EFD Station No. 15 Toilet Room Renovations

Evansville Fire Department Station No. 15
1711 South Weinbach Avenue
Evansville, Indiana 47714

1 City of Evansville - Project Location Map
Not to Scale

North

Project Location

EFD Station 15
1711 South Weinbach Avenue
Evansville, Indiana 47714

Sheet Information

Project Team

Architect / Engineer:

REMEDY Design LLC
Newburgh, Indiana
(812) 453 - 9034

MEP Consultant:

SKY Engineering LLC
Owensboro, Kentucky
(270) 784 - 0722

Owner:

Evansville Fire Department
550 SE Eighth Street
Evansville, Indiana 47713
Tony Knight, Fire Chief

Deputy Chief of Logistics and Finance:
Jarrod Brown
(812) 549 - 7501

EFD Facilities Manager:
Dustin Cline
(812) 470 - 0298

Project Information

The project consists of the renovation of the existing Firefighter Locker Room and Toilet Room, primarily to repair deteriorated plumbing, and to update fixtures while doing so.

Additionally, the project consists of updating the electrical service panels to support new electrical components and the installation of an emergency generator system.

The primary project area consists of +/- 318 square feet located witnin the Firefighter (non-public) area of Station 15.

Bids

Base Bid - Complete Construction (Entire Scope of Work)

Alternate Bid 1 - Delete Building Generator and Installation (Panel upgrades and emergency panel installation to remain in base bid to accommodate future generator installation).

Alternate Bid 2 - Delete the ductless hvac unit installation (Panel upgrades and circuit breaker to remain in base bid to accommodate future ductless hvac unit installation).

General Notes

1. Coordinate all work with the EFD Facilities Manager.
2. Coordinate all utility interruptions in advance with the Facilities Mgr.
3. Isolate water and electrical shut-offs to ONLY the immediate work area.
4. Do not block the fire apparatus at any time during the project.
5. Clean the work area daily.
6. A contractor staging area will be located on site by the Facilities Mgr.
7. Coordinate work with City Board of Public Works where required.
8. Existing toilet accessories such as mirror, paper towel dispenser, soap dispenser and toilet paper dispensers shall be carefully removed and re-installed as required to accommodate the new work.
9. The facility, with the exception of the locker room and toilet room, will be occupied by Firefighters during the work of this project. Comply with the Owner's requirements for a continuous service facility.
10. Submit shop drawings for review and approval on major components of the project including: doors, plumbing fixtures, lights, partitions, HVAC components, ceramic tile, generator system, electrical panels.

Hazardous Materials

Should the contractor encounter any suspect hazardous materials, stop work and immediately contact the Architect for a detailed inspection.

ISSUE FOR BID
May 29, 2025

Architect / Engineer:

REMEDY DESIGN LLC ENGINEERING DEVELOPMENT & ARCHITECTURE

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Consulting Engineer:

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MICHAEL L. EWALD REGISTERED AR 10700019 STATE OF INDIANA ARCHITECT

MICHAEL L. EWALD, AIA
DATE: MAY 29, 2025
EXPIRES: 12-01-2027

EFD Fire Station No. 15 Renovations
Evansville Fire Department
Evansville, Indiana
Fire Chief Tony Knight

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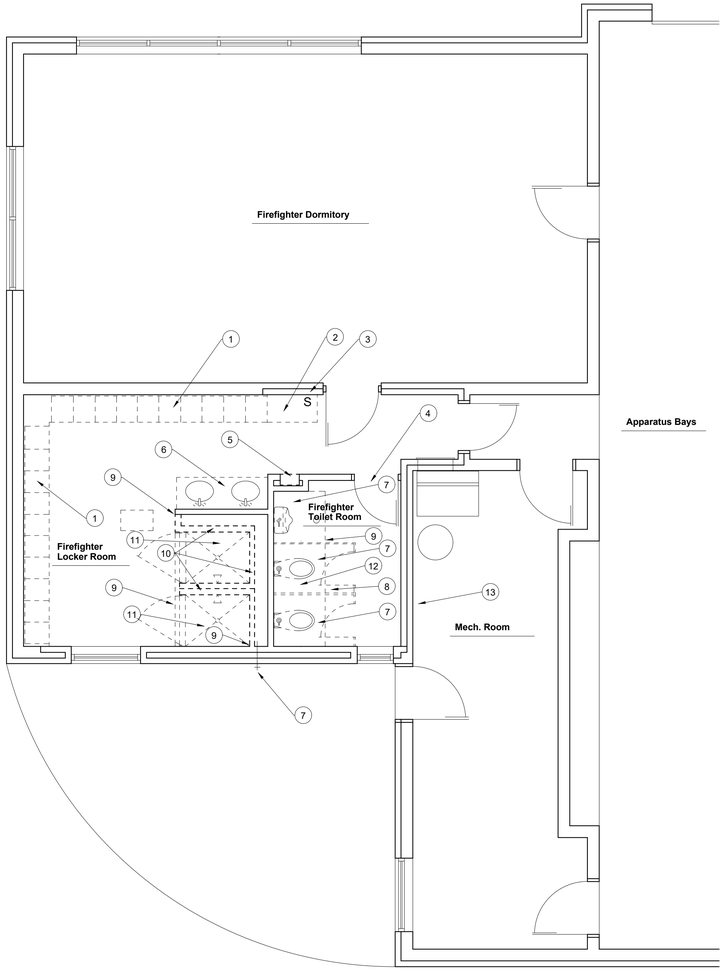
Cover Sheet

SHEET NO:

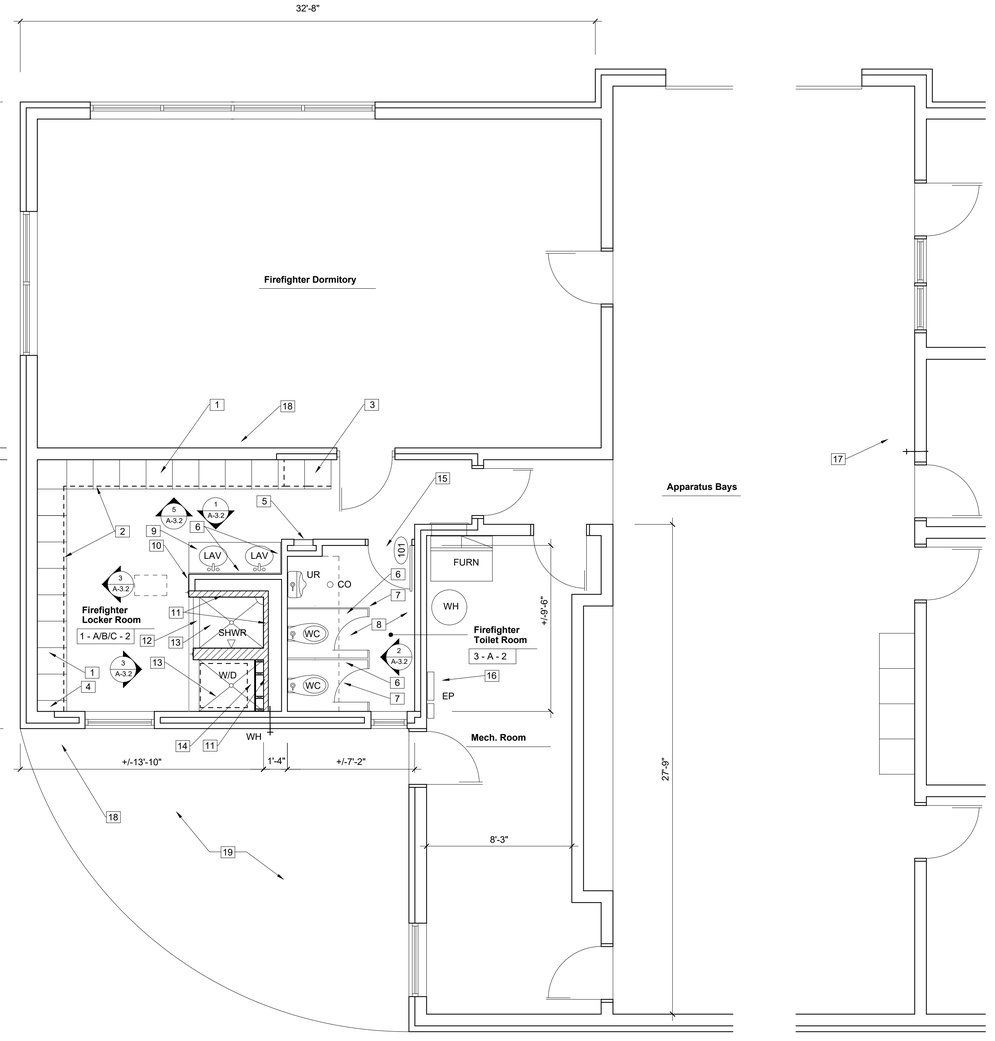
G-1.0



1 Demolition Floor Plan

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

North



2 Renovation Floor Plan

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

North

Note: The plumbing contractor shall investigate, via camera, the existing waste piping to verify that the existing sanitary sewer leaving the building is suitable for use and to aid in determining the actual connection point for new piping to existing. Share findings with the EFD Facilities Manager.

Demolition Notes

1. Carefully remove existing lockers. Lockers to remain the property of the Owner.
2. Remove existing floor tile to facilitate new concrete locker base installation.
3. Abandon, cap and cover existing wall switch for new locker installation.
4. Remove existing metal door for the installation of new door and hardware in existing metal frame to remain.
5. Remove existing recessed towel / trash receptacle unit to accommodate infill and new tile.
6. Remove existing vanity and lavatories to facilitate new construction. Carefully remove and store existing toilet accessories for re-installation in existing locations (or protect in place).
7. Remove existing toilet fixtures to accommodate the installation of new fixtures in same locations.
8. Remove existing toilet partitions to accommodate the installation of new partitions in same locations. Carefully remove and store existing toilet accessories for re-installation in existing locations.
9. Line of existing construction to remain versus demolition and new construction. Field verify.
10. Existing cmu shower stalls and chase wall to be removed to facilitate access to plumbing in chase for replacement. Protect construction intended to remain from damage during demolition.
11. Remove existing shower area concrete flooring to accommodate the replacement of shower drain plumbing and installation of new concrete slab and tile shower flooring.
12. Remove existing toilet room concrete flooring to accommodate the replacement of toilet room plumbing and installation of new concrete slab. Remove tile flooring for entire room.
13. Remove existing electrical service panels to accommodate the replacement of panels and new generator controls. See SKY Engineering sheets.

Reference Notes

1. New metal lockers. See specifications.
2. Existing tile base at locker base to remain at locker overhang.
3. New +/- 5 1/2" high x 18" deep concrete base to extend lockers. Match existing construction. Finish with quarry tile base to match existing construction as closely as possible.
4. Locker infill trim as required. Field verify exact requirements and sizes.
5. Infill opening as required to support new ceramic wall tile flush with existing glazed block. Field verify exact size and layout.
6. Existing toilet accessory re-installed to match existing construction.
7. New floor mounted, overhead braced, metal toilet partitions. Match existing layout.
8. Remove peeling paint. Prep existing ceiling to receive new primer and paint finish. Finish smooth.
9. New vanity with two (2) lavatories and faucets. See also MEP sheets.
10. Existing nominal 4" glazed block masonry to remain at existing continuous, vertical mortar joint.
11. New nominal 4" masonry chase wall with ceramic tile wall finish from floor to ceiling. Field verify layout and pattern.
12. New nominal 4" masonry shower curb with ceramic tile finish.
13. New non-slip granite tile shower floor finish and for flooring infill at new concrete floor. Field verify layout and pattern. Provide consistent joint where new meets existing quarry tile.
14. New nominal 6" metal stud wall with 1/2" plywood substrate and FRP panel finish to house new power, drain, and water supply needed for new stack washer/dryer unit installation.
15. New 2'-6" x 6'-8" x 1 3/4" hollow metal door and new hardware, set in existing metal frame. Paint new door and existing frame. See specifications.
16. New electrical panel and emergency generator panel installation. See SKY Engineering sheets.
17. Modify existing truck fill water piping to include new water fill at apparatus bay wall. See Sheet A-3.7.
18. Install complete new ductless HVAC system to supplement Bunk Room. See Sheet A-3.7.
19. Install complete new emergency generator system. See SKY Engineering sheets.

Room Finish Schedule

Floors and Base:

1. Existing to remain. No base.
2. New 2" x 2" x 5/16" ceramic, mosaic (non-slip) tile at showers and floor tile replacement. Actual color and style as selected by the Owner (showers only).
3. New toilet room quarry tile and base (entire toilet room)

Walls:

A. Existing to remain.
B. New 8" x 12" x 5/16" ceramic wall tile at chase wall replacement and showers. Actual color and style as selected by the Owner.
C. FRP panel over 1/2" plywood substrate

Ceilings:

1. Existing ceiling to remain. 8'-3" height.
2. Existing ceiling. Repair, patch, prime and paint. (Contactor, at his discretion, may install new painted gypsum board for a smooth finish). 8'-3" height.

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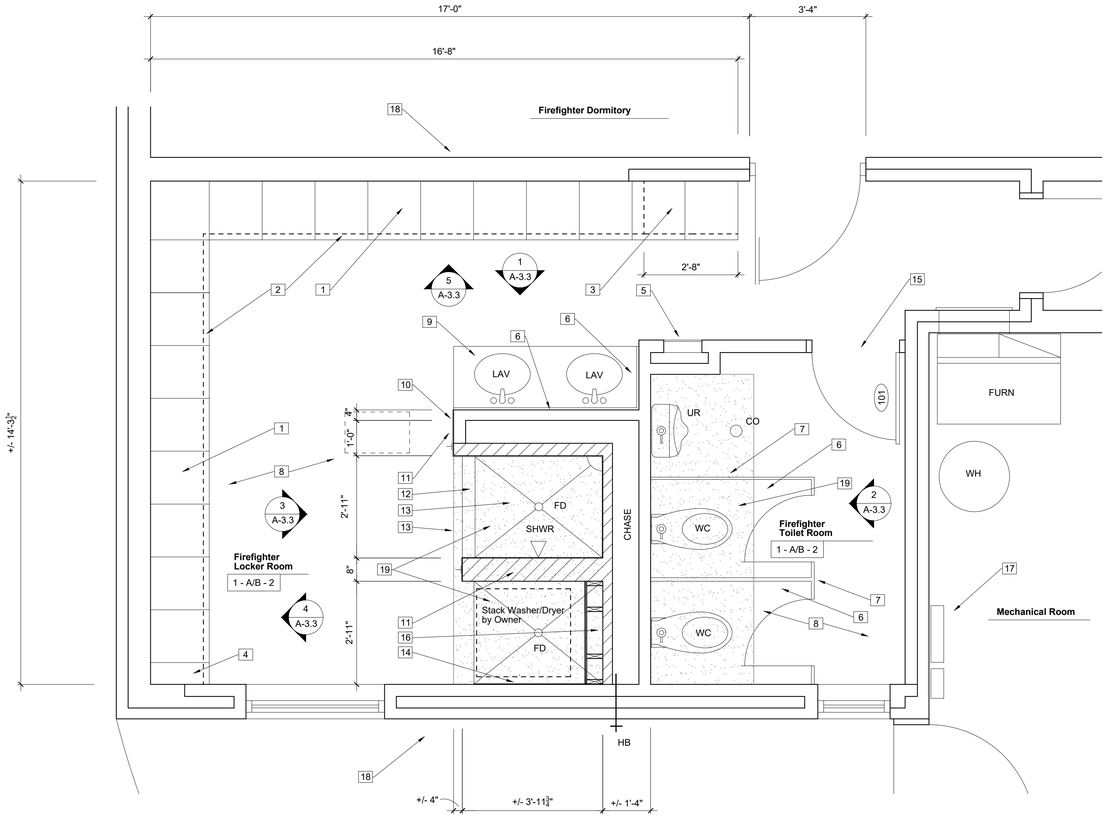
Demo & Renovation Floor Plans

SHEET NO:

A-3.1



1 Enlarged Floor Plan

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

North

LYON

STANDARD LOCKER SPECIFICATIONS
(KNOCKED DOWN)

Material - Prime, high grade Class 1 mild annealed, cold-rolled steel free from surface imperfections. A.S.T.M.-A1008. Galvannealed steel available for high humidity atmospheres. A.S.T.M.-A653. Bolts to be zinc plated or subjected to other rust-retardant treatment.

Body - 24-gauge steel, flanged to give double thickness of metal at back vertical corners.

Door Frame - 16-gauge formed steel channels. Vertical members shall have an additional flange to form continuous door strike. Corners shall be lapped and welded into a rigid assembly. In addition, bottom cross members shall have tang at each end that fits through slot in rear flange of upright frame member to prevent twisting out of alignment. Top and bottom cross members shall provide support for front edge of locker top and locker bottom.

Door - One-piece, 16-gauge steel on single, double and triple tier with both vertical edges formed into channel-shaped formation; top and bottom shall be flanged at 90 degree angle. On multiple tier lockers, hinge side shall be formed into channel shaped formation with other three sides flanged at 90 degree angle.

NOTE: Box locker doors up to and including 15" wide by 15" high shall be 18-gauge unless specified otherwise.

Ventilation - Louvers shall be provided as follows:

Locker Styles	Louvers
Single/Double tier lockers – 9"w	Six 3-1/2" louvers top and bottom.
Single tier lockers – Over 9"w	Six 6" louvers top and bottom.
Double tier lockers – Over 9"w	Six 6" louvers top and bottom.
Triple tier lockers – 9"w	Two 3-1/2" louvers top and bottom.
Triple tier lockers – Over 9"w	Two 6" louvers top and bottom.
Multiple tier lockers	Three 3-1/2" louvers per door for 12" and 15" wide lockers.
	Four 6" louvers per door for lockers 18" wide and over.

Door Jambs - 48" and higher single tier lockers shall have three door jambs; double tier and triple tier lockers shall have two jambs welded to side of door frames to engage locking device. Design and gauge of jamb shall prevent freeing of locking device by prying. Each jamb shall have easily replaceable soft rubber bumper.

Hinges - Shall not be less than 2" high, .050" steel, 5 knuckle, and full loop design forming double thickness on each leaf. Hinges to be set in slot in door and frame and projection welded to frame and securely attached to door; Hinge pin to be spun over at ends to resist removal. Single-tier lockers 48", 60" and 72" high to have three hinges. All other tiers to have two hinges – all on right hand side of door.

Quiet Locking Device - Single tier locking device shall engage frame at three points; double tier and triple tier at two points. Channel shaped locking device with full length reinforcing ribs shall be a quiet design utilizing nylon guide inserts to reduce metal-to-metal contact. The locking device shall include a latch finger that engages the 12-gauge door jamb. Lock bar shall be enclosed on three sides and operate within the channel formation of the door. Locking device shall be prelocking so mechanism can be locked in open position – door locking automatically when closed. An optional single point latch shall be available except on 9" wide lockers. Box lockers shall have one-point locking device with a 14-gauge lock clip for attaching padlock. Doors also to be provided with lock hole filler to permit use of built in lock.

Handles - On single, double and triple tier lockers, handles shall be recessed. No moving parts are to operate against outside surface of locker. Padlock attachment to be integral part of lift, which shall be attached directly to locking bar and protected by fixed handle housing. Handle to provide built in padlock strike. The recessed handle shall be 4-1⁄8"w x 6-1⁄16"h x 1-1⁄4"d. Multiple tier lockers shall be equipped with a 16-gauge door pull with padlock attachment when not used with built in locks.

Shelves - Single tier lockers shall have one 24-gauge shelf approximately 9" below top. Flanged on all four sides for strength with the front flange turned 45 degrees for safety and attached at no less than two points through each side flange. Only single tier lockers have shelves.

Coat Hooks - Single tier, double tier and triple tier lockers shall have one double prong hook and three single prong wall hooks. 5⁄6" diameter coat rods are standard in 18" and 21" deep knocked down single tier lockers, replacing ceiling hook. All hooks to be zinc plated or subjected to a comparable rust retardant treatment and attached with two bolts.

