SCHEMATIC DESIGN SUBMISSION

for

COTTAGE CITY FIRE HOUSE RENOVATION

3805 38th Avenue
Brentwood, MD 20722

A/E Design Team

Civil Engineer: Charles P Johnson and Associates, Silver Spring, MD

Architect: Murphy & Dittenhafer Architects, Baltimore, MD

Mechanical / Plumbing / Electrical Engineer/Low Voltage: Hoffman, Jun & Associates, Baltimore, MD

Structural Engineer: Cagley and Associates, Rockville, MD

June 26, 2026

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PROJECT INTRODUCTION

Murphy & Dittenhafer has been contracted by Charles P Johnson and Associates (CPJ) to undertake the Schematic Design of the existing Cottage City Fire House located on 3805 38th Street in Brentwood, Maryland. Murphy & Dittenhafer has brought into the team Cagley Engineering to address structural requirements, and Hoffman Jun and Associates to address mechanical, plumbing, and electrical requirements.

This report is intended to provide the Schematic Design intent of the Architect, Structural Engineer, and the MEP Engineers. This report is to be reviewed in conjunction with the Schematic Design Drawings dated June 26, 2026 provided by Murphy & Dittenhafer Architects.

Representatives from Murphy & Dittenhafer, Cagley Engineering, and Hoffman Jun met on site with representatives from the Cottage City town council as well as CPJ on May 11, 2026, and again on May 26, 2026 to view the existing conditions, discuss project goals, and verify site conditions.

The two story masonry structure was built in 1925, and appears to have had no major renovations since. The property has been abandoned for an unknown time period, and the deterioration of the structure throughout reflects this.

The goal of the project is to renovate the space for a future Community Outreach Center with spaces including an indoor gathering space, outdoor patio, and basement functions including a conference room, kitchenette, and supporting spaces. A new stair and elevator will be added to the building to meet the requirements of the Building Code and the American with Disabilities Act. Mechanical, Electrical, and Plumbing systems will all be replaced in their entirety, and structural repairs will be made as needed, particularly to address significant cracks in the exterior walls.

Following this Schematic Design effort, the team will begin the Construction Document phase.

ARCHITECTURAL NARRATIVE

PROJECT SUMMARY:

The goal of the project is to renovate and reuse the Cottage City Fire House, located at 3805 38th Avenue in Brentwood, MD for the purposes of a Community Outreach Center. Program spaces will include a gathering space at street level along with a lower level gathering space, conference room, and supporting spaces. A new addition will include stairs and an elevator. A street level patio will be surrounded by powder coated metal railing and slat fencing for privacy.

CODE SUMMARY:

For a full Building Code Analysis see sheet CS-2 in the Schematic Design Drawing Set.

Applicable Building Codes -

International Building Code 2021
International Energy Conservation Code 2021
International Mechanical Code 2021
International Existing Building Code 2021
National Fire Protection Association Life Safety Code 101, 2021 Edition
National Fire Protection Association Fire Code 1, 2021 Edition
National Electric Code (NEC), 2020 Edition With Local Amendments

Building Area -

Existing:
Basement: 707 square feet
First Floor: 753 net square feet
TOTAL EXISTING: 1,479 square feet

Addition:
Basement: 254 square feet
First Floor: 254 square feet
TOTAL ADDITION: 508 square feet

TOTAL:
Basement: 961 square feet
First Floor: 1,007 square feet
TOTAL BUILDING: 1,968 square feet

Construction Type:

IBC 2021 Table 602 = VB

Sprinkler Requirements:

IBC 903.2.1 and NFPA 101 Chapter 13 = Not Required (occupant load <300)

Plumbing Requirements:

2 WCs and 2 Lavs required, 2 WCs and 2 Lavs provided.
1 service sink required, 1 provided
1 water fountain required, 1 provided

PROJECT DESCRIPTION:

The existing fire house, currently abandoned, will be renovated and reused to create space for a new Community Center for Cottage City.

EXTERIOR WALLS:

Existing:

- The existing exterior walls are painted concrete masonry unit (CMU) bearing walls; the exterior face of the CMU has a distinctive rock face. The parapet walls step and are capped with thin set stone.
- There is significant cracking throughout, in particular on the rear wall. These cracks will be repaired in place, see structural narrative for design approach. The interior finish of the existing walls has been removed, revealing the exterior CMU.

New Work:

New Work at Existing Walls:

- The existing masonry walls will be re-pointed as needed, and new exterior grade paint throughout.
- The interior of the perimeter walls to receive new insulation to meet current requirements of the International Energy Conservation Code (IECC). To achieve this, a new 2x6 wood stud wall will be installed inboard of the exterior wall with R-20 batt insulation in each stud cavity.

New Work at Addition:

- The exterior walls of the new addition will be CMU structure with insulation and masonry veneer.
- The enclosure will be 2 hour fire rated.

ROOF:

Existing:

- The existing roof is a membrane which is significantly deteriorated and requires replacement.

New Work (Existing and Addition)

- New membrane roof over tapered rigid insulation. Insulation to be R-30 continuous.

FENESTRATION:

Existing:

- There are currently two large openings of unequal size in the front of the building; the larger of the two is furnished with a garage door which is deteriorated, the smaller of the two is infilled with plywood.
- There are two hinged doors, approximately 3’-0 x 7’-0, one each on the first and basement levels, but significantly deteriorated.
- The remainder of the openings are windows and are currently either boarded up with plywood or infilled with concrete.

