: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
- D. National Fire Protection Association (NFPA):
 - 1. NFPA 101: Code for Safety to Life from Fire in Buildings & Structures.
- E. The Aluminum Association:
 - 1. AA Aluminum Finishes Manual.
- F. Underwriters Laboratories, Inc. (UL):
 - 1. UL 325: Electrical Door, Drapery, Gate, Louver, and Window Operators and Systems.

1.03 SUBMITTALS

- A. General:
 - 1. Comply with provisions of Section 01 33 00.
- B. Product Data: Submit manufacturer's complete product and installation data.
- C. Shop Drawings: Submit drawings showing layout, profiles, product components including anchorage, accessories, finish and glazing details (where required).
- D. Quality Assurance and Closeout Submittals: Submit the following:
 - 1. Manufacturer's Operation and Maintenance Data.
 - 2. Warranty document as specified herein.
 - 3. AAADM inspection compliance form completed and signed by certified AAADM inspector prior to doors being placed in operation as proof of compliance with ANSI A156.10.

1.04 QUALITY ASSURANCE

- A. Automatic swing door system shall be CERTIFIED by the manufacturer to meet performance design criteria according to the following test standards:
 - 1. ANSI A156.19
 - 2. NFPA 101
 - 3. Underwriter's Laboratories 325 (UL) listed

1.05 WARRANTIES

- A. Manufacturer's Warranty: Units to be warranted against defect in material and workmanship for a period of one year from the Date of Substantial Completion. Manufacturer's warranty is in addition to, and not a limitation of, other rights Owner may have under Contract Documents.
- B. Distributor's Warranty: One-year warranty for labor and transportation charges for defective parts replacement.

1.06 PROJECT CONDITIONS

- A. Field Measurements: Verify actual dimensions/openings by field measurements before fabrication and record on shop drawings. Coordinate with fabrication and construction schedule to avoid construction delays.

1.07 DELIVERY, STORAGE AND HANDLING

- A. Ordering and Delivery: Comply with factory's ordering instructions and lead time requirements. Delivery shall be in factory's original, unopened, undamaged containers with identification labels intact.
- B. Storage and Protection: Provide protection from exposure to harmful weather conditions and vandalism.

PART 2 - PRODUCTS

2.01 MANUFACTURER

- A. Stanley Access Technologies

2.02 AUTOMATIC DOOR OPERATOR:

- A. Automatic Door: Stanley Magic-Access™ operator shall be an electro-mechanical system installed in a header to resist dust, dirt and corrosion. Bearings shall be fully lubricated and sealed to minimize wear and friction. Entire operator shall be removable from the header as a unit. All equipment shall operate between temperature extremes of -30° F and + 130° F.
- B. Power Opening: Operator shall open door with a fractional HP DC motor through reduction gears, splined spindle door arm and linkage assembly. Drive train shall have positive constant engagement. Operator shall stop the door in the open position by electrically reducing the motor voltage and stalling against a 90 degree stop.
- C. Spring Closing: Operator shall close door by power assist closing. Closing speed shall be controlled by employing the motor as a dynamic brake. Closing spring shall be pre-loaded for positive closing action at low material stress level.
- D. Manual Operation: Operator shall function as a manual door closer in the direction of swing with or without electrical power.
- E. Entrapment Protection: Door forces and speeds generated during power opening and manual opening in both directions of swing and spring closing in both directions of swing shall conform to the requirements of A156.19.
- F. Electrical Control: a solid state electronic controller with quick connect plugs shall incorporate the following features:
 - 1. Mode of operation: to be "low energy" as defined by A156.19.
 - 2. Respond to push plates

3. Immediate reverse-on-obstruction during opening capability
 4. Open, open check and closing speed adjustment
 5. Adjustable time delays
 6. On / Off / Hold Open switch
 7. Power assist closing
- G. Header: shall be 4" wide by 6" high, 6063-T5 aluminum extrusions with structurally integrated end caps. Structural sections shall have a minimum wall thickness of 0.25. Provide full length removable cover for access to operator and electronic control box.
- H. Linkage assembly: shall provide positive control of door through entire swing: shall permit use of butt-hung center pivot and offset pivot hung doors.
- I. Controls: push plates.
- J. Accessories:
1. Coordination with electric strike and card access system on scheduled doors.
 2. SuperScan I door-mounted Safety sensors on the push side of each door.

2.03 FINISHES

- A. Exposed to view aluminum shall have an anodized finish AA-M12-C22-A44 dark bronze.

PART 3 - EXECUTION

3.01 INSPECTION

- A. The door installer shall verify that the installation area is dry, clean and free of foreign matter. Check as-built conditions and verify the manufacturer's details for accuracy to fit the wall assembly prior to fabrication. Report in writing to the Contractor any detrimental conditions to the proper functioning of the swinging door operator and correct prior to any installation in accordance to the manufacturer's recommendations.

3.02 INSTALLATION OF SWINGING DOOR OPERATOR:

- A. Installation shall be by an installer approved and trained by the manufacturer in strict accordance with manufacturer's instructions and fire marshal's listing requirements.
- B. Comply with the automatic swinging door operator system manufacturer's recommendations and/or installation guide when installing the automatic swing door operator. Set all unit plum, level and true.
- C. Provide all fasteners required for installation of the automatic sliding door system.
- D. Adjustment and Cleaning: After repeated operation of the completed installation, re-adjust door operators and controls for optimum operating condition and safety. Clean all metal surfaces promptly after installation.
- E. Explain and review the Daily Safety Check Procedure.

END OF SECTION

SECTION 26 27 26
WIRING DEVICES (Addendum No. 1)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Wall switches.
- B. Wall dimmers.
- C. Receptacles.
- D. Wall plates.
- E. Emergency lighting control devices
- F. Floor boxes.

1.02 SYSTEM DESCRIPTION

- A. Provide the wiring devices as indicated on the drawings and specified herein.

1.03 REFERENCES

- A. NECA - Standard of Installation. REPLACE WITH NECA 1 – Good Workmanship in Electrical Contracting.
- B. NEMA WD 1 - General Requirements for Wiring Devices.
- C. NEMA WD 6 - Wiring Device -- Dimensional Requirements.
- D. NFPA 70 - National Electrical Code.
- E. UL 20 – General-Use Snap Switches.
- F. UL 498 – Attachment Plugs and Receptacles.
- G. UL 943 – Ground-Fault Circuit-Interrupters.

1.04 SUBMITTALS

- A. For Approval
 - 1. Product Data: Provide manufacturer's catalog information showing ratings, dimensions, colors, and configurations.
- B. For Record Purposes
 - 1. As-built/Record Drawings shall accurately indicate the location of all floor boxes.
- C. Operations and Maintenance Manuals
 - 1. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency. Include instructions for storage, handling, protection, examination, preparation and installation of Product.
 - 2. Maintenance Data: Include spare parts data listing; source and current prices of replacement parts and supplies.

1.05 EQUIPMENT DIMENSIONS

- A. Notify Engineer of any devices combinations that will not fit into be in a single box as indicated on the drawings.

1.06 EXTRA MATERIALS

- A. Spare Materials
 - 1. Furnish two of each style, size and color of wall plate.
 - 2. Provide two protective grommets of each size installed.
- B. Maintenance Materials
 - 1. None required.

1.07 WARRANTY

- A. Refer to warranty requirements in section 26 05 00.

PART 2 PRODUCTS

2.01 WIRING DEVICES

- A. Use of a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired only.
- B. Acceptable Manufacturers:
 - 1. Hubbell Wiring Devices.
 - 2. Cooper Wiring Devices.
 - 3. Pass and Seymour/Legrand.
 - 4. Leviton
- C. Provide wiring devices of one manufacturer.
- D. Switches - Standard:
 - 1. General Use Toggle Switches (20 amp type):
 - a. Single Pole - Hubbell #1221 series.
 - b. Double Pole - Hubbell #1222 series.
 - c. Three Way - Hubbell #1223 series.
 - d. Four Way - Hubbell #1224 series.
 - e. Keylock switches - Add an "L" to catalog numbers above.
 - f. Red Polycarbonate Toggle Single Pole - Hubbell #2332PL.
 - g. Switches controlling normal source circuits shall be "ivory" in color.
 - h. Switches controlling emergency source circuits shall be "red" in color.
 - i. Provide key type switches where indicated on the drawings.
 - 2. Momentary Contact Switches:
 - a. 15 amp type - Hubbell #1556.
 - b. 20 amp type - Hubbell #1557.
 - c. Switches controlling normal source circuits shall be "ivory" in color.
 - d. Switches controlling emergency source circuits shall be "red" in color.
- E. Receptacles - Standard:
 - 1. Specification grade receptacles. Equals to the listed specification grade receptacles must contain a one piece, all brass, mounting strap with integral ground contacts.
 - a. 15 amp, 120V, NEMA 5-15R, duplex - Hubbell #5262 series.
 - b. 20 amp, 120V, NEMA 5-20R, single - Hubbell #5361 series.
 - c. 20 amp, 120V, NEMA 5-20R, duplex - Hubbell #5362 series.
 - d. 15 amp, 120V, NEMA 5-15R, duplex, ground fault interrupter - Hubbell #GFR5252 series.
 - e. 20 amp, 120V, NEMA 5-20R, duplex, ground fault interrupter - Hubbell #GFR5352 series.
 - f. 15 amp, 120V, NEMA 5-15R, duplex, surge suppression - Hubbell #HBL5260S series.
 - g. 20 amp, 120V, NEMA 5-20R, duplex, surge suppression - Hubbell #HBL5360S series.
 - h. 15 amp, 120V, NEMA 5-15R, duplex, tamper resistant, with duplex USB charger - Hubbell #USB15X2 series.
 - i. 20 amp, 120V, NEMA 5-20R, duplex, tamper resistant, with duplex USB charger - Hubbell #USB20X2 series.
 - 2. Hospital Grade receptacles. Equals to the listed hospital grade receptacles must contain a one piece, nickel-plated brass, mounting strap with integral ground contacts. **(Addendum No. 1)**
 - a. 15 amp, 120V, NEMA 5-15R, duplex - Hubbell #8200 series.
 - b. 20 amp, 120V, NEMA 5-20R, single - Hubbell #8310 series.
 - c. 20 amp, 120V, NEMA 5-20R, duplex - Hubbell #8300 series.

- d. 15 amp, 120V, NEMA 5-15R, duplex, ground fault interrupter - Hubbell #HGF8200 series.
 - e. 20 amp, 120V, NEMA 5-20R, duplex, ground fault interrupter - Hubbell #HGF8300 series.
 - f. 15 amp, 120V, NEMA 5-15R, duplex, isolated ground - Hubbell #IG8200 series.
 - g. 20 amp, 120V, NEMA 5-20R, duplex, isolated ground - Hubbell #IG8300 series.
 - h. 15 amp, 120V, NEMA 5-15R, duplex, tamper resistant - Hubbell #HBL8200SG series.
 - i. 20 amp, 120V, NEMA 5-20R, duplex, tamper resistant - Hubbell #HBL8300SG series
 - j. 20 amp, 120V, single, hospital twist-loc - Hubbell #HBL23000HG.
 - k. 15 amp, 120V, NEMA 5-15R, duplex, tamper resistant, with duplex USB charger - Hubbell #USB8200 series.
 - l. 20 amp, 120V, NEMA 5-20R, duplex, tamper resistant, with duplex USB charger - Hubbell #USB8300 series.
- 3. All receptacles shall be grounding type.
 - 4. All exterior receptacles shall be weather resistant GFCI type.
 - 5. All wet location, including the pool and pool equipment areas, receptacles shall be weather resistant GFCI type.
 - 6. The use of feed-through GFCI receptacles is not allowed.
 - 7. Special purpose receptacles shall be either specification grade shall have the characteristics as shown on the drawings.
 - 8. 120 volt, 15 amp, duplex receptacles may only be utilized on 20 amp circuits where 3 or more receptacles are being served by one 20 amp circuit.
 - 9. All receptacles served from the "normal" source shall have an "ivory" face. All receptacles served from the "emergency" source shall have an "red" face.
 - 10. All hospital grade receptacles shall have a green dot on the face signifying such.
 - 11. Utilize hospital grade receptacles throughout this facility except Kitchen, Mechanical and Electrical spaces. **(Addendum No. 1)**
 - 12. **Utilize hospital grade tamper resistant receptacles in location as identified on the floor plans.**

2.02 WALL DIMMERS

- A. LED
 - 1. LED Wall Box Dimmers.
 - a. 0-10V – Leviton #AWSMT-7DW, compatible with LED driver in associated luminaire.
 - 2. Three and four way LED dimming – Dimmer/Remote Dimmer combination
 - a. This system provides dimming and on/off controls at multiple locations. Provide this system when a three way dimmer is shown controlling the same group of fixtures as three and four way dimmers. This shall consist of a base unit and three and four way remote unites. Dimmer shall be compatible with LED driver in luminaire. The dimmer component shall be:
 - 1). Master Dimming Station – Leviton #AWSMT-7DW
 - 2). Remote Dimming Stations – Leviton #AWSRT-00W.
- B. Dimming applications of greater than 2000 watts.
 - 1. Utilize the Lutron Hi-Power 2/4/6 Dimming modules
 - a. 50W through 2000W - Lutron HP-2
 - b. 100W through 4000W - Lutron HP-4
 - c. 150W through 6000W - Lutron HP-6
- C. Wall box dimmers shall be ganged where possible in accordance with the manufacturer's derating factors.