LYON

STANDARD LOCKER SPECIFICATIONS
(KNOCKED DOWN)

Number Plates - Optional aluminum number plates with etched figures at least 3⁄6" high. All lockers shall have number plates attached near top of door.

Standard Finish - Exposed steel parts shall be thoroughly cleaned, given a bonding and rust inhibitive phosphate treatment and then electrostatically sprayed with powder coat.
NOTE: Contact Lyon for finish compatibility with any chemicals.

Anchoring - To prevent tipping or injury, Lyon strongly recommends that lockers be floor and/or wall anchored.

Free-Standing Lockers - Lockers shall be furnished with 6" legs. Optional front and end closed bases available.

Recess Trim - End and top recess trim for lockers to be placed in wall recesses shall be 18-gauge formed steel with a 2-3⁄4" wide face and shall be bolted to locker frames. Top recess trim to be in approximately 5'0" lengths with a formed splice cap to cover joints and to hold top recess trim in alignment. End recess trim to be 2-3⁄4" higher than lockers and will lap over ends of top recess trim for a hairline joint at top of corners.

NOTE: There are certain sizes and/or types of lockers that are available in minimum quantity production runs only. Contact your Lyon factory representative for complete details.

Quiet-Plus
Eliminating metal to metal contact, all Lyon locker doors are fitted with nylon lockbar guides to reduce clanging and provide smoother, quieter operation. In addition to quieter lock bars, Lyon Quiet-Plus locker doors include a sound deadening door panel. The resulting combination minimizes noise levels caused by opening and closing locker doors.

Spec Summary
Standard Lockers
- 16-gauge door and frames
- 24-gauge body parts
- One piece 16-gauge door
- Full loop type hinges
- Secure multi-point locking system
- Powder coat finish
- Built in padlock loop
- Built in locks are also available
- Fully assembled construction optional

2 Locker Basis of Design Specifications

No Scale

Reference Notes

1. New metal lockers. See specifications.
2. Existing locker tile base at locker toe space to remain.
3. New +/- 5 1/2" high x 18" deep concrete base to extend lockers. Match existing construction. Install tile base to match existing tile as closely as possible.
4. Locker infill trim as required. Field verify exact requirements and sizes.
5. Infill opening as required to support new ceramic wall tile flush with existing glazed block. Field verify exact size and layout.
6. Existing toilet accessory re-installed to match existing construction.
7. New floor mounted, overhead braced, metal toilet partitions. Match existing layout.
8. Remove peeling paint. Prep existing ceiling to receive new primer and paint finish. Finish smooth.
9. New solid surface vanity top, face and side, with two (2) drop-in lavatories, anchored with two (2) 250 lb. capacity wall carriers / brackets. Color by Owner. See also MEP sheets.
10. Existing nominal 4" glazed block masonry to remain at existing continuous, vertical mortar joint.
11. New nominal 4" masonry chase wall with new 8" x 12" x 5/16" ceramic tile wall finish from floor to ceiling. Field verify layout and pattern. Tile color and pattern as selected by the Owner.
12. New nominal 4" masonry shower curb with ceramic tile finish to match wall tile.
13. New 2" x 2" x 5/16" non-slip granite tile shower flooring and flooring infill at new concrete floor. Field verify layout and pattern. Color and style by Owner. Provide consistent joint where new tile meets existing quarry tile.
14. Existing glazed masonry to remain as part of new stack washer/dryer space.
15. New 2'-6" x 6'-8" x 1 3/4" hollow metal door in existing metal frame. Field verify. Paint existing frame and new door, color by Owner.
16. New nominal 2x6 wall framing with 1/2" plywood sheathing and FRP panel finish for new stack washer/dryer space.
17. Upgraded electrical panels and new emeregency general panel to replace existing panels. See SKY Engineering sheets.
18. New ductless HVAC unit installed to supplement FF Bunk Room hvac. See sheet A-7.
19. Approximate area of new concrete floor installation following below-slab plubming repacement. Field verify exact location.

Locker Specifications

Lyon, or approved equivalent, standard-duty metal lockers, with Lyon Quiet Plus locker doors.

Single tier, 18" wide x 20" deep x 72" high, with:

Tamper guard handles
One piece, 14 gauge doors
16 gauge frames
24 gauge body parts
Full loop style hinges (total of 3)
Powder coat finish, standard color by Owner
Six (6) 6" louvers - top and bottom
Nylon lockbar guides
24 gauge shelf (+/- 9" from top)
Zinc plated wall hooks and coat rod
3/8" number plate at top of doors

Mount on existing +/- 5 1/2" high x 18" deep concrete base with masonry front and new concrete base where indicated. Mount to existing masonry walls. Provide tile base at toe space to match existing as required. Provide metal trim or tile to cover concrete base at expanded locker end.

Provide angled cap and all necessary trim, shims, and fillers to make a complete system installation of 18 total lockers.

Door and Hardware Specifications

Door 101: md / exist. frame Locker Room to Firefighter Toilet

Hinged 2'-6" x 6'-8" x 1 3/4" - 18 gauge, hollow metal door, Steelcraft, or approved equal.
Existing metal frame to remain, field verify.

Door hardware:
1 1/2 pair of butts, Hager or approved equal
Lockset - Passage function, lever handle trim
Schlage, or approved equal
Wall stop, Hager, or approved equal

Field verify all hardware to accommodate new door installation into existing metal frame to remain.

Hardware finish - 626
Paint door and frame, color by Owner.

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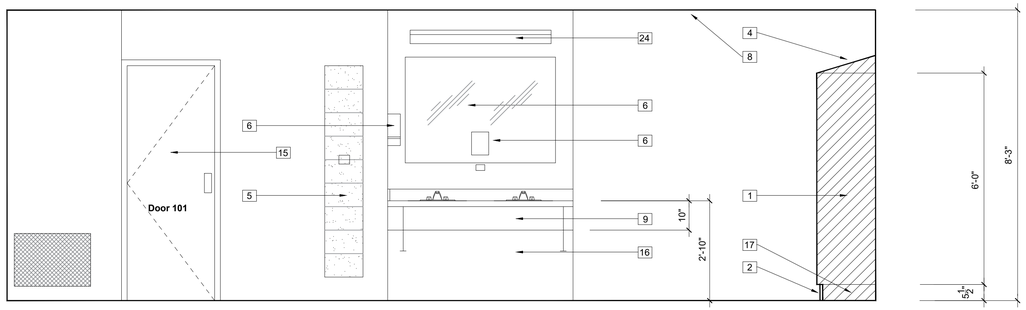
Enlarged Floor Plan

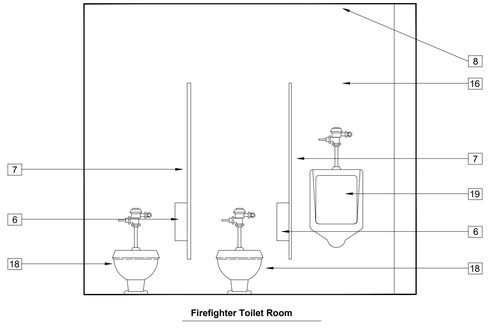
SHEET NO:
A-3.2



Firefighter Locker Room

1 Wall Elevation

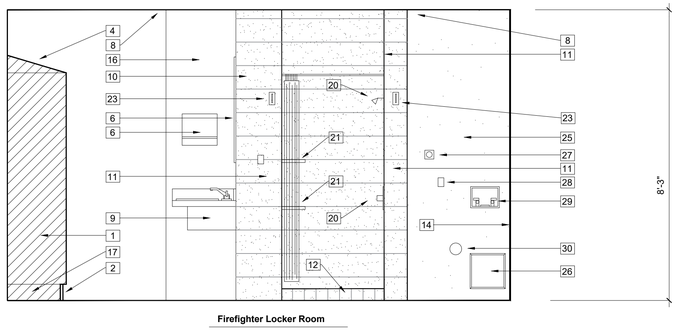
Scale: 1/2" = 1'-0"



Firefighter Toilet Room

2 Wall Elevation

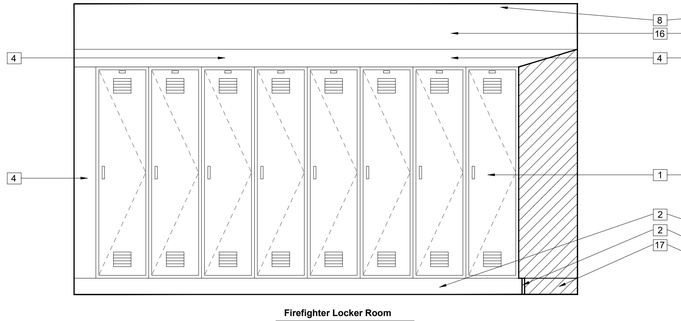
Scale: 1/2" = 1'-0"



Firefighter Locker Room

3 Wall Elevation

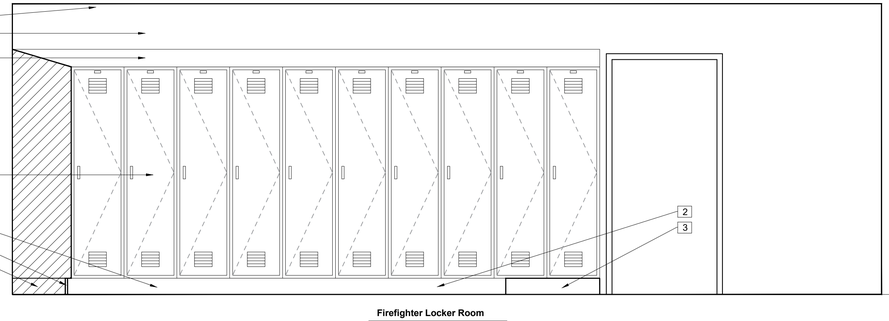
Scale: 1/2" = 1'-0"



Firefighter Locker Room

4 Wall Elevation

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



Firefighter Locker Room

5 Wall Elevation

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

Reference Notes #

1. New metal lockers. See specifications.
2. Existing tile base at locker toe space to remain.
3. New +/- 5 1/2" high x 18" deep concrete base to extend lockers. Match existing construction. Install tile base at toe space to match existing construction as closely as possible.
4. Locker infill trim as required. Field verify exact requirements and sizes.
5. Infill opening as required to support new ceramic wall tile flush with existing glazed block. Field verify exact size and layout.
6. Existing toilet accessory re-installed to match existing construction.
7. New floor mounted, overhead braced, metal toilet partitions. Match existing layout.
8. Remove peeling paint. Prep existing ceiling to receive new primer and paint finish. Finish smooth.
9. New vanity with two (2) lavatories and faucets and 4" backsplash.
10. Existing nominal 4" glazed block masonry to remain at existing continuous, vertical mortar joint.
11. New nominal 4" masonry chase wall with ceramic tile wall finish from floor to ceiling. Field verify layout and pattern.
12. New nominal 4" masonry shower curb with ceramic tile finish.
13. New non-slip granite tile shower floor finish and for flooring infill at new concrete floor. Field verify layout and pattern. Provide consistent joint where new meets existing quarry tile.
14. Existing glazed cmu to remain at new construction at stack washer/dryer area.
15. New 2'-6" x 6'-8" x 1 3/4" hollow metal door installed in existing metal frame to remain. Field verify. Paint new door and existing frame, color by Owner.
16. Existing masonry wall.
17. Existing concrete/masonry locker base.
18. New water closet with flush valve installed in same location.
19. New urinal with flush valve installed in same location.
20. New shower head, mixing valve, piping and wall control.
21. +/- 8" semi-circle shower shelf to match new ceramic wall tile (2 per shower stall).
22. Shower rod and curtain by Owner.
23. Towel hooks by Owner.
24. New light fixture.
25. Nominal 2x6 framing, 1/2" plywood sheathing, and FRP panel finish. FRP panel texture and color by Owner.
26. 12" x 12" plumbing access panel in framed wall at stack washer/dryer. Field verify exact location. White color.
27. 220 Volt dryer outlet installed in new chase wall. Provide breaker in new panel. See sheet A-3.7
28. 120 Volt GFCI receptacle installed in new chase wall. Provide breaker in new panel. See sheet A-3.7
29. Washer wall box with pvc drain and 1/2" HW and 1/2" CW supply piping. See sheet A-3.7
30. 4" diameter aluminum dryer vent. Route dryer vent to exit at adjacent exterior wall and terminate with an aluminum dryer vent cap at exterior wall. Seal weather tight.

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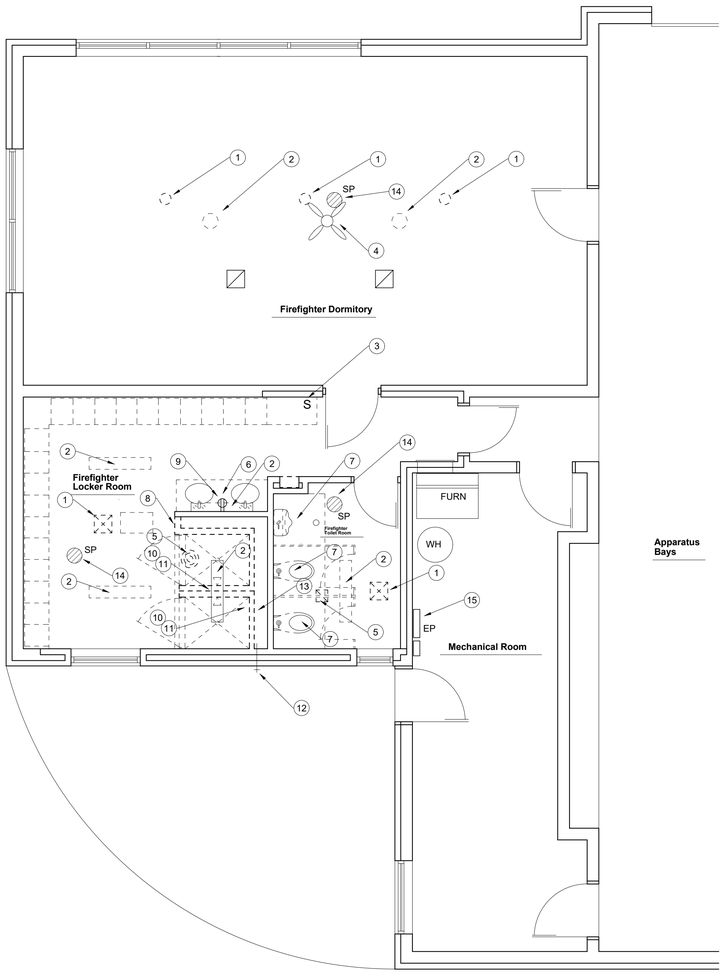
Wall Elevations

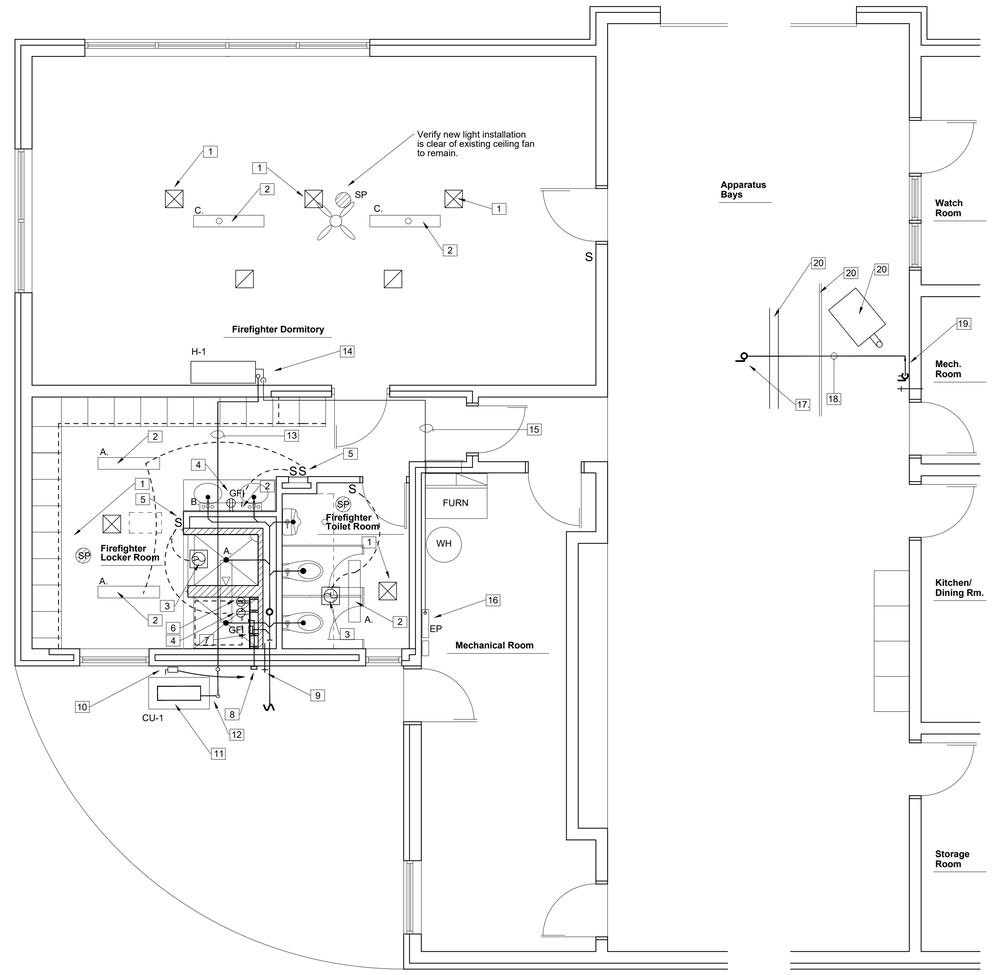
SHEET NO:
A-3.3



1 MEP Demolition Plan

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

North



2 Mechanical / Electrical Renovation Plan

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

North

Light Fixture Schedule

SYMBOL	MANUFACTURER	MODEL NUMBER	LAMP		VOLT	MOUNTING	REMARKS
			TYPE	WATTS			
A.	LITHONIA	LBL 4 * wrap around	LED	32	120	Ceiling Surface	4' length, narrow housing, patterned acrylic lens, damp location
B.	WAC LIGHTING	WS-63736 *	LED	28.5	120	Wall Surface	3' length wall mount vanity light, damp location
C.	LITHONIA	FML 4W * wrap around	LED	32	120	Ceiling Surface	4' length, narrow housing, patterned acrylic lens

* Or approved equivalent

New Exhaust Fan Specifications

Greenheck, or approved equivalent, SP-A110, 90 CFM, 120 volt, fan rpm 950.

Ductless HVAC Unit Specifications

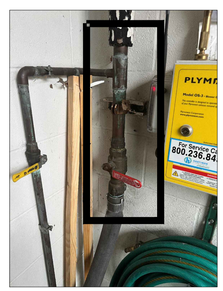
Daikin is basis of design.

Indoor Unit H-1: FXTB24BXVJU
Wall mount heat pump
Cooling capacity = 2 ton
Heating capacity = 24K BTUh

Outdoor Unit CU-1: RXB24XVJU
Condensing unit set on poured concrete base
Voltage: 208-230 / 1PH / 60
MCA: 16.55 Amps
MCB: 20 Amps

Notes:

With programmable wall thermostat, field verify route for condensate drain, install per manufacturer's printed instructions.



