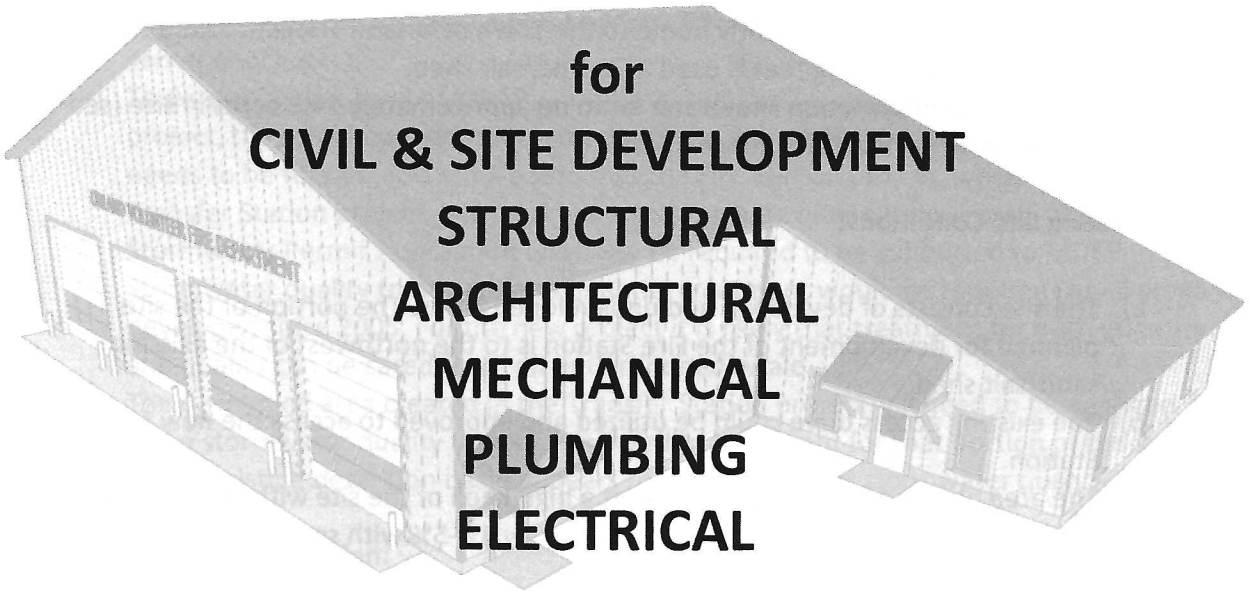
Appendix B

Orland Volunteer Fire Department

Conceptual Design Narratives

2105 / ORLAND VOLUNTEER FIRE DEPARTMENT

CONCEPT DESIGN NARRATIVES



for

CIVIL & SITE DEVELOPMENT
STRUCTURAL
ARCHITECTURAL
MECHANICAL
PLUMBING
ELECTRICAL

LMA
LEWIS + MALM
ARCHITECTURE
EST. 1983

19MAY2021

CIVIL & SITE DEVELOPMENT:

1. General:

a) The Town of Orland Volunteer Fire Department is considering the construction of a new Fire Station.
b) The site being considered for the proposed fire station is on Grey Meadow Road, about 0.4 miles northwest of the intersection with U.S. Highway 1.
c) The parcel is currently owned by the Town of Orland Tax Map 24, lot 9.
d) The existing parcel is currently home to the Town of Orland Transfer Station as well as a Quonset hut building that is used as a sand/salt shed.
e) The tax map information shows the lot to be approximately 24.5 acres in size (see appendix for lot map and information).

2. Existing Site Conditions:

a) The site consists of developed and undeveloped areas. The portion of the site planned for development of the Fire Station is to the northwest of the existing sand/salt shed.
b) The existing access drive could be utilized and improved to access the new Fire Station.
c) The area planned for development is at a high knoll of the site with grades sloping generally from north to south at approximately 4%-5% with small areas of steeper slopes.
d) The site is currently wooded and generally favorable for the type of development being considered.
e) Base plans used in a previous phase of development at the site were utilized for preliminary site layout and planning purposes. These plans show wetland boundaries on the subject parcel. The proposed layout does not include any new wetland impacts.

3. Municipal & MDEP Permitting:

a) The Code Enforcement Officer (CEO) for the Town of Orland has indicated that no zoning or setback requirements will apply to this site.
b) After a preliminary review of the Town of Orland's Ordinances, it appears that the proposed project will require Site Plan Review through the Planning Board. We do not foresee any significant hurdles regarding municipal permitting, assuming the development avoids any wetland impacts.

c) The site was permitted with MDEP for the transfer station. This permitting included a wetland impact permit and an investigation into potential vernal pools on the property. For that project, 13,454 square feet of wetland disturbance was permitted. If more wetlands would be impacted by the new development, then these would need to be permitted as well. We would note that permitting wetland disturbance is accumulative for the site, so any new disturbance will be added to the existing. A major threshold with regard to wetland permitting is 14,999 square feet. Disturbing wetlands in excess of this tends to require a more complicated process which typically requires mitigation and compensation measures.
d) The proposed layout of the building and parking takes into consideration the location of wetlands on the site and avoids impacts. (see attached copies of permits and vernal pool letter).
e) To determine the level of MDEP permitting required for stormwater related to the project, the total impervious area created from any project on the site since 2005 needs to be totaled. It is anticipated that the Fire Station project, when added to the Transfer Station project, will total more than an acre of impervious area. Therefore, a Stormwater Permit Application will likely be required to be submitted to MDEP. Stormwater quality treatment and quantity treatment would be required for all areas developed since 2005. For the new project it is likely that treatment for both quantity and quality can be cared for in an underdrained swale.
f) The developed area created in the Transfer Station project will need to be analyzed and a stormwater quality system may need to be retrofit for that portion of the site as the existing detention basin appears to be designed for stormwater quantity only.

4. Conceptual Layout Plan:

a) The proposed layout sites the new fire station to the northwest of the existing sand/salt shed.
b) A large, paved apron is proposed to provide sufficient maneuvering area for the firetrucks to enter and exit the building.
c) Parking has been located at the perimeter of the paved area.
d) The building is approximately 7,400 square foot in area with 20 parking spaces, including two ADA parking spaces.
e) As design progresses there will likely be some shifting of the exact configuration to provide efficient circulation and access. This would be part of the typical design process with the Owner.
f) On-site utility locations would need to be determined prior to finally locating the building and parking.
g) The location of the site provides good access with good site distance along Gray Meadow Road.

5. Utilities:

a) Sewer service will need to be provided by on an on-site, subsurface septic system. The configuration, location and sizing for an on-site septic system has not been determined. Final location of the septic system would be determined by test pits and an evaluation of the existing on-site soils.
b) We recommend that the Town have the potential for a system investigated early in the design process to determine if any prohibitive issues exist. If site soils permit the disposal field to be located in the area behind and to the northwest of the building, this would be preferable as it may allow the septic system to be designed without requiring a pump station.
c) The State of Maine Subsurface Wastewater Disposal Rules require certain setbacks from wetlands and streams based on the type of wetland or stream. Setbacks from existing wetlands will need to be reviewed during the septic design process.
d) Water service to the proposed building would be provided by an on-site drilled well meeting required setbacks to a subsurface disposal field. There is an existing well which servers the Transfer Station, during the design phase this well could be analyzed to see if it has a sufficient yield to serve the proposed Fire Station.
e) It is understood that the Owner has confirmed that they do not intend to fill the fire trucks at this location. The expected yield, while sufficient for domestic use is not likely sufficient to support a sprinkler system for the building. It is also understood that the new building will not be sprinklered.
f) Overhead power is available at Gray Meadow Road, adjacent to the property. Power could be extended overhead along the improved access drive or be carried underground to the building. The adequacy of the existing power line is addressed by others in this review.
g) It is assumed that the new building may utilize propane and it appears there is sufficient room for buried or above ground propane tanks as needed.

Hedefine Engineering & Design, Inc.

Eero Hedefine, P.E.,
LEED AP Project
Manager

5/11/21

Attachments: Appendix; Tax map data

STRUCTURAL:

1. Structural Framing: At this time, the structural framing material has not been selected. Framing systems under consideration include a preengineered structure, conventionally framed structural steel, and timber framing. A brief comparison of the 3 options follows:

1.1 Pre-engineered Structure: These buildings are very popular for long-span structures. Interior columns can be completely eliminated, although the inclusion of a column line at the ridge will save cost. The design of the frame is precise in its utilization of material. This efficiency is a primary reason that the buildings are the lowest cost option. Erection is typically very fast compared to other building types.

Disadvantages:

a) The precise structural design can pose a problem for future alterations.
b) The design is inherently very flexible when subjected to lateral loads. While the building is designed to tolerate that movement, it can pose a problem with brittle interior materials that are connected to the structure.
c) Many people find pre-engineered structures to be lacking in aesthetic appeal, however recent changes in this building type have brought about some changes.
d) Exterior siding is easily damaged from impact, unless IMPs are utilized, heavier IMP exterior finishes are available.
e) Roofs are typically gable-shaped. For a long-span structure, there will be significant roof run-off that must be accommodated. With the standard roofing product, there will also be a significant volume of snow that will slide off the roof and accumulate below the eaves.