2.03 WALL PLATES

- A. Flush Mounted Device Cover Plates: Stainless steel, type 302/304 except in the following areas:
 - 1. Office Areas
- B. Flush Mounted Device Cover Plates: High impact smooth nylon except in the following areas:
 - 1. Aquatic Pool
 - 2. Utility, Electrical and Mechanical spaces.
- C. Surface Mounted Device Cover Plates: 1/2 inch raised galvanized steel covers with a minimum of two screws mounting the wiring device to the coverplate.
- D. Weatherproof Cover Plate:
 - 1. New Construction:
 - a. Vertical Mount: Gasketed, molded high impact, UV stabilized polycarbonate resin with hinged gasketed device cover, TayMac Corp. #72204. Assembly shall be rainproof while in use. Color as selected by Architect from manufacturer's standard colors.
- E. All wall plates covering receptacle circuits shall have the plate marked, in a neat, concise manner, with the panel and circuit number. Utilize a permanent marking system. Handwritten identification will not be accepted.

2.04 EMERGENCY LIGHTING CONTROL DEVICES

- A. Acceptable Manufacturers
 - 1. LVS, Inc.
 - 2. Wattstopper.
 - 3. Nine 24, Inc.
 - 4. Cooper Controls
 - 5. Prior approved equal.
- B. General:
 - a. UL 924 listed and UL 94-VO or UL 94-5VA for flame rating and approved for installation above the suspended ceiling.
 - b. Faceplate (if applicable) shall have silver finish with test switch, normal power indicating and emergency power indicating lights.
- 2. Flush mount in 4 11/16" deep box with extension ring.
- C. Emergency Power Control Device Types:
 - 1. General: A UL 924 listed device that monitors a switched circuit providing normal lighting to an area.
 - a. 120/277 volts, 50/60 Hz, 20 Amp rating
 - b. Test Switch: Provide means of indicating emergency fixtures and device operability – whether onboard or device self diagnostic. Remote test switch will be required if device does not have self diagnostic test feature.
 - 2. Type A: LVS #EPC-A-1. Single relay contact that provides On/Off control of the emergency lighting to match the normal lighting. When normal power fails, relay contact energizes emergency lighting, regardless of normal lighting switch position.
 - 1). During Normal Operation, Emergency fixtures switch with normal fixtures.
 - 2). During loss of normal power, emergency fixtures shall turn On.
 - 3. Type B: LVS #EPC-1-D. Single relay contact that provides On/Off and 4-Wire dimming control of the emergency lighting to match the normal lighting. When normal power fails, relay contact energizes emergency lighting, regardless of lighting switch or dimmer position.
 - a. Shall control 0-10V or DALI dimming fixtures.
 - 1). During Normal Operation, Emergency fixtures dim and switch with normal fixtures.
 - 2). During loss of normal power, emergency fixtures shall illuminate to 100%.

4. Type C: LVS #EPC-D-F. Single relay transfer device to switch power from the normal to emergency circuit when normal power fails. Once normal power returns, device shall return normal power circuit to fixtures.
 - a. Shall control On/Off, 2- or 3-wire fluorescent line-voltage dimming fixtures or 4-wire low voltage dimmed fixtures.
 - 1). During Normal Operation, Emergency fixtures dim and switch with normal fixtures.
 - 2). During loss of normal power, emergency fixtures shall illuminate to 100%.
5. Type D: LVS #RRU-1. Single relay shunt device to bypass the emergency light control. When a local normal circuit fails, relay contact energizes emergency lighting regardless of lighting switch position.
6. Type E: LVS #EPC-PM-A. Dual relay contacts that provide On/Off control of the emergency lighting to match the normal lighting. When normal power fails, relay contacts energizes emergency lighting regardless of normal lighting switch position.
 - a. Shall have the ability to control both switch legs of a bi-level fixture when emergency lights are energized.
 - b. 2 Amp load maximum rating.
 - c. Consult Manufacturer for applications that require more than two fixtures to be controlled with Emergency power on common switch legs.
 - d. Consult Manufacturer to verify ballast/driver compatibility with unit.

2.05 FLOOR BOXES

- A. Acceptable Manufacturers
 1. Steel City/Thomas & Betts.
 2. Hubbell.
 3. Walker/Wiremold.
- B. Floor Box Types
 1. Type A: ANSI/NEMA OS 1, fully adjustable, Steel City 640 Series.
 - a. Material: Cast metal.
 - b. Shape: Rectangular. 4-gang.
 - c. Accessories: Cover plates and carpet plates shall be polished brass or brushed aluminum as selected by Architect.
 - d. Conform to regulatory requirements for concrete-tight floor boxes.

PART 3 EXECUTION

3.01 SHIPPING, DELIVERY, STORAGE AND HANDLING

- A. Inspect and report concealed damage to carrier.
- B. Handle carefully to avoid damage to devices, enclosure and finish.
- C. Store in a clean, dry location. Maintain factory packaging and, as required, provide additional heavy canvas or heavy plastic cover to protect devices from dirt, water construction debris and traffic.

3.02 EXAMINATION AND PREPARATION

- A. Verify that outlet boxes are installed at proper height.
- B. Verify that wall openings are neatly cut and will be completely covered by wall plates.
- C. Verify that floor boxes are adjusted properly.
- D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to wiring devices.
- E. Verify that all outlet boxes for GFI receptacles are located in an accessible location after intended equipment is installed.
- F. Provide extension rings to bring outlet boxes flush with finished surface.
- G. Clean debris from outlet boxes.

3.03 INSTALLATION

- A. Install in accordance with NECA "Standard of Installation."
- B. Install devices plumb and level.
- C. Install switches with OFF position down.
- D. Install vertically mounted receptacles with grounding pole on top, horizontally mounted receptacles with grounding pole on left.
- E. Do not use terminals on wiring devices (hot, neutral or ground) for feed-through connections, looped or otherwise. Make circuit connections via wire connectors and pigtails. All conductors utilized for pigtail connections shall be solid conductors. Do not terminate stranded conductors to any wiring device.
- F. Ground receptacles with an insulated green grounding conductor from the device ground screw to a pigtail connection. The pigtail connection shall also be electrically connected to the grounding conductor attached to the metallic box and the grounding conductor from the serving panel if provided.
- G. Use a torque screwdriver when a torque is recommended or required by the manufacturer.
- H. Connect wiring devices by wrapping conductor around screw terminal.
- I. Install decorative plates on switch, receptacle, and blank outlets in finished areas.
- J. Use jumbo size plates for outlets installed in masonry walls.
- K. Install galvanized steel plates on outlet boxes and junction boxes in unfinished areas, above accessible ceilings, and on surface mounted outlets.
- L. Install gasket plates for devices or system components having light emitting features, such as switches with pilot lights. Where installed on rough textured surfaces, seal plates with black self-adhesive poly-foam.
- M. Install wall dimmers to achieve full rating specified and indicated after derating for ganging as instructed by manufacturer or as outlined within this specification, whichever is more stringent.
- N. Do not share neutral conductor on load side of dimmers.
- O. Emergency Lighting Transfer Devices
 - 1. Install devices per manufacturer's instructions.
 - 2. Verify proper operation of device.

3.04 FIELD QUALITY CONTROL

- A. Inspect each wiring device for defects.
- B. Operate each wall switch with circuit energized and verify proper operation.
- C. Verify that each receptacle device is energized.
- D. For testing of wiring of receptacles refer to specification section 26 08 11.

3.05 ADJUSTMENT AND CLEANING

- A. Adjust devices and wall plates to be flush and level.
- B. Clean exposed surfaces to remove splatters and restore finish.

3.06 START UP/MANUFACTURER FIELD SERVICES

- A. None required.

END OF SECTION

**SECTION 26 32 05
PACKAGE ENGINE GENERATOR SYSTEM
(ADDENDUM NO. 1)**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Packaged engine generator system.
- B. Engine and engine equipment.
- C. Alternator.
- D. Exhaust System.
- E. Accessories
- F. Enclosure.

1.02 SYSTEM DESCRIPTION

- A. Provide the engine generator system as indicated on the drawings and specified herein.

1.03 REFERENCES

- A. Institute of Electrical and Electronic Engineers (IEEE).
- B. NEMA MG1 - Motors and Generators.
- C. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum.)
- D. NFPA 30 - Flammable and Combustible Liquids Code.
- E. NFPA 70 - National Electrical Code.
- F. NFPA 99 - Health Care Facilities.
- G. NFPA 101 - Life Safety Code.
- H. NFPA 110 - Emergency and Standby Power Systems.
- I. U. S. Environmental Protection Agency - Design Criteria of Mechanical, Electrical and Fluid System and Component Reliability.
- J. Canadian Standards Association (CSA).
- K. UL142 – Liquid Storage Tanks.
- L. UL2200 – Stationary Engine Generators.
- M. Wisconsin Department of Natural Resources (DNR) Emissions Regulations.

1.04 EQUIPMENT DIMENSIONS

- A. Refer to floor plan drawings for approximate overall dimensions for the equipment of this section. Minor dimensional increases of 6 inches or less are acceptable, unless specific dimensions are indicated for the equipment. Notify the engineer in writing 5 days prior to submitting bid if the dimensional increases will be greater than 6 inches in any dimension.

1.05 SUBMITTALS

- A. For Approval
 - 1. Shop Drawings: Indicate electrical characteristics and connection requirements. Show plan and elevation views with overall and interconnection point dimensions, fuel consumption rate curves at various loads, ventilation and combustion air requirements, electrical diagrams including schematic and interconnection diagrams.
 - 2. Product Data: Provide data showing dimensions, weights, ratings, interconnection points, and internal wiring diagrams for engine, generator, control panel, battery, battery rack, battery charger, exhaust silencer, vibration isolators, day tank, remote radiator, and heat exchanger.
 - 3. Test Reports: Indicate results of factory testing.

4. Provide, at the request of the Engineer, a scalable floor plan of the generator room with all equipment shown. Provide dimensions of all equipment in room. Note all clearance dimensions.
- B. For Record Purposes
 1. Record all field adjustable setting on engine generator system.
 2. Manufacturer's Field Reports: Indicate procedures and findings.
 3. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.
- C. Operations and Maintenance Manuals
 1. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.
 2. Operation Data: Include instructions for normal operation.
 3. Maintenance Data: Include instructions for routine maintenance requirements, service manuals for engine and day tank, oil sampling and analysis for engine wear, and emergency maintenance procedures.

1.06 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience, and with service facilities within 100 miles of Project.
- B. Supplier: Authorized distributor of specified manufacturer with minimum three years documented experience.

1.07 REGULATORY REQUIREMENTS

- A. Conform to requirements of NFPA 70, NFPA 110 and NFPA 101.
- B. Furnish Products listed and classified by Underwriters Laboratories and/or testing firm acceptable to authority having jurisdiction as suitable for purpose specified and indicated.

1.08 EXTRA MATERIALS

- A. Spare Materials
 1. Provide two of each fuel, oil and air filter element.
- B. Maintenance Materials
 1. Furnish one set of any special tools required for preventative maintenance of the engine generator system. Package tools in adequately sized metal tool box.

1.09 WARRANTY

- A. Refer to warranty requirements in section 26 05 00.

1.10 MAINTENANCE SERVICE

- A. Furnish service and maintenance of engine generator for one year from Date of Substantial Completion.