3 Wall Truck Fill Hose Detail

No Scale

Demolition Notes #

1. Remove existing SA diffuser (where present) to accommodate the installation of new diffuser.
2. Remove existing light fixture to accommodate the installation of new light fixtures as indicated.
3. Abandon, cap and cover existing wall switch for new locker installation. See alternate bid.
4. Existing ceiling fan to remain.
5. Remove existing exhasut fan to accommodate the installation of a new exhaust fan in same location.
6. Remove existing vanity and lavatories to facilitate new construction. Carefully remove and store existing toilet accessories for re-installation in existing locations (or protect in place).
7. Remove existing toilet fixtures to accommodate the installation of new fixtures in same locations.
8. Modify existing switch location as indicated.
9. Existng receptacle to remain. New receptacle shall be GFCI.
10. Existing cmu shower stalls and chase wall to be removed to facilitate access to plumbing in chase for replacement. Protect construction intended to remain from damage during demolition.
11. Remove existing shower area concrete flooring to accommodate the replacement of shower drain plumbing and installation of new concrete slab and tile shower flooring.
12. Remove existing exterior hydrant to accommodate the installation of a new hydrant in same location.
13. Identify deteriorated supply, waste and vent piping and remove obsolete piping to accommodate installation of new piping and new piping connection to all existing supply, waste and vent plumbing in work area.
14. Existing ceiling speaker to remain. Protect from damage.
15. Remove existing panels to accommodate panel upgrade and installation of emergency panel. See SKY Engineering sheets.

Reference Notes #

1. New 12" x 12" aluminum supply air, 4-way ceiling diffuser, installed in existing hard ceiling. Hart & Cooley ARE, or approved equivalent.
2. New light fixture installed in existing location.
3. New exhaust fan installed in existing location. Modify ceiling opening as required. Utilize existing duct to exterior and electrical circuitry. Wire to operate with light switch. Provide new ceiling diffuser.
4. GFCI 120 volt receptacle in existing location.
5. Wall switch location. Wire to fixtures as indicated. Utilize existing circuitry where possible.
6. New 220V. outlet for stack washer/dryer unit. (Unit furnished and installed by the Owner). Provide new 30A double pole breaker in upgraded panel.
7. New wall box for stack washer/dryer unit.
8. 4" diameter aluminum dryer vent through wall and terminated with aluminum dryer vent cap.
9. New wall hydrant to match existing. Keyed operation. Frost proof.
10. Disconnect for new ductless condensing unit in conduit from new 60A breaker in upgraded electric panel.
11. Condensing Unit CU-1 set on concrete base. See ductless hvac specifications.
12. Condensate, refrigerant, and power line set, insulated and concealed in pvc line hide cover.
13. Condensate, refrigerant, and power line set, insulated and run above ceiling to interior unit.
14. Indoor unit H-1, mounted on wall per manufacturer's recommendations. Install condensate, refrigerant, and power line set in pvc line hide cover.
15. Power wiring for ductless hvac system in conduit from new 20A breaker installed in upgraded electric panel.
16. New upgraded panels (See SKY Engineering sheets). Furnish and install new 20A and 60A breakers for new ductless hvac system for Firefighter Bunk Room.
17. Existing 1 1/2" diameter truck fill piping down from ceiling to remain. Install in-line 1 1/2" diameter tee in piping near the ceiling.
18. New 1 1/2" diameter cold water truck fill piping installed exposed on ceiling and over to south wall of apparatus bay. Insulate all new and existing exposed CW piping.
19. New 1 1/2" diameter piping down on apparatus bay wall to 36" a.f.f., with 1/4 turn shut-off valve and EFD fire thread (NFT - National Fire Thread) male fitting. See Detail 3 on this sheet.
20. Existing apparatus bay unit heater, Plymovent duct and rail at ceiling. Field verify exact location of new truck fill piping to avoid wall and ceiling conflicts.

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MICHAEL L. EWALD REGISTERED AR 10700019 STATE OF INDIANA ARCHITECT

MICHAEL L. EWALD, AIA
DATE: MAY 29, 2025
EXPIRES: 12-01-2027

EFD Fire Station No. 15 Renovations

Evansville Fire Department
Evansville, Indiana
Fire Chief Tony Knight

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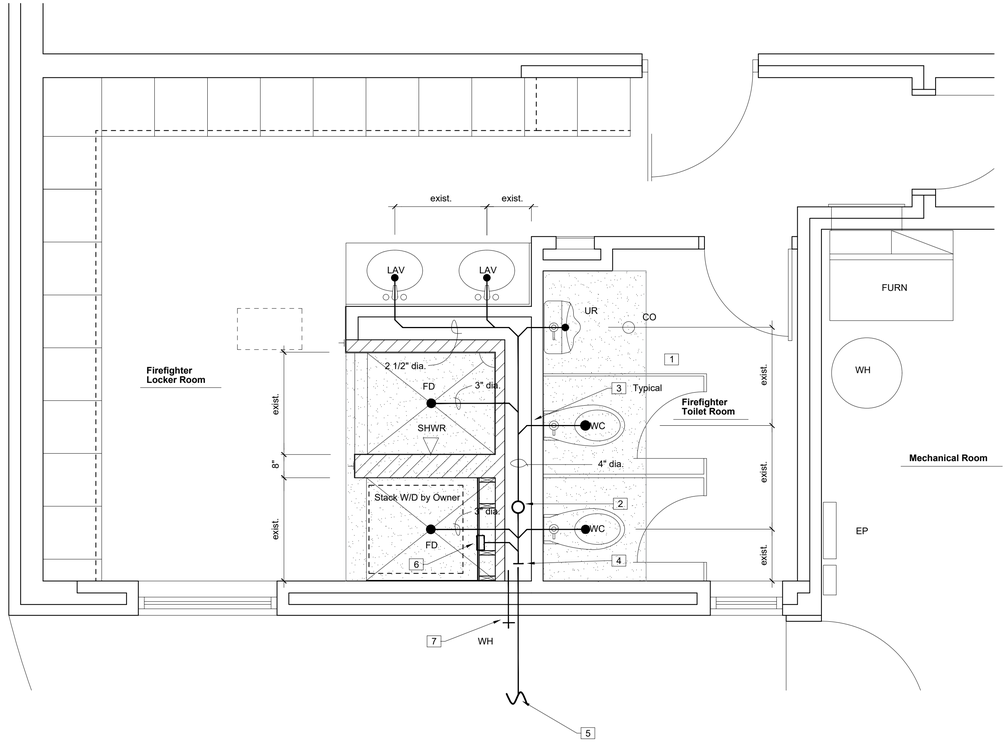
MEP Demo and Floor Plans

SHEET NO:

A-3.4

Firefighter Dormitory



1 Enlarged Plumbing Plan

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

North

Reference Notes #

1. Existing deteriorated supply, waste and vent piping. All piping within the building to be replaced and make connections to new fixtures installed in existing locations. Determine connection to existing sanitary sewer leaving the building and venting system including 4" diameter vent through the roof.

   Provide all work required to provide a complete, fully operational plumbing system for the indicated fixtures.
2. Connect new venting system to existing 4" vent up through roof. Field verify exact location of connection and extent of work required.
3. New plumbing for all supply, waste and vent piping. Determine exact location of connection and extent of work required. Typical for all fixtures indicated on the drawings.
4. Connection to existing sanitary sewer main leaving the building. Field verify exact connection and location.
5. Existing sanitary sewer main extending to Weinbach Avenue. Test system for proper operation following demolition and new construction work.
6. New washer box in chase wall with new supply, waste and vent piping tied into existing plumbing.
7. New wall hydrant to match existing with keyed operation.

Plumbing Fixture Schedule

SYMBOL	MANUFACTURER & MODEL	ROUGH-IN INFORMATION			REMARKS
		SUPPLY	WASTE	MOUNT	
WC	American Standard #2857.111.1.1, or approved equivalent, 1.6 gpf toilet	3/4" cw	Exist.	Floor	With manual flush valve and open front anti-microbial seat
UR	American Standard #6590.503, or approved equivalent, .125 gpf urinal	3/4" cw	Exist.	Wall	With manual flush valve
LAV	Ferguson, Wyndham Quartz, or approved equivalent, vanity countertop	1/2" hw,cw	1-1/4"/Exist.	Wall	With two integral lavatories and (2) 4" center faucets, drain and tailpiece
WH	Zurn #Z 1334-C, or approved equivalent, exterior frost-proof wall hydrant	3/4" cw			Auto draining, vacuum breaker, backflow preventer, bronze, keyed operation
FD	Zurn #FD-2210, or approved equivalent, adjustable strainer floor drain		3"		Shower floor drain, cast bronze body, adjustable strainer grid for tile floor
SHWR	Delta 132900 - A - WS Series, Classic single handle universal shower kit	1/2" hw,cw		Wall	Shower head, single handle control, mixing valve included in kit
WB	Washer box, Symmons Laundry Mate, or approved equal	1/2" hw,cw	3"	Wall	Washer wall box for new stack washer/dryer area, white color.
CO	Zurn CO 2450 PV-4, or approved equal, floor cleanout		3"	Floor	Floor cleanout.

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Enlarged Plumbing Plan

SHEET NO:

A-3.5

SCOPE

THE WORK OF THIS PROJECT GENERALLY INVOLVES THE REPAIR OF DETERIORATED PLUMBING PIPING IN A CHASE WALL, AND REQUIRED RELATED WORK.

DIVISION ONE - GENERAL CONDITIONS

GENERAL:

INSTALL WORK IN STRICT ACCORDANCE WITH APPLICABLE RULES AND REGULATIONS OF LOCAL AND STATE GOVERNMENTS AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION.

DRAWINGS & SPECIFICATIONS INDICATE THE MINIMUM STANDARDS OF CONSTRUCTION, BUT SHOULD ANY WORK INDICATED BE SUB-STANDARD TO ANY ORDINANCES, LAWS, CODES, RULES OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL EXECUTE WORK IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES AND REGULATIONS.

CONFINE OPERATIONS AT THE SITE TO THE AREAS PERMITTED UNDER THE CONTRACT. PORTIONS OF THE SITE BEYOND AREAS ON WHICH WORK IS INDICATED ARE NOT TO BE DISTURBED. CONFORM TO SITE RULES AND REGULATIONS AFFECTING THE WORK WHILE ENGAGED IN PROJECT CONSTRUCTION.

KEEP EXISTING DRIVEWAYS AND ENTRANCES SERVING THE PREMISES CLEAR AND AVAILABLE AT ALL TIMES. DO NOT USE THESE AREAS FOR PARKING OR STORAGE OF MATERIALS. AVOID ANY ACTIVITIES THAT PROHIBIT IMMEDIATE EMERGENCY RESPONSE OF THE FIRE ENGINE / CREW.

DO NOT UNREASONABLY ENCUMBER THE SITE WITH MATERIALS OR EQUIPMENT. CONFINE STOCKPILING OF MATERIALS AND LOCATION OF STORAGE SHEDS TO THE AREAS INDICATED. IF ADDITIONAL STORAGE IS NECESSARY, OBTAIN AND PAY FOR SUCH STORAGE ON SITE.

ANY DAMAGE TO EXISTING WORK OR NEWLY INSTALLED WORK WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR CAUSING DAMAGE TO REPAIR OR PAY RESTITUTION TO HAVE REPLACED.

CUTTING AND PATCHING:

CONTRACTOR REQUIRING CUTTING AND PATCHING OF NEWLY CONSTRUCTED WORK IN ORDER TO INSTALL HIS WORK, WHO HAS NOT COORDINATED NOR NOTIFIED OTHER APPROPRIATE ENTITIES OF SUCH REQUIREMENTS AT COORDINATION MEETINGS, SHALL BE RESPONSIBLE FOR PAYMENT OF SUCH WORK.

DO NOT CUT AND PATCH STRUCTURAL WORK IN A MANNER THAT WOULD RESULT IN A REDUCTION OF LOAD-CARRYING CAPACITY OR OF LOAD-DEFLECTION RATIO.

DO NOT CUT AND PATCH OPERATIONAL ELEMENTS OR OTHER COMPONENTS IN A MANNER THAT WOULD RESULT IN A REDUCTION OF THEIR CAPACITY TO PERFORM IN THE MANNER INTENDED, INCLUDING ENERGY PERFORMANCE, OR THAT WOULD RESULT IN INCREASED MAINTENANCE OR DECREASED OPERATIONAL LIFE.

DO NOT CUT AND PATCH WORK EXPOSED ON THE BUILDING'S EXTERIOR OR IN ITS OCCUPIED SPACES, IN A MANNER THAT WOULD, IN THE ARCHITECT/ENGINEER'S OPINION, RESULT IN LESSENING THE BUILDING'S AESTHETIC QUALITIES. DO NOT CUT AND PATCH WORK IN A MANNER THAT WOULD RESULT IN SUBSTANTIAL VISUAL EVIDENCE OF CUT AND PATCH WORK. REMOVE AND REPLACE WORK JUDGED BY OWNER TO BE CUT AND PATCHED IN A VISUALLY UNSATISFACTORY MANNER.

EXCEPT AS OTHERWISE INDICATED, OR AS DIRECTED BY THE ARCHITECT/ENGINEER, USE MATERIALS FOR CUTTING AND PATCHING THAT ARE IDENTICAL TO EXISTING MATERIALS. IF IDENTICAL MATERIALS ARE NOT AVAILABLE, OR CANNOT BE USED, USE MATERIALS THAT MATCH EXISTING ADJACENT SURFACES TO THE FULLEST EXTENT POSSIBLE WITH REGARD TO VISUAL EFFECT. USE MATERIALS FOR CUTTING AND PATCHING THAT WILL RESULT IN EQUAL-OR-BETTER PERFORMANCE CHARACTERISTICS.

PROTECT OTHER WORK DURING CUTTING AND PATCHING TO PREVENT DAMAGE. PROVIDE PROTECTION FROM ADVERSE WEATHER CONDITIONS FOR THAT PART OF THE PROJECT THAT MAY BE EXPOSED DURING CUTTING AND PATCHING OPERATIONS.

EMPLOY SKILLED WORKMEN TO PERFORM CUTTING AND PATCHING WORK. EXCEPT AS OTHERWISE INDICATED OR AS APPROVED BY THE OWNER, PROCEED WITH CUTTING AND PATCHING AT THE EARLIEST FEASIBLE TIME AND COMPLETE WORK WITHOUT DELAY.

RESTORE EXPOSED FINISHES OF PATCHED AREAS AND WHERE NECESSARY EXTEND FINISH RESTORATION INTO RETAINED ADJOINING WORK IN A MANNER WHICH WILL ELIMINATE EVIDENCE OF PATCHING AND REFINISHING.

CLEANING AND PROTECTION:

THOROUGHLY CLEAN AREAS AND SPACES WHERE WORK IS PERFORMED OR USED AS ACCESS TO WORK. REMOVE COMPLETELY EXCESS PAINT, MORTAR, OILS, PUTTY AND ITEMS OF SIMILAR NATURE. THOROUGHLY CLEAN PIPING, CONDUIT AND SIMILAR FEATURES BEFORE PAINTING OR OTHER FINISHING IS APPLIED. RESTORE DAMAGED PIPE COVERING TO ITS ORIGINAL CONDITION. AS FACILITY WILL REMAIN IN OPERATION - CLEAN WORK AREAS DAILY.

TEMPORARY SERVICES:

OPERATE TEMPORARY SERVICES AND FACILITIES IN A SAFE AND EFFICIENT MANNER. DO NOT OVERLOAD TEMPORARY SERVICES OR FACILITIES, AND DO NOT PERMIT THEM TO INTERFERE WITH THE PROGRESS OF THE WORK. DO NOT ALLOW UNSANITARY CONDITIONS, PUBLIC NUISANCES OR HAZARDOUS CONDITIONS TO DEVELOP OR PERSIST ON THE SITE.

AS THE FACILITY WILL REMAIN IN CONSTANT 24-HOUR OPERATION, ISOLATE ANY WATER AND/OR ELECTRIC DISRUPTIONS TO THE IMMEDIATE WORK AREA. PROVIDE TEMPORARY CONSTRUCTION TO DO SO IF NECESSARY.

DIVISION THREE - CONCRETE

GENERAL:

FOOTINGS MUST REST ON UNDISTURBED AND FIRM BOTTOMS. MINIMUM DIMENSION BETWEEN GRADE AND BOTTOM OF FOOTINGS SHALL BE AS INDICATED ON THE DRAWINGS. TRIM BOTTOM TO REQUIRED LINES AND GRADES TO PROVIDE SOLID BASE TO RECEIVE CONCRETE. FOOTING TRENCHES SHALL RECEIVE 3 PASSES WITH A VIBRATING COMPACTOR AND SHALL BE FREE OF WATER AND DEBRIS PRIOR TO POURING.

FOUNDATION BACKFILL SHALL BE CLEAN COMPACTED SAND, FREE OF ALL DEBRIS, TOPSOIL AND VEGETATION. FILL SHALL BE PLACED AS SOON AS WALLS ARE UP TO FLOOR LEVEL. GRANULAR FILL UNDER CONCRETE FLOOR SLABS SHALL BE APPROVED GRAVEL RANGING BETWEEN 1/4" AND 1/2" IN SIZE, COMPACTED.

CONCRETE SLAB FLOORS SHALL BE POURED OVER A MIN. 4" COMPACTED AGGREGATE BASE AND A 6 MIL VAPOR RETARDER.

REINFORCING:

REINFORCING STEEL SHALL BE DEFORMED BARS CUT TO LENGTH AND BENT TO MEET THE DRAWING REQUIREMENTS. METAL FABRIC SHALL BE COLD DRAWN STEEL WIRE, RECTANGULAR OR SQUARE MESH IN SIZES INDICATED. LAP MESH ONE SQUARE AND WIRE SECURELY. REINFORCING BARS SHALL CONFORM TO ASTM A 615, GRADE 60. WELDED WIRE SHALL CONFORM TO ASTM A 185.

CONCRETE, REINFORCEMENT AND PLACEMENT METHODS SHALL BE IN ACCORDANCE WITH ACI STANDARDS. ALL CONCRETE SHALL BE A NOMINAL 1-3-6 MIX TO PRODUCE AT LEAST 3,500 PSI CONCRETE AT 28 DAYS. EXTERIOR CONCRETE SHALL BE AIR ENTRAINED 5% WITH A 4" SLUMP. CURE CONCRETE IN ACCORDANCE WITH ACI SPECIFICATIONS. ALL FORMS AND TRENCHES SHALL BE FREE FROM LOOSE MATERIALS, WATER OR ICE BEFORE POURING. PROTECT ALL CONCRETE FOR A MINIMUM OF FIVE DAYS OR UNTIL PROPERLY CURED WITH A LAYER OF VAPOR PROOF MATERIAL SECURELY AND TIGHTLY HELD IN PLACE.

CONCRETE MIX:

DESIGN CONCRETE MIX TO PRODUCE NORMAL WEIGHT CONCRETE CONSISTING OF PORTLAND CEMENT, AGGREGATE, AIR-ENTRAINING ADMIXTURE AND WATER TO PRODUCE THE FOLLOWING PROPERTIES. ADMIXTURES WILL BE ALLOWED ACCORDING TO WEATHER CONDITIONS/TEMPERATURES.

1. COMPRESSIVE STRENGTH AT 28 DAYS:
   BELOW GRADE (FOOTINGS, GRADE BEAMS) = 3,500 PSI
   SLABS NOT SUBJECT TO DE-ICER (INTERIOR SLABS)= 3,500 PSI
   SLABS SUBJECT TO DE-ICER (AT DUMPSTER, CURBS, WALKS) = 3,500 PSI
2. SLUMP RANGE: 4"
3. AIR CONTENT: 9%

PROTECT AND CURE FINISHED CONCRETE IN ACCORDANCE WITH ACI STANDARDS. USE MEMBRANE FORMING, CURING AND SEALING COMPOUND OR APPROVED MOIST-CURING METHODS.

PROVIDE APPROPRIATE SLAB FINISH FOR THE SPECIFIC APPLICATION. PROVIDE SCRATCH, FLOAT, TROWEL AND LIGHT BROOM FINISHES AS INDICATED ON THE DRAWINGS AND AS RECOMMENDED BY THE FINISH FLOORING MANUFACTURER.

SAW-CUT CONTROL JOINTS IN SLABS SHALL BE IN ACCORDANCE WITH ACI STANDARDS. USE SOFT CUT METHOD FOR INTERIOR SLABS. EXTERIOR SLABS SHALL RECEIVE TOOLED JOINTS.