1.2 Conventional Steel Framing: This structure type offers the greatest design flexibility for building form. Steel joists would be the likely choice for repetitive roof framing members. Steel joists would be supported on structural steel beams and columns. Columns would be HSS shapes to minimize sizes. This too can be built as a clear-span structure. But introducing the interior column line as has been suggested will provide a substantial cost saving. It is possible to utilize a flat roof with internal roof drains, which would provide improved management of roof run-off. A steel moment frame is expected to be required at the front wall due to the presence of the overhead doors. Diagonal steel bracing consisting of HSS steel shapes would be introduced at other exterior walls to resist in-plane lateral loads. The wall construction would be determined when the finish material is selected.

Disadvantages:

a) The only disadvantage of this building type is the increased cost over a pre-engineered structure.

1.3 Timber Framing: This would take the form of timber stud walls with prefabricated wood truss roof construction. The attic can be heavily insulated and ventilated for improved thermal efficiency. The roof can be a clear span structure, although there will be a cost benefit to introducing the center column line. The beams and columns at that center bearing line will be structural steel. Since timber framing is not as strong as steel, much of the economy of timber framing is lost on a large, long-span roof system with tall walls and large openings. Wood studs will probably need to be constructed of engineered lumber. Requirements for higher wind load design and for seismic design, poses further wind load problems for a building that is open on one side, as will exist for the fire station. These are typically resolved using additional structural steel moment framing. On past projects, clients have found that the unique requirements for fire station design are expensive to resolve with timber-framed construction.

Disadvantages:

a) Timber framing and siding materials are not as durable as other materials.
b) Elements exposed to weather require greater attention to maintenance.
c) Wooden diaphragm construction is required at large ceilings and wall areas.
d) The structure is highly combustible. Wood trusses are particularly dangerous when subjected to fire because they often fail suddenly before burning. This occurs due to weakening of the joints from the wood shrinkage from sudden loss of moisture.

2. Mezzanine: A storage mezzanine is planned for the project. The material choice for that framing should be consistent with the building frame system to avoid requiring a separate trade to do the construction. For either of the steel-framed options described above, steel bar joists with a concrete slab cast on steel form deck is the most cost-effective choice. For a timber-framed building, parallel-chord wood trusses or I-joists would be preferred choices. This would include a plywood floor deck. These materials are less durable than the steel framed options. The floor framing would be supported at exterior wall framing and with interior concrete masonry walls. The current location of this area in all likelihood calls for fire-rated wall assemblies and floor/ceiling assemblies, which enable the building to remain unsprinklered.

The following summarizes structural systems & design requirements for the OVFD Fire Station:

3. Codes & Standards:

- 2015 International Building Code
- ASCE 7-10 Minimum Design Loads for Buildings and Other Structures

- ACI 318-14 Building Code Requirements for Structural Concrete with Commentary
- NDS 2015 National Design Standard for Wood Construction with Commentary
- AISC 360-10 Specifications for Structural Steel Buildings

4. Design Loads:

a) A fire station is considered a "critical structure" as it needs to remain functional regardless of extreme environmental loadings that may occur. Critical structures are classified as Risk Category IV structures for structural loading. Therefore, loadings for snow, wind, and seismic events are higher than would typically be used.
b) Since no geotechnical investigation has been completed to date, the code required assumption of Site Class D has been used to determine the Seismic Design Category.
c) Based on the mapped spectral ground accelerations, Site Class D places the building's Seismic Design Category as Category C. This allows for a steel-framed building lateral-force resisting system to be designed without any special seismic detailing for increased ductility.
d) The occupancy category imposes a requirement for seismic bracing of mechanical and electrical components where the component "is needed for continued operation of the facility". It is expected that this would cover all mechanical and electrical items installed in the building.
e) We recommend that a geotechnical investigation be completed to verify the seismic site class and provide structural foundation design criteria and construction recommendations.

- Building Risk Category
  - Category IV (Essential facility)
- Dead Loads
  - Self-weight of the structure
- Live Loads
  - Floor Live Load
    - Wheel loads and spacing of fire vehicles
  - Mezzanine Live Load
    - 125psf (Light storage)
  - Roof Live Load
    - 20psf (Ordinary pitched roof)
- Snow Loads
  - Ground Snow Load – Hancock, Maine
    - p_g = 60psf
  - Snow Exposure Factor
    - C_e = 1.0
  - Building Thermal Factor

        - C_t = 1.1 for potential utilizing an insulated and ventilated attic
        - Ct = 1.0 for all other building construction types
    - Overhangs and Unheated Areas
        - C_t = 1.2
    - Snow Importance Factor
        - I_s = 1.20
    - Building Flat Roof Snow Load
        - p_f = 56 psf if an insulated, ventilated attic is used
        - Pf = 51 psf for other structure types
    - Overhangs and Unheated Spaces
        - p_f = 61psf
    - Drifted and unbalanced snow loads in accordance with ASCE 7-10
- Wind Loads
    - Design Wind Speed
        - V_{ult} = 120 mph
        - V_{asd} = 93 mph
    - Exposure Category C
    - Internal Pressure Coefficient
        - G_{cpi} = 0.55
- Seismic Loads
    - Seismic Importance Factor
        - I_s = 1.50
    - Mapped Spectral Response Accelerations
        - S_s = 0.273
        - S_1 = 0.072
    - Site Class D (Assumed)
    - Seismic Design Category C
    - Basic Seismic Force Resisting System
        - Light Framed Walls Sheathed with Wood Structural Panels Rated for Shear Resistance for the timber framed option
        - Steel Systems not Specifically Detailed for Seismic Resistance for steel framed options.
    - Response Modification Factor
        - R = 6.5 for the timber-framed option
        - R = 3.0 for the steel-framed options
    - Seismic Response Coefficient
        - Cs = 0.066 for the timber-framed option
        - Cs = 0.144 for the steel-framed options
    - Design Base Shear
        - V = C_s x W

    - Analysis Procedure
        - Equivalent Lateral Force
- Allowable Soil Bearing Pressure
    - 2,000psf (Assumed)
- Required Frost Depth
    - 5’-0” below adjacent finished grade

5. Foundations and Concrete Slab-on-Grade

a) The structure is assumed to be founded on reinforced concrete foundation walls and continuous strip footings bearing below the 5’-0” frost depth. Any special considerations for subgrade preparation at footings and slabs are unknow as no geotechnical investigation has been completed and no geotechnical recommendations have been provided.

b) All concrete exposed to freeze-thaw conditions in service will be air entrained for “severe exposure” per ACI 318 and shall have a minimum 28-day compressive strength of 4500 psi. All concrete for interior slabs will have a minimum 28-day compressive strength of 4000 psi and shall be non-air-entrained. Foundation walls and footings will be reinforced with steel reinforcement complying with ASTM A615, Grade 60.

c) At this time, we anticipate the slab thickness for support of fire trucks to be 8” thick. Where the truck traffic will not exist, such as under the mezzanine, a 4” slab thickness is expected to be adequate. The final required slab thickness will be determined during the design process after receipt of the axle loads and spacing of the fire trucks to be parked in the structure. This concrete floor slab will be reinforced with steel reinforcement complying with ASTM A615, Grade 60. Where the slab thickness is reduced to 4”, it will be reinforced w/ welded wire mesh complying with ASTM A185.

d) Full area high load extruded polystyrene insulation is used beneath the concrete slabs, especially when radiant heat systems are specified.

e) Reinforcing all concrete floor slabs with welded wire mesh rather than reinforcing bars may be considered as a cost-saving measure. We recommend that dowel baskets and diamond dowel plates be provided at all concrete floor slab contraction and construction joints subjected to wheel loads to provide improved load transfer across the joint.

f) The use of dowel baskets at slab joints is recommended regardless of whether welded wire mesh or reinforcing bars are used to reinforce the concrete slabs on grade.

g) At out-swinging exterior doors with handicapped accessibility required, the exterior grade must be at floor elevation. The design must consider the potential for frost heave to prevent the door from opening. We propose to design frost walls surrounding a concrete slab outside of each person door. The slab will be anchored to the walls with reinforcing steel.

h) At overhead doors, we propose an “insulated apron slab” to make the transition between the soil bearing pavement and the interior slab edge, which will bear on the concrete frost wall. The apron slabs will bear directly on the soils at one end and bear on the foundation wall at the other end. High load extruded polystyrene insulation is used beneath the apron slab as an extra precaution.