PART 2 PRODUCTS

2.01 PACKAGE ENGINE GENERATOR SYSTEM

- A. Manufacturers:
 1. Caterpillar.
 2. Cummins Power Generation.
 3. Kohler.

- 4. MTU.
- 5. Generac
- B. Description: NFPA 110, engine generator system to provide source of power for Level 1 applications, and conforming to NFPA 99.
- C. System Capacity: See drawings for ratings and voltage. KW rating is based on an elevation of 1,000 feet above sea level, standby rating using engine mounted radiator.

2.02 ENGINE AND ENGINE EQUIPMENT

- A. Engine Type: Naturally aspirated, four stroke cycle, electric ignition internal combustion engine, heavy duty industrial type.
- B. Rating: Sufficient to operate in an ambient of 90 degrees F (32 degrees C) at the elevation indicated above.
- C. Fuel Type: Natural Gas.
- D. Emissions: Engine shall be rated for installation in Marathon County per Wisconsin Department of Natural Resources Emissions Regulations.
- E. Engine speed: 1800 rpm.
- F. Governor: Electronic isochronous type to maintain engine speed within 0.5 percent, steady state, and 5 percent, no load to full load, with recovery to steady state within 2 seconds following sudden load changes. Equip governor with means for manual operation and adjustment.
- G. Safety Devices: Engine shutdown on high water temperature, low oil pressure, over-speed, and engine over-crank. Limits as selected by manufacturer.
- H. Engine Starting: DC starting system with positive engagement, number and voltage of starter motors in accordance with manufacturer's instructions. Include remote starting control circuit, with MANUAL-OFF-REMOTE selector switch on engine-generator control panel.
- I. Engine Jacket Heater: Thermal circulation type water heater with integral thermostatic control, sized to maintain engine jacket water at 90 degrees F (32 degrees C), and suitable for operation on 208 volt AC, single phase.
- J. Engine Alternator: 35 Amp high rate battery changing alternator.
- K. Cooling System:
 - 1. Unit mounted radiator with duct flange using glycol coolant, with blower type fan, sized to maintain safe engine temperature in ambient temperature of 110 degrees F (43 degrees C). Radiator air flow restriction 0.5 inches of water (1.25 Pa) maximum. Provide ethylene-glycol antifreeze with rust inhibitor to -40° C. Radiator shall be provided with a duct adapter flange permitting the attachment of air discharge duct directing the discharge of radiator air through the wall.
- L. Engine Accessories: Fuel filter, lube oil filter, intake air filter, fuel transfer pump, fuel priming pump, electric fuel solenoid shut-off valve, gear-driven water pump. Include fuel pressure gauge, water temperature gauge, and lube oil pressure gauge on engine/generator control panel.
- M. Mounting: Provide unit with spring-type vibration isolators and mount on structural steel base.

2.03 ALTERNATOR

- A. Alternator: NEMA MG1, three phase, four pole, 12 lead, re-connectible brushless synchronous generator with brushless exciter. Factory test per CSA Standards.
- B. Rating: Refer to drawings for KW rating. Unit shall be rated for 0.8 power factor at 60 hertz at 1800 rpm.
- C. Insulation Class: H.
- D. Temperature Rise: 130 degrees C Standby.
- E. Enclosure: NEMA MG1, open drip proof.
- F. Voltage Regulation: Include generator-mounted volts per hertz exciter-regulator to match engine and generator characteristics, with voltage regulation plus or minus 1 percent from no load to full load. Include manual controls to adjust voltage droop, voltage level (plus or minus 5 percent) and voltage gain.

- G. Application of one-step load of 95% rated load shall not result in a sustained RMS voltage drop of more than 35% with recovery to within $\pm 1/2$ of 1% in less than 2 seconds.

2.04 EXHAUST SYSTEM

- A. Exhaust Silencer:
1. Hospital grade, minimum 35 dB reduction. Silencer shall be puck / pancake type, with muffler companion flanges and flexible stainless steel exhaust fittings, suitable for horizontal orientation, sized in accordance with engine manufacturer's instructions.
 2. Silencer shall be indoor enclosure mounted. The silencer shall be mounted so its weight is not supported by the engine.
 3. Provide flexible exhaust connections as required for connection between engine exhaust manifold and exhaust line, in compliance with applicable codes and regulations. If unit has two mufflers, provide "Y" fitting for single exhaust connection. Fitting shall be sized in accordance with engine manufacturer's instructions.
 4. Provide an exhaust condensation trap with manual drain valve to trap and drain off exhaust condensation and to prevent condensation from entering the engine. Drain shall be at bottom of muffler opposite of exhaust inlet. Provide drain line to drip pan.
 5. Provide a suitable rain cap at the stack outlet. Provide all necessary flanges and special fittings for proper installation.

2.05 ACCESSORIES

- A. Batteries:
1. Heavy duty, diesel starting type, lead-acid storage batteries, Provide a DC battery starting system with number of batteries and battery capacity as sized by the manufacturer adequate for (4) 30 second cranking periods (total of 2 minutes) along with all additional loads being run on the DC system. battery voltage to starting system. Include necessary cables and clamps.
- B. Battery Tray:
1. Treated to be resistant to deterioration by battery electrolyte.
 2. Tray shall contain spillage or boil-over of battery electrolyte to prevent a direct path to ground.
- C. Battery Charger:
1. Current limiting type designed to float at 2.17 volts per cell and equalize at 2.33 volts per cell. Include overload protection, full wave rectifier, DC voltmeter and ammeter, and 120 volts AC fused input. Provide wall-mounted enclosure to meet NEMA 250, Type 1 requirements.
- D. Line Circuit Breaker: None required. **See one line diagram.**
- E. Engine-Generator Control Panel: NEMA 250, Type 1 solid-state, microprocessor based, generator set control. The control panel shall be designed and built by the engine manufacturer. The control shall provide all operating, monitoring, and control functions for the generator set. The control panel shall provide real time digital communications to all engine and regulator controls via SAE J1939.
1. The following functionality shall be integral to the control panel.
 - a. The control shall include a minimum 64 x 240 pixel, 28mm x 100mm, white backlight graphical display with text based alarm/event descriptions
 - b. The control shall include a minimum of 3-line data display.
 - c. Audible horn for alarm and shutdown with horn silence switch
 - d. Standard ISO labeling
 - e. Multiple language capability
 - f. Remote start/stop control
 - g. Local run/off/auto control integral to system microprocessor
 - h. Cooldown timer
 - i. Speed adjust
 - j. Lamp test

- k. Push button emergency stop button
 - l. Voltage adjust
 - m. Voltage regulator V/Hz slope – adjustable
 - n. Password protected system programming
2. Digital Monitoring Capability: The controls shall provide the following digital readouts for the engine and generator. All readings shall be indicated in either metric or English units.
- a. Engine
 - 1). Engine oil pressure
 - 2). Engine oil temperature
 - 3). Engine coolant temperature
 - 4). Engine RPM
 - 5). Battery volts
 - 6). Engine hours
 - 7). Engine crank attempt counter
 - 8). Engine successful start counter
 - 9). Service maintenance interval
 - 10). Real time clock
 - 11). Engine exhaust stack temperature
 - 12). Engine main bearing temperature
 - b. Generator
 - 1). Generator AC volts (Line to Line, Line to Neutral and Average)
 - 2). Generator AC current (Avg and Per Phase)
 - 3). Generator AC Frequency
 - 4). Generator kW (Total and Per Phase)
 - 5). Generator kVA (Total and Per Phase)
 - 6). Generator kVAR (Total and Per Phase)
 - 7). Power Factor (Avg and Per Phase)
 - 8). Total kW-hr
 - 9). Total kVAR-hr
 - 10). % kW
 - 11). % kVA
 - 12). % kVAR
 - 13). Generator bearing temperature
 - 14). Generator stator winding temperature
 - c. Voltage Regulation
 - 1). Excitation voltage
 - 2). Excitation current
3. Alarms and Shutdowns: The control shall monitor and provide alarm indication and subsequent shutdown for the following conditions. All alarms and shutdowns are accompanied by a time, date, and engine hour stamp that are stored by the control panel for first and last occurrence:
- a. Engine Alarm/Shutdown
 - 1). Low oil pressure alarm/shutdown
 - 2). High coolant temperature alarm/shutdown
 - 3). Loss of coolant shutdown
 - 4). Overspeed shutdown
 - 5). Overcrank shutdown
 - 6). Emergency stop depressed shutdown
 - 7). Low coolant temperature alarm
 - 8). Low battery voltage alarm
 - 9). High battery voltage alarm
 - 10). Control switch not in auto position alarm
 - 11). Battery charger failure alarm
 - b. Generator Alarm/Shutdown
 - 1). Generator over voltage
 - 2). Generator under voltage
 - 3). Generator over frequency
 - 4). Generator under frequency

- 5). Generator reverse power
- 6). Generator overcurrent
- c. Voltage Regulator Alarm/Shutdown
 - 1). Loss of excitation alarm/shutdown
 - 2). Instantaneous over excitation alarm/shutdown
 - 3). Time over excitation alarm/shutdown
 - 4). Rotating diode failure
 - 5). Loss of sensing
 - 6). Loss of PMG
4. Programmable Digital Inputs: The Controller shall include the ability to accept eight (8) total with six (6) programmable digital input signals. The signals may be programmed for either high or low activation using programmable Normally Open or Normally Closed contacts.
5. Programmable Relay Outputs: The control shall include the ability to operate eight (8) total with six (6) programmable relay output signals, integral to the controller. The output relays shall be rated for 2A @ 30VDC and consist of six (6) Form A (Normally Open) contacts and two (2) Form C (Normally Open & Normally Closed) contacts.
6. Maintenance: All engine, voltage regulator, control panel and accessory units shall be accessible through a single electronic service tool. The following maintenance functionality shall be integral to the generator set control
 - a. Engine running hours display
 - b. Service maintenance interval (running hours or calendar days)
 - c. Engine crank attempt counter
 - d. Engine successful starts counter
 - e. 20 events are stored in control panel memory
 - f. Programmable cycle timer that starts and runs the generator for a predetermined time. The timer shall use 14 user-programmable sequences that are repeated in a 7-day cycle. Each sequence shall have the following programmable set points:
 - 1). Day of week
 - 2). Time of day to start
 - 3). Duration of cycle
7. Building Automation System Integration: Controller shall be fully integrated into the Building Automation System with specific points to be defined by the owner. Provide factory standard RS-485/Modbus output points on Generator Sets.
8. Local Annunciator (NFPA 99/110, CSA 282): Provide a local, control panel mounted, annunciator to meet the requirements of NFPA 110, Level 1.
 - a. Annunciators shall be networked directly to the generator set control
 - b. Local Annunciator shall include a lamp test pushbutton, alarm horn and alarm acknowledge pushbutton
 - c. Provide the following individual light indications for protection and diagnostics
 - 1). Overcrank
 - 2). Low coolant temperature
 - 3). High coolant temperature warning
 - 4). High coolant temperature shutdown
 - 5). Low oil pressure warning
 - 6). Low oil pressure shutdown
 - 7). Overspeed
 - 8). Low coolant level EPS supplying load
 - 9). Control switch not in auto
 - 10). High battery voltage
 - 11). Low battery voltage
 - 12). Battery charger AC failure
 - 13). Emergency stop
 - 14). Generator not Ready

- F. Remote Annunciator Panel: Surface mounted panel with brushed stainless steel. Provide alarm horn, and indicators and alarms per NFPA 110 Level 1 and including the following:
1. Low fuel (alarm).
 2. Fuel in Rupture Basin, when specified.
 3. System ready.
 4. Line power available.
 5. Generator power available.
 6. Ground fault, when specified.
 7. Lamp test and horn silence switch.
 8. For exterior generators installed in a skin-tight or walk-in type enclosure, provide a remote manual stop station located adjacent to the remote annunciator within the building served, or as specifically shown on the plans.
 9. The remote manual stop station shall be a surface mounted, break-glass-to-activate type switch mounted in a NEMA 1 enclosure. This station shall be manufactured by Pilla Electrical Products, model number ST120SN3R-SL with the legend reading "Emergency Generator Off." Equivalent products will also be accepted.
 - a. EC shall provide (2) #12 installed within a complete raceway system from the remote manual stop station to the generator control panel, interfacing with the emergency stop terminals.
- G. Generator Strip Heater: Manufacturer's standard integral thermostatic control, size as recommended by generator manufacturer, and suitable for operation on 120 volts AC.