CONCRETE TESTING:

THE CONTRACTOR SHALL EMPLOY A TESTING LABORATORY ACCEPTABLE TO THE OWNER TO PERFORM MATERIAL EVALUATION TESTS AND TO DESIGN CONCRETE MIXES. SAMPLING AND TESTING SHALL BE DONE IN ACCORDANCE WITH ACI STANDARDS AND APPLICABLE ASTM PROCEDURES.

DIVISION FOUR - MASONRY

CONCRETE MASONRY UNITS SHALL BE STANDARD WEIGHT, LOAD BEARING UNITS, NOMINAL SIZE OF 4" OR 8" X 8" X 16" WITH STANDARD SMOOTH FACES WHERE INDICATED. HORIZONTAL REINFORCEMENT SHALL BE LADDER TYPE, PLACED EVERY OTHER COURSE. FIELD VERIFY TIE-INTO EXISTING CONSTRUCTION.

MASONRY MORTAR SHALL BE TYPE RECOMMENDED BY MASONRY MATERIAL MANUFACTURER FOR THE SPECIFIC LOCATION AND INSTALLATION APPLICATION.

DIVISION FIVE - METALS

METAL SURFACES, GENERAL: FOR METAL FABRICATIONS EXPOSED TO VIEW UPON COMPLETION OF THE WORK, PROVIDE MATERIALS SELECTED FOR THEIR FLATNESS, SMOOTHNESS, AND FREEDOM FROM SURFACE BLEMISHES. DO NOT USE MATERIALS WHOSE EXPOSED SURFACES EXHIBIT PITTING, SEAM MARKS, ROLLED TRADE NAMES, ROUGHNESS, AND, FOR STEEL SHEET, VARIATIONS IN FLATNESS EXCEEDING THOSE PERMITTED BY REFERENCE STANDARDS FOR STRETCHER-LEVELED SHEET.
STEEL PIPE: ASTM A 53; FINISH, TYPE, AND WEIGHT CLASS AS FOLLOWS:

1. FINISH, COLOR BY OWNER.
2. GALVANIZED FINISH FOR EXTERIOR INSTALLATIONS AND WHERE INDICATED.
3. TYPE S, GRADE A, STANDARD WEIGHT (SCHEDULE 40), UNLESS OTHERWISE INDICATED, OR ANOTHER GRADE OR WEIGHT OR BOTH REQUIRED BY STRUCTURAL LOADS.

CONCRETE INSERTS: THREADED OR WEDGE TYPE, GALVANIZED FERROUS CASTINGS, EITHER MALLEABLE IRON, ASTM A 47, OR CAST STEEL, ASTM A 27. PROVIDE BOLTS, WASHERS, AND SHIMS ARE REQUIRED, HOT-DIP GALVANIZED PER ASTM A 153.
WELDING RODS AND BARE ELECTRODES: SELECT IN ACCORDANCE WITH AWS SPECIFICATIONS FOR THE METAL ALLOY TO BE WELDED.

SHOP PRIMER FOR FERROUS METAL: MANUFACTURE'S OR FABRICATOR'S STANDARD, FAST-CURING, LEAD-FREE, UNIVERSAL MODIFIED ALKYD PRIMER SELECTED FOR GOOD RESISTANCE TO NORMAL ATMOSPHERIC CORROSION, FOR COMPATIBILITY WITH FINISH PAINT SYSTEMS INDICATED, AND FOR CAPABILITY TO PROVIDE A SOUND FOUNDATION FOR FIELD-APPLIED TOPCOATS DESPITE PROLONGED EXPOSURE COMPLYING WITH PERFORMANCE REQUIREMENTS OF FS TT-P-645.PRIMED SURFACES SHALL BE FREE OF RUNS, FLAKING OR DEFECTS..

GALVANIZING REPAIR PAINT: HIGH ZINC DUST CONTENT PAINT FOR REGALVANIZING WELDS IN GALVANIZED STEEL, WITH DRY FILM CONTAINING NOT LESS THAN 94 PERCENT ZINC DUST BY WEIGHT, AND COMPLYING WITH DOD-P-21035 OR SSPC-PAINT-20.

DIVISION SEVEN - THERMAL AND MOISTURE PROTECTION

INSULATION:

PLACE CHASE WALL INSULATION TO PREVENT FIXTURES AND PIPING FROM FREEZING.

INTERIOR INSULATION SHALL BE SOUND ATTENUATION BATTS, THICKNESS TO MATCH THE CAVITY THICKNESS. SOUND ATTENUATION BATTS SHALL BE INSTALLED IN ALL INTERIOR WALLS AND IN FLOOR - CEILING ASSEMBLIES.

FOUNDATION AND SLAB PERIMETER INSULATION SHALL BE RIGID EXTRUDED POLYSTYRENE BOARD, R-10.

CEILING INSULATION SHALL BE R-38 BLOWN FIBERGLASS OR FIRE TREATED CELLULOSE.

JOINT SEALERS:

PROVIDE JOINT SEALERS, JOINT FILLERS AND OTHER RELATED MATERIALS THAT ARE COMPATIBLE WITH ONE ANOTHER AND WITH JOINT SUBSTRATES UNDER CONDITIONS OF SERVICE AND APPLICATION, AS DEMONSTRATED BY SEALANT MANUFACTURER BASED ON TESTING AND FIELD EXPERIENCE.

PROVIDE COLOR OF EXPOSED JOINT SEALERS INDICATED OR, IF NOT OTHERWISE INDICATED, AS SELECTED BY ARCHITECT FROM MANUFACTURER'S STANDARD COLORS.

INSTALL SEALANTS BY PROVEN TECHNIQUES THAT RESULT IN SEALANTS DIRECTLY CONTACTING AND FULLY WETTING JOINT SUBSTRATES, COMPLETELY FILLING RECESSES PROVIDED FOR EACH JOINT CONFIGURATION, AND PROVIDING UNIFORM, CROSS-SECTIONAL SHAPES AND DEPTHS RELATIVE TO JOINT WIDTHS WHICH ALLOW OPTIMUM SEALANT MOVEMENT CAPABILITY.

DIVISION EIGHT - DOORS AND WINDOWS

STEEL DOORS AND FRAMES:

HOLLOW METAL DOORS SHALL BE 1 3/4" THICK WITH INSULATED CORE FOR SOUND DEADENING.

HOLLOW METAL INTERIOR DOORS AND FRAMES SHALL BE 18 GAUGE.

METAL DOORS AND FRAMES SHALL RECEIVE A FACTORY APPLIED RUST-INHIBITIVE PRIMER, SUITABLE AS BASE FOR FINISH COATINGS.

DOORS SHALL BE FLUSH, SLAB DOOR. PAINT, COLOR AS SELECTED BY OWNER.

FINISH HARDWARE:

MOUNT HARDWARE UNITS AT HEIGHTS INDICATED IN "RECOMMENDED LOCATIONS FOR BUILDERS HARDWARE FOR STANDARD STEEL DOORS AND FRAMES" BY THE DOOR AND HARDWARE INSTITUTE EXCEPT AS SPECIFICALLY INDICATED OR REQUIRED TO COMPLY WITH GOVERNING REGULATIONS.

INSTALL EACH HARDWARE ITEM IN COMPLIANCE WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. WHEREVER CUTTING AND FITTING IS REQUIRED TO INSTALL HARDWARE ONTO OR INTO SURFACES WHICH ARE LATER TO BE PAINTED OR FINISHED IN ANOTHER WAY, COORDINATE REMOVAL, STORAGE AND REINSTALLTION OR APPLICATION OF SURFACE PROTECTIONS WITH FINISHING WORK SPECIFIED IN THE DIVISION-9 SECTIONS. DO NOT INSTALL SURFACE-MOUNTED ITEMS UNTIL FINISHES HAVE BEEN COMPLETED ON THE SUBSTRATE, UNLESS REQUIRED TO SECURE BUILDING.

SET UNITS LEVEL, PLUMB AND TRUE TO LINE AND LOCATION. ADJUST AND REINFORCE THE ATTACHMENT SUBSTRATE AS NECESSARY FOR PROPER INSTALLATION AND OPERATION.

MANUFACTURERS: SUBJECT TO COMPLIANCE WITH REQUIREMENTS, PROVIDE PRODUCTS OF ONE OF THE FOLLOWING MANUFACTURERS:

1. CYLINDERS: BEST, CORBIN, SARGENT, SCHLAGE, YALE.
2. BUTTS AND HINGES: HAGER, LAWRENCE, McKINNEY, STANLEY.
3. LOCKSETS: BEST, CORBIN, RUSSWIN, SARGENT, SCHLAGE, YALE.
4. KICKPLATES/CRASHPLATES: BALDWIN, BROOKLINE, CIPCO, HIAWATHA, TRIMCO.
5. OVERHEAD CLOSERS: CORBIN, LCN, NORTON, RUSSWIN, SARGENT, YALE.
6. DOOR CONTROL DEVICES: BROOKLINE, GLYNN-JOHNSON, IVES, TRIMCO, QUALITY.
7. DOOR STRIPPING AND SEALS: NATIONAL GUARD, PEMKO, REESE, ZERO.
8. THRESHOLDS: NATIONAL GUARD, PREMKO, REESE, SEALEZE, ZERO.

SEE DRAWING SHEETS FOR DOOR HARDWARE SCHEDULE

HARDWARE SHALL BE IN ACCORDANCE WITH STATE AND NATIONAL BUILDING CODES AND ACCESSIBILITY REQUIREMENTS. DOOR HARDWARE SHALL BE AS INDICATED ON THE DRAWINGS AND THE HARDWARE SCHEDULE. ALL EXTERIOR DOORS SHALL RECEIVE THRESHOLDS, WEATHERSTRIPPING AND BUTTS WITH NON-REMOVABLE PINS. INTERIOR DOORS SHALL RECEIVE 1 1/2 PAIR OF BUTTS AND LOCKSETS COMPATIBLE FOR THE TYPE OF OPENING. HANDLE DESIGN SHALL BE LEVER TYPE WHERE INDICATED BY THE DRAWINGS. ALL DOORS SHALL RECEIVE A COMPATIBLE STOP FOR THE SPECIFIC OPENING CONDITION EITHER WALL TYPE OR FLOOR TYPE.

DIVISION NINE - FINISHES

CERAMIC WALL TILE: MATTE BISCUIT K775 (1)

CERAMIC WALL TILE SHALL BE NOMINAL 8" X 24" X 5/16" STACKED HORIZONTAL PATTERN UNLESS INDICATED OTHERWISE BY OWNER OR ARCHITECT. COORDINATE INSTALLATION OF NEW WORK WITH EXISTING TO PROVIDE A COMPLETE AND LOGICAL APPEARANCE. PROVIDE ALUMINUM EDGE TRIM WHERE REQUIRED BY THE PARTICULAR CIRCUMSTANCE. GROUT JOINTS FULL AND FLUSH. SEAL GROUT JOINTS. GROUT TYPE AS RECOMMENDED FOR THE PARTICULAR USE AND TILE.

SHOWER FLOOR TILE: URBAN PUTTY SPECKLE (1) (D201 2X2 MOSAIC)

NEW FLOOR TILE IN SHOWERS AND NEW CONCRETE FLOOR INFILL AREAS SHALL BE NOMINAL 2" X 2" X 5/16" TUMBLED GRANITE (NON-SLIP) TILE. EXACT COLOR AND PATTERN TO BE SELECTED BY THE OWNER. GROUT JOINTS FULL AND FLUSH. SEAL GROUT JOINTS. GROUT TYPE AS RECOMMENDED FOR THE PARTICULAR USE AND TILE.

GROUT FOR SHOWERS AND WALLS: PALE UMBER 5044

TOILET ROOM FLOOR TILE: 33 FALCON

NEW FLOOR TILE AND BASE IN TOILET ROOM, SUMMITVILLE 6" X 6" QUARRY TILE

WATERPROOFING AND ACCESSORIES AT TILE INSTALLATIONS:

AT FLOOR TILE: SCHLUTER KERDI BONDED WATERPROOFING ADN VAPOR BARRIER MEMBRANE.

AT WALL TILE: SCHLUTER DITRA UNCOUPLING AND WATERPROOFING MEMBRANE.

SCHLUTER ALL-SET GRAY THINSET.

SCHLUTER QUADEC ALUMINUM 100.

PAINTING AND STAIN:

PROVIDE BEST QUALITY GRADE OF VARIOUS TYPES OF COATINGS AS REGULARLY MANUFACTURED BY ACCEPTABLE PAINT MATERIALS MANUFACTURERS. MATERIALS NOT DISPLAYING MANUFACTURER'S IDENTIFICATION AS A STANDARD, BEST-GRADE PRODUCT WILL NOT BE ACCEPTABLE.

APPLY PAINT IN ACCORDANCE WITH MANUFACTURER'S DIRECTIONS. USE APPLICATORS AND TECHNIQUES BEST SUITED FOR SUBSTRATE AND TYPE OF MATERIAL BEING APPLIED. APPLY PAINT TO INSTALLED FERROUS AND NON-FERROUS METALS INDICATED TO BE FIELD PAINTED, SUCH AS DOORS, FRAMES, RAILINGS, STAIRS, LADDERS, ETC. AT THE CONTRACTOR'S OPTION. INSURE COMPLETE COVERAGE AND UNIFORM FINISH. TOUCH-UP AS REQUIRED.

PAINT SHALL BE AS FOLLOWS:

EXTERIOR PAINT SCHEDULE:

GENERAL: PROVIDE THE FOLLOWING PAINT SYSTEMS OF ONE OF THE FOLLOWING MANUFACTURERS: PORTER, MAB, SHERWIN WILLIAMS, GLIDDEN, BENJAMIN MOORE, DEVOE.

1. FERROUS METAL:
   a. ACRYLIC SEMI-GLOSS FINISH:
      1. PRIMER: 1 COAT #41702 METACLAD ACRYLIC PRIMER.
      2. FINISH: 2 COATS #83XX MIRROLAC-WB ACRYLIC SEMI-GLOSS COATING
2. NON-FERROUS METAL:
   a. ACRYLIC SEMI-GLOSS FINISH:
      1. PRIMER: 1 COAT#41702 METACLAD ACYLIC PRIMER.
      2. FINISH: 2 COAT #83XX MIRROLAC-WB ACRYLIC SEMI-GLOSS COATING.
3. CONCRETE MASONRY UNIT:
   a. ACRYLIC LATEX SATIN FINISH:
      1. PRIMER: 1 COAT #52901 BLOXFIL ACRYLIC LATEX BLOCK FILLER.
      2. FINISH: 2 COATS #16XX WONDER-SHIELD ACRYLIC LATEX SATIN HOUSE PAINT
4. WOOD:
   a. ACRYLIC SEMI-GLOSS FINISH:
      1. PRIMER: 1 COAT #1502 WONDER-SHIELD ACRYLIC LATEX HOUSE PAINT.
      2. FINISH: 2 COATS #83XX MIRROLAC-WB ACRYLIC SEMI-GLOSS COATING.

INTERIOR PAINT SCHEDULE:

GENERAL: PROVIDE THE FOLLOWING PAINT SYSTEMS BASED ON DEVOE TO ESTABLISH QUALITY STANDARD FOR THE VARIOUS SUBSTRATES, AS INDICATED.

1. FERROUS METAL:
   a. ACRYLIC SEMI-GLOSS ENAMEL FINISH:
      1. PRIMER: 1 COAT #41702 METACLAD ACRYLIC LATEX PRIMER.
      2. FINISH: 2 COATS #83XX MIRROLAC-WB ACRYLIC SEMI-GLOSS ENAMEL.
2. NON-FERROUS METAL:
   a. ACRYLIC SEMI-GLOSS ENAMEL FINISH:
      1. PRIMER: 1 COAT #41702 METACLAD ACRYLIC LATEX PRIMER.
      2. FINISH: 2 COATS #83XX MIRROLAC-WB ACRYLIC SEMI-GLOSS ENAMEL.
3. GYPSUM WALL BOARD AND PLASTER:
   a. ACRYLIC LATEX SATIN ENAMEL FINISH:
      1. PRIMER: 1 COAT #50801 WONDER TONES LATEX PRIMER-SEALER.
      2. FINISH: 2 COATS #35XX WONDER TONE ACRYLIC LATEX SATIN ENAMEL.

SOLID SURFACE VANITY:

VANITY SHALL BE CORIAN, GENESIS FAMILY, OR APPROVED EQUAL. COLOR BY OWNER.

DIVISION TEN - SPECIALTIES

TOILET ACCESSORIES:

EXISTING TOILET ACCESSORIES ARE INTENDED TO REMAIN. EITHER REMOVE, STORE AND RE-INSTALL EXISTING ACCESSORIES IN SAME LOCATIONS, OR LEAVE IN PLACE IF POSSIBLE AND PROTECT FROM DAMAGE. THIS INCLUDES THE EXISTING TOILET PAPER DISPENSERS, TOWEL DISPENSER, SOAP DISPENSER, AND WALL MIRROR.

NEW TOILET PARTITIONS SHALL BE INSTALLED IN SAME LOCATIONS. PARTITIONS SHALL BE STEEL WITH BAKED ENAMEL PAINTED FINISH, COLOR BY OWNER. PARTITIONS SHALL BE FLOOR MOUNTED, OVERHEAD BRACED. PROVIDE A COMPLETE INSTALLATION WITH DOOR LATCHES, COAT HOOKS, AND WALL BUMPERS WHERE REQUIRED.

1 Architectural Specifications

No Scale

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MICHAEL L. EWALD REGISTERED AR 10700019 STATE OF INDIANA ARCHITECT

MICHAEL L. EWALD, AIA
DATE: MAY 29, 2025
EXPIRES: 12-01-2027

EFD Fire Station No. 15 Renovations
Evansville Fire Department
Evansville, Indiana
Fire Chief Tony Knight

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Architectural Specifications

SHEET NO:

A-3.6

Plumbing Specifications

1. IT IS THE INTENT OF THESDE SPECIFICATIONS TO COVER FIRST CLASS WORKMANSHIP THROUGHOUT. PERSONNEL SHALL BE THOROUGHLY TRAINED AND EXPERIENCED IN THE PRODUCTS INVOLVED AND RECOMMENDED METHODS FOR THEIR FABRICATION AND INSTALLATION. NO ALLOWANCE SHALL BE MADE FOR LACK OF SKILL ON THE PART OF THE WORKER IN THE ACCEPTANCE AND/ OR REJECTION OF COMPLETED WORK.

2. MATERIALS AND EQUIPMENT SHALL BE NEW AND INSTALLED AS INDICATED ON THE DRAWINGS AND/ OR SPECIFICATIONS. THEY SHALL BE INSTALLED PLUMB AND TRUE-TO-LINE WITH ADJACENT WORK. WHERE INSTALLATION METHODS ARE NOT SPECIFICALLY COVERED BY THE DRAWINGS AND/ OR SPECIFICATIONS, FIRST CLASS TRADE PRACTICES AND MANUFACTURER'S WRITTEN SPECIFICATIONS AND RECOMMENDATIONS SHALL GOVERN.

3. CAREFULLY EXAMINE ALL CIVIL, STRUCTURAL, ARCHITECTURAL, PLUMBING, AND ELECTRICAL DRAWINGS PERTAINING TO THE CONSTRUCTION. COOPERATE WITH OTHER TRADES IN LOCATING PIPING, EQUIPMENT, ETC. IN ORDER TO AVOID CONFLICT WITH OTHER TRADE'S WORK. NO CLAIM FOR COSTS WILL BE ALLOWED FOR RELOCATING EQUIPMENT, PIPING, ETC. THAT INTERFERES WITH OTHER TRADE'S WORK.

4. IN ADDITION TO ANY STANDARD GUARANTEE PROVIDED BY THE MANUFACTURER, THE CONTRACTOR SHALL FURNISH TO THE OWNER A WRITTEN GUARANTEE AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR ALL EQUIPMENT AND MATERIALS FURNISHED AND FOR WORKMANSHIP OF INSTALLATION FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE OF WORK. DURING GUARANTEE PERIOD AND WITHOUT EXPENSE TO THE OWNER, REPAIR ALL DEFECTS IN WORKMANSHIP OR MATERIAL PROVIDED.