6. Bearing and Shearwall System (Timber-framed Option)

a) We anticipate that 20’ tall load bearing walls will be constructed from 10” nominal Timberstrand wood studs. Wall studs must align below wood trusses bearing above, which are anticipated to be two feet on center.
b) Exterior walls will be sheathed with wood structural panels rated for shear resistance to resist in-plane and out-of-plane lateral loads. Shear wall construction will include holdown anchors at each corner with enlarged footings to resist uplift loads.
c) At the front wall of the fire station, we anticipate that a steel moment frame need to be constructed to provide in-plane lateral load resistance. Steel columns would be required in each corner of the building and between each overhead door. The steel columns would be founded on concrete piers integral with the typical foundation wall piers and be supported on footings integral with the typical foundation wall footing.
d) The top of pier can be held down below the top of floor slab to provide a clean finish at the floor elevation. Steel beams would frame between each column over the overhead doors. The steel moment frame will need to be connected to the roof diaphragm.

Lincoln Haney Engineering Associates, Inc.

Michael Cunningham, P.E., LEED AP
Structural Engineer

19MAY2021

ARCHITECTURE

1. Exterior Walls:

The exterior walls of the pre-engineered steel building as proposed to be either:

a) R-25 Insulated Metal Panels, 24 gauge exterior, 26 gauge interior filled w/ polyisocyanurate insulation, w/ interlocking joints, factory and field caulked, or
b) R-25 Optiliner built-up Metal Panels, 24 gauge exterior, 26 gauge interior metal liner panel w/ thermal isolation tape, heavy gauge vapor barrier and Fiberglass insulation, banded prior to closing.
c) 12" Reinforced Concrete upstand walls, 8" thick around entire perimeter of building.

2. Roof:

The roof of the pre-engineered steel building as proposed to be either:

a) R-35 Insulated Integral Standing Seam Metal Panels, 24 gauge exterior, 26 gauge interior filled w/ polyisocyanurate insulation, w/ interlocking joints, factory and field caulked, mechanically seamed w/ double fold lock, or
b) R-35 Optiliner built-up Metal Panels, 24 gauge exterior, w/ thermal isolation tape, heavy gauge vapor barrier and banded & reinforced heavy duty vinyl fiberglass insulation.
c) The Exterior Entry Canopies will be tubular steel frames & posts, primed & painted with 24 gauge standing seam metal on high temperature ice & water shield on plywood decking (doubled if snow & ice falling area), w/ 24 gauge flashing & trim, rain diverters to be welded to steel structure.
d) The Snow Guards & Ice Flags located above Entry Doors beneath roof eaves will be heavy duty metal, double metal pipe rails, clamping type w/ milled aluminum mounting hardware, all trim.

3. Miscellaneous Metals:

a) The Mezzanine Stairway will be powder coated steel, w/ closed toe design, pipe railings.
b) The Mezzanine Storage area will have powder coated pipe stanchions w/ chain-link railings, removable for lifting larger objects anywhere around the perimeter.

c) The Bollards will be 6” steel tube, embedded in concrete min. 4’ deep, filled with concrete, w/ heavy duty PVC covers.

4. Doors:

a) The R-17 Overhead Doors will be 14’X14’, segmented 24 gauge metal panels (interior & exterior), filled w/ polyisocyanurate insulation, large fixed pane insulated acrylic insert windows, galvanized vertical/horizontal tracking w/ heavy duty hardware, motorized belt operation, manual chain operation, electric eye w/ anti-crush device, brush and rubber gaskets, w/ 24 gauge metal wrapped wood jambs & header trim.
b) The Exterior Personnel Entry/Exit Doors will be factory primed steel panels w/ robust honeycomb core, hollow metal frames, insulated & tempered vision glazing w/ metal frames, key-coded cylinder mortise locks, heavy duty- ADA compliant hardware, push bar exit devices, 5-knuckle hinges, kick-plates, automatic closers, field painted.
c) The Exterior Emergency Exit Doors will be factory primed steel w/ robust honeycomb core, hollow metal frames, w/ heavy duty hardware, cylinder mortise locks (accessed inside only), 5-knuckle hinges, kick-plates, automatic, closers, field painted.
d) The Interior Fire Rated Doors will be factory primed steel w/ robust honeycomb core, hollow metal rated frames, tempered narrow vision glazing w/ metal frames, cylinder mortise locks, heavy duty- ADA compliant hardware, 5-knuckle hinges, kick-plates, automatic closers, rubber gasketed w/ brush sweeps at Corridor access points, field painted.
e) The Interior Doors will be factory primed steel w/ robust honeycomb core, hollow metal frames, tempered wide vision glazing w/ metal frames, cylinder mortise locks, heavy duty- ADA compliant hardware, 5-knuckle hinges, kick-plates, automatic closers, field painted.

5. Windows:

a) The Exterior Windows will be pultruded fiberglass construction, double hung w/ Argon filled Low-E insulated glazing, integral cellular PVC jamb extensions & sills, hardware, heavy duty insect screens, w/ 24 gauge metal flashing.
b) The Interior Fire-Rated Window at the Dispatch Room will be in a hollow metal rated frame, insulated fire-lite glazing.

6. Interior Walls (Occupied Spaces):

a) The Interior Walls will be Type X impact resistant gypsum board, level 4 finish, primed & painted.

b) The Interior Wet Room Walls will be either moisture resistant Type X impact resistant gypsum board, level 4 finish, primed painted, or cementitious board panels behind ceramic tile.

7. Fire-Rated Walls:

a) The Fire-Rated Separation Walls will be CMU w/ steel rebar reinforced and fully grouted cores, primed & painted.

8. Floors:

a) The Apparatus Bay & Dispatch Room Floors will be sealed, or painted concrete w/ integral trench drains as indicated, slip resistant finish, painted linework will be provided as vehicle guides & service area markings.
b) The SCBA / Maintenance Room- & Mezzanine-Floors will be sealed, or painted concrete, w/ slip resistant finish.
c) The Training/Meeting Room Floor will be either polished concrete, or 2'x2' quartz tile.
d) The Restroom Floors will be either sealed concrete w/ slip resistant finish, or welded resilient sheet goods w/ a 4" integral cove base.
e) The Dispatch & Fire Chief's Office Room Floors will be either polished concrete, or 2'x2' quartz tile.
f) The Storage Room Floors will be either sealed concrete w/ slip resistant finish, or quartz tile.

9. Suspended Ceilings:

a) The Suspended Ceilings will be 2'X2' acoustic tile, square inlay in metal grid, w/ shadow joint perimeter molding, anti-microbial composition w/ suitable fire safety & acoustic ratings.
b) The Kitchen and Restroom Ceilings will be 2'x2' vinyl coated washable acoustic tile, square inlay in metal grid, w/ shadow joint perimeter molding, anti-microbial composition w/ suitable fire safety & acoustic ratings.

10. Interior Trim:

a) The Interior Window & Door Trim will be select grade pine or poplar, primed on all sides and painted.
b) The Interior Window Sills will be either select grade pine or poplar, primed on all sides and painted, or solid surfacing material.
c) The Cove Base will be 4" rubber or vinyl.

11. Building Signage:

a) The Building Signage will be code compliant, acrylic plate w/ raised text & numbers and braile identification.
b) All Mechanical, Electrical & Plumbing labels will be robust, high-tack vinyl.

13. Kitchen Base & Wall Casework:

a) The Kitchen Base & Wall Casework will be made of cabinet grade plywood construction w/ plastic laminate on all exterior surfaces, melamine coating on interior surfaces, plastic laminate countertops w/ 4" sealed backsplash, sealed cut-outs for sink, adjustable plywood shelves w/ 1/8" hardwood front edges and stainless steel supports, warp- and moisture-resistant doors and drawer fronts, solid wood drawer boxes, stainless steel hardware including some lockable units, under cabinet lighting, 4" toe kick for cove base application.

14. Interior & Exterior Paint:

a) Sherwinn Williams Industrial Grade primers & paints for metal & wood, 3 coats to full coverage (1 primer + 2 finish).

15. Specialties:

a) The Steel Columns that extend below the top of slab will be treated with bituminous anti-corrosion coating on bottom and all sides prior to erection.
b) The Exterior Metal Flashing & Trim will be factory primed & painted, 24 gauge w/ all exposed edges hemmed, drip edges where applicable.
c) The Supply Air Grilles & Exhaust Air Louvers will be factory painted metal w/ integral trim frames, metal insect & bird screens.
d) The Fire Stopping Caulking will be NFPA compliant at all penetrations in rated walls and along junctions between rated walls and interior face of exterior walls, as well a floor/ceiling junctions and interior face of exterior walls.
e) The Joint Sealants will be either urethane caulk (exterior), silicone caulk, or latex caulk (interior).

