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Schematic Design Report

May 2025

New Public Works Facility

17 Town Hall Road
Truro, Massachusetts 02666

TOWN OF
Truro
MASSACHUSETTS

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Introduction

The Town of Truro retained services from Weston & Sampson Engineers, Inc. (W&S), to design their new Department of Public Works (DPW) Facility. The following Schematic Design (SD) Report is to guide the project and show stakeholders the background documentation and key design decisions for their project. The program needs of DPW operations have been developed and refined since the initial feasibility study that began in 2018. The SD Report results from various meetings between the Design Team, Owner's Project Manager (OPM), DPW workforce, and Truro's Ad Hoc Building Committee to discuss design progress and collect input regarding budgetary considerations, building design concepts, and goals for sustainability, asset management, and occupant health and safety. The schematic phase also included planning conversations with Truro's Board of Health as well as coordination meetings with environmental engineers of HRP Associates, Inc. who are contracted with Truro for PFAS remediation services in a portion of the project site.

Programmatic input and project goals are reflected throughout the content of this report, although it is an ongoing effort that will continue into the next phase of design referred to as Design Development (DD). With the completion of SD comes the milestone of a schematic-level cost estimate (refer to Section III). Due to the preliminary nature of schematic design, many budget items are based on general building costs per square foot, with site development costs per acre. Estimates include a design contingency to cover items that are not yet fully defined or designed and a construction contingency to account for potential unforeseen conditions which may be discovered during construction.

The next phase of design (DD) will allow the Town, OPM and Design Team to further discuss the project budget and adjust the design in an effort to manage costs. At the end of DD, there will be another opportunity to collect cost estimates that are typically more accurate than SD cost estimates as the design progresses and becomes more defined.

SECTION I

Schematic Design Narratives

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SCHEMATIC DESIGN NARRATIVE

General

PROJECT: Truro, MA – Public Works Facility

FROM: Project Management Team

DATE: May 2, 2025

SUBJECT: Schematic Design Narrative – General

PROJECT INFORMATION

The project is located at 17 Town Hall Road in the Town of Truro, MA and consists of demolishing the existing Department of Public Works (DPW) building structures, providing site improvements, and constructing a new, consolidated DPW facility. The proposed building includes administrative offices, employee facilities (i.e. locker rooms, a training room), a carpentry shop and sign storage, fleet maintenance bays and support spaces like fluid and parts storage, a vehicle wash bay, a fleet storage garage, utility rooms, and mezzanine storage spaces. The project also includes site components like an exterior knock-down pad, material storage bins and a salt shed. The existing fuel station will remain.

During the schematic design phase, several pricing alternatives were identified in an effort to manage construction costs with consideration for the Town/stakeholders and their budget. The following section outlines the project's pricing alternatives, which will be evaluated based on project requirements and cost-effectiveness.

Pricing Alternates:

The following pricing alternates have been prepared to assist the Town with making key decisions for their project. They are listed as separate line items in the cost estimates in Section III, allowing for easy addition or deduction from the project cost:

- Alternate 1: Additional 5,000 square feet of fleet storage
    - An extension of the fleet storage garage totaling 5,000 square feet to provide additional storage space for DPW vehicles and equipment. Refer to the architectural drawings for additional details.

- Alternate 2: Detached Storage Canopy
    - The construction of a standalone canopy structure on the north edge of the project site measuring 30' x 135'. Refer to the architectural and civil drawings for additional details.

- Alternate 3: Wash Bay Finishes & Equipment
    - To finish out the wash bay, Alternate 3 includes the proposed wall finishes and respective industrial vehicle wash equipment. Refer to the architectural drawings and equipment layout plans for additional details.

- Alternate 4: Rooftop Solar Installation
    - Installation of rooftop solar panels as part of the initial construction. Based on the available roof area of approximately 10,345 square feet and typical solar panel efficiencies, the entire system is estimated to produce between 200 MWH and 250 MWH per year, depending on the specific panel type. The east- and west-facing roofs with minimal pitch will optimize solar generation for morning and afternoon production, although overall output will be lower than a south-facing installation. The solar array is designed to offset a portion of the building's energy usage and will comply with local regulations.

- Alternate 5: Ground Source Heat Pumps (GSHP)
    - The geothermal / ground source heat pump system will be provided as an alternate to the ASHP system. It will utilize a closed-loop well design sized for a heating load of 30 tons and measures for redundancy. The tonnage values are assumptions at this stage, and if this option is selected, it is recommended that a test well be drilled to gather more precise information on the actual performance and final spacing requirements. The test well would then become part of the final proposed system. Refer to the Geothermal Well Narrative for additional details.

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SCHEMATIC DESIGN NARRATIVE

Geotechnical Engineering

PROJECT: Truro, MA – Public Works Facility

FROM: Stephen Spink

DATE: May 2, 2025

SUBJECT: Schematic Design Narrative – Geotechnical Considerations

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The following is the Geotechnical Engineering narrative for the referenced project. Project details had not yet been finalized at the time of this narrative. The geotechnical engineering considerations discussed herein have been based on Preliminary Design Plans prepared by Weston & Sampson dated April 15, 2025.

General Subsurface Soil & Groundwater Conditions:

The subsurface conditions encountered in our explorations generally consisted of previously placed non-engineered fill overlying native granular soils to the depths explored.

The fill thickness was generally less than 2 feet within the majority of the site but increased to the north. Adjacent to the existing slope at the northern portion of the currently developed parcel, fill thickness increased to depths up to approximately 13 feet. The fill was generally very loose to loose and contained varying amounts of debris.

The native granular soils generally consisted of loose to medium dense sand with trace non-plastic fines and trace gravel.

Groundwater was not encountered in our explorations which were extended to a maximum depth of approximately 39 feet.

Seismic Design Considerations:

Based on our explorations, the project should be evaluated using parameters associated with Site Class D.

Liquefaction can occur in loose, saturated, granular soils. Strong shaking, such as that experienced during earthquakes, can cause a sudden loss of shear strength, densification, and subsequent settlement of these soils. Based on the anticipated depth to groundwater encountered in our explorations, the risk of structurally damaging ground deformations related to liquefaction is considered low.

Structure Foundations:

The existing non-engineered fill is not suitable (or allowed by the Massachusetts State Building Code, MSBC) for support of foundations, building floor slabs or other rigid structural site improvements that could be adversely affected by differential settlement. Existing fill and subsoil should be completely removed from within the zone-of-influence beneath proposed foundations and other structural elements. The 'zone-of-influence' is defined by a plane extending horizontally away from the bottom outside edges of footings and other structural site improvements a horizontal distance of two feet in all directions, then down and away at 1H:1V (horizontal:vertical) slopes to the intersection with undisturbed native soils.

Main Building and Fleet Storage: Provided non-engineered fill and subsoil is removed from the zone-of-influence beneath footings and lower level floor slabs as described above and structural loads are typical for one- to two-story structures, these proposed structures can be supported using conventional, shallow spread footings bearing on native, undisturbed, inorganic, granular soils or on properly constructed structural fill directly overlying these materials.

Due to the generally loose density of the shallow granular soils, a maximum net allowable bearing capacity of 2,000 psf is recommended for design of spread footings. Resistance to lateral loads can be obtained by a passive equivalent fluid pressure of 225 pounds per cubic foot (pcf), ignoring the top 12 inches of embedment, and by a cast-in-place footing base friction coefficient of 0.45.

Footings should be embedded at least 4 feet below the nearest proposed adjacent ground surface exposed to freezing.

Canopy Bid Alternate: Due to the depth, density and variability of the fill encountered in the area of the proposed canopy, shallow foundations *are not* considered feasible foundation support alternatives. Deep foundations consisting of helical piles or driven piles should be anticipated for foundation support.

Salt Shed: Following the removal of existing fill, shallow foundations are expected to be suitable for support of the proposed structure. To reduce the potential of future settlement below the salt pile in the building interior, preloading or use of this area for material stockpiling during construction is recommended.

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SCHEMATIC DESIGN NARRATIVE

STRUCTURAL

PROJECT: Truro, MA – Department of Public Works

FROM: Abigail Cory, PE

DATE: May 29th, 2025

SUBJECT: Schematic Structural Design Narrative

PROJECT UNDERSTANDING

The Truro Department of Public Works Building is proposed to be located at 17 Town Hall Road in Truro, MA. The structure shall be a pre-engineered metal building consisting of four main areas: an employee facilities space, fleet storage space, fleet maintenance space, and a workshop area. Mezzanine spaces are assumed to be in the fleet storage and fleet maintenance areas. A wash bay area will be included adjacent to the fleet maintenance area. Other proposed structures include a fabric membrane structure salt shed with concrete foundation walls.

Proposed bid alternates include a vehicle storage extension, a detached exterior canopy storage area, wash bay finishes and equipment, roof-mounted solar, and a ground source heat pump system.

It is our understanding that the Town is interested in lowering embodied carbon of the proposed structure. Low carbon and cost-effective material options may be explored and included in the project specifications. Potential options include performance criteria for lower carbon concrete and considering locally available materials.

DESIGN CRITERIA

Codes:

- 2021 International Building Code (IBC 2021)
- 780 CMR: Massachusetts Amendments, 10th Edition
- ASCE 7-16 “Minimum Design Loads for Buildings and Other Structures”
- AISC Manual of Steel Construction 14th Edition
- ACI 318-19 “Building Code Requirements for Structural Concrete”
- ACI 503-14 “Building Code Requirements for Masonry Structures”
- MBMA “Metal Building Systems Manual 2012”

Design Loading Criteria:

- Building Risk Category IV for DPW Structure
- Building Risk Category II for Salt Shed
- Dead Loads:
    - Actual Weight of Building Components

  - Collateral Load_____10 psf minimum
  - Solar Allowance_____8 psf
- Live Loads:
  - Office + Partitions_____70 psf
  - Assembly Areas, Corridors, Stairs_____100 psf
  - Mechanical Areas_____250 psf
  - Storage Mezzanines_____250 psf
  - Vehicle Storage/Maintenance Areas_____250 psf or HS-20
  - Roof _____20 psf
- Snow:
  - Ground Snow Load, Pg_____ 25 psf
  - Min. Flat Roof Snow Load, Pf_____25 psf
  - Design Snow Load_____25 psf + Drift
  - Importance Factor, Is_____1.2 (including Salt Shed)
- Wind:
  - Ultimate Design Wind Speed, Vult_____141 mph Risk Cat IV
  - Ultimate Design Wind Speed, Vult_____128 mph Risk Cat II
  - Exposure Category_____C
- Seismic:
  - Spectral Acceleration Ss_____0.168
  - Spectral Acceleration S1_____0.051
  - Site Class_____ Assume D**
  - Fa _____1.60
  - Fv _____ 2.40
  - Sms, Sm1_____0.268, 0.122
  - Sds, Sd1_____0.179, 0.082
  - Seismic Design Category _____C for DPW Structure
- Frost Depth_____4'-0"

Weston & Sampson Geotechnical Engineers will develop a geotechnical report indicating allowable soil bearing pressures. **Geotech Report shall also indicate existing soil site class.

PROPOSED STRUCTURES

The Truro DPW proposed scope of work includes the following:

The proposed facility is approximately 23,605 square feet (SF), not including the detached salt shed or the canopy bid alternate. The fleet storage building will be a one-story structure with 15 vehicle parking spaces totaling approximately 12,910 SF. The fleet maintenance area includes (2) maintenance bays and (1) bay of maintenance support area, totaling approximately 4,730 SF. The workshop area includes (1) bay, approximately 1,400 SF. The administrative space includes employee facilities and offices, totaling approximately 2,915 SF. The detached salt shed structure is located at the northern corner of the site and is approximately 2,400 SF. The wash bay will be located adjacent to fleet maintenance, approximately 1,650 SF. The vehicle storage area extension bid alternate will be approximately 5,000 SF. The detached exterior vehicle canopy bid alternate will be located north of the DPW building, approximately 4,050 SF.

The roofs for the fleet storage, fleet maintenance, wash bay, and workshops areas will be mono-slope with a slope at ½" on 12", typical eave elevations vary for each space. The fleet storage area has a typical eave elevation of

20'-0" feet (low side) above finished floor. The vehicle maintenance, wash bay and workshops areas have a typical eave elevation of 28'-0" feet (low side) above finished floor. The administrative space has a gable roof with a 4" on 12" slope, with a typical eave elevation of 14'-0" (low side) above finished floor. The roofs will be standing seam metal roofing supported on cold formed steel purlins spanning between steel frames. The mezzanine floor elevation will be 12'-0" above finished floor.

The exterior walls of the building will consist of a cast-in-place concrete back up wall with masonry veneer siding to elevation 3'-4" and insulated metal panel siding from the top of concrete back up wall to the top of eave. The insulated metal panel siding will be supported by cold-formed steel horizontal girts spaced as required spanning from face of column to face of column. The exterior wall at the administrative space will consist of fiber cement lap siding with fiber cement shingle siding on the gable ends, cold formed metal stud framing. There will be a continuous concrete strip footing and foundation wall along the perimeter of the building. Exterior columns will be supported by concrete piers cast integrally with the foundation walls and supported on spread footings. An 8-inch reinforced concrete slab-on-grade will be designed to support HS-20 vehicle traffic inside the limits of the structure, except for in the administrative area. The slab-on-grade for the administrative space consists of a 6-inch reinforced concrete with moisture reduction admixture. Slabs will be sloped strategically to provide sufficient drainage.

The framing for this structure, including but not limited to, columns and frames, overhead door supports, wind posts, baseplates, roof purlins, horizontal girts, metal roofing, metal siding, lateral force resisting systems, and all steel connections will be designed and fabricated by the pre-engineered metal building (PEMB) manufacturer. The PEMB manufacturer will submit all calculations of the design loads, as well as column baseplate reactions to the engineer to verify foundation design and general conformance to the design specifications. We are anticipating two mezzanines to be included in this space.

The salt shed is located at the northern corner of the site and will consist of a steel frame and fabric structure with reinforced concrete walls up to 7'-0" tall. The salt shed will have an asphalt floor and be supported by reinforced concrete continuous footing foundations. The steel framing will be pre-engineered by the manufacturer. The manufacturer will submit all calculations of the design loads, as well as column baseplate reactions to the engineer to verify foundation design and general conformance to the design specifications.

The vehicle storage extension bid alternate will be the same construction as the base bid fleet storage area.

The detached vehicle canopy alternate will be similar construction to the fleet storage and maintenance areas of the facility. The roof will be standing seam metal roofing supported on cold formed steel purlins spanning between steel frames. The exterior walls will be cast-in-place concrete back up wall with masonry veneer siding to elevation 3'-4" and insulated metal panel siding from the top of concrete back up wall to the top of eave. The insulated metal panel siding will be supported by cold formed steel horizontal girts spaced as required spanning from face of column to face of column. The framing will be designed by the PEMB, as stated above. The slab-on-grade will be 8-inches thick and designed to support HS-20 vehicle traffic. There will be a continuous concrete foundation wall along the perimeter of the building. Exterior columns will be supported by concrete piers cast integrally with the foundation walls. The canopy structure is anticipated to be supported by deep foundations consisting of helical piles or driven piles, following recommendations from Westin & Sampson Geotechnical Engineers.

FACTORS YET TO BE DETERMINED

There are several factors that could affect the structural design that have not yet been determined. They are including but not limited to below:

- Soil investigations affecting the allowable bearing pressure, site class, and potential addition of ground improvements (e.g. CSC's or rigid inclusions);
- Locations of utility penetrations into and exiting the building;
- Locations of any MEP rooftop equipment, hoof hatches, other hung equipment from roof framing;
- Location of floor drainage and the floor slope;
- Any objects discontinuing the slab on grade including embedded angles, grating, inground lifts, or others.

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SCHEMATIC DESIGN NARRATIVE

Fire Protection

PROJECTS: Truro DPW

FROM: Fire Protection Team

DATE: May 2025

SUBJECT: Schematic Fire Protection Design Narrative

PROJECT INFORMATION:

This schematic design narrative, prepared by Weston & Sampson Engineers, Inc., serves as the foundation for the building's design and can be used for the project cost estimate. It outlines the anticipated scope at the schematic design stage. This schematic design narrative, prepared by Weston & Sampson Engineers, Inc., outlines the fire protection scope for the new Truro Department of Public Works (DPW) facility, located at 17 Town Hall Road, Truro, MA 02666

The proposed DPW building will be fully sprinklered in accordance with NFPA 13 and all applicable local codes. The facility will be protected by two wet sprinkler risers and one dry sprinkler riser. Each riser will be equipped with its own dedicated alarm check valve, installed in compliance with NFPA 13 requirements.

For the purposes of this schematic phase, it is assumed that the available water supply, which is expected to come from a proposed new water main project to the north of the DPW site, will not provide sufficient flow and pressure to support the sprinkler system. As a result, a fire pump and a fire water storage tank will be required. Additional details regarding the proposed fire pump and tank design will be provided in the next design phase.

A new fire service line will be extended from the proposed fire pump, which will draw water from the fire protection tank, and enter the building through a dedicated Fire Protection/Plumbing room. The water service will be mechanically restrained and include three

alarm check valve assemblies. The FP/Plumbing room will be heated and conditioned in accordance with NFPA 13 and the Massachusetts Building Code.

CODES:

- Massachusetts State Building Code, 10th Edition (780 CMR)
- Massachusetts Comprehensive Fire Safety Code (527 CMR 1.00)
- 2021 International Building Code (IBC)
- 2021 NFPA 1 – Fire Code
- 2019 NFPA 3 – Standard for Commissioning of Fire Protection and Life Safety Systems
- 2019 NFPA 13 – Standard for the Installation of Sprinkler Systems
- 2019 NFPA 14 – Standard for the Installation of Standpipe and Hose Systems
- 2019 NFPA 20 – Standard for the Installation of Stationary Pumps for Fire Protection
- 2023 NFPA 22 – Standard for Water Tanks for Private Fire Protection
- 2019 NFPA 24 – Standard for the Installation of Private Fire Service Mains and Their Appurtenances

DESIGN BASIS:

a. Hazard Classification:

- Light Hazard: Corridors, bathrooms, office space, locker rooms.
- Ordinary Hazard Group 1: Storage (less than 8'), vehicle storage garage and mechanical rooms.
- Ordinary Hazard Group 2: Storage areas (up to 12 feet in height), workshops, vehicle maintenance bays, and wash bay.
- Extra Hazard Group 1: Fluid room.

b. Minimum Density for Automatic-Sprinkler:

- Light Hazard: 0.1 gpm over 1,500 sq. ft.
- Ordinary Hazard Group 1: 0.15 gpm over 1,500 sq. ft.
- Ordinary Hazard Group 2: 0.20 gpm over 1,500 sq. ft.
- Extra Hazard Group 1: 0.30 gpm over 2,500 sq. ft.
- For dry pipe systems, the hydraulically calculated design area shall be increased by 30% in accordance with NFPA 13. The design density remains unchanged.
- Total Combined Hose Stream Demand Requirement: In accordance with NFPA 13 unless otherwise indicated.

c. Maximum Protection Area per Sprinkler:

- Light Hazard: 225 sq. ft.
- Ordinary Hazard: 130 sq. ft.

- Extra Hazard: 100 sq. ft.

WATER SERVICES:

The new water service shall be AWWA C151 class 52 double cement lined, piping shall be UL listed, and FM approved for fire service. Mechanical joint ductile-iron fittings shall be AWWA C110, ductile-iron standard pattern or AWWA C153, ductile-iron compact pattern. All joints shall be furnished with ductile retainer glans, flanges shall meet ASME 16.1, cast-iron, class to match pipe class rating. A post indicating valve shall be provided or other sort of controlling valves that is required by NFPA-24.

FIRE DEPARTMENT CONNECTION:

A four-inch (4") grooved galvanized pipe header with galvanized fittings shall be installed in the fire protection room. It is assumed that one exterior Storz Fire Department Connection (FDC) will be used during the design stage. The final decision for the (FDC) type shall be made after coordinating with the local fire department. Signage shall be provided in accordance with NFPA signage requirements.

WET PIPE SPRINKLER SYSTEM:

A wet sprinkler system will be installed throughout the maintenance bays and office areas. The owner will be responsible for providing adequate heating to ensure temperatures remain above freezing. The fire protection room will contain a tow wet alarm check valves serving these spaces. All sprinkler heads will be quick-response, intermediate temperature-rated, UL-listed, and FM-approved for their intended applications.

Pipes with a nominal pipe size (NPS) of 2 inches or smaller shall be Schedule 40 with threaded fittings, while pipes from NPS 2.5 to NPS 6 shall be Schedule 10 with grooved fittings. All piping components must have a minimum working pressure rating of 175 psig. Valves shall be UL-listed and FM-approved, with zone valves being indicating-type butterfly valves equipped with electronic supervision. Fittings will consist of ductile-iron or cast-iron flanges, or grooved joints, all rated for a minimum of 175 psig. Grooved-end pipe couplings shall comply with AWWA C606 and UL 213 standards, featuring a rigid pattern, ferrous housing sections, EPDM-rubber gaskets, and bolted connections.

The alarm valve shall be UL 193 compliant and equipped with the necessary trim sets including a bypass, drain, alarm flow switch, and pressure gauges. Inspector's test connections. Sprinklers must meet the UL Fire Protection Equipment Directory or FM Global Approval Guide listings. Water flow indicators shall comply with UL 346, be electronically supervised and paddle-operated, rated for 250 psig, and suitable for both horizontal and vertical installations.

DRY PIPE SPRINKLER SYSTEM:

A dry sprinkler valve with nitrogen generator that come with integrated air compressor, and appurtenances shall be provided in the FP/ Plumb room. Pipe size equal or less than NPS 2, shall be Schedule 40 with threaded fittings; pipe size NPS 2.5 to NPS 6 shall be Schedule 10 with grooved fittings. Valves shall be UL listed and FM approved. Fittings shall be galvanized ductile iron, galvanized cast-iron flanges or grooved joint, with a 175 psig minimum pressure rating. Galvanized Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213, rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts. Provide inspectors test connection at each zone. Sprinklers shall meet UL's Fire Protection Equipment Directory listing or Approval Guide published by FM Global listing. Sprinklers shall be quick response. Water flow indicators shall meet UL 346, shall be electronically supervised, paddle operated, with 250 psig pressure rating, and shall be able to be installed in the horizontal and vertical positions.

FIRE PUMP / WATER TANK:

At the time of writing this report, it is assumed that a fire pump will be required to meet the flow, and pressure demands of the sprinkler system. To support this, a dedicated fire water storage tank will also be necessary. Based on preliminary calculations, the fire pump is expected to have a rated flow of approximately 500 (gpm) at a discharge pressure of 70 (psi). The fire water tank will be sized accordingly to ensure an adequate water supply is available for the duration required by applicable codes and standards. A detailed design analysis, including final tank sizing, pump specifications, and the location of the fire pump room and tank, will be performed in the next phase of the design process.

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SCHEMATIC DESIGN NARRATIVE

PLUMBING

PROJECT: Truro, MA – New Public Works Facility

FROM: Plumbing Team

DATE: May 2023

SUBJECT: Schematic Design Narrative – Plumbing

DESIGN BASIS:

New Truro Department of Public Works facility including Vehicle Maintenance Bays, Vehicle Storage Vehicle Wash, Tire Storage, Fluids Room, Parts Storage, Administration Office, and Toilet/Locker Rooms.

The DPW will include complete code compliant plumbing systems. The plumbing systems will be designed to support the architectural layout including fixtures and equipment. The plumbing systems will be designed at the DPW to include domestic hot and cold water, non-potable cold water, tempered water, recirculated hot water, storm drainage, sanitary drainage and venting, oil waste drainage and venting, and compressed air systems.

This schematic design narrative is prepared by Weston & Sampson Engineers, Inc. and shall be used in conjunction with the Structural, Architectural, Fire Protection, HVAC, and Electrical schematic design documents. This document includes anticipated scope for the project as understood at the schematic design level. This document addresses sanitary/storm systems to ten (10) feet outside the building and water supply systems after utility meter. It does not address site utilities, surface layout and finishes, grading, planting, and irrigation.

DESIGN CRITERIA:

REFERENCED CODES & STANDARDS:

- The Massachusetts State Building Code, 780 CMR, 10th Edition
    - 2021 International Energy Conservation Code (IECC)
    - 2021 International Mechanical Code
- 248 CMR 10.00 Uniform State Plumbing Code

- 522 CMR 7.00 Air Tanks

DOMESTIC WATER SYSTEM DESCRIPTION:

The new domestic water service shall be extended from the water main on Town Hall Road and enter the facility in the FP/Plumbing room to a water meter, this work shall be done by the general contractor and the utility. Plumbing work shall start after the utility water meter where a new reduced pressure principal backflow preventer, pressure reducing valve (if required) shall be installed. Domestic cold water shall be distributed throughout the new DPW facility as required to support the plumbing fixtures as shown on the Architectural Drawings.

A heat pump style water heater system shall be provided and located in the mechanical room. Hot water distribution and recirculation loops shall be distributed throughout the new DPW facility as required to support the plumbing fixtures shown on the Architectural Drawings. Domestic water equipment, piping and supporting appurtenances shall in installed in accordance with 248 CMR 10.00 Uniform State Plumbing Code. Isolation valves and drain valves shall be provided at each riser.

SANITARY DRAINAGE SYSTEM DESCRIPTION:

The new sanitary drainage system shall be connected to a new septic system.

A new oil water separator (OWS) shall be provided to service the floor drains located in the vehicle storage, shop areas, and vehicle wash bay. The OWS shall be provided and sized in accordance with 248 CMR 10.00 Uniform State Plumbing Code. Discharge from the OWS will be plumbed to a tight tank and will not be plumbed to the new septic system.

STORM WATER DRAINAGE SYSTEM DESCRIPTION:

Storm water drainage is not required as all the roof drainage will be via gutters and downspouts piped to a drywell.

COMPRESSED AIR SYSTEM DESCRIPTION:

Compressed air shall be provided by a rotary scroll air compressor. The compressor shall feature a VFD, refrigerated air dryer, inline filtration down to 0.1 micron and oil water separator. A 120-gallon storage tank shall be provided. The compressed air intake shall be ducted to the outside for increased compression efficiency. Heat rejected by the air compressor shall be directed either into the space or outside controlled by a thermostat.

Compressed air drops shall be provided in vehicle maintenance, the workshops, and vehicle storage. Each drop shall include a filter, regulator, and lubricator with a drip leg.

DOMESTIC COLD WATER PIPING DISTRIBUTION:

Domestic cold-water connections shall be provided to all fixtures and equipment in accordance with applicable codes, as required based on the Architectural drawings. Domestic water piping shall be hard copper tube, Type L, ASTM B88 with pressure fittings. Cold water make-up will be provided to HVAC

equipment as required with backflow preventers as outlined in 310 CMR 22: The Massachusetts Drinking Water Regulations.

DOMESTIC HOT WATER PIPING DISTRIBUTION:

Domestic hot-water connections shall be provided to all fixtures and equipment in accordance with applicable codes, as required based on the Architectural drawings. Domestic water piping shall be hard copper tube, Type L, ASTM B88 with pressure fittings. Hot water shall be generated via water-to-water heat pump water heaters. The hot water system shall be sized to accommodate the plumbing fixture load and safety shower eyewash stations.

The water shall be stored in the hot water storage tank at 140°F. Check valves, vacuum breakers, heat trap, circulator pumps and an expansion tank shall be provided at the water heaters. Mixing valves serving handwash sinks shall be tempered to provide maximum 105°F water in accordance with CMR 248 10.00 Uniform State Plumbing Code.

SANITARY DRAINAGE PIPING DISTRIBUTION:

A single 6" sanitary main will collect all sanitary waste stacks, exit the facility at the lowest level and discharge into a septic system. Sanitary waste and vent branch connections will be provided for all plumbing fixtures including toilets, lavatories, urinals, showers, floor drains in mechanical rooms and toilet rooms and drinking fountains. All toilet room waste/vent stacks shall be coordinated to avoid exposed waste piping at the finished ceiling. Vent stacks shall start at the lowest level and exit the facility at the highest point of elevation.

Floor drains/trench drains located in the vehicle storage area, workshops, and wash bay shall drain to an outdoor oil water separator piped to a tight tank.

All floor drains shall be provided with automatic trap priming devices.

EMERGENCY STATIONS/EYEWASH:

Emergency stations/eyewash stations shall be provided in the workshops, fluids rooms, and vehicle maintenance. The water supply shall be 65°F tempered water with re-circulation. A local tepid water mixing valve shall be provided at each safety station, eyewash and handwash sink throughout the facility. Audio and visual alarms shall be provided at each station that will be tied into the building management system in case of activation.

FACTORS YET TO BE DETERMINED:

There are several factors that could affect the plumbing design that have not yet been determined. They are including but not limited to below:

- Locations of utility penetrations into and exiting the building.
- Location of floor drainage and septic system.

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TRURO, MA – NEW DPW FACILITY SEPTIC SYSTEM

As part of the schematic design for the new Truro, MA Department of Public Works (DPW) facility, proposed wastewater flows will be conveyed to a new on-site sewage disposal system (septic system). Typically, the projected wastewater flow for new DPW facilities is calculated by using the "Commercial-Office Building" criteria for design flow from Title 5 (310 CMR 15.000, the MassDEP State Environmental Code for septic systems).

Based on initial discussions between the project team and the Truro Board of Health staff, the project wastewater flow for the new Truro DPW facility will also be calculated by using the "Commercial-Factory, Industrial Plant, Warehouse or Dry Storage Space" criteria for design flow from Title 5 (which is calculated per person, rather than per square foot of building space). The two methods will be compared and a conservative design flow for the facility will be selected. It was also recommended that the new Truro DPW facility septic system be sized to include both the new DPW facility and the existing Town Hall facility (which is located directly adjacent to the DPW facility, on Town Hall Road).

Per the "Office Building" criteria, the design flow is 75 gallons per day (gpd) per 1,000 square feet (s.f.) of office/building space (minimum 200 gpd design flow). The area used for the design flow calculation only includes the office/administrative area of the proposed building (not including the workshop, vehicle maintenance, wash bay, etc. areas of the building).

Per the "Factory, Industrial Plant, Warehouse or Dry Storage" criteria (without cafeteria), the design flow is 15 gpd per person, based on estimated staff/employees.

Based on the draft schematic design prepared by the project team, the approximate size of the administration/office and employee facilities areas for the proposed DPW facility is 2,900 s.f. and the approximate size of the existing Town Hall is 4,315 s.f. (for a total square footage of 7,215 s.f.). The anticipated DPW staff is approximately twelve (12) people, and the existing Town Hall staff is approximately twenty-six (26) people (for a total of thirty-eight (38) people).

The proposed design flow is calculated as follows for each method:

Projected Wastewater Flow from the new DPW Facility and existing Town Hall (Office Building)

- 7,215 s.f./1,000 s.f. = 7.22
- 7.22 x 75 gpd = 542 gpd

Projected Wastewater Flow from the new DPW Facility and existing Town Hall (Factory)

- 38 people (staff/employees) x 15 gpd = 570 gpd

Both the "Office Building" method (542 gpd) and the "Factory" method (570 gpd) result in comparable estimated proposed design flow calculations for the new DPW facility and existing Town Hall facility, therefore the more conservative 570 gpd design flow calculation will be utilized for the schematic design.

Preliminary Septic System Design

Based on the available soil data, test pit and boring findings show native granular soils generally consisting of loose to medium dense sand. Groundwater was not encountered in explorations, which were extended to a maximum depth of approximately 39 feet below grade. Official test pits with the approving authority will be required to confirm the Title 5 Soil Textural Class, but for the purposes of this analysis it is assumed that the soils fall into Class I (Sands, Loamy Sands). The official testing will also confirm the percolation rate of the soils, however for the purposes of this analysis it is also assumed that the percolation rate is less than 5 minutes per inch.

Based on a Class I soil and a percolation rate of less than 5 minutes per inch, the effluent loading rate is 0.74 gpd/s.f. Using this rate and the design flow of 570 gpd for the proposed Truro DPW and Town Hall septic system, the effective leaching area required would be as follows:

- 570 gpd/0.74 gpd/s.f. = 770 s.f. (required)

Assuming a conventional leaching trench configuration, with the reserve area trenches located between the primary area trenches – there are many different configurations that can be considered, depending on number of trenches, length and width. Assuming three (3) trenches, a sample leaching trench design would be the following:

- 43' L x 2' W x 2' D x 2 sides (sidewalls) = 172 s.f.
- 43' L x 2' W (bottom) = 86 s.f.
- Total (per trench) = 258 s.f. effective leaching area x 3 trenches = 774 s.f. total (provided)

Per Title 5, when designed to serve facilities other than a single-family dwelling unit, a two-compartment septic tank (or two tanks in series) are required, with a minimum liquid capacity of 1,500 gallons. For a two-compartment tank, the first compartment shall be sized for a minimum hydraulic detention time of 48 hours, and the second compartment sized for 24 hours (based on design flow). The compartments shall be interconnected by a vented, inverted U-shaped pipe (minimum 4-inch) that extends below the bottom of the scum layer of the tank, and the outlet tee of each compartment shall be equipped with a corrosion resistant gas baffle or effluent tee filter.

- First tank compartment (48-hour detention time): 2 days x 570 gpd = 1,140 gallons
- Second tank compartment (24-hour detention time): 1 day x 570 gpd = 570 gallons
- Required Tank Volume = 1,710 gallons
    - Go with a 2,000 gallon 2-compartment septic tank

Most of Cape Cod is in a nitrogen sensitive area, which based on recent Title 5 regulation updates, now requires an advanced Innovative/Alternative (I/A) septic system design to further reduce nitrogen. Based on recent experience, the Town of Truro specifically prefers the Advantex treatment system for nitrogen

removal I/A system in Town. The Advantex system would consist of an additional recirculation/treatment system tank to be installed downstream of the septic tank, along with a control panel and associated wiring/piping (assuming Advantex AX25RT gravity discharge treatment system or equal for the schematic/conceptual design, final design details to be determined later).

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SCHEMATIC DESIGN NARRATIVE

HVAC

PROJECT: Truro, MA – New Public Works Facility

FROM: HVAC Team

DATE: May 2025

SUBJECT: Schematic Design Narrative – HVAC

INTRODUCTION

This schematic design narrative is prepared by Weston & Sampson Engineers, Inc. and shall be used in conjunction with the Structural, Architectural, Fire Protection, Plumbing, and Electrical schematic design documents. This document includes anticipated scope for the project as understood at the schematic design level. This document addresses systems to ten (10) feet outside the building. It does not address site utilities, surface layout and finishes, grading, planting, and irrigation.

PROJECT PROGRAM:

The new Public Works Facility will be located at 17 Town Hall Road in the town of Truro, MA and consists of a non-separated "mixed use" building program. The primary "mixed use" operational components are an Administration Suite, Vehicle Storage Garage, various Workshops, Fluids and Parts Storage rooms, a Vehicle Maintenance area, a vehicle wash and miscellaneous Utility rooms.

- The Administration Suite consists of private and open offices, conference rooms, a multipurpose room, and employee support spaces such as male and female locker rooms, a laundry room, kitchenette, file storage, and a copy and mail room, public service counter.
- The Vehicle Storage will provide semi-heated indoor storage of the Town's various vehicle types
- The Workshops include a combined carpentry and sign workshop.
- The Parts and Fluid Storage will provide storage areas for various lubrication and non-fluid vehicle parts.
- The Vehicle Maintenance area is a comprehensive vehicle maintenance workspace.
- Miscellaneous Utility rooms

APPLICABLE CODES:

The Massachusetts State Building Code, 780 CMR 10th Edition

- 2021 IMC International Mechanical Code
- 225 CMR 23 Massachusetts Commercial Stretch Energy Code and Municipal Opt-In Specialized Code 2023
    - 2021 IECC International Energy Conservation Code with Massachusetts 225 CMR 23 Amendments

- ASHRAE Standard 62.1-2022 – Ventilation for Acceptable Indoor Air Quality
- ASHRAE Standard 90.1-2019 – Energy Standard for Building Except Low-Rise Residential Buildings
- ASHRAE 2021 Fundamental Handbook
- 2023 National Electric Code (NFPA 70)

Energy Code Compliance Pathway

The Town of Truro has adopted the Municipal Opt-In Specialized Code 2023. The building will be designed under 225 CMR 23 CC101.3.2 All-Electric Pathway. 225 CMR 23 CC104.1.1 has been chosen as the optional compliance path.

Furthermore:

- Per 225 CMR 23 C401.2.4 Mixed Use Buildings, the building's energy code compliance path will be 225 CMR 23 C.401.2.1.1 Prescriptive Compliance. The Administration Suite, Vehicle Maintenance, Vehicle Storage, the Workshop, and the Fluids and Parts Storage rooms are each less than 20, 000 SF and will comply with 225 CMR 23 C.401.2.1.1 Prescriptive Compliance.

DESIGN CRITERIA:

Outdoor Design Conditions:

Provincetown, MA, USA

- Summer: 83.6°F DB / 72.8°F WB
- Winter: 12.8°F DB

Source: Based on ASHRAE 2021 Fundamentals Handbook Summer/Cooling 0.4% DB/WB and Winter/Heating 99.6% DB. Weather Station – Provincetown Airport, MA, USA.

Indoor Design Conditions:

- Administration Area (Office space, conference rooms, locker rooms)

  - Occupied Temperature/Humidity Set Points
    - Cooling Season: 75°F DB (+/- 3°F) and 40%-60% Relative Humidity.
    - Heating Season: 70°F DB (+/- 3°F) and no humidity control.
  - Unoccupied Temperature/Humidity Set Points
    - Cooling Season: 85°F DB (+/- 3°F) and 40%-60% Relative Humidity.
    - Heating Season: 55°F DB (+/- 3°F) and no humidity control.
- Vehicle Maintenance, Workshops, Parts Storage, and Fluid Storage
  - Occupied Temperature/Humidity Set Points
    - Cooling Season: 78°F DB (+/- 3°F) and no Humidity Control.
    - Heating Season: 70°F DB (+/- 3°F) and no humidity control.
  - Unoccupied Temperature/Humidity Set Points
    - Cooling Season: 85°F DB (+/- 3°F) and 40%-60% Relative Humidity.
    - Heating Season: 55°F DB (+/- 3°F) and no humidity control.
- Vehicle Wash Bay
  - Occupied Temperature/Humidity Set Points
    - Cooling Season: No temperature or humidity control.
    - Heating Season: 60°F DB (+/- 5°F) and no humidity control.
  - Unoccupied Temperature/Humidity Set Points
    - Cooling Season: No temperature or humidity control.
    - Heating Season: 55°F DB (+/- 5°F) and no humidity control.
- Vehicle Storage
  - Occupied Temperature/Humidity Set Points
    - Cooling Season: N/A – normally unoccupied
    - Heating Season: 60°F DB (+/- 5°F) and no humidity control.
  - Unoccupied Temperature/Humidity Set Points
    - Cooling Season: No temperature or humidity control.
    - Heating Season: 55°F DB (+/- 5°F) and no humidity control.

- Mechanical Room, Plumbing/FP Room, Electrical Room
  - Occupied Temperature/Humidity Set Points
    - Cooling Season: N/A – normally unoccupied
    - Heating Season: 65°F DB (+/- 5°F) and no humidity control.
  - Unoccupied Temperature/Humidity Set Points
    - Cooling Season: 85°F DB (+/- 5°F) and no humidity control.
    - Heating Season: 55°F DB (+/- 5°F) and no humidity control.
- Tel/Data Room
  - Occupied Temperature/Humidity Set Points
    - Cooling Season: 72°F DB (+/-3°F) and 40%-60% relative humidity.
    - Heating Season: 72°F DB (+/- 3°F) and no humidity control.
  - Unoccupied Temperature/Humidity Set Points
    - Cooling Season: 72°F DB (+/-3°F) and 40%-60% relative humidity.
    - Heating Season: 72°F DB (+/- 3°F) and no humidity control.

Outdoor Air Ventilation:

The minimum outside air will be introduced as required by the greater of ASHRAE Standard 62.1-2022, International Mechanical Code 2021, or the requirement to make up exhaust air.

- Administration Area
  - Office spaces, Conference rooms
    - 5 CFM/Person
    - 0.06 CFM/SF
  - Corridors, Storage
    - 0.06 CFM/SF
  - Training Rooms
    - 7.5 CFM/Person
    - 0.06 CFM/SF
  - Locker Room
    - 0.25 CFM/SF (Exhaust)
- Vehicle Maintenance
  - 1 CFM/SF (Exhaust)
- Shops
  - 0.5 CFM/SF (Exhaust)
  - 0.75 CFM/SF (Exhaust Purge Mode)
- Vehicle Wash Bay
  - 1 ACH (Exhaust)
  - 0.75 CFM/SF (Exhaust Purge Mode)
- Parts Storage, Fluid Storage
  - 1CFM/SF (Exhaust)
- Vehicle Storage
  - 0.05 CFM/SF (Exhaust)
  - 0.75 CFM/SF (Exhaust Purge Mode)
- Mechanical Room, Plumbing/FP Room, Electrical Room
  - 0.12 CFM/SF (note: this value exceeds the required ventilation)
- Tel/Data Room
  - 0.06 CFM/SF

HVAC SYSTEMS:

Central Systems

Air-to-Water Heat Pumps

The primary source of heating and cooling will be modular air-to-water heat pumps (ATWHP). It is anticipated that there will be two (2) banks of 50 nominal tons each sized for heating with each

bank being 2/3 of the peak heating load. The water side of the heat pumps will be 30% propylene glycol.

The hydronic distribution system will be a 2-pipe, 30% propylene glycol system. It will provide all the heating and cooling needs of the entire building with the exception of the building's electric room and tel-data rooms. Each heat pump will have a dedicated variable speed pump. The hydronic plant will operate in a primary secondary variable pumping configuration with two (2) variable speed base-mounted end suction system pumps. Spaces that are heating only will have normally closed hydronic isolation valves to prevent chilled water from entering heating only equipment when the system is in heating mode. Additional hydronic specialties will include a low flow system bypass with modulating 3-way control valve, expansion tank, air separator, flow meter, coupon rack, glycol feeder, and chemical shot feeder.

The heating hot water loop will be designed with a supply water temperature of 130°F and a return water temperature of 100°F. The chilled water will be designed with a chilled water supply temperature of 44F and a return temperature of 56F. Both chilled water and hot water plant control will reset supply water temperature based on the outside air temperature. In addition, the controller will optimize the operation of the heat pump plant by staging and rotating the operation of each heat pump.

Building Management Systems

The HVAC systems serving the building will be controlled by direct digital control (DDC) building management system (BMS). The BMS will provide monitoring and control of the system from a remote access web-based interface.

A gas monitoring system will be installed to monitor, alarm, and control purge ventilation equipment located in the necessary building locations. The gas monitoring system will include carbon monoxide (CO) and nitrogen dioxide (NO_2) sensors installed as required in each space to provide complete coverage of the area. Each sensor will include a visual and audible indication if gas is detected above the programmed high limit. The sensors will be tied to the main gas monitoring system control panel which will interface with the BMS to control the HVAC equipment setup with a purge mode sequence of operation. Manual wind down times will be provided to allow for a manual temporary purge by operators for all spaces that have a purge cycle.

Administrative Suite

The administration area will be served by 2-pipe ducted fan coils and an indoor, semi-custom, energy recovery unit (ERU) to provide heating, cooling, and ventilation to the spaces. The ERU will be comprised of the following main components: variable speed supply fan, variable speed exhaust fan, a 2-pipe hot water/ chilled water coil, and a rotary energy recovery wheel. The energy recovery exhaust fan will be provided with the ERU to relieve the minimum ventilation air introduced during normal operation and during economizer operation. The ERU will be capable of 100% economizer operation and will be controlled based on the outdoor air enthalpy.

The ERU exhaust fan will serve the locker rooms, janitor closet, breakrooms, etc.

Additional systems will include exhaust fans and an electric unit heater serving the electrical room. The tel/data room will be served by a dedicated ductless split-system with a wall mounted indoor unit and a remote outdoor condensing unit (CU).

VEHICLE MAINTENANCE:

The vehicle maintenance area will be served by an energy recovery unit (ERU) and a radiant floor heating system. The ERU will provide neutral supply air temperature (space temp setpoint -2F) in the heating mode and will provide for the cooling of the space during the cooling season.

The ERU will serve the maintenance area, fluid storage room, and parts storage. The ERU will be comprised of the following main components: variable speed supply fan, variable speed exhaust fan, non-cross contaminating air-to-air heat exchanger, and a 2-pipe heating/cooling coil. The ERU will be sized to maintain the ventilation requirements of the space and will only operate during occupied hours. Supply ductwork will be installed exposed to the space with duct mounted supply grilles. Exhaust ductwork will be installed exposed to the space with duct drops along the perimeter walls to 12" above the finished floor. The exhaust fan in the ERU will operate in purge mode when triggered by the gas monitoring system. In addition, the vehicle maintenance area will be installed with source capture vehicle exhaust and hose reels.

The vehicle maintenance area will be heated by an in-floor radiant heating system. The radiant floor system will utilize hot water from the air-to-water heat pumps. It will be installed in multiple circuits along with control valves and/or pump to control water supply temperatures to the floor loop and maintain the space temperature during occupied and unoccupied hours. The radiant heating system will be hydraulically isolated in the cooling months.

The fluid storage, tool storage, and parts storage rooms will be served by dedicated exhaust fans and utilize ventilation air from the ERU as the source of make-up air. Hot water unit heaters will provide heat to these spaces. The vehicle maintenance office will be heated and cooled by a 2-pipe ducted fan coil and ventilated by a dedicated energy recovery ventilator (ERV).

VEHICLE STORAGE:

The vehicle storage area will be heated by ceiling or wall mounted hot water unit heaters.

The vehicle storage area will be served by two exhaust fans. The first exhaust fan will be installed for normal operation to provide ventilation air to the space. The second exhaust fan will be installed to operate during a purge mode initiated by the gas monitoring system.

High volume low speed fans will be installed above the vehicle storage area to provide thermal comfort in the summer and shoulder seasons.

SHOPS:

The shop area will be served by an Energy Recovery Unit (ERU) to provide heating, cooling, and ventilation to the spaces. The ERU will be comprised of the following main components: variable speed supply fan, variable speed exhaust fan, non-cross contaminating air-to-air heat exchanger, and a 2-pipe heating/cooling coil. Supply duct work will be installed exposed to the space with high-throw, duct mounted, supply grilles to deliver air. Exhaust ductwork will be installed exposed to the space with duct drops along the perimeter walls to 12" above the finished floor. The exhaust fan in the ERU will operate normally to relieve outdoor air introduced to the space. The exhaust fan will operate in purge mode when triggered by the gas monitoring system.

MECHANICAL ROOM AND PLUMBING/FIRE PROTECTION ROOM:

The building utility rooms will be installed with hot water unit heaters to provide heat to the space. Ventilation will be provided with exhaust fans and an outdoor air intake roof hood or wall louver.

VEHICLE WASH BAY

The vehicle wash bay will be served by a roof mounted heating and ventilating unit (HV). This unit will provide heat and ventilation to the space. The HV unit will be comprised of a variable speed supply fan and a hot water heating coil. Supply ductwork from the HV unit will be aluminum construction and be installed exposed to the space. The return ductwork will be aluminum construction and installed with duct drops along the perimeter of the space to 12" above the finished floor.

The wash bay will also be served by 2 roof mounted exhaust fans. The first exhaust fan will operate during normal operation to relieve outdoor air introduced to the space by the HV unit. The second exhaust fan will be installed to operate in purge mode triggered from the gas monitoring system. Ductwork from both exhaust fans will be aluminum construction and duct drops along the perimeter of the space to 12" above the finished floor.

CLOSED LOOP GEOTHERMAL SYSTEM Alternate 5:

The primary source of heating and cooling will be provided by a closed-loop geothermal bore field located on site. The geothermal field will provide the source of both heating and cooling in each of the respective seasons.

The geothermal system will consist of multiple wells headered to a common supply and return pipe that will be pumped to the building mechanical room. The condenser water will circulate through the closed-

loop piping, this loop will exchange or reject heat to the bore field, depending on seasonal demand. See the Geothermal section of the Schematic Design for further details on the geothermal system.

Water-to-Water Heat Pumps

The water-to-water heat pumps will be sized at 50% of the building heating or cooling loads whichever is greater. The heat pumps will have N+1 redundancy and as such there will be three (3) heat pumps at approximately 15 tons a piece to provide for the heating and cooling needs of the building in the form of hot water for heating and chilled water for cooling. The heat pumps will take condenser water from the closed loop bore field.

Hot Water Systems/Chilled Water Systems

The hydronic distribution system will be a 2-pipe, 30% propylene glycol system. It will provide all the heating and cooling needs of the entire building with the exception of the building's electric room and tel-data rooms. Each heat pump will have a dedicated variable speed pump. The hydronic plant will operate in a primary secondary variable pumping configuration with two (2) variable speed base-mounted end suction system pumps. Spaces that are heating only will have normally closed hydronic isolation valves to prevent chilled water from entering heating only equipment when the system is in heating mode. Additional hydronic specialties will include a low flow system bypass with modulating 3-way control valve, expansion tank, air separator, flow meter, coupon rack, glycol feeder, and chemical shot feeder.

The heating hot water loop will be designed with a supply water temperature of 130°F and a return water temperature of 100°F. The chilled water will be designed with a chilled water supply temperature of 44F and a return temperature of 56F. Both chilled water and hot water plant control will reset supply water temperature based on the outside air temperature. In addition, the controller will optimize the operation of the heat pump plant by staging and rotating the operation of each heat pump.

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SCHEMATIC DESIGN NARRATIVE

Electrical

PROJECT: Truro, MA – Public Works Facility

FROM: Electrical Team (GGD Consulting Engineers, Inc.)

DATE: May 2, 2025

SUBJECT: Schematic Design Narrative – Electrical

The following is the Electrical Systems narrative, which defines the scope of work and capacities of the Power and Lighting systems, as well as the Basis of Design.

CODES

All work installed under Section 26 00 00 shall comply with the Massachusetts State Building Code and all state, county, and federal codes, laws, statutes, and authorities having jurisdiction.

DESIGN INTENT

All work is new and consists of furnishing all materials, equipment, labor, transportation, facilities, and all operations and adjustments required for the complete and operating installation of the Electrical work and all items incidental thereto, including commissioning and testing.

Energy Efficiency: Lighting system shall be designed and installed in accordance with IECC 2021 requirements.

A. Power Distribution:

1. Electrical power will be brought into the site via underground medium voltage cables from the utility company network. A pad mounted step-down transformer will be located at grade adjacent to the building. Service entrance and distribution switchgear will be located in the electrical room along with lighting and power distribution panels. The service capacity will be sized at 800 amperes at 277/480V, 3 phase, 4 wire:

2. A 400kW, 500.5kVA, 277/480V, 3Ø, 4W diesel fired emergency generator will be provided and include automatic starting and safety controls. The unit will be housed outdoors on a concrete pad. The generator will include three (3) service breakers: one (1) for life safety equipment, one (1) for optional standby equipment, and one (1) for the load bank.

3. The generator will be sized to support the entire facility with exception to the wash bay and EV car charging.

4. The emergency power distribution system will consist of two automatic transfer switches, one 100 ampere with bypass isolation for life safety equipment and one 800 ampere for optional-standby systems. A separate system of distribution panels and conduit systems will be provided for each level of emergency power. A kirk key interlock system will be provided for a roll up full building back-up generator, as well as a manual transfer switch with kirk key interlock for a temporary roll up generator on the life safety system for maintenance of the permanent generator.