New Work:

- In the front of the building, the smaller of the two openings will be expanded in height to match the height of the adjacent opening. A bond beam will carry over a new steel lintel to create a visual match to the adjacent opening.
- Both openings will be infilled with aluminum storefront. The new storefront system in the larger opening will also feature an egress door.
- The existing hinge door will be replaced in the current opening on the first floor.
- The exisiting door opening on the basement level to be re-purposed for the basement level elevator door.
- Each window opening will be infilled with new aluminum clad wood windows, double hung fixed. Brick headers and sills will be replaced.
- No new openings in the existing exterior walls are anticipated.

INTERIOR:

Existing:

- The interior of the building is currently either demolished or completely deteriorated. All remaining interior finishes including wood flooring, carpeting, drywall, and ceilings are to be removed following all required regulations.

New Work:

- First Floor Flooring: New engineered wood floor over new subfloor
- First Floor Walls: Painted drywall over new wood studs
- Ceiling: Acoustic board, painted

- Basement Flooring: Polished concrete in Gathering; carpet tile in Conference; Ceramic Tile in restrooms
- Basement Walls: Painted drywall over new wood studs
- Ceiling: Mix of exposed painted and Acoustic Ceiling Tile

- Two new ADA compliant restrooms on the basement level. Lavatory surface to be solid surface material. Floors and walls up to 5’ above finish floor to be ceramic tile.
- One service sink and one water fountain / bottle filler to be provided.
- New kitchenette to include single basin stainless steel sink and refrigerator. Millwork to be p-lam base cabinets with solid surface countertops.

ELEVATOR:

New Work:

- Basis of Design for the elevator to be Otis Hydrofit (Machine-roomless holeless hydraulic elevator).

STRUCTURAL NARRATIVE

EXISTING CONDITIONS

Construction of the Cottage City Fire House reportedly dates to the mid 1920's. No structural drawings exist for the building, so Cagley & Associates visited the site on 26 May 2026 to document the framing layout and condition of the structural components. In general, the two-story building has perimeter load-bearing masonry walls. The floor and roof are framed with sawn lumber joists, supported by interior steel beams and the perimeter masonry walls.

Overall, the roof and floor structural elements appear to be in decent condition. There were no systemic indications of rotting or splitting of wood members. There are a handful of locations that will require very minor repairs in isolated locations that can be addressed as construction documents are being prepared. The structural steel members appeared to be in good condition, with no signs of corrosion. The exterior masonry walls on the front and south facades are generally in good condition. The rear wall and portions of the north facade have experienced a significant amount of cracking along with visible displacements.

The roof has a low slope from a high-point at the front of the structure to a low point at the rear wall. Roof decking spans between wood roof joists, which span parallel to the long direction of the building. The roof joists slope to match the roof elevation, and bear on the exterior masonry walls at the front and rear, and two steel beams approximately evenly spaced within the roof footprint. The joists span between 11 to 12 feet, and were measured to be 1-3/4" wide by 5-5/8" deep (approximately a modern 2x6), spaced generally at 16" on center. The joists run continuously over the tops of the supporting steel beams, and are lapped together approximately midspan between the steel beams. While the rafters are continuous over the supporting steel beams, there is a sawn notch at the bottom of each rafter to provide a flat bearing surface as the sloping joist passes over the level supporting steel beam. The notch varies in depth depending upon location, with a minimum remaining member depth of 4" at the deepest notch observed. The steel beams were measured in the field to be 12" deep with a 6" wide flange. The beam flanges are also tapered, with a minimum thickness of around ¼" at the free end, and up to a maximum thickness of around ½". A review of AISC historical steel shape catalogues suggests this beam is a S12x28. These steel beams span approximately 23 feet between the opposing masonry bearing walls. Ceiling purlins, which support only the ceiling construction below, bear on the bottom flanges of the steel beams. We measured the purlins to be the same size and spacing as the roof joists above.

The elevated floor structure is comprised of wood floor decking supported by wood floor joists and steel beams. At this level, the floor joists span across the short direction of the building, supported by the exterior masonry bearing walls at each end, and a line of steel framing (beam and columns) that run along the middle of the floor plan. The floor joists span approximately 11-1/2 feet. The typical floor joists were measured to be 1-3/4" wide by 11-1/2" deep sawn lumber (approximately a modern 2x12) and are spaced at about 16" on center. The steel beam was measured in field be about 12" deep with a 5" wide flange. This beam's flanges are also tapered from around 3/8" minimum to 5/8" maximum. A review of AISC historical steel shape catalogues suggests this beam is a S12x34.1. The beam spans approximately 12-1/2 feet between supports.