5. DRAWINGS ARE DIAGRAMATIC AND INDICATE THE GENERAL ARRANGEMNET OF PIPING EQUIPMENT, ETC. DO NOT SCALE THE DRAWINGS. THE EXACT LOCATION AND/ OR ROUTING OF PIPING , ETC. UNLESS SPECIFICALLY DIMENSIONED ON THE DRAWINGS, SHALL BE DETERMINED IN THE FIELD. MAKE REASONABLE MODIFICATIONS IN THE INSTALLATION SO ALL PIPING. EQUIPMENT, ETC. FIT PROPERLY AND CAN BE SERVICED. COORDINATE ALL INSTALLATIONS AND ROUTING WITH OTHER TRADES.

6. PLUMBING EQUIPMENT AND INSTALLATION SHALL CONFORM TO THE LATEST EDITION OF;
   - STATE BUILDING CODE
   - STATE PLUMBING CODE
   - STATE MECHANICAL CODE
   - STATE FIRE CODE
   - STATE ENERGY CODE
   - NATIONAL ELECTRIC CODE
   - APPLICABLE OSHA AND NFPA STANDARDS
   - COUNTY AND CITY BUILDING REGULATIONS AND CODES

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PLUMBING PENETRATIONS REQUIRED THROUGH WALL. FLOORS. ETC.

8. INSTALL PROPER ADAPTERS AT ALL CHANGES IN PIPING MATERIALS.

9. INSTALL DIELECTRIC UNIONS / COUPLINGS OR INSULATED FLANGE KITS AT ALL JUNCTIONS OF DISSIMILAR METAL PIPING SYSTEMS.

10. ALL VALVES SHALL BE INSTALLED IN LOCATIONS WHERE THEY ARE ACCESSIBLE AND ABLE TO BE OPERATED AND MAINTAINED. PROVIDE ACCESS PANELS AS REQUIRED. RECORD ALL VALVE LOCATIONS ON "AS-BUILT" DRAWINGS.

11. THE CONTRACTOR SHALL ARRANGE AND PAY FOR ALL PLUMBING PERMITS AND INSPECTIONS AS REQUIRED BY LOCAL ORDINANCES.

12. UNLESS INDICATED OTHERWISE, SANITARY DRAIN AND VENT PIPING SHALL BE TYPE DWV PLASTIC.

13. UNLESS INDICATED OTHERWISE, UNDER BUILDING SLAB WATER PIPING SHALL BE SOFT COPPER TUBE, ASTM B88, TYPE K WITH WROUGHT COPPER, SOLDER-JOINT FITTINGS AND BRAZED JOINTS.

14. ABOVE GROUND WATER PIPING SHALL BE HARD DRAWN TYPE L COPPER, ASTM B88, ASTM B75 WITH LEAD-FREE SOLDER JOINTS AND WROUGHT STEEL FITTING ANSI B16-22, STREAMLINED PATTERN.

15. INSULATE ALL HOT WATER, HOT WATER RETURN, AND COLD WATER PIPING WITH 1" THICK FIBERGLASS INSULATION CONFORMING TO ASTM C547, CLASS 1,

16. ALL EQUIPMENT SHALL BE INSTALLED PER NEC REQUIREMENTS AND TO ALLOW FOR CODE REQUIRED CLEARANCES AND MANUFACTURER'S RECOMMENDED CLEARANCES.

17. THE CONTRACTOR SHALL FURNISH ALL LABOR, MATERIALS, TOOLS, AND EQUIPMENT TO INSTALL ALL PUMBING SYSTEMS INDICATED ON THE DRAWINGS.

18. DELIVER MATERIALS TO THE PROJECT SITE IN GOOD CONDITION. STORE MATERIALS OFF THE GROUND AND PROTECTED FROM THE ELEMENTS.

19. AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL REMOVE FROM THE SITE AND DISPOSE OF ALL WASTE AND DISCARDED MATERIALS AND RESTORE DISTURBED AREAS AND SURFACES. PROVIDE ENTIRE INSTALLATION THOROUGHLY FREE FROM OIL, GREASE, DIRT, ETC. AFTER COMPLETING ALL TESTS AND BEFORE WORK IS TURNED OVER TO THE OWNER.

20. THE CONTRACTOR SHALL KEEP ACCURATE RECORDS OF ALL PIPING AND EQUIPMENT THAT DEVIATED FROM THE DRAWINGS. WITHIN 90 DAYS OF SUBSTANTIAL COMPLETION, THE CONTRACTOR SHALL PRESENT TO THE OWNER'S REPRESENTATIVE A MARKED SET OF DESIGN PRINTS WITH INDICATED CHANGES,

21. ALL PENETRATIONS THROUGH WALLS SHALL BE PROVIDED WITH PROPER SIZED SLEEVES. SEAL ALL PIPE SLEEVES WITH APPROPRIATE CAULKING. ALL SIX (6) INCH AND SMALLER PIPE PENETRATIONS THROUGH FIRE-RATED WALLS AND/ OR FLOORS SHALL BE INSTALLED IN ACCORDANCE WITH APPROPRIATE 3M FIRESTOP SYSTEM (OR APPROVED EQUAL.) ALL PIPE SLEEVES SHALL BE SCHEDULE 40, CARBON STEEL, ASTM A53, GRADE B.

HVAC Specifications

1. IT IS THE INTENT OF THESE SPECIFICATIONS TO COVER FIRST CLASS WORKMANSHIP THROUGHOUT. PERSONNEL SHALL BE THOROUGHLY TRAINED AND EXPERIENCED IN THE PRODUCTS INVOLVED AND RECOMMENDED METHODS FOR THEIR FABRICATION AND INSTALLATION. NO ALLOWANCE SHALL BE MADE FOR LACK OF SKILL ON THE PART OF THE WORKER IN THE ACCEPTANCE AND/ OR REJECTION OF COMPLETED WORK.

2. MATERIALS AND EQUIPMENT SHALL BE NEW AND INSTALLED AS INDICATED ON THE DRAWINGS AND/ OR SPECIFICATIONS. THEY SHALL BE INSTALLED PLUMB AND TRUE-TO-LINE WITH ADJACENT WORK. WHERE INSTALLATION METHODS ARE NOT SPECIFICALLY COVERED BY THE DRAWINGS AND/ OR SPECIFICATIONS, FIRST CLASS TRADE PRACTICES AND MANUFACTURER'S WRITTEN SPECIFICATIONS AND RECOMMENDATIONS SHALL GOVERN.

3. CAREFULLY EXAMINE ALL CIVIL, STRUCTURAL, ARCHITECTURAL, PLUMBING, AND ELECTRICAL DRAWINGS PERTAINING TO THE CONSTRUCTION. COOPERATE WITH OTHER TRADES IN LOCATING DUCTWORK, EQUIPMENT, ETC. IN ORDER TO AVOID CONFLICT. NO CLAIM FOR COSTS WILL BE ALLOWED FOR RELOCATING EQUIPMENT, DUCTWORK, ETC. THAT INTERFERES WITH WORK OF OTHER TRADES.

4. IN ADDITION TO ANY STANDARD GUARANTEE PROVIDED BY THE MANUFACTURER, THE CONTRACTOR SHALL FURNISH TO THE OWNER A WRITTEN GUARANTEE AGAINST DEFECTS IN MATERIALS AND WORKMANSHIP FOR ALL EQUIPMENT AND MATERIALS FURNISHED AND FOR WORKMANSHIP OF INSTALLATION FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE OF WORK. DURING GUARANTEE PERIOD AND WITHOUT EXPENSE TO THE OWNER, REPAIR ALL DEFECTS IN WORKMANSHIP OR MATERIAL PROVIDED.

5. DRAWINGS ARE DIAGRAMATIC AND INDICATE THE GENERAL ARRANGEMENT OF DUCTWORK, EQUIPMENT, ETC. DO NOT SCALE THE DRAWINGS. THE EXACT LOCATION AND/ OR ROUTING OF DUCTWORK, ETC. UNLESS SPECIFICALLY DIMENSIONED ON THE DRAWINGS, SHALL BE DETERMINED IN THE FIELD. MAKE REASONABLE MODIFICATIONS IN THE INSTALLATION SO ALL DUCTWORK, EQUIPMENT, ETC. FIT PROPERLY AND CAN BE SERVICED.

6. HVAC EQUIPMENT AND INSTALLATION SHALL CONFORM TO THE LATEST EDITION OF;
   - STATE BUILDING CODE
   - STATE PLUMBING CODE
   - STATE MECHANICAL CODE
   - STATE FIRE CODE
   - STATE ENERGY CODE
   - NATIONAL ELECTRIC CODE
   - APPLICABLE OSHA AND NFPA STANDARDS
   - COUNTY AND CITY BUILDING REGULATIONS AND CODES

7. FURNISH ALL LABOR, MATERIAL, TOOLS AND EQUIPMENT TO INSTALL ALL HVAC COMPONENTS AS INDICATED ON THESE DRAWINGS.

8. DELIVER MATERIALS TO PROJECT IN GOOD CONDITION. STORE MATERIALS OFF GROUND AND PROTECTED FROM THE ELEMENTS.

9. AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL REMOVE FROM THE SITE AND DISPOSE OF ALL RUBBISH AND DISCARDED MATERIALS AND RESTORE DISTURBED AREAS AND SURFACES. PROVIDE ENTIRE INSTALLATION THOROUGHLY FREE FROM ALL OIL, GREASE, DIRT, ETC. BEFORE WORK IS TURNED OVER TO THE OWNER.

10. THE CONTRACTOR SHALL KEEP ACCURATE RECORDS OF ALL DUCTWORK AND EQUIPMENT THAT DEVIATED FROM THE DRAWINGS. WITHIN 90 DAYS OF SUBSTANTIAL COMPLETION, THE CONTRACTOR SHALL PRESENT TO THE OWNER'S REPRESENTATIVE A MARKED SET OF DESIGN PRINTS WITH INDICATED CHANGES.

11. ALL EQUIPMENT SHALL BE IDENTIFIED WITH ENGRAVED MARKERS.

12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES AND PERMITS.

13. THE CONTRACTOR SHALL PROVIDE TRAINING TO THE OWNER ON ALL HVAC EQUIPMENT.

14. ALL EQUIPMENT SHALL BE INSTALLED PER NEC REQUIREMENTS AND TO ALLOW FOR CODE REQUIRED CLEARANCES AND MANUFACTURER'S RECOMMENDED CLEARANCES.

15. DUCTWORK: COMPLY WITH SMACNA'S "HVAC DUCT CONSTRUCTION STANDARDS - METAL AND FLEXIBLE" FOR ACCEPTABLE MATERIALS, MATERIAL THICKNESSES AND DUCT CONSTRUCTION METHODS.

16. INSULATION INSTALLER QUALIFICATIONS: SKILLED MECHANICS WHO HAVE SUCCESSFULLY COMPLETED AN APPRENTICESHIP PROGRAM OR ANOTHER CRAFT TRAINING PROGRAM CERTIFIED BY THE DEPARTMENT OF LABOR, BUREAU OF APPRENTICESHIP AND TRAINING.

17. PIPING MATERIALS SHALL BE AS FOLLOWS:

    A. CONDENSATE DRAIN LINES:
    - SCHEDULE 40 PVC
    - TYPE L COPPER

    B. REFRIGERANT PIPING:
    - ASTM B 280, TYPE ACR DRAWN TEMPER COPPER WITH BRAZED JOINTS
    - ASTM, B 88, TYPE L DRAWN TEMPER COPPER WITH BRAZED JOINTS

18. PIPE INSULATION SHALL BE AS FOLLOWS:

    A. CONDENSATE DRAIN:
    - 1/2" FLEXIBLE ELASTOMERIC

    B. REFRIGERANT PIPING:
    - 1" FLEXIBLE ELASTOMERIC

19. ENGAGE A TESTING, ADJUSTING AND BALANCING AGENT CERTIFIED BY EITHER AABC OR NEBB FOR ALL TESTING, ADJUSTING AND BALANCING. PROVIDE (4) COPIES OF TEST AND BALANCE REPORT.

Electrical Specifications

1. ALL ELECTRICAL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE AND WITH ALL OTHER APPLICABLE STATE AND LOCAL CODES.

2. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL FURNISH AND UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL FURNISH AND UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL FURNISH AND FIRST-CLASS CONSTRUCTION, AND SHALL BE THE PRODUCT OF AN ESTABLISHED AND REPUTABLE MANUFACTURER AND SHALL BE DESIGNED TO PERFORM THE SERVICE REQUIRED.

3. ALL ELECTRICAL SYSTEMS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE ENTIRE ELECTRICAL SYSTEM SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER AND ACCORDING TO GOOD PRACTICE.

4. ALL MATERIALS USED IN THE WORK SHALL BE APPROVED BY THE UNDERWRITER'S LABORATORIES, INC., AND SHALL BEAR THEIR LABEL WHERE SUCH APPROVAL IS AVAILABLE FOR THE TYPE OF MATERIAL.

5. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROCURE ALL PERMITS, CERTIFICATES, AND LICENSES REQUIRED OF HIM BY LAW FOR THE EXECUTION OF HIS WORK.

6. THE CONTRACTOR SHALL VISIT SITE TO OBTAIN KNOWLEDGE OF EXACT CIRCUIT DISTANCES AND INSTALLATION REQUIREMENTS.

7. CONDUCTORS NO. 8 AND LARGER SHALL BE CODE GRADE THWN STRANDED COPPER WIRE. CONDUCTORS SMALLER THAN NO. 8 SHALL BE CODE GRADE THHN WIRE, SOLID OR STRANDED COPPER. MINIMUM WIRE SIZE SHALL BE NO. 12, UNLESS NOTED OTHERWISE.

8. CONDUIT SHALL BE AS FOLLOWS: EMT OR MC CABLE SHALL BE USED FOR CONCEALED INTERIOR RACEWAYS AND ABOVE LAY-IN CEILINGS. LIQUID TIGHT FLEXIBLE METAL CONDUIT WITH LIQUID TIGHT CONNECTIONS SHALL BE USED FOR ALL MECHANICAL EQUIPMENT CONNECTIONS. FLEXIBLE METALLIC (NON-LIQUID-TIGHT) CONDUIT SHALL BE USED FOR LAY-IN TYPE LIGHTING FIXTURES. CONDUIT SHALL BE 1/2" MINIMUM SIZE. THE USE OF CRIMP TIGHT CONNECTORS FOR CONDUIT WILL NOT BE ALLOWED. UNDERGROUND CONDUIT SHALL BE PVC EXCEPT AT CONDUIT BEND THROUGH FLOOR WHERE CONDUIT SHALL BE RIGID. ALL WORK PER NEC.

9. DISCONNECT SWITCHES SHALL BE "HEAVY-DUTY" RATED. NEMA 1 OR 3R, AS REQUIRED.

10. WIRING DEVICES (SWITCHES AND RECEPTACLES) SHALL BE 20A, 125VAC "SPECIFICATION GRADE", IVORY FINISH WITH METAL DEVICE PLATE. SWITCH DEVICES SHALL BE HUBBELL 1221 OR APPROVED EQUAL BY BRYANT, ARROW-HART, OR PASS AND SEYMOUR. RECEPTACLES SHALL BE HUBBELL #5362 SERIES OR APPROVED EQUAL BY BRYANT, ARROW-HART, OR PASS AND SEYMOUR. UTILIZE GFI WHERE INDICATED.

11. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS PER ARCHITECTURAL FRONT END DOCUMENTS ON ALL ELECTRICAL EQUIPMENT EQUIPMENT INCLUDING LIGHT FIXTURES, SWITCHGEAR/ PANELBOARDS, WIRING DEVICES, DATA/VOICE CABLING, DISCONNECT SWITCHES/ CONTACTORS/ TIME CLOCK, MOTION SENSORS, TRANSFORMERS AND DATA/TELEPHONE SUPPORT SYSTEMS.

12. EXAMINE ALL ARCHITECTURAL, STRUCTURAL, PLUMBING AND HVAC CONSTRUCTION DRAWINGS. COOPERATE WITH OTHER TRADES IN LOCATING COMPONENTS IN ORDER TO AVOID CONFLICT WITH OTHER TRADE'S WORK. NO CLAIM FOR COSTS WILL BE ALLOWED FOR RELOCATING EQUIPMENT, ETC.. THAT INTERFERES WITH OTHER TRADES WORK.

13. IN ADDITION TO EQUIPMENT GUARANTEE PROVIDED BY MANUFACTURER, THE CONTRACTOR SHALL FURNISH OWNER A WRITTEN GUARANTEE AGAINST DEFECT IN ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE OF WORK. DURING GUARANTEE PERIOD AND WITHOUT EXPENSE TO THE OWNER, REPAIR ALL DEFECTS IN WORKMANSHIP OR MATERIAL PROVIDED.

14. DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF ELECTRICAL INSTALLATION. THE EXACT LOCATION AND / OR ROUTING OF CONDUIT, RECEPTACLES, PANELS ETC., SHALL BE DETERMINED IN THE FIELD. MAKE REASONABLE MODIFICATIONS IN THE INSTALLATION AS REQUIRED BASED ON FIELD CONDITIONS.

15. AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL REMOVE FROM THE SITE AND DISPOSE OF ALL RUBBISH AND DISCARDED MATERIALS.

16. THE ELECTRICAL CONTRACTOR SHALL KEEP ACCURATE RECORDS OF INSTALLATION THAT DEVIATED FROM THE DRAWINGS. AT THE COMPLETION OF PROJECT, CONTRACTOR SHALL PRESENT TO THE OWNER A MARKED UP SET OF AS BUILT PRINTS WITH INDICATED CHANGES.

17. THE ELECTRICAL CONTRACTOR SHALL KEEP ACCURATE RECORDS OF INSTALLATION THAT DEVIATED FROM THE DRAWINGS. AT THE COMPLETION OF PROJECT, CONTRACTOR SHALL PRESENT TO THE OWNER A MARKED UP SET OF AS BUILT PRINTS WITH INDICATED CHANGES.

18. ALL PENETRATIONS THROUGH WALLS AND FLOORS SHALL BE PROVIDED WITH PROPERLY SIZED SLEAVES. SEAL ALL SLEAVES WITH APPROPRIATE CAULK.

19. THE ELECTRICAL CONTRACTOR SHALL PROVIDE TRAINING TO THE OWNER ON ALL ELECTRICAL EQUIPMENT.

1 **MEP Specifications**

No Scale

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STATE OF
INDIANA
ARCHITECT

MICHAEL L. EWALD, AIA
DATE: MAY 29, 2025
EXPIRES: 12-01-2027

EFD Fire Station No. 15 Renovations

Evansville Fire Department
Evansville, Indiana
Fire Chief Tony Knight

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MEP Specifications

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GENERAL PLUMBING NOTES

1. ALL CONSTRUCTION DEBRIS SHALL BE DISPOSED OF BY THE CONTRACTOR, UNLESS NOTED OTHERWISE.
2. THERE SHALL BE NOTHING ABANDONED IN PLACE, UNLESS SPECIFICALLY IDENTIFIED AS SUCH.
3. THESE PLANS ARE DIAGRAMMATIC IN NATURE, CONTRACTORS SHALL INCLUDE APPROPRIATE ALLOWANCES FOR OFFSETS AS REQUIRED TO ACCOMMODATE VERTICAL AND HORIZONTAL VARIATIONS IN THE LOCATIONS AND ELEVATIONS OF DUCTWORK, PIPING AND EXISTING CONDITIONS.
4. EACH TRADE SHALL COORDINATE THE ROUTING AND INSTALLATION OF HIS WORK WITH THAT OF ALL OTHER TRADES THROUGH THE GENERAL CONTRACTOR. IN ANY INSTANCES OF CONFLICT, SYSTEMS REQUIRING "GRADE" OR "SLOPE" FOR DRAINAGE (SANITARY SEWER, SANITARY VENT, EQUIPMENT DRAINS, ETC...) SHALL HAVE PRIORITY.
5. PENETRATIONS OF WALLS OR FLOORS FOR THE PASSAGE OF PIPING, OR OTHER EQUIPMENT SHALL BE PROPERLY SEALED AFTER INSTALLATION OF EQUIPMENT. FIELD VERIFY EXISTING WALL PENETRATIONS AND PROPERLY SEAL AS REQUIRED TO MAINTAIN WALL OR FLOOR RATING.
6. PROVIDE ALL EQUIPMENT, MATERIAL, LABOR, SUPERVISION, COSTS AND SERVICES REQUIRED TO INSTALL COMPLETE AND WORKING SYSTEMS, INCLUDING ALL ITEMS AND APPURTENANCES NECESSARY, REASONABLE, INCIDENTAL OR CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM IS NOT SPECIFIED OR SHOWN.
7. ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, INCLUDING ADDENDA, AND APPLICABLE CODES AND STANDARDS.
8. INSTALL SHUT-OFF VALVES AT ALL EQUIPMENT.
9. CONTRACTOR SHALL VERIFY DIMENSIONS BEFORE STARTING WORK.
10. ALL EQUIPMENT INSTALLED AS PER CERTIFIED SHOP DRAWING FROM MFR.
11. ALL EXTERIOR EXPOSED GAS PIPING TO BE PAINTED WITH WATER PROOF PAINT. COORDINATE WITH ARCHITECT ON COLOR.
12. PIPING MUST CONFORM TO LOCAL AND STATE SEISMIC CODES.
13. C-CLAMPS ARE NOT TO BE USED WITHOUT A SEISMIC RETAINER STRAP ON ANY PROJECTS LOCATED WITHIN A SEISMIC ZONE.
14. NO PIPING SHALL BE RUN DIRECTLY OVER ANY ELECTRICAL PANELS, TRANSFORMERS, SWITCHGEAR ETC.