B. Interior Lighting System:

Offices

- Lighting fixtures will consist of recessed 2" linear slot type LED luminaries with dimming drivers where ceilings are 9'-6" or less. In any ceiling condition greater than 9'-6" 2" LED linear pendant fixtures with direct and indirect sources shall be used. The fixtures will be wired for automatic dimming where natural day light is available and required by applicable energy codes. Vacancy sensors shall also be provided for automatic control of the lighting within the space as required. All fixtures will be provided with 0-10v dimming capability.

Corridors

- Corridor lighting shall consist of linear recessed slot type lighting and recessed down light fixtures. All fixtures will be provided with 0-10v dimming drivers. Occupancy sensors will also be provided for automatic control of the lighting in these passage areas.

Conference Room

- Lighting fixtures will consist of recessed 2" linear slot type LED luminaries with dimming drivers where ceilings are 9'-6" or less. In any ceiling condition greater than 9'-6" 2" LED linear pendant fixtures with direct and indirect sources shall be used. Recessed 2" down lighting fixtures may also be used for supplemental lighting if the space. The fixtures will be wired for automatic dimming where natural day light is available and required by applicable energy codes. Vacancy sensors shall also be provided for automatic control of the lighting within the space as required. All fixtures will be provided with 0-10v dimming capability.

Storage & Utility Rooms

- Storage and utility rooms will be provided with surface mounted LED utility strip type fixtures with wrap around lensing. Fixtures will be provided with 0-10v dimming capable driver. Occupancy sensors will be provided in all spaces for automatic control of the lighting with the exception of any electrical rooms.

Exit Signs

The following exit signs types shall be provided:

- Standard – single or double faced edge-lit mirrored exit sign with 6" tall green lettering.
- Handicap – Single faced mirrored edge-lit sign with 6" tall green lettering and international symbol of accessibility.
- Rough Service – Single faced sign with die cast aluminum housing. Fixture to have 6" tall green lettering.

Toilet Rooms

- Toilet rooms will be provided with a 4" regressed wall to wall slot type fixture along the wet wall. Supplemental 2" recessed down lighting fixtures may be added when needed to appropriately light the space. . All fixtures will be provided with 0-10v dimming drivers. Occupancy sensors will also be provided for automatic control of the lighting in these passage areas.

Fleet Storage

- Apparatus bay lighting will consist of linear LED pendant mounted fixtures with vapor tight polycarbonate lensing. All fixtures shall be provided with 0-10v dimming capable driver. High bay occupancy sensors shall be provided for automatic control of the lighting with in the space. Photo sensors may be provided if required.

Locker Rooms

- Locker rooms will be provided with surface or recessed mounted impact and water resistant LED fixtures. All fixtures shall be provided with 0-10v dimming capability. Vacancy sensors shall be provided for automatic control of the lighting within the space.
- Each space shall be provided with simple local control stations with engraved descriptive keys. The control stations will allow the occupant of the space to control all room zones and to raise and lower the lighting levels in the space.
- The entire facility will be provide with an addressable networked automatic lighting control system for programming of any desired schedules, control of all exterior lighting, emergency override conditions, and energy usage information.

C. Site Lighting System:

1. Fixtures for area lighting will be pole mounted LED luminaries in the parking area. The exterior lighting will be connected to the automatic lighting control system for photocell on and timed off operation.

2. Building perimeter fixtures will be wall mounted LED sconces over exterior doors.

3. All fixtures will be of the cut-off type.

D. Wiring Devices:

1. Offices will generally have one (1) duplex outlet per wall. At each workstation a double duplex receptacle will be provided.

2. Corridors will have a cleaning receptacle at approximately 30-40 foot intervals.

3. Exterior weatherproof receptacles will be installed at exterior doors.

4. Receptacles in garage/shop spaces will be GFI type with weatherproof covers mounted at 48 inches above floor.

5. Emergency power off (EPO) stations shall be provided at each entry/exit door to kitchen. Device shall serve to shut down all kitchen equipment quickly in the event of an alarm.

E. Fire Alarm System:

1. A fire alarm and detection system will be provided with 24 hour battery back-up. The system will be of the addressable type, where each device will be identified at the control panel and remote annunciator by device type and location to facilitate search for origin of alarms.

2. Smoke detectors will be provided in open areas, corridors, and other egress ways.

3. The sprinkler system will be supervised for water flow and tampering with valves.

4. Horn/strobes will be provided in egress ways, assembly spaces, open areas and other large spaces. Strobe only units will be provided in single toilets and conference rooms.

5. Manual pull stations will be provided at exit discharge personnel doors.

6. The system will be connected to automatically report alarms to the fire department.

F. Distributed Antennae System (DAS):

1. A public safety radio distributed antenna system (DAS) which consists of bi-directional amplifiers (BDA), donor antennas, coverage antennas, coax cable, coax connectors, splitters, combiners and couplers. These devices will be used as part of a system for in-building public safety 2-way radio system communication.

G. Lightning Protection System:

1. A system of lightning protection devices will be provided.

2. The lightning protection equipment will include air terminals, conductors, conduits, fasteners, connectors and ground rods.

3. The lightning protection system will be provided with a UL master label certificate.

H. Renewable Energy System Provisions:

1. The base project will include Electrical provisions for a roof mounted renewable energy system for a grid connected photovoltaic PV system intended to reduce the facilities demand for power.

I. Metering:

1. Measurement devices shall be installed to monitor the electrical energy use for each of the following separately:

    a. Total electrical energy

    b. Sub-metering in accordance with ASHRAE 90.1 paragraph 8.4.3

2. Recording and Reporting:

   a. The electrical energy usage for all loads listed above shall be recorded a minimum of every 15 minutes and reported at least hourly, daily, monthly, and annually. The system shall be capable of maintaining all data collected for a minimum of 36 months.

J. Level 2 AC Dual Electric Vehicle Charging Equipment. (EVSE)

1. Provide provisions for dual port EVSE stations fed with 40 ampere feeders back to a EVSE panel for at least 10% of parking spaces per Massachusetts stretch energy code. Two protective bollards will be installed at each charging station.

K. Security System:

- An addressable security system will be provided. The system will be integrated with the card access and closed circuit TV (CCTV) system.

- Position switches will be provided at all exterior doors.

- A UL Listed closed circuit TV system will be provided. The system consists of computer servers with image software, computer monitors, and IP based closed circuit TV cameras. The head end server shall be located in the server room and will be rack mounted. The system can be accessed from any PC within the facility or externally via an IP address. Each camera can be viewed independently. The Stored Appliance Network (SAN) will store this information for 45 days at 30 images per second.

- The location of the cameras is generally in corridors, secure areas, and exterior building perimeter. The exterior cameras are pan-tilt-zoom type. The site shall be 100% covered. Cameras will not be provided in Fire department living quarters.

- The system will fully integrate with the access control system to allow viewing of events from a single alarm viewer. Camera images and recorded video shall be linked to the access system to allow retrieval of video that is associated with the event.

- The system includes a card access controller, door controllers, and proximity readers/keypads. The electrical hardware for each door will be provided by the door Hardware Contractor. Proximity readers will be located at various locations as shown on the security drawings. The purpose is to only allow access to authorized personnel at all times. Each proximity reader will have a distinctive code to identify the user and a log will be kept in memory. The log within the panel can be accessed through a computer.

- The alarm condition will also initiate real time recording on the integral CCTV system that is included as part of this submission. The system is programmed with graphic maps allowing the end-user to quickly identify alarm conditions and lock/unlock doors.

- The system shall be tested and complete documentation shall be provided to the Owner on the operational and programming functions available. The system may be easily expanded to accommodate any additional devices that may be added in the future.

TESTING REQUIREMENTS

The Electrical Contractor shall provide testing of the following systems with the Owner and Owner's Representative present:

- Lighting and power panels for correct phase balance.
- Emergency generator.
- Lighting control system (interior and exterior).
- Distributed Antennae System.
- Fire alarm system.
- Lightning Protection System

Testing reports shall be submitted to the Engineer for review and approval before providing to the Owner.

OPERATION MANUALS AND MAINTENANCE MANUALS:

When the project is complete, the Electrical Contractor shall provide operation and maintenance manuals to the Owner. Final affidavits will not be issued until Operation and Maintenance Manuals are issued.

RECORD DRAWINGS AND CONTROL DOCUMENTS:

When the project is completed, an as-built set of drawings, showing all lighting and power requirements from contract and addendum items will be provided to the Owner.

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SCHEMATIC DESIGN NARRATIVE

Technology Systems

PROJECT: Truro, MA – Public Works Facility

FROM: Electrical Team (GGD Consulting Engineers, Inc.)

DATE: May 2, 2025

SUBJECT: Schematic Design Narrative – Technology Systems

The following is the Technology system narrative which defines scope of work, as well as, basis of design:

The Technology system design at the Truro DPW Building is designed with Category 6A cable and intended for 10G bps to the workstation. The voice wiring will be capable of VOIP.

Technology Components:

Installation and integration of multiple technology components are as follows:

A. Cabling for Voice, Data, and Video Technologies

B. Data Electronics for LAN/WAN Data Infrastructure (not included as part of scope)

C. Data Electronics for Internet Access (not included as part of scope)

D. Data Network Computer Hardware (not included as part of scope)

E. Data Network Software (not included as part of scope)

F. Computer Peripherals (not included as part of scope)

Data System:

The data system is designed for a 10 Gig Ethernet (Category 6A cable) with 10G Base-T connection to the workstation. The high-speed data transmission will allow users to retrieve data from the internet and local area network almost instantly. The data system has been designed for users to accomplish:

A. Internet access through a wireless lan and hard-wired data drops.

B. Applications for word processing, spreadsheet, and alike through a central applications server.

C. Printing of documents from any user computer connected to network printers.

D. Wireless access for employees at the facility.

Telephone System:

The telephone system will utilize Category 6A cable similar to the data system. The infrastructure will be designed to accommodate Voice-Over-IP.

Cable-TV System:

The Cable-TV system will comprise of a coaxial cable drops at each location. The system will be bi-directional type, which allows for both receiving and transmitting broadband signals.

Sound System:

The facility will have a paging/sound system. The system will have inputs from the phone system and paging module.

The paging system will be provided with eight (8) zones.

Volume controls will be provided in private office areas.

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SCHEMATIC DESIGN NARRATIVE

Geothermal Wells

PROJECT: Truro, MA – Public Works Facility

FROM: Geothermal Team

DATE: May 2, 2025; updated May 23, 2025

SUBJECT: Schematic Design Narrative – Geothermal Wells

PROJECT INFORMATION

The hydrogeologic conditions of the outer Cape dictate the ability to use the most effective of the ground source heat pump systems – open loop. This area is underlain by a significant thickness of unconsolidated sand and gravel units of high groundwater yield potential, interbedded with discontinuous clay layers. These materials in-mass possess, under groundwater saturated conditions, a high thermal conductivity value on par with some of the massive bedrock units that underlie the mainland of the state. This sequence of unconsolidated deposits is typically several hundred feet thick below the Cape, making the option of bedrock drilling costly and impractical. Thus, the use of a common closed loop system completed in the bedrock underlying the Cape is not common.

Of significance to the siting and use of an open-loop system in the Outer Cape, is the occurrence of freshwater lenses in the corresponding unconsolidated sand and gravel deposits that support both public and private water systems. Static water level elevations typically range between 10-12 feet above sea level (inland) and approach approximately sea level near the coast. Beneath the freshwater, brackish groundwater generally can naturally be found at 30-40 times the height of the freshwater elevation above sea level. For example, a static groundwater level elevation of 10 feet above sea level can be associated with a corresponding underlying brackish groundwater contact elevation of approximately 400 feet below sea level. Because of the typically corrosive nature of brackish water, the use of a closed loop system that would typically need to extend into this deeper subsurface environment (i.e., unconsolidated deposits and underlying bedrock both occurring below the freshwater) would require specialty materials for construction, the use of extreme drilling protections, and are generally not cost effective. At the proposed DPW facility groundwater levels are greater than 100 feet below grade adding complexity and cost to drilling and eliminating effective heat transfer in this upper “dry” zone.

Selected Alternatives

OPEN LOOP

Because of the conditions described above, the selected and most efficient ground source heat pump (GSHP) system adopted in this region is an open-loop style system consisting of well pairs. The first well is an extraction well fitted with a submersible pump. The extracted water is pumped through a plate & frame heat exchanger and reinjected into an injection well (the second well of the pair). The extraction well pumping rates and drilling depths are generally selected to avoid the upconing of the brackish zone below. At this site we would assume permeable sand could be encountered within the upper 60 feet of the saturated sand and gravel deposits making anticipated well depths between 120' and 180' below grade. The corresponding reinjection wells can be shallower, screened almost their entire depth, and are anticipated to be completed at depths ranging from 100-140' for this side.

The installation of a well pair, pump, controls and connecting piping should range in cost from $70,000 to $90,000, dependent on conditions and well separation distances. Injection wells will have wire wound PVC screens while extraction wells require up to 30 feet of wire wound stainless steel screens (Johnson or equal). Based on the need for redundancy and estimated heating/cooling load for the building of up to 30 tons, it is recommended that a maximum of 3 well pairs should readily provide sufficient ground heat exchange.

Cartridge filters, plate & frame heat exchangers and controls (i.e. VFD's) would be additional system components but are considered part of the mechanical HVAC components and should be costed separately.

CLOSED LOOP

Due to the documented presence of PFAS in the subsurface and the upper portions of the freshwater sand and gravel aquifer, Mass DEP and Truro's LSP, HRP Associates, Inc., have indicated that any proposal to develop an open loop geothermal systems at the DPW site will be denied. At this time, based on these preliminary discussions, the proposed designed is a closed loop geothermal system despite its higher costs and well quantities. A closed loop system will require a ground loop coupled through multiple wells each with a completion depth of less than 300 feet. This depth limit is anticipated to avoid penetrating the contact with the underlying brackish groundwater and take advantage of the bulk thermal conductivity afforded by 150 feet of saturated sand and gravel. Anticipated heating and cooling loads can come from approximately 20 to 22 wells depending on the "u"-loop design. We recommend direct connection to a ground source heat pump or pumps with a water to air exchange. This will allow the elimination of plate and frame heat exchanger and a separate internal circulation system. However, a larger 90 to 100 gpm circulation pump will be needed (with redundancy) to move water through the entire ground loop and building components. The entire system should benefit from a reduced maintenance schedule by using materials of construction for the subsystem components having a 50-year life cycle expectancy.

Preliminary Site Design Considerations for Closed Loop

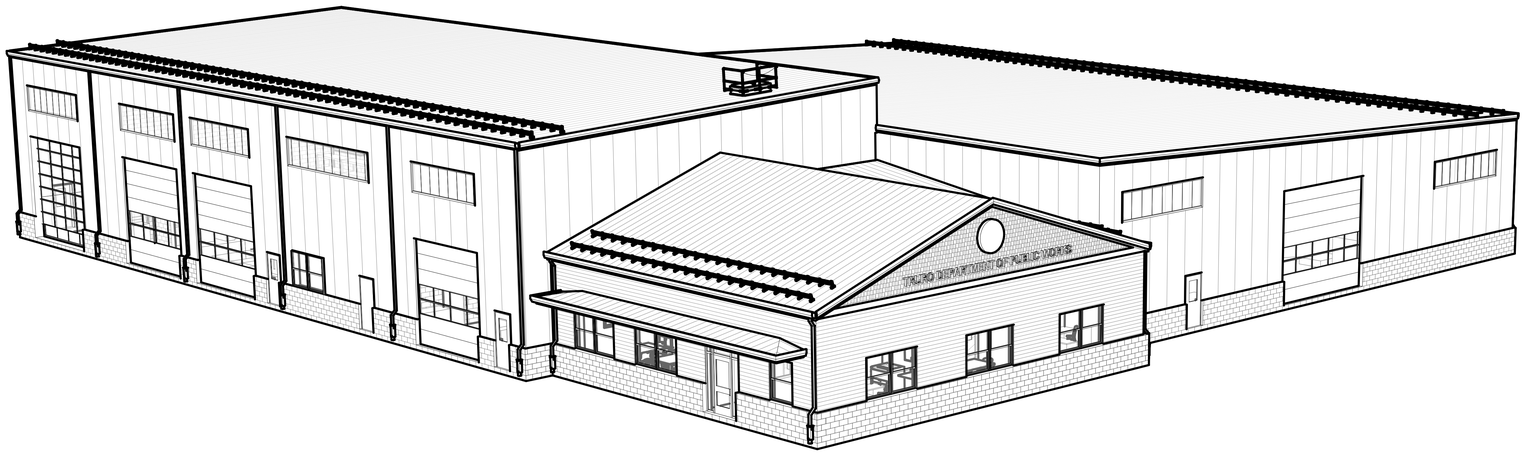
Based on the need for redundancy and estimated heating/cooling load for the building of up to 30 tons, it is recommended that a maximum of 22 wells should readily provide sufficient ground heat exchange. System components for pricing and bidding purposes are provided below.

Drill and install wells (anticipate 6,600 feet of borehole)	_____ per foot
Furnish and install u-loop and connections to building (assume 6,600 feet of polyethylene u-loops) (assume 2" polyethylene pipe return and two, 4 inch diameter headers buried a minimum of 4' below grade) estimate 800 linear feet	_____ per foot
Provided startup and training services including pump and UFD manuals and specifications (assume 8 hours)	_____ hour

SECTION II

Schematic Design Drawings

TOWN of TRURO, MA
NEW DEPARTMENT of PUBLIC WORKS FACILITY
17 TOWN HALL
TRURO, MA 02666



Client Logo:

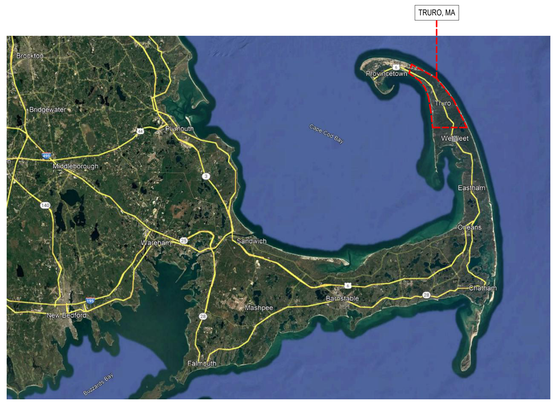
Weston & Sampson Engineers, Inc.
100 Foxborough Boulevard, Suite 250
Foxborough, MA 02035
978.532.1900 800.SAMPSON

www.westonandsampson.com

Consultants:

DRAWING LIST

GENERAL	
G000	TITLE SHEET
G101	CODE SUMMARY & PLANS
CIVIL	
C100	EXISTING CONDITION PLAN I
C101	EXISTING CONDITIONS PLAN II
C201	SITE PREPARATION AND EROSION CONTROL PLAN & DEMOLITION PLAN
C301	SITE LAYOUT & MATERIALS PLAN
C401	GRADING & DRAINAGE PLAN
C501	UTILITY PLAN
ARCHITECTURAL	
A011	ABBREVIATIONS, SYMBOLS, LEGEND & GENERAL NOTES
A021	GENERAL NOTES & MOUNTING HEIGHTS
A031	PARTITION TYPES & EXTERIOR WALL ASSEMBLIES
A101	OVERALL FLOOR PLAN
A102	OVERALL MEZZANINE PLAN
A103	REFLECTED CEILING PLAN - BELOW MEZZANINE
A105	ROOF PLAN
A106	STORAGE CANOPY PLANS & ELEVATIONS (BID ALT 2)
A111	LARGE SCALE FLOOR PLAN - ADMIN & EMPLOYEE FACILITIES
A201	OVERALL EXTERIOR ELEVATIONS
A231	3D VIEWS I
A301	BUILDING SECTIONS I
A302	BUILDING SECTIONS II
A401	WALL SECTIONS I
EQUIPMENT	
EQ101	EQUIPMENT LAYOUT PLAN I
EQ102	EQUIPMENT LAYOUT PLAN II
EQ103	TIGHT TANK DETAILS



Location Map

Vicinity Map

Issue Date: MAY 30, 2025

Issued For: SCHEMATIC DESIGN

USE GROUP LEGEND

- USE GROUP: S-1 STORAGE
- USE GROUP: S-2 STORAGE
- USE GROUP: B BUSINESS
- MEZZANINE

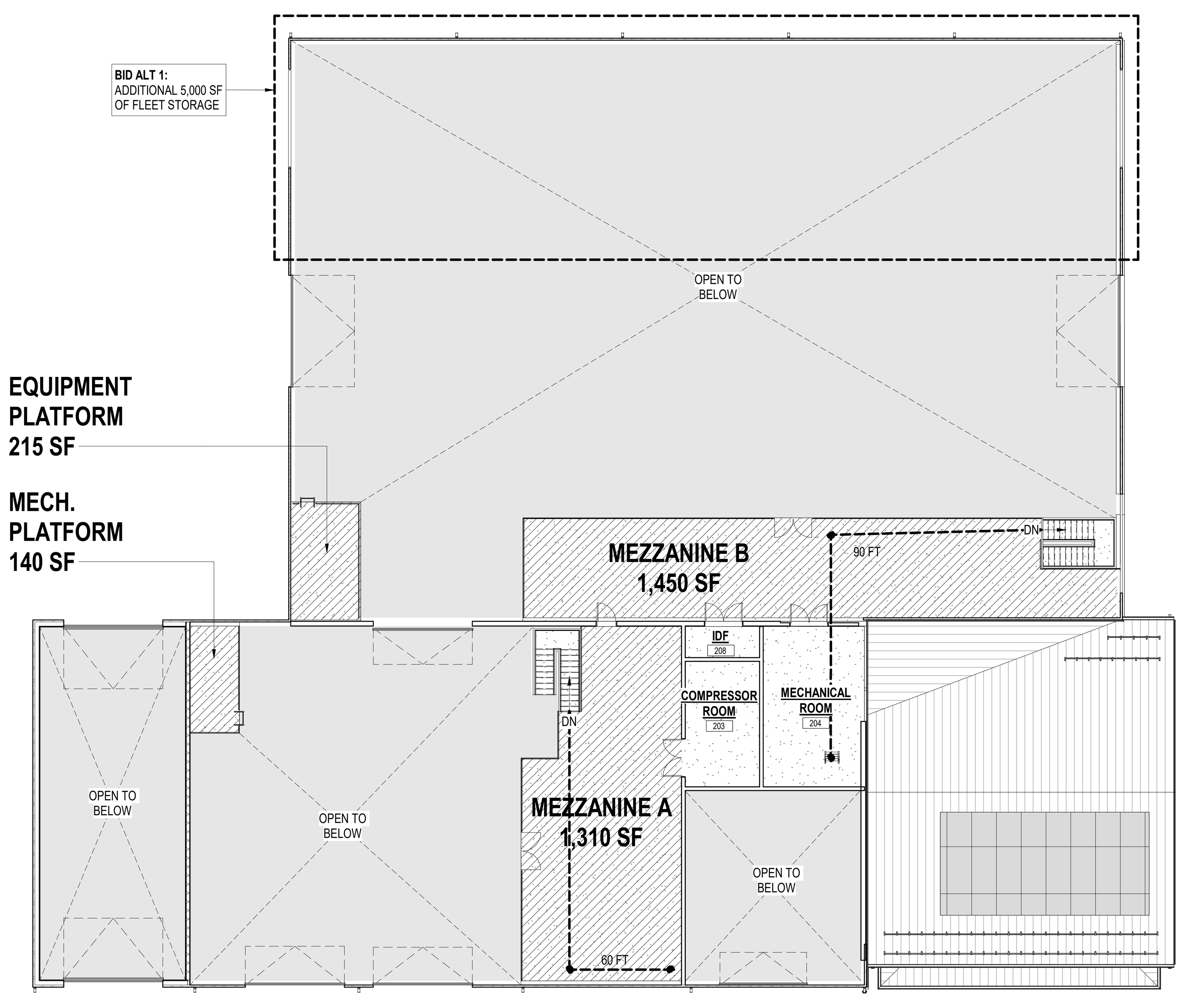
CODE PLAN LEGEND

EXIT CAPACITY
- XX / XX — ACTUAL EGRESS OF DOOR OR STAIR; MAXIMUM ALLOWABLE EGRESS CAPACITY OF DOOR OR STAIR

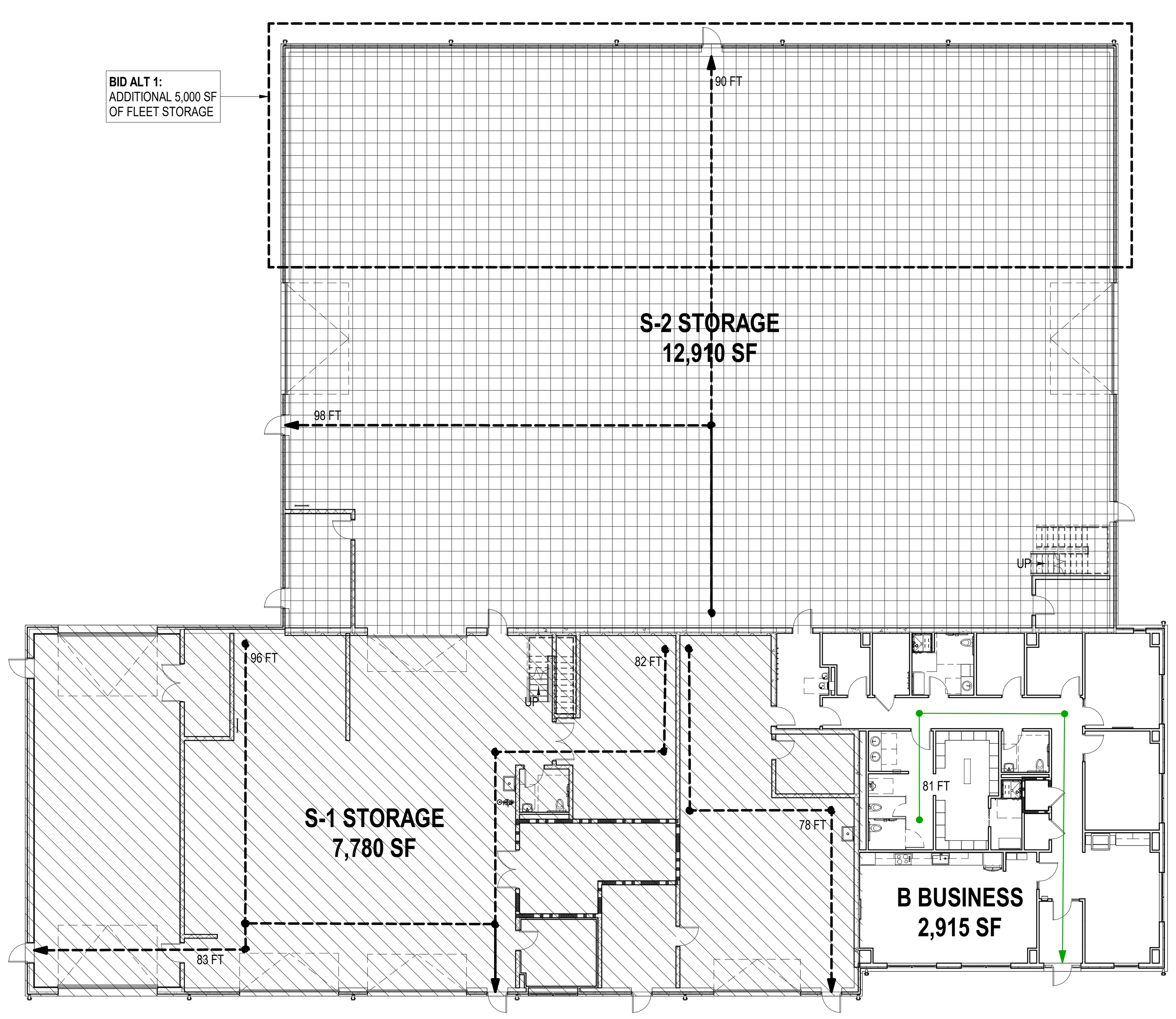
ROOM NAME
- 101 — ROOM NUMBER
- 150 / 50SF/P / 3P — MAXIMUM NUMBER OF ALLOWABLE OCCUPANTS; AREA IN NET SQUARE FEET (GROSS SQUARE FEET); OCCUPANCY LOAD FACTOR
- 115' — PATH OF MAXIMUM TRAVEL DISTANCE TO EXIT
- 15 — DIRECTION OF TRAVEL TO EXIT

FIRE EXTINGUISHERS:
- FE = FIRE EXTINGUISHER, BRACKET MOUNTED
- FEC = FIRE EXTINGUISHER, CABINET MOUNTED (SEMI-RECESSED)

SEPARATIONS ARE DESIGNATED AS FOLLOWS:
- 2 HOUR FIRE-RESISTANCE RATED FIRE BARRIER
- 1 HOUR FIRE-RESISTANCE RATED FIRE BARRIER
- SMOKE RESISTANT SEPARATION



5 MEZZANINE - CODE PLAN
1/16" = 1'-0" 1/ A201



4 FIRST FLOOR - CODE PLAN
1/16" = 1'-0" 4/ A106

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INTERNATIONAL ENERGY CONSERVATION CODE 2021 (IECC)
225 CMR 23 WITH APPRENDIX CC - ZONE 5A - BARNSTABLE COUNTY (TABLE C301.1)

ENERGY CODE: ROOF TYPE VALUES
TABLE C402.1.4 - IECC 2021

STANDING SEAM METAL ROOF W/ THERMAL BLOCKS & LINER SYSTEM

MATERIAL	DEPTH	U-VALUE
STANDING SEAM METAL ROOF PANEL	N / A	0.00
THERMAL BLOCKS (UPPER INSULATION LAYER)	4"	0.76
BATT INSULATION (STRUCTURE LAYER)	8"	0.040
FABRIC LINER SYSTEM	N / A	0.00
TOTAL U-VALUE	12"	0.026

REQUIRED U-VALUE = 0.035 FOR METAL BUILDINGS
COMPLIANT

ENERGY CODE: WALL ABOVE GRADE VALUES
TABLE C402.1.4 - IECC 2021

INSULATED METAL WALL PANEL ON GIRTS

MATERIAL	DEPTH	U-VALUE
INSULATED METAL WALL PANEL	4.00"	0.029
TOTAL OF VALUES	4.00"	0.030

REQUIRED U-VALUE = 0.050 FOR METAL BUILDING WALL
C402.7.2.1.3 CLADDING SYSTEMS W/ QUALIFYING THERMAL BREAKS WITH A DERATING FACTOR OF 0.80.
COMPLIANT

FIBER CEMENT SIDING ON METAL STUD

MATERIAL	DEPTH	U-VALUE
FIBER CEMENT SHAKE SIDING	0.25"	N/A
WEATHER BARRIER	N/A	8.33
EXTERIOR SHEATHING	0.625"	1.78
CONT. RIGID INSULATION	3.00"	0.066
TOTAL OF VALUES	3.875"	0.0637
VAPOR RETARDER	N / A	8.33
EXTERIOR SHEATHING	0.625"	1.78
MTL FRAMING	6.00"	0.13
*Table C402.1.4.2. states an effective R-Value of 7.35 based on 16" o.c. framing		
VAPOR RETARDER	N / A	8.33
GYPSUM BOARD, PAINTED	0.625"	1.78
TOTAL OF VALUES	7.25"	0.103
TOTAL OF VALUES	11.125"	0.041

REQUIRED U-VALUE = 0.050 FOR METAL BUILDING WALL
C402.7.2.1.3 CLADDING SYSTEMS W/ QUALIFYING THERMAL BREAKS WITH A DERATING FACTOR OF 0.80.
COMPLIANT

CMU VENEER ON CONC BACK-UP WALL

MATERIAL	DEPTH	U-VALUE
CMU VENEER	4.00"	2.27
CAVITY **	1.75"	0.833
CONT. RIGID INSULATION	3.00"	0.066
VAPOR RETARDER	N / A	8.33
CONC BACK-UP WALL *	8.00"	0.74
TOTAL OF VALUES	16.75"	0.694

REQUIRED U-VALUE = 0.090 FOR MASS WALL
C402.7.2.1.3 CLADDING SYSTEMS W/ QUALIFYING THERMAL BREAKS WITH A DERATING FACTOR OF 0.80.
* BASED ON 150 LB/FT3 DENSITY CONCRETE
** UTILIZING 0.50 EFFECTIVE EMITTANCE AS BASIS FOR VALUE.
COMPLIANT

CMU VENEER ON METAL STUD

MATERIAL	DEPTH	U-VALUE
CMU VENEER	4.00"	2.27
CAVITY / AIR SPACE **	1.75"	0.833
CONT. RIGID INSULATION	3.00"	0.66
TOTAL OF VALUES	8.75"	0.060
VAPOR RETARDER	N / A	8.33
EXTERIOR SHEATHING	0.625"	1.78
MTL FRAMING	8.00"	0.13
*Table C402.1.4.2. states an effective R-Value of 7.35 based on 16" o.c. framing		
VAPOR RETARDER	N / A	8.33
GYPSUM BOARD, PAINTED	0.625"	1.78
TOTAL OF VALUES	7.25"	0.103
TOTAL OF VALUES	8.75" + 7.25" = 16.00"	0.038

REQUIRED U-VALUE = 0.055 FOR A METAL FRAMED
C402.7.2.1.3 CLADDING SYSTEMS W/ QUALIFYING THERMAL BREAKS WITH A DERATING FACTOR OF 0.80.
** UTILIZING 0.50 EFFECTIVE EMITTANCE AS BASIS FOR VALUE.
COMPLIANT

ENERGY CODE: FLOOR TYPE VALUES
TABLE C402.1.4 - IECC 2021

SLAB ON GRADE - UNHEATED

MATERIAL	DEPTH	U-VALUE
CONCRETE SLAB (MIN DEPTH USED)	6.00"	N / A
20 MIL VAPOR RETARDER	N / A	N / A
CONT. RIGID INSULATION	1.00"	5.00
F-FACTOR		0.46

REQUIRED F-FACTOR = 0.52 FOR UNHEATED SLABS
COMPLIANT

SLAB ON GRADE - HEATED

MATERIAL	DEPTH	U-VALUE
CONCRETE SLAB (MIN DEPTH USED)	8.00"	N / A
20 MIL VAPOR RETARDER	N / A	N / A
CONT. RIGID INSULATION	10.00"	10.00
F-FACTOR		0.55

REQUIRED F-FACTOR = 0.62 FOR UNHEATED SLABS
COMPLIANT

ENERGY CODE: WALL BELOW GRADE VALUES
TABLE C402.1.4 - IECC 2021

WALL BELOW GRADE

MATERIAL	DEPTH	U-VALUE
CONT. RIGID INSULATION	3.00"	15.00
C-FACTOR		0.063

REQUIRED C-FACTOR = 0.119 FOR BELOW GRADE WALLS
COMPLIANT

ENERGY CODE: FENESTRATION VALUES
TABLE C402.4 - IECC 2021

BUILDING ENVELOPE FENESTRATION - U-FACTORS

MATERIAL	SPECIFIED U-VALUE	MAX ALLOWED U-VALUE
FIXED FENESTRATION ***COMPLIANT***	0.16	0.30
OPERABLE FENESTRATION ***COMPLIANT***	0.18	0.32
ENTRANCE DOORS (PERSONNEL) ***COMPLIANT***	0.25	0.63

ENERGY COMPLIANCE & SUSTAINABILITY

THE BUILDING WILL ALSO BE DESIGNED TO ACCOMMODATE THE FOLLOWING FEATURES:

- SUB-METERING OF ELECTRIC SERVICE FOR MONITORING ENERGY USE.
-
- ELECTRIC VEHICLE PARKING SPACES (20% OF ON-SITE PARKING).
- BUILDING ROOF TO BE DESIGNED TO SUPPORT FUTURE PV SOLAR PANEL ARRAY.

FURTHERMORE: PER 225 CMR 23 C401.2.4 MIXED USE BUILDINGS, THE BUILDING'S ENERGY CODE COMPLIANCE PATH WILL BE C401.2.1 PRESCRIPTIVE AND PERFORMANCE COMPLIANCE PATH WITH EACH USE TYPE EVALUATED SEPARATELY IF NEEDED. AS SUCH THE FOLLOWING SPACES WILL COMPLY WITH THE FOLLOWING CODE SECTIONS:

- 225 CMR 23 C.401.2.1.1 PRESCRIPTIVE COMPLIANCE. THE ADMINISTRATION SUITE, WORKSHOP, FLEET MAINTENANCE, AND FLEET STORAGE PORTIONS OF THE BUILDING ARE EACH LESS THAN 20,000 SF AND WILL COMPLY WITH 225 CMR 23 C.401.2.1.1 PRESCRIPTIVE COMPLIANCE.

C402.1.5.1 LOW GLAZED WALL SYSTEM BUILDINGS

BUILDINGS IN WHICH LESS THAN OR EQUAL TO 50% OF THE TOTAL, ABOVE GRADE WALL AREA OF THE BUILDING THERMAL ENVELOPE IS A GLAZED WALL SYSTEM SHALL COMPLY WITH EQUATION 4-2A AND VISION GLASS USED IN THE GLAZED WALL SYSTEM SHALL HAVE A MAXIMUM WHOLE ASSEMBLY U FACTOR OF U-0.25.
AREA-WEIGHTED U PROPOSED <= 0.1285(EQUATION 4-2A)

- THE BUILDING IS CONSIDERED A LOW GLAZED WALL SYSTEM BUILDINGS AS INDICATED IN C402.1.5.1.

DEFINITIONS:
- **CI** = CONTINUOUS INSULATION
- **LS** = LINER SYSTEM
- **C-FACTOR** = THE COEFFICIENT OF HEAT TRANSMISSION (SURFACE TO SURFACE) THROUGH A BUILDING COMPONENT OR ASSEMBLY, EQUAL TO THE TIME RATE OF HEAT FLOW PER UNIT AREA AND THE UNIT TEMPERATURE DIFFERENCE BETWEEN THE WARM SIDE AND COLD SIDE SURFACES (BTU/H × FT^2 × °F) [W/(M^2× K)].
- **F-FACTOR** = THE PERIMETER HEAT LOSS FACTOR FOR SLAB-ON-GRADE FLOORS (BTU/H × FT × °F) [W/(M × K)].
- **R-VALUE** = THE INVERSE OF THE TIME RATE OF HEAT FLOW THROUGH A BODY FROM ONE OF ITS BOUNDING SURFACES TO THE OTHER SURFACE FOR A UNIT TEMPERATURE DIFFERENCE BETWEEN THE TWO SURFACES, UNDER STEADY STATE CONDITIONS, PER UNIT AREA (H × FT^2× °F/BTU) [(M^2× K)/W].
- **U-VALUE** = THE COEFFICIENT OF HEAT TRANSMISSION (AIR TO AIR) THROUGH A BUILDING COMPONENT OR ASSEMBLY, EQUAL TO THE TIME RATE OF HEAT FLOW PER UNIT AREA AND UNIT TEMPERATURE DIFFERENCE BETWEEN THE WARM SIDE AND COLD SIDE AIR FILMS (BTU/H × FT^2× °F) [W/(M^2× K)].

REFER TO TABLE C402.1.4, MA STRETCH ENERGY CODE, IECC 2021, WITH MA AMENDMENTS FOR ADDITIONAL INFORMATION.

CODE PLAN NOTES

NEW CONSTRUCTION

A. ALL SPACES, FACILITIES AND PROGRAMS REQUIRED BY CODE TO BE ACCESSIBLE TO PHYSICALLY DISABLED PERSONS SHALL BE ACCESSIBLE.

- WHERE A WORKSTATION IS PROVIDED, AN ACCESSIBLE WORKSTATION IS REQUIRED.

- WHERE A SINK IS PROVIDED, AN ACCESSIBLE SINK WITH PIPE PROTECTION IS REQUIRED.

- ALL LABS AND SHOPS SHALL HAVE AN ACCESSIBLE EYE AND BODY WASH.

- ALL ACCESSORIES SHALL MEET REACH RANGES FOR FRONT OR SIDE APPROACH.

- ALL ACCESSIBLE ROUTES THROUGH BUILDING SHALL PROVIDE A MINIMUM 32 INCHES CLEARANCE (DOORWAYS IN PARTICULAR).

- ALL ACCESSIBLE SPACES, FURNISHING FIXTURES AND EQUIPMENT, AND ALL OPERATIONAL AND ACCESSIBLE ROUTE CLEARANCES SHALL MEET REQUIREMENTS OF SECTION 504, REHABILITATION ACT 1973 INCLUDING UNIFORM FEDERAL ACCESSIBILITY STANDARDS (UFAS) AND 504 REGULATIONS, ICC/ANSI 521 CMR, AND THE AMERICANS WITH DISABILITIES ACT, TITLE II, INCLUDING THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) AND ADA REGULATIONS.

- REFER TO A012 FOR MOUNTING HEIGHTS FOR ACCESSIBLE FIXTURES.

B. NEW AND EXISTING SMOKE PARTITIONS, INCLUDING STORAGE ROOMS OVER 100 SQUARE FEET, SHALL HAVE PENETRATIONS AND VOIDS FIRESTOPPED IN ACCORDANCE WITH DIVISION 07 SPECIFICATION SECTION "PENETRATION FIRESTOPPING". ALL HEAD-OF-WALL JOINTS AND FLOOR-TO-WALL JOINTS AT NEW AND EXISTING SMOKE RESISTANT PARTITIONS SHALL BE SEALED IN ACCORDANCE WITH DIVISION 07 SPECIFICATION SECTION "FIRESTOPPING".

C. NEW AND EXISTING FIRE-RESISTANCE RATED WALLS SHALL HAVE PENETRATIONS AND VOIDS FIRESTOPPED IN ACCORDANCE WITH DIVISION 07 SPECIFICATION SECTION "FIRESTOPPING". ALL HEAD-OF-WALL JOINTS AND FLOOR-TO-WALL JOINTS AT NEW AND EXISTING FIRE-RATED WALLS SHALL BE SEALED IN ACCORDANCE WITH DIVISION 07 SPECIFICATION SECTION "FIRESTOPPING".

D. ALL PENETRATIONS THROUGH FLOORS, INCLUDING FLOOR OF DUCTWORK ENCLOSURES, SHALL BE FIRESTOPPED IN ACCORDANCE WITH DIVISION 07 SECTION "FIRESTOPPING". PENETRATIONS THROUGH FLOORS OF RATED ROOMS OR FLOOR SYSTEMS SHALL BE FIRESTOPPED TO MEET RATING OF ROOM OR FLOOR SYSTEM.

FOR INTERIOR FINISHES

INTERIOR FINISHES SHALL BE PROVIDED AND CONFIRMED TO HAVE THE FOLLOWING CLASSIFICATION RATINGS :

WALLS AND CEILINGS (OTHER THAN TEXTILE)
BUSINESS AND EDUCATIONAL OCCUPANCIES:
- VERTICAL EXITS AND EXIT PASSAGEWAYS - CLASS A
- EXIT ACCESS CORRIDORS AND OTHER EXIT WAYS - CLASS B
- ROOMS AND ENCLOSED SPACES - CLASS C

WALLS - TEXTILE
IBC 803.6.1.1 OR 803.6.1.2

CEILINGS - TEXTILE
CLASS A

FLOOR FINISH
OCCUPANCIES A, B, E, H, I-4, M, R-1, R-2, S
- VERTICAL EXITS, EXIT PASSAGEWAYS, AND EXIT ACCESS CORRIDORS - CLASS II
- OTHER AREAS - DOC FF-1 (CPSC 16 CFR, PART 1630)

CODE SUMMARY:

THE PROPOSED TRURO DEPARTMENT OF PUBLICS WORKS FACILITY CONSISTS OF A NON-SEPARATED "MIXED-USE" BUILDING PROGRAM, INCLUDING THREE (3) MAIN OPERATIONAL COMPONENTS, AS FOLLOWS:

1. **USE GROUP "B", BUSINESS**: A ONE-STORY ADMINISTRATION WING, CONSISTING OF EMPLOYEE SUPPORT SPACES (E.I. LUNCH/TRAINING ROOM, MEN'S & WOMEN'S LOCKER ROOM ETC.), DIRECTORS' OFFICES, SHARED ADMINISTRATIVE OFFICE, AND OFFICE SUPPORT SPACES.

2. **USE GROUP "S-1" MODERATE HAZARD USE**: SINGLE-STORY, DOUBLE-HEIGHT VEHICLE MAINTENANCE AND CARPENTRY SHOP AREAS AND ADJACENT VEHICLE WASH-BAY. MAINTENANCE AREA HAS AN ASSOCIATED OPEN MEZZANINE SPACE.

3. **USE GROUP "S-2" LOW HAZARD USE**: SINGLE-STORY, MINIMALLY HEATED VEHICLE & EQUIPMENT STORAGE GARAGE AREA WITH AN ASSOCIATED OPEN MEZZANINE SPACE.

THE PROPOSED BUILDING IS STEEL-FRAMED WITH CONCRETE SLAB FLOORS AND MEZZANINE LEVEL STEEL DECK AND CONCRETE SLAB. THE BUILDING ENCLOSURE CONSISTS OF A INSULATED STANDING SEAM METAL ROOF SYSTEM, FACTORY FOAMED IN PLACE INDUSTRIAL METAL PANEL WALL SYSTEM ON A METAL STUD OR GIRT BACKUP WALL WITH AN INSULATED CMU BASE WALL. TRIPLE-GLAZED STOREFRONT AND WINDOWS ARE PROVIDED AT THE ADMINISTRATION WING AND TRANSLUCENT PANEL DAYLIGHT SYSTEMS ARE INCORPORATED INTO THE WALL PANEL SYSTEM AT THE INDUSTRIAL SHOP AREAS.

SPECIFIC ASPECTS OF THIS BUILDING TO NOTE ARE AS FOLLOWS:

1. A 2-HOUR FIRE-RESISTANCE RATED FLUID STORAGE ROOM IS PROVIDED TO STORE FLAMMABLE / HAZARDOUS FLUIDS USED FOR THE MAINTENANCE & REPAIR OF VEHICLES.
2. A STANDBY GENERATOR, WHICH IS HOUSED WITHIN A SOUND-ATTENUATED ENCLOSURE IS LOCATED ON THE WEST SIDE OF THE EXTERIOR OF THE BUILDING AND IS SIZED TO PROVIDE FULL OPERATIONAL POWER TO THE FACILITY.
3. THE BUILDING IS FULLY SPRINKLED PER NFPA 13 REQUIREMENTS, AND WILL HAVE AN EMERGENCY VOICE / ALARM COMMUNICATION SYSTEM.
4. WITH EXCEPTIONS OF MEZZANINES, THE BUILDING AND FACILITY ARE FULLY ACCESSIBLE AND MEET ADA AND CMR 521 MASSACHUSETTS ARCHITECTURAL ACCESS BOARD REGULATIONS.

GENERAL BUILDING INFORMATION:
ALL AREAS ARE SHOWN IN GROSS SQUARE FEET (GSF).

BUILDING FOOTPRINT AREA (NOT INCLUDING VEHICLE CANOPY):	**23,605 GSF**
TOTAL BUILDING SQUARE FOOT AREA (NOT INCLUDING MEZZANINES):	**23,605 GSF**
1. USE GROUP "B" , BUSINESS (ADMINISTRATION / STAFF WING)	**2,915 GSF**
2. USE GROUP "S-1", MODERATE HAZARD STORAGE (VEHICLE MAINTENANCE / WASH / WORKSHOPS):	**7,780SF**
3. USE GROUP "S-2", LOW HAZARD STORAGE (VEHICLE & EQUIPMENT STORAGE GARAGE)	**12,910 GSF**
BUILDING HEIGHT (TO ROOF RIDGE AT VEHICLE STORAGE AREA):	**31' - 4"**

APPLICABLE CODES AND STANDARDS:

- MASSACHUSETTS STATE BUILDING CODE & APPROPRIATE AMENDMENTS:
  - 780 CMR TENTH EDITION
  - IBC 2021
- 2021 INTERNATIONAL MECHANICAL CODE (IMC)
- 248 CMR 10.00 UNIFORM STATE PLUMBING CODE (USPC)
- 2023 NATIONAL ELECTRICAL CODE
- 2023 MASSACHUSETTS ENERGY CODE
  - 2021 IECC W/ MA AMENDMENTS
  - 225 CMR 23.00 - MA COMMERCIAL STRETCH ENERGY CODE
  - APPENDIX CC - MA MUNICIPAL OPT-IN SPECIALIZED ENERGY CODE
- 2019 MASSACHUSETTS COMPREHENSIVE FIRE CODE
  - 527 CMR, BOARD OF FIRE PREVENTION REGULATIONS
  - NFPA 1 FIRE CODE, 2015 EDITION
- 271 CMR: BOARD OF EXAMINERS OF SHEET METAL WORKERS
- 521 CMR ARCHITECTURAL ACCESS BOARD REGULATIONS

BUILDING CODE ANALYSIS:

CHAPTER 3 - USE AND OCCUPANCY CLASSIFICATION

(SECT. 304) USE GROUP B (BUSINESS):	**2,915 GSF**
(SECT. 311.2) USE GROUP S-1 (MODERATE-HAZARD STORAGE):	**7,780 GSF**
(SECT. 311.3) USE GROUP S-2 (LOW-HAZARD STORAGE):	**12,910 GSF**
TOTAL BUILDING:	**23,605 GSF**

CHAPTER 5- GENERAL BUILDING HEIGHTS AND AREAS

(SECT. 504.3) ALLOWABLE BUILDING HEIGHT
TYPE IIB CONSTRUCTION
"B" AND "S" OCCUPANCY, SPRINKLED
ALLOWABLE HEIGHT: **75' - 0"**
PROPOSED HEIGHT (COMPLIANT): **31' - 5"**

(SECT. 504.4) ALLOWABLE NUMBER OF STORIES
"S-1" OCCUPANCY (MOST RESTRICTIVE)
ALLOWABLE STORIES: **3 STORIES**
PROPOSED STORIES (COMPLIANT): **1 STORY**

(SECT. 506.2) ALLOWABLE BUILDING AREA
GROUP "S-1" (MOST RESTRICTIVE): **70,000 SF**
(FOR 1-STORY STRUCTURE OF TYPE IIB CONSTRUCTION, W/ SPRINKLER SYSTEM)
PROPOSED AREA FOR TOTAL BUILDING: **45,234 GSF**
PROPOSED HEIGHT FOR TOTAL BUILDING: **1 STORY**

(SECT. 505.2.1) MEZZANINE AREA LIMITATIONS

MEZZANINE B + EQUIPMENT PLATFORM: (FLEET STORAGE)
VEHICLE STORAGE OPEN AREA: = 12,180 SF
ALLOWABLE MEZZANINE AREA: = 12,180 x 1/2 = 6,090 SF
ACTUAL AGGREAGATE MEZZANINE AREA: = 1,665 SF (*COMPLIANT*)

MEZZANINE A + MECHANICAL PLATFORM: (FLEET MAINTENANCE)
FLEET MAINTENANCE OPEN AREA: = 3,075 SF
ALLOWABLE MEZZANINE AREA: = 3,075 x 1/2 = 1,538 SF
ACTUAL AGGREGATE MEZZANINE AREA: = 1,450 SF (*COMPLIANT*)

(SECT. 508.3.2) MIXED USE AND OCCUPANCY, NON-SEPARATED OCCUPANCIES
GROUP 'S-1" (MOST RESTRICTIVE OCCUPANCY)
ALLOWABLE AREA FOR USE GROUP S: **70,000 SF**
ALLOWABLE HEIGHT FOR USE GROUP S: **1 STORY, SPRINKLED**

(SECT. 509) INCIDENTAL USES
AUTOMATIC SPRINKLER SYSTEM PROVIDED
INCIDENTAL USES - 1 OR 2 HOUR SEPARATION PROVIDED AT ELECTRICAL ROOM > KVA - AUTOMATIC SPRINKLER SYSTEM AND 1-HOUR SEPARATION PROVIDED AT FLUID STORAGE ROOM.