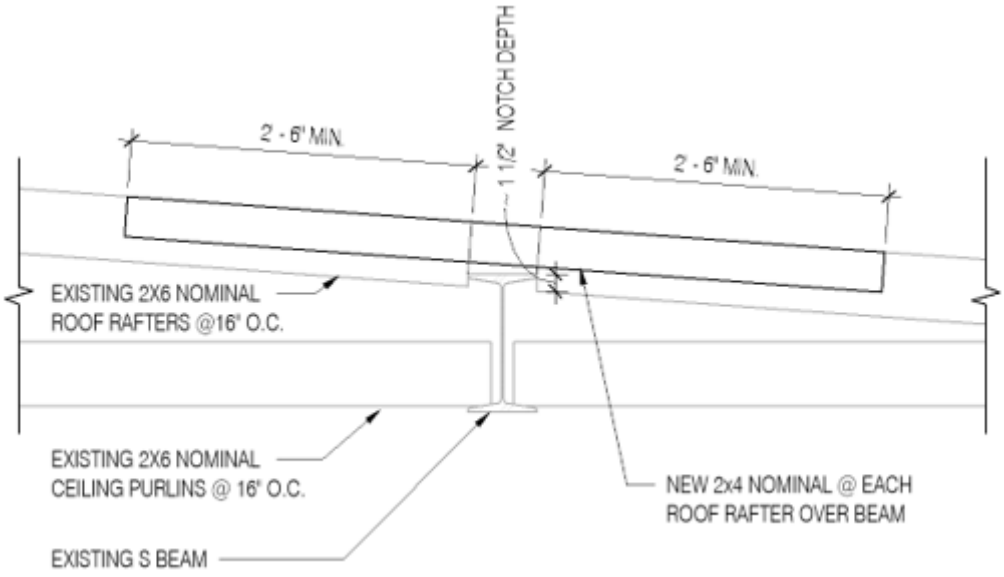
The perimeter walls around the building are load-bearing masonry. The cracking observed at the rear and north facades appears in most cases to be due in large part to water infiltration from above, with the resulting observed damage caused by numerous freeze thaw cycles over a number of years. At this time, the walls appear to be structurally stable, but repair is needed to prevent this condition from deteriorating further which eventually would lead to a loss of structural capacity.

RENOVATION SCOPE OF WORK

Roof Analysis and Retrofit

We carried out a structural analysis to determine if sufficient capacity exists to support rooftop solar panels. We analyzed the existing structural members for their ability to withstand typical roof and ceiling loads, code required snow loads, and an allowance of up to 15 psf to account for an unballasted solar panel system.

The results of our analysis show the steel roof beams have sufficient capacity to support this load. The roof joists also have ample capacity over a majority of their length; however, the reduction in member depth at the notches previously described reduce the capacity of the wood framing locally below required strengths. The joists can be easily reinforced by sistering in a new 2x4 member to reinforce the notch area, as shown in the detail below.



Strengthening Detail at Typical Roof Joist

There will likely be new mechanical units on the roof, or suspended in the ceiling space. These units are expected to have weights in the range of 100 to 150 pounds. Strengthening of the roof locally will be required to support these units, in the form of sistering new 2x6's onto existing 2x6's at each side of the unit, extending full length between supports.

Abandonment of Existing Interior Stair

The existing interior wood stair is in poor condition, and does not meet current code. A new stair will be provided external to the existing footprint, so the existing floor opening is to be infilled. This will be accomplished by installing new 2x12 members @ 16" oc spanning from the interior steel beam to the exterior wall, covered by wood decking to match existing.

Repair of Cracked Load-Bearing Masonry Walls

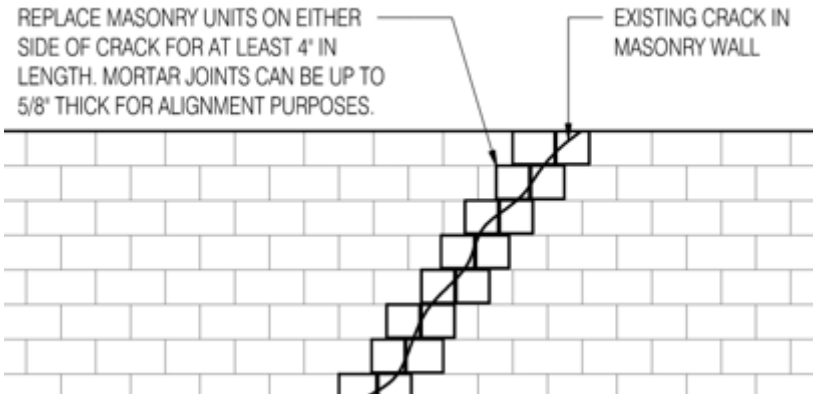
The cracking in the load-bearing masonry walls on the north and rear facades needs to be repaired. Typical cracked wall conditions are shown in the photos below.

Cracking in Rear Wall

Cracking at Northwest Building Corner

Cracking in Rear Wall

The masonry wall cracking generally occurs in an area which visually does not require restoration to a pristine condition, nor do the walls need to be brought back to perfect alignment to recover the displacements that currently exist at some locations. In the case of more severe cracking, repair can be accomplished by local masonry unit replacement as shown in the detail below. In minor cases without displacement across the joint, retooling would be an acceptable repair, or pressure injection with an epoxy resin where feasible. In total, it is estimated there is approximately 250 linear feet of cracks to be repaired.