16. Moveable Furnishings & Equipment:

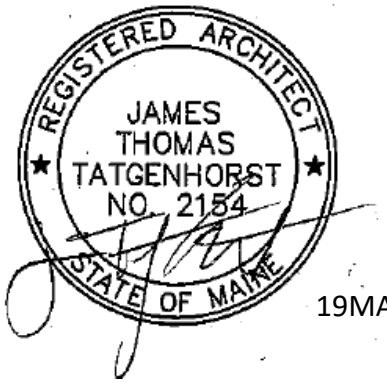
a) Shelving & Racks: Heavy duty powder coated metal w/ plywood inserts.
b) Workbenches: Heavy duty powder coated metal w/ double thickness plywood work surfaces & task lighting.
c) Desks, Chairs & Training/Meeting Room Tables by Owner.
d) Warming Oven, Microwave Oven, Toaster, Blender by Owner.

f) Specialized Fire Fighting Equipment & Vehicles by Owner.

Lewis + Malm Architecture

Charles Earley, LEED AP
Sr. Designer / Project Manager

Jim Tatgenhorst
Architect



19MAY2021

HVAC

1. Heating / AC Systems:

a) The proposed heating and ventilating system will use a high efficiency LP gas fired boiler to produce hot water for heating and ventilation.
b) Mini-split heat pump systems shall be the primary source of heating and cooling in the office, training room and dispatch areas of the facility.
c) A low temperature radiant floor heating system will be provided in the apparatus bay. The radiant floor heating system will extend throughout the facility, will be provided with approximately three zones and will provide supplemental heat to the mini-split heat pump systems serving the training room, and offices.
d) A high temperature hot water loop will serve overhead unit heaters in the apparatus bay to provide quick recovery heating for when the bay doors are opened. This loop will also serve unit heaters in the mechanical mezzanine and vertical toe space heaters in the entrance vestibules.
e) In-line pumps will be provided for each loop and piping will be Schedule 40 steel or Type “L” copper with fiberglass insulation.
f) All controls will be DDC. Night setback controls will be provided and cycled accordingly.

2. Ventilation Systems:

a) Ventilation for the SCBA, office, training room and dispatch areas will be through two energy recovery units with bathrooms, and possibly the laundry room, served off the exhaust side of the unit. Two units are to be provided due to the relatively large ventilation load associated with the training room, which most likely would be only minimally occupied the majority of the time.
b) A vehicle exhaust system will be provided in the apparatus bay to capture fumes at the source of all vehicles. An exhaust fan will also be provided on the roof of the apparatus bay for general exhausting of that entire area. It will be ducted to pick up fumes high and low and will be controlled by a local wall switch and by fume sensors located in the apparatus bay. Louvers would be provided at the front of the truck bays for make-up air when the doors are closed.
c) Exhaust fans will be provided for locations with air compressors and for the laundry room as required.

3. Plumbing

a) The proposed plumbing system will include all fixtures, waste, vent, hot, cold and recirculation piping.
   a. Hot, cold and recirculation piping: Type "L" copper with 95-5 solder, insulated to prevent condensation and/or heat loss. Fixtures will be supplied with 110° F water and recirculation systems shall be provided. .
   b. Waste and vent piping: Service-weight cast iron "No-Hub" sleeve couplings or schedule 40 PVC with cemented joints.
   c. Gas piping: Schedule 40 steel.

b) Insulation: Fiberglass insulation with all service jacket to be provided on hot and recirculation lines in accordance with current energy codes.

c) Fixtures: Water saving fixtures will be used throughout.
   a. Floor drains and cleanouts.
   b. Trench drains in the apparatus bay.
   c. Plumbing fixtures and trim suitable for ADA as required.
   d. Floor mounted tank type water closets.
   e. Wall mounted lavatories.
   f. Break room stainless steel sink.
   g. An oil separator for the trench drains.
   h. Non freeze wall hydrants.
   i. Emergency eyewash and shower station.
   j. Mop sink in the janitor's closet.

d) Water heater:
   a. Electric hybrid, heat pump, hot water heater. Hot water heater to have adequate capacity for tempering water for shower and emergency shower use.
   b. Mixing valve.

e) Compressed Air System:
   a. Compressed air for truck brakes as required.
   b. Compressed air for tire filling.
   c. Others TBD.
   d. SCBA compressor system would be by the Owner.

f) Miscellaneous:
   a. Fire extinguishers and cabinets.
   b. Water shall be obtained from an on-site well and shall include well pressure tanks as required.
   c. Hose reels in the apparatus bays for truck washing
   d. A 5000± gallon tight tank with level controls for capturing water and runoff from the trench drains in the apparatus bays.
   e. LP gas tanks: It is assumed that two buried or three above ground 1000 gallon LP tanks would be required, however that would need to be determined in the design phase based on the connected load

ELECTRICAL

1. Electrical Service:

a) The electrical service will likely be a 225 amp three phase 120/208 volt system. The size will be determined when the electrical loads are known.
b) A 400 amp single phase 240/120 volt system will be considered, based on initial cost and estimated demand charges.
c) Power will come onto the site aerially and then underground into the building.

2. Power Receptacles:

a) General purpose receptacles will be located throughout the building.
b) Power cord drops will be located in the apparatus bay by the driver side door of the truck.

3. Lighting Systems:

a) The lighting systems will consist of LED light fixtures including the apparatus bay.
b) The exterior lighting is light fixtures with full cut-off photometrics.
c) For increased energy efficiency virtually all the interior spaces have occupancy sensors to turn off the lights.
d) The apparatus bay has individually controlled light fixtures with occupancy sensors.
e) Exterior and parking lot lighting is controlled with the electronic low voltage control panel's astronomic time clock on separate circuits that can be set for different time settings.

4. Fire Alarm:

a) An addressable fire alarm system will be installed with manual pull stations and smoke detection throughout the facility.
b) Audio visual devices will be in all of the spaces as required by code.

5. Voice / Data:

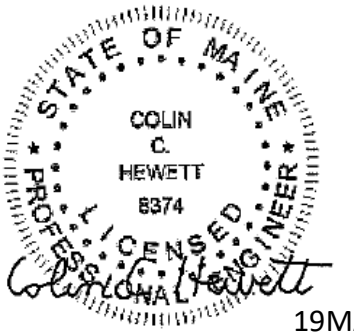
a) A small voice/data system infrastructure will include category 6 horizontal wiring terminated on jacks and patch panels.

6. Emergency Power Generator:

a) The proposed generator is a 60 KW emergency LP gas fired generator to provide backup power for the facility in the event of a power outage.

Hewett & Whitney Engineers

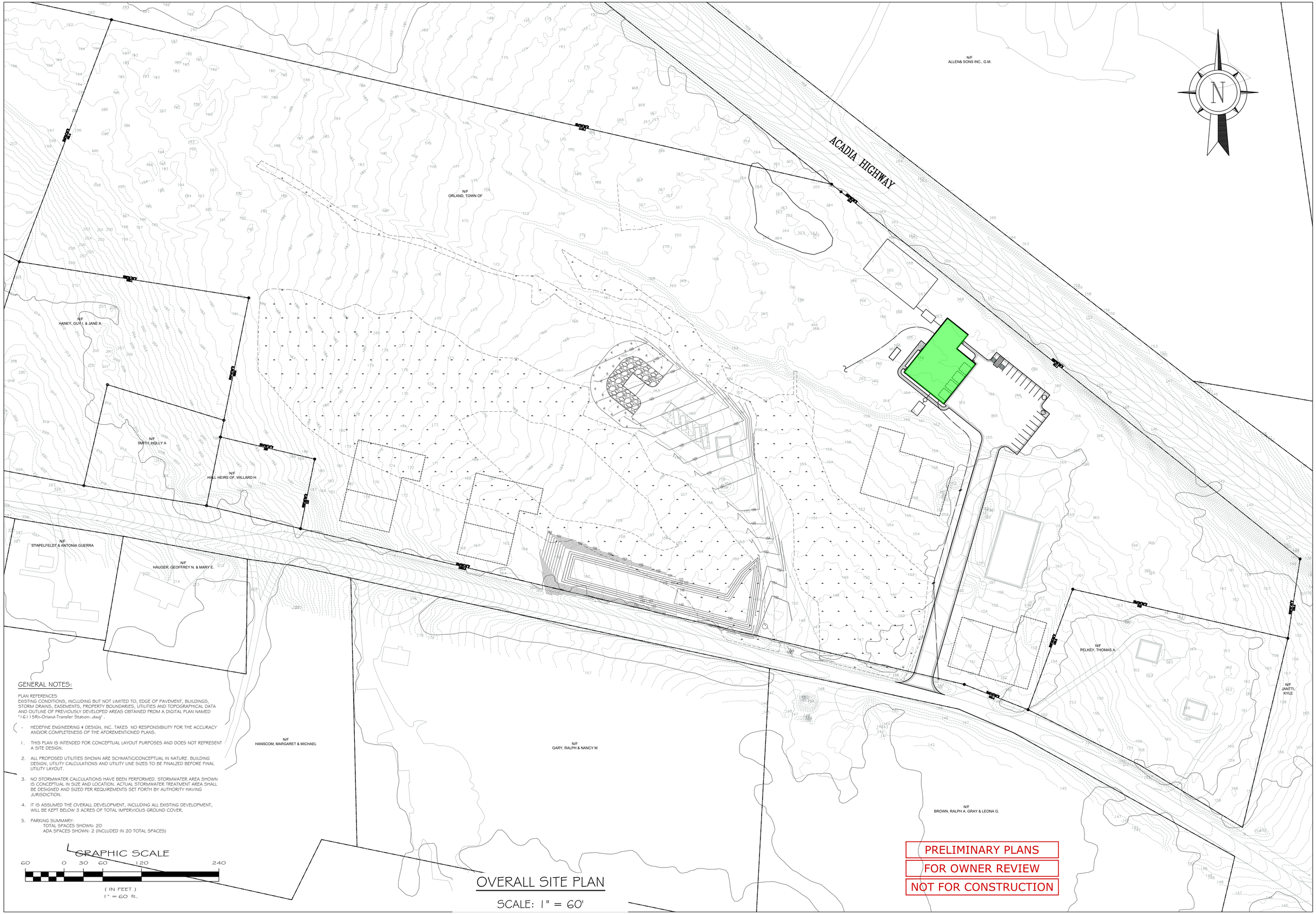
Colin Hewett, P.E.
Electrical Engineer



19MAY2021

Ken Whitney
Mechanical Engineer

19MAY2021



GENERAL NOTES:

PLAN REFERENCES
EXISTING CONDITIONS, INCLUDING BUT NOT LIMITED TO, EDGE OF PAVEMENT, BUILDINGS, STORM DRAINS, EASEMENTS, PROPERTY BOUNDARIES, UTILITIES AND TOPOGRAPHICAL DATA AND OUTLINE OF PREVIOUSLY DEVELOPED AREAS OBTAINED FROM A DIGITAL PLAN NAMED "1161 15Rn-Orland-Transfer Station-.dwg" .

- HEDEFINE ENGINEERING 4 DESIGN, INC. TAKES NO RESPONSIBILITY FOR THE ACCURACY AND/OR COMPLETENESS OF THE AFOREMENTIONED PLANS.

1. THIS PLAN IS INTENDED FOR CONCEPTUAL LAYOUT PURPOSES AND DOES NOT REPRESENT A SITE DESIGN.
2. ALL PROPOSED UTILITIES SHOWN ARE SCHMATIC/CONCEPTUAL IN NATURE. BUILDING DESIGN, UTILITY CALCULATIONS AND UTILITY LINE SIZES TO BE FINALIZED BEFORE FINAL UTILITY LAYOUT.
3. NO STORMWATER CALCULATIONS HAVE BEEN PERFORMED. STORMWATER AREA SHOWN IS CONCEPTUAL IN SIZE AND LOCATION. ACTUAL STORMWATER TREATMENT AREA SHALL BE DESIGNED AND SIZED PER REQUIREMENTS SET FORTH BY AUTHORITY HAVING JURISDICTION.
4. IT IS ASSUMED THE OVERALL DEVELOPMENT, INCLUDING ALL EXISTING DEVELOPMENT, WILL BE KEPT BELOW 3 ACRES OF TOTAL IMPERVIOUS GROUND COVER.
5. PARKING SUMMARY:
   TOTAL SPACES SHOWN: 20
   ADA SPACES SHOWN: 2 (INCLUDED IN 20 TOTAL SPACES)

GRAPHIC SCALE
60 0 30 60 120 240
(IN FEET)
1" = 60 ft.

OVERALL SITE PLAN

SCALE: 1" = 60'

PRELIMINARY PLANS
FOR OWNER REVIEW
NOT FOR CONSTRUCTION

GENERAL NOTES:

PLAN REFERENCES
EXISTING CONDITIONS, INCLUDING BUT NOT LIMITED TO, EDGE OF PAVEMENT, BUILDINGS, STORM DRAINS, EASEMENTS, PROPERTY BOUNDARIES, UTILITIES AND TOPOGRAPHICAL DATA AND OUTLINE OF PREVIOUSLY DEVELOPED AREAS OBTAINED FROM A DIGITAL PLAN NAMED "1611 5Rn-Orland-Transfer Station-.dwg" .

- HEDEFINE ENGINEERING 4 DESIGN, INC. TAKES NO RESPONSIBILITY FOR THE ACCURACY AND/OR COMPLETENESS OF THE AFOREMENTIONED PLANS.

1. THIS PLAN IS INTENDED FOR CONCEPTUAL LAYOUT PURPOSES AND DOES NOT REPRESENT A SITE DESIGN.
2. ALL PROPOSED UTILITIES SHOWN ARE SCHMATIC/CONCEPTUAL IN NATURE. BUILDING DESIGN, UTILITY CALCULATIONS AND UTILITY LINE SIZES TO BE FINALIZED BEFORE FINAL UTILITY LAYOUT.
3. NO STORMWATER CALCULATIONS HAVE BEEN PERFORMED. STORMWATER AREA SHOWN IS CONCEPTUAL IN SIZE AND LOCATION. ACTUAL STORMWATER TREATMENT AREA SHALL BE DESIGNED AND SIZED PER REQUIREMENTS SET FORTH BY AUTHORITY HAVING JURISDICTION.
4. IT IS ASSUMED THE OVERALL DEVELOPMENT, INCLUDING ALL EXISTING DEVELOPMENT, WILL BE KEPT BELOW 3 ACRES OF TOTAL IMPERVIOUS GROUND COVER.
5. PARKING SUMMARY:
   TOTAL SPACES SHOWN: 20
   ADA SPACES SHOWN: 2 (INCLUDED IN 20 TOTAL SPACES)

SEPTIC TANK AND DISPOSAL FIELD, SIZE TO BE DETERMINED. CONCEPTUAL LOCATION SHOWN. FINAL LOCATION SHALL BE DETERMINED BASED ON ACCEPTABLE SOILS AND ACCORDING TO ALL APPLICABLE CODES AND SETBACKS.

CONCRETE PAD FOR ABOVE GROUND LP TANK(S). PROVIDE UNDERGROUND LP LINE TO BUILDING.

WATER SERVICE TO NEW FIRE STATION TO BE DETERMINED.

OPTION 1:
PROVIDE NEW WELL

OPTION 2:
CONNECT TO EXISTING TOWN WELL

EDGE OF WETLANDS (TYP.)

OIL/WATER SEPARATOR AND HOLDING TANK SYSTEM WITH ALARM CONNECTED TO INTERNAL TRENCH DRAINS. SIZE OF SEPARATOR AND TANK TO BE DETERMINED. ASSUME 5,000 GALLON TANK FOR ESTIMATING.

LOCATION OF EXISTING WELL SERVING TRANSFER STATION NOT KNOW. VERIFY LOCATION OF WELL PRIOR TO DESIGNING SEPTIC DISPOSAL SYSTEM FOR PROPOSED FIRE STATION.

PROVIDE ADA PARKING AND LOADING SPACE(S) WITH SIGNAGE.
ONE SPACE REQUIRED BY CODE, ADDITIONAL SPACE AT OWNERS OPTION.

S20°00'00"E
111.1

POTENTIAL STORMWATER TREATMENT AREA (SIZE AND LOCATION T.B.D.)

CONTINUE UNDERGROUND ELECTRICAL SERVICE TO BUILDING. ELECTRICAL SERVICE TO BE DESIGNED BY QUALIFIED ELECTRICAL CONSULTANT.

OVERHEAD ELECTRICAL SERVICE, CONNECTED TO EXISTING SERVICE AT STREET. ASSUME POLES, TRANSFORMER AND NEW LINES ARE REQUIRED. ELECTRICAL SERVICE TO BE DESIGNED BY QUALIFIED ELECTRICAL CONSULTANT.

N54°56'00"E
342

S34°29'00"E
196.2

S46°10'00"E
106.4

N/F
PELKEY, THOMAS A.