CHAPTER 6 - TYPES OF CONSTRUCTION

(TABLE 601) FIRE-RESISTANCE RATING REQUIREMENTS FOR BUILDING ELEMENTS

CONSTRUCTION TYPE IIB - BUILDING ELEMENTS

STRUCTURAL FRAME (INC. COLUMNS, GIRDERS AND TRUSSES):	0 HRS
BEARING WALLS - EXTERIOR:	0 HRS
BEARING WALLS - INTERIOR:	0 HRS
NON BEARING WALLS AND PARTITIONS - EXTERIOR:	0 HRS
NON BEARING WALLS AND PARTITIONS - INTERIOR:	0 HRS
FLOOR CONSTRUCTION:	0 HRS
ROOF CONSTRUCTION:	0 HRS

(TABLE 602) FIRE RESISTANCE RATING REQUIREMENTS FOR EXTERIOR WALLS BASED ON FIRE SEPARATION DISTANCE

CONSTRUCTION TYPE IIB
FIRE SEPARATION DISTANCE = X
SEPARATION DISTANCE TO FUELING FACILITY: X > 30
OCCUPANCY USE GROUP S-1: 0 HRS
OCCUPANCY USE GROUP S-2: 0 HRS

(SECT. 602.2) CONSTRUCTION TYPE IIB, NONCOMBUSTIBLE, FULLY SPRINKLED

CHAPTER 9 - FIRE PROTECTION SYSTEMS

(SECT. 903.2.9) USE GROUP S-1
REQUIRE AUTOMATIC SPRINKLER SYSTEMS WHERE FIRE AREAS EXCEED 12,000 SF, OR WHERE FIRE AREAS USED FOR THE STORAGE OR REPAIR OF COMMERCIAL MOTOR VEHICLES EXCEED 5,000 SF.

(SECT. 903.3.1.1) ALTERNATIVE PROTECTION
AN NFPA-13 COMPLIANT AUTOMATIC SPRINKLER SYSTEM WILL BE PROVIDED AT ALL INTERIOR BUILDING AREAS. SHOP AND VEHICLE STORAGE AREA WILL HAVE DRY-PIPE ZONES.

(SECT. 907.5.2.2) EMERGENCY VOICE / ALARM COMMUNICATION SYSTEM
AS REQUIRED UNDER SECTION 505.2.1, EXCEPTION #2, AN NFPA-72 COMPLIANT EMERGENCY VOICE / ALARM COMMUNICATION SYSTEM WILL BE PROVIDED.

CHAPTER 10 - MEANS OF EGRESS

(TABLE 1004.1.2) MAXIMUM FLOOR AREA ALLOWANCE PER OCCUPANT

STORAGE AREA S-1	= 300 GSF / OCC
STORAGE AREA S-2	= 300 GSF / OCC
BUSINESS / OFFICE AREA B	= 150 GSF / OCC
ASSEMBLY (MUSTER ROOM)	= 15 NSF / OCC
LOCKER ROOM	= 50 GSF / OCC
MEZZANINES (S-1, S-2)	= 300 GSF / OCC
MECHANICAL ROOM	= 300 GSF / OCC

(SECT. 1004) OCCUPANT LOAD

FLEET STORAGE S-2 :	12,910 SF (÷ 300 SF/OCC)	= 43 OCCUPANTS
MEZZANINE B	1,450 SF (÷ 300 SF/OCC)	= 5 OCCUPANTS
EQUIP PLATFORM	215 SF (÷ 300 SF/OCC)	= 1 OCCUPANT
FLEET MAINTENANCE S-1:	6,260 SF (÷ 300 SF/OCC)	= 21 OCCUPANTS
MEZZANINE B	1,310 SF (÷ 300 SF/OCC)	= 4 OCCUPANTS
EQUIP PLATFORM	140 SF (÷ 300 SF/OCC)	= 1 OCCUPANT
WORKSHOP S-1:	1,520 SF (÷ 300 SF/OCC)	= 5 OCCUPANTS
BUSINESS / OFFICE AREA B:	2,915 SF (÷ 150 SF/OCC)	= 19 OCCUPANTS
MUSTER ROOM:	(UNDER 750 SF, CONSIDERED PART OF BUSINESS)	
LOCKER ROOMS:	(UNDER 750 SF, CONSIDERED PART OF BUSINESS)	
MECHANICAL ROOMS:	644 SF (÷ 300 SF/OCC)	= 2 OCCUPANTS
TOTAL:		**= 101 OCCUPANTS**

(SECT. 1005) MEANS OF EGRESS SIZING

FLEET STORAGE S-2 (INCLUDING MEZZANINES AND MECHANICAL ROOM):
DOORWAY WIDTH REQUIRED MIN. 50 OCC @ 0.2 IN. PER OCC = 10 IN
DOORWAY WIDTH PROVIDED 36" CLEAR (x 3 DOORS) = 108 IN

FLEET MAINTENANCE S-1 (INCLUDING MEZZANINE):
DOORWAY WIDTH REQUIRED MIN. 26 OCC @ 0.2 IN. PER OCC = 5 IN
DOORWAY WIDTH PROVIDED 36" CLEAR (x 3 DOORS) = 108 IN

WORKSHOP S-1:
DOORWAY WIDTH REQUIRED MIN. 5 OCC @ 0.2 IN. PER OCC = 10 IN
DOORWAY WIDTH PROVIDED 36" CLEAR (x 1 DOORS) = 36 IN

BUSINESS / OFFICE AREA B:
DOORWAY WIDTH REQUIRED MIN. 19 OCC @ 0.2 IN PER OCC = 4 IN
DOORWAY WIDTH PROVIDED 36" CLEAR (x 1 DOOR) = 36 IN

(SECT. 1006) NUMBER OF EXISTS AND EXIT ACCESS DOORWAYS

(TABLE 1006.2.1) MAXIMUM COMMON PATH OF EGRESS TRAVEL DISTANCE (FT)
B AND **S** OCCUPANCIES, WITH SPRINKLER SYSTEM = 100 FT
MAXIMUM PROVIDED = 99FT

(TABLE 1006.2.1) SPACE WITH ONE EXIT
S OCCUPANCY (MOST RESTRICTIVE) MAXIMUM OCCUPANCY = 29
MAXIMUM PROVIDED = 8

(TABLE 1006.3.1) MINIMUM NUMBER OF EXITS PER STORY
REQUIRED FOR 1-500 OCCUPANTS = 2
PROVIDED = 8

(SECT. 1007) EXIT AND EXIT ACCESS DOORWAY CONFIGURATION
1007.1.1 EXCEPTION #2: WHERE A BUILDING IS EQUIPPED THROUGHOUT WITH AN AUTOMATIC SPRINKLER SYSTEM, THE SEPARATION DISTANCE OF THE EXIT DOORS OR EXIT ACCESS DOORWAYS SHALL NOT BE LESS THAN ONE-THIRD OF THE LENGTH OF THE MAXIMUM OVERALL DIAGONAL DIMENSIONS OF THE AREA SERVED.

(SECT. 1016.2) EGRESS THROUGH INTERVENING SPACES
1016.2.2 EXCEPTION - MEANS OF EGRESS ARE PERMITTED THROUGH ADJOINING OR INTERVENING ROOMS OR SPACES WHEN THE ADJOINING OR INTERVENING ROOMS OR SPACES ARE THE SAME OR LESSER HAZARD OCCUPANCY GROUP.

(SECT. 1017) EXIT ACCESS TRAVEL DISTANCE
EXITS SHALL BE SO LOCATED ON EACH STORY THAT THE MAXIMUM LENGTH OF EXIT ACCESS TRAVEL, MEASURED FROM THE MOST REMOTE POINT WITHIN A STORY ALONG THE NATURAL AND UNOBSTRUCTED PATH OF EGRESS TRAVEL TO THE EXTERIOR EXIT DOOR AT THE LEVEL OF EXIT DISCHARGE SHALL NOT EXCEED THE DISTANCE GIVEN IN TABLE 1017.2:

(TABLE 1017.2) EXIT ACCESS TRAVEL DISTANCE (WITH SPRINKLER SYSTEM)
USE GROUP S-1 ALLOWABLE (MOST RESTRICTIVE): = 250 FT MAX
MAXIMUM PROVIDED: = 138 FT

(TABLE 1020.1) CORRIDORS FIRE-RESISTANCE RATING
OCCUPANCY B AND S, OCCUPANT LOAD > 30 WITH SPRINKLER SYSTEM = 0 HR

WARNING: THROUGH-PENETRATION FIRESTOP SYSTEM - DO NOT DISTURB

NOTIFY FACILITY MANAGER / OWNER OF ANY DAMAGE

- *CONTRACTOR'S NAME, ADDRESS, PHONE NUMBER*
- *THROUGH-PENETRATION FIRESTOP SYSTEMS DESIGNATION OF APPLICABLE TESTING AND INSPECTION AGENCY*
- *DATE OF INSTALLATION*
- *THROUGH-PENETRATION FIRESTOP SYSTEMS MANUFACTURER'S NAME*
- *INSTALLER'S NAME*

PRESSURE-SENSITIVE, SELF ADHESIVE PRE-PRINTED VINYL LABELS

FOR ALL RATED WALL ASSEMBLIES, BOTH SIDES
- REFER TO "FIRESTOPPING" SPECIFICATION FOR ADDITIONAL INFORMATION

3 RATED WALL LABEL
1 1/2" = 1'-0"

ADDRESS IDENTIFICATION SIGNAGE:

17 (8")

APPLICABILITY:
- VERIFY SPECIFIC REQUIREMENTS WITH LOCAL FIRE CODE OFFICIAL
- CHARACTER HEIGHT - 8" MINIMUM W/ 1/2" STROKE MINIMUM
- COLOR - EASILY IDENTIFIABLE COLOR, CONTRASTING WITH BACKGROUND

2 EXTERIOR SIGNAGE - ADDRESS
1 1/2" = 1'-0"

PARTITION LETTERING: IBC 2015 - 703.7 MARKING AND IDENTIFICATION

2 HOUR FIRE WALL - PROTECT ALL OPENINGS (3")

1 HOUR FIRE WALL - PROTECT ALL OPENINGS (3")

APPLICABILITY:
- APPLY TO OUTSIDE OF FIRE RATED SHAFTS AND TO BOTH SIDES OF PARTITIONS AT INTERVALS NOT TO EXCEED 30'-0" FOR ENTIRE LENGTH OF PARTITION OR WALL OR TWICE ANY PARTITION 30'-0" IN LENGTH OR LESS. MINIMUM 15'-0" FROM EACH END OF PARTITION ALSO.
- LOCATE IDENTIFICATION IN ALL ACCESSIBLE FLOOR, FLOOR-CEILING AND ATTIC SPACES. LOCATE IDENTIFICATION WITHIN 12 - 18 INCHES ABOVE FINISHED CEILINGS
- APPLY STENCILED LETTERING BY SPRAY OR BRUSH OR PROVIDE PERMANENT SIGNAGE. IDENTIFICATION SHALL BE WATERPROOF, FADE-PROOF, AND NON-COMBUSTIBLE. SIGNAGE SHALL BE MECHANICALLY FASTENED OR PERMANENTLY ADHERED TO PARTITION OR SHAFT.
- STENCIL CHARACTER HEIGHT - 3" MINIMUM
- COLOR - EASILY IDENTIFIABLE COLOR, CONTRASTING WITH BACKGROUND ACCEPTABLE TO OWNER

1 CHAPTER 7 CODE RATED WALL LABELS
1 1/2" = 1'-0"

0' 6" 1' 2'
SCALE: 1 1/2" = 1'-0"

0' 4' 8' 16'
SCALE: 1/8" = 1'-0"

Project:
TOWN of TRURO, MA
NEW DEPARTMENT of PUBLIC WORKS FACILITY

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TRURO, MA 02666

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Consultants:

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CODE SUMMARY & PLANS

Sheet Number:
G101

N

NOTES:

1) THE INFORMATION SHOWN HEREON IS BASED ON AN ON-THE-GROUND SURVEY PERFORMED BETWEEN BETWEEN SEPTEMBER 26 & DECEMBER 4, 2024, BY ALPHA SURVEY GROUP, LLC.

2) THE HORIZONTAL DATUM FOR THIS PROJECT IS THE MASSACHUSETTS STATE PLANE COORDINATE SYSTEM REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD83), CORS ADJUSTMENT (NAD83 [2011]/GEOID18) AS DETERMINED BY REDUNDANT GPS OBSERVATIONS MADE BETWEEN SEPTEMBER 26 & OCTOBER 4, 2024. UTILIZING MACORS REAL TIME NETWORK.

3) THE VERTICAL DATUM FOR THIS PROJECT IS REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88), CORS ADJUSTMENT (NAD83 (2011)/GEOID18) AS DETERMINED BY REDUNDANT GPS OBSERVATIONS MADE BETWEEN SEPTEMBER 26 & OCTOBER 4, 2024. UTILIZING MACORS REAL TIME NETWORK. DIFFERENTIAL LEVELING WAS PERFORMED BETWEEN THE BENCHMARKS SHOWN HERON AND SELECT ALPHA SURVEY CONTROL POINTS UTILIZING A SOKKIA DIGITAL LEVEL & BAR-CODED ROD.

5) THE SUBJECT PREMISES DOES NOT LIE WITHIN A FEMA FLOOD ZONE BASED UPON FLOOD INSURANCE RATE MAP NUMBERS 25001C0231J WITH AN EFFECTIVE DATE OF 7/16/2014.

6) THE PROPERTY LINES SHOWN HEREON ARE BASED ON CITED PLANS AND DEEDS AND AN ON-THE-GROUND SURVEY. THE BOUNDARIES WERE ESTABLISHED UTILIZING PRIMACODE'S TRANSFORM PROGRAM TO OBTAIN A "BEST FIT" TO MONUMENTS LOCATED IN THE FIELD.

7) THIS PLAN AND THE ACCOMPANYING CERTIFICATIONS DO NOT CONSTITUTE A CERTIFICATION OF TITLE TO THE PROPERTY DISPLAYED HEREON. THE OWNER OF LOCUS AND ABUTTING PROPERTIES ARE SHOWN ACCORDING TO THE CURRENT TOWN ASSESSOR'S RECORDS. THIS PLAN WAS PREPARED WITHOUT THE BENEFIT OF A TITLE ABSTRACT AND IS SUBJECT TO THE RESTRICTIONS, COVENANTS AND/OR EASEMENTS THAT MAY BE CONTAINED THEREIN.

8) TOPOGRAPHICAL CONTOURS SHOWN ON 22 & 24 MEETING HOUSE RD. TAKEN FROM 2021 USGS LIDAR: CENTRAL EASTERN MASSACHUSETTS.

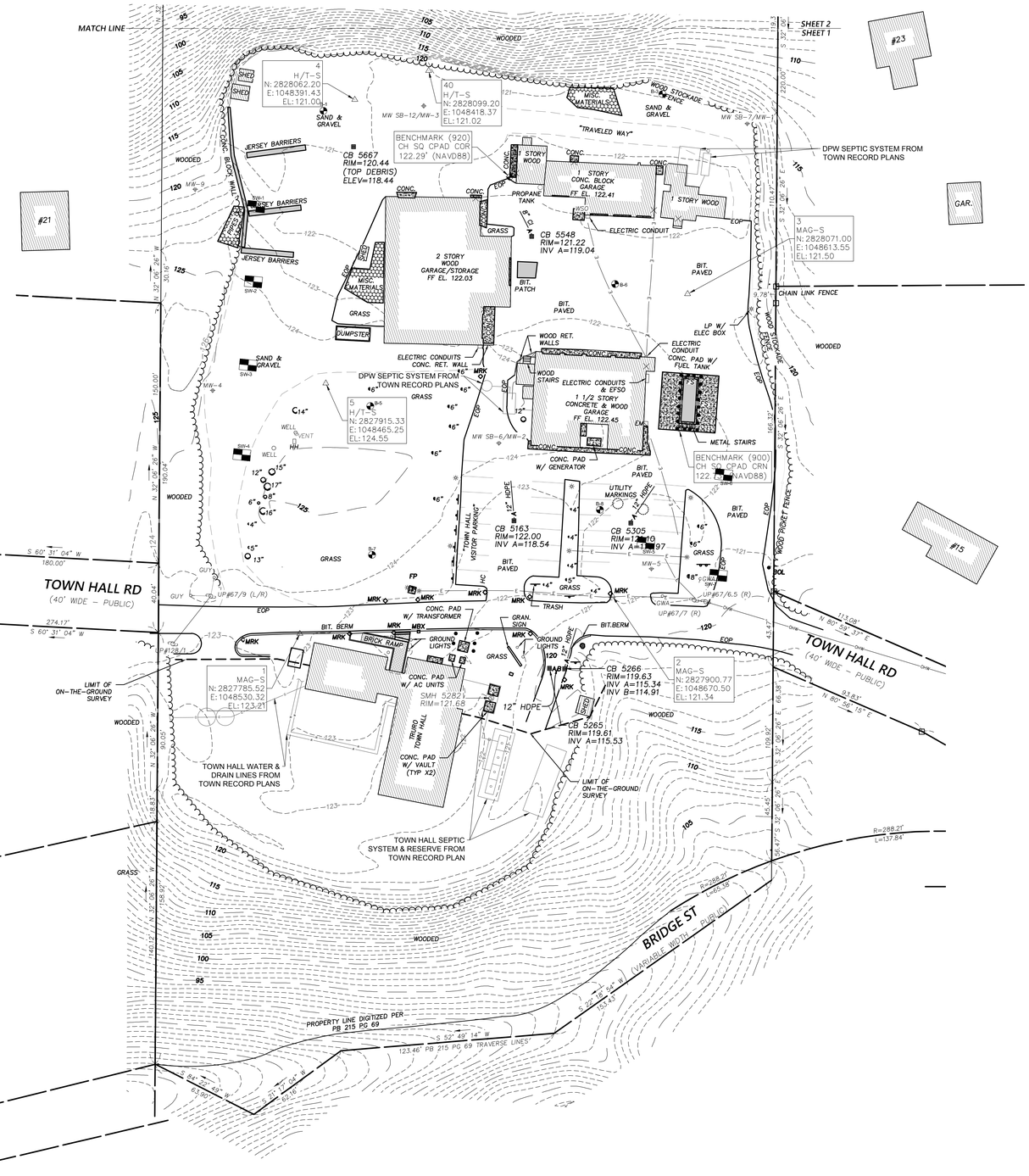
9) ALL UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE ONLY AND WERE COMPILED ACCORDING TO AVAILABLE RECORD PLANS FROM THE VARIOUS UTILITY COMPANIES AND PUBLIC AGENCIES. ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD.

PLAN REFERENCES:

PB 174 PG 83
PB 174 PG 85
PB 213 PG 45
PB 215 PG 69
PB 316 PG 60
PB 368 PG 100
PB 378 PG 19
PB 551 PG 12

DRAWING LEGEND

WATER SHUT OFF	WSO
ELECTRIC METER	E
UTILITY POLE	
GUY WIRE ANCHOR	GUY
SEWER MANHOLE	S
CATCH BASIN	
HAND HOLE	HH
HYDRANT	
BOLLARD	
LIGHT POLE	
FLOODLIGHT	
TREE (SIZE INCHES)	
MONITORING WELL	MW#
GAS LINE	G
TELEPHONE LINE	T
DRAIN LINE	D
SEWER LINE	S
ELECTRIC LINE	E
WATER LINE	W
OVERHEAD ELECTRIC	OHW
CHAIN LINK FENCE	X X
TREELINE	
RETAINING	RET.
CONCRETE	CONC.
BITUMINOUS	BIT.
SPOT GRADE	X 100.00
FOUND	-F
RECORD	(R)
STONE BOUND	SB
CONCRETE BOUND	CB
DRILL HOLE	DH
IRON PIPE	IP
IRON ROD	IR
PARKER-KALON NAIL	PK
MAG NAIL	MAG
BENCHMARK	
TRAVERSE (CONTROL) POINT	
SIGN	
REFLECTIVE ROAD MARKER	MRK
SPLICE BOX	SBOX
EMERGENCY FUEL SHUT OFF	EFSO
FUEL SERVICE PUMP	FS
FLAG POLE	FP



0 30 60 100

SCALE: 1" = 30'

Project:
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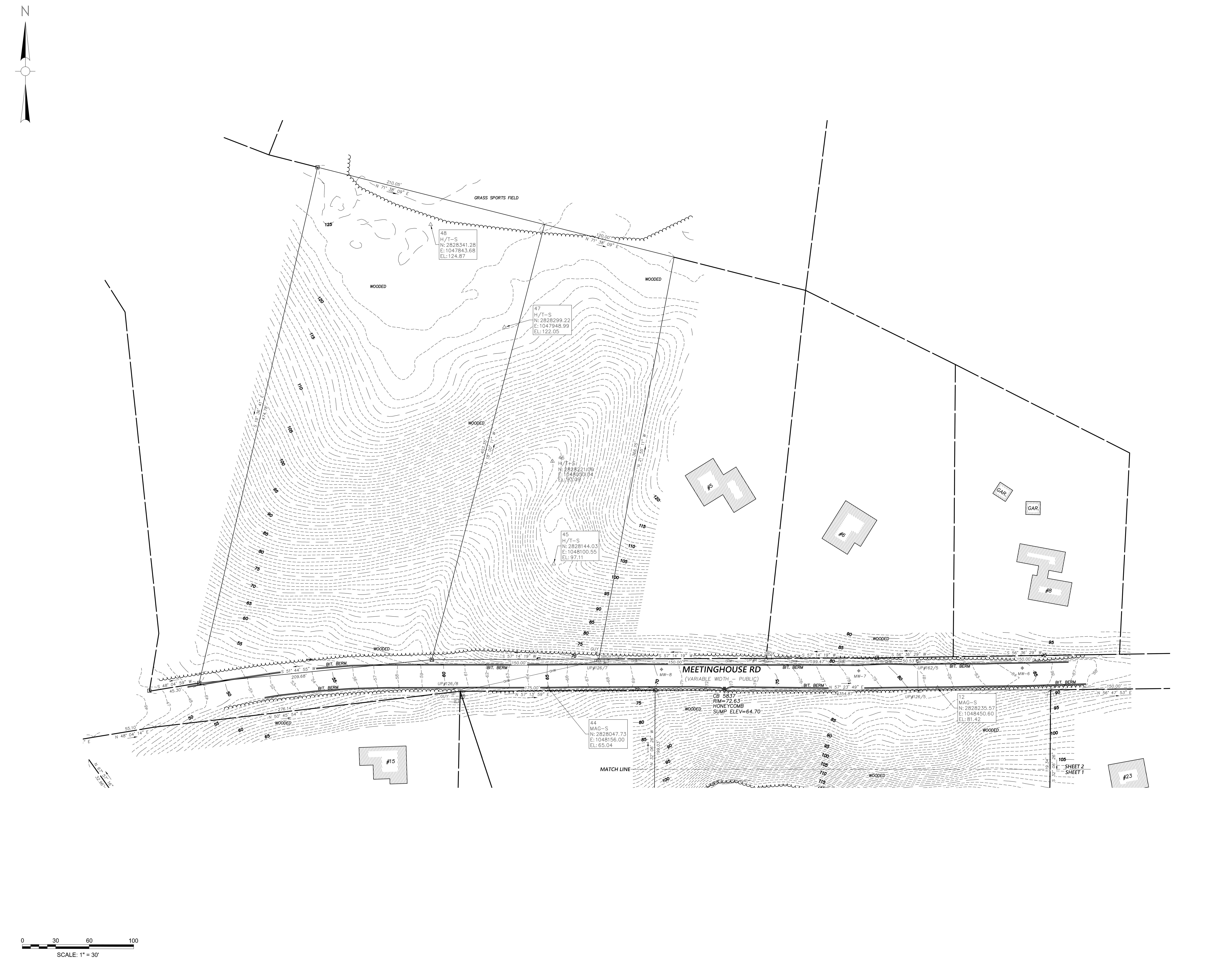

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EXISTING CONDITIONS PLAN II

Sheet Number:
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SITE NOTES

1. ALL EXISTING PIPES TO BE ABANDONED SHALL BE DONE IN ACCORDANCE WITH SPECIFICATION SECTION 02 41 13.29 "ABANDONMENT OF SEWER AND DRAINS."
2. ALL EXISTING UTILITIES, PIPES, STRUCTURES, OBSERVATION WELLS, ETC. SHALL BE ABANDONED AS REQUIRED TO COMPLETE THE WORK AS SHOWN ON THE PLANS UNLESS OTHERWISE NOTED.
3. CONTRACTOR SHALL COORDINATE REMOVAL OF MATERIAL STOCKPILES WITH THE ABINGTON DPW. TOWN SHALL REMOVE MATERIAL STOCKPILES IN ADVANCE OF THE WORK.
4. ALL UTILITIES AND DRAINAGE STRUCTURES BELOW PROPOSED FOOTPRINT OF BUILDINGS MUST BE REMOVED IN THEIR ENTIRETY.
5. REMOVAL OF CONCRETE WALLS SHALL INCLUDE ALL ASSOCIATED FOUNDATIONS.
6. UTILITIES FOR SITE AMENITIES INCLUDING LIGHT POLES AND BUILDINGS SCHEDULED TO BE DEMOLISHED SHALL BE DISCONNECTED AND MADE SAFE AT THE POWER SOURCE BY THE ELECTRICAL FILED SUB-BIDDER. SITE CONTRACTOR TO REMOVE AMENITIES INCLUDING THE DISCONNECTED UTILITIES FEEDING THE AMENITIES.
7. ALL VOIDS CREATED BY REMOVAL OF EXISTING ELEMENTS SHALL BE BACKFILLED WITH GRAVEL BORROW IN ACCORDANCE WITH 31 00 00 EARTHWORK.
8. CONTRACTOR SHALL BE AWARE THAT THE EXISTING LIMIT OF BITUMINOUS CONCRETE IS APPROXIMATE. CONTRACTOR SHALL FIELD VERIFY LIMITS PRIOR TO BIDDING. ALL EXISTING BITUMINOUS CONCRETE SHALL BE REMOVED TO COMPLETE THE PROPOSED WORK WITHOUT ADJUSTMENT TO COMPENSATION.
9. SEDIMENTATION CONTROL DEVICES WITHIN THE TOWN'S RIGHT OF WAY, MUST BE MAINTAINED, INSPECTED, CLEANED AND REPLACED AS NECESSARY TO PREVENT POSSIBLE FLOODING ISSUES DURING RAIN EVENTS. ONCE ALL WORK IS DONE, ANY SEDIMENTATION CONTROL DEVICES MUST BE REMOVED BY THE CONTRACTOR AS SOON AS POSSIBLE.
10. CONTRACTOR SHALL CORDON OFF THE WATER QUALITY BIORETENTION SWALE AREA TO PREVENT CONSTRUCTION EQUIPMENT AND STOCKPILES MATERIALS FROM COMPACTING THE SUBGRADE SOILS. SEE PLAN C401 GRADING & DRAINAGE PLAN FOR MORE NOTES ON PROTECTING THE STORMWATER SWALE DURING CONSTRUCTION.
11. CONTRACTOR SHALL MAINTAIN CONTINUOUS ACCESS TO ENSURE CONTINUOUS OPERATION OF THE EXISTING FUEL ISLAND AND COORDINATE ANY CONSTRUCTION ACTIVITIES THAT MIGHT TEMPORARILY INTERFERE WITH OPERATION WITH THE TOWN.

SITE PREPARATION LEGEND

- STABILIZED CONST ENTRANCE
- STRUCTURES TO BE DEMOLISHED AND REMOVED FROM SITE
- GRAVEL SURFACE TO BE REMOVED
- PAVEMENT TO BE REMOVED
- LIMITS OF TREE CLEARING
- EXISTING BUILDING/STRUCTURE TO REMAIN
- TEMPORARY CONSTRUCTION FENCE
- SILT FENCE
- COMPOST FILTER TUBING
- LIMIT OF WORK
- TREE REMOVAL
- INLET PROTECTION

0 20 50 100

SCALE: 1" = 20'

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SITE PREPARATION AND EROSION CONTROL PLAN & DEMOLITION PLAN

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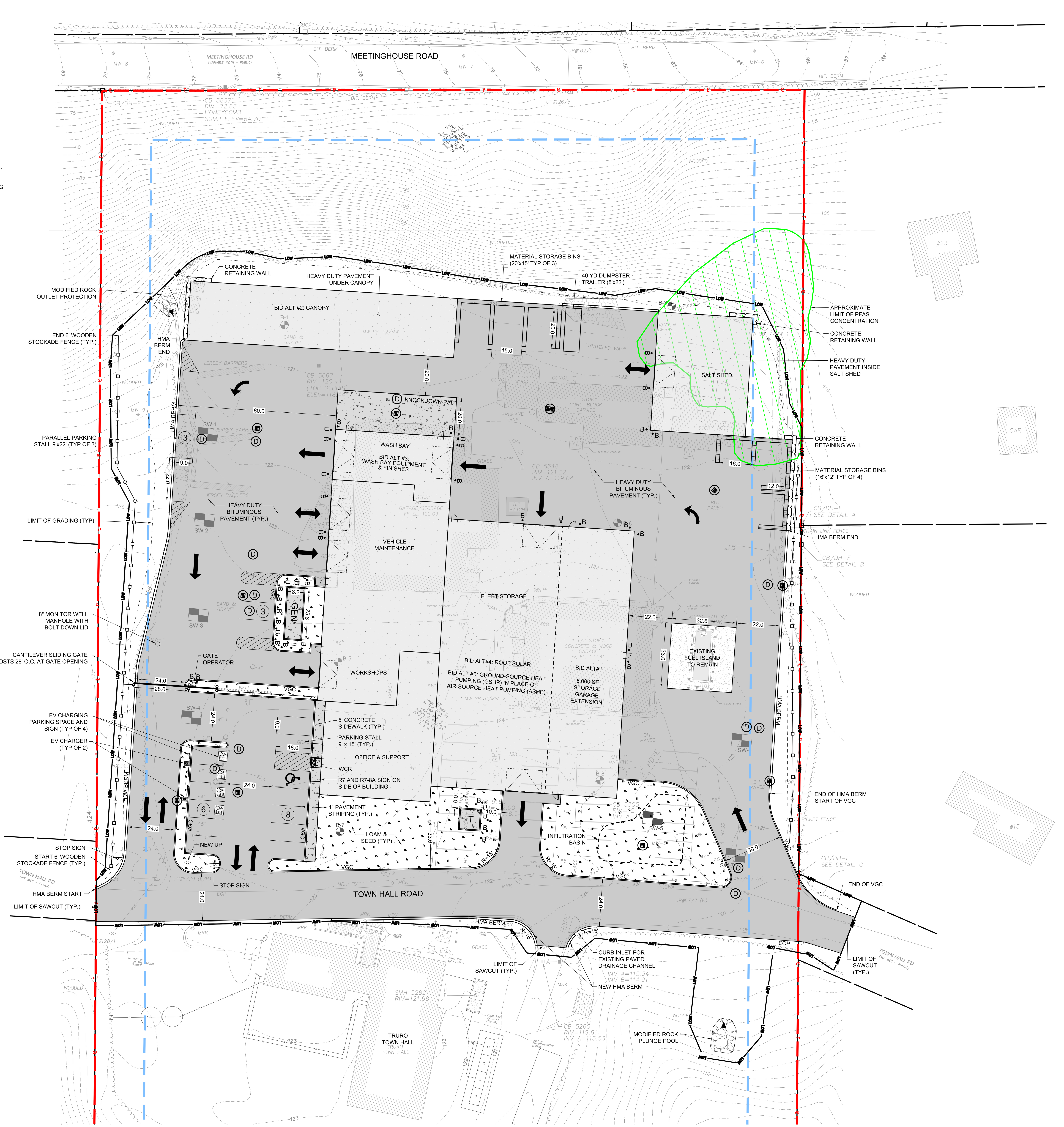
NOTE:
1. THE CONTRACTOR SHALL GIVE TWENTY-FOUR (24) HOUR NOTICE TO PERTINENT TOWN DEPARTMENTS BEFORE COMMENCING ANY WORK IN THE FIELD.
2. DIRECTIONAL ARROWS ARE SHOWN FOR INFORMATION ONLY TO SHOW THE DIRECTION OF TRAFFIC ON SITE. THEY DO NOT INDICATE PAVEMENT MARKINGS.
3. GRANITE CURB SHALL BE TYPE VA-4 UNLESS OTHERWISE IDENTIFIED.
4. PROVIDE NEW HOT MIX ASPHALT PAVEMENT BETWEEN ALL PROPOSED CURB LINES & BUILDINGS, (INCLUDING UP TO SAWCUT LIMITS) AND BETWEEN PROPOSED RETAINING WALLS, CURB LINES & BUILDING.
5. CONTRACTOR SHALL PROVIDE TEMPORARY CONSTRUCTION SIGNAGE AS REQUIRED FOR CONTROL OF TRAFFIC AND PEDESTRIANS.
6. CONTRACTOR SHALL PATCH EXISTING PAVED AREAS WITH HMA FOLLOWING UTILITY INSTALLATION.
7. ALL BACKFILL MATERIAL BELOW PROPOSED BUILDINGS SHALL CONSIST OF STRUCTURAL AGGREGATE BACKFILL OR PROCESSED GRAVEL PER SPECIFICATION SECTION 31 00 00-EARTHWORK.

LEGEND

- BITUMINOUS PAVEMENT
- CONCRETE
- LOAM & SEED/PLANTINGS (SEE LANDSCAPE PLAN)
- MODIFIED ROCKFILL
- LIMIT OF WORK



N
MEETINGHOUSE ROAD
TOWN HALL ROAD
BID ALT #2: CANOPY
HEAVY DUTY PAVEMENT UNDER CANOPY
CONCRETE RETAINING WALL
MODIFIED ROCK OUTLET PROTECTION
END 6' WOODEN STOCKADE FENCE (TYP.)
HMA BERM END
MATERIAL STORAGE BINS (20'x15' TYP OF 3)
40 YD DUMPSTER TRAILER (8'x22')
APPROXIMATE LIMIT OF PFAS CONCENTRATION
HEAVY DUTY PAVEMENT INSIDE SALT SHED
SALT SHED
KNOCKDOWN PAD
WASH BAY
BID ALT #3: WASH BAY EQUIPMENT & FINISHES
PARALLEL PARKING STALL 9'x22' (TYP OF 3)
MATERIAL STORAGE BINS (16'x12' TYP OF 4)
HEAVY DUTY BITUMINOUS PAVEMENT (TYP.)
HMA BERM END
LIMIT OF GRADING (TYP)
VEHICLE MAINTENANCE
FLEET STORAGE
8" MONITOR WELL MANHOLE WITH BOLT DOWN LID
GEN
EXISTING FUEL ISLAND TO REMAIN
CANTILEVER SLIDING GATE POSTS 28' O.C. AT GATE OPENING
GATE OPERATOR
WORKSHOPS
BID ALT#4: ROOF SOLAR
BID ALT #5: GROUND-SOURCE HEAT PUMPING (GSHP) IN PLACE OF AIR-SOURCE HEAT PUMPING (ASHP)
BID ALT#1
5,000 SF STORAGE GARAGE EXTENSION
EV CHARGING PARKING SPACE AND SIGN (TYP OF 4)
EV CHARGER (TYP OF 2)
5' CONCRETE SIDEWALK (TYP.)
PARKING STALL 9' x 18' (TYP.)
OFFICE & SUPPORT
WCR
R7 AND R7-8A SIGN ON SIDE OF BUILDING
4" PAVEMENT STRIPING (TYP.)
LOAM & SEED (TYP)
INFILTRATION BASIN
END OF HMA BERM START OF VGC
STOP SIGN
START 6' WOODEN STOCKADE FENCE (TYP.)
HMA BERM START
LIMIT OF SAWCUT (TYP.)
NEW UP
END OF VGC
CURB INLET FOR EXISTING PAVED DRAINAGE CHANNEL
NEW HMA BERM
LIMIT OF SAWCUT (TYP.)
MODIFIED ROCK PLUNGE POOL
TRURO TOWN HALL

0 20 50 100

SCALE: 1" = 20'

Project:
TRURO NEW DEPARTMENT OF PUBLIC WORKS

TOWN OF TRURO INCORPORATED 1709

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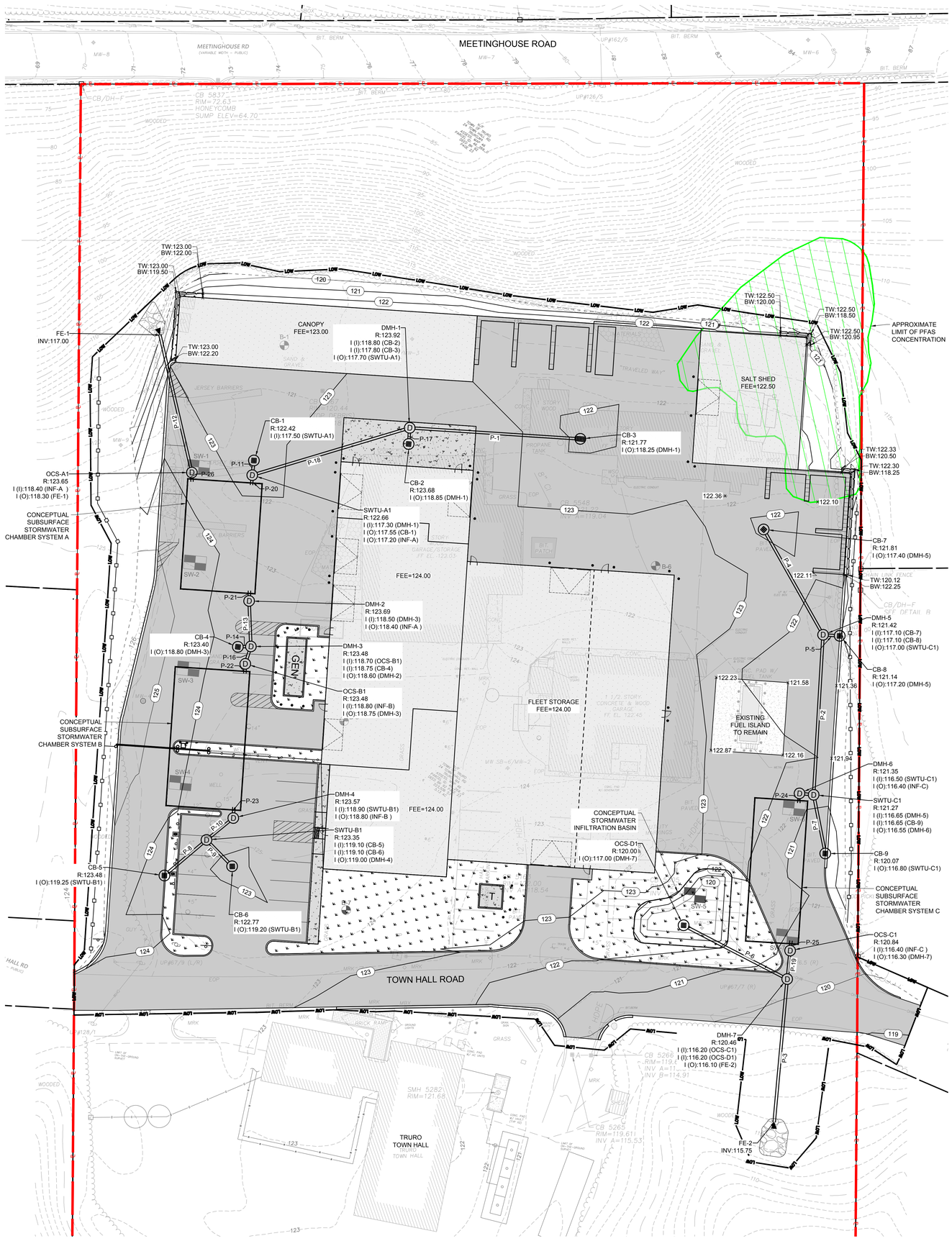
SITE LAYOUT & MATERIALS PLAN

Sheet Number:
C301



NOTES:

1. ALL EXISTING EARTHWORK MATERIALS, (EXCEPT FOR STOCKPILED FILL MATERIALS SHOWN ON C101) MAY BE INCORPORATED IN THE WORK AND USED FOR BACKFILL IF MATERIALS MEET 31 00 00 EARTHWORK SPECIFICATION REQUIREMENTS. THE CONTRACTOR IS RESPONSIBLE FOR TESTING OF EXISTING MATERIAL FOR POTENTIAL REUSE ON SITE. IF MATERIAL DOES NOT MEET MATERIAL REQUIREMENTS LISTED IN 31 00 00 FOR REUSE ON SITE, THEN THE CONTRACTOR SHALL REMOVE AND DISPOSE OF MATERIAL AND IMPORT NEW MATERIAL AS NEEDED TO COMPLETE THE WORK AT NO ADDITIONAL COST TO THE TOWN. THE CONTRACTOR SHALL PROVIDE ADDITIONAL BACKFILL MATERIALS AS NEEDED AND AS SPECIFIED IN SECTION 31 00 00 EARTHWORK. NO ON-SITE BACKFILL MATERIAL MAY BE USED AS PIPE TRENCH BACKFILL OR BELOW THE BUILDING SLAB AND FOUNDATION, UNLESS IT MEETS THE REQUIREMENTS OF THE SPECIFICATIONS.
2. UNLESS OTHERWISE NOTED, ALL DRAIN MANHOLES SHALL BE 4' DIAMETER.
3. ALL RIM ELEVATIONS SHALL BE FLUSH WITH FINISH GRADE.
4. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE CONTRACTOR'S FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE CONTRACTOR AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
5. DUMPSTER PADS SHALL SLOPE AT A MINIMUM 2% INTO THE PAVED AREA.
6. ALL CATCH BASINS SHALL BE SET FLUSH AGAINST THE GRANITE CURBING.
7. EROSION CONTROL FABRIC SHALL BE USED FOR ALL SLOPES 3:1 OR STEEPER PER 32 91 19 SEEDING.
8. REFER TO EXISTING CONDITIONS PLAN FOR BENCHMARK LOCATIONS.
9. REFER TO UTILITY PLAN FOR PROPOSED UTILITY LOCATIONS AND COORDINATE ACCORDINGLY WITH ALL GRADING AND DRAINAGE WORK.
10. UNLESS NOTED AS TOP OF CURB (TOC), ALL SPOT ELEVATIONS ARE SHOWN AS THE BOTTOM OF CURB OR BOTTOM OF WALL ELEVATION. TOP OF CURB ELEVATIONS ARE 6" HIGHER THAN BOTTOM OF CURB.
11. GRASSED AREAS ADJOINING THE BUILDING SHALL SLOPE AWAY FROM THE BUILDING AT A 1% MINIMUM SLOPE.

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GRADING &
DRAINAGE PLAN

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C401

NOTES:

1. THE G.C. IS RESPONSIBLE FOR EXCAVATION AND BACKFILL FOR ALL UNDERGROUND UTILITIES WITHIN THE BUILDING. COORDINATE LOCATIONS, ROUTING, DEPTH, ETC. WITH EACH SUBCONTRACTOR.
2. THE G.C. SHALL COORDINATE BOLLARD LOCATIONS FOR ELECTRICAL TRANSFORMER WITH UTILITY COMPANY PRIOR TO INSTALLATION.
3. THE LOCATIONS OF EXISTING UNDERGROUND UTILITIES ARE SHOWN IN AN APPROXIMATE WAY ONLY AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY THE OWNER OR ITS REPRESENTATIVE. THE G.C. SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK, AND AGREES TO BE FULLY RESPONSIBLE FOR ANY AND ALL DAMAGES WHICH MIGHT BE OCCASIONED BY THE G.C. FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES. WHERE AN EXISTING UTILITY IS FOUND TO CONFLICT WITH THE PROPOSED WORK, THE LOCATION, ELEVATION AND SIZE OF THE UTILITY SHALL BE ACCURATELY DETERMINED WITHOUT DELAY BY THE G.C. AND THE INFORMATION FURNISHED TO THE ENGINEER FOR RESOLUTION OF THE CONFLICT.
4. THE G.C. SHALL MAKE ALL ARRANGEMENTS FOR THE ALTERATION AND ADJUSTMENT OF GAS, ELECTRIC, TELEPHONE AND ANY OTHER PRIVATE UTILITIES BY THE UTILITY OWNER.
5. THE G.C. IS RESPONSIBLE FOR ADJUSTING HORIZONTAL AND VERTICAL ALIGNMENT OF PROPOSED UTILITIES AS REQUIRED TO COMPLETE THE PROPOSED DRAINAGE AND SEWER WORK.
6. THE G.C. SHALL PROVIDE ALL NECESSARY FITTINGS TO ACHIEVE WATER SERVICE LAYOUT AS SHOWN ON THE DRAWINGS.
7. THE G.C. IS RESPONSIBLE FOR PROVIDING PROPER TRANSITION MATERIAL AND FITTINGS TO PROVIDE A TIGHT TRANSITION FROM DISSIMILAR PIPE MATERIALS FROM PLUMBING & FIRE PROTECTION WORK TO G.C. WORK.
8. THE G.C. SHALL BE RESPONSIBLE FOR THE EXCAVATION, SAND PIPE BEDDING, AND BACKFILL OF THE GAS LINE. THE PIPE INSTALLATION WILL BE THE RESPONSIBILITY OF THE GAS COMPANY FROM THE MAIN TO THE METER. THE GAS COMPANY WILL DETERMINE IN THE FIELD THE EXACT LOCATION FOR PROPER CONNECTION TO THE EXISTING GAS MAIN.
9. THE G.C. IS RESPONSIBLE FOR EXCAVATION, BACKFILL, CONCRETE ENCASEMENT, AND REINFORCEMENT FOR ALL UNDERGROUND CONDUITS/DUCTBANKS, HANDHOLES, PLUMBING, AND FIRE PROTECTION WORK. COORDINATE LIMITS OF WORK WITH FP, P, E, AND TC DRAWINGS FOR WORK NOT SHOWN ON THIS DRAWING.