Masonry Wall Repair Detail at Cracking

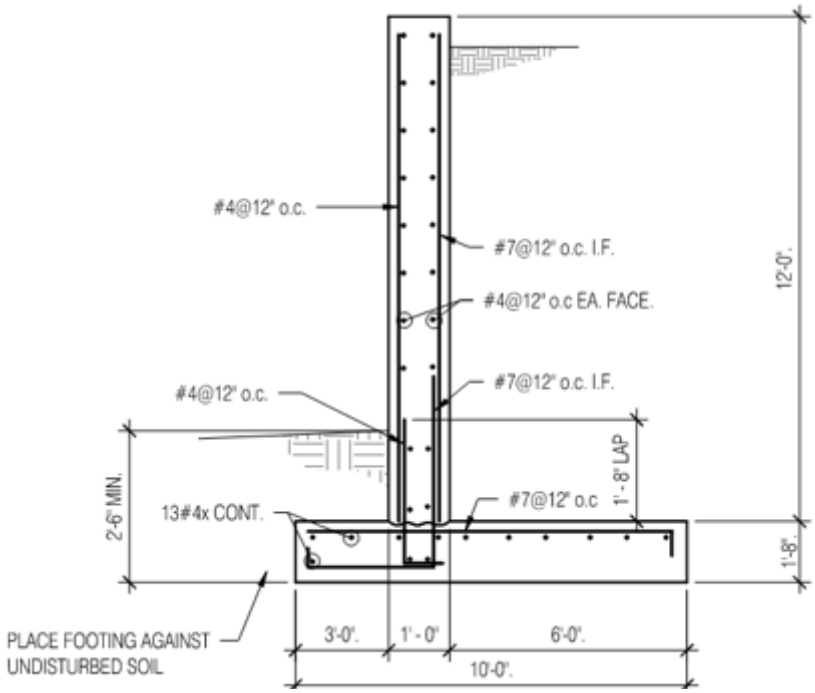
Modified Masonry Opening at Front of Building

There are two existing large openings on the front façade of the building. One of the openings is to be expanded vertically to match the height of the adjacent opening. Several rows of existing masonry are to be removed. A new reinforced masonry lintel will be required over the top of the enlarged opening.

Framing for New Elevator and Stair/Exterior Patio

A new elevator and stair will be added external to the existing building footprint. New shaft walls will be created with 8" thick masonry walls, reinforced with #4 @ 24" oc. A 4' deep elevator pit is required. 3" deep 18 gage galvanized metal decking will span across the top of the shaft to complete the enclosure.

Two sides of the new addition will be concrete cantilevered retaining walls below grade to create a level 600 to 700 gsf exterior patio adjacent to the building. Existing sloping grades will require about 70 linear feet of retaining wall. A typical wall section is as shown on the sketch below for the typical wall condition. The slab on grade within the patio area will be a 5" thick conventional slab on ground reinforced with welded wire fabric.



Cantilevered Retaining Wall at Exterior Patio

MECHANICAL/PLUMBING/HVAC

A. SECTION 20 00 00: GENERAL MECHANICAL REQUIREMENTS

1. Scope: The scope of work will be as schematically clarified hereinafter:
    i. Plumbing (Division 22)
        1. Sanitary piping will be extended from fixtures and appliances requiring connection to a 4" main to a point 5'-0" beyond the building. Make connection to line provided under another division.
        2. Storm water piping will be extended from roof drains to a 4" main to a point 5'-0" beyond the building. Make connection to line provided under another division.
        3. Condensate drains will be extended to discharge indirectly into the storm water system.
        4. Domestic water piping will be extended from fixtures and appliances requiring connection to a 1" main with a ¾" meter to a point 5'-0" beyond the building. Make connection to line provided under another division.
        5. Domestic hot water will be provided by an electric storage tank water heater with distribution piping.
        6. A domestic hot water recirculation pump will be provided.
    ii. Heating Ventilating and Air Conditioning (Division 23)
        1. The building will be heated and air conditioned by mini split system heat pumps with distribution ductwork. Units shall be horizontal, above ceiling, ducted, medium static type. There will be (2) one-to-one units and (1) mulit-port unit.
            a. One-to-one units
                i. First floor community space – 3-ton
                ii. Elevator shaft – 2 ton
            b. Multi-port unit
                i. Lower-level event space – 1.5 ton
                ii. Remainder of lower-level – 1.5 ton
        2. The building will be ventilated with wheel type energy recovery ventilators, with ventilation air being ducted to the return side of the split system heat pumps. Exhaust ventilation will be provided for toilet rooms, janitors closets, and kitchens. There will be (2) energy recovery ventilators, (1) serving the lower level and (1) serving the upper level. Each energy recovery ventilator shall be roughly 450 cfm capacity.
        3. Auxiliary electric heaters will be provided at entries and stair towers.
        4. A system of automatic temperature controls will be provided. Occupied/Unoccupied mode of the split systems shall control the occupied/unoccupied mode of the associated energy recovery ventilator.

B. SECTION 22 00 00: PLUMBING

1. Technical Information
    i. Piping will be as approved by the Authority Having Jurisdiction, with the following as Project minimum standards:
        1. Sanitary and Vent
            a. Below grade and under the lowest building slab:
                i. Cast-Iron Soil Pipe: ASTM A74, Service weight, hub-and-

spigot soil pipe and fittings.
ii. As a Deduct Alternate Price: Schedule 40 PVC with solvent weld joints and fittings.
b. Above grade and above the lowest building slab:
i. Cast-Iron Soil Pipe CISPI 301 and ASTM A888, hub-less pipe and fittings.