2.06 ENCLOSURE

- A. Enclosure – Weather protective, skin-tight
1. Intent: The intent of this specification is to provide the owner with a generator set enclosure complete in every detail and requiring no additional in-field modifications or assembly, except where specifically allowed by these specifications. The enclosure is to be accurately dimensioned so as to be in compliance with the National Electrical Code (NEC), and the National Fire Protection Association (NFPA) for clearance of all specified items included therein, and all applicable fire codes for a structure and application of this type. Construction drawings or other bid documents accompanying these specifications which show circuit breakers, and other service or distribution equipment within the generator set enclosure must be considered complimentary to and not in lieu of this written specification. Drawings submitted for approval shall reflect this fact clearly and any contradiction or omission shall be brought to the attention of the designing engineer prior to order.
 2. Construction: The weatherproof enclosure shall be of formed galvanized steel, 14 gauge minimum, construction design specifically for the engine/generator set size indicated on the drawings. The enclosure shall be rated to a wind load of 120 MPH and 50 lbs/sq ft roof load. Rain test equal to 4 inches/hour. The basic structure shall meet all seismic requirements of Zone 4 or equivalent. The design and construction shall be modular in that the panels shall not exceed 24" in width and doors shall not exceed 36" in width. The roof shall be strengthened in such a manner as to support the largest commercially available exhaust silencer recommended by the engine manufacturer. All exterior component of the enclosure shall be assembled utilizing stainless steel hardware. All seams shall be sealed to prevent leaks.
 3. The enclosure skid base shall contain an electrical stub up area located under the **cable termination compartment**.
 4. Doors: All doors shall be strategically located in areas as to allow ease of maintenance on the engine/generator and allow good access to and visibility of instruments, controls, engine gauges and etc. The doors shall be fitted with stainless steel bolt-on, lift-off hinges with .375" pins. Each door shall be fitted with flush-mounted, key lockable latches or pad lockable latches. The latch hardware shall allow escape from within when locked externally. Door holdback hardware

- shall be provided to secure doors when open. All doors shall be gasketed to prevent leaks.
5. Skid Base:
 - a. The generator set and enclosure shall be mounted on a structural steel skid base manufactured by the enclosure manufacturer. Provisions for crane handling on the complete package built into the skid base.
 - b. The weight of the entire unit consisting of the generator set, base, enclosure and other specified items including all liquids (i.e., fuel oil and cooling solutions) and accessories shall be calculated by the engine dealer utilizing manufacturer's data. The base of the unit shall be designed and manufactured as a heavy duty, structural steel construction with lifting provisions to support the calculated weight. Details of the base construction shall be included with the drawings submitted for approval as well as all dealer weight calculations supported by manufacturer's data.
 6. Finish: The enclosure shall be powder coat painted or prime painted with a minimum of two (2) coats of rust-inhibiting primer and finished with a minimum of two (2) coats of polyurethane. Enclosure color shall be manufacturer standard
 7. Sound attenuation:
 - a. The entire enclosure shall have acoustic material installed on the interior roof and wall panels of a weight and thickness consistent with the specified level of noise reduction. The acoustic material shall be held in place by galvanized perforated metal sheeting to form a removable section easily inspected by maintenance personnel. The enclosure package shall be designed to achieve a 87 dBA sound rating when measured at a distance of 7 meters. The sound enclosure shall reduce the sound by the advertised reduction in all directions of the enclosure as measured 3 meters from ground level. At no time will an average sound reduction be acceptable. The enclosure and attenuation methods shall not exceed the engine cooling system's maximum allowable air flow restriction. The sound level will be verified after unit installation at the above distance.
 - b. Enclosure sound attenuation shall be designed and stamped by the enclosure manufacturer's acoustical engineer. Provide verification of sound attenuation levels with submittal information.
 - c. Factory test generator and enclosure sound levels.
 8. Oil and radiator drains: Provide all necessary fittings, hoses, shut-off valves and etc. to facilitate the draining lube oil and draining the radiator from the exterior of the enclosure. Any engines equipped with crankcase breather tubes shall have this tube terminate outside the enclosure.
 9. Exhaust System: The exhaust silencer shall be mounted internal to the enclosure according to the silencer manufacturer's written recommendations. The silencer shall be mounted such that its weight is not supported by the engine nor will exhaust system growth due to thermal expansion be imposed on the engine. Exhaust pipe sizes shall be sufficient to ensure that exhaust backpressure does not exceed the maximum limits specified by the engine manufacturer. Each silencer shall be fitted with a 90° tail pipe extension (elbow) terminating in a vertical position and, to prevent the entrance of rainwater, shall be fitted with a weighted rain cap. At the point where the exhaust pipe penetrates the enclosure, a suitable rain skirt and collar shall be installed. It shall be designed to prevent the entrance of rain yet allow the expansion and vibration of the exhaust piping without chafing or stress to the exhaust system. All exposed exhaust piping within the enclosure shall be insulated as follows:
 - a. Owens-Corning Kaylo, Manville Thermo-12, PABCO Super Caltemp, or equivalent.
 - b. Rigid hydrous calcium silicate, asbestos-free pipe and block insulation.
 - c. K factor of 0.5 at 400 degrees F., minimum 13.0 lb. density.
 - d. Minimum insulation thickness shall be 3".
 - e. Preformed pipe insulation for piping up to 24 inch diameter, segmental and scored block for larger pipe and muffler.

- f. Provide jacket over piping and segmented insulation of field or factory applied, .016 inch thick, aluminum jacket.
- g. On pipe insulation, circumferential and longitudinal joints shall be tightly butted and the half-section secured in place with 16 gauge galvanized wire, 12" on center, then apply jacket.
- h. For mitered segments, secure in place with 16 gauge galvanized wire, and provide a smoothing coat of finishing cement, then apply jacket.
- i. For application of block insulation to pipe and mufflers larger than 24" diameter:
 - 1). Secure with No. 16 gauge galvanized steel wire of 1/2" x .015 galvanized bands on maximum of 12" centers.
 - 2). Where required, provide welded studs, clips or angles to serve as anchors for wires and bands.
 - 3). All voids between equipment surface and insulation shall be packed with light density fiberglass.
 - 4). Finish the insulation with 1" galvanized hexagonal wire mesh secured to bands or welded pins.
 - 5). Lace edges of wire mesh and apply 1/2" thickness of insulating cement in two (2) coats.
 - 6). Over the cement, when dry, apply a pre-sized glass cloth adhered with lagging adhesive.

PART 3 EXECUTION

3.01 SHIPPING, DELIVERY, STORAGE AND HANDLING

- A. Lift engine/generator using eyes, yokes and skids provided by manufacturer.
- B. Do not store indoor type equipment exposed to weather.
- C. Protect from work of other trades.
- D. While in storage, provide temporary heat to unit as recommended by the manufacturer.

3.02 EXAMINATION AND PREPARATION

- A. Examine area to receive engine/generator to assure adequate clearance for engine/generator installation.
- B. Examine room air intake and exhaust to assure adequate air requirements.
- C. Verify that mounting area is level and free of irregularities.
- D. Start work only after unsatisfactory conditions are corrected.
- E. Convene a pre-installation conference one week prior to commencing work of this Section.

3.03 INSTALLATION

- A. Engine/Generator:
 - 1. Install engine/generator in accordance with manufacturer's written instructions and NEC.
 - 2. Lubrication and break-in oil to be supplied and installed by supplier's or manufacturer's technician at time of start-up.
 - 3. Anti-freeze with rust inhibitor (set to -40° C.) to be supplied and installed by supplier's or manufacturer's technician at time of start-up.
- B. Starting batteries and charger:
 - 1. Locate freestanding battery rack near engine starter and connect cables with suitable lugs.
 - 2. Wall mount battery charger, within the enclosure, near batteries and extend battery wiring as necessary. Connect battery charger to an emergency circuit as indicated on the drawings.
- C. Miscellaneous Wiring:
 - 1. The electrical contractor shall be responsible for all control wiring associated with the installation of this generator. This shall include but not limited to the following:

- a. Interface between the generator control panel and the transfer switches such as:
 - 1). Engine start contact wiring (2 hour fire resistant rated cabling).
 - 2). Transfer switch position wiring.
 - 3). A minimum of 4 conductors shall be installed between each transfer switch and the generator controller. If more than two conductors are required, than two spare conductors shall always be installed. The conductor size shall be a minimum of #12 AWG. Refer to engine start contact wiring detail on drawings.
 - b. Interface between generator and the remote generator annunciator. This wiring shall include a minimum of four spare conductors.
 - c. Wiring between the generator controller and associated mechanical equipment such as:
 - 1). Day tank, rupture basin, day tank transfer pump.
 - 2). Mechanical fans, dampers, etc. for proper control of the emergency generator.
 - d. All conduit connections, either power, control and annunciation, to the generator shall utilize flexible connections.
- D. Grounding:
- 1. Four pole transfer switches are being utilized on this project. the generator shall be installed and connected as a separately derived system and the factory installed generator ground/neutral bonding strap shall be maintained.
- E. Labeling:
- 1. Provide a sign at service entrance equipment indicating type and location of onsite emergency power sources (EPS).
 - 2. Provide a sign at the grounding electrode conductor when grounding connection is remote from generator. Sign shall identify location of all emergency and normal sources connected to that location.

3.04 FIELD QUALITY CONTROL

- A. Field tests prior to start-up:
- 1. Megger check of phase-to-phase and phase-to-ground insulation levels.
 - 2. Continuity.
 - 3. Short circuit.
 - 4. Do not megger check solid state equipment.
 - 5. Perform tests according to engine/generator manufacturer's instructions.
 - 6. Test tank and piping with 60 psig air for 8 hours [before final burial and backfill].

3.05 ADJUSTMENT AND CLEANING

- A. Clean equipment and equipment room floor prior to start- up.
- B. Touch up scratches or marred surfaces to match original finish.

3.06 START UP/MANUFACTURER'S SERVICES

- A. Retain services of engine/generator set manufacturer's factory trained technician employed by engine/generator set manufacturer or his authorized distributor to perform following services:
- 1. Installation services:
 - a. Visit project site to:
 - 1). Review installation requirements with CONTRACTORS involved. Prior to permanently installing equipment and/or making mechanical or electrical connections.
 - 2). Contractor to coordinate meeting to ensure presence of parties concerned.
 - 2. Coordinate transfer switch vendor and/or synchronizing switchgear vendor to set all timer relays associated with this equipment so the engine/generator is on line in 8 seconds so emergency loads can be transferred to the engine/generator within

10 seconds. This timing shall be tested prior to any witness testing by the Engineer or Code Authorities.

3. Provide a 3-phase portable load bank at project site, in addition to normal factory tests. If a load bank is part of the installation, it shall be utilized for the test. After equipment has been permanently installed, conduct a load bank test under provisions of Section 26 08 11. The load bank test shall be performed in presence of the Engineer.

3.07 DEMONSTRATION AND TRAINING

- A. Provide a comprehensive demonstration to Owner or maintenance personnel and Engineer of system maintenance and operation after load bank test and after engine/generator set is electrically connected to automatic transfer switch.
 1. Include a minimum of six simulated power failures in the presence of transfer switch manufacturer's start-up representative.
 2. Test remotely connected engine/generator status indication signals.
 3. Test transfer switch.
 4. Contractor to coordinate meeting to ensure presence of all parties concerned.
- B. Provide a comprehensive demonstration to Owner or maintenance personnel and Engineer of system maintenance and operation after load bank test and after engine/generator set is electrically connected to each service switchboard circuit breaker and each automatic transfer switch.
 1. Test the system per NFPA 110 requirements.
 2. Include a minimum of six simulated power failures in the presence of transfer switch manufacturer's start-up representative. Utilize different signal sources for each simulated power outage. Coordinate with the engineer.
 3. Test remotely connected engine/generator status indication signals. This includes both the remote annunciator and the integration with the Building Automation System and the Generator controller.
- C. Contractor to coordinate meeting to ensure presence of all parties concerned regarding all system testing.

END OF SECTION

**SECTION 26 36 02
ENCLOSED TRANSFER SWITCH
(ADDENDUM NO. 1)**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Automatic transfer switch.

1.02 SYSTEM DESCRIPTION

- A. Provide the automatic and manual transfer switches as indicated on the drawings and as specified herein.

1.03 REFERENCES

- A. NFPA 70 - National Electrical Code.
- B. NEMA ICS 1 - General Standards for Industrial Control and Systems.
- C. NEMA ICS 2 - Standards for Industrial Control Devices, Controllers, and Assemblies.
- D. NEMA ICS 6 - Enclosures for Industrial Controls and Systems.
- E. Underwriters' Laboratories, Inc. Standard UL 1008.