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UTILITY PLAN

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C501

GENERAL NOTES:

1. COORDINATE THE ARCHITECTURAL DRAWINGS WITH STRUCTURAL, PLUMBING, FIRE PROTECTION, MECHANICAL, AND ELECTRICAL / FIRE ALARM DRAWINGS FOR THE VERIFICATION OF ALL PROJECT REQUIREMENTS.
2. FINISH FIRST FLOOR SLAB ELEVATION HIGH POINT IS 124'-0" FOR THIS PROJECT.
3. ALL INTERIOR DIMENSIONS ARE TAKEN FROM FACE OF STUD / FACE OF MASONRY / CENTERLINE OF COLUMN TO FACE OF STUD / FACE OF MASONRY / CENTERLINED OF COLUMN UNLESS SPECIFICALLY NOTED OTHERWISE. DO NOT SCALE DRAWINGS, REFER TO ENLARGED PLANS AND DETAILS FOR FURTHER DIMENSIONING INFORMATION. ALL WORK LINES AND LEVELS SHALL BE LAID OUT BY WRITTEN DIMENSIONS. ANY DEVIATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGNER. ALL DEVIATIONS AND DISCREPANCIES SHALL BE CORRECTED BY THE CONTRACTOR BEFORE HE BEGINS HIS PORTION OF THE WORK.
4. FIRE EXTINGUISHER AND CABINET QUANTITIES AND LOCATIONS TO BE COORDINATED WITH THE TOWN FIRE DEPARTMENT PRIOR TO ORDERING AND INSTALLATION. CONFORM TO THE STATE FIRE REGS AND NFPA.
5. COORDINATE MASTER BOX, KNOX BOX, AND BEACON LOCATIONS WITH THE ELECTRICAL / FIRE ALARM DRAWINGS AND THE TOWN FIRE DEPARTMENT REQUIREMENTS. ELECTRICAL CONTRACTOR TO PROVIDE KNOX BOX THAT MEET THE TOWN FIRE DEPARTMENT REQUIREMENTS.
6. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS & CONDITIONS PRIOR TO THE WORK AND SHALL NOTIFY THE DESIGNER REGARDING ANY DISCREPANCIES.
7. THE CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS, SAMPLES, CATALOG CUTS ETC., INCLUDING COLOR CHARTS FOR PAINTS, FOR ALL INTERIOR FINISHES, TO THE DESIGNER FOR SELECTION, REVIEW AND APPROVAL WITH THE OWNER PRIOR TO FABRICATION OR INSTALLATION. THE COLORS MUST BE SUBMITTED IN A TIMELY MANNER AND TOGETHER FOR REVIEW AND COLOR BOARDS. FAILURE TO DO SO IN A TIMELY MANNER WILL FALL ON THE CONTRACTOR'S RESPONSIBILITY AND NOT ON THE OWNER. REFER TO EACH INDIVIDUAL SPECIFICATIONS FOR SIZE, QUANTITY AND TYPE OF COLOR SELECTION.
8. PERFORM ALL WORK IN ACCORDANCE WITH THE STATE BUILDING CODE, AS WELL AS LOCAL CODES AND ORDINANCES.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL PERMITS, BACKCHARGES AND FEES AS REQUIRED BY THE TOWN.
10. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAILY REMOVAL AND LEGAL DISPOSAL OF ALL DEBRIS OFF SITE.
11. THE CONTRACTOR SHALL SEAL ALL THROUGH-WALL & FLOOR PENETRATIONS WITH 3M BARRIER CAULK (O.A.E.) AND SEALANT ON USG SAFING 2600 PSI GROUT U.N.O. INSTALL ANY REQUIRED FIRE RATED PARTITIONS TO UNDERSIDE OF FLOOR AND ROOF DECK, INCLUDING DEFLECTION HEAD FIRE SAFING.
12. INSTALL A CONTINUOUS SEALANT BEAD ON BACKER ROD AT ALL JUNCTURES OF DISSIMILAR MATERIALS (E.G.: METAL TO CMU, STEEL TO ALUMINUM) AND ALL MATERIAL JOINTS AS REQUIRED BY THE MANUFACTURER'S SPECIFICATION AND RECOMMENDATIONS, INDUSTRY STANDARDS AND GOOD PRACTICE.
13. PROVIDE CONTINUOUS GALVANIZED METAL EDGE TRIM AT ALL GWB WORK.
14. THE CONTRACTOR SHALL INSTALL ALL INTERIOR FINISHES AT ALL SURFACES INDICATED ON THE DRAWINGS IN CONFORMANCE TO STATE BUILDING CODE. ALL DOORS SHALL HAVE LEVER HARDWARE TO CONFORM TO 521 CMR.
15. INSTALL USG .093 (OR APPROVED EQUAL) CONTROL JOINTS AT 30'-0" O.C. MAX. OR AS PER MANUFACTURER'S SUGGESTED DETAILS AND SPECIFICATIONS.
16. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A GAP FILLING SYSTEM OR OTHER SYSTEM WHICH SPANS ANY GAP IN THE EXTERIOR WALL SYSTEM WHICH DOES NOT MEET THE MAXIMUM SPAN OF THE APPROVED AIR BARRIER MEMBRANE SYSTEM. THIS SYSTEM SHALL BE PROVIDED TO ALLOW FOR A COMPLETE AIR BARRIER MEMBRANE INSTALLATION. THE SYSTEM SHALL BE COMPATIBLE WITH THE APPROVED AIR BARRIER PRODUCT AND SHALL BE APPROVED BY THE DESIGNER PRIOR TO INSTALLATION.
17. THE ELECTRICAL CONTRACTOR SHALL PROVIDE DISCONNECT SWITCHES, STARTERS AND ALL LINE VOLTAGE WIRING AND CONDUIT TO OH DOOR OPERATORS. THE HAND-OFF-AUTO SWITCH, PUSH BUTTON CONTROL STATION (MOMENTARY UP-STOP-DOWN) AND CONTROLLER IS FURNISHED BY THE OVERHEAD DOOR MANUFACTURER AND INSTALLED BY THE ELECTRICAL CONTRACTOR. THE ELECTRICAL CONTRACTOR IS TO PROVIDE CONDUIT AND WIRING BETWEEN THE HAND-OFF-AUTO SWITCH, THE PUSH BUTTON CONTROL STATION AND CONTROLLER PER OVERHEAD DOOR MANUFACTURER REQUIREMENTS. FURNISHING AND INSTALLATION OF THE MOTOR UNIT, OPTICAL SENSORS, PNEUMATIC DOOR SAFETY BOTTOM, LOW VOLTAGE WIRING AND ALL OTHER ACCESSORIES ASSOCIATED WITH THE OVERHEAD DOORS SHALL BE THE RESPONSIBILITY OF THE OVERHEAD DOOR CONTRACTOR.
18. ALL STRUCTURAL ELEMENTS WHICH PASS IN FRONT OF WINDOWS / CLERESTORES SHALL BE BACK PAINTED.
19. ALL STRUCTURAL ELEMENTS SHOWN ON THE ARCHITECTURAL DRAWINGS ARE FOR INFORMATION ONLY. REFER TO STRUCTURAL DRAWINGS FOR EXACT SIZES AND LOCATION OF STRUCTURAL ELEMENTS.
20. THE CONTRACTOR SHALL PROVIDE SUPPLEMENTAL FRAMING AND OR BLOCKING AS NECESSARY TO SUPPORT ALL EXTERIOR WALL MOUNTED ELEMENTS.
21. ALL OPENINGS IN EXTERIOR WALLS FOR PLUMBING, FIRE PROTECTION, MECHANICAL, AND ELECTRICAL / FIRE ALARM SYSTEMS SHALL BE SEALED WEATHER-TIGHT BY THE CONTRACTOR. CONTRACTOR TO PROVIDE FIRE RATED SEALANTS AS REQUIRED AT FIRE RATED WALL, FLOOR, CEILING, AND ROOF ASSEMBLIES.
22. THE CONTRACTOR IS TO FIELD MEASURE OH DOOR OPENINGS TO ENSURE PROPER FIT OF OH DOORS.
23. ALL EXPOSED SURFACES (INCLUDING, BUT NOT LIMITED TO: WALLS, UNDERSIDE OF EXPOSED ROOF AND FLOOR DECK, STRUCTURAL STEEL, MISCELLANEOUS METALS, DOORS/FRAMES, DUCTWORK, CONDUIT, AND PIPING) SHALL BE PRIMED AND PAINTED.
24. BLOCKING SHALL BE PROVIDED FOR ALL WALL MOUNTED EQUIPMENT (INCLUDING, BUT NOT LIMITED TO: PLUMBING FIXTURES, TOILET ACCESSORIES, UTILITY SINKS, FIRE EXTINGUISHER CABINETS, SHELVING, COUNTERS, CASEWORK, CABINETS, MEDIA EQUIPMENT, AND WINDOW TREATMENTS). PROVIDE ADDITIONAL METAL STUD FRAMING AS REQUIRED TO SUPPORT BLOCKING.
26. THE AIR BARRIER MEMBRANE (ABM) SHALL BE CONTINUOUS THROUGH THE BUILDING ENVELOPE AND BETWEEN THE WALL AND ROOF SYSTEMS INSTALLED ON THE WINTER WARM SIDE OF THE INSULATION. OPENINGS AND PENETRATIONS IN THE BUILDING ENVELOPE SHALL BE SEALED WITH SEALANT MATERIALS OR CLOSED WITH GASKETING SYSTEMS WHICH IS COMPATIBLE WITH THE ABM SYSTEM AND MEETS THE PERFORMANCE REQUIREMENTS IN THE SPEC. SYSTEM SHALL BE COMPATIBLE WITH THE CONSTRUCTION MATERIALS AND LOCATION. JOINTS AND SEAMS SHALL BE SEALED IN THE SAME MANNER OR TAPED OR COVERED WITH A MOISTURE VAPOR-PERMEABLE WRAPPING MATERIAL. SEALING MATERIALS SPANNING JOINTS BETWEEN CONSTRUCTION MATERIALS SHALL ALLOW FOR EXPANSION AND CONTRACTION OF THE CONSTRUCTION MATERIALS. AT ALL OH DOOR JAMBS AND HEADERS, THE ABM SHALL TERMINATE AT THE STEEL FACE WHERE THE INSULATION ABUTS STEEL FRAMED OPENINGS. TERMINATE ABM ON THE INSIDE FACE OF EXTERIOR WALL SYSTEM AT DOORS, WINDOWS, LOUVERS, AND CLERESTORIES. THE TERMS VAPOR RETARDER, AND AIR MOISTURE BARRIER ARE SYNONYMOUS WITH ABM.
27. METAL BUILDING SYSTEM SHALL BE A SINGLE SOURCE MANUFACTURED SYSTEM. ALL ACCESSORIES, NOT LIMITED TO, PRIMARY FRAMING, WALLS, ROOF INSULATION, EXTRUSIONS, TRIMS, FASTENERS, GASKETS, SUBGIRT FRAMING, ETC SHALL BE PROVIDED BY THE METAL BUILDING SYSTEM MANUFACTURER. METAL WALL PANEL COLOR TO BE SELECTED BY THE DESIGNER FROM THE MANUFACTURES STANDARD COLOR SELECTION WITH FINISH PROTECTIONS AS SPECIFIED.
28. ALL WALL/PARAPET FLASHING SHALL TERMINATE WITH A MINIMUM 8" VERTICAL LEG TO ALLOW FOR PROPER INTERFACE WITH THE ABM. ABM SHALL BE INSTALLED BEHIND FLASHING AND THE FLASHING SHALL BE INTEGRATED INTO THE ABM SYSTEM USING A SELF-ADHERED MEMBRANE FLASHING WITH MINIMUM OVERLAP REQUIREMENTS PER MANUFACTURER.
29. ALL EXTERIOR AND INTERIOR MATERIAL SURFACE COLOR AND TEXTURES SHALL BE SELECTED BY THE DESIGNER FROM THE MANUFACTURES STANDARD & PREMIUM FINISH / COLOR SELECTIONS. ONCE ALL COLORS HAVE BEEN SUBMITTED, THE OWNER WILL REVIEW AND PROVIDE GUIDANCE ON COLORS FOR INCLUSION IN THE MOCK-UP REFERENCED IN DIVISION 1 OF THE SPECIFICATIONS.
30. DETAILS AND NOTES SHOWN ON THE ARCHITECTURAL DRAWINGS SHALL BE APPLICABLE TO ALL PARTS OF THE ARCHITECTURAL WORK EXCEPT WHERE SPECIFICALLY REQUIRED OTHERWISE BY THE CONTRACT DOCUMENTS. CONDITIONS NOT SPECIFICALLY SHOWN SHALL BE SIMILAR TO THOSE SHOWN FOR LIKE CONDITIONS AS DETERMINED BY THE DESIGNER.
31. PROVIDE ALL ACCESSIBLE FIXTURES, CONTROLS & ACCESSORIES, AND APPROPRIATE CLEARANCES, AS REQUIRED FOR COMPLIANCE W/ STATE BUILDING CODE W/ ALL AMENDMENTS, TYP.
32. SEALANT DEPTH AT ALL EXTERIOR OPENINGS SHALL BE EQUAL TO THE WIDTH OF THE JOINT.
33. THE CONTRACTOR TO PROVIDE CANE PROTECTION AT ALL PANELS IN EGRESS PATHS (AS DETERMINED BY THE DESIGNER) WHICH EXTEND 4" OR MORE FROM FACE OF WALL AND ARE GREATER THAN 27" ABOVE FINISHED FLOOR.
34. FOR SITE LEGEND REFER TO DRAWING SERIES C100.
35. FOR STRUCTURAL LEGEND REFER TO DRAWING SERIES SX00.
36. FOR WALL TYPES REFER TO DRAWING SERIES A000.
37. FOR CEILING LEGEND AND SOFFIT DETAILS REFER TO DRAWING SERIES A100.
38. FOR LARGE SCALE STAIR PLANS REFER TO DRAWING SERIES A500.
39. FOR ROOF DETAILS REFER TO DRAWING SERIES A600.
40. FOR LARGE SCALE TOILET PLANS REFER TO DRAWING SERIES A700.
41. FOR INTERIOR ELEVATIONS, REFER TO DRAWING SERIES A700.
42. FOR DOOR NUMBERS AND DETAILS REFER TO DRAWING SERIES A800.
43. FOR FINISH SCHEDULE REFER TO DRAWING SERIES A900.
44. FOR CASEWORK ELEVATIONS REFER TO DRAWING SERIES A900.
45. FOR FIRE PROTECTION LEGEND REFER TO DRAWING SERIES FPX00.
46. FOR PLUMBING LEGEND REFER TO DRAWING SERIES PX00.
47. FOR MECHANICAL LEGEND REFER TO DRAWING SERIES MX00.
48. FOR ELECTRICAL LEGEND REFER TO DRAWING SERIES EX00.
49. ALL NOTES AND DIMENSIONS DESIGNATED "TYPICAL" APPLY TO ALL LIKE OR SIMILAR CONDITIONS THROUGHOUT THE PROJECT.
50. SIGNAGE TO BE MOUNTED ON THE WALL, ADJACENT TO THE LEVER SIDE OF THE DOOR, AT A HEIGHT OF FIVE (5) FEET A.F.F. REFER TO THE FLOOR PLANS FOR LOCATIONS OF DIRECTIONAL SIGNAGE.
51. CONTRACTOR(S) TO TAKE AND VERIFY ALL DIMENSIONS AND CONDITIONS OF THE WORK AND BE RESPONSIBLE FOR COORDINATION OF THE SAME. FIELD VERIFY ALL EXISTING CONDITIONS PRIOR TO START OF WORK.
52. GENERAL CONTRACTOR TO PROVIDE EXCAVATION & TRENCHING AT ALL UNDERGROUND UTILITIES IN EXISTING AND NEW BUILDINGS AS REQUIRED FOR MEP/FP UTILITIES AND COORDINATION. REFER TO MEP / FP DRAWINGS FOR OVERALL REQUIREMENTS. GENERAL CONTRACTOR TO COORDINATE INVERTS AND COMPACT ALL MATERIALS FOR PLACEMENT OF CONCRETE SLAB INFILL IN ACCORDANCE WITH ASTM D1557. GC TO PROVIDE SOIL COMPACTION, DOWELS, WWF MESH, VAPOR RETARDER AND TIE-INS. CONCRETE PLACEMENT AND ALL REQUIREMENTS TO CLOSE UP TRENCH ONCE MEP/FP SUB-TRADE WORK IS COMPLETE.
53. PROVIDE AN ACCENT WALL AT ALL ROOMS. ARCHITECT / ENGINEER TO PROVIDE LOCATION DURING CONSTRUCTION FOR ACCENT WALL IF NOT IDENTIFIED ON PROJECT PLANS.

ABBREVIATIONS:

A	
A/C	AIR CONDITION
AC	ACOUSTICAL
ACT	ACOUSTICAL CEILING TILE
ADJ	ADJACENT
AFF	ABOVE FINISH FLOOR
ALT	ALTERNATE
ALUM	ALUMINUM
ANC BLT	ANCHOR BOLT
ANOD	ANODIZED
APPROX.	APPROXIMATE
ARCH	ARCHITECT
ARGB	ABUSE RESISTANT GYPSUM BOARD
ASPH	ASPHALT
AVB	AIR VAPOR BARRIER
B	
BC	BASE CABINET
BD	BOARD
BF	BRACE FRAME
BITUM	BITUMINOUS
BLDG	BUILDING
BLK	BLOCK
BLKG	BLOCKING
BM	BENCH MARK
BOF	BOTTOM OF FOOTING
BOS	BOTTOM OF STEEL
BOTT	BOTTOM
BPL	BEARING PLATE
BRG	BEARING
BRK	BRICK
BS	BRICK SHELF
BSMT	BASEMENT
BVL	BEVELED
C	
CAB	CABINET
CB	CEMENT BOARD / CATCH BASIN
CDM	CAVITY DRAINAGE MATERIAL
CF	CUBIC FEET
CH	CEILING HEIGHT
CIP	CAST IN PLACE
CJ	CONTROL JOINT
CL	CENTER LINE / COLUMN LINE
CL	CLOSET / CHAIN LINK
CLG	CEILING
CLOS	CLOSET
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CNTR	COUNTER
CO	CASED OPENING
COL	COLUMN
COMP	COMPOSITION
CONC	CONCRETE
CONST	CONSTRUCTION
CONT	CONTINUOUS
CONTC	CONTRACTOR
CONV	CONVECTOR
COORD	COORDINATE
CORR	CORRIDOR
CPET	COMMON PATH OF EGRESS TRAVEL
CPT	CARPET
CT	CERAMIC TILE
CTR	CENTER
CW	COLD WATER
CWT	CERAMIC WALL TILE
CY	CUBIC YARD
D	
D	DRYER
D-PART	DEMOUNTABLE PARTITION
DBL	DOUBLE
DEMO	DEMOLITION
DF	DRINKING FOUNTAIN
DH	DOUBLE HUNG
DI	DRAIN INLET
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DIST	DISTANCE
DL	DRAIN LEADER
DN	DOWN
DR	DOOR
DS	DOWNSPOUT
DTL	DETAIL
DW	DISHWASHER
DWG	DRAWING
E	
EA	EACH
EF	EACH FACE
EIFS	EXTERIOR INSULATED FINISH SYSTEM
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRIC
ELEV	ELEVATOR
EMER	EMERGENCY
ENCL	ENCLOSURE
EOC	EDGE OF CONCRETE
EP	ELECTRICAL PANEL
EQ	EQUAL
EQUIP	EQUIPMENT
ER	EXISTING TO REMAIN
ES	EXPOSED STRUCTURE
EW	EACH WAY
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
F	
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FAK	FIRST AID KIT
FB	FIRE BLANKET
FC	FILE CABINET
FD	FLOOR DRAIN
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FF	FINISH FLOOR
FFE	FINISH FLOOR ELEVATION
FG	FIBERGLASS
FIN	FINISH
FLASH	FLASHING
FLR	FLOOR
FLUOR	FLUORESCENT
FOC	FACE OF CONCRETE
FOF	FACE OF FINISH
FOM	FACE OF MASONRY
FOS	FACE OF STUD
FOUND	FOUNDATION
FP	FIREPROOF(ING)
FR	FIRE RETARDANT
FRP	FIBERGLASS REINFORCED WALL PANEL
FRTW	FIRE RETARDANT TREATED WOOD
FSB	FILED SUB BID
FT	FEET
FTG	FOOTING
FUR	FURRING
G	
GA	GAUGE
GALV	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GDRL	GUARD RAIL
GL	GLASS
GLAZ	GLAZED BLOCK
GLB	GLASS BLOCK
GN	GOOSENECK
GRT	GROUT
GWB	GYPSUM WALL BOARD
H	
HB	HOSE BIB
HC	HANDICAP
HD	HEAVY DUTY
HDWR	HARDWARE
HM	HOLLOW METAL
HOR	HORIZONTAL
HP	HIGH POINT
HT	HEIGHT
HTR	HEATER
HVAC	HEATING, VENTILATING, & AIR CONDITIONING
HW	HOT WATER
I	
ID	INSIDE DIAMETER
IN	INCH
INCL	INCLUDED
INFO	INFORMATION
INSUL	INSULATION
INT	INTERIOR
INV	INVERT
IRGWB	IMPACT-RESISTANT GWB
J	
JAN	JANITOR
JST	JOIST
JT	JOINT
K	
KD	KNOCK-DOWN
KIP	1,000 LBS
KO	KNOCKOUT
KPLT	KICKPLATE
L	
L	LENGTH
LAM	LAMINATE
LAV	LAVATORY
LBL	LABEL
LC	LEAD COATED
LCC	LEAD COATED COPPER
LGMF	LIGHT-GAUGE METAL FRAMING
LIN	LINOLEUM
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LP	LOW POINT
LSC	LIFE SAFETY CODE
LT	LIGHT
M	
M	METER
MANUF	MANUFACTURER
MAS	MASONRY
MAT	MATERIAL
MAX	MAXIMUM
MB	MOISTURE BARRIER
MBL	MARBLE
MBM	METAL BUILDING MANUFACTURER
MBR	MEMBER
MC	MEDICINE CABINET
MDF	MEDIUM DENSITY FIBERBOARD
MDO	MEDIUM DENSITY OVERLAY
MECH	MECHANICAL
MFR	MANUFACTURER
MH	MANHOLE
MIN	MINIMUM
MIR	MIRROR
MISC	MISCELLANEOUS
ML	MATCH LINE
MLDG	MOULDING
MO	MASONRY OPENING
MOD	MODULAR
MR	MOISTURE RESISTANT
MRGB	MOISTURE RESISTANT GYPSUM BOARD
MS	METAL STUD
MTD	MOUNTED
MTL	METAL
MTP	METAL TOILET PARTITION
N	
N/A	NOT APPLICABLE
NAT	NATURAL
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NTS	NOT TO SCALE
NUM	NUMBER
NW	NEW
O	
OA	OVERALL
OC	ON CENTER
OD	OUTSIDE DIAMETER
OH	OVERHEAD DOOR
OPNG	OPENING
OPP	OPPOSITE
OPPHAND	OPPOSITE HAND
OSB	ORIENTED STRAND BOARD
OTS	OPEN TO STRUCTURE
OW	OPERABLE WALL
OZ	OUNCE
P	
PART BD	PARTICLE BOARD
PAV	PAVING
PCP	PRECAST CONCRETE PLANK
PERIM	PERIMETER
PL	PROPERTY LINE / PLATE
PLAM	PLASTIC LAMINATE
PLAS	PLASTIC
PLY	PLYWOOD
PMLF	PRE-MOLDED JOINT FILLER
PNT	PAINT
PR	PAIR
PREFIN	PREFINISHED
PRFB	POURED RESIN FLOOR BASE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	PRESSURE TREATED
PTD	PAPER TOWEL DISPENSER
PTN	PARTITION
PVC	POLYVINYL CHLORIDE
PVMT	PAVEMENT
Q	
QT	QUARRY TILE
R	
R	RISER
R & D	REMOVE & DISPOSE
R & R	REMOVE AND REPLACE
R & S	REMOVE AND SALVAGE
RAD	RADIUS
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REF	REFRIGERATOR
REFURB	REFURBISH
REINF	REINFORCEMENT
RELOC	RELOCATED
REM	REMOTE
REQD	REQUIRED
RES	RESILIENT
REV	REVISION
RFG	ROOFING
RFI	RIGID FOAM INSULATION
RFS	RESINOUS FLOOR SYSTEM
RH	RIGHT HAND
RL	ROOF LADDER
RM	RUBBER MAT
RM	ROOM
RO	ROUGH OPENING
RT	RUBBER TILE
RTU	ROOF TOP UNIT
RUB	RUBBER
S	
S	SEALANT
S.L.	STRUCTURAL LINE
SACI	SPRAY-APPLIED CELLULOSE INSULATION
SACP	SECURITY ALARM CONTROL PANEL
SAFI	SPRAY-APPLIED FOAM INSULATION
SCHED	SCHEDULE
SCR	SHOWER CURTAIN ROD
SCW	SOLID CORE WOOD
SD	SOAP DISPENSER
SECT	SECTION
SF	SQUARE FEET
SH	SINGLE HUNG
SHR	SHOWER
SIM	SIMILAR
SND	SANITARY NAPKIN DISPENSER
SNV	SANITARY NAPKIN VENDOR
SOLSUR	SOLID SURFACE (COUNTER)
SPC	SPECIAL
SPEC	SPECIFICATION
SQ	SQUARE
SR	SHEET RUBBER
SS	STAINLESS STEEL
STD	STANDARD
STL	STEEL
STOR	STORAGE
STRUCT	STRUCTURE or STRUCTURAL
SUSP	SUSPENDED or SUSPENSION
SV	SHEET VINYL
SYS	SYSTEM(S)
T	
T & B	TOP AND BOTTOM
T & G	TONGUE AND GROOVE
TB	TRASH BARREL
TBA	TO BE ABANDONED
TBB	TILE BACKER BOARD
TBD	TO BE DETERMINED
TBOC	TOP BACK OF CURB
TEL	TELEPHONE
TEMP	TEMPORARY
THK	THICK(NESS)
THRESH	THRESHOLD
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOL	TOP OF LANDING
TOP	TOP OF PLATE
TOS	TOP OF STEEL
TOW	TOP OF WALL
TP	TRANSLUCENT PANEL
TR	TREAD
TS	TUBULAR STEEL
TTD	TOILET TISSUE DISPENSER
TW	TO WEATHER
TYP	TYPICAL
U	
UC	UNDERCUT
UG	UNDERGROUND
UND	UNDERSIDE (OF DECK)
UNFIN	UNFINISHED
UNO	UNLESS NOTED OTHERWISE
UV	UNIT VENTILATOR
V	
VB	VINYL BASE / VAPOR BARRIER
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VEST	VESTIBULE
VIF	VERIFY IN FIELD
VPD	VENEER PLASTER BASE
VS	VENT STACK
VT	VINYL TREAD
VTS	VINYL TRANSITION STRIP
VWB	VINYL WALL BASE
VWC	VINYL WALL COVERING
W	
W	WASHER
W/	WITH
W/O	WITHOUT
WB	WOOD BASE
WC	WALL CABINET
WD	WOOD
WDC	WATERPROOFING, DAMPPROOFING, & CAULKING CONTRACTOR
WF	WIRE FABRIC
WG	WIRE GLASS
WH	WALL HUNG
WIN	WINDOW
WP	WATER PROTECTION
WPG	WATERPROOF(ING)
WR	WATER RESISTANT
WS	WATER STOP
WT	WEIGHT
WWF	WELDED WIRE FABRIC

SYMBOLS:

- EXTERIOR ELEVATION — X / AX.XX
- INTERIOR ELEVATION — 1 / 1 A1.01 1 / 1
- BUILDING SECTION — X / AX.XX and X / AX.XX
- WALL SECTION — X / AX.XX
- DETAIL — X / AX.XX
- PARTITION TYPE — X
- EXTERIOR WALL ASSEMBLY — XX
- DOOR TYPE or VISION PANEL (VP) — X
- WINDOW TYPE — X
- ROOF TYPE — X
- SPECIFIC DEMOLITION NOTE — X
- SPECIFIC CONSTRUCTION NOTE — X
- CHANGE IN PLANE — X
- LEADER
- DIMENSION — 3' - 0"
- CHANGE IN ELEVATION
- CONTROL JOINT — C J
- ELEVATION or WORK POINT (WP)
- COLUMN GRID — A / 1
- EXISTING COLUMN GRID — A / 1
- ALIGN SURFACES — ALIGN
- REVISION MARKER — X
- ROOM TAG — ADMINISTRATION / 100
- DRAWING TITLE — 1 View Name, 1/8" = 1'-0" (ORIGINAL TAG REFERENCE 1/A201; LOCATED NEXT TO SCALE)

LEGEND:

- RIGID/SEMI-RIGID INSULATION
- CONCRETE
- SAND / P.C. CONCRETE
- PARTICLE BOARD / MDF
- PLYWOOD/MDO
- FINISH WOOD
- ALUMINUM
- STEEL
- PVC
- FIBER CEMENT
- CONCRETE MASONRY UNIT
- BRICK
- MORTAR
- GROUT
- TERRA COTTA
- EARTH
- GRAVEL
- SPRAY FOAM
- INSULATED METAL PANEL
- WOOD STUDS/FRAMING (DIMENSIONAL LUMBER)
- WOOD BLOCKING
- BATT INSULATION / SOUND ATTENUATION BLANKET
- MATCHLINE

Project:
TOWN of TRURO, MA
NEW DEPARTMENT of PUBLIC WORKS FACILITY

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Consultants:

Revisions:

No.	Date	Description

COA:

Seal:

Issued For:

SCHEMATIC DESIGN

Scale: NTS

Key Plan:

Date: MAY 30, 2025
Drawn By: MMS
Reviewed By: DRD
Approved By: -

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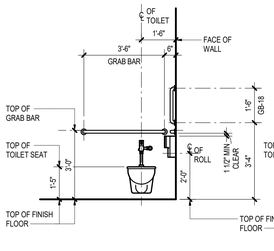
Drawing Title:

ABBREVIATIONS, SYMBOLS, LEGEND & GENERAL NOTES

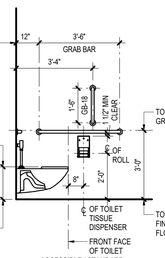
Sheet Number:

A011

PLUMBING FIXTURE SCHEDULE / MOUNTING HEIGHTS: 3/8" = 1'-0"



ACCESSIBLE / STANDARD
WALL MOUNTED WATER CLOSET



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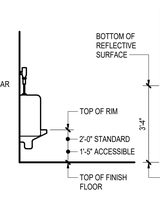
WALL MOUNTED WATER CLOSET



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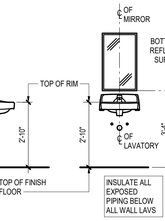
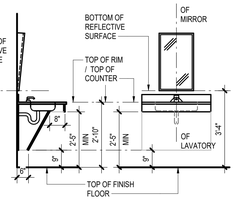
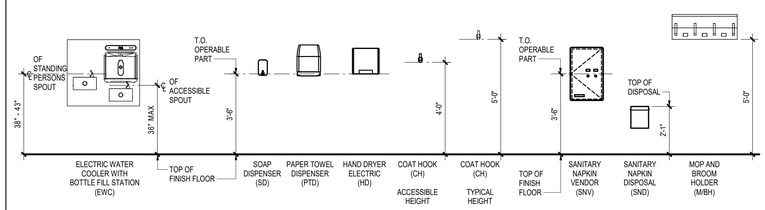
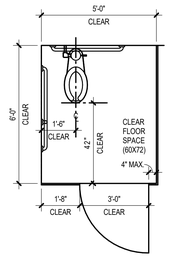


ACCESSIBLE / STANDARD
WALL HUNG LAVATORY

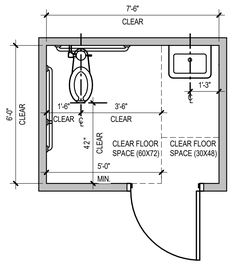


ACCESSIBLE / STANDARD SINK IN
COUNTERTOP

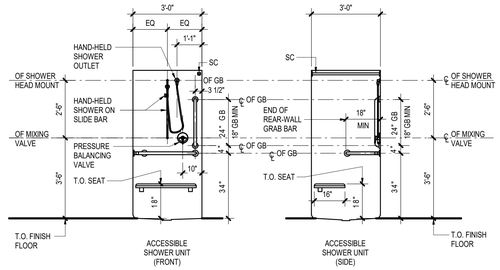




WALL MOUNTED WATER CLOSET
IN STALL

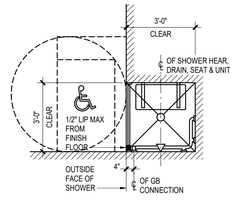


WALL MOUNTED WATER CLOSET
AND LAVATORY IN ROOM

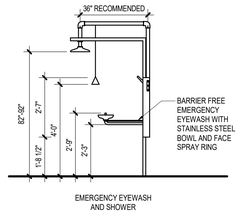


SECTION / ELEVATION

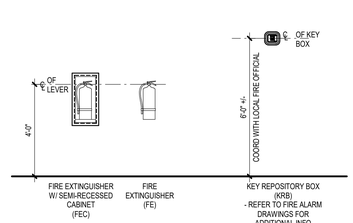
SECTION / ELEVATION



PLAN



EMERGENCY EYEWASH
AND SHOWER



FIRE EXTINGUISHER W/ SEMI-RECESSED CABINET (FEC)

FIRE EXTINGUISHER (FE)

KEY REPOSITORY BOX (KRB)
- REFER TO FIRE ALARM DRAWINGS FOR ADDITIONAL INFO

MEZZANINE GENERAL NOTES:

1. AT EACH MEZZANINE SWING GATE LOCATION, PROVIDE 4" H (RED) LETTER SIGNAGE AT MEZZANINE FASCIA TO READ: 200LBS/SF MAXIMUM MEZZANINE LOADING
2. PROVIDE SAFETY CHAIN PER OSHA STANDARDS AT EACH SWING GATE.
3. PROVIDE SAFETY YELLOW PAINT AT MEZZANINE FLOOR AT EACH SWING GATE, AS INDICATED.
4. COORDINATE EXACT LOCATION WITH MECHANICAL, STRUCTURAL AND EQUIPMENT REQUIREMENTS.
5. DO NOT RUN ANY UTILITIES BELOW GATES EXPOSED AND MOUNTED TO WALLS.
6. PROVIDE TIE-OFF POINT FOR OSHA FALL ARREST SYSTEM NEAR MEZZANINE SWING-GATE ON PRIMARY STRUCTURAL ELEMENT.

TYPICAL DEVICE MOUNTING HEIGHTS:

ELECTRICAL EQUIPMENT MOUNTING HEIGHT DIMENSIONS ARE TO CENTER OF DEVICE UNLESS OTHERWISE NOTED:

- RECEPTACLES: 18" A.F.F. AT LOCATIONS ABOVE CASEWORK, MOUNT BOTTOM OF RECEPTACLE AT 2" ABOVE BACKSPLASH. AT LOCATIONS BELOW CASEWORK, MOUNT AT 24" A.F.F.
- EXTERIOR RECEPTACLES: 24" A.F.F.
- SWITCHES: 48" A.F.F.
- BOILER EMERGENCY SWITCH: 60" A.F.F.
- DATA/PHONE OUTLETS: 18" A.F.F.
- WALL MOUNTED CLOCKS AND SPEAKERS: COORDINATE LOCATION ABOVE DOOR WITH CEILING HEIGHT. IF THE CLOCK AND SPEAKER DO NOT FIT, PLACE AT 7'-6" A.F.F. NEXT TO DOOR. COORDINATE WITH BLOCK COURSING AS OCCURS. CONSULT DESIGNER IF CONDITIONS DIFFER.
- FIRE ALARM PULL STATIONS: 48" A.F.F.
- AREA OF REFUGE CALL STATION: 48" A.F.F.
- EMERGENCY SHUT-OFF SWITCH/PUSH BUTTON: 48" A.F.F.
- EMERGENCY CALL SWITCH: 36" A.F.F.
- EMERGENCY CALL BELL/LIGHT: 7'-6" A.F.F.
- FIRE ALARM VISUAL/AUDIO INDICATING UNITS: 6'-8" TO BOTTOM OF DEVICE.
- WALL MOUNTED EXIT SIGNS: 8" ABOVE DOOR OR 7'-6" A.F.F.

DOOR HARDWARE MOUNTING HEIGHT DIMENSIONS ARE TO CENTER OF HARDWARE:

- PULL: 42"
- PUSH PLATE: 45"

TOILET ACCESSORY SCHEDULE - DIV 10

FURNISHED BY OWNER - INSTALLED BY CONTRACTOR:

MARK	DESCRIPTION	MFR	QTY
SD	SOAP DISPENSER	OWNER REQ'S	PER PLANS
PTD	PAPER TOWEL DISPENSER	OWNER REQ'S	PER PLANS
TTD	TOILET TISSUE DISPENSER	OWNER REQ'S	PER PLANS
TB	TRASH BARREL	OWNER REQ'S	PER PLANS

FURNISHED AND INSTALLED BY CONTRACTOR:

MARK	DESCRIPTION	MFR	QTY
SRWR	SEMI-RECESSED WASTE RECEPTICLE	PER SPEC	PER PLANS
SNV	SANITARY NAPKIN VENDOR	PER SPEC	PER PLANS
SND	SANITARY NAPKIN DISPOSAL	PER SPEC	PER PLANS
CH	COAT / ROBE HOOK	PER SPEC	PER PLANS
GB	GRAB BAR (DIMENSION PER PLANS)	PER SPEC	PER PLANS
MIRR	MIRROR	PER SPEC	PER PLANS
M/BH	MOP/BROOM HOLDER	PER SPEC	PER PLANS
JS	JANITOR'S SHELVING	PER SPEC	PER PLANS
SC	SHOWER CURTAIN	PER SPEC	PER PLANS
CR	CURTAIN ROD FOR SHOWER	PER SPEC	PER PLANS

GENERAL NOTES:

1. PROVIDE BULLNOSE TOP COURSE / MTL EDGE TRIM AND CEMENTITIOUS TILE BACK BOARD / CEMENT BOARD AT ALL CERAMIC TILE LOCATIONS, TYPICAL. INSTALLATION OF CERAMIC TILE OVER GYPSUM BOARD EXCEPT FOR A KITCHENETTE BACKSPLASH IS NOT ACCEPTABLE.
2. PROVIDE CONT. BLOCKING AT SHELVING, ACCESS PANELS, DISPLAY MONITORS, MARKER BOARDS ETC. COORDINATE LOCATION IN FIELD.
3. MOISTURE RESISTANT (MR) GYPSUM BOARD TO BE USED IN ALL TOILET ROOM / RESTROOM FACILITIES.
4. PROVIDE PVC SHIMS AS NECESSARY TO MAKE TOILET ROOM ACCESSORIES SUCH AS PTD'S, MIRRORS, SD'S, TOILET PARTITIONS, ETC.., FLUSH ON WALL OVER CERAMIC TILE WAINSCOT. SHIMS TO BE PAINTED BY PAINTING FSB. THICKNESS TO MATCH CERAMIC WALL TILE.

FINISH NOTES:

1. FINISH PLANS ARE TO BE READ IN CONJUNCTION WITH THE FINISH SCHEDULE. SHOULD THERE BE ANY DISCREPANCY BETWEEN INFORMATION GIVEN ON THE FINISH/COLOR SCHEDULE AND ANY OTHER DRAWINGS OR SPECIFICATIONS, PROVIDE THE HIGHER QUALITY FINISH.
2. REFER TO REFLECTED CEILING PLANS FOR CEILING TYPES AND HEIGHTS.
3. REFER TO THE FINISH LEGEND AND FINISH FLOOR PLANS FOR DEFINITION, PATTERNS AND EXTENT OF COLORS USED.
4. IN AREAS DESIGNATED WITH NEW CONCRETE FLOORS, PAINT MASONRY WALLS DOWN TO THE FLOOR WHERE NO RUBBER BASE IS PROVIDED. WHERE NO SUSPENDED CEILING IS INSTALLED, WALLS ARE TO BE PAINTED UP TO DECK.
5. PROVIDE THE INTERIOR OF ALL SPACES DESIGNATED "CLOSET" WITH ROD AND SHELF, UNLESS OTHERWISE DESIGNATED TO RECEIVE ADJUSTABLE SHELVES ON STANDARDS SPANNING THE WIDTH OF THE CLOSET.
6. ALL NEW GYPSUM BOARD SOFFITS AND CEILING SHOWN ON REFLECTED CEILING PLANS TO BE PAINTED. REFER TO FINISH NOTES FOR COLOR DESIGNATIONS.
7. ALL NEW HOLLOW METAL FRAMES TO BE PAINTED. REFER TO FINISH NOTES FOR COLOR DESIGNATIONS.
8. ALL NEW STAIR STRINGERS AND RAILINGS TO BE PAINTED. REFER TO FINISH NOTES FOR COLOR DESIGNATIONS.
9. AT ALL WALLS DESIGNATED TO RECEIVE TILED FINISH, TILE BACKING PANELS SHALL BE INSTALLED BEHIND ALL TILED AREAS.
10. ALL EXPOSED TO VIEW CONCRETE ON VERTICAL SURFACES TO RECEIVE SMOOTH FORMED FINISH, CLASS "A".

MINIMUM CLEARANCE ENVELOPE:

DESCRIPTION	LOCATION	MIN CLEARANCE FROM FF TO ANY STRUCTURE OR SYSTEM
WASH BAY	DEPT of PUBLIC WORKS	23' - 0"
VEHICLE MAINTENANCE	DEPT of PUBLIC WORKS	23' - 0"
VEHICLE STORAGE	DEPT of PUBLIC WORKS	19' - 8"
VEHICLE MAINT. AT MEZZ.	DEPT of PUBLIC WORKS	7' - 0"
VEHICLE STOR. AT MEZZ.	DEPT of PUBLIC WORKS	7' - 0"
SHOP AREAS	DEPT of PUBLIC WORKS	19' - 0"
CANOPY	DETACHED CANOPY	21' - 8"

NOTES:
1. THIS IS A LIST OF MINIMUM CLEARANCE ENVELOPES FOR THE MAINTENANCE, MATERIAL STORAGE, WORKSHOPS, VEHICLE STORAGE AND WASH BAY AREAS. ALL STRUCTURE AND SYSTEMS LOCATED IN THESE AREAS MUST BE INSTALLED ABOVE THESE LIMITS UNLESS NOTED OTHERWISE OR APPROVED BY ENGINEER.
2. MECHANICAL DUCTWORK DROPS (VERTICAL LEG) TO FLOOR FOR EXHAUST ARE NOT SUBJECT TO THIS TABLE.

0' 1' 2' 4'
SCALE: 3/8" = 1'-0"

Project:
TOWN of TRURO, MA
NEW DEPARTMENT of PUBLIC WORKS FACILITY
17 TOWN HALL
TRURO, MA 02666

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Consultants:

Revisions:

No.	Date	Description

COA:

Seal:

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Scale: NTS

Key Plan:

Date: MAY 30, 2025
Drawn By: MMS
Reviewed By: DRD
Approved By: -
W&S Project No.: ENG24-1552
W&S File No.: XXX

Drawing Title:
GENERAL NOTES & MOUNTING HEIGHTS

Sheet Number:
A021

EXTERIOR WALL ASSEMBLIES:

NOTE: SEE DETAILS ON A6 & A7 SERIES FOR ADDITIONAL INFORMATION. "F" USED FOR FUME SEPERATION WALLS.

TYPE A

LOWER WALL ASSEMBLY
(UP TO 3'-4" HT)
(1'-4" TOTAL THICKNESS)

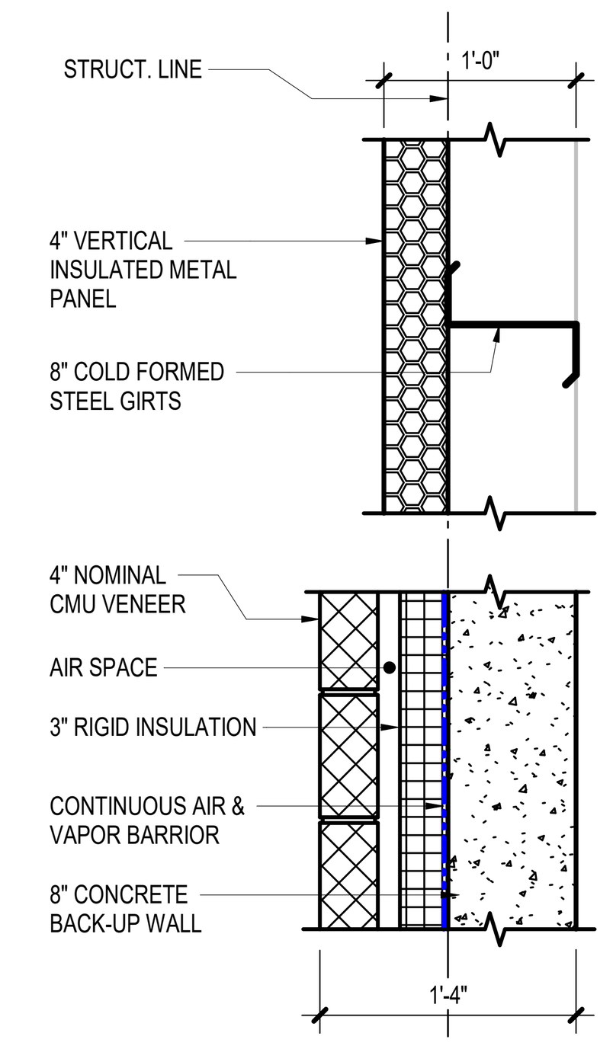
EXTERIOR
- 4" NOMINAL CMU VENEER
- AIR SPACE
- 3" RIGID INSULATION
- CONTINUOUS AIR & VAPOR BARRIER
- 8" CONCRETE BACK-UP WALL

INTERIOR

UPPER WALL ASSEMBLY
(1'-0" TOTAL THICKNESS)

EXTERIOR
- 4" VERTICAL INSULATED METAL PANEL, BREAK METAL TRIM, BY MBM
- 8" COLD FORMED STEEL GIRTS, BY MBM
- STEEL BUILDING FRAME, BY MBM

INTERIOR



TYPE B

LOWER WALL ASSEMBLY
(UP TO 3'-4" HT)
(1'-3 1/2" TOTAL THICKNESS)

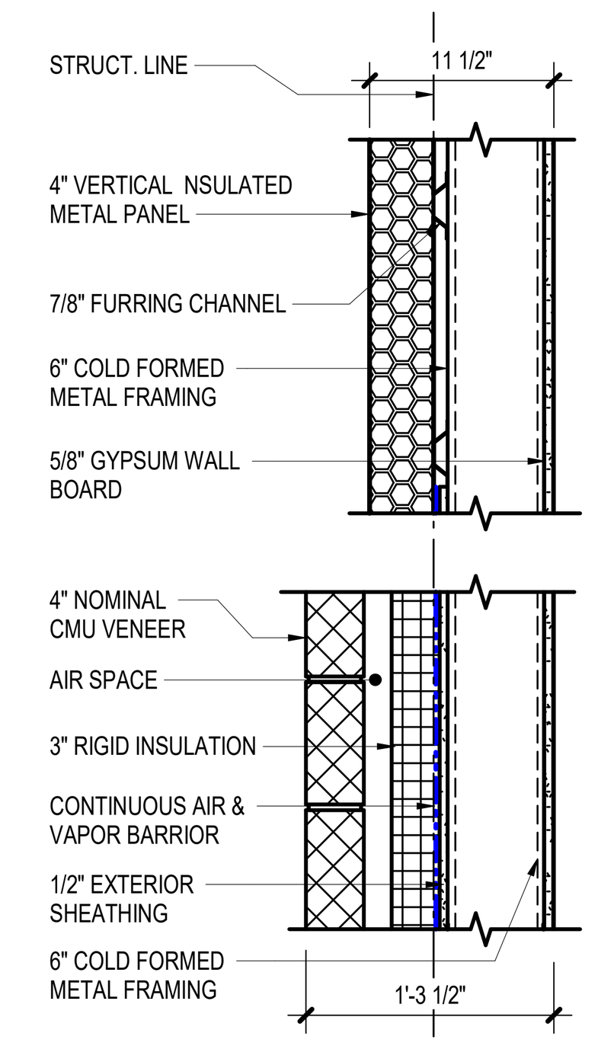
EXTERIOR
- 4" NOMINAL CMU VENEER
- AIR SPACE
- 3" RIGID INSULATION
- CONTINUOUS AIR & VAPOR BARRIER
- 1/2" EXTERIOR SHEATHING
- 6" COLD FORMED METAL FRAMING, AT 16" O.C. MAX.
- 5/8" GYPSUM WALL BOARD

INTERIOR

UPPER WALL ASSEMBLY
(0'-11 1/2" TOTAL THICKNESS)

EXTERIOR
- 4" VERTICAL INSULATED METAL PANEL, BREAK METAL TRIM, BY MBM
- 7/8" FURRING CHANNEL AT 16" O.C., COORDINATE WITH METAL PANEL FASTENER REQUIREMENTS, BY MBM
- 6" COLD FORMED METAL FRAMING, AT 16" O.C. MAX.
- 5/8" GYPSUM WALL BOARD

INTERIOR



TYPE C

LOWER WALL ASSEMBLY
(UP TO 3'-4" HT)
(1'-4" TOTAL THICKNESS)

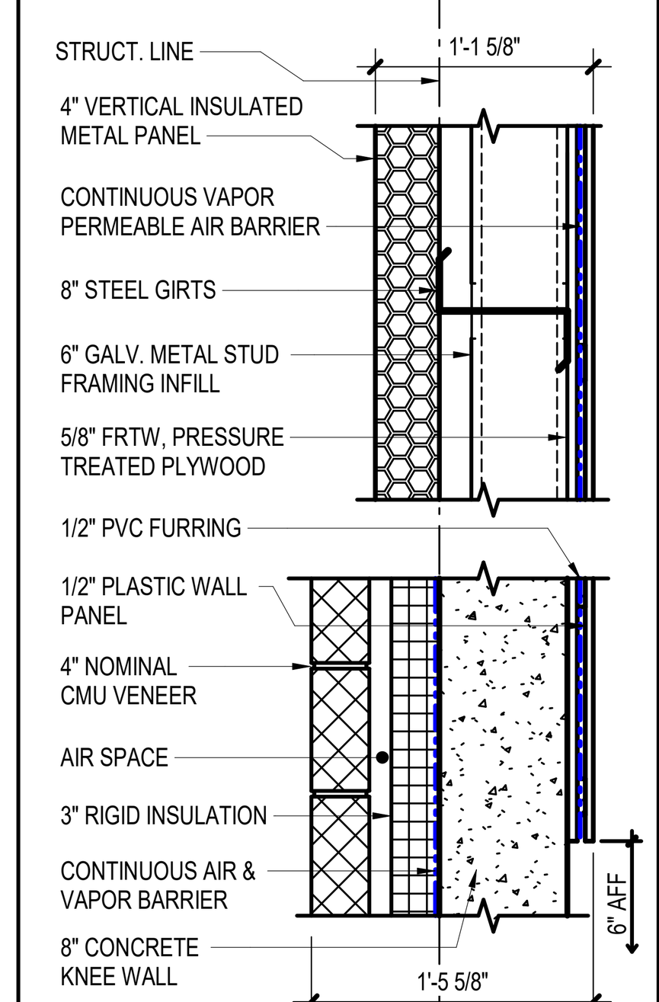
EXTERIOR
- 4" NOMINAL CMU VENEER
- AIR SPACE
- 3" RIGID INSULATION
- CONTINUOUS AIR & VAPOR BARRIER
- 8" CONCRETE BACK-UP WALL (3' - 4" HT)
- CONTINUOUS AIR & VAPOR BARRIER
- 1/2" PVC FURRING SLOPED TO DRAIN, SHIM AS NEEDED
- 1/2" PLASTIC WALL PANEL

INTERIOR

UPPER WALL ASSEMBLY
(1'-1 5/8" TOTAL THICKNESS)

EXTERIOR
- 4" VERTICAL INSULATED METAL PANEL, BREAK METAL TRIM, BY MBM
- 8" COLD FORMED STEEL GIRTS, BY MBM
- 6" GALVANIZED STEEL STUD FRAMING, SPAN BETWEEN HORIZONTAL GIRT FRAMING, TYP.
- 5/8" FIRE RETARDENT TREATED, PRESSURE TREATED A-C PLYWOOD SHEATHING AT ALL WASH BAY WALLS, TYP.
- CONTINUOUS VAPOR PERMEABLE AIR BARRIER
- 1/2" PVC FURRING SLOPED TO DRAIN, SHIM AS NEEDED
- 1/2" PLASTIC WALL PANEL

INTERIOR



TYPE G

LOWER WALL ASSEMBLY
(1'-4" TOTAL THICKNESS)

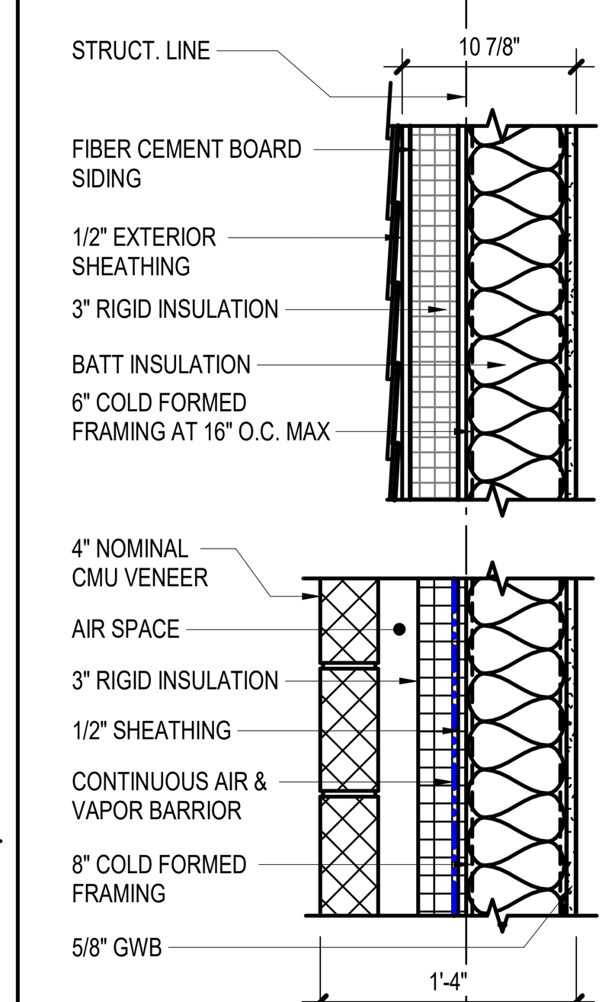
EXTERIOR
- 4" NOMINAL CMU VENEER
- AIR SPACE
- 3" RIGID INSULATION
- CONTINUOUS AIR & VAPOR BARRIER
- 1/2" EXTERIOR SHEATHING
- 6" COLD-FORMED FRAMING W/ BATT INSULATION (R-30 +/-)
- 5/8" GWB

INTERIOR

UPPER WALL ASSEMBLY
(9 3/8" TO OUTSIDE FACE OF SHEATHING)

EXTERIOR
- FIBER CEMENT SIDING
- WEATHER BARRIER
- 1/2" EXTERIOR PLYWOOD SHEATHING
- 3" RIGID INSULATION
- 1/2" EXTERIOR PLYWOOD SHEATHING
- 6" COLD-FORMED FRAMING W/ BATT INSULATION (R-30 +/-)
- 5/8" GWB