2. Storm Water
a. Below grade and under the lowest building slab:
i. Cast-Iron Soil Pipe: ASTM A74 and CISPI Standard 301, Service weight, hub-and-spigot soil pipe.
ii. As a Deduct Alternate Price: Schedule 40 PVC with solvent weld joints and fittings, for use exterior of building only. This alternate price will be clearly identified on the Bid Form.
b. Above grade and above the lowest building slab:
i. Cast-Iron Soil Pipe: ASTM A74 and CISPI Standard 301, Service weight, hub-and-spigot soil pipe for pipe ten inch (10") and larger and hubless for eight inch (8") and smaller.

3. Condensate
a. Below grade and under the lowest building slab:
i. Cast-Iron Soil Pipe: ASTM A74 and CISPI Standard 301, Service weight, hub-and-spigot soil pipe.
ii. As a Deduct Alternate Price: Schedule 40 PVC with solvent weld joints and fittings.
b. Above grade and above the lowest building slab:
i. Provide seamless Type "L" copper tube for sizes 2-inch and less and Type "K" copper tube for pipe sizes 2-1/2-inch to 4-inch.
ii. Pressurized Pipe and Fittings: Pipe and fittings from the sump pump will copper Type "K".

4. Foundation Drain
a. Provide PVC SDR35 perforated pipe with minimum 2 rows of ½-inch diameter holes spaced 4 inches on center, parallel to the axis of the pipe, at a maximum 45 degrees apart at interior of below grade walls.

5. Domestic Water
a. Below grade and under the lowest building slab:
i. Pipes used for underground water main service to the building will be cement lined, centrifugally cast, ductile iron pipe with bell and spigot with push-on or mechanical joints.
b. Below grade or below concrete slab equipment or fixture supply branch feeds will be tube size ¾-inch and larger and will be fed through a 2" or larger PVC sleave.
c. Above grade and above the lowest building slab:
i. For pipe sizes 4-inch and smaller:
1. Provide seamless Type "L" copper tube for sizes 2-inch and less and Type "K" copper tube for pipe sizes 2-1/2-inch to 4-inch.

2. As a Deduct Alternate Price: Copper and cast copper alloy press-connect fittings: When pressing onto B88 copper tube, types K, L, and M may be used. Tempers O60 and O50 ("soft copper") are limited to nominal sizes 1/2" to 1-1/4".

ii. Insulation
    1. Insulation will be provided for the following:
        a. Storm water:
            i. Roof drain bodies
            ii. Horizontal pipe sections
            iii. Vertical pipe risers for acoustical treatment
        b. Condensate:
            i. Horizontal and vertical pipe sections
        c. Domestic Water:
            i. The complete CW, HW and HWC systems except:
                1. Chrome plated fixture risers
    2. Insulated piping at the following locations will also be provided with a metal jacket:
        a. Exposed in mechanical rooms and closets
        b. Exposed on roof
    3. Insulated piping at the following locations will also be provided with a heat trace:
        a. Exposed to freezing conditions
    4. Insulation will be:
        a. Long strand fiberglass:
            i. Thermal Conductivity: a minimum k-value of 0.23 BTU-In/ Hr.-degree F or less at 75°F.
            ii. Density: 3.5-5.5 lbs/ft³
            iii. Rated as maximum 25 flame spread and maximum 50 smoke developed.

iii. Water Heaters
    1. Water heaters will be 30 gallon, 4.5KW.
    2. Water heaters will be/have:
        a. Factory complete with insulated tank, heating elements, operating and safety controls and internal wiring to a junction and control box.
        b. Enamel finished steel jacket.
        c. ASME T&P relief valve.
        d. Three year tank warranty.
        e. Set up to store 140 degF water and will be served by a main digital mixing valve for lower temperature distribution (122 degF). The individual plumbing fixtures will each be provided with tempering valves for final delivery temperature (108 degF).

iv. Domestic Recirculation Pump
    1. Inline domestic circulating pumps will be/have:
        a. Bronze impeller and body with stainless steel sleeve bearings.

v. Expansion Tanks
    1. An expansion tank will be provided for each domestic hot water system and be/have:
        a. Fixed Heavy Duty Butyl Diaphragm NSF/ANSI 61
        b. Antimicrobial Polypropylene w/ Anti-Legionella Protection Liner

vi. Backflow Preventer
    1. A reduced pressure zone backflow preventor will be provided at the service entrance:
        a. ASSE 1013 listed
        b. Assembly will automatically reduce the pressure in the zone between the check valves to at least 5 psi lower than the inlet pressure.

vii. Hose Bibs and Wall Hydrants
    1. Provide exterior wall hydrants around the building perimeter at 100 feet intervals:
        a. Frostproof lead-free hydrant contained within a locked housing.
        b. Integral backflow preventor
        c. Automatic draining
    2. At a minimum, provide (1) wall hydrant at the following locations:
        a. Front
        b. Back
        c. Patio
    3. Provide interior hose bibs in main mechanical room:
        a. Lead-free hydrant
        b. Integral backflow preventor
    4. Provide a roof hydrant:
        a. Frostproof lead-free roof hydrant
        b. Integral backflow preventor
        c. Automatic draining
        d. Wide anchoring flange and clamp collar