1.04 SUBMITTALS

- A. For Approval
 - 1. Product Data: Provide catalog sheets showing voltage, switch size, ratings and size of switching and overcurrent protective devices, operating logic, short circuit ratings, dimensions, and enclosure details.
- B. For Record Purposes
 - 1. As-built/Record Drawings shall accurately indicate the location of the equipment and the equipment shall be identified with the final designation as directed by the Owner.
- C. Operations and Maintenance Manuals
 - 1. Manufacturer's Installation Instructions: Indicate application conditions and limitations of use stipulated by Product testing agency specified under Regulatory Requirements. Include instructions for storage, handling, protection, examination, preparation, installation, and starting of Product.
 - 2. Operation Data: Include instructions for operating equipment. Include instructions for operating equipment under emergency conditions when engine generator is running.
 - 3. Maintenance Data: Include routine preventative maintenance and lubrication schedule. List special tools, maintenance materials, and replacement parts.

1.05 EQUIPMENT DIMENSIONS

- A. Refer to floor plan drawings for approximate overall dimensions for the equipment of this section. Minor dimensional increases of 6 inches or less are acceptable, unless specific dimensions are indicated for the equipment. Notify the engineer in writing 5 days prior to submitting bid if the dimensional increases will be greater than 6 inches in any dimension.

1.06 EXTRA MATERIALS

- A. Spare Materials
 - 1. None required.
- B. Maintenance Materials
 - 1. Two sets of any special tools needed to maintain equipment.

1.07 WARRANTY

- A. Refer to warranty requirements in section 26 05 00.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Russelectric.
- B. Automatic Switch Company (ASCO).
- C. GE/Zenith.

2.02 AUTOMATIC TRANSFER SWITCH

- A. OPEN TRANSITION SINGLE OPERATOR TYPE
 - 1. Transfer switch is to be mechanically held, electrically operated by a single solenoid or motor mechanism momentarily energized from the source to which the load is being transferred. The switch shall be rated for continuous duty and shall be inherently double throw, mechanically interlocked to ensure only one of two possible positions -- normal or emergency. The transfer switches shall be double throw, actuated by a single electrical operator momentarily energized and connected to the transfer mechanism by a simple over-center type linkage with a total transfer time not to exceed 2 second. Load carrying parts shall have full 600 volt insulation and main contacts, as well as arcing contacts, shall be replaceable without disassembly of the operating mechanism or disconnection of power conductors.
 - 2. Transfer switch shall consist of a power transfer module and a control module separately mounted. Control module shall be mounted on the inside surface of the enclosure door to facilitate safe adjustment and service. Harnessing between transfer module and control module shall have built-in disconnect.
- B. DELAYED TRANSITION DUAL OPERATOR TYPE
 - 1. Transfer switch is to be mechanically held, electrically operated by a dual solenoid mechanism momentarily energized from the source to which the load is being transferred. Transfer switches with dual solenoid operators may be provided without the in-phase monitor option if the operator control scheme is such that a time delay between the opening of the closed contacts and the closing of the open contacts, to allow for system voltage decay. The switch shall be rated for continuous duty and shall be inherently double throw, mechanically interlocked to ensure only one of two possible positions -- normal or emergency. Load carrying parts shall have full 600 volt insulation and main contacts, as well as arcing contacts, shall be replaceable without disassembly of the operating mechanism or disconnection of power conductors.
 - 2. Transfer switch shall consist of a power transfer module and a control module separately mounted. Control module shall be mounted on the inside surface of the enclosure door to facilitate safe adjustment and service. Harnessing between transfer module and control module shall have built-in disconnect.
- C. CLOSED TRANSITION DUAL OPERATOR TYPE
 - 1. The transfer switch shall be double throw, actuated by two electric operators momentarily energized, and connected to the transfer mechanism by a simple over center type linkage. Maximum contact overlap time shall be 100 milliseconds. Transfer switch is to be mechanically held, electrically operated by a dual solenoid mechanism momentarily energized from the source to which the load is being transferred.
 - 2. The main contacts shall be mechanically locked in both the normal and emergency positions without the use of hooks, latches, magnets, or springs, and shall be silver-tungsten alloy. Separate arcing contacts with magnetic blowouts shall be provided

- on all transfer switches. Interlocked, molded case circuit breakers or contactors are not acceptable.
3. The slip rate between the engine generator source and the normal source shall be 0.2 Hertz or less.

2.03 AUTOMATIC SWITCH STANDARD ACCESSORIES

- A. All the accessories listed below are standard accessories which apply to all the transfer switches provided on this project.
 1. Microprocessor based control system.
 - a. The transfer switch shall be equipped with a microprocessor based control system, to provide all the operational functions of the close transition transfer switch. The controller shall have two asynchronous serial ports. The controller shall have a real time clock with NiCad battery back up.
 - b. The CPU shall be equipped with self diagnostics which perform periodic checks of the memory I/O and communication circuits, with a watchdog/power fail circuit.
 - c. The controller shall use industry standard open architecture communication protocol for high speed serial communications via multidrop connection to other controllers and to a master terminal with up to 4000 ft of cable, or further, with the addition of a communication repeater. The serial communication port shall be RS422/485 compatible.
 - d. The serial communication port shall allow interface to either the manufacturer's or owner furnished remote supervisory control. The controller shall have password protection required to limit access to qualified and authorized personnel.
 - e. The controller shall include a 20 character, LCD display, with a keypad, which allows access to the system.
 - f. The controller shall include three-phase over/under voltage, over/under frequency, phase sequence detection and phase differential monitoring on both normal and emergency sources.
 - g. The controller shall be capable of storing the following records in memory for access either locally or remotely:
 - 1). Number of hours transfer switch is in the emergency position (total since record reset).
 - 2). Number of hours emergency power is available (total since record reset).
 - 3). Total transfer in either direction (total since record reset).
 - 4). Date, time, and description of the last four source failures.
 - 5). Date of the last exercise period.
 - 6). Date of record reset.
 - h. Provide full integration with the facilities Building Automation System with specific digital and analog information to be as coordinated with the owner.
 2. Control panel shall meet or exceed the voltage surge withstand capacity in accordance with IEEE Std. 472-1974 and impulse voltage withstand test in accordance with NEMA Std. ICS 1-109.
 3. Engine starting contacts, gold plated for low voltage DC service. Contacts to close on failure of normal source to initiate engine starting.
 4. Indicating Lights: Mount in cover of enclosure to indicate NORMAL SOURCE AVAILABLE, ALTERNATE SOURCE AVAILABLE, SWITCH POSITION. For bypass isolation transfer switches only provide NORMAL BYPASS and ALTERNATE SOURCE BYPASS indicating lights.
 5. Test Switch: Mount in cover of enclosure to simulate failure of normal source.
 6. Return to Normal Switch: Mount in cover of enclosure to initiate manual transfer from alternate to normal source.
 7. Transfer Switch Auxiliary Contacts: 2 normally open; 2 normally closed.
 8. Normal Source Monitor: Monitor each line of normal source voltage and frequency; initiate transfer when voltage drops below 90 percent or frequency varies more than 90 percent from rated nominal value.

9. Alternate Source Monitor: Monitor alternate source voltage and frequency; inhibit transfer when voltage is below 90 percent or frequency is below 95 percent from rated nominal value.
- B. Additional accessories required for closed transition type switches only.
 1. Automatic synchronizing check function to prevent transfer from normal to emergency or retransfer from emergency to normal until both sources are within acceptable limits of synchronism.
 2. A keyed selector switch to choose either open or closed transfer mode of operation.
 3. A normal control breaker trip relay with contact wired to terminal strip. Contact to trip normal circuit breaker if closed transition position has exceeds time setting.
 4. An emergency control breaker trip relay with contact wired to terminal strip. Contact to trip emergency circuit breaker if closed transition position has exceeds time setting.

2.04 AUTOMATIC SWITCH OPTIONAL ACCESSORIES

- A. The accessories below apply to each transfer switch as indicated on the Transfer Switch Information labels shown on the one line diagram.
 1. OPTION 01; Load shed relay energized by DC signal or remote contact closure to disconnect the load from the emergency source when an overloaded condition occurs.
 2. OPTION 02; Block transfer relay energized by DC signal or remote contact closure to allow transfer to emergency with 2-position key operated switch to bypass block transfer to emergency.
 3. OPTION 03; Automatic synchronizing check relay to prevent transfer from emergency to normal and normal to emergency until the normal and emergency sources are within acceptable limits.
 4. OPTION 04; Peak indicating, manually resettable ammeter with 4-position selector switch marked "off, 1, 2, 3" to read current in all three phases of load circuit.
 5. OPTION 05; Ammeter with 4-position selector switch marked "off, 1, 2, 3" to read current in all three phases of load circuit.
 6. OPTION 06; Voltmeter with seven position selector switch marked "OFF", VL1 to VL2, VL2 to VL3, VL3 to VL1, V1, V2, V3.
 7. OPTION 07; Power terminations shall be solderless compression type, tool and die applied.
 8. OPTION 08; (2) time delay contacts that open simultaneously 1-300 seconds (adjustable) before transfer in either direction and reclose instantaneously after transfer. Factory set at 5 seconds.
 9. OPTION 09; Overlapping neutral contacts.
 10. OPTION 10; Digital metering. Refer to section 26 27 14 and utilize Digital Meter Type-B.

2.05 AUTOMATIC SEQUENCE OF OPERATION

- A. Open or Delayed Transition Type Switches
 1. Initiate Time Delay to Start Alternate Source Engine Generator: Upon initiation by normal source monitor.
 2. Time Delay To Start Alternate Source Engine Generator: 0.5 to 3 seconds, adjustable.
 3. Initiate Transfer Load to Alternate Source: Upon initiation by normal source monitor and permission by alternate source monitor.
 4. Time Delay Before Transfer to Alternate Power Source: 0 to 5 seconds, adjustable.
 5. Initiate Retransfer Load to Normal Source: Upon permission by normal source monitor.
 6. Time Delay Before Transfer to Normal Power: 0 to 30 minutes, adjustable; bypass time delay in event of alternate source failure.

7. Time Delay Before Engine Shut Down: 0 to 30 minutes, adjustable, of unloaded operation.
- B. Closed Transition Type Switches
 1. Initiate Time Delay to Start Alternate Source Engine Generator: Upon initiation by normal source monitor.
 2. Time Delay To Start Alternate Source Engine Generator: 0.5 to 3 seconds, adjustable.
 3. Initiate Transfer Load to Alternate Source: Upon initiation by normal source monitor and permission by alternate source monitor.
 4. Time Delay Before Transfer to Alternate Power Source: 0 to 5 seconds, adjustable.
 5. If both sources are available, the alternate power source contacts shall close and after the overlap time, not to exceed 100 milliseconds, the normal power contacts shall open.
 6. Initiate Retransfer Load to Normal Source: Upon permission by normal source monitor.
 7. Time Delay Before Transfer to Normal Power: 0 to 30 minutes, adjustable; bypass time delay in event of alternate source failure.
 8. The normal source contacts shall close and after the overlap time, not to exceed 100 milliseconds, the alternate power source contacts shall open.
 9. Time Delay Before Engine Shut Down: 0 to 30 minutes, adjustable, of unloaded operation.

2.06 MANUAL TRANSFER SWITCH

- A. OPEN TRANSITION – NO DELAY TYPE
 1. Description: Transfer switch is to be mechanically held, manually operated via pushbuttons. The switch shall be rated for continuous duty and shall be inherently double throw, mechanically interlocked to ensure only one of two possible positions -- normal or emergency. Load carrying parts shall have full 600 volt insulation and main contacts, as well as arcing contacts, shall be replaceable without disassembly of the operating mechanism or disconnection of power conductors. Transfer switch shall consist of a normal source auxiliary transformer used to operate the electrical motor operator.
- B. OPEN TRANSITION - DELAYED TYPE
 1. Description: Transfer switch is to be mechanically held, manually operated via pushbuttons. The switch shall be rated for continuous duty and shall be inherently double throw. Load carrying parts shall have full 600 volt insulation and main contacts, as well as arcing contacts, shall be replaceable without disassembly of the operating mechanism or disconnection of power conductors. Transfer switch shall consist of a normal source auxiliary transformer used to operate the electrical motor operators.
- C. The automatic transfer switch shall be suitable for use in emergency systems, listed by Underwriter's Laboratories under Standard 1008 for total system transfer.
- D. The transfer switches shall be capable of switching all classes of loads and shall be rated for continuous duty when installed in a non-ventilated enclosure constructed in accordance with Underwriters' Laboratories, Inc. Standard UL-508.
- E. The normal and emergency contact shall be positively interlocked mechanically and electrically to prevent simultaneous closing. Main contact shall be mechanically locked in position in both the normal and emergency positions without use of hooks, latches, magnets, or springs; and shall be silver tungsten alloy protected by arcing contacts with magnetic blow outs on each pole. Interlocked molded case circuit breakers or contactors are not acceptable.
- F. The transfer switches shall be equipped with an external manual operator. The manual operator shall provide the same contact-to-contact transfer speed as the electric operator to prevent a flashover from switching the main contacts slowly. A mechanical visual indicator for the switch position shall be provided.
- G. All accessories to be front accessible. The pilot lights shall be on front of cabinet door.