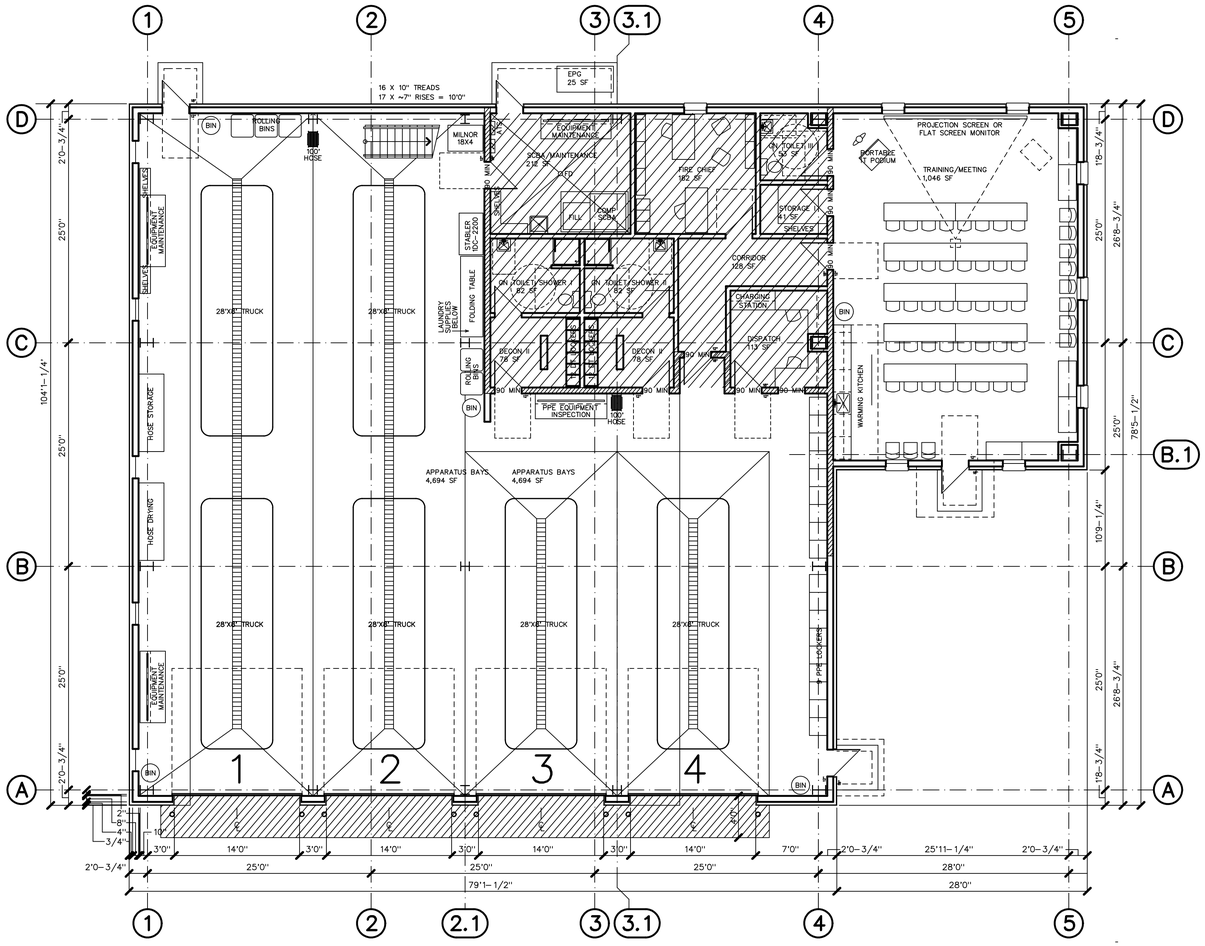
GRAY MEADOW ROAD

GRAPHIC SCALE
30 0 15 30 60 120
(IN FEET)
1" = 30 ft.

CONCEPTUAL SITE PLAN

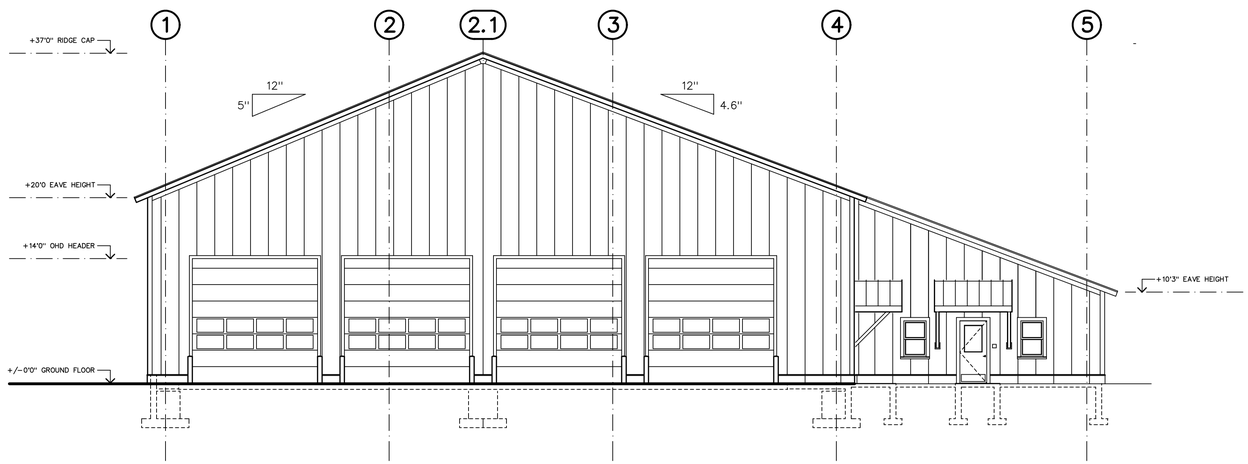
SCALE: 1" = 30'

PRELIMINARY PLANS
FOR OWNER REVIEW
NOT FOR CONSTRUCTION



1 / A1 CONCEPT FLOOR PLAN & FRONT ELEVATION

SCALE: 1/8" = 1'-0"

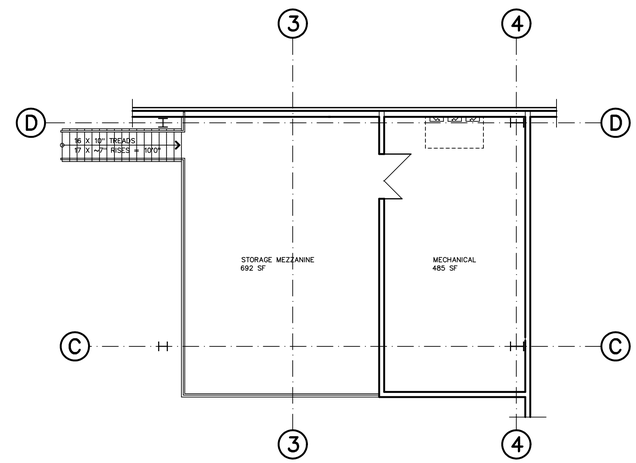


LEGEND:

- 2-HOUR FIRE RATED CONSTRUCTION
- INSULATED CONCRETE APRON
- PROPOSED MEZZANINE AREA

CONCEPT DESIGN BUILDING PROGRAM AREA

DESCRIPTION	SF
APPARATUS BAYS	4,694
DECONTAMINATION I	78
DECONTAMINATION II	78
GN TOILET/SHOWER I	82
GN TOILET/SHOWER II	82
DISPATCH	113
SCBA/MAINTENANCE	212
CORRIDOR	128
FIRE CHIEF	182
STORAGE II	41
GN TOILET III	53
TRAINING/MEETING	1,046
MEZZANINE STORAGE III	692
MECHANICAL MEZZANINE	485
WALLS	577
CONCRETE ENTRY PADS	145
INSULATED CONCRETE APRON	316
TOTAL GROSS SQUARE FEET	**9,004**



2 / A1 MEZZANINE FLOOR PLAN

SCALE: 1/8" = 1'-0"