viii. Drains and Cleanouts
    1. Drains will be provided:
        a. Floor Drain, General Area Drainage: Z415 Series-Round:
            i. Trap primer connection and piping back to the trap primer
        b. Roof Drain, General Roof Area Drain: Z100 Series, with:
        c. Secondary Drain Discharge, General Secondary Roof Area Drain – Discharge Termination: Z199 Series, with:
            i. Decorative face of wall flange and outlet “tongue” nozzle
        d. An alternative for secondary drainage would be to provide scuppers and downspouts.
    2. Cleanouts will be provided as required by the Authority Having Jurisdiction, at changes of direction, and at 100 feet intervals. Cleanouts will be suitable for the adjacent floor or wall finish.
        a. Cleanouts will be of the same piping material as the system being served by the cleanout.
        b. Access covers will be:
            i. Finished Areas: Polished nickel bronze
            ii. Unfinished areas: brass

ix. Plumbing Fixtures
    1. Plumbing fixtures will be provided as indicated on the architectural drawings and have:
        a. Sinks which are designated as ADA Compliant will be provided with:
            i. Molded vinyl pipe covers to provide scald protection on hot water, hot water recirculation, tempered water, and drain piping.
        b. Public area fixtures will be provided with sensor operated flush valves and faucets. :

x. Sterilization
    1. The domestic water system will be sterilized per the requirements of the Authority Having Jurisdiction.
    2. The domestic water system being sterilized will undergo a 3 hour retention period where the chlorine concentration is above 100 PPM.

C. SECTION 23 00 00: HEATING VENTILATION AND AIR CONDITIONING

1. Technical Information
    i. Split System Heat Pumps
        1. Split System Heat Pumps systems will be of the following type:
            a. Inverter compressor outdoor units matched to variable flow fan coil units.
        2. Fan Coil Units will be:
            a. Horizontal ducted fan coils located within ceiling spaces.
        3. Acceptable manufacturers are:
            a. Daikin
            b. Mitsubishi
    ii. Energy Recovery Ventilators
        1. ERVs will be provided as indicated on the drawings.
        2. Energy Recovery Ventilators shall include:
            a. Galvanized steel housing
            b. Direct drive ECM motors with centrifugal fan wheel for supply and exhaust fans
            c. Speed controllers
            d. 1” pleated filters
            e. Total enthalpy energy recovery wheel
        3. Acceptable manufacturers are:
            a. Greenheck
            b. Ruskin
    iii. Electric Heaters
        1. Heaters will be of the following type:
            a. Wall
            b. Unit
        2. Acceptable manufacturers are:
            a. Qmark
            b. Berko

iv. Air Distribution
    1. Ductwork will be fabricated and installed per SMACNA Standards.
    2. Air distribution ductwork will be galvanized steel unless noted otherwise.
    3. Acoustical lining will be applied a minimum of 15 feet from fan based equipment on the inlet and outlet side of the unit, ½" thickness. Lined ductwork will also be externally wrapped to meet thermal insulation requirements.
    4. Manual volume dampers will be provided at each branch duct serving a single air device, and at intermediate points in the system to aid in balancing the systems.
    5. Fire and Fire/Smoke dampers will be provided as required by the Authority Having Jurisdiction.
    6. Air devices will be provided and will be of the following types:
        a. Supply Air Diffusers – Titus TDC Series
        b. Supply Registers – Titus 300 Series
        c. Supply Ceiling/Wall Linear Slots – Titus ML Series
        d. Supply/Return Floor Slots – Titus CT Series
        e. Return/Exhaust/Transfer Ceiling Registers – Titus 50F Series
        f. Return/Exhaust/Transfer Wall Registers – Titis 350 Series

v. Insulation
    1. The pipe and duct insulation systems will meet the requirements of the Authority Having Jurisdiction with the following serving as project minimums:
    2. Ductwork – Concealed
        a. Within Unconditioned Space:
            i. Minimum R-Value = 12.0
            ii. Two layers of duct wrap - glass fiber with FRK vapor retarder facing
        b. Within the Building Envelope:
            i. Minimum R-Value = 6.0
            ii. Duct wrap – glass fiber with FRK vapor retarder facing
        c. Ductwork – Exposed Within Building (Utilitarian Spaces)
            i. Minimum R-Value = 6.0
            ii. Duct board – rigid fiberglass with FRK vapor retarder facing
        d. Ductwork – Exposed Within Building (Finished Areas)
            i. Minimum R-Value = 6.0
            ii. Double wall round spiral insulated duct system
        e. Ductwork – Outdoor
            i. Minimum R-Value = 12.0
            ii. One layer of 1-3/4" Panel System
            iii. Exterior vinyl shell
            iv. Aluminum interior surface
            v. Apply a 22 gauge galvanized sheet metal cap on the top horizontal surfaces of the duct sections. The cap will be sloped to maintain positive drainage. The cap will extend down the full height of the duct sections. The cap wall sides will be joined together with sheet metal straps on the bottom side of the Thermaduct system.

3. Refrigerant Piping
    a. Suction – Two Pipe Splits
    b. ¾ inch thickness, 6 PCF
    c. Polyethylene foam closed cell elastomeric
4. Piping located outside of the building will be provided with a jacket of B209 aluminum, 0.016-inch thick, with factory-applied 2-mil moisture barrier.

vi. Test and Balance
1. Test and balance the air distribution and hydronic distribution systems to the flow rates indicated on the drawings.
2. Testing agency will be an independent and certified organization from any of the contractors performing other work covered under Division 20.

vii. Controls
1. A series of stand-alone controls will be provided.