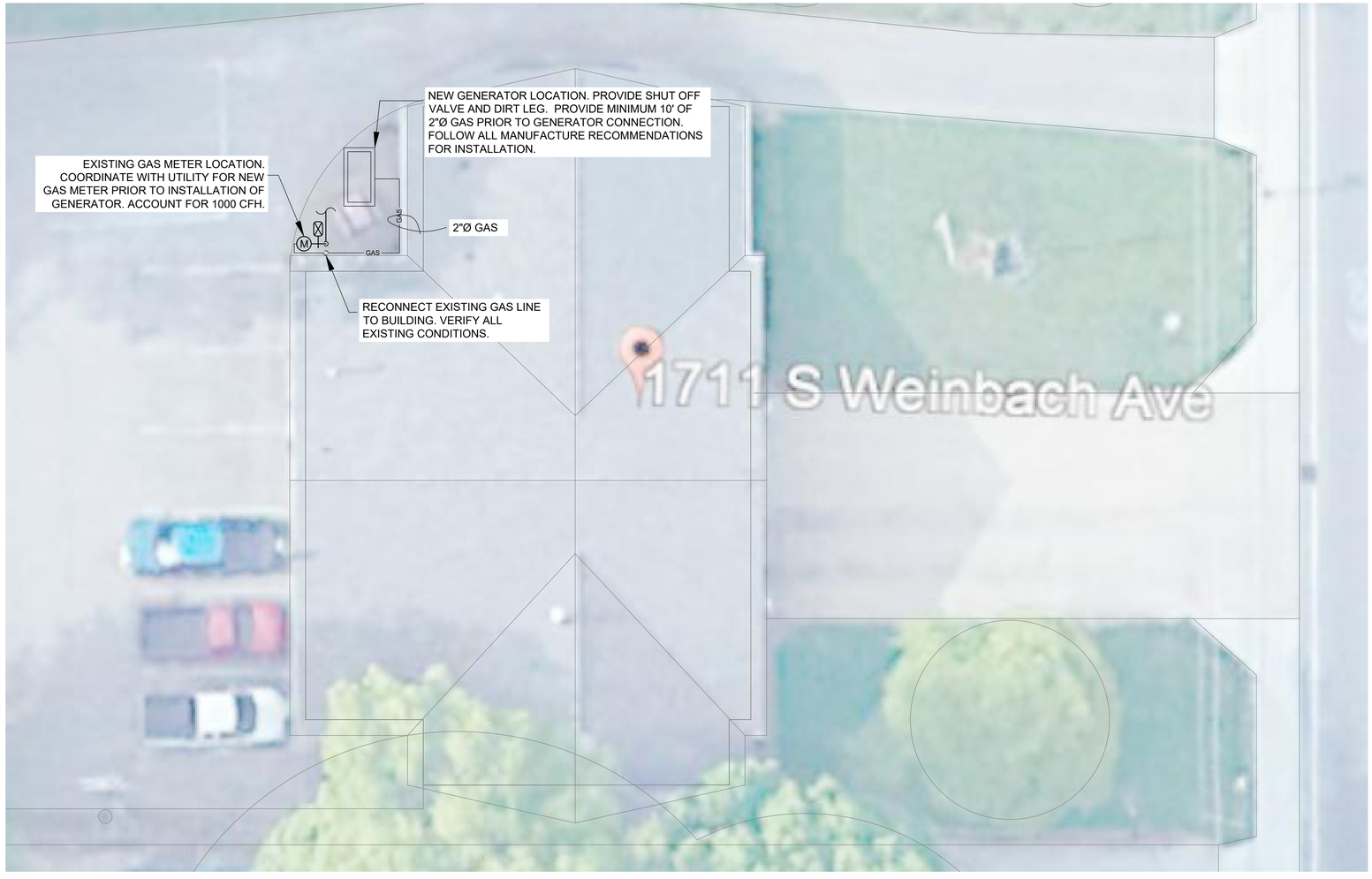
MATERIALS

NATURAL GAS -

PIPING TO BE BLACK STEEL SCHEDULE 40 OR CARBON STEEL

FITTINGS TO BE THREADED UP TO 2" IN DIA AND OVER MUST BE WELDED.

OR FITTINGS TO BE CARBON STEEL PRESS-CONNECT AND CONFORM TO ASTM F3226. PRESS CONNECT FITTING SHALL HAVE A FEATURE TO DETECT UNPRESSED FITTINGS SHALL BE INTEGRATED INTO THE BODY OF THE FITTING



1 GAS PLUMBING SITE PLAN
NOT TO SCALE

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REGISTERED
No. 10302106
STATE OF
INDIANA
PROFESSIONAL ENGINEER
5/2/25

EFD Fire Station No. 15 Renovations

Evansville Fire Department
Evansville, Indiana
Fire Chief Tony Knight

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Plumbing Gas Plan

SHEET NO:

P-1.0

ELECTRICAL LEGEND - POWER

SYMBOL	DESCRIPTION
	WALL OUTLET WITH 20A, 125V DUPLEX RECEPTACLE. MOUNT 18 INCHES ABOVE FINISHED FLOOR TO TO CENTER, UNLESS NOTED OTHERWISE.
	WALL OUTLET WITH 20A, 125V DUPLEX RECEPTACLE. MOUNT 48 INCHES ABOVE FINISHED FLOOR TO CENTER, OR 8 INCHES ABOVE COUNTER OR COUNTER BACKSPLASH TO CENTER, UNLESS NOTED OTHERWISE.
	CEILING MOUNTED OUTLET WITH 20A, 125V DUPLEX RECEPTACLE.
	WALL OUTLET WITH 20A, 125V DOUBLE-DUPLEX RECEPTACLE. MOUNT 18 INCHES ABOVE FINISHED FLOOR TO CENTER, UNLESS NOTED OTHERWISE.
	WALL OUTLET WITH 20A, 125V DOUBLE-DUPLEX RECEPTACLE. MOUNT 48 INCHES ABOVE FINISHED FLOOR TO TO CENTER, OR 8 INCHES ABOVE COUNTER OR COUNTER BACKSPLASH TO CENTER, UNLESS NOTED OTHERWISE.
	WALL OUTLET WITH SIMPLEX RECEPTACLE AS NOTED ON POWER PLANS.
	WALL OUTLET WITH 2 POLE, 250V RECEPTACLE. COORDINATE MOUNTING HEIGHT WITH EQUIPMENT BEING SERVED. NEMA TYPE AND CONFIGURATION TO MATCH EQUIPMENT BEING SERVED.
GFCI	SYMBOL INDICATES GROUND FAULT CIRCUIT INTERRUPTER TYPE RECEPTACLE WHEN SHOWN ADJACENT TO RECEPTACLE SYMBOL ON PLANS.
WP	SYMBOL INDICATES WEATHER RATED RECEPTACLE AND WEATHER-PROOF WHILE-IN-USE TYPE ENCLOSURE WHEN SHOWN ADJACENT TO RECEPTACLE SYMBOL ON PLANS.
	WALL-MOUNT JUNCTION BOX AS NOTED ON PLANS.
	CEILING-MOUNT JUNCTION BOX AS NOTED ON PLANS.
30A/3 NEMA 3R	FUSIBLE DISCONNECT SWITCH. TEXT INDICATES AMP AND ENCLOSURE RATINGS.
PHASE CONDUCTOR GROUND NEUTRAL	CIRCUIT. NUMBER OF CROSSBARS INDICATE QUANTITY OF CONDUCTORS REQUIRED. MINIMUM CONDUIT SIZE SHALL BE 3/4 INCH TRADE SIZE. MINIMUM CONDUCTOR SIZE SHALL BE #12 AWG.
LP1-1,3,5	HOME RUN TO PANEL. NUMBER OF ARROW HEADS INDICATES NUMBER OF CIRCUITS. PREFIX INDICATES PANEL NOMENCLATURE. NUMBERS INDICATE CIRCUIT NUMBERS.

ELECTRICAL SPECIFICATIONS:

1. ALL ELECTRICAL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRIC CODE AND WITH ALL OTHER APPLICABLE STATE AND LOCAL CODES.
2. UNLESS OTHERWISE NOTED, THE CONTRACTOR SHALL FURNISH AND INSTALL ALL MATERIAL AND EQUIPMENT AS INDICATED ON THE DRAWINGS. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND OF FIRST-CLASS CONSTRUCTION, AND SHALL BE THE PRODUCT OF AN ESTABLISHED AND REPUTABLE MANUFACTURER AND SHALL BE DESIGNED TO PERFORM THE SERVICE REQUIRED.
3. ALL ELECTRICAL SYSTEMS SHALL BE INSTALLED IN STRICT ACCORDANCE WITH MANUFACTURER'S INSTALLATION INSTRUCTIONS. THE ENTIRE ELECTRICAL SYSTEM SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER AND ACCORDING TO GOOD PRACTICE.
4. ALL MATERIALS USED IN THE WORK SHALL BE APPROVED BY THE UNDERWRITER'S LABORATORIES, INC., AND SHALL BEAR THEIR LABEL WHERE SUCH APPROVAL IS AVAILABLE FOR THE TYPE OF MATERIAL.
5. THE CONTRACTOR SHALL, AT HIS OWN EXPENSE, PROCURE ALL PERMITS, CERTIFICATES, AND LICENSES REQUIRED OF HIM BY LAW FOR THE EXECUTION OF HIS WORK.
6. THE CONTRACTOR SHALL VISIT SITE TO OBTAIN KNOWLEDGE OF EXACT CIRCUIT DISTANCES AND INSTALLATION REQUIREMENTS.
7. CONDUCTORS NO. 8 AND LARGER SHALL BE CODE GRADE THWN STRANDED COPPER WIRE. CONDUCTORS SMALLER THAN NO. 8 SHALL BE CODE GRADE THHN WIRE, SOLID OR STRANDED COPPER. MINIMUM WIRE SIZE SHALL BE NO. 12, UNLESS NOTED OTHERWISE.
8. CONDUIT SHALL BE AS FOLLOWS: EMT OR MC CABLE SHALL BE USED FOR CONCEALED INTERIOR RACEWAYS AND ABOVE LAY-IN CEILINGS. LIQUID TIGHT FLEXIBLE METAL CONDUIT WITH LIQUID TIGHT CONNECTIONS SHALL BE USED FOR ALL MECHANICAL EQUIPMENT CONNECTIONS, FLEXIBLE METALLIC (NON-LIQUID-TIGHT) CONDUIT SHALL BE USED FOR LAY-IN TYPE LIGHTING FIXTURES. CONDUIT SHALL BE 3/4" MINIMUM SIZE. THE USE OF CRIMP TIGHT CONNECTORS FOR CONDUIT WILL NOT BE ALLOWED. UNDERGROUND CONDUIT SHALL BE PVC EXCEPT AT CONDUIT BEND THROUGH FLOOR WHERE CONDUIT SHALL BE RIGID. ALL WORK PER NEC.
9. DISCONNECT SWITCHES SHALL BE "HEAVY-DUTY" RATED. NEMA 1, 3R, OR 4X AS REQUIRED.
10. WIRING DEVICES (SWITCHES AND RECEPTACLES) SHALL BE 20A,125VAC. SWITCH DEVICES SHALL BE HUBBELL 1221 OR APPROVED EQUAL BY BRYANT, ARROW-HART, OR PASS AND SEYMOUR. RECEPTACLES SHALL BE HUBBELL #5362 SERIES OR APPROVED EQUAL BY BRYANT, ARROW-HART, OR PASS AND SEYMOUR. UTILIZE GFI WHERE INDICATED.
11. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS PER ARCHITECTURAL FRONT END DOCUMENTS ON ALL ELECTRICAL EQUIPMENT EQUIPMENT INCLUDING (BUT NOT LIMITED TO) LIGHT FIXTURES, SWITCHGEAR/PANELBOARDS, WIRING DEVICES, DATA/VOICE CABLING, DISCONNECT SWITCHES/CONTACTORS/TIME CLOCK, MOTION SENSORS, TRANSFORMERS AND DATA/TELEPHONE SUPPORT SYSTEMS.
12. EXAMINE ALL ARCHITECTURAL, STRUCTURAL, PLUMBING AND HVAC CONSTRUCTION DRAWINGS. COOPERATE WITH OTHER TRADES IN LOCATING COMPONENTS IN ORDER TO AVOID CONFLICT WITH OTHER TRADE'S WORK. NO CLAIM FOR COSTS WILL BE ALLOWED FOR RELOCATING EQUIPMENT, ETC. THAT INTERFERES WITH OTHER TRADES WORK.
13. IN ADDITION TO EQUIPMENT GUARANTEE PROVIDED BY MANUFACTURER, THE CONTRACTOR SHALL FURNISH OWNER A WRITTEN GUARANTEE AGAINST DEFECT IN ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE OF WORK. DURING GUARANTEE PERIOD AND WITHOUT EXPENSE TO THE OWNER, REPAIR ALL DEFECTS IN WORKMANSHIP OR MATERIAL PROVIDED.
14. DRAWINGS ARE DIAGRAMMATIC AND INDICATE THE GENERAL ARRANGEMENT OF ELECTRICAL INSTALLATION. THE EXACT LOCATION AND / OR ROUTING OF CONDUIT, RECEPTACLES, PANELS ETC., SHALL BE DETERMINED IN THE FIELD. MAKE REASONABLE MODIFICATIONS IN THE INSTALLATION AS REQUIRED BASED ON FIELD CONDITIONS.
15. AT THE COMPLETION OF THE PROJECT, THE CONTRACTOR SHALL REMOVE FROM THE SITE AND DISPOSE OF ALL RUBBISH AND DISCARDED MATERIALS.
16. THE ELECTRICAL CONTRACTOR SHALL KEEP ACCURATE RECORDS OF INSTALLATION THAT DEVIATED FROM THE DRAWINGS. AT THE COMPLETION OF PROJECT, CONTRACTOR SHALL PRESENT TO THE OWNER A MARKED UP SET OF AS BUILT PRINTS WITH INDICATED CHANGES.
17. ALL PENETRATIONS THROUGH WALLS AND FLOORS SHALL BE PROVIDED WITH PROPERLY SIZED SLEEVES. SEAL ALL SLEEVES WITH APPROPRIATE CAULK.
18. THE ELECTRICAL CONTRACTOR SHALL PROVIDE TRAINING TO THE OWNER ON ALL ELECTRICAL EQUIPMENT.
19. CIRCUIT BREAKER PANELBOARDS SHALL HAVE AIC RATING AS INDICATED ON BUSSING DIAGRAM. PANELBOARDS SHALL BE SQUARE D OR APPROVED EQUAL BY EATON OR SIEMENS. CONTRACTOR SHALL PROVIDE DETAILED TYPED PANELBOARD DIRECTORY.
20. ALL HVAC, PLUMBING AND ELECTRICAL EQUIPMENT, PIPES, DUCTWORK, CONDUIT, ETC. SHALL BE RESTRAINED TO RESIST SEISMIC FORCES. RESTRAINTS SHALL MAINTAIN EQUIPMENT, PIPING, DUCTWORK AND CONDUIT IN A CAPTIVE POSITION. RESTRAINT DEVICES SHALL BE DESIGNED AND SELECTED TO MEET THE SEISMIC REQUIREMENTS AS DEFINED IN THE LATEST ISSUE OF THE KENTUCKY BUILDING CODE OR LOCAL JURISDICTION BUILDING CODE.
21. EC SHALL BE RESPONSIBLE FOR LOW VOLTAGE DATA BACKBOX, CONDUIT, AND PULL STRING UNLESS NOTED OTHERWISE.
22. FIRE ALARM DESIGN IS FOR INTENT PURPOSES ONLY. ALL DEVICES, PANELS, ETC. SHALL BE IN ACCORDANCE WITH ALL APPLICABLE CODES AND STANDARDS.
23. FIRE ALARM CONTRACTOR SHALL SUBMIT FULLY DESIGNED FIRE ALARM DRAWINGS TO AHJ FOR COMPLETE REVIEW.
24. DUCT SMOKE DETECTORS SHALL BE PROVIDED FOR ALL HVAC UNITS SUPPLYING 2000 CFM OR GREATER.
25. EC SHALL BE RESPONSIBLE FOR UPSIZING CONDUCTOR SIZING AS REQUIRED TO ACHIEVE A VOLTAGE DROP OF LESS THAN 3% ON BRANCH CIRCUITS.

GENERAL NOTES:

1. ALL WORK SHALL BE DONE BY A LICENSED CONTRACTOR.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR JOBSITE SAFETY, INCLUDING REQUIREMENTS OF AUTHORITIES HAVING JURISDICTION.
3. ALL CONSTRUCTION DEBRIS SHALL BE DISPOSED OF BY THE CONTRACTOR, UNLESS NOTES OTHERWISE.
4. THERE SHALL BE NOTHING ABANDONED IN PLACE, UNLESS SPECIFICALLY IDENTIFIED AS SUCH.
5. ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS, INCLUDING ADDENDA, AND APPLICABLE CODES AND STANDARDS.
6. ALL TRADES SHALL COORDINATE THE ROUTING AND INSTALLATION OF HIS WORK WITH THAT OF ALL OTHER TRADES THROUGH THE GENERAL CONTRACTOR.
7. PROVIDE ALL EQUIPMENT, MATERIAL, LABOR, SUPERVISION, COST, AND SERVICES REQUIRED TO INSTALL COMPLETE AND WORKING SYSTEMS. INCLUDING ALL ITEMS AND APPURTENANCES NECESSARY, REASONABLE, INCIDENTAL, OR CUSTOMARILY INCLUDED, EVEN THOUGH EACH AND EVERY ITEM IS NOT SPECIFIED OR SHOWN.
8. ALL ELECTRICAL WORK SHALL BE IN ACCORDANCE WITH WITH ALL APPLICABLE STATE AND LOCAL BUILDING CODES, INCLUDING THE NEC.
9. ALL ELECTRICAL EQUIPMENT INSTALLED SHALL MEET MANUFACTURER SPECIFICATIONS.