FEET 0 2 4 8 16 20 30

LMA
LEWIS + MALM ARCHITECTURE
EST. 1983
124 MAIN ST.
P.O. BOX 1459
BUCKSPORT
MAINE 04416
207.469.7440

FOR OWNER REVIEW ONLY

NOT FOR CONSTRUCTION

27MAY2021

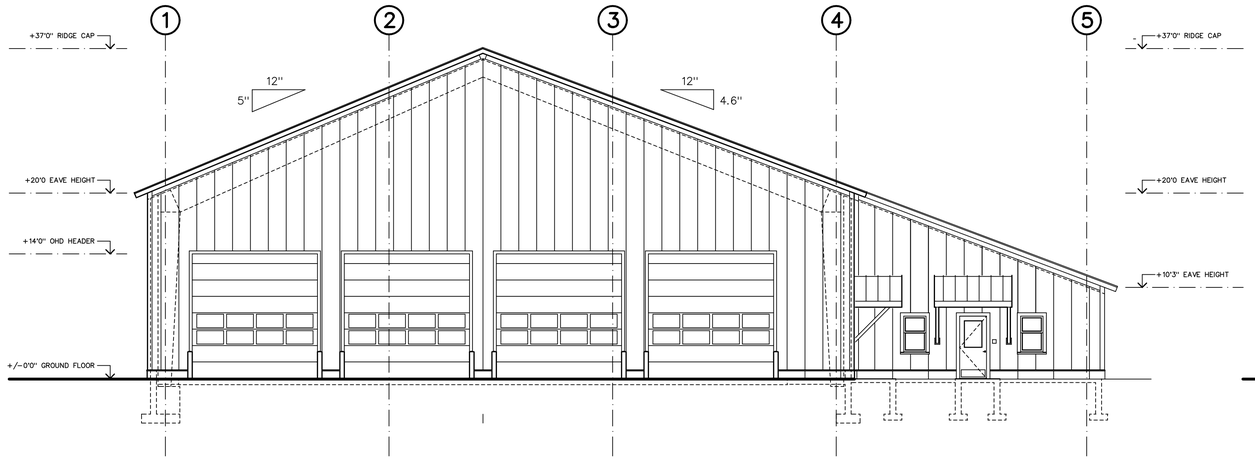
REV	DATE

ORLAND VOLUNTEER FIRE DEPARTMENT
ORLAND, MAINE, MAINE

CONCEPT FLOOR PLANS & ELEVATION

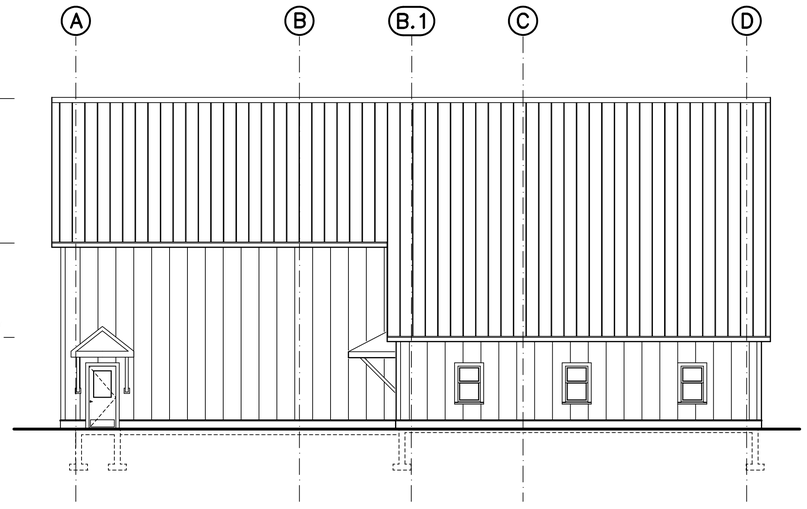
2105

A1



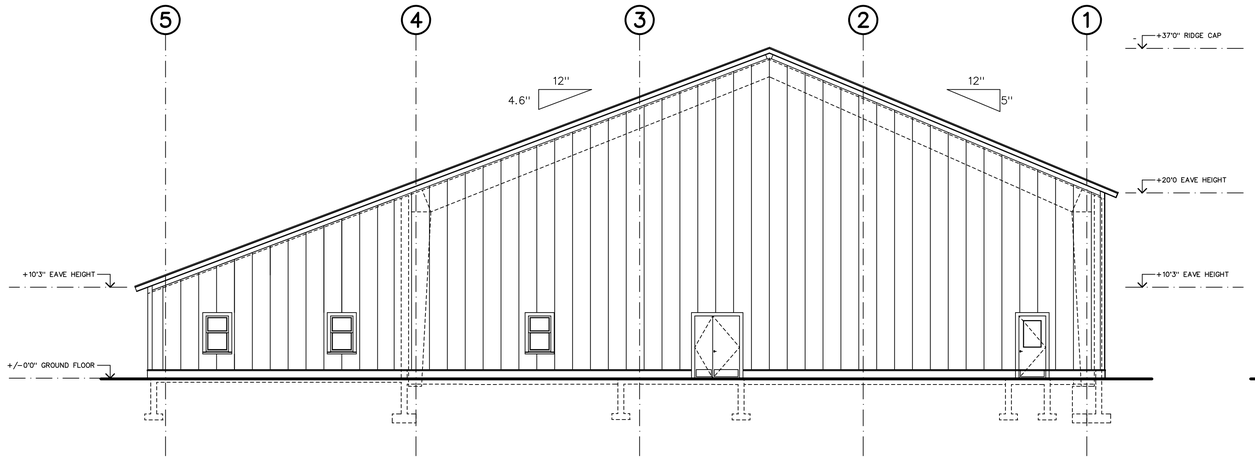
1/A2 SOUTHEAST ELEVATION

SCALE: 1/8" = 1'-0"



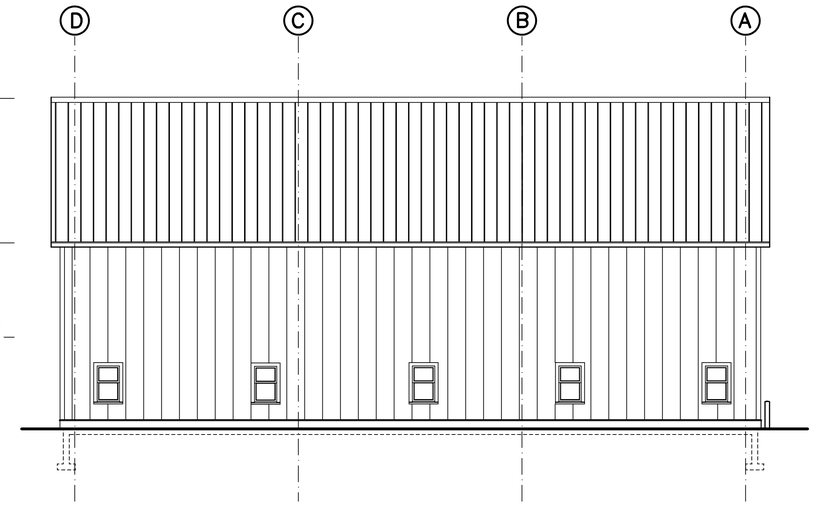
2/A2 NORTHEAST ELEVATION

SCALE: 1/8" = 1'-0"



3/A2 NORTHWEST ELEVATION

SCALE: 1/8" = 1'-0"



4/A2 SOUTHWEST ELEVATION

SCALE: 1/8" = 1'-0"