ELECTRICAL

A. SECTION 26 00 00: GENERAL ELECTRICAL REQUIREMENTS

1. Scope: The scope of work will be as schematically depicted on the accompanying set of drawings and as clarified hereinafter:
    i. Telephone and Cable TV service conduits (overhead).
    ii. Secondary electrical service conduits (in concrete encased ductbank) and conductors.
    iii. Power distribution infrastructure, including panelboard(s), feeder conduits and wiring, and branch circuit conduits and wiring.
    iv. Power to HVAC and Plumbing equipment.
    v. Convenience receptacles.
    vi. Interior Lighting (normal and emergency) and lighting controls.
    vii. Exterior Lighting (building mounted) and lighting controls.
    viii. Branch circuit conduits and wiring.
    ix. Fire Alarm system.
    x. Telecommunications system (data, voice, CATV).
2. Technical Information
    i. Laminated acrylic nameplates (interior dry locations) and metal backed butyrate (interior/exterior wet and damp locations). Nameplate to include voltage and source.
    ii. Branch circuit identification on the face of junction boxes and the backside of device cover plates.

B. SECTION 26 05 00: ELECTRICAL METHODS AND MATERIALS

1. Technical Information:
    i. Electrical Service - Electrical power to the building will be obtained from utility provided transformer(s) mounted to utility pole.
    ii. Secondary Electrical Service - Secondary electrical service to the building will be provided from the utility transformer(s). Estimated service size(s) is 400A at 208Y/120 volts. Conduits shall route down utility pole, below grade, and enter building at lower level. Coordinate ductbank requirements with electric utility company. At a minimum provide (2) sets of (4)250KCM aluminum service entrance cables in (2) 4” conduits.
    iii. Power Distribution System:
        1. The electrical service equipment will consist of one of the following or a combination of the following:
            a. A 60 pole, 400A panelboard with 400A service entrance rated LSI main breaker on the lower level, and a CT cabinet and meter mounted on the exterior of the building.
        2. Distribution and Lighting/Appliance Panelboards will be 3-phase, 4-wire with copper bussing and bolt-on style circuit breakers unless specified otherwise.
        3. Provide integral surge protection for incoming service panelboard.
        4. Floor mounted electrical equipment will be installed on 4” high concrete housekeeping pads with chamfered edges. Pad will extend 3” beyond equipment edges.
        5. Acceptable manufacturers of electrical equipment are Square D, ABB General Electric, Siemens, Eaton Cutler Hammer.

iv. Grounding:
    1. The electrical service will be grounded in accordance with the National Electrical Code Article 250. In addition, a separate insulated green grounding conductor will be run for each circuit. Where circuits are combined in a single raceway, the grounding conductor will be sized appropriately.

v. Power for HVAC and Plumbing Equipment
    1. Power to 3-phase motors, 1/2HP and above will be provided at 208V, 3 phase. For single phase motors below 1/2HP, 120V will be provided. Provide 3 phase equipment without integral disconnecting means with separate standalone non-fusible or fusible disconnect switch as applicable. Disconnect switches will be heavy duty type above 100A (240V) and general duty type 100A (240V) and below. Heavy duty type switches will have a minimum interrupting capacity of 200,000 amperes. General duty type will have a minimum interrupting capacity of 100,000 amperes. Provide single phase equipment without integral disconnecting means with separate standalone manual motor starter switch (with or without overloads as applicable). Control of equipment will be provided under another division.

vi. Elevator Disconnect Switches
    1. Provide horsepower rated disconnect switches with the following features:
        a. Class J fuse holders
        b. Lockable external handle
        c. 120V shunt trip
        d. Fire alarm interface relay
        e. Auxiliary contacts for elevator battery lowering controls
        f. NEMA 12 Enclosure
    2. Manufacturers: Bussman, Mersen and Littlefuse

vii. Power for Lighting
    1. Power for lighting will be provided at either 120V single phase.
    2. Emergency lighting will be provided by one of the following:
        a. Battery powered exit signs and lighting fixtures with integral battery backup

viii. Power for General Use
    1. Power for general use receptacles will be provided at 120V single phase. For larger equipment or appliances 208V single phase or three phase will be utilized.

ix. Wiring Materials
    1. Conduit and conduit fittings installed below grade or encased in concrete will be rigid polyvinyl chloride (PVC) schedule 40. Conduit through and within 5’-0” of foundation walls and for stubups into equipment will be rigid galvanized steel. Conduits installed in damp or wet locations inside the building or conduits installed exposed outside will be rigid galvanized steel. Conduits installed in interior dry locations will be EMT. Connections to vibrating equipment will be flexible metal conduit (interior dry locations) or liquid tight flexible metal conduit (interior damp/wet locations and exterior locations). The use of flexible non-metallic conduit or liquid tight flexible non-metallic conduit is not permitted. Metal boxes will be

utilized. Cast boxes will be utilized in damp and wet locations and where surface mounted. Conduit will be installed parallel and perpendicular to structural members.