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PROFESSIONAL ENGINEER

4/30/25

EFD Fire Station No. 15 Renovations

Evansville Fire Department
Evansville, Indiana
Fire Chief Tony Knight

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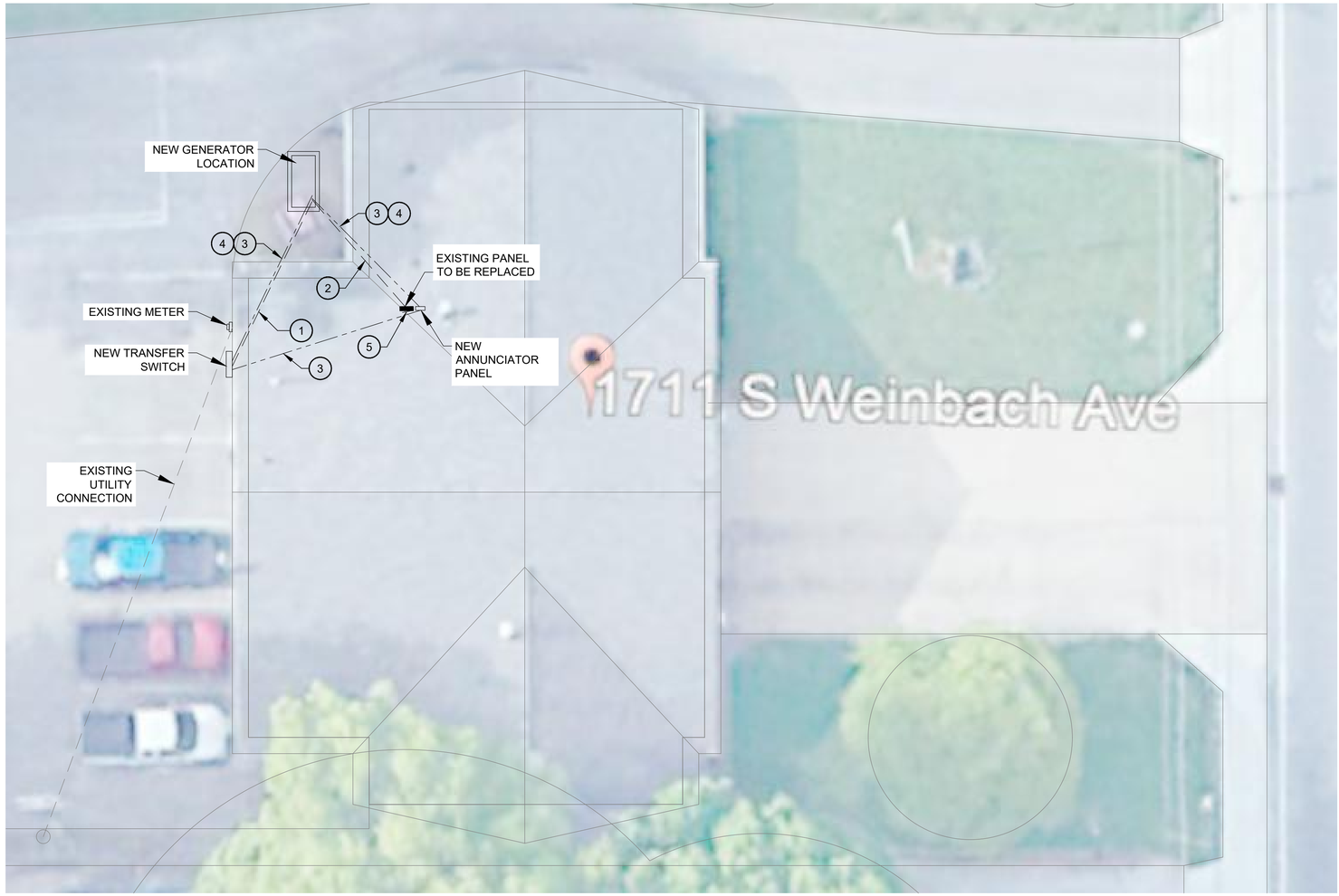
Electrical
Cover Sheet

SHEET NO:

E-0.0

ⓗ KEYNOTES:

1. REFER TO ELECTRICAL ONE-LINE. ELECTRICAL SERVICE SHALL BE REWORKED TO INCORPORATE NEW FULL-BUILIDNG GENERATOR. FIELD VERIFY EXISTING CONDITIONS AND LOCATIONS. REROUTE AND REPLACE CONDUCTORS AND CONDUITS AS NECESSARY.
2. COORDINATE WITH THE GENERATOR SUPPLIER FOR ANY SUPPLEMENTAL POWER FEEDS REQUIRED FOR GENERATOR ACCESSORIES. PROVIDE A MINIMUM OF 1" CONDUIT FROM PANEL TO GENERATOR PER CIRCUIT. PROVIDE NEW BREAKER WITHIN NEW PANEL AND CONDUCTOR SIZED AS REQUIRED FOR ACCESSORY CIRCUIT. FIELD VERIFY EXACT QUANTITY, SIZES, AND RUNS FOR GENERATOR ACCESSORIES REQUIRING POWER. UPSIZE CONDUIT SIZE AS NECESSARY.
3. COORDINATE WITH THE GENERATOR SUPPLIER FOR ANY LOW VOLTAGE COMMUNICATION REQUIREMENTS BETWEEN GENERATOR, TRANSFER SWITCH, AND ANNUNCIATE PANEL LOCATIONS. PROVIDE A MINIMUM OF 1" CONDUITS FOR BETWEEN LOCATIONS FOR COMMUNICATION RUNS. FIELD VERIFY EXACT QUANTITY AND PATHS OF RUNS FOR EACH COMMUNICATION LINE. PROVIDE CONDUIT AND LOW VOLTAGE CABLING AS NECESSARY.
4. PROVIDE ADDITIONAL EMPTY 1" CONDUIT FROM TRANSFER SWITCH TO GENERATOR AND FROM PANEL TO GENERATOR. FIELD VERIFY EXACT RUN PATH.
5. REPLACE EXISTING PANEL AS INDICATED. FIELD VERIFY EXISTING CONDITIONS OF ELECTRICAL DEVICES, DISCONNECTS, AND ACCESSORIES. ADJACENT DISCONNECTS TAPPED FROM EXISTING PANEL SHALL BE REWORKED TO BE FED FROM A NEW BREAKER ON THE NEW PANEL. PROVIDE NEW BREAKERS AND CONDUCTORS AS REQUIRED. REFER TO ONE-LINE DIAGRAM.



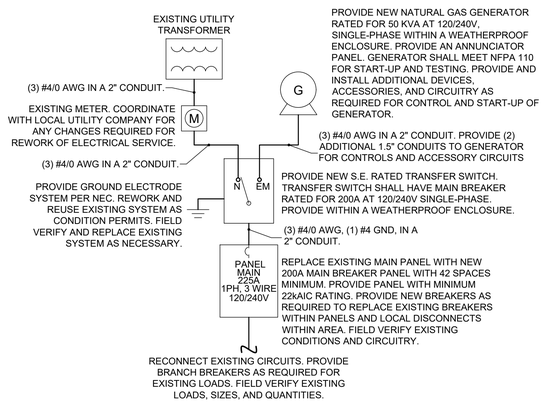
1 ELECTRICAL SITE PLAN
NOT TO SCALE

GENERAL AIC NOTE:

CONTRACTOR SHALL COORDINATE WITH THE UTILITY CO. FOR AVAILABLE FAULT CURRENT OF THE UTILITY TRANSFORMER, AND DETERMINE THE MAXIMUM FAULT CURRENT ON THE BUILDING POWER DISTRIBUTION SYSTEM BASED UPON AVAILABLE FAULT CURRENT FROM UTILITY POWER AND MOTOR LOADS ON THE SYSTEM. THE GEAR EQUIPMENT VENDOR SHALL PROVIDE A FAULT CURRENT ANALYSIS WITH PANEL SPECIFICATIONS FOR REVIEW BY THE ENGINEER.

ONE-LINE DIAGRAM NOTES:

1. PROVIDE ARC FLASH LABEL ON ALL EQUIPMENT WITH INCIDENT ENERGY AND PPE REQUIREMENTS BASED ON ARC FLASH STUDY PERFORMED BY GEAR MANUFACTURER.
2. PROVIDE LABEL ON ALL PANELS INDICATING:
   PANEL NAME
   PANEL VOLTAGE
   PANEL FED FROM



2 ONE-LINE DIAGRAM
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Electrical Power Plan

SHEET NO:
E-1.0

SECTION 263213 – SPARK IGNITED ENGINE-DRIVEN GENERATOR SETS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Spark-Ignited Engine.
2. Natural Gas Fuel Supply System.
3. Control and monitoring.
4. Generator overcurrent and fault protection.
5. Generator, exciter, and voltage regulator.
6. Outdoor engine generator enclosure (where selected).
7. Vibration isolation devices (where applicable).

B. Related Requirements:

1. Section 263600 "Transfer Switches" for transfer switches including sensors and relays to initiate automatic-starting and -stopping signals for engine generators.

1.2 DEFINITIONS

A. EPS: Emergency power supply.

B. EPSS: Emergency power supply system.

C. Operational Bandwidth: The total variation from the lowest to highest value of a parameter over the range of conditions indicated, expressed as a percentage of the nominal value of the parameter.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
2. Include thermal damage curve for generator.
3. Include time-current characteristic curves for generator protective device.
4. Include fuel consumption in gallons per hour (liters per hour) at 0.8 power factor at 0.5, 0.75, and 1.0 times generator capacity.
5. Include generator efficiency at 0.8 power factor at 0.5, 0.75, and 1.0 times generator capacity.
6. Include airflow requirements for cooling and combustion air in cubic feet per minute (cubic meters per minute) at 0.8 power factor, Provide Drawings indicating requirements and limitations for location of air intake and exhausts.
7. Include generator characteristics, including, but not limited to, kilowatt rating, efficiency, reactances, and short-circuit current capability.

B. Shop Drawings:

1. Dimensioned Outline Drawings of Equipment Unit: With engine and generator mounted on rails, identify center of gravity and total weight for provided components; fuel tank, enclosure, silencer, base tank, each piece of equipment not integral to the engine generator.
2. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Identify fluid drain ports and clearance requirements for proper fluid drain.
4. Design calculations for selecting vibration isolators and seismic restraints and for designing vibration isolation bases.
5. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include base weights.
6. Include diagrams for power, signal, and control wiring. Complete schematic, wiring, and interconnection diagrams indicating terminal markings for engine generators and functional relationship between all electrical components.
7. Rigging Information: Indicate location of each lifting attachment, generator-set center of gravity, and total package weight in submittal drawings.

1.4 INFORMATIONAL SUBMITTALS

A. Seismic Qualification Data: Certificates, for engine generator, accessories, and components, from manufacturer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

B. Source Quality-Control Reports: Including, but not limited to, the following:

1. Certified summary of prototype-unit test report. Perform tests at rated load and power factor. Provide the following test results:

a. Maximum Power Level
b. Maximum Motor Starting (sKVA)
c. Structural Soundness
d. Torsional Analysis
e. Transient Response
f. Alternator Temperature Rise
g. Engine Cooling Requirements (unit mounted radiator)
h. Harmonic Analysis (per IEEE-115 and ANSI-100)
i. Voltage Regulation
j. Endurance Testing

2. Certified Test Reports: For components and accessories that are equivalent, but not identical, to those tested on prototype unit.
3. Report of factory test on units to be shipped for this Project, indicating evidence of compliance with specified requirements.
4. Report of sound generation.

5. Report of exhaust emissions indicating compliance with applicable regulations.
6. Certified Torsional Vibration Compatibility: Comply with NFPA 110.

C. Field quality-control reports. Field start up report and unit in-service documentation, including load bank test results if applicable.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For packaged engine generators to include in emergency, operation, and maintenance manuals. Include manufacturer's recommended maintenance and periodic testing plan in accordance with NFPA 110, Chapter 8.

B. Furnish extra materials required by local Authority Having Jurisdiction (AHJ) and defined in project documents that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1.6 QUALITY ASSURANCE

A. The generator set covered by these specifications shall be designed, tested, rated, assembled and installed in accordance with all applicable standards below:

1. CSA C22.2, No. 14-M91 Industrial Control Equipment.
2. CSA C22.2, No. 100 Motors and Generators
3. CSA 282-15
4. EN 61000-6
5. EN 55011
6. FCC Part 15 Subpart B
7. ISO 8528
8. IEC 61000
9. UL 508
10. UL 2200
11. UL 142
12. UL 6200
13. Designed to allow for installed compliance to NFPA 37, NFPA 70, NFPA 99 and NFPA 110

B. Manufacturer Qualifications:

1. Current certificate holder for ISO 9001 compliance.
2. The power system shall be produced by a manufacturer who has produced this type of equipment for a period of at least 25 years and who maintains a service organization of factory-authorized generator technicians available twenty-four hours a day throughout the year.
3. Manufacturing and assembly of products must be done in the United States using domestically sourced materials to the extent practical.

C. Installer Qualifications: An authorized representative who is trained and certified by the manufacturer on stationary power systems.

1.7 WARRANTY

A. Manufacturer's Warranty: Manufacturer agrees to repair or replace components of packaged engine generators and associated auxiliary components that fail in materials or workmanship within specified warranty period.

1. Warranty: 2 Year Comprehensive from date of Substantial Completion.
2. A Comprehensive Warranty is defined as the manufacturer covering replacement parts, labor, and limited technician travel costs for covered warranty repairs during the listed warranty period. A Limited warranty is defined as the manufacturer covering replacement parts, labor, and limited technician travel costs for the first 2 years and then replacement parts for the remainder of the listed warranty period.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide Generac Power Systems, Inc.; 50kW T, 4.5L (Turbo) with a A0080044N21 - 80kW alternator. The Single Phase generator shall be rated for 50 kW at 240 volts and 60 Hz, at 0.8 power factor lagging while operating at a maximum ambient temperature of 77 Fahrenheit and maximum altitude of 3500 feet above sea level without reduction in electrical output capacity. Comparable products by one of the following will also be considered:

1. Caterpillar, Inc.
2. Cummins Power Generation.

B. Source Limitations: Obtain packaged engine generators and auxiliary components from single source from single manufacturer. "Source Limitations: Obtain packaged engine generators and auxiliary components from single supplier. The equipment supplied and installed shall meet the requirements of NEC and all applicable local codes and regulations. All equipment shall be new, of current production. There shall be one source responsibility for warranty; parts and service through a local representative with factory certified service personnel.

C. Requests for substitutions shall be made a minimum of ten (10) days prior to bid date. Manufacturers catalog data and a completed generator sizing model using the proposed manufacturer's generator sizing software shall accompany each request and authorized acceptance shall be addenda only. Should any substitutions be made, the contractor shall bear responsibility for the installation, coordination and operation of the system as well as any engineering and redesign costs, which may result from such substitutions.

2.2 PERFORMANCE REQUIREMENTS

A. NFPA Compliance:

1. Comply with NFPA 37.
2. Comply with NFPA 70.
3. Comply with NFPA 99.

4. Comply with NFPA 110 requirements for Level 1 EPSS.

B. UL Compliance: Engine generator assembly and factory enclosure (if provided) shall be UL 2200 listed.

C. Engine Exhaust Emissions: Comply with applicable US EPA, State and Local Government requirements. Spark-ignited Stationary Emergency: Engines shall be certified by the manufacturer to comply with 40 CFR Part 60 Subpart JJJJ, Table 1, Emission Standards for Stationary Emergency SI Engines and Table 2, Requirements for Performance Tests.

2.3 ENGINE GENERATOR ASSEMBLY DESCRIPTION

A. Factory-assembled and -tested, water-cooled engine, with brushless generator and accessories.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

C. Power Rating: Standby.

D. Service Load: The generator set shall be a Generac model 50kW T, 4.5L (Turbo) with a A0080044N21 - 80kW alternator. It shall provide 50 kW and 50 kVA while operating at the maximum ambient operating temperature and elevation specified in the project documents.

E. Power Factor: 0.8 lagging.

F. Frequency: 60 Hz.

G. Voltage: 240 Volts ac.

H. Phase: Single Phase, Three Wire.

I. Induction Method: Naturally aspirated or Turbocharged.

J. Governor: Adjustable isochronous, with speed sensing.

K. Mounting Frame: Structural steel framework to maintain alignment of mounted components without depending on concrete foundation. Provide lifting attachments sized and spaced to prevent deflection of base during lifting and moving.

L. Nameplates: For each major system component to identify manufacturer's name, model and serial number of component.

M. Engine Generator Performance:

1. Steady-State Voltage Operational Bandwidth: 3 percent of rated output voltage from no load to full load.
2. Transient Voltage Performance: Not more than 10.79 percent variation for 50 percent step-load increase or decrease at unity power factor. Voltage shall recover and remain within the steady-state operating band within three seconds.
3. Steady-State Frequency Operational Bandwidth: 0.5 percent of rated frequency from no load to full load.

4. Steady-State Frequency Stability: When system is operating at any constant load within the rated load, there shall be no random speed variations outside the steady-state operational band and no hunting or surging of speed.
5. Transient Frequency Performance: Less than 3.7 Hertz variation for 50 percent step-load increase or decrease at unity power factor. Frequency shall recover and remain within the steady-state operating band within five seconds.
6. Output Waveform: At no load, harmonic content measured line to line or line to neutral shall not exceed 5 percent total and 3 percent for single harmonics. Telephone influence factor, determined in accordance with NEMA MG 1, shall not exceed 50 percent.
7. Sustained Short-Circuit Current: For a three-phase, bolted short circuit at system output terminals, system shall supply a minimum of 300 percent of rated full-load current for not less than 10 seconds and then clear the fault automatically, without damage to generator system components.
8. Start time to comply with NFPA system requirements.

2.4 ENGINE PERFORMANCE

A. Fuel: Natural gas shall be "pipeline grade" meeting the following conditions:

1. Methane number 80 or greater.
2. High heating value shall be within the range of 950 - 1,150 BTU/scf.
3. Hydrogen sulfide shall not exceed 0.3 g/100 scf.
4. Total sulfur shall not exceed 20 g/100 scf.
5. Water vapor content shall not exceed 0.32 g/100 scf.

B. Rated Engine Speed: 1800 rpm.

C. Lubrication System to be engine mounted.

1. Oil filter shall be engine-mounted replaceable cartridge type with integral bypass valve, in accordance with manufacturer recommendations.
2. Thermostatic Control Valve: Control flow in system to maintain optimum oil temperature. Unit shall be capable of full flow and is designed to be fail-safe.
3. Crankcase Drain: Arranged for complete gravity drainage to an easily removable container with no disassembly and without use of pumps, siphons, special tools, or appliances.

D. Jacket Coolant Heater: Jacket water heater shall be sized per NFPA110 and UL listed to ensure that genset will start within the specified time period and ambient conditions.

E. Integral Cooling System: Closed loop, liquid cooled, with radiator factory mounted on engine generator set mounting frame and integral engine-driven coolant pump.

1. Coolant: Solution of 50 percent ethylene-glycol-based antifreeze and 50 percent water, with anticorrosion additives as recommended by engine manufacturer.
2. Expansion Tank: Constructed of welded steel plate and rated to withstand maximum closed-loop coolant system pressure for engine used. Equip with gauge glass and petcock.
3. Temperature Control: Self-contained, thermostatic-control valve modulates coolant flow automatically to maintain optimum constant coolant temperature as recommended by engine manufacturer.
4. Maximum Ambient Operating Temperature on Radiator: 104 degrees F (40 degrees C).

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5. Coolant Hose: Flexible assembly with inside surface of nonporous rubber and outer covering of aging-, UV-, and abrasion-resistant fabric.

   a. Rating: 50-psig (345-kPa) maximum working pressure with coolant at 180 deg F (82 deg C), and noncollapsible under vacuum.
   b. Meets SAE 100R1A Type S, EN853 1SN, ISO 1436-1 Type 1SN
   c. a Fittings: Flanges or steel pipe nipples with clamps to suit piping and equipment connections.

F. Muffler/Silencer:

1. Critical type, sized as recommended by engine manufacturer and selected with exhaust piping system to not exceed engine manufacturer's engine backpressure requirements.

G. Air-Intake Filter: Heavy duty, engine-mounted air cleaner with replaceable dry-filter element and "blocked filter" indicator.