- H. Pilot light system shall indicate which sources of power are available and indicate if the switch is in normal or emergency position.
- I. Two auxiliary contacts rated 10 amp, 120 volt shall be mounted on the main shaft, one closed on normal, the other closed on emergency. Both contacts will be wired to a terminal strip for ease of customer connections.
- J. Transfer switch shall be capable of field conversion to remote control or automatic operation.
- K. The manufacturer of the automatic transfer switch shall verify that the switches are listed by Underwriters' Laboratories, Inc. Standard UL-1008 with withstand and close-in values at least equal to the interrupting rating of the circuit breaker that is specified to protect the circuit.
- L. The transfer switch shall be mounted in a NEMA rated enclosure, refer to drawings for enclosure type. For exterior manual transfer switches, enclosure shall be NEMA 3R rated with integral 120V heater with thermostat to prevent condensation and ice formation of water.
- M. Transfer switch shall be pad mounted and have internal quick-connect Camlock type cable terminations for connection of a temporary generator.
- N. Enclosure shall be NEMA 3R rated with integral 120V heater with thermostat to prevent condensation and ice formation of water.
- O. All control components and wiring shall be front accessible. All control wire terminals shall be ring or locking spade terminals. All wiring shall be identified by tubular sleeve-type markers.

2.07 SERVICE CONDITIONS

- A. Service Conditions: NEMA ICS 1.
- B. Temperature: 104 degrees F.
- C. Altitude: 1,000 feet.

2.08 RATINGS

- A. Voltage: As indicated on the one line diagram..
- B. Switched Poles: As indicated on the one line diagram. Provide fully rated neutral bar as required by the utilization voltage.
- C. Load Inrush Rating: Combination Tungsten lamp, Electric discharge lamp, Resistive load.
- D. Continuous Rating: As indicated on the one line diagram.
- E. Close and Withstand Current Rating: As indicated on the one line diagram.

2.09 ENCLOSURE

- A. Enclosure: ICS 6, Type 1 12.
- B. Finish: Manufacturer's standard gray enamel.

PART 3 EXECUTION

3.01 SHIPPING, DELIVERY, STORAGE AND HANDLING

- A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.
- B. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the purpose. Handle carefully to avoid damage to internal components, enclosure and finish.

3.02 EXAMINATION AND PREPARATION

- A. Verify that surface is suitable for transfer switch installation.

- B. Examine area to receive transfer switch to assure adequate clearance for transfer switch installation.
- C. All switchboards shall have a 3 1/2" high concrete housing pad under the unit. Coordinate the installation of this housekeeping pad with the general contractor.

3.03 INSTALLATION

- A. Install transfer switches in accordance with manufacturer's instructions.
- B. Clean all dust, dirt and debris from the transfer switch enclosure prior to energizing transfer switch.
- C. Provide control wiring between each transfer switch and the upstream generator. All control wiring shall be a minimum of #12 gauge wire. Control wiring shall consist of the following:
 - 1. (2) conductors for engine start (2 hour fire resistant cable assembly)
 - 2. (2) conductors for control power from generator batteries
 - 3. (2) conductors for future use
- D. For closed transition type transfer switches, provide 2 #12 in 3/4" conduit from the transfer switch to the normal side upstream distribution equipment. This wiring is for operation of the shunt trip on the normal side overcurrent device should the transfer switch exceed the acceptable time it is connected to both the normal and generator sources. Provide a 120 volt normal, emergency, life safety or UPS circuit to power the shunt trip.
- E. Provide engraved plastic nameplates under the provisions of Section 26 05 53.

3.04 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 26 08 11.

3.05 ADJUSTMENT AND CLEANING

- A. Adjust doors and operating mechanisms for free mechanical movement.
- B. Tighten lugs and bus connections.
- C. Clean interior of equipment.
- D. Sand, prime and paint scratched or marred surfaces to match original finish.

3.06 START UP/MANUFACTURER'S FIELD SERVICES

- A. Retain services of transfer switch manufacturer's factory trained technician to perform the following services:
 - B. Testing and settings as indicated in section 26 08 11.
 - C. Demonstration as described below.

3.07 DEMONSTRATION

- A. Provide comprehensive demonstration of system maintenance and operation to OWNER or OWNER'S maintenance personnel. Demonstrate operation of transfer switch in normal and emergency modes and bypass mode when feature is provided.

END OF SECTION

SECTION 26 43 13
SURGE PROTECTIVE DEVICES
(ADDENDUM NO. 1)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Individually mounted surge protective device.

1.02 SYSTEM DESCRIPTION

- A. Provide the surge protective devices (SPD) as indicated on the drawings and as specified herein.

1.03 REFERENCES

- A. ANSI/IEEE C62.11 - Standard for Metal-Oxide Surge Arresters for AC Power Circuits.
- B. ANSI/IEEE C62.41 - Recommended Practice on Surge Voltages in Low-Voltage AC Power Circuits,
- C. ANSI/IEEE C62.45 – Recommended Practice on Surge Testing for Equipment Connected to Low-Voltage AC Power Circuits.
- D. IEEE C62.62 – Test Specifications for Surge-Protective Devices for Use on the Load Side of the Service Equipment in Low Voltage AC Power Circuits.
- E. NEMA LA 1 – Surge Arresters.
- F. NEMA LS1 – Low Voltage Surge Protective Devices.
- G. NFPA 70 - National Electrical Code.
- H. UL96A Standard for Installation Requirements for Lightning Protection Systems.
- I. UL 1283, 4th Edition or newer, Standard for Electromagnetic Interference Filters.
- J. UL 1449, 7th Edition or newer, Surge Protective Devices (SPD).

1.04 SUBMITTALS

- A. For Approval
 - 1. Shop Drawings:
 - a. Electrical and mechanical drawings shall be provided by the manufacturer which show unit dimensions, weights, component and connection locations
 - b. Device mounting provisions
 - c. Internal wiring diagram illustrating all modes of protections,
 - d. Wiring diagram showing all field connections
 - e. Manufacturer's recommended wire and overcurrent protection device size
 - f. Submit manufacturer's installation instructions.
 - 2. Product Data:
 - a. Short Circuit Current Rating (SCCR)
 - b. Voltage Protection Ratings (VPRs) for all modes
 - c. Maximum Continuous Operating Voltage rating (MCOV)
 - d. Nominal Discharge Current Rating (I_n)
 - e. Noise Rejection Rating
 - f. Type 1 device listing
 - g. Options

3. Test Reports: Provide documentation to verify the following standards have been met.
 - a. Surge Protective Device is listed from a Nationally Recognized Testing Laboratory (NRTL) (UL, ETL, etc) and is tested and multi-listed to the latest accepted edition UL 1449 and UL 1283.
 - b. Actual let through voltage data in the form of oscilloscope results per ANSI/IEEE C62.41
 - c. System's UL 1449 Listing and clamping voltage ratings of all protection modes.
 - d. Noise Rejection testing as outlined in NEMA LS1-1992 (R2000) Section 3.11. Noise rejection is to be measured between 50 kHz and 100 MHz verifying the devices noise attenuation. Must show multiple attenuation levels over a range of frequencies.
 - e. Test reports from a recognized independent testing laboratory, capable of producing 200kA surge current waveforms, verifying the suppressor components can survive published surge current rating on a per mode basis using the ANSI/IEEE C62.41 impulse waveform C3 (8 x 20 microsecond, 20kV/10kA). Submit test report data clearly demonstrating the maximum surge current rating has been tested on a COMPLETE SPD unit including all necessary fusing/overcurrent protection, thermal disconnects, integral disconnects and monitoring systems. Manufacturers who cannot provide this data will not be approved.
- B. For Record Purposes
 1. As-built/Record Drawings shall accurately indicate the location of the equipment and the equipment shall be identified with the final designation as directed by the Owner.
- C. Operations and Maintenance Manuals
 1. Submit manufacturer's installation instructions.
 2. Maintenance Data: Include maintenance instructions for cleaning methods; cleaning materials recommended; component replacement, testing and adjustment.

1.05 EQUIPMENT DIMENSIONS

- A. Refer to floor plan drawings for approximate overall dimensions for the equipment of this section. Minor dimensional increases of 6 inches or less are acceptable, unless specific dimensions are indicated for the equipment. Notify the engineer in writing 5 days prior to submitting bid if the dimensional increases will be greater than 6 inches in any dimension.

1.06 EXTRA MATERIALS

- A. Spare Materials
 1. None required.
- B. Maintenance Materials
 1. Furnish two each of any special tools required to operate and maintain surge suppressors.

1.07 WARRANTY

- A. The manufacturer shall provide a limited five-year warranty against failure.
- B. Copy of warranty statement clearly establishing the terms and conditions to the building/facility owner/operator.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Current Technology.
 - 2. Liebert.
 - 3. Mersen.
 - 4. Square D.

2.02 SURGE PROTECTIVE DEVICE - GENERAL REQUIREMENTS

- A. All surge protective devices shall meet the following specifications:
 - 1. SPD shall be UL labeled with at 200kA Short Circuit Current Rating (SCCR). Fuse ratings shall not be considered in lieu of demonstrated withstand testing of SPD per NEC 285.6.
 - 2. SPD shall be UL labeled as Type 1 intended for use without need for external or supplemental overcurrent devices.
 - 3. SPD shall be UL labeled with a 20kA Nominal Discharge Current (I_n).
 - 4. Surge suppressor shall have a UL1449 Listed suppression rating for each L-N, L-G and N-G mode of protection, shall be no greater than values as follows:
 - 1). 480/277 volt 3 phase, "wye" - L-N, L-G, N-G, 1200 volts, L-L 2000 volts
 - 2). 208/120 volt 3 phase, "wye" - L-N, L-G, N-G, 700 volts, L-L 1200 volts
 - 5. Suppression device shall provide protection in all modes. Ten modes for "wye" systems L-L, L-N, L-G, and N-G and six modes for "delta" systems L-L and L-G.
 - 6. The unit shall include a UL1283 high-frequency EMI/RFI noise rejection filter. Noise attenuation for electric noise shall be as follows using the MIL-STD-220B insertion loss method:
 - a. 50dB at 100kHz
 - b. All other frequencies shall be 31 dB or better
 - 7. SPD shall have a UL 1449 List Maximum Continuous Operating Voltage (MCOV) minimum rating as follows:
 - a. 480/277 volt 3 phase, "wye" - 320 volts
 - b. 208/120 volt 3 phase, "wye" -150 volts
 - 8. Minimum continuous operating voltage of any component shall not be less than 115% of nominal operating voltage.
 - 9. Unit shall include externally mounted LED visual status indicators that show the on-line status of each phase.
 - 10. The unit shall be mounted in the distribution equipment in a dedicated compartment with barriers separating the compartment from the rest of the distribution equipment
 - 11. The primary suppression path shall be line to neutral.

2.03 SURGE PROTECTIVE DEVICE - SERVICE ENTRANCE APPLICATIONS

- A. Minimum Single Pulse Surge Current Capacity shall be based on ANSI/IEEE C62.41-1991's standard 8 x 20 microsecond current waveform. The minimum surge current capacity, in amps, of the unit shall be no less than as follows:
 - 1. 125,000 amps, L-N
 - 2. 125,000 amps, L-G
 - 3. 125,000 amps, N-G
 - 4. 125,000 amps, L-L
- B. All surge protective devices shall meet the general requirements indicated above.