INTERIOR



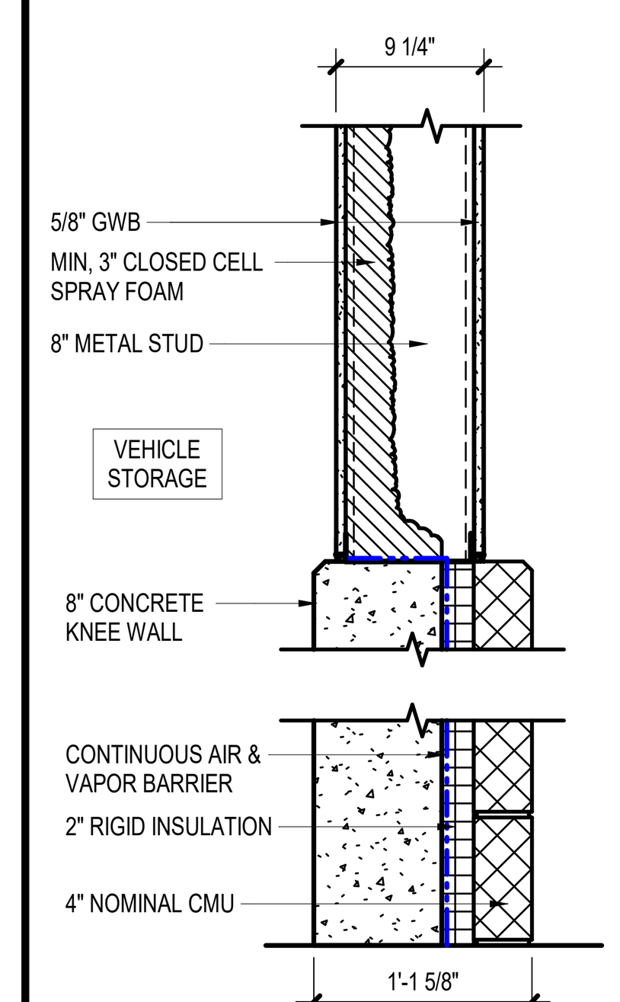
FUME SEPARATION WALL ASSEMBLIES:

TYPE F1

LOWER WALL ASSEMBLY
(UP TO 5'-4" HT)
(1' - 1 5/8" TOTAL THICKNESS)

- 8" CONC. KNEE WALL
- CONTINUOUS AIR & VAPOR BARRIER
- 2" RIGID INSULATION
- AIR SPACE
- 8" NOMINAL CMU VENEER

UPPER WALL ASSEMBLY
(0' - 9 1/4" TOTAL THICKNESS)
- 5/8" GYPSUM WALL BOARD
- 8" COLD FORMED METAL FRAMING, AT 16" O.C. MAX.
- MIN. 3" CLOSED CELL SPRAY FOAM BETWEEN STUDS
- 5/8" GYPSUM WALL BOARD

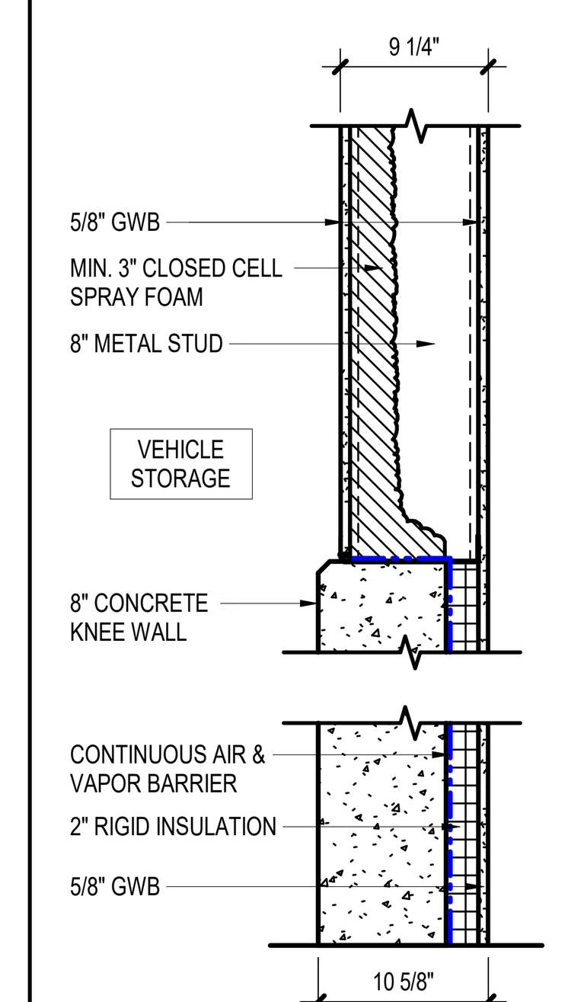


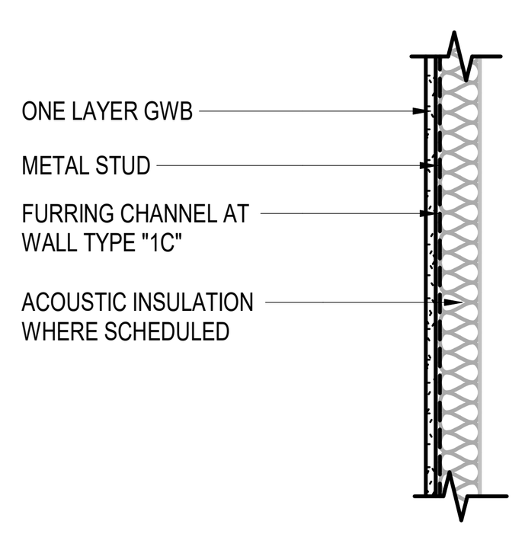
TYPE F2

LOWER WALL ASSEMBLY
(UP TO 5'-4" HT)
(0'-10 5/8" TOTAL THICKNESS)

- 8" CONC. KNEE WALL
- CONTINUOUS AIR & VAPOR BARRIER
- 2" RIGID INSULATION & Z-FURRING CHANNEL
- 6" COLD FORMED METAL FRAMING, AT 16" O.C. MAX.
- 5/8" GYPSUM WALL BOARD

UPPER WALL ASSEMBLY
(0'-9 1/4" TOTAL THICKNESS)
- 5/8" GYPSUM WALL BOARD
- 8" COLD FORMED METAL FRAMING, AT 16" O.C. MAX.
- MIN. 3" CLOSED CELL SPRAY FOAM BETWEEN STUDS
- 5/8" GYPSUM WALL BOARD





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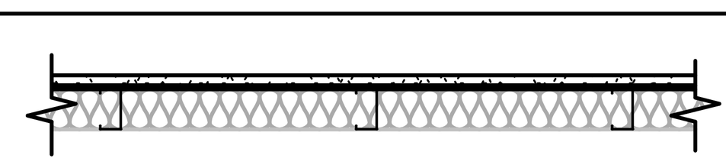
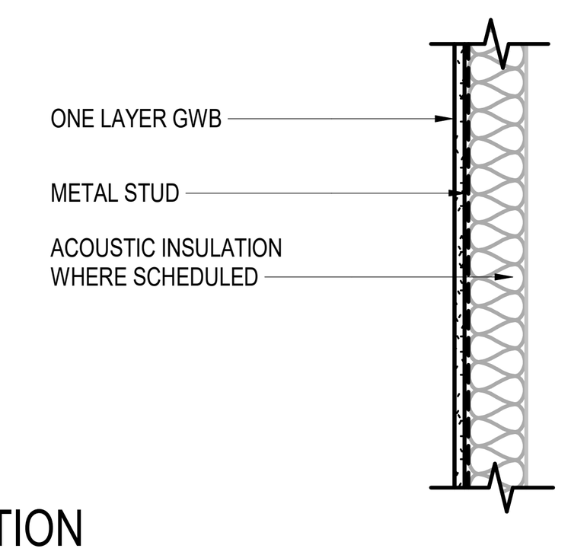


PLAN

MARK	CORE SIZE	GWB THICK	GWB HEIGHT	TOTAL PARTITION THICK	ACOUSTIC INSUL	FIRE RATING / UL DESIGN NO.
1	2 1/2"	5/8"	FULL HEIGHT	3 1/8"	NO	-
1A	2 1/2"	5/8"	FULL HEIGHT	3 1/8"	YES	-
1B	2 1/2"	5/8"	6" ABOVE FINISHED CLG	3 1/8"	NO	-
1C	7/8"	5/8"	6" ABOVE FINISHED CLG	1 1/2"	NO	-

1 2 1/2" METAL STUD



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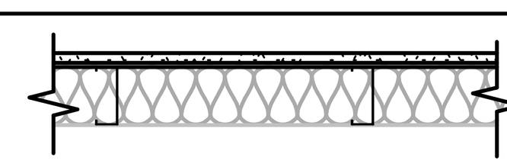
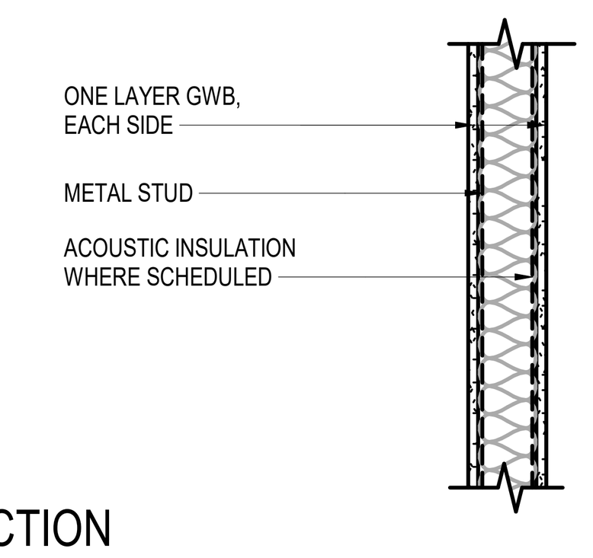


PLAN

MARK	CORE SIZE	GWB THICK	GWB HEIGHT	TOTAL PARTITION THICK	ACOUSTIC INSUL	FIRE RATING / UL DESIGN NO.
2	3 5/8"	5/8"	FULL HEIGHT	4 1/4"	NO	-
2A	3 5/8"	5/8"	FULL HEIGHT	4 1/4"	YES	-
2B	3 5/8"	5/8"	6" ABOVE FINISHED CLG	4 1/4"	NO	-

2 3 5/8" METAL STUD - 1 LAYER GWB - 1 SIDE



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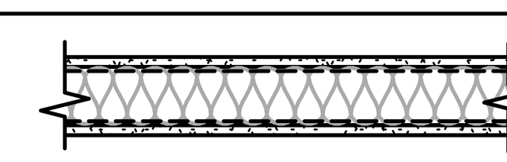
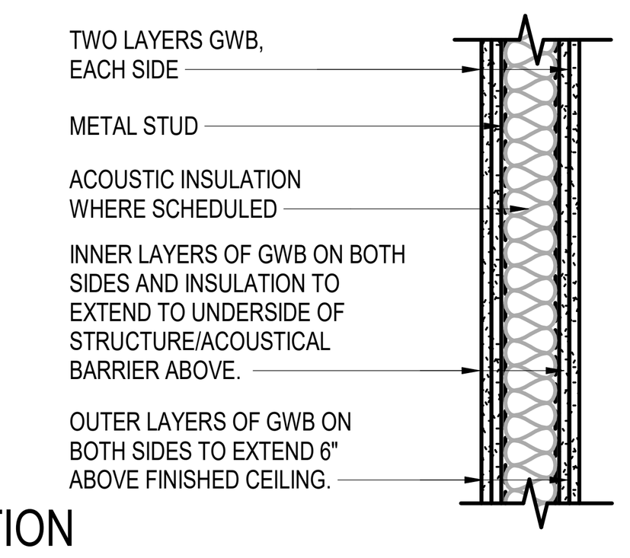


PLAN

MARK	CORE SIZE	GWB THICK	GWB HEIGHT	TOTAL PARTITION THICK	ACOUSTIC INSUL	FIRE RATING / UL DESIGN NO.
3	3 5/8"	5/8"	FULL HEIGHT	4 7/8"	NO	-
3A	3 5/8"	5/8"	FULL HEIGHT	4 7/8"	YES	-
3B	3 5/8"	5/8"	6" ABOVE FINISHED CLG	4 7/8"	NO	-

3 3 5/8" METAL STUD - 1 LAYER GWB - BOTH SIDES



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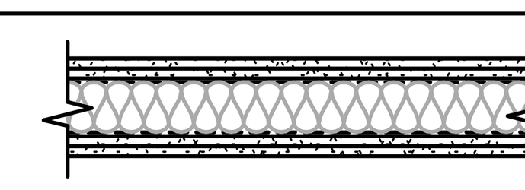
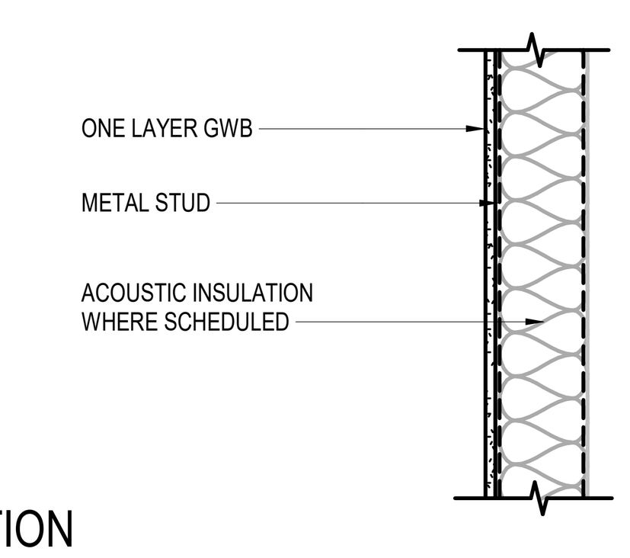


PLAN

MARK	CORE SIZE	GWB THICK	GWB HEIGHT	TOTAL PARTITION THICK	ACOUSTIC INSUL	FIRE RATING / UL DESIGN NO.
4	3 5/8"	(2) 5/8"	FULL HEIGHT	6 1/8"	NO	-
4A	3 5/8"	(2) 5/8"	6" ABOVE FINISHED CLG	6 1/8"	NO	-
4B - 2H	3 5/8"	(2) 5/8"	FULL HEIGHT	6 1/8"	YES	2 HR PARTITION - U419

4 3 5/8" METAL STUD - 2 LAYER GWB - BOTH SIDES



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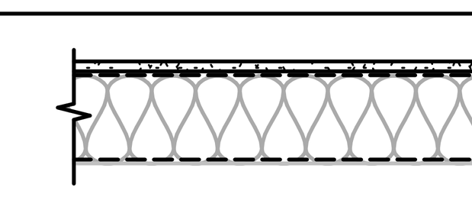
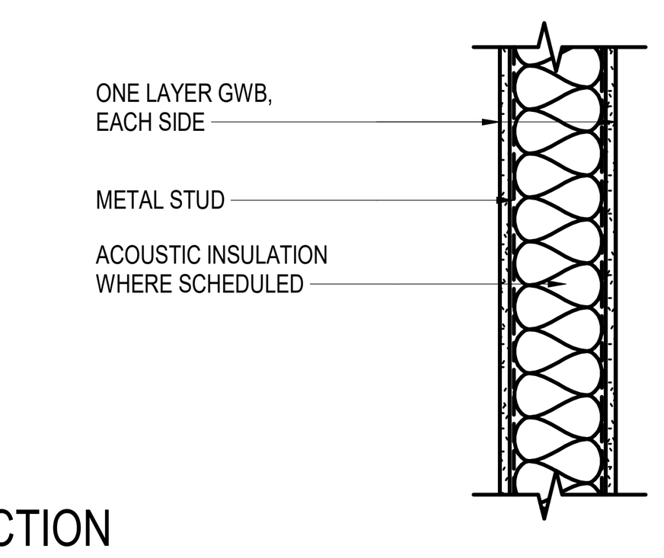


PLAN

MARK	CORE SIZE	GWB THICK	GWB HEIGHT	TOTAL PARTITION THICK	ACOUSTIC INSUL	FIRE RATING / UL DESIGN NO.
5	6"	5/8"	FULL HEIGHT	6 5/8"	NO	-
5A	6"	5/8"	FULL HEIGHT	6 5/8"	YES	-
5B	6"	5/8"	6" ABOVE FINISHED CLG	6 5/8"	NO	-

5 6" METAL STUD - 1 LAYER GWB - 1 SIDE



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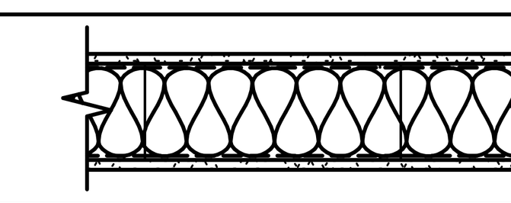
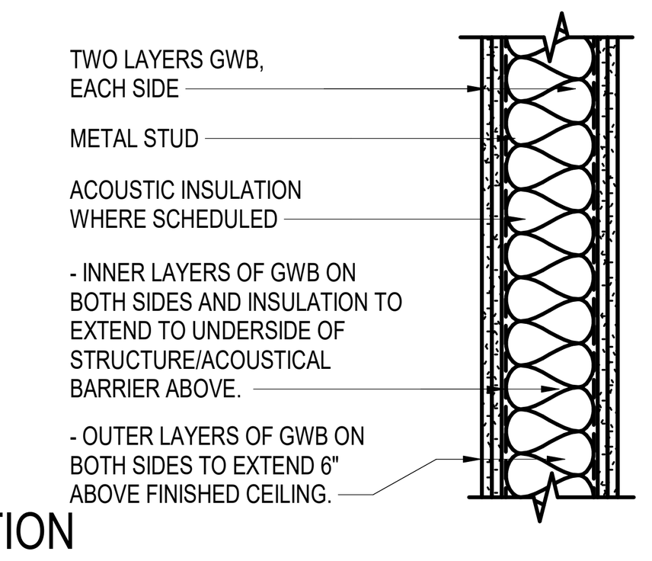


PLAN

MARK	CORE SIZE	GWB THICK	GWB HEIGHT	TOTAL PARTITION THICK	ACOUSTIC INSUL	FIRE RATING / UL DESIGN NO.
6	6"	5/8"	FULL HEIGHT	7 1/4"	NO	-
6A	6"	5/8"	FULL HEIGHT	7 1/4"	YES	-
6B	6"	5/8"	6" ABOVE FINISHED CLG	7 1/4"	NO	-
6C	8"	5/8"	FULL HEIGHT	9 1/4"	NO	-

6 6" METAL STUD - 1 LAYER GWB - BOTH SIDES



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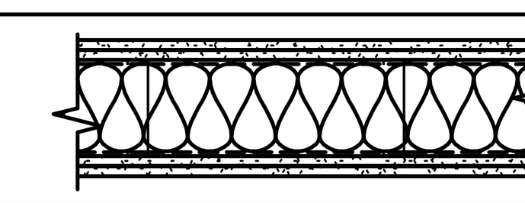
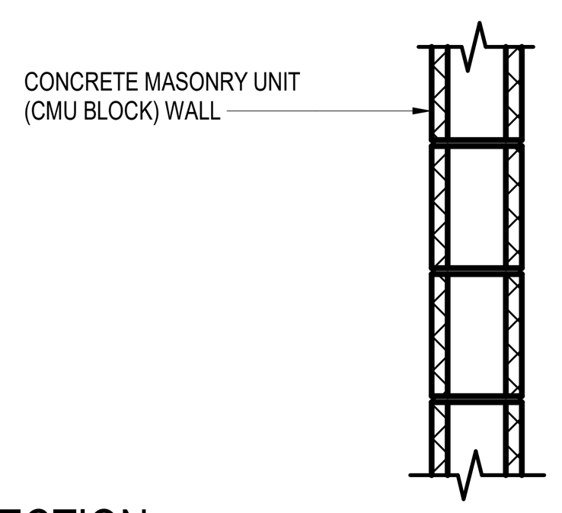


PLAN

MARK	CORE SIZE	GWB THICK	GWB HEIGHT	TOTAL PARTITION THICK	ACOUSTIC INSUL	FIRE RATING / UL DESIGN NO.
7 - 2h	6"	5/8"	FULL HEIGHT	8 1/2"	YES	2 HR PARTITION - U411

7 6" METAL STUD - 2 LAYERS GWB - BOTH SIDES



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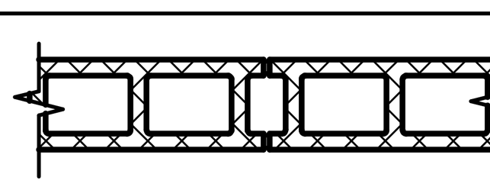
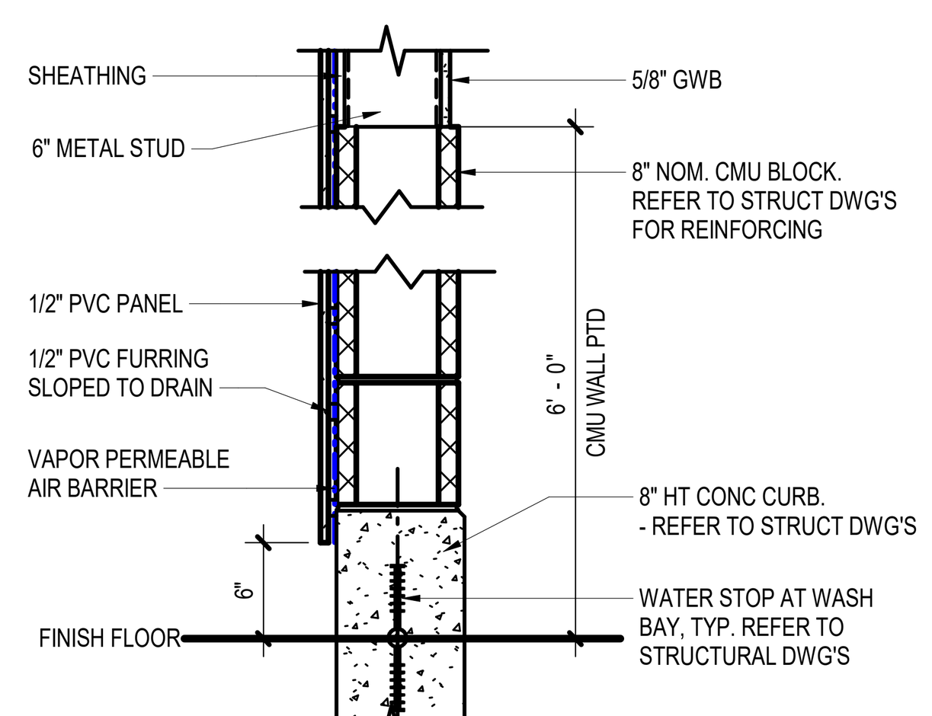


PLAN

MARK	CORE SIZE	GWB THICK	GWB HEIGHT	TOTAL THICK	ACOUSTIC INSUL	FIRE RATING / UL DESIGN NO.
8A	8" NOM	-	-	7 5/8"	NO	-
8A - 1H	8" NOM	-	-	7 5/8"	NO	1 HR PARTITION - U905
8A - 2H	8" NOM	-	-	7 5/8"	NO	2 HR PARTITION - U905

8 CMU WALLS



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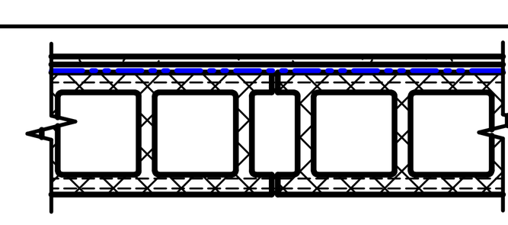
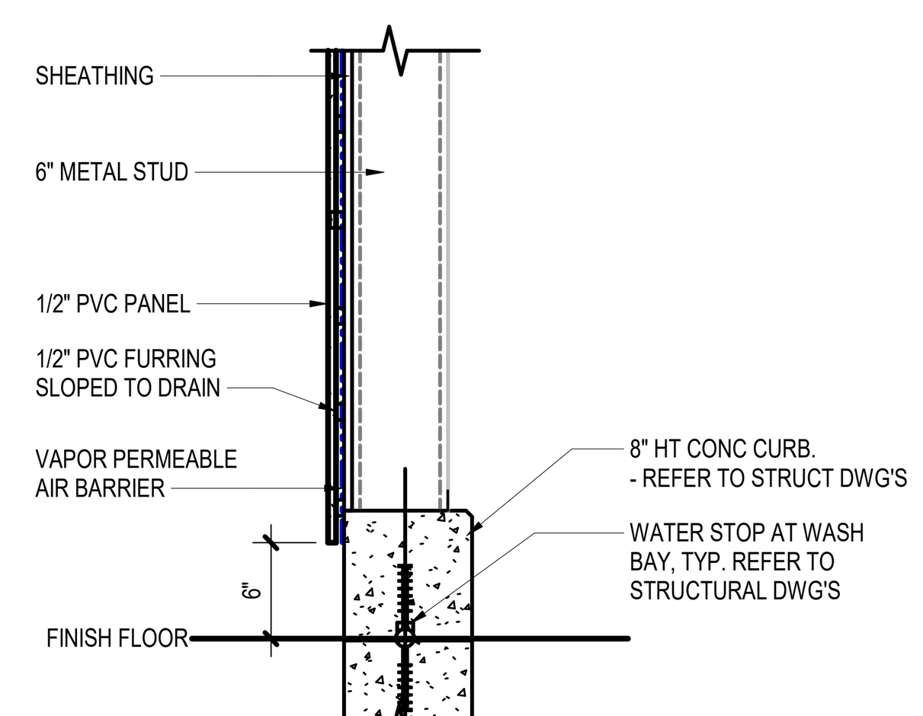


PLAN

MARK	ASSEMBLY DESCRIPTION
16	PARTITION CMU WALL

16 VEHICLE WASH BAY WALL ASSEMBLIES



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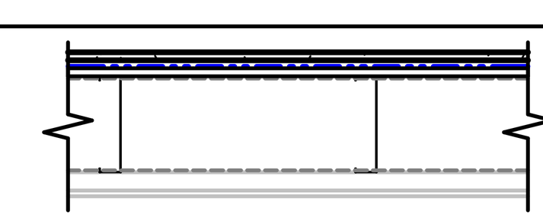
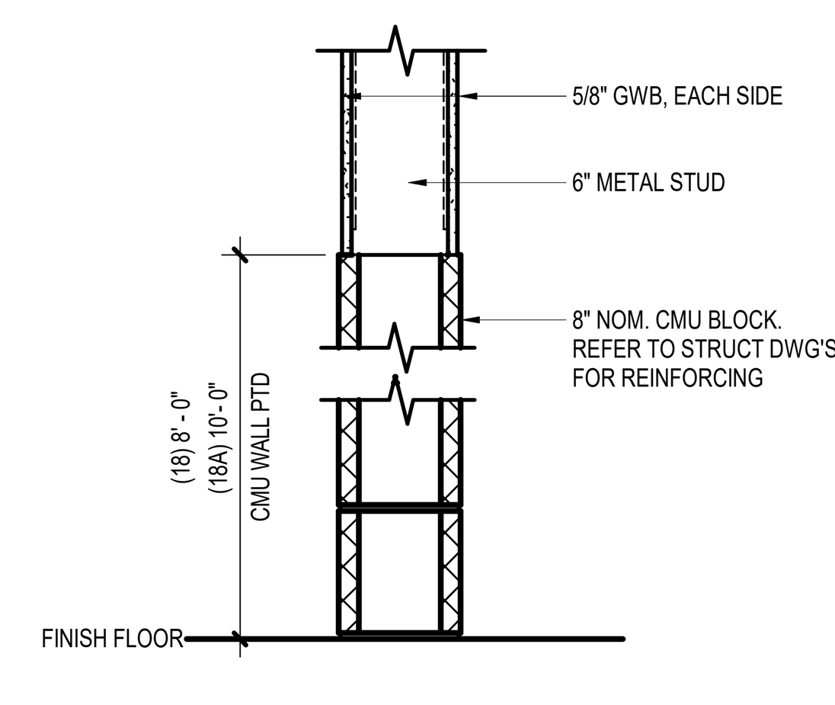


PLAN

MARK	ASSEMBLY DESCRIPTION
16A	PARTITION CMU WALL

16 VEHICLE WASH BAY WALL ASSEMBLIES



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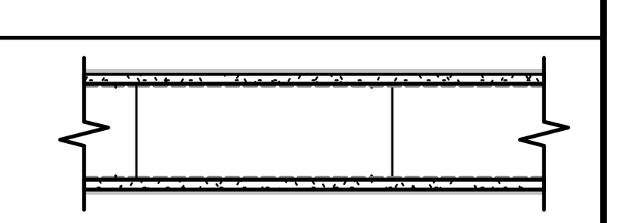

PLAN

MARK	CORE SIZE	GWB THICK	GWB HEIGHT	TOTAL PARTITION THICK	ACOUSTIC INSUL	FIRE RATING / UL DESIGN NO.
18	VARIES	5/8"	FULL HEIGHT	VARIES	NO	-
18A	VARIES	5/8"	FULL HEIGHT	VARIES	NO	-

18 STACKED PARTITION: 8" CMU / 6" METAL STUD - 1 LAYER GWB - BOTH SIDES

0' 6" 1' 2'
SCALE: 1" = 1'-0"

Project:
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W&S Project No.:	ENG24-1552
W&S File No.:	XXX

Drawing Title:
PARTITION TYPES & EXTERIOR WALL ASSEMBLIES

Sheet Number:
A031

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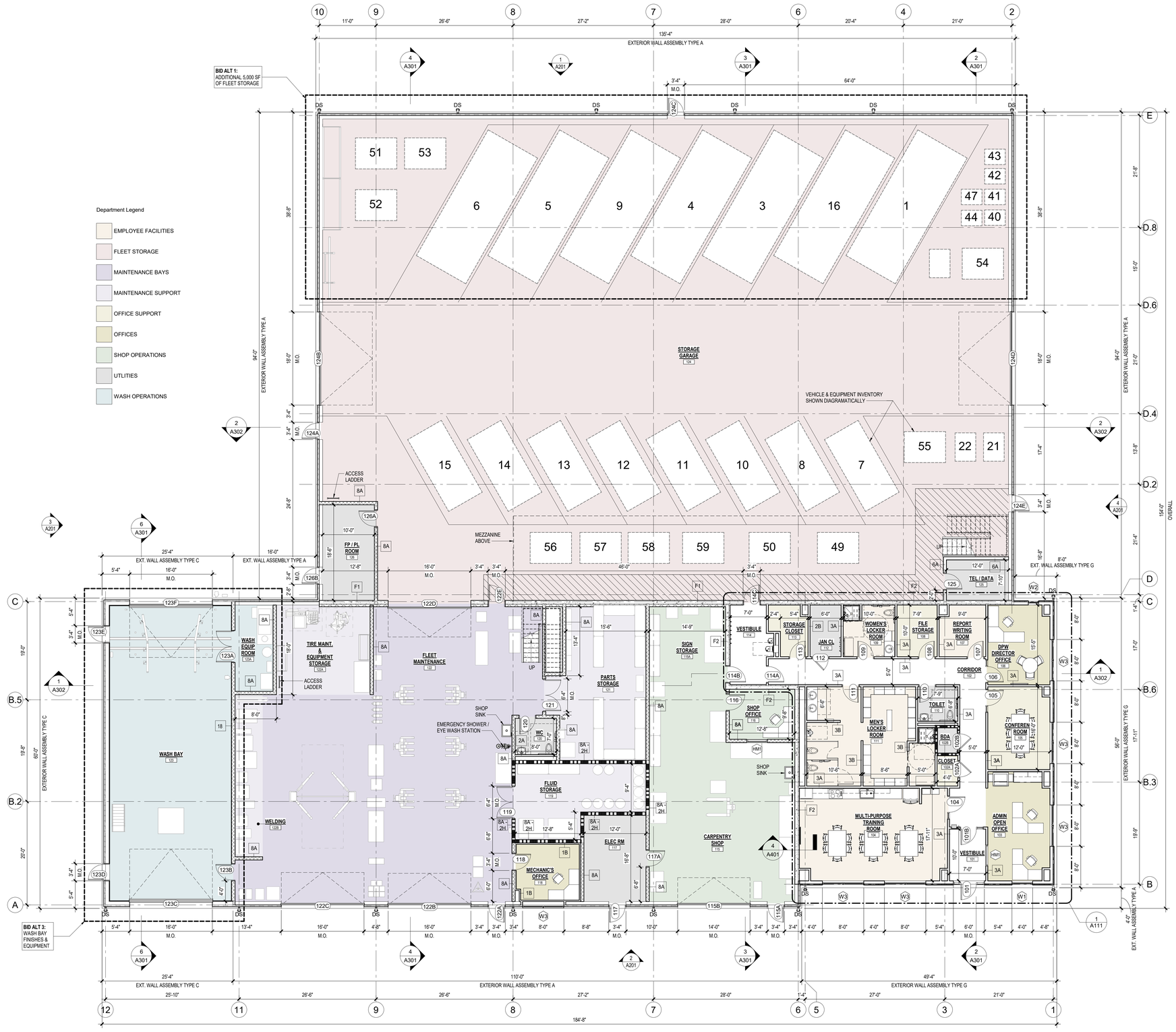


1 FIRST FLOOR PLAN
1/8" = 1'-0"

Department Legend

- EMPLOYEE FACILITIES
- FLEET STORAGE
- MAINTENANCE BAYS
- MAINTENANCE SUPPORT
- OFFICE SUPPORT
- OFFICES
- SHOP OPERATIONS
- UTLITIES
- WASH OPERATIONS

FLOOR PLAN GENERAL NOTES:

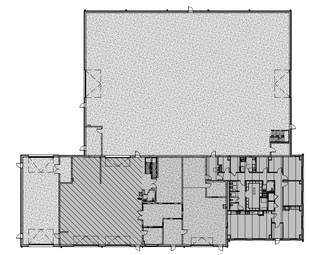
1. EQUIPMENT SHOWN FOR REFERENCE ONLY. SEE EQ DRAWINGS FOR MORE INFO.
2. FURNITURE SHOWN FOR INFORMATION ONLY (N.I.C.). SEE FURNITURE PLAN A921 FOR MORE INFO.
3. F.E. = FIRE EXTINGUISHER.
   F.E.C = FIRE EXTINGUISHER CABINET
   - BRACKET MOUNTED
   - CABINET MOUNTED (SEMI-RECESSED)
4. ALL INTERIOR DIMENSIONS ARE TAKEN FROM FACE OF GYPSUM WALL BOARD TO FACE OF GYPSUM WALL BOARD OR FACE OF CMU UNLESS SPECIFICALLY NOTED OTHERWISE.
5. SEE SHEET A012 FOR PLUMBING FIXTURE SCHEDULE / MOUNTING HEIGHTS.
6. BOLLARDS:
   - EB: EXTERIOR BOLLARD, 6" DIAMETER (SEE CIVIL DWGS)
   - IB: INTERIOR BOLLARD, 6" DIAMETER (SEE DETAIL X / AXXX)
7. FUME SEPARATION PARTITION, SEE A031 - FUME SEPARATION ASSEMBLY, TYPE F1 AND F2.
8. BOX-OUT DIMENSIONS AT STRUCTURAL COLUMNS ARE APPROXIMATE. GENERAL CONTRACTOR TO INSTALL TIGHT TO STRUCTURE, TYPICAL.
9. NOT ALL TV / MONITOR LOCATIONS ARE SHOWN. COORDINATE PROPOSED LOCATIONS WITH ELECTRICAL &TELECOMMUNICATIONS DRAWINGS. PROVIDE BLOCKING AT EACH LOCATION ACCORDINGLY.
10. CG — CORNER GUARD, SEE A901 FOR LOCATIONS.

UNDERSLAB RIGID INSULATION LEGEND:

a) R-15 RIGID INSULATION (AT ALL VERTICAL INSTALLATIONS)
R-5 RIGID INSULATION (HORIZONTAL AT ADMINISTRATION AREA)
- STANDARD COMPRESSIVE STRENGTH (25 PSI)
- COMPLETELY UNDER ENTIRE SLAB
- 2'-0" MIN. VERTICAL DOWN ON EXTERIOR AND INTERIOR SIDES OF FOUNDATION WALL

b) R-15 RIGID INSULATION (VEH. MAINTENANCE)
- HIGH COMPRESSIVE STRENGTH (60 PSI)
- COMPLETELY UNDER ENTIRE SLAB
- VERTICAL ON EXTERIOR SIDE OF FOUNDATION WALL (25 PSI)

c) R-15 RIGID INSULATION (AT ALL VERTICAL INSTALLATIONS)
R-5 RIGID INSULATION (HORIZONTAL AT VEH. STORAGE, WASHBAY, SHOPS)
- HIGH COMPRESSIVE STRENGTH (60 PSI)
- COMPLETELY UNDER ENTIRE SLAB
- 2'-0" MIN. VERTICAL DOWN ON EXTERIOR AND INTERIOR SIDES OF FOUNDATION WALL



2 UNDERSLAB RIGID INSULATION LOCATIONS
1" = 40'-0"

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Drawing Title:

OVERALL FLOOR PLAN

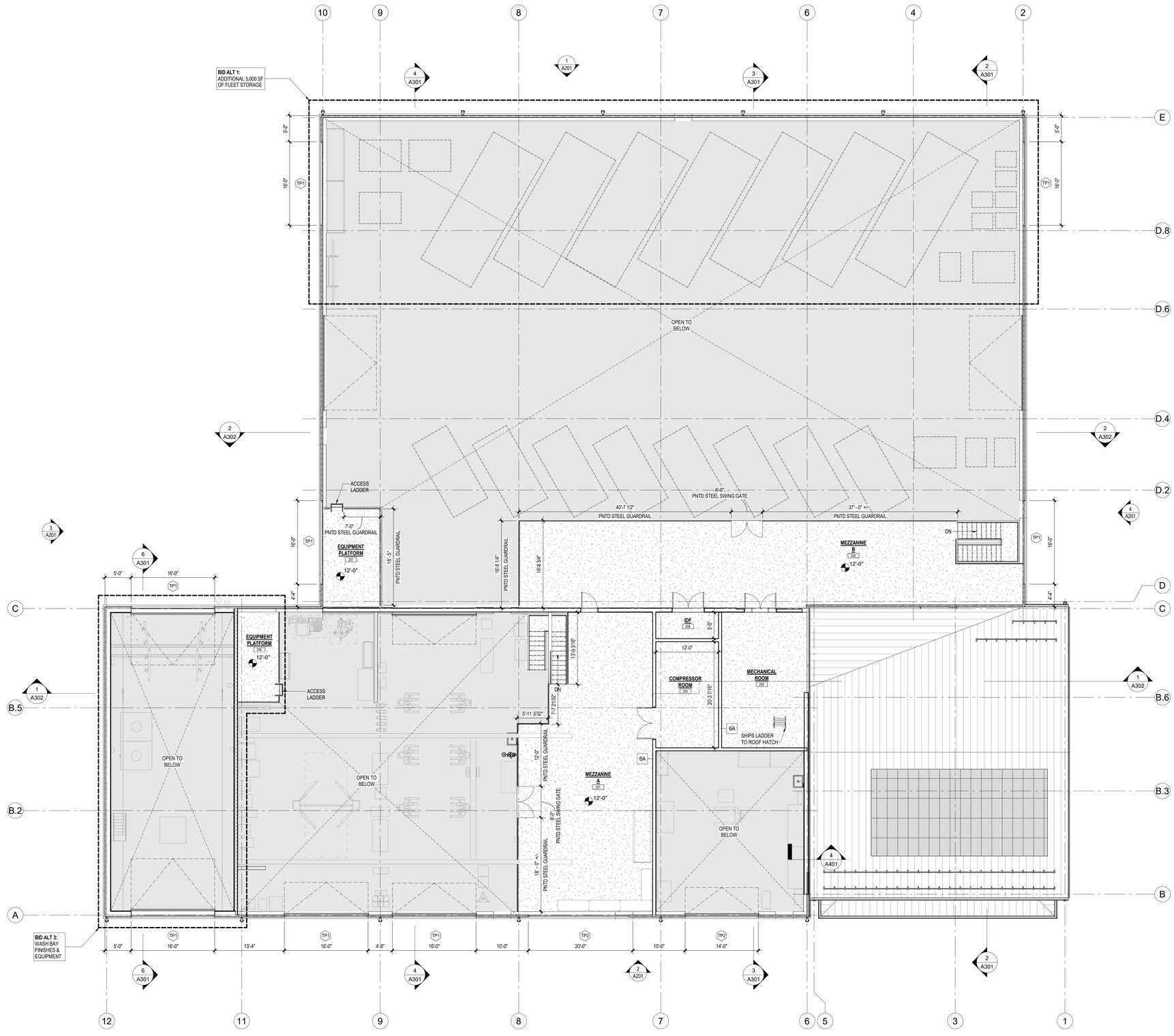
Sheet Number:

A101

0' 4' 8' 16'
SCALE: 1/8" = 1'-0"

MEZZANINE GENERAL NOTES:

1. AT EACH MEZZANINE SWING GATE LOCATION, PROVIDE 4" H (RED) LETTER SIGNAGE AT MEZZANINE FASCIA TO READ: 200LBS/SF MAXIMUM MEZZANINE LOADING
2. PROVIDE SAFETY CHAIN PER OSHA STANDARDS AT EACH SWING GATE.
3. PROVIDE SAFETY YELLOW PAINT AT MEZZANINE FLOOR AT EACH SWING GATE, AS INDICATED.
4. COORDINATE EXACT LOCATION WITH MECHANICAL, STRUCTURAL AND EQUIPMENT REQUIREMENTS.
5. DO NOT RUN ANY UTILITIES BELOW GATES EXPOSED AND MOUNTED TO WALLS.
6. PROVIDE TIE-OFF POINT FOR OSHA FALL ARREST SYSTEM NEAR MEZZANINE SWING-GATE ON PRIMARY STRUCTURAL ELEMENT.



1 MEZZANINE PLAN
1/8" = 1'-0"

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

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W&S Project No.: ENG24-1552
W&S File No.: XXX

Drawing Title:

OVERALL MEZZANINE PLAN

Sheet Number:

A102

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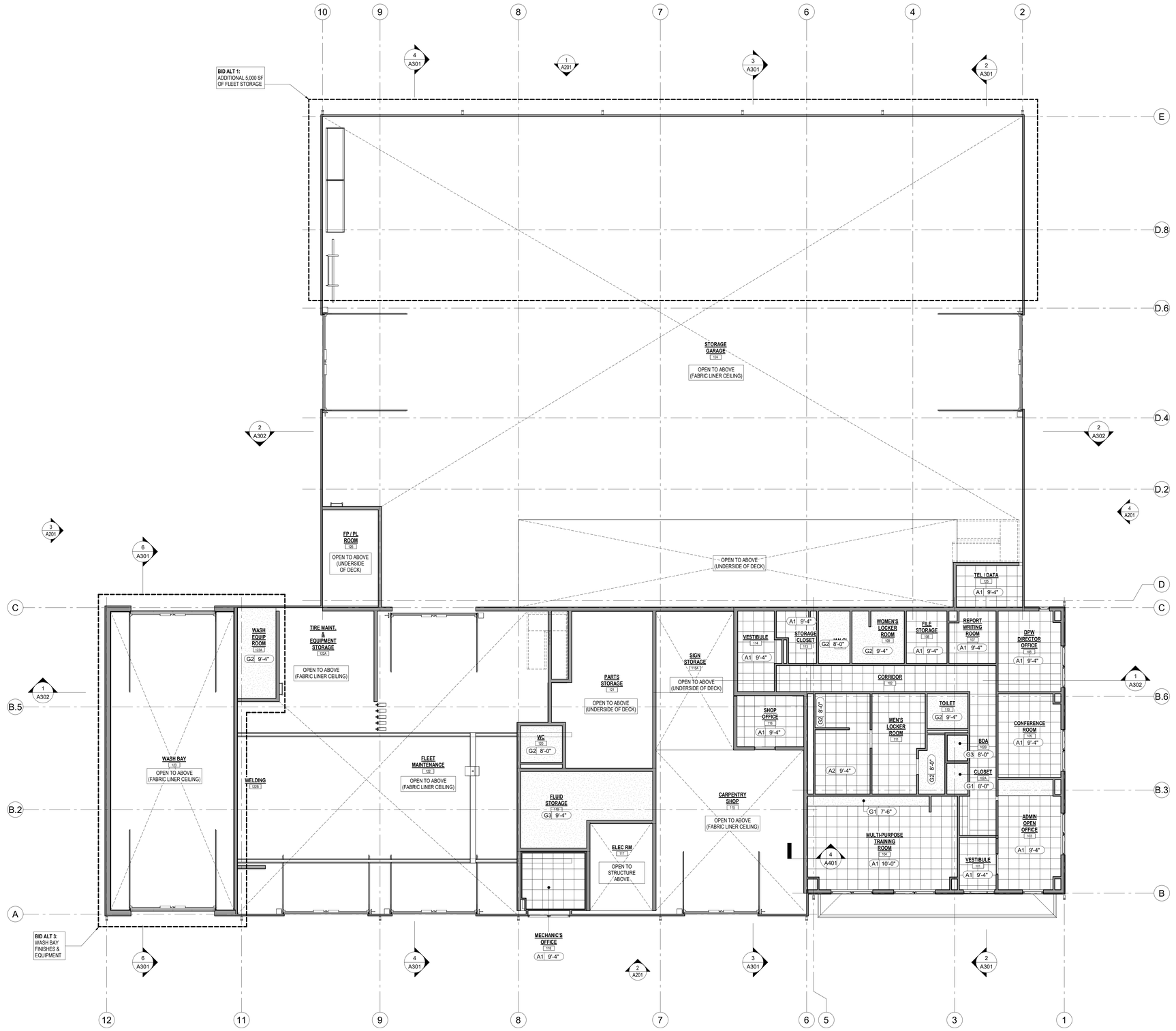

1 FIRST FLOOR RCP
1/8" = 1'-0"

0' 4' 8' 16'
SCALE: 1/8" = 1'-0"

REFLECTED CEILING PLAN NOTES:

1. REFER TO M.E.P / F.P. DRAWINGS FOR LOCATION OF LIGHT FIXTURES, SPRINKLER HEADS, SUPPLIES, RETURNS AND ADDITIONAL CEILING INFORMATION.
2. ALL DIFFUSERS, SPRINKLER HEADS, ETC. AT ACT AREAS TO BE CENTERED ON TILE.
3. SUSPENDED ACT AT 9'-4" AFF UNLESS NOTED OTHERWISE (U.N.O.)
4. ALL GWB CEILINGS AND SOFFITS AT 9'-4" AFF (U.N.O.)
5. COORDINATE QUANTITY AND LOCATION OF LIGHT FIXTURES WITH ELECTRICAL DRAWINGS.
6. LIGHT FIXTURE SYMBOLS ON REFLECTED CEILING PLANS ARE DIAGRAMMATIC FOR REFERENCE ONLY. REFER TO ELECTRICAL DRAWINGS FOR TYPE OF LIGHT FIXTURES. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR QUANTITY OF LIGHT FIXTURES AS INDICATED ON THE ELECTRICAL DRAWINGS.
7. FOR CEILING HEIGHTS AND TYPES, REFER TO REFLECTED CEILING PLAN DRAWINGS.
8. NO SUSPENDED LOADS SHALL BE SUPPORTED BY THE ROOF DECK. THIS INCLUDES PIPING, DUCTWORK, MECHANICAL EQUIPMENT, STAGE RIGGING, CEILING, ETC. ALL STEEL FRAMING MEMBERS PREFERABLY UTILIZING A SYSTEM OF UNISTRUTS, BEAM CLAMPS, AND THREADED RODS. ALL ATTACHMENT DEVICES SHALL BE SUBMITTED FOR REVIEW AND ARE SUBJECT TO APPROVAL OF THE DESIGNER.
9. COORDINATE QUANTITY AND LOCATION FOR EXIT SIGNS WITH ELECTRICAL DRAWINGS.
10. COORDINATE QUANTITY AND LOCATION OF SPRINKLERS WITH FIRE PROTECTION DRAWINGS.

REFLECTED CEILING PLAN LEGEND:

CEILING TYPES:

- **TYPE A1**: 2' x 2' SUSPENDED ACOUSTICAL PANEL
- **TYPE A2**: 2' x 2' SUSPENDED ACOUSTICAL PANEL - MOISTURE RESISTANT
- **TYPE G1**: GYPSUM BOARD CEILING
- **TYPE G2**: GYPSUM BOARD CEILING - MOISTURE RESISTANT
- **TYPE G3**: 2-HR FIRE RATED CEILING UL DESIGN NO. U415

- XX — SOFFIT DETAIL - REFER TO CEILING SERIES
- TYPE / A | X'-X" / HEIGHT — CEILING TAG
- LIGHT FIXTURES
- SURFACE MTD. LIGHT FIXTURE
- TRACK LIGHTING
- SUPPLY DIFFUSER - REF: MECH DWGS
- RETURN VENT - REF: MECH DWGS
- EXHAUST VENT - REF: MECH DWGS
- CLG. MTD. / EXTERIOR SECURITY CAMERA
- R.H. — RADIANT HEATER
- C.U.H. — CABINET UNIT HEATER
- U.H. — UNIT HEATER
- EXIT SIGN
- MOTION DETECTOR
- SD — SMOKE DETECTOR
- OS — OCCUPANCY SENSOR
- PS — CEILING PHOTO SENSOR
- S — CEILING FLUSH MOUNTED SPEAKER
- F — FIRE ALARM SPEAKER / VISUAL SIGNAL
- F CLG — CEILING MOUNTED FIRE ALARM SPEAKER / VISUAL SIGNAL
- F — FIRE ALARM VISUAL SIGNAL
- CEILING MOUNTED SPRINKLER
- WALL MOUNTED SPRINKLER

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REFLECTED CEILING PLAN - BELOW MEZZANINE

Sheet Number:

A103

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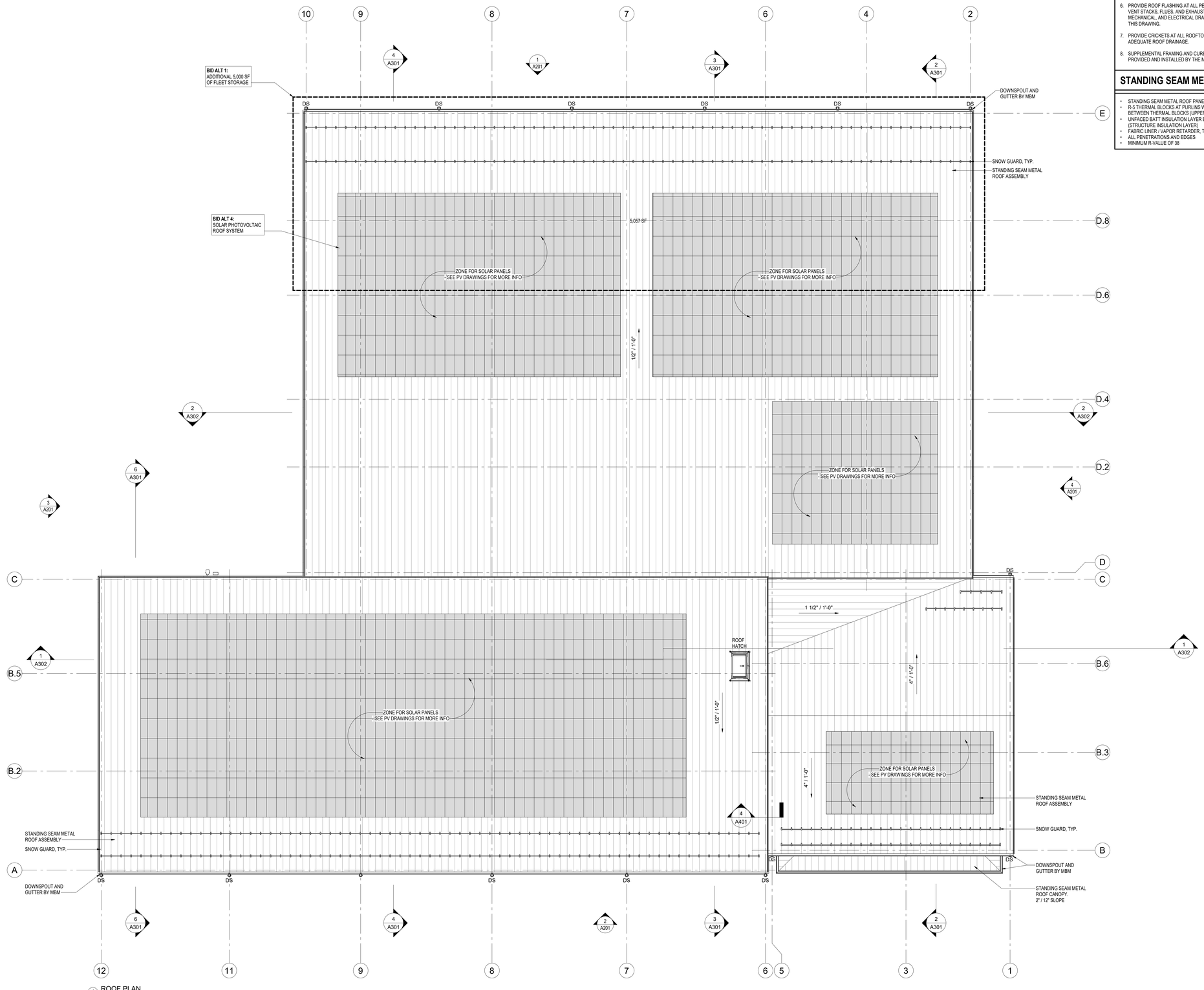
GENERAL ROOF NOTES - METAL BUILDINGS

1. REFER TO EQUIPMENT, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR ADDITIONAL ROOF PENETRATIONS AND EQUIPMENT NOT SHOWN. ANY DISCREPANCIES REGARDING LOCATION OF EQUIPMENT SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR RESOLUTION IN FIELD.
2. ROOF SLOPE VARIES
3. SEE GENERAL NOTES ON A012
4. ALL GUTTERS TO PITCH TOWARDS DOWNSPOUTS AT A MINIMUM 1/16" PER FOOT AND SUPPORTED AS PER METAL BUILDING MANUFACTURER.
5. ROOF PENETRATIONS TO BE CUT AND FLASHED BY METAL BUILDING MANUFACTURER.
6. PROVIDE ROOF FLASHING AT ALL PENETRATIONS INCLUDING BUT NOT LIMITED TO VENT STACKS, FLUES, AND EXHAUST FANS. REVIEW PLUMBING, EQUIPMENT, MECHANICAL, AND ELECTRICAL DRAWINGS FOR CONSTRUCTION NOT INDICATED ON THIS DRAWING.
7. PROVIDE CRICKETS AT ALL ROOFTOP EQUIPMENT AND PENETRATIONS TO CREATE ADEQUATE ROOF DRAINAGE.
8. SUPPLEMENTAL FRAMING AND CURBS FOR ALL ROOFTOP EQUIPMENT SHALL BE PROVIDED AND INSTALLED BY THE METAL BUILDING MANUFACTURER.