2. Conductors and cables will be annealed copper unless otherwise noted. Insulation for conductors will be 600V, 75 degree C dry and 90 degrees C wet, type THHN/THWN. Service entrance conductors can also be type XHHW. Minimum conductor size will be #12AWG. Conductors larger than #10AWG will be stranded. Feeders greater than 100A are permitted to be aluminum. Cabling will be installed parallel and perpendicular to structural members. Feeders will be wire in conduit. Exposed branch circuits will be wire in conduit. Concealed branch circuits will be MC cable.

x. Wiring Devices:

1. Receptacles will be commercial specification grade and be rated 20A. Receptacles will be back and side wired capable. Receptacles will be tamper resistant, GFCI, AFCI, or any combination where required. Acceptable manufacturers are Hubbell, Leviton and Pass & Seymour. Provide receptacles as follows:
   a. Community Room: one receptacle every 15’ on center. Minimum (4) floor boxes with power/data.
   b. Meeting Space: one receptacle every 12’ on center around wall perimeter, one receptacle every 2’ on center above countertop and one dedicated for each piece of kitchenette equipment (refrigerator, microwave, etc.). Floor boxes as required per NEC.
   c. Conference Rooms: minimum of one duplex receptacle per wall, one duplex receptacle in floor box under table and additional as required by code. One duplex receptacle in a recessed TV wall box centered behind wall mounted TVs.
   d. Corridors: one duplex receptacle every 50’-0” on center
   e. Restrooms: one duplex GFI receptacle per sink.
   f. Storage rooms: one duplex receptacle
   g. Electrical/Mechanical equipment rooms: one duplex receptacle every 12’-0” on center
2. Special receptacles as required for other equipment requiring a special receptacle.
3. Cover plates will be painted steel.

xi. Telephone/CATV Service

1. The telephone and cable TV service to the building will originate from a point coordinated with the respective telephone and cable TV service providers. Provide (4) 4” conduits (in concrete encased ductbank) (2 for Telephone and 2 for CATV) from telephone and cable TV service provider coordinated site location to building with utility. Cap conduits on both ends.
2. In the building provide (2) 2’W x 4’H fire retardant painted plywood backboards (1 for each service). On each backboard provide a quad receptacle on a dedicated 20A circuits. Provide grounding busbar for telephone and cable TV service and connect back to electrical service main ground bar.

xii. Security / Access Control System

1. A security and access control system will be provided by the Owner’s vendor. Work of this division includes providing back boxes, conduit, and

120V power for the system where required.

xiii. Two-way Communication System For Area of Refuge

1. A two-way communication system between elevator lobbies and the main lobby will be provided per the requirements of IBC Section 1009.8.

C. Section 26 50 00 Lighting

1. Technical Information

i. Interior lighting light levels will comply with those as recommended by the Illuminating Engineering Society of North America (IESNA) unless otherwise directed by the owner or code. In general, LED light fixtures will be specification grade in common areas. Kelvin temperature will be 3000K. Fixtures utilizing a LED driver will include 0-10V dimming capability. Exterior light fixtures will be DLC listed and have full cutoff distributions that comply with local zoning requirements.

Application	Light Level (FC) AVG (Maintained)	Luminaire	Lighting Control
Corridors	20	2 x 2 Flat Panels Downlights	Dual tech ceiling mtd. occupancy sensors
Stairwells	20	Lensed wall mounted	Integral PIR occupancy sensor with dim to 20% under no occupancy
Restrooms	20	2 x 2 Flat Panels Downlights Decorative wall mtd.	Dual tech ceiling mtd. occupancy sensors
Storage Rooms	20	2 x 2 Flat Panel	Dual tech wall box vacancy sensor with manual on/ auto off Dual tech ceiling mounted vacancy sensor with low voltage wall station manual on/auto off
Conference Room	40	2 x 2 Volumetric Downlights Linear Pendant	Dual tech ceiling mtd. vacancy sensor with low voltage dimming wall stations for manual on/auto off.
Electrical/Mech. Rooms	20-30	Lensed industrial	Toggle Switch
Community Room / Meeting Room	35	Decorative Architectural Linear or Circular	Dual tech ceiling mtd. vacancy sensor with low voltage dimming wall stations for manual on/auto off.
Building Mounted		Sconces and wall packs	Photocell/Timeclock via Contactor

D. Section 27 50 00 Distributed Antenna System

1. Technical Information

i. An emergency responder distributed antenna system will be provided for part

or all of the building based on signal strength measurements at the project site prior to construction, before walls are enclosed and after building is substantially complete. If it is determined that signal strength is inadequate during any of these measurement periods, a distributed antenna system will be provided. Signal strength results that indicate a distributed antenna system is not required to be provided to the Authority Having Jurisdiction for approval that no system is required.

E. Section 28 30 00 Fire Alarm Systems
    1. Technical Information
        i. A new addressable fire alarm system will be provided for the building. Concealed fire alarm cabling and wiring to be installed in ¾" conduit, MC fire alarm cabling or open cabling methods as approved by the Authority Having Jurisdiction. Exposed fire alarm cabling and wiring to be installed in ¾" conduit.
        ii. System initiation will be by manual pull stations, smoke detectors, heat detectors, duct detectors, and carbon monoxide detectors. System annunciation will be by horns, strobes and combination horn/strobes.
        iii. Signals to be transmitted by the fire alarm control panel to the owners monitoring agency and to the remote annunciator panel.

END