H. Starting System: 12 or 24-V electric, with negative ground.
1. Cranking Cycle: As required by NFPA 110 for system level specified.
2. Battery: Lead acid, with capacity within ambient temperature range specified in "Performance Requirements" Article to provide specified cranking cycle as required by NFPA 110 for system level specified.
3. Battery-Charging Alternator: Factory mounted on engine with solid-state voltage regulation and 35 minimum continuous rating.
4. Battery Charger: Current-limiting, automatic-equalizing, and float-charging type designed for lead-acid batteries. Unit shall comply with UL 1236 and NFPA 110 Section 5.6.4.6 for Level 1 systems.:

2.5 FUEL SYSTEM – NATURAL GAS

A. Comply with NFPA 37.

B. Operating Pressure: 5 inches of water column.

C. Flowrate: Maximum gas flow demand at 100% load: 665 cubic feet per hour.

2.6 CONTROL AND MONITORING

A. Automatic Starting System Sequence of Operation: When mode-selector switch on the control and monitoring panel is in the automatic position, remote-control contacts in one or more separate automatic transfer switches initiate starting and stopping of engine generator. When mode-selector switch is switched to the on position, engine generator starts. The off position of same switch initiates engine generator shutdown. When engine generator is running, specified system or equipment failures or derangements automatically shut down engine generator and initiate alarms.

B. Manual Starting System Sequence of Operation: Switching on-off switch on the generator control panel to the on position starts engine generator. The off position of same switch initiates engine

generator shutdown. When engine generator is running, specified system or equipment failures or derangements automatically shut down engine generator and initiate alarms.

C. Provide minimum run time control set for 15 minutes with override only by operation of a remote emergency-stop switch.

D. Control panel must comply with UL 6200. The controller shall meet ASTM B117 (salt spray test).

E. Connection to Building Management: Provide connections for data transmission of indications to remote data terminals via Modbus.

F. Environmentally Hardened Design: Open circuit boards, edge cards, and PC ribbon cable connections are unacceptable.

G. PCB Construction: Circuit boards with surface-mounted components to provide vibration durability. Circuit boards utilizing large capacitors or heat sinks must utilize encapsulation methods to securely support these components.

H. Configuration:

1. Operating and safety indications, protective devices, basic system controls, and engine gauges shall be grouped in a common control and monitoring panel mounted on the engine generator. Mounting method shall isolate the control panel from engine generator vibration. Panel powered from the engine generator battery.

I. Control and Monitoring Panel:

1. Digital engine generator controller with integrated touch screen, controls, and microprocessor, capable of local and remote control, monitoring, and programming, with battery backup.
2. Instruments: Located on the control and monitoring panel and viewable during operation.

   a. Engine lubricating-oil pressure gauge.
   b. Engine-coolant temperature gauge.
   c. DC voltmeter (alternator battery charging).
   d. Running-time meter.
   e. AC voltmeter, for each phase.
   f. AC ammeter, for each phase.
   g. AC frequency meter.
   h. Generator-voltage adjusting feature.

3. Controls and Protective Devices: Controls, shutdown devices, and common alarm indication, including the following:

   a. Cranking control equipment.
   b. Run-Off-Auto switch.
   c. Control switch not in automatic position alarm.
   d. Overcrank alarm.
   e. Overcrank shutdown device.
   f. Low-water temperature alarm.

g. High engine temperature pre-alarm.
h. High engine temperature.
i. High engine temperature shutdown device.
j. Overspeed alarm.
k. Overspeed shutdown device.
l. Low fuel main tank.

   1) Low-fuel-level alarm shall be initiated when the level falls below that required for operation for duration required for the indicated EPSS class.

m. Coolant low-level alarm.
n. Coolant low-level shutdown device.
o. Coolant high-temperature prealarm.
p. Coolant high-temperature alarm.
q. Coolant low-temperature alarm.
r. Coolant high-temperature shutdown device.
s. EPS load indicator.
t. Battery high-voltage alarm.
u. Low cranking voltage alarm.
v. Battery-charger malfunction alarm.
w. Battery low-voltage alarm.
x. Lamp test.
y. Contacts for local and remote common alarm.
z. Remote manual stop shutdown device.
aa. Total engine run hours, non-resettable.
bb. Engine generator metering, including voltage, current, hertz, kilowatt, kilovolt ampere, and power factor.

J. External Alarm & Status Relays: Provide a separate terminal block, factory wired to Form C dry contacts, for each alarm and status condition required by Building Management or other external systems as shown on electrical drawings.

K. Common Remote Panel with Common Audible Alarm: Include necessary contacts and terminals in control and monitoring panel. Remote panel shall be powered from the engine generator battery.

L. Remote Alarm Annunciator: An LED indicator light labeled with proper alarm conditions shall identify each alarm event, and a common audible signal shall sound for each alarm condition. Silencing switch in face of panel shall silence signal without altering visual indication. Connect so that after an alarm is silenced, clearing of initiating condition will reactivate alarm until silencing switch is reset. Cabinet and faceplate are surface- or flush-mounting type to suit mounting conditions indicated.

1. Overcrank alarm.
2. Low water-temperature alarm.
3. High engine temperature pre-alarm.
4. High engine temperature alarm.
5. Low lube oil pressure alarm.
6. Overspeed alarm.
7. Low fuel main tank alarm.
8. Low coolant level alarm.

9. Low cranking voltage alarm.
10. Contacts for local and remote common alarm.
11. Audible-alarm silencing switch.
12. Air shutdown damper when used.
13. Run-Off-Auto switch.
14. Control switch not in automatic position alarm.
15. Fuel tank derangement alarm.
16. Fuel tank high-level shutdown of fuel supply alarm.
17. Lamp test.
18. Low-cranking voltage alarm.
19. Generator overcurrent-protective-device not-closed alarm.

M. Remote Emergency-Stop Switch: Provide remote emergency stop switch in quantity and style as shown on electrical drawings. Electrical contractor to coordinate exact location with engineer and local AHJ.

N. Engine Run Relay: The generator set shall be provided with a run relay which shall provide a double-pole, double-throw relay with 10-amp/ 250 VAC contacts to indicate that the generator is running. The run relay dry contacts can be used for energizing or de-energizing customer devices while the generator is running (e.g. louvers, indicator lamps, etc.)

O. Data Logging:

1. Event Logging – the controller keeps a record of up to 8,000 events with date and time locally for warning and shutdown faults. This event log can be downloaded onto a USB storage device or onto a PC through the service program.
2. Event Snapshot – the control system shall capture 15 seconds of critical data around the time a fault or warning. This data shall be viewable on the controller and downloadable.
3. Data Logging – the controller shall allow customized parameters to be logged based on a start trigger from the controller interface.

   a. The parameters are selectable from all monitored parameters.
   b. The sample period shall be configurable from 1 second to 1 day.
   c. The collected data shall be stored on a USB storage device plugged into the control panel.

2.7 GENERATOR OVERCURRENT AND FAULT PROTECTION

A. Overcurrent protective devices shall be coordinated to optimize selective tripping when a short circuit occurs.

1. Overcurrent protective devices for the entire EPSS shall be coordinated to optimize selective tripping when a short circuit occurs. Coordination of protective devices shall consider both utility and EPSS as the voltage source.

2. Overcurrent protective devices for the EPSS shall be accessible only to authorized personnel.

B. Generator Overcurrent Protective Device:

1. Unit mounted circuit breakers. Rating, ampacity, accessories, as shown on drawings or as listed below:
2. Molded-case circuit breaker, electronic-trip type; 100 percent rated; complying with UL 489:

   a. Tripping Characteristics: Adjustable long-time and short-time delay and instantaneous.
   b. Trip Settings: Selected to coordinate with generator thermal damage curve.
   c. Shunt Trip: Connected to trip breaker when engine generator is shut down by other protective devices.
   d. Mounting: Adjacent to, or integrated with, control and monitoring panel.

C. Generator Controller Integrated Alternator Protective Functions:

1. Short-time I^2t function: Generator controller-based function shall continuously monitor current level in each phase of alternator output, integrate alternator heating effect over time, and predict when thermal damage of alternator will occur. As overcurrent heating effect on the alternator approaches the thermal damage point of the unit, protector switches the excitation system off, opens the generator disconnect device, and shuts down the engine generator. When signaled by generator protector or other engine generator protective devices, a shunt-trip device in the generator disconnect switch shall open the switch to disconnect the generator from load circuits.
2. Long-time function: Initiates a generator overload alarm when generator has operated at an overload equivalent to 110 percent of full-rated load for 60 seconds. Indication for this alarm is integrated with other engine generator malfunction alarms. Contacts shall be available for load shed functions.
3. Short-circuit fault clearing: Under single- or three-phase fault conditions, regulates generator to 300 percent of rated full-load current for up to 10 seconds.
4. Senses clearing of a fault by other overcurrent devices and controls recovery of rated voltage to avoid overshoot.

2.8 GENERATOR, EXCITER, AND VOLTAGE REGULATOR

A. Comply with NEMA MG 1.

B. Drive: Generator shaft shall be directly connected to engine shaft. Exciter shall be rotated integrally with generator rotor.

C. Electrical Insulation: Class H.

D. Stator-Winding Leads: Brought out to terminal box to permit future reconnection for other voltages if required.

E. Range: Provide range of output voltage by adjusting the excitation level.

F. Construction shall prevent mechanical, electrical, and thermal damage due to vibration, overspeed up to 125 percent of rating, and heat during operation at 110 percent of rated capacity. Stator shall be skewed construction to minimize harmonic voltage distortion.

G. Enclosure: Drip proof.

H. Instrument Transformers: Mounted within generator enclosure.

I. Voltage Regulator:

1. Voltage Regulator: Solid-state type, separate from exciter. The digital voltage regulator shall be microprocessor based with fully programmable operating and protection characteristics. The regulator shall maintain steady-state generator output voltage within +/- 0.25% for any constant load between no load and full load. The regulator shall be capable of sensing true RMS. The regulator shall provide an adjustable Volts/Hz slope regulation characteristic in order to optimize voltage and frequency response for site conditions.
2. Alternator Excitation: Permanent Magnet Generator (PMG) shall provide excitation power for optimum motor starting and short circuit performance.
3. The generator must accept rated load in one-step.
4. Calculated Transient Voltage Performance: Motor starting performance and voltage dip determinations shall be based on the complete generator assembly. Voltage dip shall not exceed 17.8 percent based on the largest project block load, as determined by manufacturer's sizing program.
5. System Transient Voltage Performance: Alternator shall be capable of supplying 62 sKVA with a voltage dip not more than 35% at 0.3 starting power factor. Sustained voltage dip data or manufacturer-published SKVA numbers based on unity PF alternator-only dynamometer testing will not be accepted.
6. Calculated Transient Frequency Performance: Transient frequency dip performance shall be based on the complete generator set. Maintain frequency within 6.2 percent based on largest project block load, as determined by manufacturer's sizing program.

J. Strip Heater: Thermostatically controlled unit arranged to maintain stator windings above dew point. The strip heater shall be wired directly to the incoming power distribution panel or load center.

K. Windings: Two-thirds pitch stator winding and fully linked amortisseur winding.

2.9 OUTDOOR ENGINE GENERATOR ENCLOSURE

A. Basis of design is a Sound Level 1.

B. Generator packaged within manufacturer's weather protective, sound attenuated enclosure. Enclosure and generator set shall be UL 2200 Listed as a system.

C. Enclosure Construction: Minimum 14 gauge construction. Roof construction shall be raised-seam, gasket-free interlocking panels. Rivets shall not be used on external painted surfaces. Design shall be rodent resistant.

D. Doors shall be equipped with lift-off pin and sleeve type hinges to allow access to the engine, alternator, and control panel. Hinges shall be adjustable for door alignment. Hinges and all exposed fasteners shall be stainless steel. Each door shall be equipped with minimum 2-point latching mechanism and identical keys. Perimeter of all door openings shall include polyethylene gasket.

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E. Upward discharging exhaust hood for engine cooling airflow and exhaust.

F. Engine exhaust silencer mounted within enclosure discharge hood.

G. Enclosure Finish: Electrostatic applied powered paint, baked and finished to manufacturer's specifications. Finish system shall be subjected to the following tests:

1. ASTM D1186 - 87; 2.5+ mil Paint Thickness
2. ASTM D3363 - 92a; Material Hardness
3. ASTM D522 - B; Resistance to Cracking
4. ASTM D3359 - B; Adhesion
5. ASTM B117 D 1654; Resistant to Salt Water Corrosion
6. ASTM D1735 D 1654; Resistant to Humidity
7. ASTM 2794 93 (2004); Impact Resistance
8. SAE J1690 - UV Protection"

H. Enclosure Color: Manufacturer's standard color, or custom color matched based on architect's design with color sample provided to generator manufacturer.

I. Wind Rating: Enclosure shall be constructed to attain basic wind speed rating of 110 MPH; WIF 1.15, Exposure Category "C", Building Classification "Enclosed", Topographic Factor Kzt = 1. Wind Design Pressures: windward, 20.6 lb/ft^2; leeward, -12.9 lb/ft^2; roof, -18.0 lb/ft^2."

J. Snow Load Rating: Minimum 70 pounds per square foot.

K. Engine-Cooling Airflow through Enclosure: Maintain temperature rise of system components within required limits when unit operates at 110 percent of rated load for two hours with ambient temperature at top of range specified in system service conditions.

L. Sound Insulation: Enclosure and air discharge hood completely lined with reflective silver mylar faced sound attenuating closed cell foam that meets UL 94 HF1 standards for flammability (FMVSS 302 test method). Roof sound insulation panels shall include additional mechanical retention.

M. Sound Performance: The engine generator, while operating at full rated load, shall not exceed 69.00 dBA average measured at 23 ft (7 meters) from the engine generator in a free field environment.

N. Louvers: Fixed-engine, cooling-air inlet and discharge. Stormproof and drainable louvers prevent entry of rain and snow.

O. Distribution Panel for Accessory Loads: Accessory Load Panel: Provide an internal, factory mounted and wired, electrical distribution panel to serve accessory loads; including:

1. Engine block heater
2. Battery charger
3. Battery warmer (if included)
4. Enclosure lights (if included)
5. Enclosure heater (if included)
6. Accessory outlets
7. Motorized louvers (if included)

8. Other accessories (if included)

P. Convenience Outlet: Factory-wired convenience 120v duplex-outlet within enclosure, GFCI.

2.10 VIBRATION ISOLATION DEVICES

A. Elastomeric Isolator Pads: Oil- and water-resistant elastomer or natural rubber, arranged in single or multiple layers, molded with a nonslip pattern and galvanized-steel baseplates of sufficient stiffness for uniform loading over pad area, and factory cut to sizes that match requirements of supported equipment for units with a ratings 750kw or below.

1. Material: Standard neoprene separated by steel shims.

B. Spring Isolators: Freestanding, steel, open-spring isolators with seismic restraint for units with a rating larger than 750kw.

1. Housing: Steel with resilient vertical-limit stops to prevent spring extension due to wind loads or if weight is removed; factory-drilled baseplate bonded to 1/4-inch- (6-mm-) thick, elastomeric isolator pad attached to baseplate underside; and adjustable equipment-mounting and -leveling bolt that acts as blocking during installation.
2. Outside Spring Diameter: Not less than 80 percent of compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Minimum Deflection: 0.5.

C. Vibration isolation devices shall not be used to accommodate misalignments or to make bends.

2.11 SOURCE QUALITY CONTROL

A. Prototype Testing: Factory test engine generator using same engine model, constructed of identical or equivalent components and equipped with identical or equivalent accessories.

1. Tests: Comply with IEEE 115 and with NFPA 110, Level 1 Energy Converters.

B. Project-Specific Equipment Tests: Before shipment, factory test engine generator and other system components and accessories manufactured specifically for this Project. Perform tests at rated load and power factor. Include the following tests:

1. Test components and accessories furnished with installed unit that are not identical to those on tested prototype to demonstrate compatibility and reliability.
2. Test generator, exciter, and voltage regulator as a unit.
3. Full load run.
4. Maximum power.
5. Voltage regulation.

6. Transient and steady-state governing.
7. Single-step load pickup.
8. Safety shutdowns.
9. Report factory test results within 10 days of completion of test.

2.12 FINISHES

A. Indoor and Outdoor Enclosures and Components: Manufacturer's standard finish over corrosion-resistant pretreatment and compatible primer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, equipment bases, and conditions, with Installer present, for compliance with requirements for installation and other conditions affecting packaged engine generator performance.

B. Examine roughing-in for piping systems and electrical connections. Verify actual locations of connections before packaged engine generator installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Interruption of Existing Electrical Service: Do not interrupt electrical service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electrical service in accordance with requirements indicated:

1. Notify Project Manager in advance of proposed interruption of electrical service.
2. Do not proceed with interruption of electrical service without written permission.

3.3 INSTALLATION

A. Comply with NECA 1 and NECA 404.

B. Comply with packaged engine generator manufacturers' written installation and alignment instructions and with NFPA 110.

C. Equipment Mounting:

1. Install packaged engine generators on cast-in-place concrete equipment bases or steel dunnage as indicated on drawings.
2. Coordinate size and location of mounting bases for packaged engine generators.
3. Install unit with vibration isolation devices described in section 2.11.

3.4 FIELD QUALITY CONTROL

A. Tests and Inspections: The supplier of the electric generating plant and associated items covered herein shall provide factory certified technicians to inspect the completed installation and to perform an initial startup inspection to include:

1. Ensuring the engine starts (both hot and cold) within the specified time.
2. Verification of engine parameters within specification.
3. Verify no load frequency and voltage, adjusting if required.
4. Test all automatic shutdowns of the engine-generator.
5. Perform a load test of the electric plant, ensuring full load frequency and voltage are within specification by using building load.

B. NFPA 110 Acceptance Tests: Perform tests required by NFPA 110 that are additional to those specified here, including, but not limited to, single-step full-load pickup test.

C. Battery and Charger Tests:

1. Measure charging voltage and voltages between available battery terminals for full-charging and float-charging conditions.
2. Verify that measurements are within manufacturer's specifications."

D. System Integrity Tests: Verify proper installation, connection, and integrity of each element of engine generator system before and during system operation. Check for air, exhaust, and fluid leaks.

E. Coordinate tests with tests for transfer switches and run them concurrently.

F. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation for generator and associated equipment.

G. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

H. Remove and replace malfunctioning units and retest and reinspect as specified above.

I. Retest: Correct deficiencies identified by tests and observations, and retest until specified requirements are met.

J. Report results of tests and inspections in writing. Record adjustable relay settings and measured insulation resistances, time delays, and other values and observations.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain packaged engine generators.

3.6 MAINTENANCE SERVICE

A. Repair Service Capabilities:

1. The generator set supplier shall maintain service parts inventory for the entire power system at a central location which is accessible to the service location 24 hours per day, 365 days per year. The manufacturer of the generator set shall maintain a central parts inventory to support the supplier, covering all the major components of the power system, including: engines, alternators, control systems, paralleling electronics, and power transfer equipment.
2. The generator set shall be serviced by a local service organization that is trained and factory certified in generator set service. The supplier shall maintain an inventory of power system replacement parts in the local service location. Service vehicles shall be stocked with critical replacement parts. The service organization shall be on call 24 hours per day, 365 days per year. The service organization shall be physically located within 50 miles of the site.
3. The manufacturer shall maintain model and serial number records of each generator set provided for at least 20 years.

B. Preventative Maintenance Service Agreement: The supplier shall include as a line item adder in the proposal, a one-year maintenance service agreement. The maintenance shall be performed by factory authorized service technicians capable of servicing both the engine generator set(s) and the transfer switch(es). This agreement shall include semi-annual preventative maintenance visits to verify operation and/or complete the following:

1. All periodic engine maintenance as recommended by the service manual.
2. All electrical controls maintenance and calibrations as recommended by the manufacturer.
3. All auxiliary equipment as a part of the emergency systems.
4. The supplier shall guarantee emergency service.
5. All expendable maintenance items are to be included in this agreement.
6. A copy of this agreement and a schedule shall be provided in the submittal documents, detailing scope of work and preventative maintenance service visit interval.

END OF SECTION 263213

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