STANDING SEAM METAL ROOF ASSEMBLY (BY MBM)

- STANDING SEAM METAL ROOF PANEL
- R-5 THERMAL BLOCKS AT PURLINS W/ UNFACED BATT INSULATION BETWEEN THERMAL BLOCKS (UPPER INSULATION LAYER)
- UNFACED BATT INSULATION LAYER BETWEEN PURLINS (STRUCTURE INSULATION LAYER)
- FABRIC LINER / VAPOR RETARDER, TAPE AND SEAL
- ALL PENETRATIONS AND EDGES
- MINIMUM R-VALUE OF 38



1 ROOF PLAN
1/8" = 1'-0"

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

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

Key Plan:

NORTH

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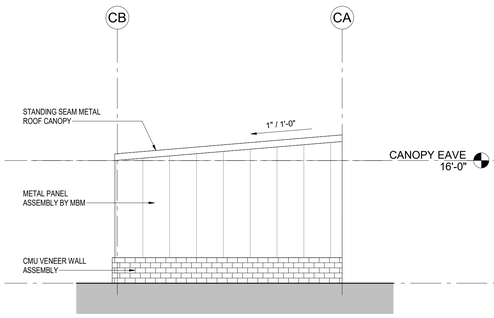
Drawing Title:

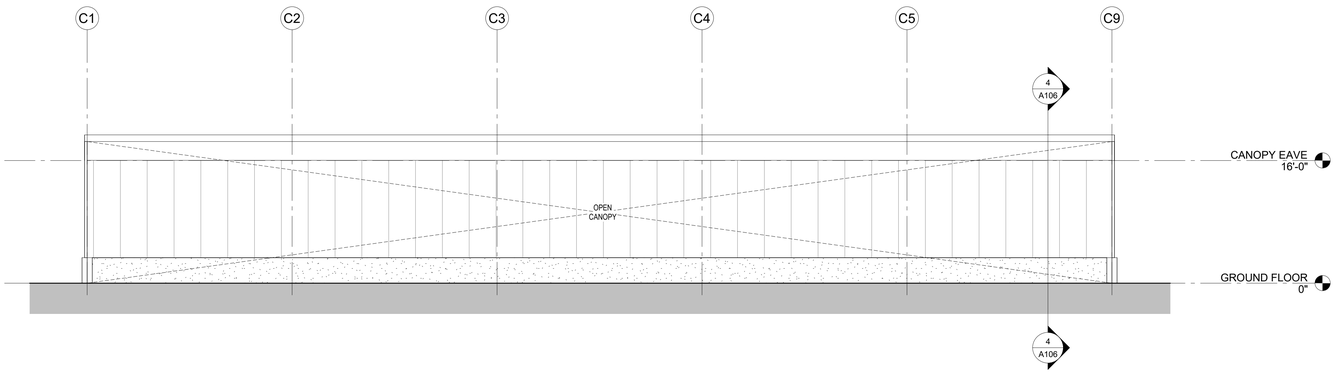
ROOF PLAN

Sheet Number:

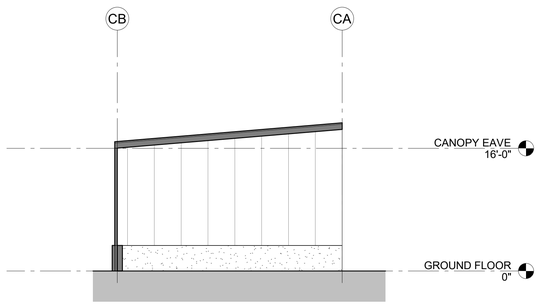
A105



6 WEST ELEVATION - STORAGE CANOPY
1/8" = 1'-0" 1/ A106



5 SOUTH ELEVATION - STORAGE CANOPY
1/8" = 1'-0" 1/ A106



4 BUILDING SECTION - STORAGE CANOPY
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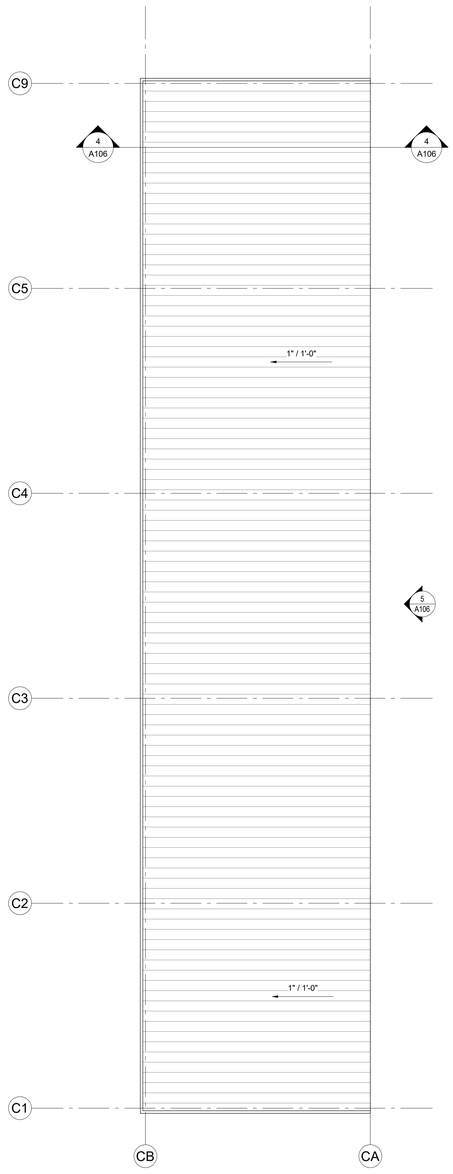
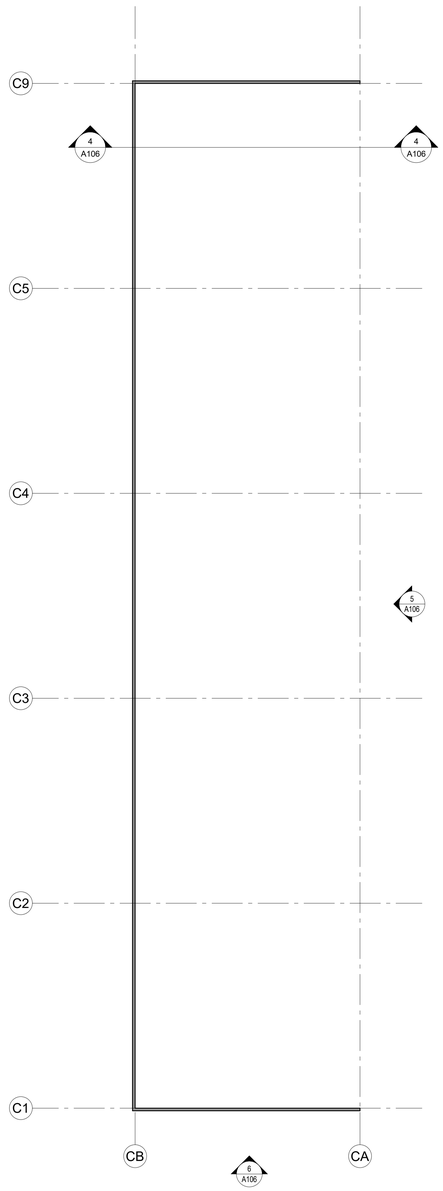
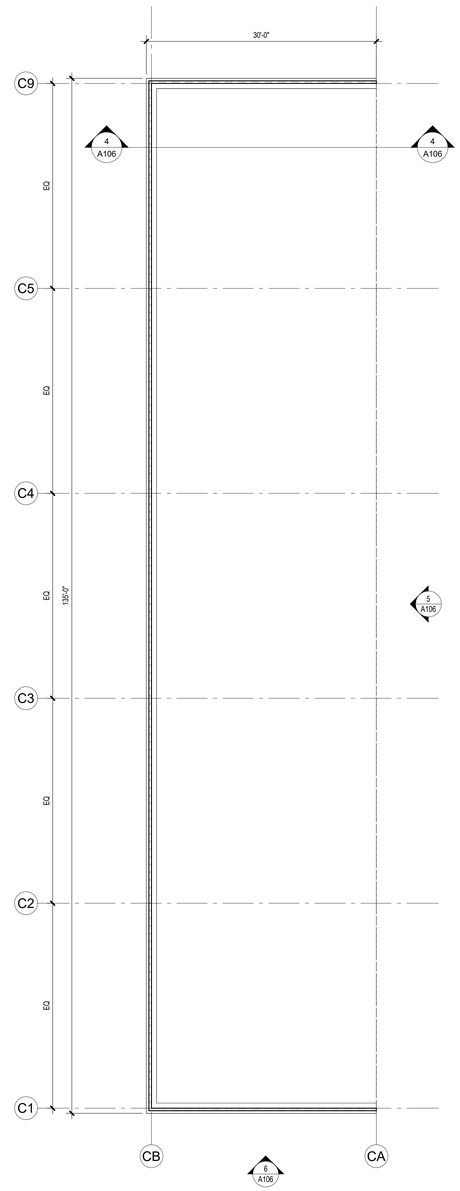


2 ROOF PLAN - STORAGE CANOPY
1/8" = 1'-0"



3 RCP - STORAGE CANOPY
1/8" = 1'-0"



1 FLOOR PLAN - STORAGE CANOPY
1/8" = 1'-0"

0' 4' 8' 16'
SCALE: 1/8" = 1'-0"

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STORAGE CANOPY PLANS & ELEVATIONS (BID ALT 2)

Sheet Number:

A106

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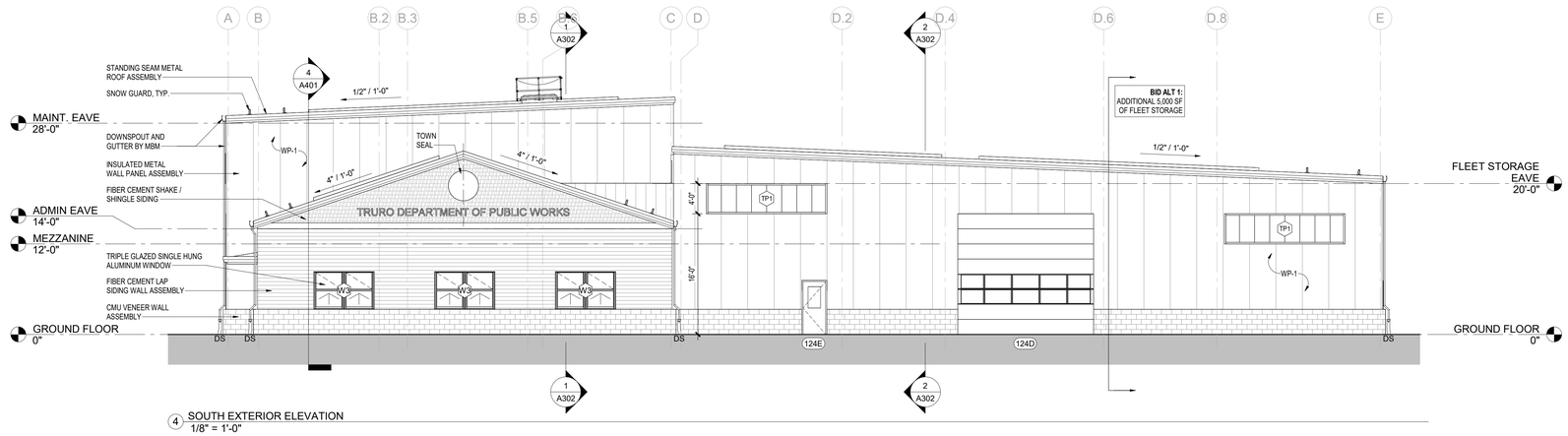
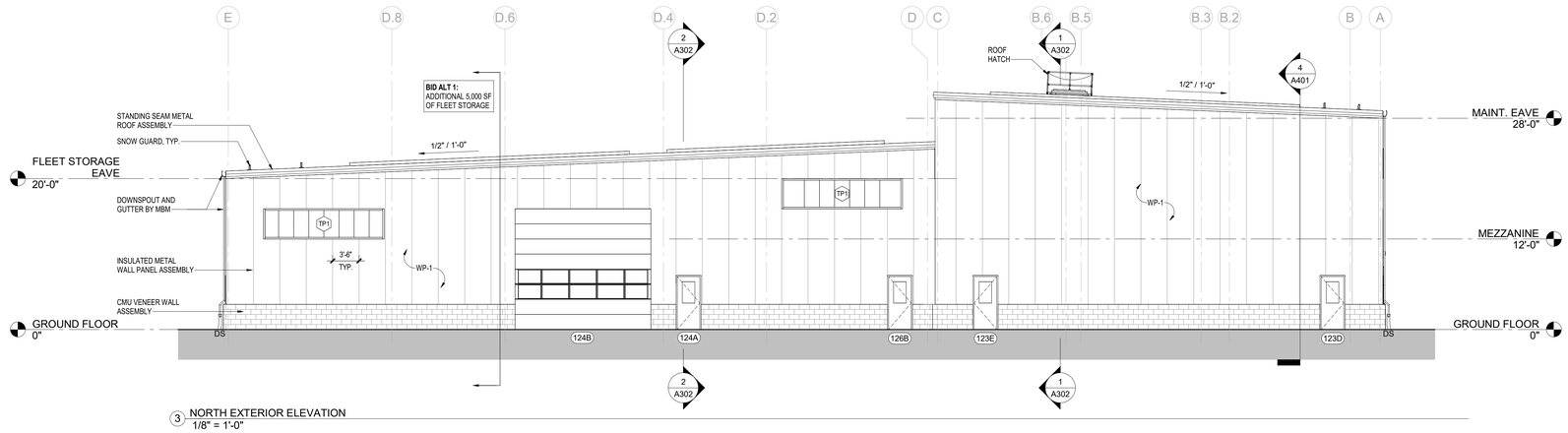
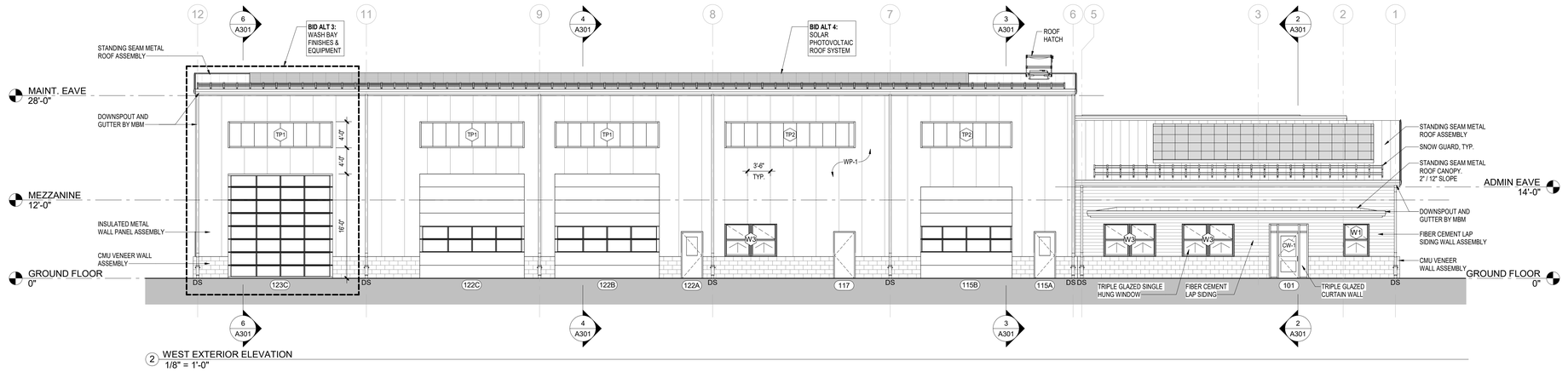


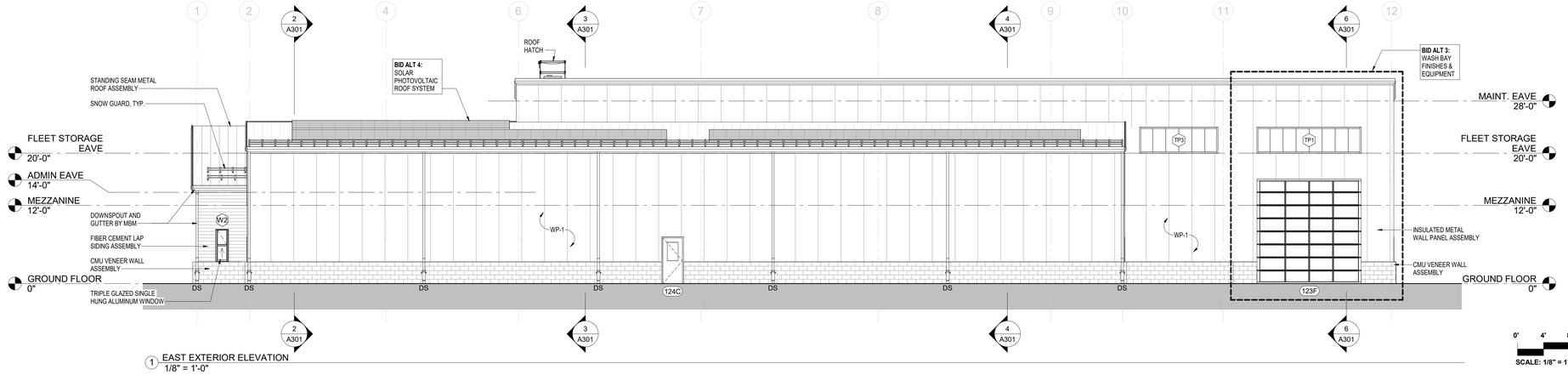
4 SOUTH EXTERIOR ELEVATION
1/8" = 1'-0"



3 NORTH EXTERIOR ELEVATION
1/8" = 1'-0"



2 WEST EXTERIOR ELEVATION
1/8" = 1'-0"



1 EAST EXTERIOR ELEVATION
1/8" = 1'-0"

0' 4' 8' 16'
SCALE: 1/8" = 1'-0"

WALL PANEL TYPES LEGEND:

EXTENTS OF WALL PANEL - WP-1, INSULATED METAL WALL PANELS

CMU VENEER LEGEND:

CONTROL JOINT LOCATION - REFER TO X / AXXX FOR ADDITIONAL INFO

TYPE 1 - STANDARD GROUND FACE MASONRY BLOCK: 8" X 16"

MINERAL FIBER CEMENT SIDING LEGEND:

FIBER CEMENT SHINGLE / SHAKE WALL PANEL SIDING

FIBER CEMENT LAP SIDING

NOTES:
1. COORDINATE OPENINGS NOT SHOWN WITH EQUIPMENT AND MEP/FP DRAWINGS.
2. FOR MOCK-UP REQUIREMENTS, SEE SPECIFICATIONS FOR ADDITIONAL INFORMATION.

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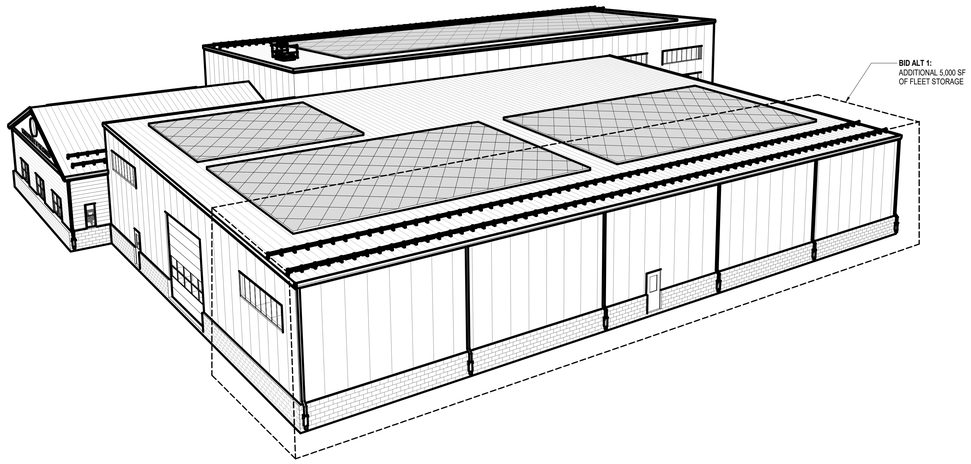
Drawing Title:

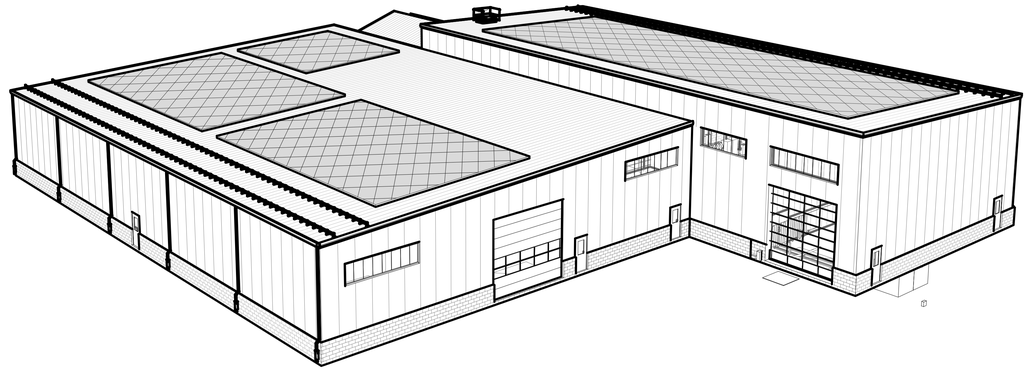
OVERALL EXTERIOR ELEVATIONS

Sheet Number:

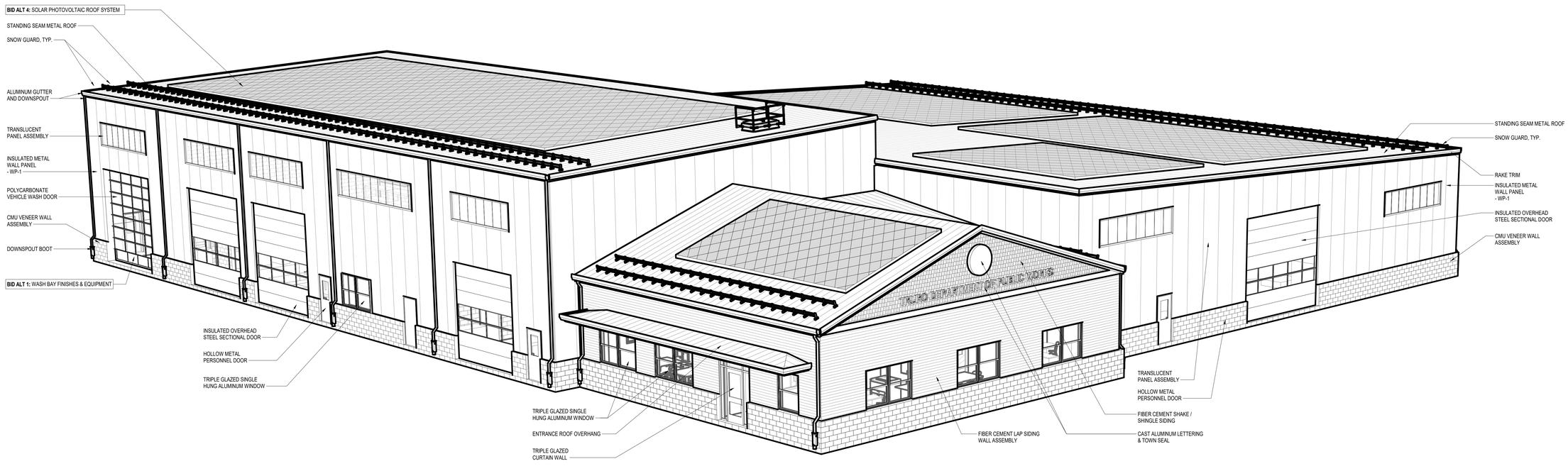
A201



3 3D VIEW C



2 3D VIEW B



1 3D VIEW A

NOTE: 3D VIEWS ARE PROVIDED FOR REFERENCE ONLY. REFER TO PLANS, ELEVATIONS, SECTIONS, DETAILS AND SCHEDULES FOR BUILDING REQUIREMENTS.

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3D VIEWS I

Sheet Number:

A231

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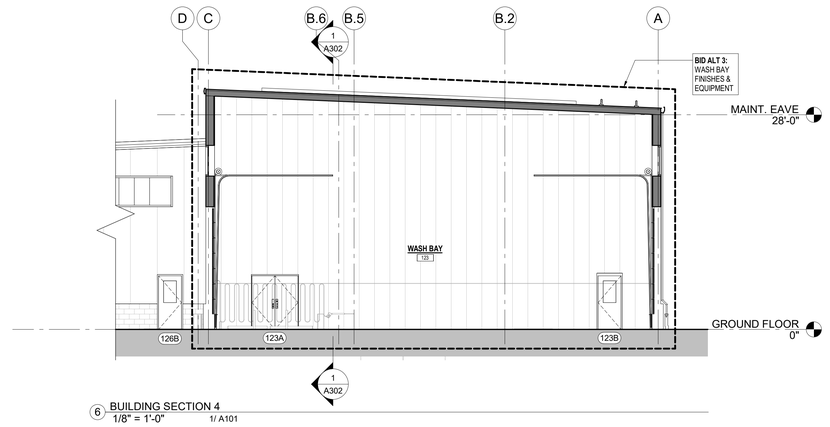
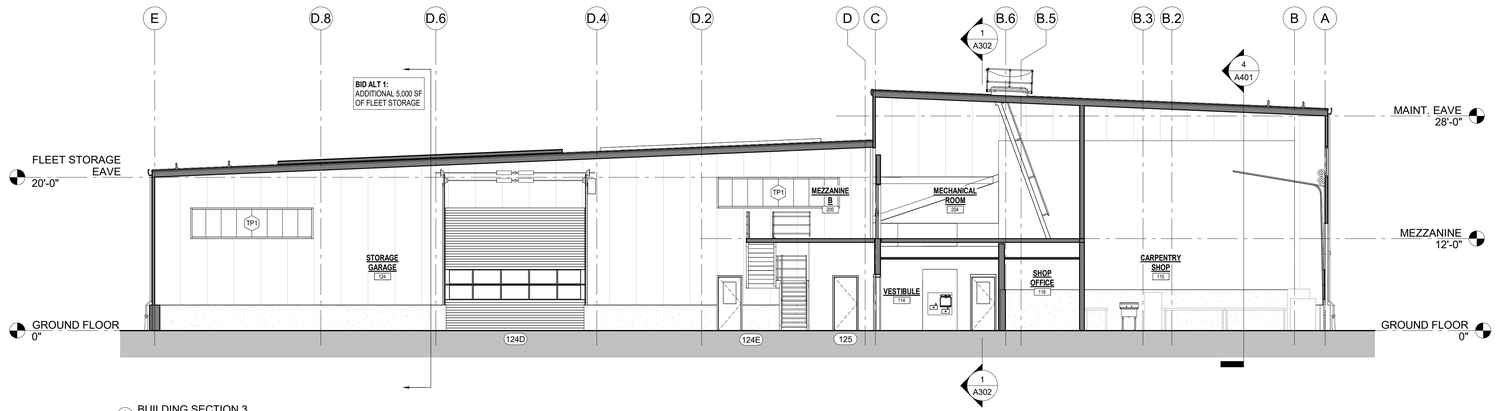
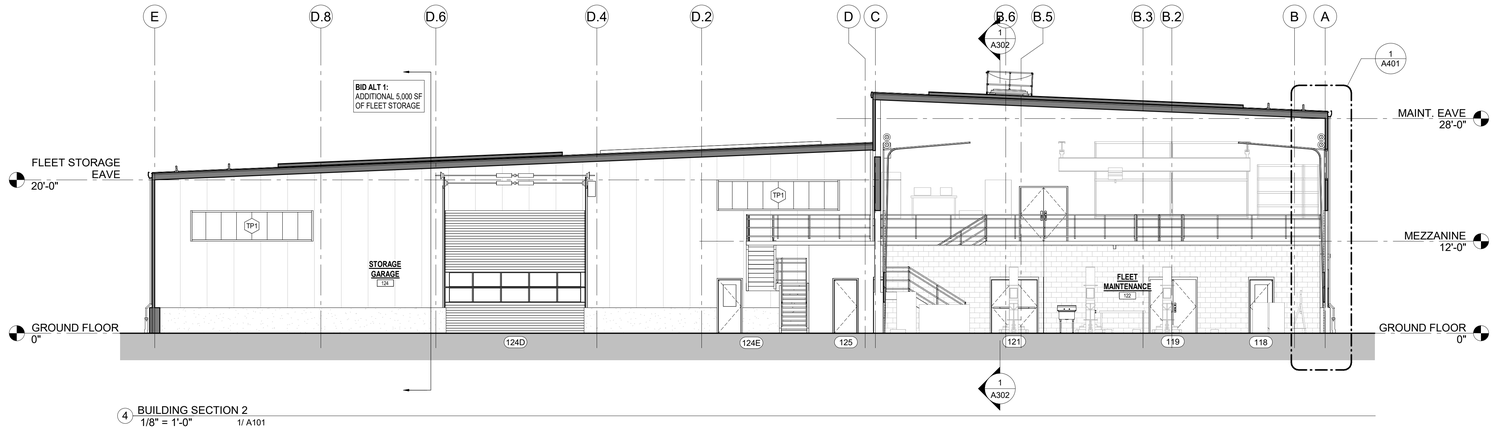


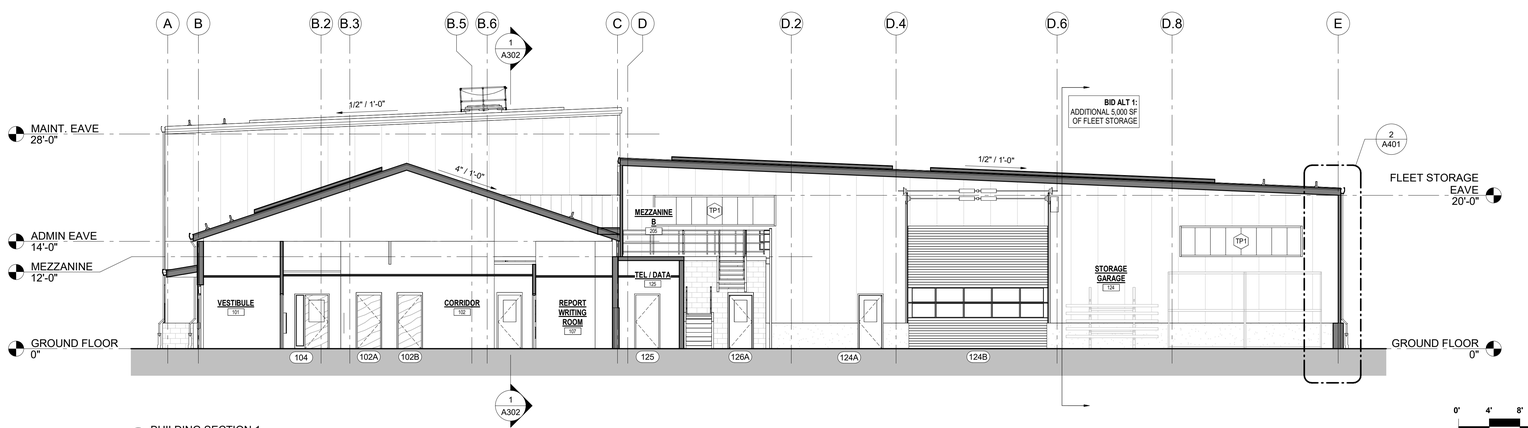
6 BUILDING SECTION 4
1/8" = 1'-0" 1/ A101



3 BUILDING SECTION 3
1/8" = 1'-0" 1/ A101



4 BUILDING SECTION 2
1/8" = 1'-0" 1/ A101



2 BUILDING SECTION 1
1/8" = 1'-0" 1/ A101

0' 4' 8' 16'
SCALE: 1/8" = 1'-0"

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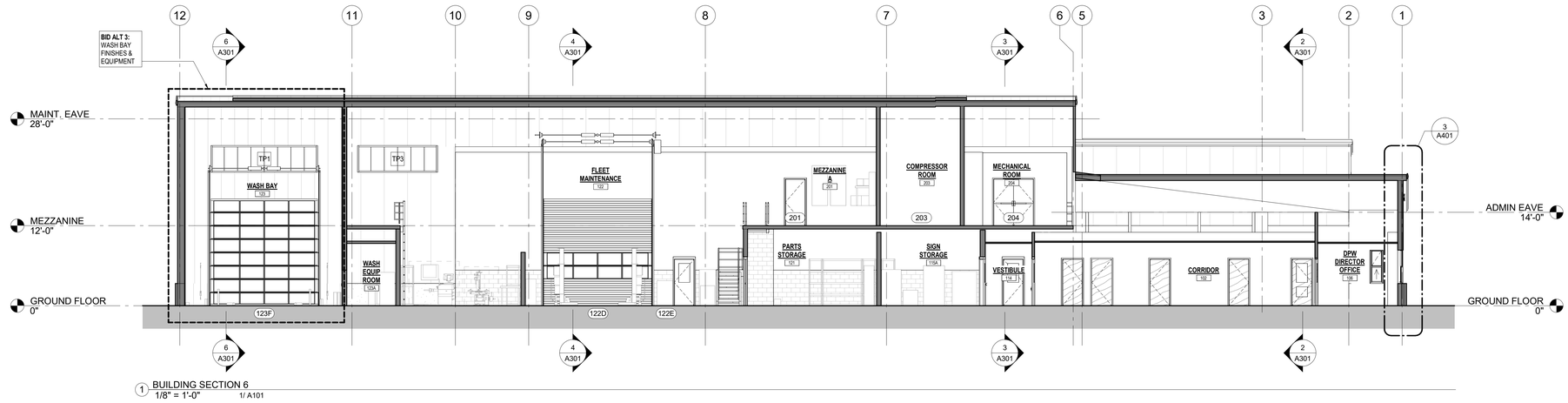
Drawing Title:

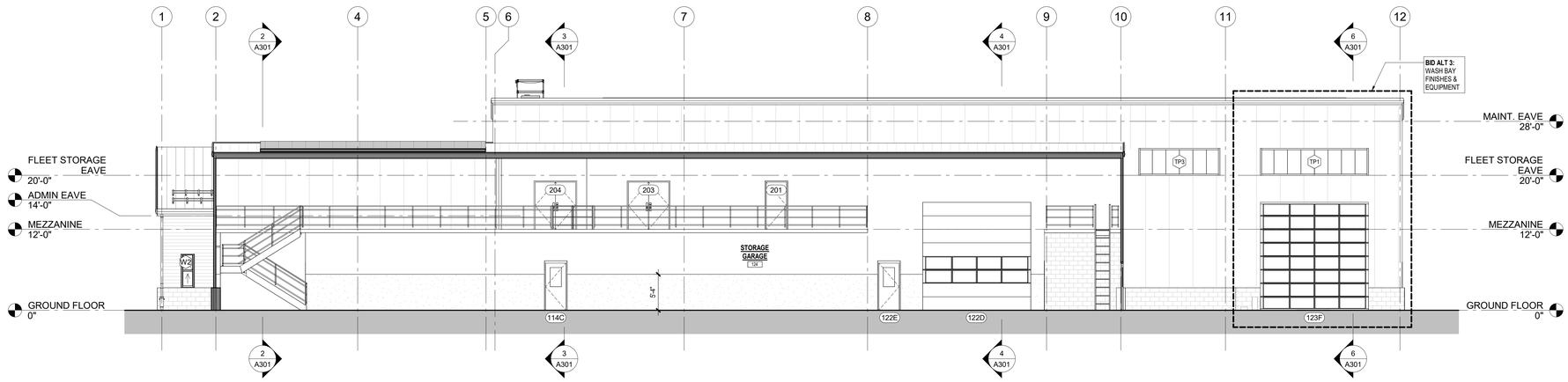
BUILDING SECTIONS I

Sheet Number:

A301



1 BUILDING SECTION 6
1/8" = 1'-0" 1/ A101



2 BUILDING SECTION 5
1/8" = 1'-0" 1/ A101

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

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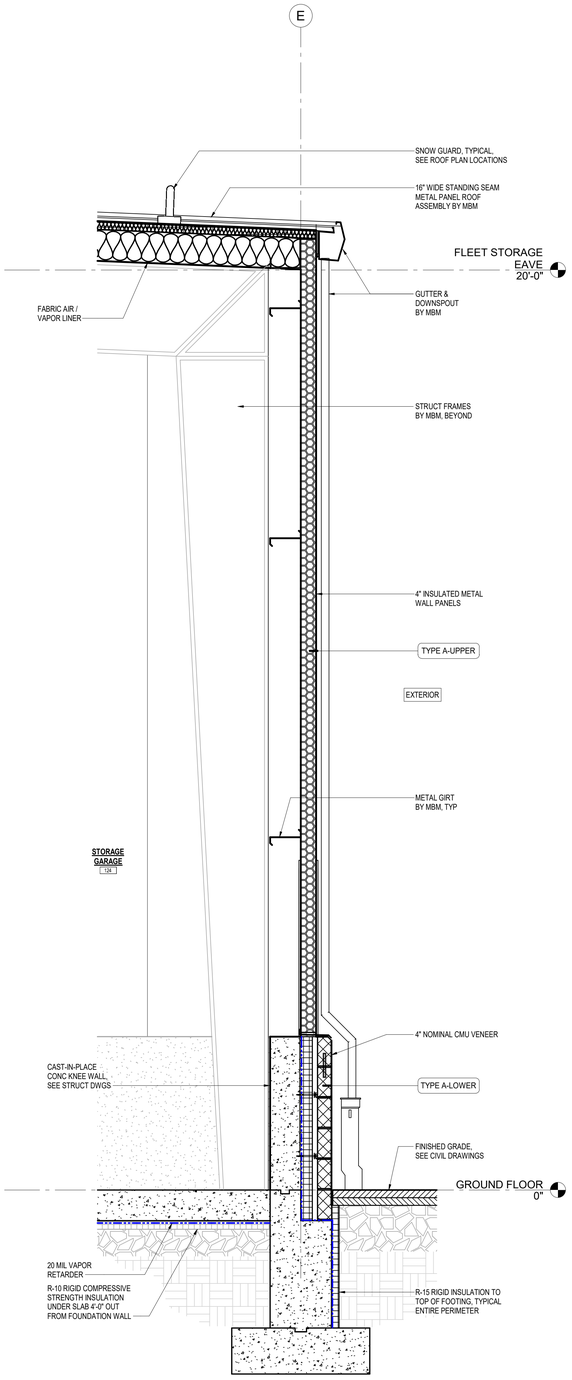
BUILDING SECTIONS II

Sheet Number:

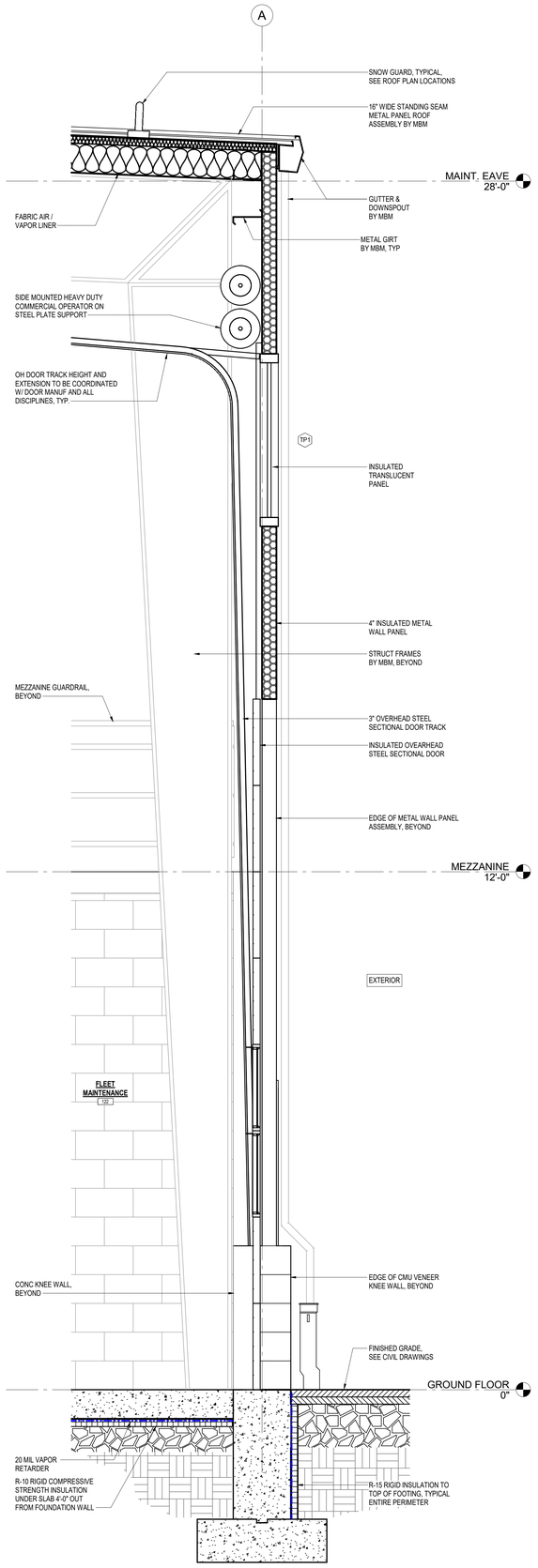
A302

TYPICAL WALL SECTION NOTES

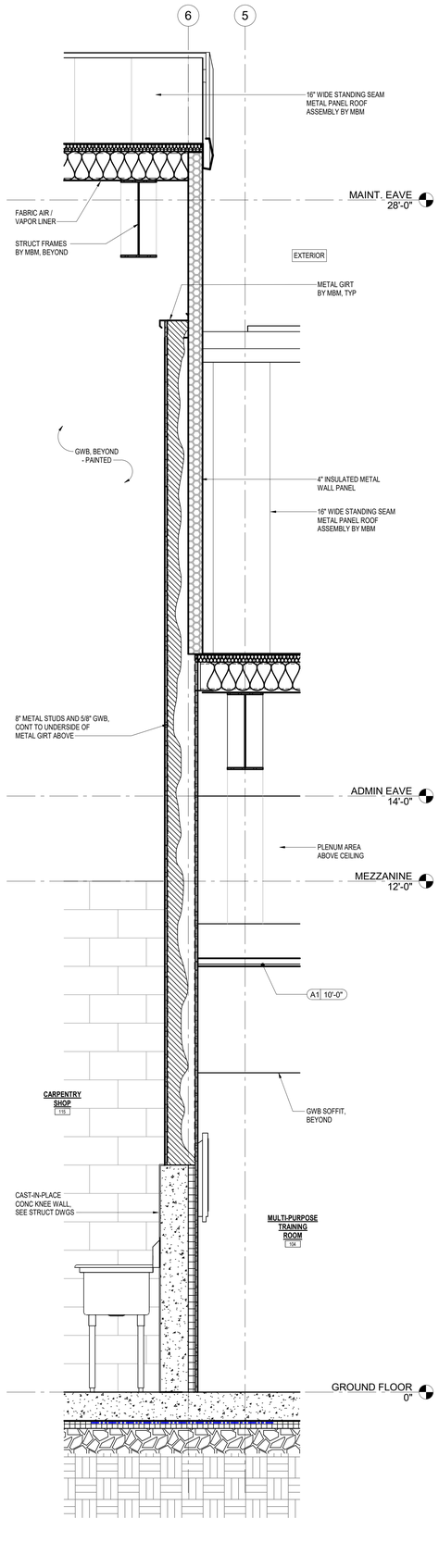
- GIRT SPACING IS SHOWN DIAGRAMATICALLY ONLY, ACTUAL SPACING WILL BE BY MBM.
- AVB SHALL BE SEALED TO ALL ROOF FABRIC AND ANY STRUCTURE OR SYSTEMS WHICH PASSES THRU THE PLANE OF THE AVB TO FORM A CONTINUOUS AIR VAPOR BARRIER BETWEEN SPACES, TYP.
- SEE A031 FOR WALL AND ROOF ASSEMBLY TYPES



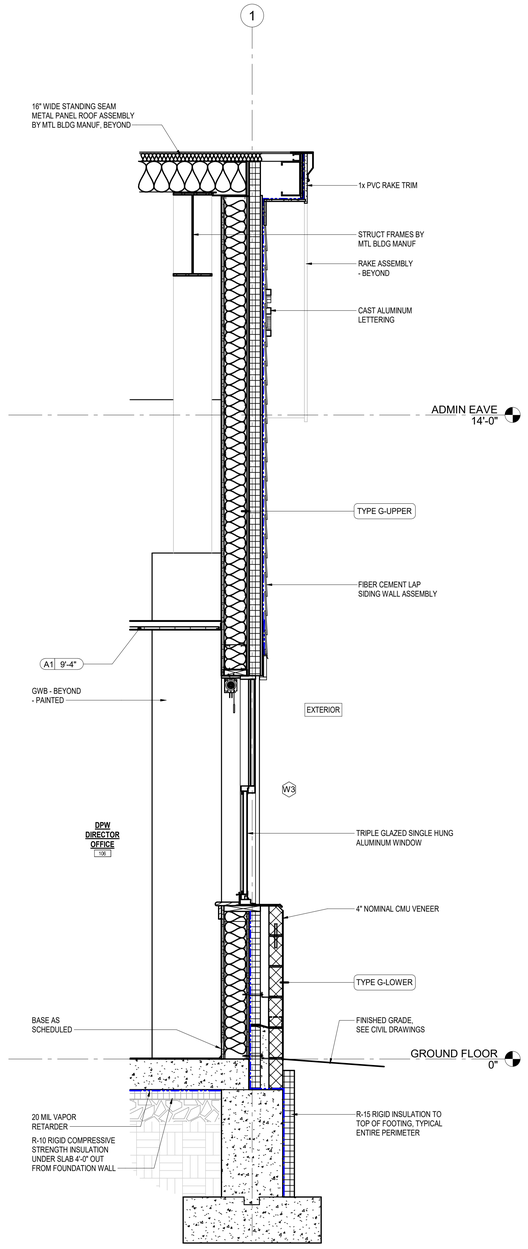
2 BUILDING SECTION 1 - Callout 1
3/4" = 1'-0" 2/ A301



1 BUILDING SECTION 2 - Callout 1
3/4" = 1'-0" 4/ A301



4 WALL SECTION - ADMIN TO SHOPS ROOF TRANSITION
3/4" = 1'-0" 1/ A101



3 BUILDING SECTION 6 - Callout 1
3/4" = 1'-0" 1/ A302

0' 1' 2' 3'
SCALE: 3/4" = 1'-0"

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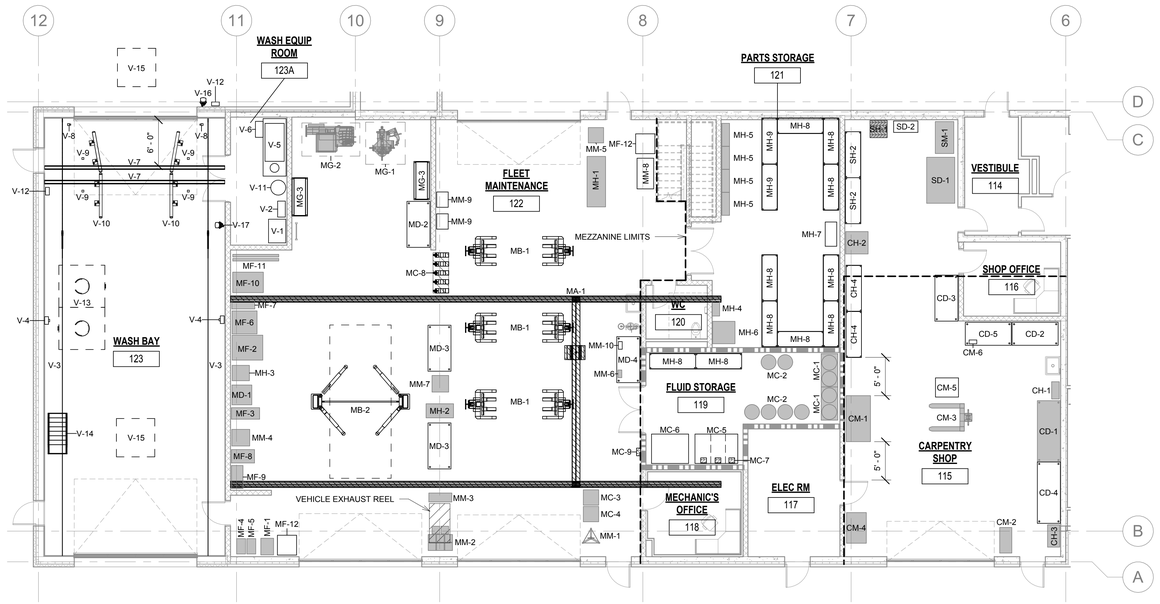
WALL SECTIONS I

Sheet Number:
A401



1 MAINTENANCE & CARPENTRY SHOP EQUIPMENT
1/8" = 1'-0"

GENERAL NOTES:

1. EQUIPMENT LAYOUTS ARE SCHEMATIC. GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING EXACT LOCATIONS WITH OWNER AND MANUFACTURER REQUIREMENTS. COORDINATE ALL UTILITY REQUIREMENTS WITH SUB-CONTRACTORS. FINAL EQUIPMENT LOCATIONS SHALL BE CONFIRMED BY THE OWNER PRIOR TO RUNNING UTILITIES AND INSTALLATION EQUIPMENT.
2. GENERAL CONTRACTOR SHALL COORDINATE UTILITY REQUIREMENTS OF EXISTING EQUIPMENT PRIOR TO INSTALLATION OF SERVICES.
3. PRIOR TO RUNNING UTILITIES, GENERAL CONTRACTOR SHALL MARK OUT ALL EQUIPMENT LOCATIONS ON THE FLOOR USING CHALK OR ANOTHER ACCEPTABLE MEANS, AND SHALL REVIEW/REVISE FINAL EQUIPMENT LOCATIONS AS DIRECTED BY THE OWNER AND THE ENGINEER.
4. FIXED LIFTS SHALL BE CENTERED IN THE MAINTENANCE BAYS AS DEFINED BY THE OVERHEAD DOOR OPENING. CONFIRM INSTALLATION LAYOUT DIMENSIONS WITH THE MANUFACTURER. ALSO SEE OWNERS MANUALS.
5. ELECTRICAL, MECHANICAL, AND PLUMBING FSBs SHALL PROVIDE AND CONNECT UTILITIES TO ALL EQUIPMENT AS SHOWN ON THE ELECTRICAL, MECHANICAL AND PLUMBING DRAWINGS AND SPECIFICATIONS, AND IN ACCORDANCE WITH THE MANUFACTURERS REQUIREMENTS IN ORDER TO PROVIDED A COMPLETE AND OPERABLE SYSTEM.
6. THE ELECTRICAL CONTRACTOR SHALL HAVE A MASSACHUSETTS LICENSED ELECTRICIAN CONFIRM THE VOLTS, PHASE, AMPS, AND NEMA PLUG CONFIGURATION FOR EACH PIECE OF EQUIPMENT (INCLUDING EXISTING EQUIPMENT TO BE RELOCATED) IN ADVANCE OF ORDERING MATERIALS AND INSTALLATION.
7. SEE SPECIFICATION SECTION 11 11 29 - FLUID DISTRIBUTION SYSTEM ALONG WITH DETAILS ON EQ103 FOR ADDITIONAL INFORMATION AND SCOPE DELINEATION FOR THE FLUID AND WASTE FLUID DISTRIBUTION SYSTEMS.