2.04 SURGE PROTECTIVE DEVICE – POWER PANEL APPLICATIONS

- A. Minimum Single Pulse Surge Current Capacity shall be based on ANSI/IEEE C62.41-1991's standard 8 x 20 microsecond current waveform. The minimum surge current capacity, in amps, of the unit shall be no less than as follows:
 - 1. 80,000 amps, L-N
 - 2. 80,000 amps, L-G
 - 3. 80,000 amps, N-G

4. 80,000 amps, L-L
- B. All surge protective devices shall meet the general requirements indicated above.

2.05 SURGE PROTECTIVE DEVICE – BRANCH PANEL APPLICATIONS

- A. Minimum Single Pulse Surge Current Capacity shall be based on ANSI/IEEE C62.41-1991's standard 8 x 20 microsecond current waveform. The minimum surge current capacity, in amps, of the unit shall be no less than as follows:
 1. 40,000 amps, L-N
 2. 40,000 amps, L-G
 3. 40,000 amps, N-G
 4. 40,000 amps, L-L
- B. All surge protective devices shall meet the general requirements indicated above.

2.06 SURGE PROTECTIVE DEVICE - OPTIONS AND ACCESSORIES

- A. The accessories below apply to each surge protective device as indicated on the drawings.
 1. OPTION 01:
Unit Status Indicators: Red and green solid state indicators with printed labels shall be provided on the hinged front cover to repeatedly indicate unit module status. The absence of the green light and the presence of the red light shall reliably indicate that one or more surge current diversion modules has failed and that service is needed to restore full operation. Additionally, a electrically isolate Form C (one N.O. and one N.C.) summary alarm contact rated for at least 120 VAC and 1 ampere shall be provided for remote annunciation of unit status. The summary alarm contact shall change state if any one or more of the surge current diversion modules has failed.
 2. OPTION 02:
Audible Alarm: The specified system shall be equipped with an audible alarm which shall be activated when any one or more of the surge current diversion modules has failed. In conjunction with the audible alarm, an alarm on, off switch shall be provided to silence the alarm and an alarm push-to-test switch shall be provided to test the alarm function. Both switches and the audible alarm shall be located on the unit's hinged front cover.
 3. OPTION 03:
Transient Counter: A transient voltage surge counter shall be included to totalize transient voltage surge which deviate from the sine wave envelope by more than 125 volts. The readout shall be at least a six digit LCD located on the unit's hinged front cover. The counter shall be equipped with a battery back-up to retain memory when power is not present. A push-button switch on the display's face plate shall be provided for manual counter reset.
 4. OPTION 04:
A Remote Monitor Panel: A self-contained, UL listed, monitoring panel shall be available to allow remote annunciation of the system status. Input power to the monitoring panel shall be equipped with a 6 foot long input power cord with a NEMA 5-15 plug. The monitor panel shall have an audible alarm, red and green LED's, an alarm on/off switch to silence, and a push-to-test alarm switch. The monitor panel shall connect to a specified surge suppression system by way of a two wire control cable. Under normal operation the green LED shall be illuminated. Upon correction of module failure, the monitor panel shall automatically reset to normal mode. The panel shall be a non conductive enclosure.
 5. OPTION 05:
Service Disconnect Switch: The specified system shall include a circuit breaker or disconnect switch with fuses located in-line with the SPD system enclosure with an external manual operator. The switch shall disconnect all ungrounded circuit conductors from the high energy surge current diversion modules. The switch shall be rated for 600 VAC and 30 amps (minimum) continuous. Wiring

- terminations shall be provided for at least #8 AWG.
6. OPTION 06:
Summary Alarm Relay Contacts: The unit shall be equipped with a summary alarm relay with one set of Normally Open and Normally Closed (Form C) dry contacts rated for 125 VAC, 1 Amp (minimum). The contacts will change state and indicate a failure of the unit, a phase loss condition or a full power loss condition.

PART 3 EXECUTION

3.01 SHIPPING, DELIVERY, STORAGE AND HANDLING

- A. Accept surge suppressor equipment on site. Inspect for damage.
- B. Protect products from weather and moisture by covering with heavy plastic or canvas and by maintaining heating within enclosure in accordance with manufacturer's instructions.

3.02 EXAMINATION AND PREPARATION

- A. Examine areas to receive surge suppressor equipment to assure adequate working clearance for equipment installation.
- B. Verify that field measurements are as indicated on shop drawings.

3.03 INSTALLATION

- A. Install surge suppressor equipment in accordance with manufacturer's recommendations.
- B. Install surge suppressor equipment plumb. Install recessed equipment flush with wall finishes. Provide supports in accordance with Section 26 05 29.
- C. The surge suppressors shall be connected in parallel to the power source, keeping conductors as short and straight as practically possible. The conductors between the surge suppressor and the power source shall be twisted together to reduce input conductor impedance.
- D. When the surge suppressor is connected to an electrical distribution panelboard the unit shall be close nipped to the panel and be supplied by the circuit breaker indicated on the drawings.
- E. The conductors from the circuit breaker to the surge suppressor shall be installed with the shortest length possible and as straight as possible.
- F. Provide engraved plastic nameplates under the provisions of Section 26 05 53.

3.4 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed under provisions of Section 26 08 11.

3.5 ADJUSTMENT AND CLEANING

- A. Adjust doors and operating mechanisms for free mechanical movement.
- B. Tighten lugs and bus connections.
- C. Clean interior of equipment.
- D. Sand, prime and paint scratched or marred surfaces to match original finish.

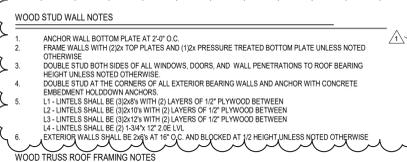
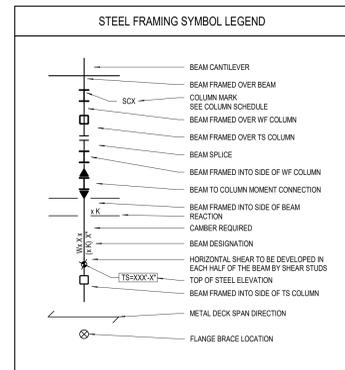
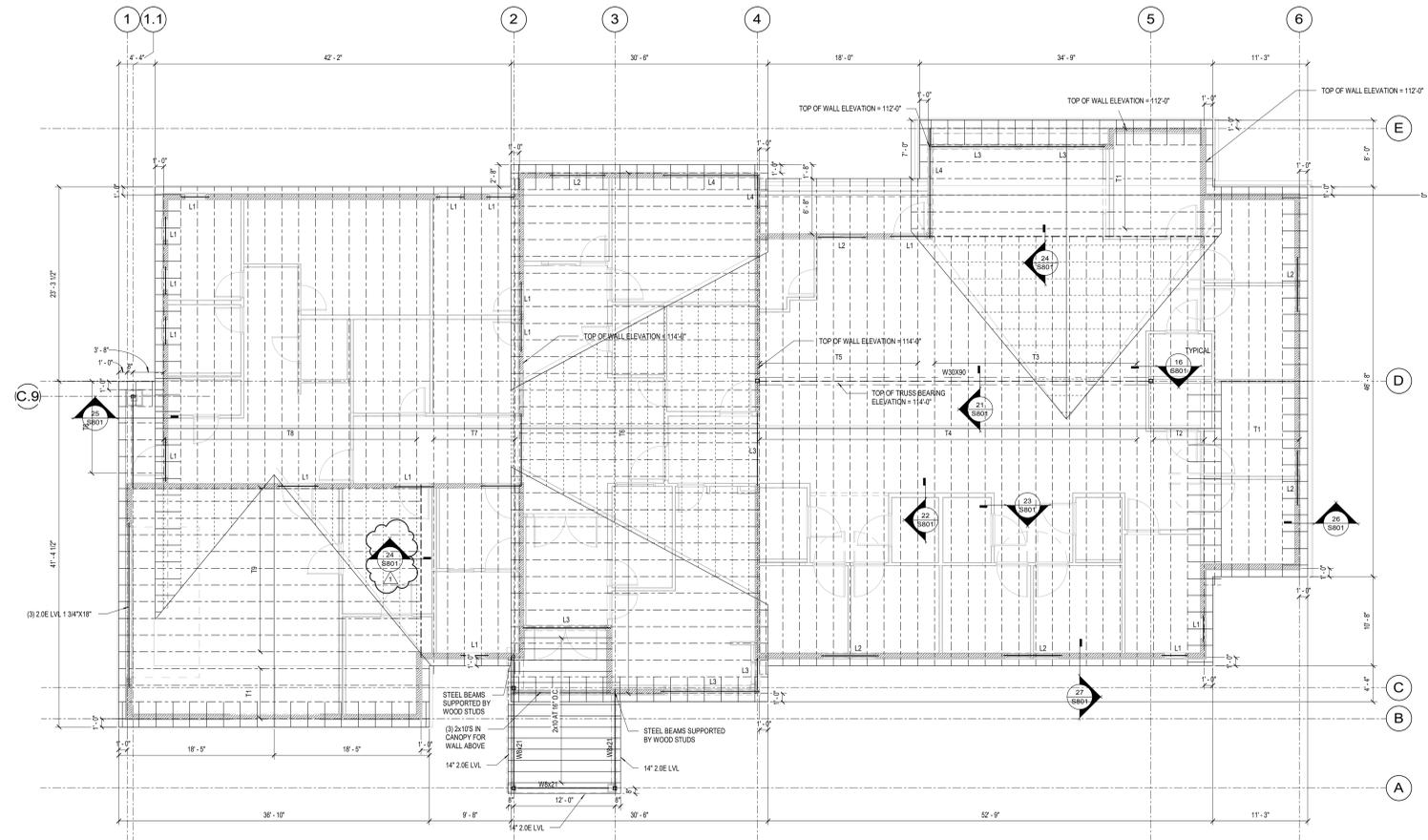
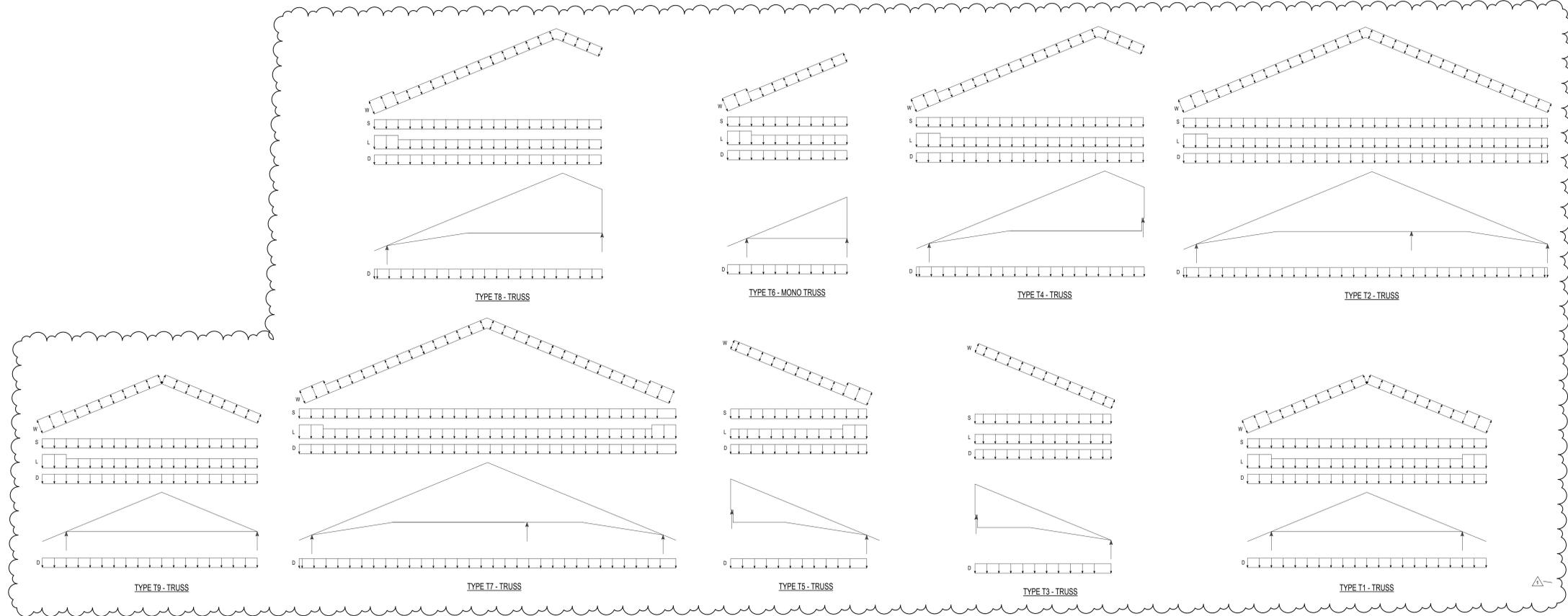
3.6 START UP/MANUFACTURER FIELD SERVICES

- A. None required.