LMA
LEWIS + MALM ARCHITECTURE
EST. 1983

124 MAIN ST.
P.O. BOX 1459
BUCKSPORT
MAINE 04416
207.469.7440

FOR OWNER REVIEW ONLY

NOT FOR CONSTRUCTION

27MAY2021

REV	DATE

ORLAND VOLUNTEER FIRE DEPARTMENT
ORLAND, MAINE, MAINE

CONCEPT ELEVATIONS

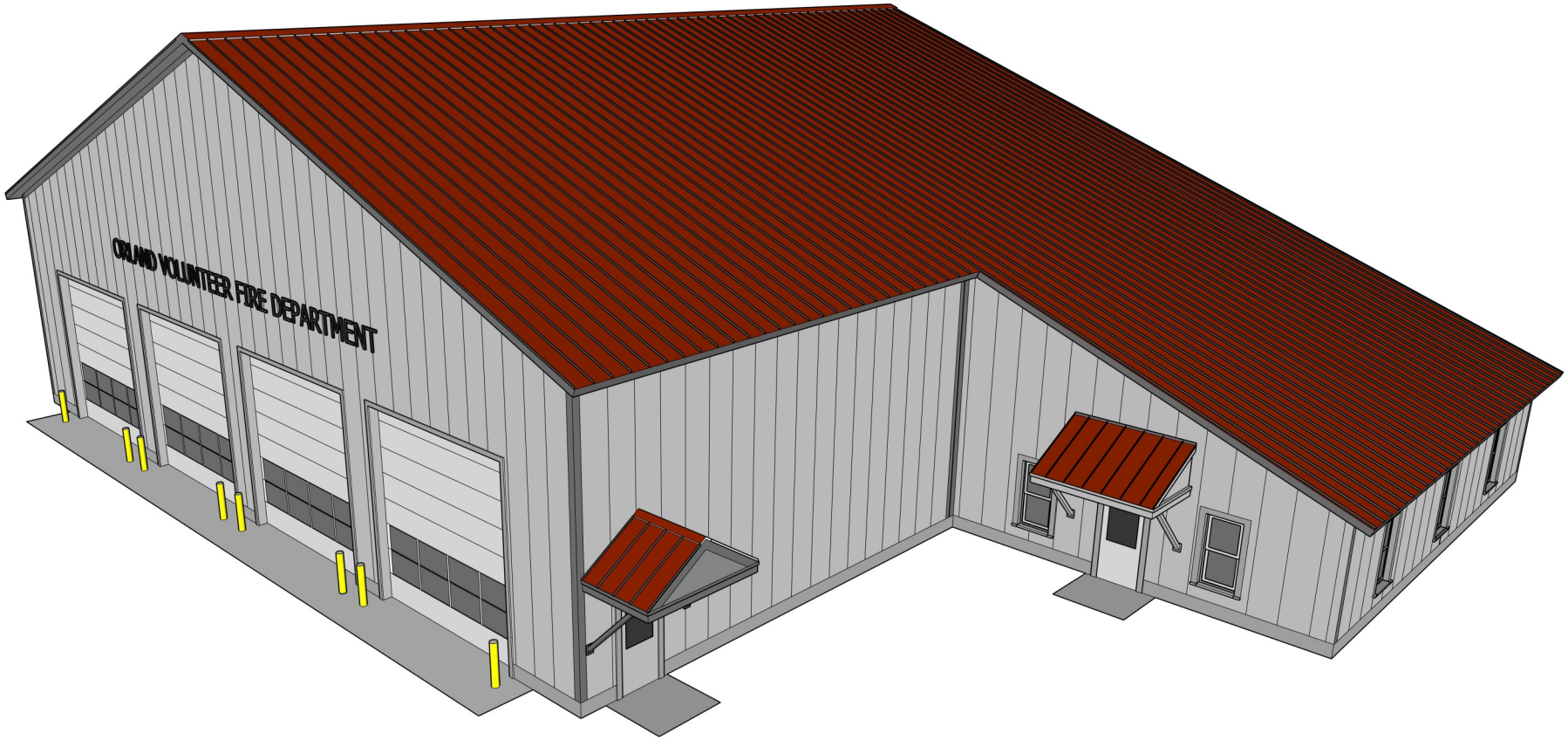
2105

A2

2105 / ORLAND VOLUNTEER FIRE DEPARTMENT

27APR2021

LMA
LEWIS + MALM
ARCHITECTURE
EST. 1983

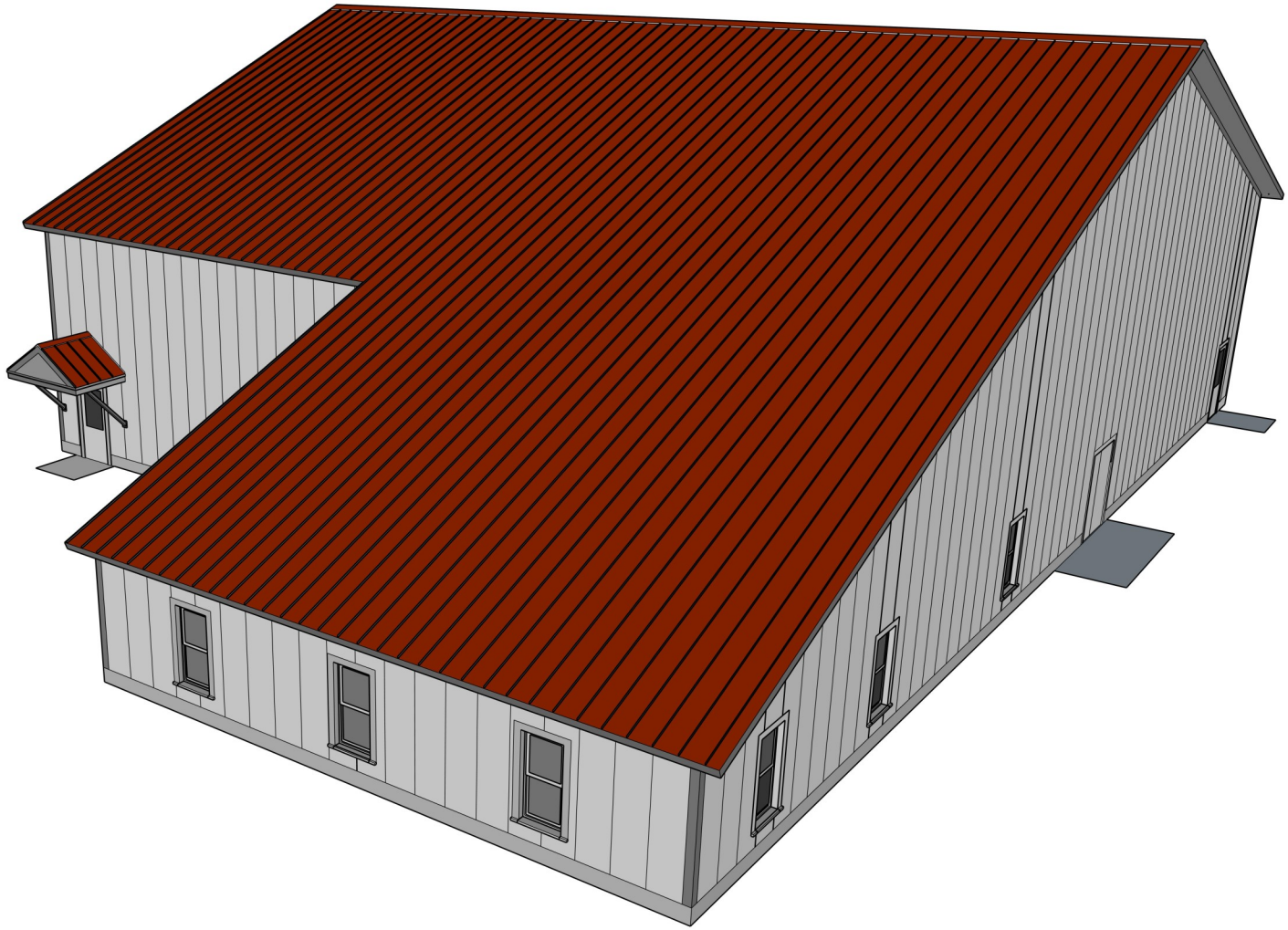


Concept Design Rendering I

2105 / ORLAND VOLUNTEER FIRE DEPARTMENT

27APR2021

LMA
LEWIS + MALM
ARCHITECTURE
EST. 1983

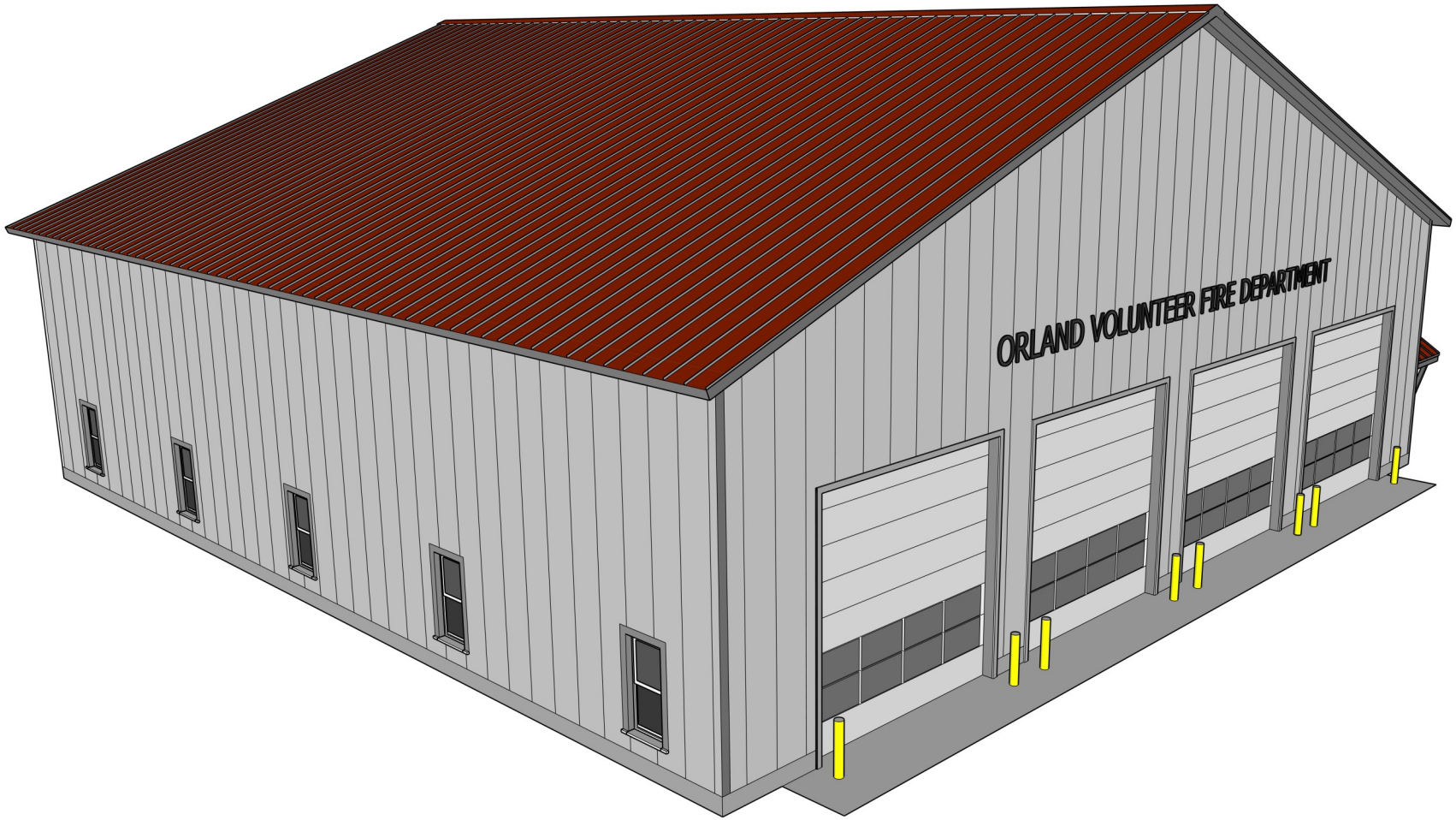


Concept Design Rendering II

2105 / ORLAND VOLUNTEER FIRE DEPARTMENT

27APR2021

LMA
LEWIS + MALM
ARCHITECTURE
EST. 1983



Concept Design Rendering III