ABBREVIATIONS:

N	NEW EQUIPMENT TO BE SUPPLIED AND INSTALLED BY THE CONTRACTOR.
ERO	EXISTING EQUIPMENT TO BE RELOCATED AND INSTALLED BY THE OWNER. UTILITIES FOR ERO EQUIPMENT TO BE PROVIDED BY THE FILED SUB-BID CONTRACTORS.
ERC	EXISTING EQUIPMENT TO BE RELOCATED AND INSTALLED BY THE CONTRACTOR. UTILITIES FOR ERC EQUIPMENT TO BE PROVIDED BY THE FILED SUB-BID CONTRACTORS
NIC	NEW EQUIPMENT PROVIDED AND INSTALLED BY THE OWNER (NOT IN CONTRACT), HOWEVER UTILITIES FOR THIS EQUIPMENT SHALL BE PROVIDED BY THE FILED SUB-BID CONTRACTORS.

LINE TYPES
- MEZZANINE LIMITS
- NIC/ERO EQUIPMENT
- NEW EQUIPMENT

HATCHES
- CEILING MOUNTED
- WALL MOUNTED

Maintenance Equipment Schedule

EQ Number	Description	Count	Equipment Type	Spec Number	Notes
CD-1	Wood Workbench with Casters	1	ERO	N/A	
CD-2	Steel Work Bench (72inx36in) (14,000 Lbs Capacity)	1	N	12 40 00	
CD-3	Electric Charging Workbench	1	N	12 40 00	
CD-4	Long Wood Workbench	1	N	12 40 00	
CD-5	Heavy Duty Thick Top Workbench	1	N	12 40 00	
CH-1	Carpentry Tool Drawer	1	ERO	N/A	
CH-2	Flammable Cabinet (Green)(60-Gallons)	1	ERO	N/A	
CH-3	Flammable Cabinet (45-Gallons)	1	ERO	N/A	
CH-4	Parts Shelving (6' x 2')	2	N	12 40 00	
CM-1	Miter Saw with Stand	1	ERO	N/A	
CM-2	Saw Horse	1	ERO	N/A	
CM-3	Pallet Jack	1	ERO	N/A	
CM-4	Portable Table Saw	1	ERO	N/A	
CM-5	Portable Dust Collector	1	N	12 40 00	
CM-6	Bench Vise	1	N	12 40 00	
MA-1	5 Ton Bridge Crane	1	N	14 22 13	
MB-1	18k Mobile Column	6	N	14 45 00	
MB-2	20K 2 Post Lift	1	N	14 45 00	
MC-1	2-Drum Spill Pallet	2	ERO	N/A	
MC-2	55-Gallon Drum	10	NIC	N/A	
MC-3	Waste Oil Caddy	1	ERO	N/A	
MC-4	Grease Cart	1	ERO	N/A	
MC-5	600-Gallon Bulk Fluids Tank (300G 15W-40/180G 0W-30/120G 0W-20)	1	N	11 11 29	
MC-6	400-Gallon Waste Oil Tank	1	N	11 11 29	
MC-7	Wall Mounted Lube Pumps	3	N	11 11 29	
MC-8	Lube Reel Bank (0W-20, 0W-30, 15W-40, Electric Reel, 1/2" Air)	1	N	11 11 29	
MC-9	Fluid Storage Room Sump Alarm	1	N	11 11 29	
MD-1	Metal Worktop	1	ERO	N/A	
MD-2	Electric Charging Workbench	1	N	12 40 00	
MD-3	Steel Work Bench on Casters	2	N	12 40 00	
MD-4	Heavy Duty Thick Top Workbench	1	N	12 40 00	
MF-1	Torch Cart	1	ERO	N/A	
MF-2	Lincoln AC225 Arc Welder	1	ERO	N/A	
MF-3	Miller Millermatic 252	1	ERO	N/A	
MF-4	Metabo HPT Hammer Cart	1	ERO	N/A	
MF-5	Thermal Dynamics Welder	1	ERO	N/A	
MF-6	Lincoln Welden Power	1	ERO	N/A	
MF-7	Lincoln SP-170T Arc Welder	1	ERO	N/A	
MF-8	Drill Press	1	ERO	N/A	
MF-9	Shop Press	1	ERO	N/A	
MF-10	Portable Weld Fume Extractor	1	NIC	N/A	
MF-11	Welding Screen	2	NIC	N/A	
MF-12	Oxygen/Acetylene Tank Storage Cage	2	N	12 40 00	
MG-1	Tire Changer	1	ERO	N/A	
MG-2	Tire Balancer	1	ERO	N/A	
MG-3	Tire Storage Rack	2	N	12 40 00	
MH-1	Snap-on Tool Box	1	ERO	N/A	
MH-2	MAC Tools Blue Cart	1	ERO	N/A	
MH-3	Wooden Cabinet (Glass Window)	1	ERO	N/A	
MH-4	Windshield Wiper Blade Rack	1	ERO	N/A	
MH-5	Nuts and Bolts Storage	4	ERO	N/A	
MH-6	Flammable Cabinet (60-Gallons)	1	ERO	N/A	
MH-7	Metal Cabinet	1	N	12 40 00	
MH-8	Parts Shelving (6' x 2')	10	N	12 40 00	
MH-9	Parts Shelving (6' x 2')	2	N	12 40 00	Reserved for existing sliding drawers
MM-1	Tall Jack Stand	1	ERO	N/A	
MM-2	Small Jack Stands	8	ERO	N/A	
MM-3	Floor Jack	1	ERO	N/A	
MM-4	Chop Saw on Cart	1	ERO	N/A	
MM-5	Snap-on Battery Charger	1	ERO	N/A	
MM-6	Chain Sharpener	1	ERO	N/A	
MM-7	Heated Carpet Extractor	1	ERO	N/A	
MM-8	Parts Washer	1	N	12 40 00	
MM-9	Pedestal Grinder	2	N	12 40 00	
MM-10	Bench Vise	1	N	12 40 00	
SD-1	Drafting Table	1	ERO	N/A	
SD-2	Computer Desk	1	N	12 40 00	
SH-1	Hanging Vinyl Storage	1	ERO	N/A	
SH-2	Parts Shelving (6' x 2')	2	N	12 40 00	
SM-1	Vinyl Express Printer	1	ERO	N/A	
V-1	Manual Wash Pressure Plant	1	N	11 11 26	BID ALTERNATE
V-2	Manual Wash Control Panel	1	N	11 11 26	BID ALTERNATE
V-3	Festoons	2	N	11 11 26	BID ALTERNATE
V-4	Manual Wash On/Off Switch	2	N	11 11 26	BID ALTERNATE
V-5	Undercarriage Wash Pressure Plant	1	N	11 11 26	BID ALTERNATE
V-6	Undercarriage Wash Control Panel	1	N	11 11 26	BID ALTERNATE
V-7	Automatic Undercarriage Pre-Fab Trenches	2	N	11 11 26	
V-8	Automatic Undercarriage photo Eye	2	N	11 11 26	BID ALTERNATE
V-9	Automatic Wheel Washers	1	N	11 11 26	BID ALTERNATE
V-10	Vehicle Wash Guide Rails	1	N	11 11 26	BID ALTERNATE
V-11	Vehicle Wash Soap drum	1	N	11 11 26	BID ALTERNATE
V-12	Undercarriage Wash Control Station	2	N	11 11 26	
V-13	Vehicle Wash Pre-Treatment Tank (1500gal)	1	N	11 11 26	BID ALTERNATE
V-14	Mobile Platform	1	N	11 11 26	BID ALTERNATE
V-15	Loop Detector	2	N	11 11 26	BID ALTERNATE
V-16	Vehicle Wash Entry Traffic Light	1	N	11 11 26	BID ALTERNATE
V-17	Undercarriage Wash Status Light	1	N	11 11 26	BID ALTERNATE

Project:
TRURO, MA DEPARTMENT OF PUBLIC WORKS FACILITY

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Consultants:

Revisions:

No.	Date	Description

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Key Plan:
NORTH

Date:
Draw By: NCH
Reviewed By: ZDW
Approved By:

W&S Project No.: ENG24-1552
W&S File No.: XXX

Drawing Title:
EQUIPMENT LAYOUT PLAN I

Sheet Number:
EQ101

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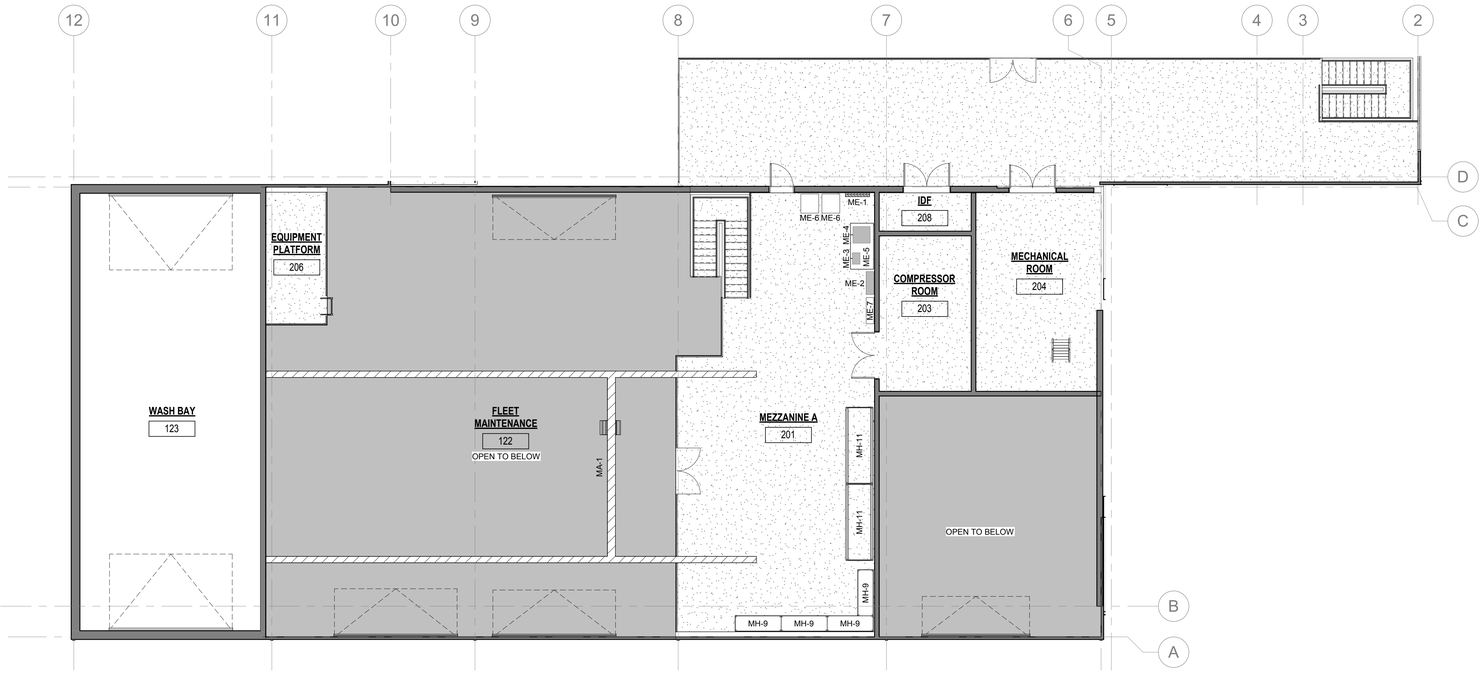
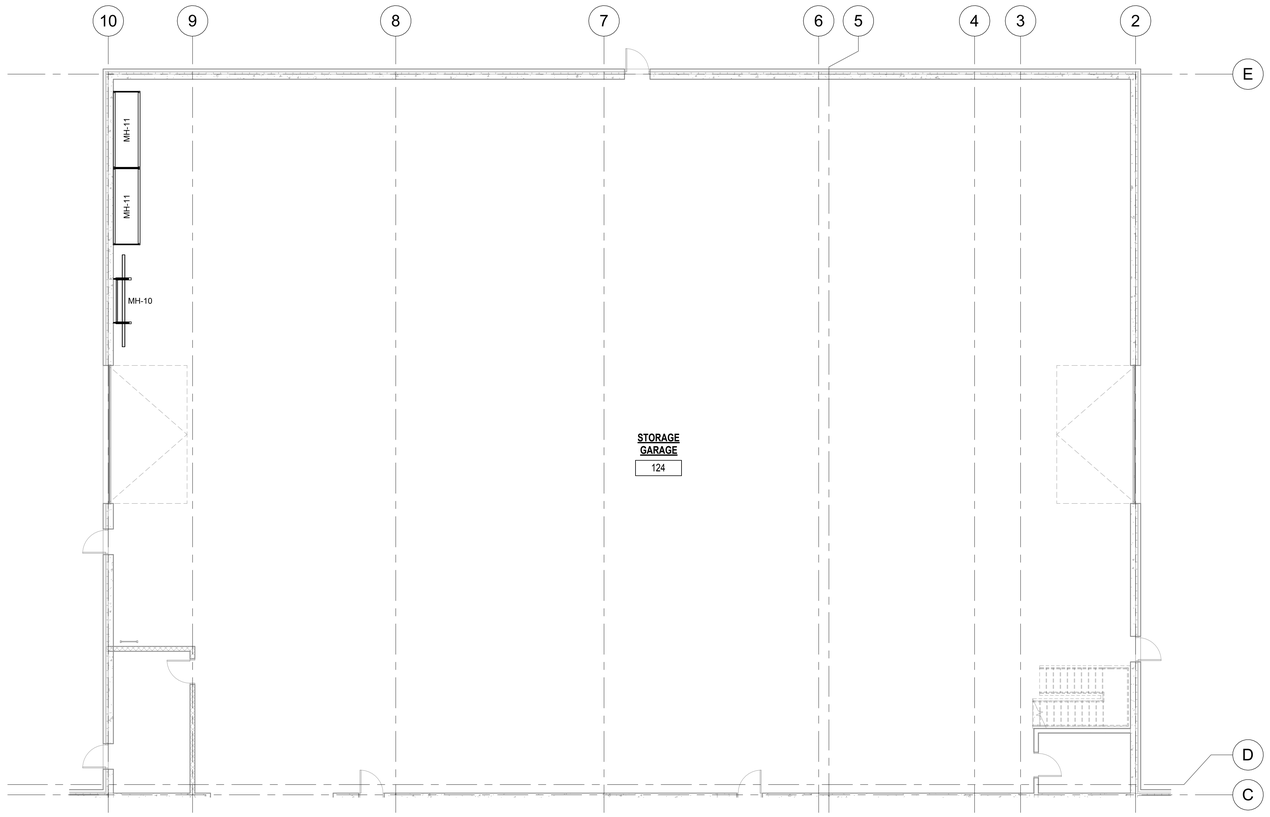


2 MEZZANINE EQUIPMENT
1/8" = 1'-0"

Mezzanine Industrial Equipment Schedule

EQ Number	Description	Count	Equipment Type	Spec Number	Notes
ME-1	Hose Clamp Rack	2	ERO	N/A	
ME-2	Hydraulic Hose Bins	1	ERO	N/A	
ME-3	Hydraulic Hose Chop Saw	1	ERO	N/A	
ME-4	Hydraulic Hose Crimper	1	ERO	N/A	
ME-5	Steel Work Bench on Casters	1	N	12 40 00	
ME-6	Hydraulic Hose Reel Rack	2	N	12 40 00	
ME-7	Hydraulic Vertical Storage Cabinet	1	N	12 40 00	
MH-9	Parts Shelving (6' x 2')	4	N	12 40 00	
MH-11	Pallet Rack Hanging Tool Storage	2	N	12 40 00	



3 FLEET STORAGE EQUIPMENT
1/8" = 1'-0"

Fleet Storage Industrial Equipment Schedule

EQ Number	Description	Count	Equipment Type	Spec Number	Notes
MH-10	Cantilever Rack (Flat)	1	N	12 40 00	
MH-11	Pallet Rack Hanging Tool Storage	2	N	12 40 00	

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Scale: AS NOTED = 1'-0"

Key Plan:
NORTH

Date:
Draw By: SMD
Reviewed By: ZDW
Approved By: Approver
W&S Project No.: ENG24-1552
W&S File No.: XXX

Drawing Title:
EQUIPMENT LAYOUT PLAN II

Sheet Number:
EQ102

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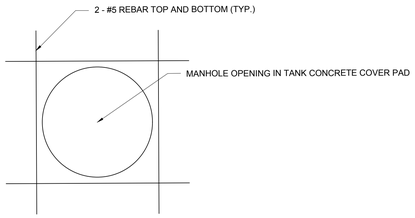
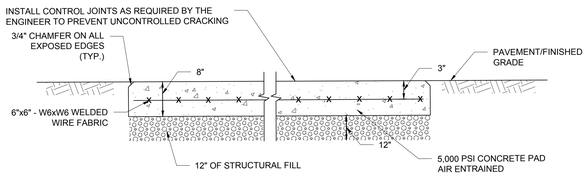


NOTE: REBAR SHALL HAVE 2"-3" OF CONCRETE COVER PER INDUSTRY STANDARDS

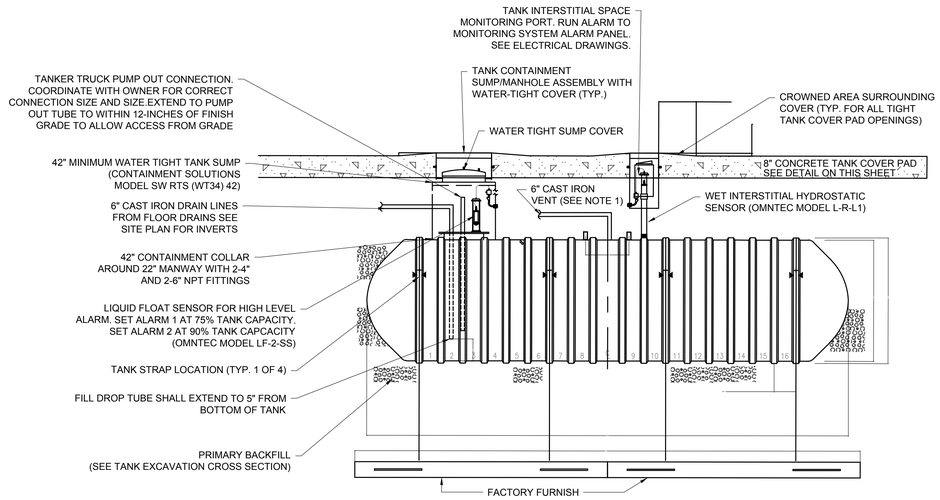
1 TIGHT TANK COVER PAD MANHOLE OPENING DETAIL
SCALE: N.T.S.

PLAN VIEW

2 TIGHT TANK COVER PAD PLAN
SCALE: N.T.S.



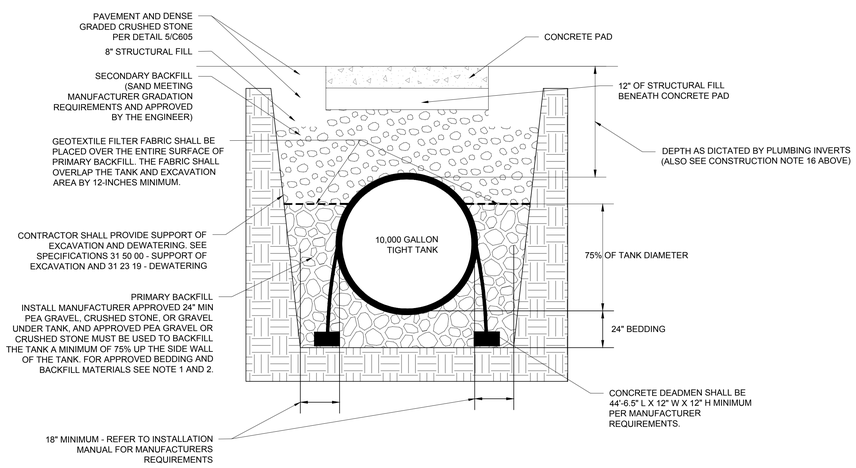
3 5,000 PSI CONCRETE TANK COVER PAD DETAIL
SCALE: N.T.S.



4 PROPOSED 10,000 GALLON DOUBLE WALL FIBERGLASS TIGHT TANK DETAIL
SCALE: N.T.S.

CONSTRUCTION NOTES:

1. TANK VENT SHALL EXTEND TO THE ADJACENT BUILDING AND BE RUN/SECURE TO INSIDE OF BUILDING UP THROUGH ROOF. VENT SHALL BE EQUIPPED WITH A VENT CAP AND INSECT SCREEN PER MANUFACTURER RECOMMENDATIONS. VENT PIPING/SYSTEM SHALL BE PROVIDED AND INSTALLED BY PLUMBING FSB.
2. STRIKE PLATES TO BE INSTALLED UNDER ALL TANK FITTINGS.
3. CONCRETE COVER PAD SHALL BE 3'-0" WIDER AND 3'-0" LONGER OVERALL THAN TANK SIZE AS SHOWN.
4. HOLD-DOWN STRAPS' QUALITY, SIZE AND LOCATION OF ANCHORS AND STRAPS AS REQUIRED BY TANK MANUFACTURER. CONCRETE HOLD-DOWN DEADMEN SHALL BE PROVIDED PER MANUFACTURER'S RECOMMENDATIONS.
5. ALL PIPING TO PITCH TOWARD THE TANK PER SPECIFICATIONS.
6. AREA TO BE RESTORED TO MATCH PROPOSED CONDITIONS.
7. ALL MANHOLE COVERS/FRAMES SHALL BE HS-20 WHEEL LOAD RATED. FRAMES SHALL BE CAST INTO CONCRETE TANK COVER PAD IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
8. OUTLINE DESCRIPTION AND DIAGRAMMATIC REPRESENTATION OF SYSTEM OPERATION AND EQUIPMENT DOES NOT LIMIT CONTRACTOR LIABILITY FOR THE INSTALLATION OF A COMPLETE AND OPERABLE SYSTEM. CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH ANY MISCELLANEOUS PARTS AND APPURTENANCES NOT SPECIFICALLY IDENTIFIED, TO MAKE A COMPLETE AND OPERABLE SYSTEM.
9. PLACE LABEL ON MANWAY COVER WITH THE WORDS "INDUSTRIAL WASTEWATER".
10. ALL SUMP OPENING COVER ASSEMBLIES IN CONCRETE COVER PAD SHALL BE WATER-TIGHT.
11. INSTALLATION OF THE TIGHT TANK SHALL FOLLOW MANUFACTURER RECOMMENDATIONS.
12. UST SHALL BE CONSTRUCTED AS DOUBLE WALLED FRP TANK DESIGNED IN ACCORDANCE ASTM D1248, D1785, AND D3299 STANDARDS.
13. LIQUID TIGHT SUMP ENTRY BOOTS SHALL BE PROVIDED FOR ALL SUMP PENETRATIONS.
14. TIGHT TANK SHALL BE MANUFACTURED BY CONTAINMENT SOLUTIONS, OR APPROVED EQUAL.
15. SEE PLUMBING DRAWINGS FOR THE DRAIN LINE CONNECTION TO BUILDING.
16. TIGHT TANK SHALL BE RATED FOR BURIAL DEPTHS GREATER THAN 7 FEET.
17. CONTRACTOR SHALL PROVIDE THE UNDERGROUND STORAGE TANK IN A WORKMAN LIKE MANNER AND SHALL PROVIDE A COMPLETE AND OPERABLE SYSTEM.
18. LISTED MAKE/MODEL NUMBERS ARE THE BASIS OF DESIGN FOR PUBLIC BID. ALTERNATIVE EQUIPMENT MAY BE SUBMITTED AS AN "OR EQUAL".



5 TANK EXCAVATION CROSS SECTION
SCALE: N.T.S.

NOTES:

1. PEA GRAVEL: CLEAN NATURALLY-ROUNDED AGGREGATE WITH PARTICLE SIZES NO LARGER THAN $\frac{3}{4}$ IN. WITH NO MORE THAN 5% PASSING A #8 SIEVE. DRY BULK DENSITY, PER ASTM C29, MUST BE A MINIMUM OF 95 POUNDS PER CUBIC FOOT. THE BACKFILL MUST MEET THE FINE AGGREGATE REQUIREMENTS FOR DELETERIOUS SUBSTANCES AND SOUNDNESS OF ASTM C33.
2. CRUSHED STONE OR GRAVEL: WASHED, WITH ANGULAR PARTICLE SIZES NO LARGER THAN $\frac{1}{2}$ IN. WITH NO MORE THAN 5% PASSING A #8 SIEVE. DRY BULK DENSITY, PER ASTM C29, MUST BE A MINIMUM OF 95 POUNDS PER CUBIC FOOT. THE BACKFILL MUST MEET THE FINE AGGREGATE REQUIREMENTS FOR DELETERIOUS SUBSTANCES AND SOUNDNESS OF ASTM C33.
3. INSTALL GEOTEXTILE FABRIC UNDERNEATH BEDDING MATERIAL AND ALONG SIDE WALLS OF ENTIRE EXCAVATION. INSTALL THE GEOTEXTILE FABRIC IN ACCORDANCE WITH MANUFACTURERS REQUIREMENTS.

Project:
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Date:

Draw By:	NCH
Reviewed By:	ZDW
Approved By:	Approver
W&S Project No.:	ENG24-1552
W&S File No.:	XXX

Drawing Title:
TIGHT TANK DETAILS

Sheet Number:
EQ103

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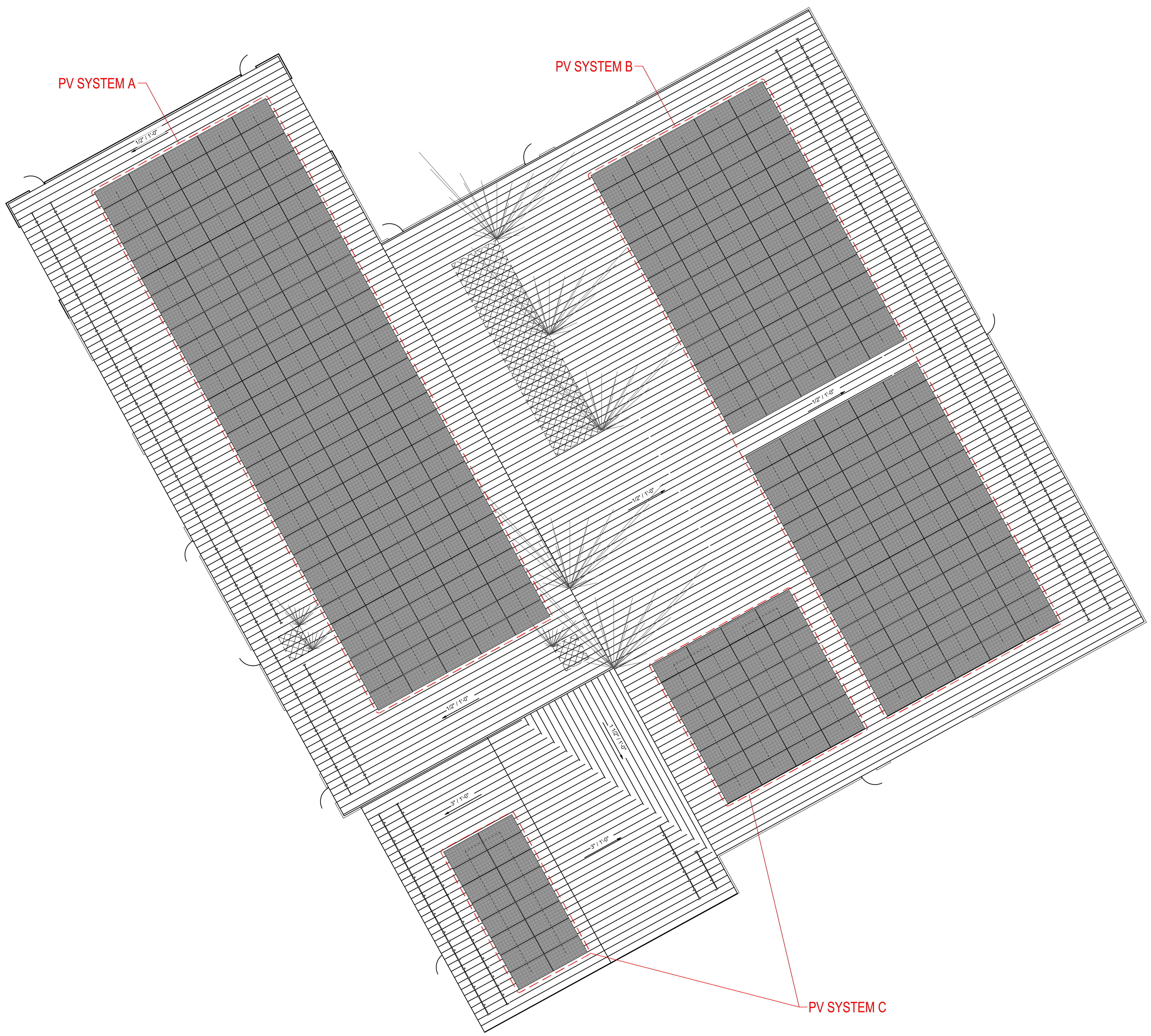

SOLAR PHOTOVOLTAIC (PV) SYSTEM SUMMARY

	SYSTEM A	SYSTEM B	SYSTEM C	NOTES
MODULE QTY	150±	150±	48±	348±
MODULE POWER	550 WATT	550 WATT	550 WATT	---
DC NAMEPLATE	82.5± KW DC	82.5± KW DC	26.4± KW DC	191.4± KW DC (TOTAL)
INVERTER QTY	2	2	1	---
INVERTER RATING	25 KW & 36 KW	25 KW & 36 KW	20 KW	---
AC NAMEPLATE	61± KW AC	61± KW AC	20± KW AC	142± KW AC (TOTAL)
SYSTEM AZIMUTH	241°±	61°±	61°± / 241°±	BLDG. ORIENTATION
SYSTEM TILT	1/2" / 1'-0"	1/2" / 1'-0"	3" / 1'-0" & 1/2" / 1'-0"	FLUSH (ROOF PITCH)
RACKING	RAIL/CLAMPED	RAIL/CLAMPED	RAIL/CLAMPED	---
ENERGY PRODUCTION	±90 - ±110 MWH/YR	±85 - ±105 MWH/YR	±25 - ±35 MWH/YR	±200 - ±250 MWH/YR

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Project:
TRURO NEW DEPARTMENT OF PUBLIC WORKS

TOWN OF TRURO — INCORPORATED 1709. — EXPEDITION OF NOV 26th — CORN HILL PAMET 1620.

17 TOWN HALL ROAD,
TRURO, MA 02666

Weston & Sampson

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100 Foxborough Boulevard, Suite 250
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978.532.1900 800.SAMPSON

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(IN FEET)
1 inch = 10 ft.

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Issued For:
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Scale: AS NOTED

Date: 05 / 02 / 2025
Drawn By: RWG
Reviewed By: DD
Approved By: ---

W&S Project No.: ENG24 - 1552
W&S File No.:

Drawing Title:
CONCEPTUAL SOLAR PV LAYOUT BID ALT. 4

Sheet Number:
PV101

SECTION III

Schematic Cost Estimate

100 Foxborough Blvd., Suite 250, Foxborough, MA 02035
Tel: 508.698.3034

Estimated Total Project Costs Summary

	Base Pricing	Base Price + Pricing Alternates
Construction Costs	± $ 22,500,000	± $ 27,750,000
Soft Costs & Contingencies	± $ 6,562,500	± $ 7,638,750
Opinion of Probable Total Project Costs	**± $ 29,062,500**	**± $ 35,388,750**
2024 Appropriation	($ 2,800,000)	($ 2,800,000)
Total Remaining Appropriation	**± $ 26,262,500**	**± $ 32,588,750**

Construction Cost:

- The Designer's independent cost estimator (TCi Construction Cost Estimating) resulted in an estimated total construction cost of $22,300,000 for the Base Pricing.
- The OPM's independent cost estimator (CostPro, Inc.) resulted in an estimated total construction cost of $22,490,000 for Base Pricing.
- The Pricing Alternatives resulted in an estimated total construction cost of $5,250,000.
- TCi and CostPro's full cost estimate breakdowns are provided on the following pages, including Pricing Alternates as separate line items.

Soft Costs & Contingencies:

- To account for potential, unforeseen conditions which may be discovered during construction, a 5% Construction Contingency is included.
- Additionally, to provide an allowance for potential scope modifications made by the Town, an Owner's Contingency is also included.
- Remaining soft costs and contingencies equate to 28% - 29% of construction costs.

Owner's Soft Costs for Base Pricing		
A&E Fees (Design, Bidding, Construction Administration)	(Assume 10% of Const. Value)	$ 2,250,000
A&E Special Services (Energy Modeling, Solar, 3D Model, etc.)	(Assume 1.5% of Const. Value)	$ 337,500
Owner's Project Manager Fees	(Assume 4% of Const. Value)	$ 900,000
Fixtures, Furnishings & Equipment	Allowance	$ 200,000
Communication / Low Voltage System	Allowance	$ 400,000
Temporary Facilities	Allowance	$ 480,000
Engineering & Permitting New Water Service from Snow's Field	Allowance	$ 130,000
Phase 2 Environmental Survey	by Town's LSP	-
Printing Cost - Advertisement	Allowance	$ 10,000
Legal Costs	Allowance	$ 35,000
Utility Backcharges	Allowance	$ 75,000
Commissioning	Allowance	$ 100,000
Moving Costs	Allowance	$ 40,000
Construction Tests & Inspections	Allowance	$ 80,000
Owner's Contingency	Allowance	$ 400,000
Construction Contingency	(Assume 5% of Const. Value)	$ 1,125,000
	Total Soft Costs	**$6,562,500**

Schematic Design Cost Estimate

New Department of Public Works Facility

17 Town Hall

Truro, Ma

Prepared by:

TCi Construction Cost Estimating

Post Office Box 1988

North Falmouth, Ma 02556

www.tortoraconsulting.com

p 781-275-5511

Prepared for:

Weston and Sampson

May 29, 2025

New Department of Public Works Facility
Truro, Ma

Schematic Design Cost Estimate

29-May-25

MAIN CONSTRUCTION COST SUMMARY

	Building GSF	$/sf	Estimated Construction Cost
BASE ESTIMATE	22,140	$1,007.59	$22,308,047
TOTAL SD BASE CONSTRUCTION COSTS	**22,140**	**$1,007.59**	**$22,308,047**

Alternates

1. Add Vehicle Wash Bay Finish & Equipment	add	**$937,091**
2. Add Detached Canopy	add	**$1,104,680**
3. Add Rooftop Solar	add	**$645,213**
4. Add Ground Source Heat Pump (GSHP) in lieu of ASHP	add	**$1,192,833**
5. Add 5,000 SF Fleet storage	add	**$1,368,670**

QUALIFICATIONS

This Schematic Design cost estimate was produced from drawings prepared by Weston and Sampson and their design team dated May 2, 2025.

This estimate includes all direct construction costs, general contractor's overhead and profit and design contingency. Cost escalation assumes bid received 1st quarter 2026.

Bidding conditions are expected to be chapter 149 public bidding to pre-qualified general contractors, and pre-qualified sub-contractors, open specifications for materials and manufactures. The project is expected to be bid and construction start there after with one continuous phase.

The estimate is based on prevailing wage rates for construction in this market and represents a reasonable opinion of cost. It is not a prediction of the successful bid from a contractor as bids will vary due to fluctuating market conditions, errors and omissions, proprietary specifications, lack or surplus of bidders, perception of risk, etc. Consequently the estimate is expected to fall within the range of bids from a number of competitive contractors or subcontractors, however we do not warrant that bids or negotiated prices will not vary from the final construction cost estimate.

ITEMS NOT CONSIDERED IN THIS ESTIMATE

All professional fees and insurance
All Furnishings, Fixtures and Equipment not identified
Items identified in the design as Not In Contract (NIC)
Items identified in the design as by others
Special foundations (unless indicated by design engineers)
Utility company back charges, including work required off-site
Work to City streets and sidewalks, (except as noted in this estimate)
Construction or occupancy phasing or off hours' work, (except as noted in this estimate)
Off hours
Ledge & contaminated soils
Building Permit
Temporary trailer rentals
Phasing
Permit costs

New Department of Public Works Facility
Truro, Ma

TCi Construction Cost Estimating

Schematic Design Cost Estimate 29-May-25

CONSTRUCTION COST SUMMARY IN CSI FORMAT	*BASE ESTIMATE*	*22,140 $/sf*
DIV. 2 DEMOLITION		
020500 Demolition	$144,000	*$6.50*
024500 Hazardous Material Abatement	$50,000	*$2.26*
DIV. 3 CONCRETE		
033000 Cast-in-Place Concrete	$1,050,762	*$47.46*
DIV. 4 MASONRY		
042000 Unit Masonry	$304,860	*$13.77*
DIV. 5 METALS		
055000 Metal Fabrications	$207,950	*$9.39*
DIV. 6 WOODS & PLASTICS		
061000 Rough Carpentry	$23,310	*$1.05*
064020 Interior Architectural Woodwork	$26,210	*$1.18*
DIV. 7 THERMAL & MOISTURE PROTECTION		
072100 Thermal Insulation	$133,420	*$6.03*
072700 Air Barriers & Waterproofing	$62,100	*$2.80*
074600 Cement Board Siding and Trim	$58,350	*$2.64*
075400 Membrane Roofing	$0	*$0.00*
075450 Through-wall flashing	$0	*$0.00*
077200 Roof Accessories	$8,400	*$0.38*
078410 Penetration Firestopping	$4,553	*$0.21*
079200 Joint Sealants	$77,557	*$3.50*
DIV. 8 DOORS & WINDOWS		
081110 Doors and Frames	$69,500	*$3.14*
083110 Access Doors and Frames	$0	*$0.00*
083310 Overhead Coiling Doors	$205,200	*$9.27*
084110 Aluminum Windows	$54,600	*$2.47*
084500 Aluminum Storefront and Curtainwall	$14,050	*$0.63*
084550 Skylights	$0	*$0.00*
084555 Sunshades	$0	*$0.00*
084600 Translucent Windows	$67,500	*$3.05*
087100 Door Hardware	$36,600	*$1.65*
088000 Glazing	$8,000	*$0.36*
089000 Louvers and Vents	$15,000	*$0.68*
DIV. 9 FINISHES		
092110 Gypsum Board Assemblies	$388,282	*$17.54*
093000 Tiling	$29,700	*$1.34*
095100 Acoustical Ceilings	$33,020	*$1.49*
096510 Resilient Flooring and Accessories	$21,360	*$0.96*
096550 Carpet	$11,800	*$0.53*
097300 Resinous flooring and base	$9,360	*$0.42*
099000 Painting and Coating	$170,137	*$7.68*
DIV 10 SPECIALTIES		
101400 Signage	$17,000	*$0.77*
102800 Toilet Accessories	$8,288	*$0.37*
104400 Fire Protection Specialties	$2,000	*$0.09*
106500 Toilet Partitions	$2,900	*$0.13*
108500 Lockers	$19,250	*$0.87*
109400 Screen Partitions	$0	*$0.00*
109500 Fall Arrest	$20,000	*$0.90*
DIV. 11 EQUIPMENT		
113100 Appliances	$0	*$0.00*
118100 Industrial Equipment	$785,924	*$35.50*
DIV. 12 FURNISHINGS		
122110 Horizontal Louver Blinds	$5,100	*$0.23*
DIV. 13 SPECIAL CONSTRUCTION		
13100 Pre-fabricated Metal Building, Mezzanine Steel and Decking	$2,375,815	*$107.31*
13200 Pre-fabricated Building (salt shed)	$216,000	*$9.76*
13300 Fuel Island Equipment and Canopy	$0	*$0.00*

New Department of Public Works Facility
Truro, Ma

TCi Construction Cost Estimating

Schematic Design Cost Estimate 29-May-25

CONSTRUCTION COST SUMMARY IN CSI FORMAT	***BASE ESTIMATE***	***22,140 $/sf***
DIV. 21 FIRE SUPPRESSION		
210000 Fire Suppression - FSB	$663,515	*$29.97*
DIV. 22 PLUMBING		
220000 Plumbing - FSB	$882,167	*$39.84*
DIV. 23 HVAC		
220000 HVAC - FSB	$1,774,245	*$80.14*
DIV. 26 ELECTRICAL		
260000 Electrical - FSB	$1,445,822	*$65.30*
DIV. 31 EARTHWORK		
311000 Site Clearing	$190,995	*$8.63*
312000 Earthwork	$565,725	*$25.55*
312500 Erosion and Sedimentation Controls	$27,500	*$1.24*
315000 Ground Improvements	$72,000	*$3.25*
DIV. 32 EXTERIOR IMPROVEMENTS		
321216 Asphalt Paving	$475,208	*$21.46*
321213 Portland Cement Concrete Paving	$24,480	*$1.11*
321613 Curbs and Gutters	$59,940	*$2.71*
323100 Site Improvements	$149,525	*$6.75*
329000 Landscaping	$75,000	*$3.39*
DIV. 33 UTILITIES		
331000 Site Water Distribution	$525,850	*$23.75*
333000 Sanitary Sewerage Utilities	$200,000	*$9.03*
334000 Storm Drainage	$521,250	*$23.54*
335000 Gas	$0	*$0.00*
SUBTOTAL DIRECT (TRADE) COST	*$14,391,080*	*$650.00*
GENERAL CONDITIONS & REQUIREMENTS 14%	$2,014,751	
GL INSURANCE 1.3%	$187,084	
BONDS 1.8%	$259,039	
GC - OVERHEAD & PROFIT 5%	$842,598	
DESIGN AND PRICING CONTINGENCY 10%	$1,769,455	
ESCALATION TO 1ST QUARTER 2026 5%	$973,200	
OUTER CAPE PREMIUM 10%	$1,439,108	
TARIFFS PREMIUM ALLOWANCE 3%	$431,732	
TOTAL SD BASE CONSTRUCTION COSTS	**$22,308,047**	*$1,007.59*

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	NEW BUILDING						
	GROSS FLOOR AREA CALCULATION						
	Admin/Support areas			**2,900**			
	Workshops			**1,450**			
	Fleet Storage			**7,700**			
	Fleet Maintenance			**4,680**			
	Wash Bay Shell			**1,480**			
	Mezzanines			**3,930**			
	TOTAL GROSS FLOOR AREA (including mezzanine)				**22,140**	***gsf***	
	A10 FOUNDATIONS						
	A1010 STANDARD FOUNDATIONS						
	Strip footings to walls						
03300	Formwork	**1,500**	sf	18.00	27,000		
03300	Re-bar	**5,280**	lbs	2.50	13,200		
03300	Concrete material	**88**	cy	190.00	16,720		
03300	Placing concrete	**88**	cy	40.00	3,520		
	Foundation walls						
03300	Formwork	**9,000**	sf	18.00	162,000		
03300	Re-bar	**15,780**	lbs	2.50	39,450		
03300	Concrete material	**263**	cy	190.00	49,970		
03300	Placing concrete	**263**	cy	40.00	10,520		
	Back up knee walls						
03300	Formwork	**5,400**	sf	18.00	97,200		
03300	Re-bar	**4,440**	lbs	2.50	11,100		
03300	Concrete material	**74**	cy	190.00	14,060		
03300	Placing concrete	**74**	cy	40.00	2,960		
	Column footings						
03300	Formwork	**800**	sf	18.00	14,400		
03300	Re-bar	**7,440**	lbs	2.50	18,600		
03300	Concrete material	**124**	cy	190.00	23,560		
03300	Placing concrete	**124**	cy	40.00	4,960		
	Piers						
03300	Formwork	**520**	sf	18.00	9,360		
03300	Re-bar	**2,400**	lbs	2.50	6,000		
03300	Concrete material	**40**	cy	190.00	7,600		
03300	Placing concrete	**40**	cy	40.00	1,600		
	SUBTOTAL					533,780	
	A1030 LOWEST FLOOR CONSTRUCTION						
	8" Slab on grade						
03300	Vapor barrier	**15,310**	sf	2.00	30,620		
03300	Reinforcing	**15,310**	sf	2.50	38,275		
03300	Concrete - 8" thick	**424**	cy	190.00	80,560		
03300	Placing concrete	**424**	cy	45.00	19,080		
03300	Finishing and curing concrete	**15,310**	sf	1.65	25,262		
03300	Control joints - saw cut	**15,310**	sf	0.50	7,655		
	6" Slab on grade						
03300	Vapor barrier	**2,900**	sf	2.00	5,800		
03300	Reinforcing	**2,900**	sf	1.50	4,350		
03300	Concrete - 6" thick	**59**	cy	190.00	11,210		
03300	Placing concrete	**59**	cy	45.00	2,655		
03300	Finishing and curing concrete	**2,900**	sf	1.65	4,785		
03300	Control joints - saw cut	**2,900**	sf	0.50	1,450		
	Miscellaneous						
07210	R10 - 25 PSI Rigid insulation at 4' horizontal and 2' vertical	**4,500**	sf	5.00	22,500		
07210	R10 - 60 PSI Rigid insulation at 4' horizontal and 2' vertical	**4,000**	sf	5.50	22,000		
07210	R115 - 60 PSI rigid insulation under slab	**4,680**	sf	6.00	28,080		
07270	Damp proofing of foundation walls	**3,600**	sf	4.00	14,400		
03300	4' haunch under CM walls	**60**	cy	350.00	21,000		
03300	Pits, curbs, equipment Pads and supports	**1**	ls	15,000.00	15,000		
	SUBTOTAL					354,682	
	TOTAL - FOUNDATIONS						***$888,462***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	NEW BUILDING						
	B10 SUPERSTRUCTURE						
	B1010 FLOOR CONSTRUCTION						
	Mezzanine Floor Structure - Steel:						
13100	W columns, beam, bracing, HSS tubes, L angles and Channels	**24**	tons	6,000.00	144,000		
	Mezzanine Floor Structure						
13100	Floor deck - 1 1/2'' deck	**3,930**	sf	5.50	21,615		
03300	WWF reinforcement	**3,930**	sf	2.00	7,860		
03300	2" Concrete Fill to metal deck	**48**	cy	195.00	9,360		
03300	Place and finish concrete	**3,930**	sf	2.00	7,860		
	Miscellaneous						
05500	Misc metals - overall added cost for FSB pricing	**18,210**	sf	4.00	72,840		
07841	Firestopping	**18,210**	sf	0.25	4,553		
	SUBTOTAL					268,088	
	B1020 ROOF CONSTRUCTION						
	Pre-fabricated Structure (includes steel, insulated metal panels walls and roof) :						
13100	Main Building - Prefabricated metal building package (galv steel, metal panels, metal roof, gutters, downspouts and snow guards)	**18,210**	sf	120.00	2,185,200		
13100	Entry canopy structure and roof, gutters and downspouts	**200**	sf	125.00	25,000		
	Miscellaneous						
05500	Overhead door openings	**8**	ea	1,500.00	12,000		
05500	Window openings	**260**	sf	12.00	3,120		
05500	Translucent window openings	**500**	sf	12.00	6,000		
	SUBTOTAL					2,231,320	
	TOTAL - SUPERSTRUCTURE						***$2,499,408***
	B20 EXTERIOR CLOSURE						
	B2010 EXTERIOR WALLS						
	Admin exterior wall back-up						
09211	6" Metal stud, sheathing	**1,600**	sf	22.00	35,200		
09211	5/8" int gwb	**1,600**	sf	8.00	12,800		
09900	Paint	**1,600**	sf	2.00	3,200		
	CMU & Fiber cement						
07460	Fiber cement board lap siding	**1,200**	sf	40.00	48,000		
07460	Fiber cement board shakes	**230**	sf	45.00	10,350		
04200	CMU veneer	**2,200**	sf	55.00	121,000		
07270	Air barrier	**3,630**	sf	10.00	36,300		
07210	Rigid insulation	**2,200**	sf	6.00	13,200		
	SUBTOTAL					280,050	
	B2020 WINDOWS						
	Storefront and windows						
84600	Translucent windows	**500**	sf	135.00	67,500		
84110	W - Aluminum windows (triple glazed)	**260**	sf	210.00	54,600		
08900	Louvers	**1**	ls	15,000.00	15,000		
07920	Backer rod & double sealant	**511**	lf	12.00	6,132		
06100	Wood blocking at openings	**511**	lf	10.00	5,110		
07920	Waterproofing - overall added cost for FSB pricing	**18,210**	sf	3.50	63,735		
	SUBTOTAL					212,077	