3.7 DEMONSTRATION AND TRAINING

- A. None required.

END OF SECTION



ISSUANCES / REVISIONS		
NO.	DESCRIPTION:	DATE:
1	construction documents	08.08.2019
1	ADDENDUM #1	08/23/2019

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PROJECT NUMBER
65371

APPROVED BY
AYA

REVIEWED BY
AYA

DRAWN BY
BEC

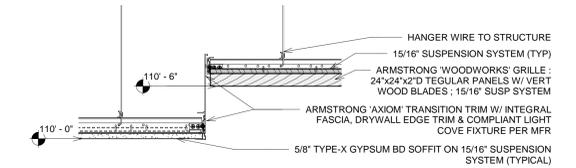
ROOF FRAMING PLAN

S201

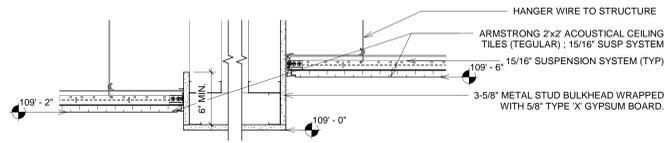
Certification:

Consultant Logo:

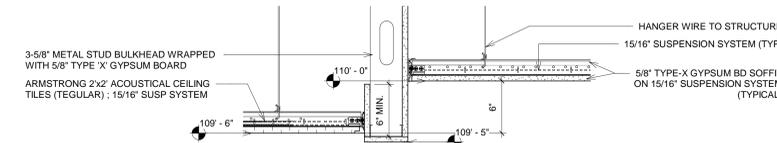
Key Plan:



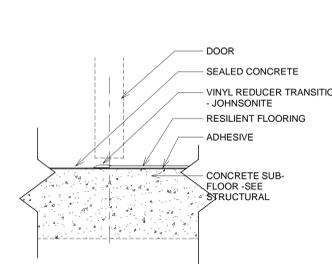
19 LOBBY CEILING
1 1/2" = 1'-0"



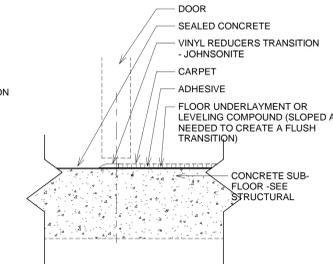
18 NURSE STATION CEILING DETAIL
1 1/2" = 1'-0"



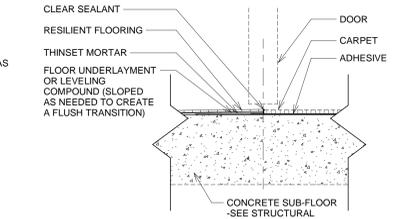
17 BULKHEAD DETAIL
1 1/2" = 1'-0"



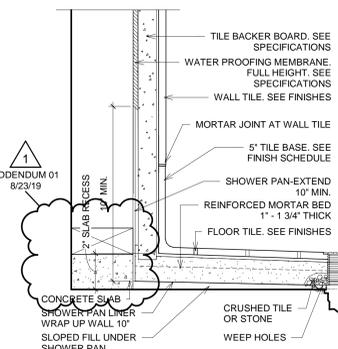
1. RESILIENT TO SEALED CONCRETE



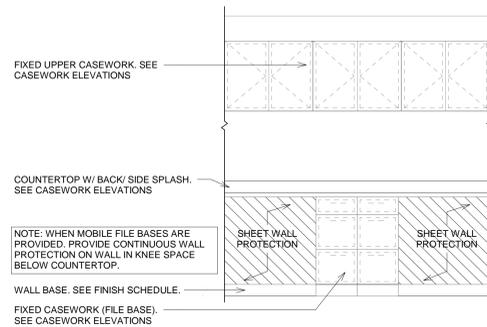
2. CARPET TILE TO SEALED CONCRETE



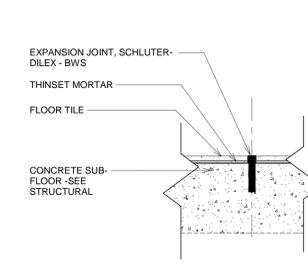
3. RESILIENT TO CARPET



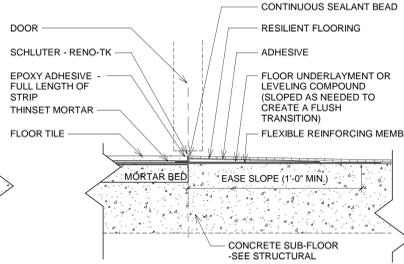
16 SHOWER FLOORING DTL.
3" = 1'-0"



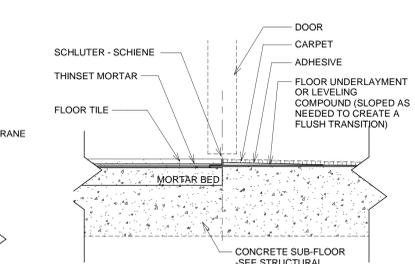
15 WALL PROTECTION DTL.
1/2" = 1'-0"



4. TILE TO TILE

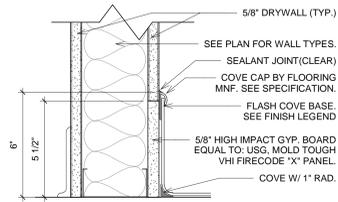


5. TILE TO RESILIENT

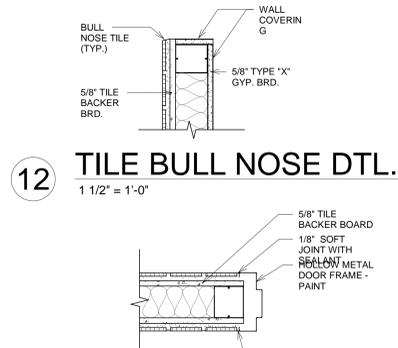


6. TILE TO CARPET

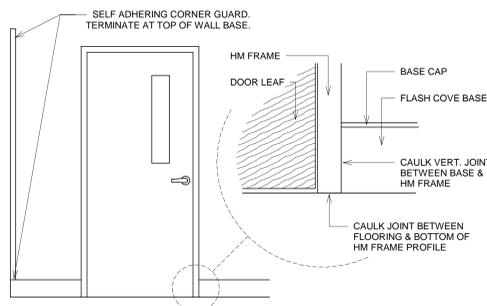
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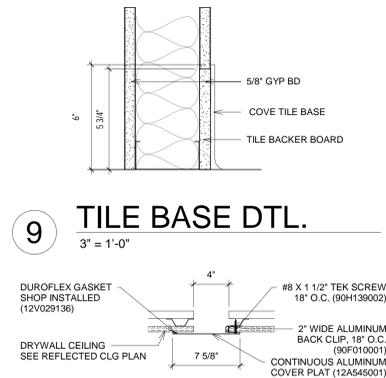
13 FLASH COVE BASE DTL.
3" = 1'-0"



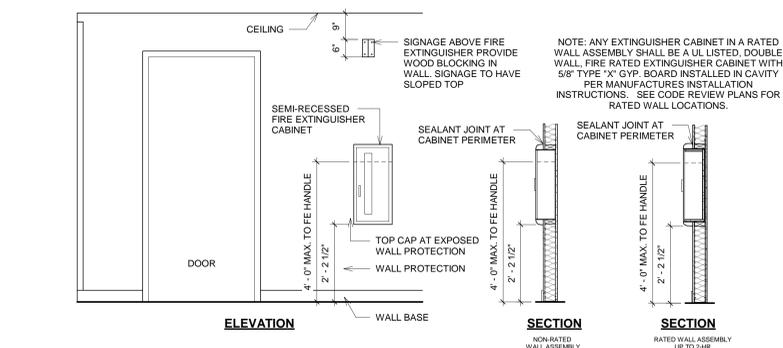
12 TILE BULL NOSE DTL.
1 1/2" = 1'-0"



10 FLOORING DTL.
1/2" = 1'-0"

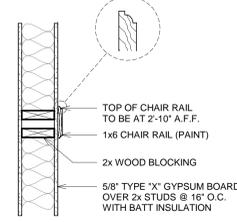


9 TILE BASE DTL.
3" = 1'-0"

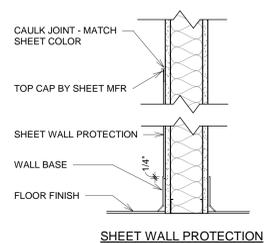


7 FIRE EXTINGUISHER DTL.
1/2" = 1'-0"

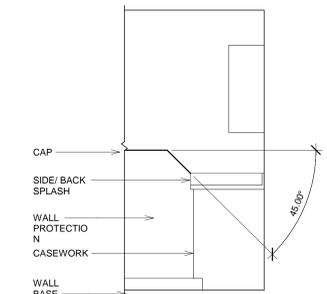
NOTE: WALL COMPOSITION WILL VARY. ADJUST ACCORDINGLY.



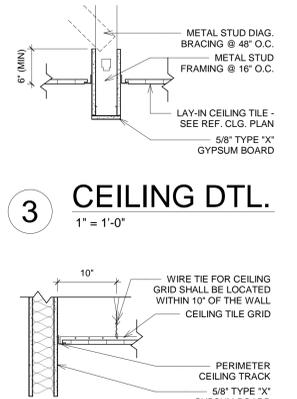
6 CHAIR RAIL DTL.
1" = 1'-0"



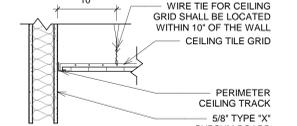
5 WALL PROTECTION DTL.
1 1/2" = 1'-0"



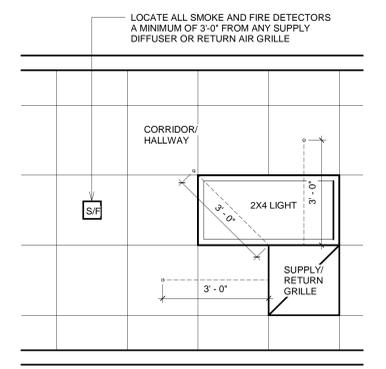
4 WALL PROTECTION DTL.
1/2" = 1'-0"



3 CEILING DTL.
1" = 1'-0"



2 CEILING DTL.
1" = 1'-0"



1 SMOKE/FIRE DETECTOR DTL.
1/2" = 1'-0"



North Central Health Care
Person centered. Outcome focused.

NORTH CENTRAL HEALTH CARE
NEW CBRF & YOUTH HOSPITAL
2400 MARSHALL ST.
WAUSAU, WI 54403

REVISION	
No.	Date
1	8/23/19
	ADDENDUM 1

DRAWING CONTENTS
INTERIOR FINISH
DETAILS/TYPICALS

ISSUE DATE: 08.08.2019 PROJECT NO: 18064
DRAWING NO: A-513

Marathon County
 Marathon City - NCHC New Adult CBRF & Youth Hospital
 Pre-Bid Meeting Attendance

A/E# 65370

Meeting Date: August 20, 2019 10:30 AM

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Trent Vollrath	Pieper Electric	trent.vollrath@pieperpower.com
Alex Hilgert	Pieper Electric	alex.hilgert@pieperpower.com
Jason Wilkowiak	Ellis Construction	Jason@elliswi.com
Kelly Reith	Huckman Mech. Ind	Kellyreith@huckman.com
Kyle Ericson	J.H. Findorff & Son	kerickson@findorff.com
Bill Shardlow	Big-D Const.	bill.shardlow@big-d.com
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Kinoy Kotala	Kotala Frost Insulators	Kinoy@kotala.com
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Jon Wald	FFM	jwald@FFMech.com
Matt Paulus	BOLDT	MAT.PAULUS@BOLDT.COM

Mike Murphy
 Michael Murphy @ greenfire.com

Marathon County
 Marathon City - NCHC New Adult CBRF & Youth Hospital
 Pre-Bid Meeting Attendance

A/E# 65370

Meeting Date: August 20, 2019 10:30 AM

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