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	NEW BUILDING						
	B2030 EXTERIOR DOORS						
	Overhead doors						
08331	18x16 OHD	**2**	ea	28,800.00	57,600		
08331	16x16 OHD	**5**	ea	25,600.00	128,000		
08331	14x14 OHD	**1**	ea	19,600.00	19,600		
	Man Doors						
08111	HM doors with half light/HM frame 3x7 HM	**7**	ea	2,500.00	17,500		
08111	HM flush doors/frame 3x7 HM	**1**	ea	2,200.00	2,200		
84500	AS-1/Al 3x7 - Alum entry and side/tran	**1**	ea	750.00	750		
08710	Hardware	**9**	lvs	950.00	8,550		
	Misc						
09900	Paint	**8**	ea	200.00	1,600		
07920	Backer rod & double sealant	**320**	lf	12.00	3,840		
06100	Wood blocking at openings	**320**	lf	10.00	3,200		
	SUBTOTAL					242,840	
	TOTAL - EXTERIOR CLOSURE						***$734,967***
	B30 ROOFING						
	B3010 ROOF COVERINGS						
	All roofing, gutters, downspouts and snow guards included with Prefabricated metal building						
	SUBTOTAL					-	
	B3020 ROOF OPENINGS						
07720	Roof hatch and ladder	**1**	ea	6,750.00	6,750		
07720	Roof ladders	**1**	ea	1,650.00	1,650		
10950	Fall arrest system allowance	**1**	ls	20,000.00	20,000		
	SUBTOTAL					28,400	
	TOTAL - ROOFING						**$28,400**
	C10 INTERIOR CONSTRUCTION						
	C1010 PARTITIONS						
09211	Type 1B GWB partition	**1,080**	sf	13.00	14,040		
09211	Type 2A/B GWB partition	**1,056**	sf	15.00	15,840		
09211	Type 3A GWB partition	**3,150**	sf	20.00	63,000		
09211	Type 3B GWB partition	**1,680**	sf	21.00	35,280		
09211	Type 6A GWB partition	**2,282**	sf	26.00	59,332		
04200	Type 8A - 8" CMU walls	**4,396**	sf	35.00	153,860		
	<u>18 - Wash bay separation walls</u>						
04200	8" CMU wall to 8'	**480**	sf	35.00	16,800		
09211	6" metal stud and gwb each side	**1,200**	sf	22.00	26,400		
	<u>F1 - Fire separation walls</u>						
09211	8" lgmf with gwb each side to deck above knee wall 5'-4"	**1,600**	sf	25.00	40,000		
03300	Concrete knee wall	**17**	cy	950.00	16,150		
07210	3" closed cell spray foam	**1,600**	sf	10.00	16,000		
04200	4" CMU behind knee wall	**440**	sf	30.00	13,200		
07210	2" rigid behind knee wall	**440**	sf	6.00	2,640		
07270	AVB	**440**	sf	10.00	4,400		
	<u>F2 - Fire separation walls</u>						
09211	8" lgmf with gwb each side to deck above knee wall 5'-4"	**2,480**	sf	25.00	62,000		
03300	GWB to knee wall	**700**	sf	8.00	5,600		
03300	Concrete knee wall	**28**	cy	950.00	26,600		
07210	3" closed cell spray foam	**2,480**	sf	10.00	24,800		
07210	2" rigid behind knee wall	**700**	sf	6.00	4,200		
07270	AVB	**700**	sf	10.00	7,000		
	<u>Misc</u>						
06100	Rough blocking	**800**	lf	10.00	8,000		
	SUBTOTAL					615,142	

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	NEW BUILDING						
	C1020 INTERIOR DOORS						
	Doors and Frames						
08111	Single doors and frames	**23**	lvs	1,600.00	36,800		
08111	Double doors and frames	**5**	pr	2,600.00	13,000		
	Hardware						
08710	Hardware	**33**	lvs	850.00	28,050		
	Misc						
08800	Glazing to doors and frames	**160**	sf	50.00	8,000		
84500	HM1 window frames	**2**	ea	1,650.00	3,300		
09900	Paint HM frames	**35**	ea	200.00	7,000		
07920	Sealants & caulking	**35**	ea	110.00	3,850		
12211	Interior blinds	**6**	ea	200.00	1,200		
	SUBTOTAL					101,200	
	C1030 SPECIALTIES / MILLWORK						
06402	Restroom vanities	**10**	lf	450.00	4,500		
06402	Window sills	**54**	lf	65.00	3,510		
06402	Multi-purpose back walls cabinets, counter and shelving	**16**	lf	650.00	10,400		
06402	Admin office counters	**12**	lf	650.00	7,800		
84500	Misc millwork and finish carpentry	**1**	ls	10,000.00	10,000		
10140	Tack/white boards	**2**	ea	500.00	1,000		
	Lockers						
10850	Large Lockers	**16**	ea	950.00	15,200		
10850	Lockers benches	**1**	ea	750.00	750		
10850	ADA benches	**2**	ea	1,650.00	3,300		
	Restrooms						
10650	Toilet partitions HC	**1**	ea	1,600.00	1,600		
10650	Toilet partitions Reg	**1**	ea	1,300.00	1,300		
10280	Soap disp	**5**	ea	30.00	150		
10280	Mirror	**5**	ea	285.00	1,425		
10280	Robe hook	**10**	ea	30.00	300		
10280	Grab bar	**6**	ea	150.00	900		
10280	Shower seat and bars	**2**	ea	285.00	570		
10280	Wet gear hooks	**10**	ea	65.00	650		
10280	SRWR	**2**	ea	250.00	500		
10280	TTD	**5**	ea	110.00	550		
10280	SND	**2**	ea	165.00	330		
10280	PTD	**4**	ea	330.00	1,320		
10280	Hooks	**12**	ea	40.00	480		
10280	Shower curtain and rods	**3**	ea	276.00	828		
10280	Jan closet MB	**1**	ea	285.00	285		
	Miscellaneous						
06100	Plywood backers, locker bases and misc	**800**	sf	5.00	4,000		
10440	Fire extinguisher cabinets	**8**	ea	250.00	2,000		
10140	Town seal/ exterior signage	**1**	ls	8,500.00	8,500		
10140	Interior signage	**1**	ls	7,500.00	7,500		
	SUBTOTAL					89,648	
	TOTAL - INTERIOR CONSTRUCTION						***$805,990***
	C20 STAIRCASES						
	C2010 STAIR CONSTRUCTION						
05500	Mezzanine Stairs	**2**	ea	17,500.00	35,000		
05500	Mezzanine railings	**214**	lf	185.00	39,590		
05500	Gates	**2**	ea	1,250.00	2,500		
05500	Ladders	**2**	ea	1,250.00	2,500		
03300	Concrete material in pan infill	**2**	ea	1,200.00	2,400		
	SUBTOTAL					81,990	
	C2020 STAIR FINISHES						
09900	Paint to mezzanine stairs	**2**	ea	3,850.00	7,700		
09900	Paint to mezzanine rails/gates	**240**	lf	35.00	8,400		
	SUBTOTAL					16,100	
	TOTAL - STAIRCASES						***$98,090***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	NEW BUILDING						
	C30 INTERIOR FINISHES						
	C3010 WALL FINISHES						
09900	Paint to GWB	**28,156**	sf	1.50	42,234		
09900	Paint to interior CMU	**9,712**	sf	2.50	24,280		
09300	Wall tile	**800**	sf	33.00	26,400		
06100	FRP to janitor closet	**200**	sf	15.00	3,000		
	SUBTOTAL					95,914	
	C3020 FLOOR FINISHES						
09651	LVT	**1,200**	sf	14.00	16,800		
09665	Carpet tile	**800**	sf	6.00	4,800		
09730	RF - Resinous Flooring	**520**	sf	18.00	9,360		
09900	SC - Sealed Concrete	**18,040**	sf	1.50	27,060		
09665	Walk off mats	**2**	ea	3,500.00	7,000		
09300	Tile	**100**	sf	33.00	3,300		
09651	Rubber base	**760**	lf	6.00	4,560		
09900	Line stripping	**600**	sf	5.00	3,000		
	SUBTOTAL					75,880	
	C3030 CEILING FINISHES						
09510	A1 - ACT ceilings; 2' x 2'	**2,500**	sf	11.00	27,500		
09510	A2 - ACT ceilings; 2' x 2'	**460**	sf	12.00	5,520		
09211	G2 - GWB ceilings	**380**	sf	18.00	6,840		
09211	G3 - GWB ceilings	**575**	sf	22.00	12,650		
09211	G1 - L gwb soffits	**20**	lf	125.00	2,500		
09211	Drop gwb soffits	**40**	lf	60.00	2,400		
09900	Paint to GWB ceilings and soffits	**1,195**	sf	2.00	3,800		
09900	Exposed prefab metal columns and beams	**16,745**	sf	2.50	41,863		
	SUBTOTAL					103,073	
	TOTAL - INTERIOR FINISHES						***274,867***
	D20 PLUMBING						
	D20 PLUMBING, GENERALLY						
	Equipment						
220000	Water Meter	**1**	ea	2,950.00	2,950		
220000	Backflow Preventor Assembly	**1**	ea	6,045.00	6,045		
220000	Water Pressure Regulator	**1**	ea	1,170.00	1,170		
220000	Heat Pump Water Heaters	**2**	ea	15,112.50	30,225		
220000	Hot Water Storage Tank	**1**	ea	7,020.00	7,020		
220000	Recirc Pump	**2**	ea	1,235.00	2,470		
220000	Expansion Tank	**2**	ea	455.00	910		
220000	Thermostatic Mixing Valve	**2**	ea	2,710.50	5,421		
220000	Oil/Water Seperator	**1**	ea	11,830.00	11,830		
220000	Air Compressor w/ Dryer	**1**	ea	31,083.00	31,083		
220000	Trap Primers	**9**	ea	425.00	3,825		
220000	Make Up Water Station	**1**	ea	1,140.00	1,140		
220000	Plumbing Specialties	**1**	ls	11,398.70	11,399		
220000	Equipment Connections	**24**	ea	845.00	20,280		
	Fixtures						
220000	Water Closets	**5**	ea	1,413.50	7,068		
220000	Urinal	**1**	ea	1,216.54	1,217		
220000	Lavatory	**5**	ea	1,292.50	6,463		
220000	Showers	**2**	ea	2,035.00	4,070		
220000	Sink - Mop	**1**	ea	1,292.50	1,293		
220000	Kitchen Sink	**1**	ea	1,527.54	1,528		
220000	Kitchen Sink Garbage Disposal	**1**	ea	780.00	780		
220000	Laundry Sink	**1**	ea	1,560.00	1,560		
220000	Shop Sink	**1**	ea	4,810.00	4,810		
220000	Emergency Shower / Eyewash	**6**	ea	3,918.75	23,513		
220000	Drinking Fountian	**1**	ea	2,887.50	2,888		
220000	Wall Hydrant	**6**	ea	357.50	2,145		
220000	Hose Bibbs	**2**	ea	258.50	517		
220000	Hose Stations	**3**	ea	884.00	2,652		
220000	Ice Machine Box	**1**	ea	181.50	182		
220000	Outlet Box	**1**	ea	287.64	288		
220000	Compressed Air Outlets	**10**	ea	294.87	2,949		

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	NEW BUILDING						
220000	Floor Drains	**12**	ea	654.50	7,854		
220000	Floor Sinks	**2**	ea	808.50	1,617		
220000	(8) Trench Drains	**150**	lf	158.50	23,775		
220000	Trench Drain Catch Basin	**4**	ea	1,365.00	5,460		
220000	Clean Outs	**12**	ea	262.00	3,144		
220000	Vent Thru Roof	**12**	ea	290.00	3,480		
220000	Hose Connection	**5**	ea	475.00	2,375		
220000	Compressed Air Equipment Connections	**5**	ea	475.00	2,375		
220000	Fixture Rough Ins	**34**	ea	624.00	21,216		
	Piping						
220000	Water Service	**25**	lf	168.32	4,208		
220000	Water - 1/2"	**672**	lf	39.00	26,208		
220000	Water - 3/4"	**588**	lf	42.25	24,843		
220000	Water - 1"	**294**	lf	48.75	14,333		
220000	Water - 1 1/4"	**42**	lf	53.95	2,266		
220000	Water - 1 1/2"	**151**	lf	59.80	9,030		
220000	Water - 2"	**151**	lf	68.25	10,306		
220000	Water - 3"	**210**	lf	97.50	20,475		
220000	UGSan - 2"	**8**	lf	94.25	754		
220000	UGSan - 3"	**84**	lf	123.50	10,374		
220000	UGSan - 4"	**316**	lf	130.00	41,080		
220000	San - 2"	**44**	lf	94.25	4,147		
220000	San - 3"	**45**	lf	123.50	5,558		
220000	San - 4"	**92**	lf	130.00	11,960		
220000	UGVent- 2"	**15**	lf	94.25	1,414		
220000	UGVent - 3"	**30**	lf	123.50	3,705		
220000	UGVent - 4"	**8**	lf	130.00	1,040		
220000	UGOil Vent - 2 1/2"	**210**	lf	117.65	24,707		
220000	UGOil Vent - 3"	**91**	lf	133.90	12,185		
220000	UGOil Vent - 4"	**225**	lf	140.40	31,590		
220000	Oil Vent - 2 1/2"	**71**	lf	117.65	8,353		
220000	Oil Vent - 3"	**67**	lf	133.90	8,971		
220000	Oil Vent - 4"	**63**	lf	140.40	8,845		
220000	Oil Vent - 6"	**34**	lf	166.40	5,658		
220000	UG Oil Waste - 3"	**8**	lf	133.90	1,071		
220000	UG Oil Waste - 4"	**606**	lf	140.40	85,082		
220000	UG Oil Waste - 6"	**336**	lf	166.40	55,910		
220000	Compressed Air- 1/2"	**29**	lf	41.60	1,206		
220000	Compressed Air - 3/4"	**672**	lf	45.50	30,576		
220000	Compressed Air - 1"	**156**	lf	51.35	8,011		
220000	Compressed Air - 1 1/2"	**150**	lf	58.50	8,775		
220000	Compressed Air - 2"	**80**	lf	71.50	5,720		
220000	Insulation	**2,133**	lf	13.98	29,819		
	Trade Requirements						
220000	Project Supervision	**400**	hrs	130.00	52,000		
220000	Coordination	**200**	hrs	130.00	26,000		
	SUBTOTAL					867,167	
	TOTAL - PLUMBING						***$867,167***

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	NEW BUILDING						
	D30 HVAC						
	D30 HVAC						
	Base ASHP						
230000	Equipment	**22,140**	sf	24.68	546,415		
230000	Sheet Metal	**22,140**	sf	23.72	525,161		
230000	Piping	**22,140**	sf	8.79	194,611		
230000	Insulation	**22,140**	sf	4.93	109,150		
230000	Controls	**22,140**	sf	11.52	255,053		
230000	Commissioning	**22,140**	sf	2.44	54,022		
230000	Trade Requirements	**22,140**	sf	3.38	74,833		
	SUBTOTAL					1,759,245	
	TOTAL - HVAC						***$1,759,245***
	D40 FIRE PROTECTION						
	D40 FIRE PROTECTION						
210000	FP service equipment, valves, compressors and misc	**1**	ls	20,000.00	20,000		
210000	Sprinkler heads	**277**	ea	125.00	34,625		
210000	Branch sprinkler piping with fittings & hangers	**4,155**	lf	38.00	157,890		
210000	Main sprinkler piping with fittings & hangers	**600**	lf	60.00	36,000		
210000	Hydraulic calculations, coordination and testing	**1**	ls	15,000.00	15,000		
210000	Fire pump and 50,000 gal cistern allowance	**1**	ls	400,000.00	400,000		
	SUBTOTAL					663,515	
	TOTAL - FIRE PROTECTION						***$663,515***
	D50 ELECTRICAL						
	D50 ELECTRICAL						
	Light Fixtures						
260000	Light Fixtures	**22,140**	sf	7.00	154,980		
	Branch Circuitry						
260000	Branch Circuitry	**22,140**	sf	5.00	110,700		
260000	Lighting Control Devices	**22,140**	sf	1.00	22,140		
260000	Power Wiring Devices	**22,140**	sf	1.50	33,210		
	Power Circuitry						
260000	Power Circuitry and Motor Feeders	**22,140**	sf	3.00	66,420		
	Power Distribution						
260000	3/4" Emt, 4#10	**50**	lf	14.00	700		
260000	1 1/4" Emt, 4#3	**10**	lf	30.00	300		
260000	1 1/2" Emt, 4#1	**140**	lf	40.00	5,600		
260000	2" Emt, 4 3/0	**30**	lf	55.00	1,650		
260000	2 1/2" Emt, 4 250Mcm	**10**	lf	75.00	750		
260000	4" Emt, 4 500 Mcm	**10**	lf	125.00	1,250		
260000	4" Emt, 4 600 Mcm	**100**	lf	150.00	15,000		
260000	4" Rigid, 4 600 Mcm	**40**	lf	185.00	7,400		
260000	1 1/2" Emt, future PV	**200**	lf	18.00	3,600		
260000	3" Emt, future PV	**200**	lf	25.00	5,000		
260000	4" Emt, future PV	**100**	lf	30.00	3,000		
260000	PV Power Pullbox, WP	**2**	ea	500.00	1,000		
260000	PV Comm Pullbox, WP	**2**	ea	300.00	600		
	Lightning Protection & Grounding						
260000	Lightning Protection Allowance	**1**	ls	15,000.00	15,000		
260000	Service Grounding	**1**	ls	4,500.00	4,500		
260000	MDF Grounding	**1**	ls	1,500.00	1,500		

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	NEW BUILDING						
	Power Equipment						
260000	100 Amp Panel Board	**1**	ea	4,500.00	4,500		
260000	225 Amp Panel Board, 60P	**1**	ea	8,800.00	8,800		
260000	400 Amp Panel Board, 2-Section	**1**	ea	16,500.00	16,500		
260000	800 Amp Main Switchboard	**1**	ls	35,000.00	35,000		
260000	Current Monitor	**3**	ea	2,200.00	6,600		
260000	Lighting Control Panel - Allow	**1**	ea	5,000.00	5,000		
260000	SPD @ MDB	**1**	ea	2,600.00	2,600		
260000	30 Kva Transformer	**1**	ea	7,000.00	7,000		
260000	75 Kva Transformer	**1**	ea	10,000.00	10,000		
260000	112 Kva Transformer	**1**	ea	12,000.00	12,000		
260000	800 Amp CT Cabinet	**1**	ea	7,500.00	7,500		
260000	800 Amp Service Disconnect	**2**	ea	12,000.00	24,000		
260000	800 Amp Service Disconnect EG	**1**	ea	12,000.00	12,000		
260000	Meter Pan	**1**	ea	650.00	650		
260000	400 Kw Emerg Generator, WP Encl	**1**	ea	150,000.00	150,000		
260000	Autotransfer Sw 800A	**1**	ea	20,000.00	20,000		
260000	Autotransfer Sw 100A	**1**	ea	6,500.00	6,500		
260000	EG Ennunciator	**1**	ea	1,500.00	1,500		
260000	EG Junc Box	**3**	ea	125.00	375		
260000	EPO Pushbutton	**2**	ea	200.00	400		
260000	800 Amp Encl Ckt Brkr	**2**	ea	9,500.00	19,000		
260000	100 Amp Encl Ckt Brkr	**1**	ea	1,500.00	1,500		
260000	200KW Load Bank	**1**	ea	18,500.00	18,500		
260000	100A Storm Switch	**1**	ea	5,500.00	5,500		
260000	Motor Disconnects	**22,140**	sf	1.50	33,210		
	Misc systems						
260000	Fire Alarm System	**22,140**	sf	4.00	88,560		
260000	BDA Allowance	**1**	ls	45,000.00	45,000		
260000	Telecommunications System	**18,210**	sf	3.00	54,630		
260000	Security Access Control System	**18,210**	sf	2.00	36,420		
260000	CCTV Security System	**18,210**	sf	1.50	27,315		
260000	Sound/PA/Intercom System	**18,210**	sf	1.50	27,315		
260000	A/V System Roughin Allowance	**18,210**	sf	0.20	3,642		
	Site Lighting						
260000	Type SL1 Light Pole w/ 1-Fixt	**8**	ea	3,600.00	28,800		
260000	Type SL6 Flagpole Light	**3**	ea	525.00	1,575		
260000	1" PVC, 3#8, #10 UG	**890**	lf	12.00	10,680		
260000	#10 Wire in Poles	**720**	lf	1.25	900		
260000	Site Lighting Controls	**1**	ls	3,600.00	3,600		
	EV Charging Stations						
260000	EV Charging Station	**2**	ea	5,500.00	11,000		
260000	1" PVC, 3#8, #10 UG	**500**	lf	12.00	6,000		
	Site Utilities						
260000	Utility Pole Riser	**1**	ls	3,600.00	3,600		
260000	4" PVC CDT UG (Pri)	**400**	lf	18.00	7,200		
260000	Utility Transformer Pad	**1**	ls	3,600.00	3,600		
260000	4" PVC, 4 600 Mcm UG (Sec)	**570**	lf	135.00	76,950		
260000	4" PVC CDT UG (Spare)	**50**	lf	18.00	900		
260000	3" PVC, 4 600MCM UG	**120**	lf	135.00	16,200		
260000	1" PVC, EG Controls, 120v, UG	**150**	lf	10.00	1,500		
	Telecommunications						
260000	Telecomm Utility Riser	**1**	ls	3,600.00	3,600		
260000	4" PVC (Tel,empty)	**800**	lf	18.00	14,400		
260000	1 1/4" Innderduct	**600**	lf	3.50	2,100		
	Misc						
260000	Temp Power and Lighting	**1**	ls	15,000.00	15,000		
260000	Coordination and project management	**200**	hrs	135.00	27,000		
260000	Startup, Testing, Commissioning	**160**	hrs	135.00	21,600		
	SUBTOTAL					1,402,022	
	TOTAL - ELECTRICAL						***$1,402,022***

New Department of Public Works Facility
Truro, Ma

TCi Construction Cost Estimating

29-May-25

Schematic Design Cost Estimate

GSF 22,140

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	NEW BUILDING						
	E20 FURNISHINGS						
	E2010 FIXED FURNISHINGS						
12211	Horizontal Louver Blinds/Blackout	**260**	sf	15.00	3,900		
11310	Kitchen appliances				by owner		
	SUBTOTAL					$3,900	
	E2020 MOVABLE FURNISHINGS						
	All movable furnishings to be provided and installed by owner					NIC	
	SUBTOTAL						
	TOTAL - FURNISHINGS						***$3,900***
	F10 INDUSTRIAL EQUIPMENT						
	Maintenance Equipment Schedule						
11810	CD-1 Wood Workbench with Casters 1 ERO N/A	**ERO**					
11810	CD-2 Steel Work Bench (72inx36in) (14,000 Lbs Capacity) 1 N 12 40 00	**1**	ea	1,037.30	1,037		
11810	CD-3 Electric Charging Workbench 1 N 12 40 00	**1**	ea	937.60	938		
11810	CD-4 Long Wood Workbench 1 N 12 40 00	**1**	ea	600.00	600		
11810	CD-5 Heavy Duty Thick Top Workbench 1 N 12 40 00	**1**	ea	850.00	850		
11810	CH-1 Carpentry Tool Drawer 1 ERO N/A	**ERO**					
11810	CH-2 Flammable Cabinet (Green)(60-Gallons) 1 ERO N/A	**ERO**					
11810	CH-3 Flammable Cabinet (45-Gallons) 1 ERO N/A	**ERO**					
11810	CH-4 Parts Shelving (6' x 2') 3 N 12 40 00	**3**	ea	1,005.40	3,016		
11810	CM-1 Miter Saw with Stand 1 ERO N/A	**ERO**					
11810	CM-2 Saw Horse 1 ERO N/A	**ERO**					
11810	CM-3 Pallet Jack 1 ERO N/A	**ERO**					
11810	CM-4 Portable Table Saw 1 ERO N/A	**ERO**					
11810	CM-5 Portable Dust Collector 1 N 12 40 00	**1**	ea	1,280.00	1,280		
11810	CM-6 Bench Vise 1 N 12 40 00	**1**	ea	691.90	692		
11810	MA-1 5 Ton Bridge Crane 1 N 14 22 13	**1**	ea	185,000.00	185,000		
11810	MB-1 18k Mobile Column 6 N 14 45 00	**6**	ea	65,000.00	390,000		
11810	MB-2 20K 2 Post Lift 1 N 14 45 00	**1**	ea	38,000.00	38,000		
11810	MC-1 2-Drum Spill Pallet 2 ERO 11 11 29	**ERO**					
11810	MC-2 55-Gallon Drum 10 NIC N/A	**NIC**					
11810	MC-3 Waste Oil Caddy 1 ERO N/A	**ERO**					
11810	MC-4 Grease Cart 1 ERO N/A	**ERO**					
11810	MC-5-9 Fluid storage	**1**	ls	95,000.00	95,000		
11810	MC-5 600-Gallon Bulk Fluids Tank (300G 15W-40/180G 0W-30/120G 0W-20) 1 N	**1**	ea		inc above		
11810	MC-6 400-Gallon Waste Oil Tank 1 N 11 11 29	**1**	ea		inc above		
11810	MC-7 Wall Mounted Lube Pumps 3 N 11 11 29	**3**	ea		inc above		
11810	MC-8 Lube Reel Bank (0W-20, 0W-30, 15W-40, Electric Reel, 1/2" Air) 1 N 11 11	**1**	ea		inc above		
11810	MC-9 Fluid Storage Room Sump Alarm 1 N 11 11 29	**1**	ea		inc above		
11810	MD-1 Metal Worktop 1 ERO N/A	**ERO**					
11810	MD-2 Electric Charging Workbench 1 N 12 40 00	**1**	ea	937.60	938		
11810	MD-3 Steel Work Bench on Casters 2 N 12 40 00	**2**	ea	2,800.00	5,600		
11810	MD-4 Heavy Duty Thick Top Workbench 1 N 12 40 00	**1**	ea	950.00	950		
11810	MF-1 Torch Cart 1 ERO N/A	**ERO**					
11810	MF-2 Lincoln AC225 Arc Welder 1 ERO N/A	**ERO**					
11810	MF-3 Miller Millermatic 252 1 ERO N/A	**ERO**					
11810	MF-4 Metabo HPT Hammer Cart 1 ERO N/A	**ERO**					
11810	MF-5 Thermal Dynamics Welder 1 ERO N/A	**ERO**					
11810	MF-6 Lincoln Welden Power 1 ERO N/A	**ERO**					
11810	MF-7 Lincoln SP-170T Arc Welder 1 ERO N/A	**ERO**					
11810	MF-8 Drill Press 1 ERO N/A	**ERO**					
11810	MF-9 Shop Press 1 ERO N/A	**ERO**					
11810	MF-10 Portable Weld Fume Extractor 1 NIC N/A	**NIC**					
11810	MF-11 Welding Screen 2 NIC N/A	**NIC**					
11810	MF-12 Oxygen/Acetylene Tank Storage Cage 2 N 12 40 00	**2**	ea	1,303.50	2,607		

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	NEW BUILDING						
11810	MG-1 Tire Changer 1 ERO N/A	**ERO**					
11810	MG-2 Tire Balancer 1 ERO N/A	**ERO**					
11810	MG-3 Tire Storage Rack 2 N 12 40 00	**2**		220.00	440		
11810	MH-1 Snap-on Tool Box 1 ERO N/A	**ERO**					
11810	MH-2 MAC Tools Blue Cart 1 ERO N/A	**ERO**					
11810	MH-3 Wooden Cabinet (Glass Window) 1 ERO N/A	**ERO**					
11810	MH-4 Windshield Wiper Blade Rack 1 ERO N/A	**ERO**					
11810	MH-5 Nuts and Bolts Storage 4 ERO N/A	**ERO**					
11810	MH-6 Flammable Cabinet (60-Gallons) 1 ERO N/A	**ERO**					
11810	MH-7 Metal Cabinet 1 N 12 40 00	**1**	ea	1,450.00	1,450		
11810	MH-8 Parts Shelving (6' x 2') 10 N 12 40 00	**10**	ea	1,005.40	10,054		
11810	MH-9 Parts Shelving (6' x 2') 2 N 12 40 00 Reserved for existing sliding drawers	**2**	ea	1,005.40	2,011		
11810	MM-1 Tall Jack Stand 1 ERO N/A	**ERO**					
11810	MM-2 Small Jack Stands 8 ERO N/A	**ERO**					
11810	MM-3 Floor Jack 1 ERO N/A	**ERO**					
11810	MM-4 Chop Saw on Cart 1 ERO N/A	**ERO**					
11810	MM-5 Snap-on Battery Charger 1 ERO N/A	**ERO**					
11810	MM-6 Chain Sharpener 1 ERO N/A	**ERO**					
11810	MM-7 Heated Carpet Extractor 1 ERO N/A	**ERO**					
11810	MM-8 Parts Washer 1 N 12 40 00	**1**	ea	2,500.00	2,500		
11810	MM-9 Pedestal Grinder 2 N 12 40 00	**2**	ea	559.90	1,120		
11810	MM-10 Bench Vise 1 N 12 40 00	**1**	ea	691.90	692		
11810	SD-1 Drafting Table 1 ERO N/A	**ERO**					
11810	SD-2 Computer Desk 1 N 12 40 00	**1**		506.00	506		
11810	SH-1 Hanging Vinyl Storage 1 ERO N/A	**ERO**					
11810	SH-2 Parts Shelving (6' x 2') 2 N 12 40 00	**2**		800.00	1,600		
11810	SM-1 Vinyl Express Printer 1 ERO N/A	**ERO**					
	Mezzanine Industrial Equipment Schedule						
11810	ME-1 Hose Clamp Rack 2 ERO N/A	**ERO**					
11810	ME-2 Hydraulic Hose Bins 1 ERO N/A	**ERO**					
11810	ME-3 Hydraulic Hose Chop Saw 1 ERO N/A	**ERO**					
11810	ME-4 Hydraulic Hose Crimper 1 ERO N/A	**ERO**					
11810	ME-5 Steel Work Bench on Casters 1 N 12 40 00	**1**	ea	2,800.00	2,800		
11810	ME-6 Hydraulic Hose Reel Rack 2 N 12 40 00	**2**	ea	836.00	1,672		
11810	ME-7 Hydraulic Vertical Storage Cabinet 1 N 12 40 00	**1**	ea	1,556.50	1,557		
11810	MH-9 Parts Shelving (6' x 2') 5 N 12 40 00	**5**	ea	0.00	-		
11810	MH-11 Pallet Rack Hanging Tool Storage 4 N 12 40 00	**4**	ea	176.00	704		
	Fleet Storage Industrial Equipment Schedule						
11810	MH-10 Cantilever Rack (Flat) 1 N 12 40 00	**1**	ea	2,310.00	2,310		
	Misc						
11810	Connect and or install ERO equipment	**200**	hrs	150.00	30,000		
	SUBTOTAL					785,924	
	TOTAL - INDUSTRIAL EQUIPMENT						***$785,924***
	B SITEWORK						
	Building Demolition						
02050	Demolish and remove buildings	**12,000**	sf	12.00	144,000		
02450	Haz-mat allowance	**1**	ls	50,000.00	50,000		
220000	Demo, cut and cap plumbing	**3**	ea	5,000.00	15,000		
230000	Demo, cut, cap and decommission HVAC	**3**	ea	5,000.00	15,000		
260000	Demo/make safe electrical	**3**	ea	5,000.00	15,000		
	SUBTOTAL					239,000	

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	NEW BUILDING						
	Site Demo & Prep						
312000	Mobilization	**1**	ea	7,500.00	7,500		
311000	Site fencing, protection, barricades	**1**	ls	25,000.00	25,000		
311000	Stabilized Construction Entrance	**1**	ea	7,500.00	7,500		
312500	Compost filter tubes and silt fence	**1,500**	lf	18.00	27,000		
312500	Inlet protection	**2**	ea	250.00	500		
311000	Tree/stump removals	**27**	ea	500.00	13,500		
311000	Clear and grub	**23,500**	sf	0.90	21,150		
311000	Sawcut and remove paving & curbing	**36,200**	sf	0.85	30,770		
311000	Remove sand and gravel	**1,163**	cy	25.00	29,075		
311000	Remove sheds	**3**	ea	1,500.00	4,500		
311000	Remove flag pole and bollards	**1**	ls	2,500.00	2,500		
311000	Remove concrete walks, ramps, pads and misc items at building perimeter	**1**	ls	20,000.00	20,000		
311000	Remove drainage structures & piping	**2**	ea	3,500.00	7,000		
311000	Remove wells	**1**	ls	10,000.00	10,000		
311000	Remove septic systems	**2**	ea	10,000.00	20,000		
	SUBTOTAL					225,995	
	Earthwork						
312000	Strip topsoil	**600**	cy	15.00	9,000		
312000	Screen & Respread	**600**	cy	25.00	15,000		
312000	Site Cuts to Fills	**4,195**	cy	15.00	62,925		
312000	Remove unsuitable material under building	**3,704**	cy	30.00	111,120		
312000	Import structural fill under building	**3,704**	cy	60.00	222,240		
	Structural excavation and backfill						
312000	Import 12" subbase for under slabs	**674**	cy	60.00	40,440		
312000	E&E foundation footing and walls	**1,200**	cy	25.00	30,000		
312000	E&B foundation column footings	**400**	cy	25.00	10,000		
	SUBTOTAL					500,725	
	Paving and curbing						
321216	12" Dense Grade at paving and walks	**2,126**	cy	58.00	123,308		
321216	Asphalt pavement	**57,400**	sf	6.00	344,400		
321216	Patch roads and connections	**1**	ls	7,500.00	7,500		
321613	Granite curbs	**870**	lf	58.00	50,460		
321613	Bitum berm	**474**	lf	20.00	9,480		
	SUBTOTAL					535,148	
	Storm						
334000	CB	**9**	ea	6,500.00	58,500		
334000	DMH	**7**	ea	8,500.00	59,500		
334000	OCS	**4**	ea	12,500.00	50,000		
334000	SWTU	**3**	ea	15,000.00	45,000		
334000	FE	**2**	ea	3,500.00	7,000		
334000	HDPE piping	**650**	lf	100.00	65,000		
334000	Perimeter building roof drainage piping/boots	**450**	lf	45.00	20,250		
334000	Storm water infiltration system (E,B, prep and manifolds)	**5,400**	sf	40.00	216,000		
	SUBTOTAL					521,250	
	Water						
331000	8" FP DI water main	**600**	lf	125.00	75,000		
331000	4" Dom DI water	**10**	lf	85.00	850		
331000	Gates & valves	**8**	ea	1,500.00	12,000		
331000	Hydrants	**2**	ea	6,500.00	13,000		
331000	Water CTE	**1**	ea	5,000.00	5,000		
331000	Offsite water well & water main Allowance	**1**	ls	420,000.00	420,000		
	SUBTOTAL					525,850	
	Sanitary Septic						
333000	Septic system - two compartment 2,000 gal tanks, piping, 3 trenches and Nitogen removal	**1**	ls	200,000.00	200,000		
	SUBTOTAL					200,000	

New Department of Public Works Facility
Truro, Ma

TCi Construction Cost Estimating

29-May-25

Schematic Design Cost Estimate

GSF 22,140

CSI CODE	DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
	NEW BUILDING						
	Site Improvements						
323100	28' Sliding entry gate and access key pad	**1**	ea	25,000.00	25,000		
323100	Parking signs	**8**	ea	250.00	2,000		
321213	Concrete walks	**400**	sf	14.00	5,600		
321213	Knockdown pad	**1,180**	sf	16.00	18,880		
03300	Concrete retaining walls	**50**	cy	950.00	47,500		
323100	20x20 blocks walls at storage bins	**1,425**	sf	65.00	92,625		
323100	Parking space lines, symbols and hatching	**17**	ea	250.00	4,250		
323100	6' wood stockade fence	**270**	lf	95.00	25,650		
05500	Site bollards	**43**	ea	800.00	34,400		
03300	Transformer Pad	**1**	ea	5,000.00	5,000		
03300	Generator Pad	**1**	ea	8,500.00	8,500		
312000	E&B Elec/communication duct banks	**260**	lf	55.00	14,300		
03300	Encase duct banks in concrete	**39**	cy	350.00	13,650		
	SUBTOTAL					297,355	
	Salt Shed						
312000	Earthwork, HMA interior paving	**2,880**	sf	15.00	43,200		
315000	Ground improvements	**2,880**	sf	25.00	72,000		
03300	Foundation and 7' perimeter walls	**104**	cy	950.00	98,800		
13200	Structure - fabric roof structure	**2,880**	sf	75.00	216,000		
260000	Electrical - lighting and power	**2,880**	sf	10.00	28,800		
	SUBTOTAL					458,800	
	Landscaping						
329000	Landscaping allowance	**1**	ls	75,000.00	75,000		
	SUBTOTAL					75,000	
	TOTAL - SITEWORK						***3,579,123***

New Department of Public Works Facility
Truro, Ma

Schematic Design Cost Estimate

29-May-25

DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
1. Add Vehicle Wash Bay Finish & Equipment						
C30 INTERIOR FINISHES						
C3010 WALL FINISHES						
Wash bay - 1/2" PVC panels	**3,500**	sf	23.00	80,500		
Wash bay - AVB	**3,500**	sf	9.00	31,500		
Exterior wall framing and column wraps	**2,850**	sf	20.00	57,000		
SUBTOTAL					169,000	
C3020 FLOOR FINISHES						
SC - Sealed Concrete	**1,480**	sf	1.50	2,220		
SUBTOTAL					2,220	
C3030 CEILING FINISHES						
Exposed prefab decking and beams	**1,480**	sf	2.50	3,700		
SUBTOTAL					3,700	
TOTAL - INTERIOR FINISHES						***174,920***
D20 PLUMBING						
D20 PLUMBING, GENERALLY						
Plumbing	**1,480**	sf	30.00	44,400		
SUBTOTAL					44,400	
TOTAL - PLUMBING						***$44,400***
D30 HVAC						
D30 HVAC						
HVAC	**1,480**	sf	50.00	74,000		
SUBTOTAL					74,000	
TOTAL - HVAC						***$74,000***
D40 FIRE PROTECTION						
D40 FIRE PROTECTION						
Sprinkler heads	**18**	ea	125.00	2,250		
Branch sprinkler piping with fittings & hangers	**216**	lf	38.00	8,208		
Main sprinkler piping with fittings & hangers	**20**	lf	60.00	1,200		
Hydraulic calculations, coordination and testing	**1**	ls	2,500.00	2,500		
SUBTOTAL					14,158	
TOTAL - FIRE PROTECTION						***$14,158***
D50 ELECTRICAL						
D50 ELECTRICAL						
Light Fixtures	**1,480**	sf	8.00	11,840		
Branch Circuitry	**1,480**	sf	5.00	7,400		
Lighting Control Devices	**1,480**	sf	1.50	2,220		
Power Wiring Devices	**1,480**	sf	3.00	4,440		
3/4" Emt, 4#12	**120**	lf	14.79	1,775		
1" Emt, 4#8	**100**	lf	22.64	2,264		
Manual Snap Switch Starter WP EF	**2**	ea	1,064.80	2,130		
60 Amp Disconnect HV	**1**	ea	1,833.15	1,833		
Fire Alarm System	**1,480**	sf	4.00	5,920		
Telecommunications System	**1,480**	sf	3.00	4,440		
Security Access Control System	**1,480**	sf	2.00	2,960		
CCTV Security System	**1,480**	sf	1.50	2,220		
Temp Power and Lighting	**1,480**	sf	1.00	1,480		
SUBTOTAL					50,922	
TOTAL - ELECTRICAL						***$50,922***

DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
1. Add Vehicle Wash Bay Finish & Equipment						
F10 INDUSTRIAL EQUIPMENT						
Manual high pressure wash and undercarriage wash	**1**	ls	250,000.00	250,000		
V-1 Manual Wash Pressure Plant 1 N 11 11 26	**1**	ea		*inc above*		
V-2 Manual Wash Control Panel 1 N 11 11 26	**1**	ea		*inc above*		
V-3 Festoons 2 N 11 11 26	**2**	ea		*inc above*		
V-4 Manual Wash On/Off Switch 2 N 11 11 26	**2**	ea		*inc above*		
V-5 Undercarriage Wash Pressure Plant 1 N 11 11 26	**1**	ea		*inc above*		
V-6 Undercarriage Wash Control Panel 1 N 11 11 26	**1**	ea		*inc above*		
V-7 Automatic Undercarriage Pre-Fab Trenches 2 N 11 11 26	**2**	ea		*inc above*		
V-8 Automatic Undercarriage photo Eye 2 N 11 11 26	**2**	ea		*inc above*		
V-9 Automatic Wheel Washers 1 N 11 11 26	**1**	ea		*inc above*		
V-10 Vehicle Wash Guide Rails 1 N 11 11 26	**1**	ea		*inc above*		
V-11 Vehicle Wash Soap drum 1 N 11 11 26	**1**	ea		*inc above*		
V-12 Undercarriage Wash Control Station 2 N 11 11 26	**2**	ea		*inc above*		
V-13 Vehicle Wash Pre-Treatment Tank (1500gal) 1 N 11 11 26	**1**	ea		*inc above*		
V-14 Mobile Platform 1 N 11 11 26	**1**	ea		*inc above*		
V-15 Loop Detector 2 N 11 11 26	**2**	ea		*inc above*		
V-16 Vehicle Wash Entry Traffic Light 1 N 11 11 26	**1**	ea		*inc above*		
V-17 Undercarriage Wash Status Light 1 N 11 11 26	**1**	ea		*inc above*		
SUBTOTAL					250,000	
TOTAL - INDUSTRIAL EQUIPMENT						***$250,000***
SUBTOTAL						***$608,400***
GENERAL CONDITIONS & REQUIREMENTS				14%		$85,176
GL INSURANCE				1.3%		$7,909
BONDS				1.8%		$10,951
GC - OVERHEAD & PROFIT				5%		$30,420
DESIGN AND PRICING CONTINGENCY				10%		$74,286
ESCALATION TO 1ST QUARTER 2026				5%		$40,857
OUTER CAPE PREMIUM				10%		$60,840
TARIFFS PREMIUM ALLOWANCE				3%		$18,252
TOTAL - ALTERNATE 1						***$937,091***

DESCRIPTION	QTY	*UNIT*	*UNIT COST*	*EST'D COST*	*SUB TOTAL*	*TOTAL COST*
2. Add Detached Canopy						
30' x 135' Storage Canopy						
Ground improvements	**4,050**	sf	25.00	101,250		
E&B foundation	**741**	cy	35.00	25,935		
Import underslab subbase	**150**	cy	60.00	9,000		
Foundation - footings and walls	**86**	cy	950.00	81,700		
8" slab on grade	**4,050**	sf	15.00	60,750		
PEMB frame, non insulated metal panels	**4,050**	sf	85.00	344,250		
4" CMU veneer	**780**	sf	60.00	46,800		
AVB	**780**	sf	9.00	7,020		
Lighting and power	4,050	sf	10.00	40,500		
Plumbing				NIC		
HVAC				NIC		
FP				NIC		
SUBTOTAL				717,205		
SUBTOTAL						***717,205***
GENERAL CONDITIONS & REQUIREMENTS			14%			$100,409
GL INSURANCE			1.3%			$9,324
BONDS			1.8%			$12,910
GC - OVERHEAD & PROFIT			5%			$35,860
DESIGN AND PRICING CONTINGENCY			10%			$87,571
ESCALATION TO 1ST QUARTER 2026			5%			$48,164
OUTER CAPE PREMIUM			10%			$71,721
TARIFF PREMIUM			3%			$21,516
TOTAL - ALTERNATE 2						***1,104,680***

New Department of Public Works Facility
Truro, Ma

TCi Construction Cost Estimating

Schematic Design Cost Estimate 29-May-25

DESCRIPTION	*QTY*	*UNIT*	*UNIT COST*	*EST'D COST*	*SUB TOTAL*	*TOTAL COST*
3. Add Rooftop Solar						
Solar Photovoltaic System	**142**	kw	2,950.00	418,900		
SUBTOTAL					418,900	
TOTAL						***$418,900***
SUBTOTAL						***$418,900***

GENERAL CONDITIONS & REQUIREMENTS	14%	$58,646
GL INSURANCE	1.3%	$5,446
BONDS	1.8%	$7,540
GC - OVERHEAD & PROFIT	5%	$20,945
DESIGN AND PRICING CONTINGENCY	10%	$51,148
ESCALATION TO 1ST QUARTER 2026	5%	$28,131
OUTER CAPE PREMIUM	10%	$41,890
TARIFF PREMIUM	3%	$12,567

TOTAL - ALTERNATE 3	***$645,213***

DESCRIPTION	QTY	*UNIT*	*UNIT COST*	*EST'D COST*	*SUB TOTAL*	*TOTAL COST*
4. Add Ground Source Heat Pump (GSHP) in lieu of ASHP						
Deduct base ASHP HVAC	**1**	ls	(1,759,245.00)	(1,759,245)		
Add closed loop GSHP HVAC						
Equipment	**22,140**	sf	32.00	708,480		
Geothermal Well Field	**22,140**	sf	22.00	487,080		
Sheet Metal	**22,140**	sf	23.72	525,161		
Piping	**22,140**	sf	9.02	199,703		
Insulation	**22,140**	sf	4.93	109,150		
Controls	**22,140**	sf	11.52	255,053		
Commissioning	**22,140**	sf	2.44	54,022		
Trade Requirements	**22,140**	sf	3.38	74,833		
Electrical						
1" Emt, 4#6	**750**	lf	25.37	19,028		
1 1/4" Emt, 4#2	**300**	lf	41.00	12,300		
2" Emt, 4 2/0	**(300)**	lf	61.79	(18,537)		
60 Amp Disconnect	**5**	ea	1,833.15	9,166		
100 Amp Disconnect	**2**	ea	1,936.00	3,872		
200 Amp Disconnect	**(2)**	ea	2,813.25	(5,627)		
Sitework						
Earthwork to support wells	**1**	ls	100,000.00	100,000		
SUBTOTAL					774,439	
SUBTOTAL						***774,439***
GENERAL CONDITIONS & REQUIREMENTS			14%			$108,421
GL INSURANCE			1.3%			$10,068
BONDS			1.8%			$13,940
GC - OVERHEAD & PROFIT			5%			$38,722
DESIGN AND PRICING CONTINGENCY			10%			$94,559
ESCALATION TO 1ST QUARTER 2026			5%			$52,007
OUTER CAPE PREMIUM			10%			$77,444
TARIFF PREMIUM			3%			$23,233
TOTAL - ALTERNATE 4						***1,192,833***

DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
5. Add 5,000 SF Fleet storage						
GROSS FLOOR AREA CALCULATION						
Add 5,000 sf			**5,000**			
TOTAL GROSS FLOOR AREA				**5,000**	***gsf***	
A10 FOUNDATIONS						
A1010 STANDARD FOUNDATIONS						
Strip footings to walls						
Formwork	**152**	sf	18.00	2,736		
Re-bar	**540**	lbs	2.50	1,350		
Concrete material	**9**	cy	190.00	1,710		
Placing concrete	**9**	cy	40.00	360		
Foundation walls						
Formwork	**912**	sf	18.00	16,416		
Re-bar	**1,755**	lbs	2.50	4,388		
Concrete material	**27**	cy	190.00	5,130		
Placing concrete	**27**	cy	40.00	1,080		
Back up knee walls						
Formwork	**912**	sf	18.00	16,416		
Re-bar	**780**	lbs	2.50	1,950		
Concrete material	**12**	cy	190.00	2,280		
Placing concrete	**12**	cy	40.00	480		
Column footings						
Formwork	**48**	sf	18.00	864		
Re-bar	**225**	lbs	2.50	563		
Concrete material	**3**	cy	190.00	570		
Placing concrete	**3**	cy	40.00	120		
Piers						
Formwork	**32**	sf	18.00	576		
Re-bar	**75**	lbs	2.50	188		
Concrete material	**1**	cy	190.00	190		
Placing concrete	**1**	cy	40.00	40		
SUBTOTAL					57,407	
A1030 LOWEST FLOOR CONSTRUCTION						
8" Slab on grade						
Vapor barrier	**5,000**	sf	2.00	10,000		
Reinforcing	**5,500**	sf	2.50	13,750		
Concrete - 8" thick	**132**	cy	190.00	25,080		
Placing concrete	**132**	cy	45.00	5,940		
Finishing and curing concrete	**5,000**	sf	1.65	8,250		
Control joints - saw cut	**5,000**	sf	0.50	2,500		
SUBTOTAL					65,520	
TOTAL - FOUNDATIONS						***$122,927***

DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
5. Add 5,000 SF Fleet storage						
B10 SUPERSTRUCTURE						
B1020 ROOF CONSTRUCTION						
Pre-fabricated Structure (includes steel, insulated metal panels walls and roof) :						
Main Building - Prefabricated metal building package (galv steel, metal panels, metal roof, gutters, downspouts and snow guards)	**5,000**	sf	80.00	400,000		
SUBTOTAL					400,000	
TOTAL - SUPERSTRUCTURE						***$400,000***
B30 ROOFING						
B3010 ROOF COVERINGS						
All roofing, gutters, downspouts and snow guards included with Prefabricated metal building						
SUBTOTAL					-	
B3020 ROOF OPENINGS						
Fall arrest system allowance	**1**	ls	2,500.00	2,500		
SUBTOTAL					2,500	
TOTAL - ROOFING						**$2,500**
D20 PLUMBING						
D20 PLUMBING, GENERALLY						
Plumbing - floor drains	**1**	ls	20,000.00	20,000		
SUBTOTAL					20,000	
TOTAL - PLUMBING						***$20,000***
D30 HVAC						
D30 HVAC						
HVAC	**5,000**	sf	30.00	150,000		
SUBTOTAL					150,000	
TOTAL - HVAC						***$150,000***
D40 FIRE PROTECTION						
D40 FIRE PROTECTION						
Sprinkler heads	**56**	ea	125.00	7,000		
Branch sprinkler piping with fittings & hangers	**672**	lf	38.00	25,536		
Main sprinkler piping with fittings & hangers	**100**	lf	60.00	6,000		
Hydraulic calculations, coordination and testing	**1**	ls	5,000.00	5,000		
SUBTOTAL					43,536	
TOTAL - FIRE PROTECTION						***$43,536***

DESCRIPTION	QTY	UNIT	UNIT COST	EST'D COST	SUB TOTAL	TOTAL COST
5. Add 5,000 SF Fleet storage						
D50 ELECTRICAL						
D50 ELECTRICAL						
Light Fixtures	**5,000**	sf	7.00	35,000		
Branch Circuitry	**5,000**	sf	5.00	25,000		
Lighting Control Devices	**5,000**	sf	1.00	5,000		
Power Wiring Devices	**5,000**	sf	2.00	10,000		
Motor Feeders	**5,000**	sf	2.00	10,000		
Motor Disconnects	**5,000**	sf	1.00	5,000		
Fire Alarm System	**5,000**	sf	4.00	20,000		
Security Access Control System	**5,000**	sf	2.00	10,000		
CCTV Security System	**5,000**	sf	1.50	7,500		
Temp Power and Lighting	**5,000**	sf	1.00	5,000		
SUBTOTAL					132,500	
TOTAL - ELECTRICAL						***$132,500***
B SITEWORK						
Structural excavation and backfill						
Over excavate foundation footprint and export	**741**	cy	30.00	22,230		
Import structural fill	**185**	cy	60.00	11,100		
Import 12" subbase for under slabs	**185**	cy	60.00	11,100		
Backfill foundation footing and walls	**74**	cy	25.00	1,850		
Backfill foundation column footings	**15**	cy	25.00	375		
SUBTOTAL					46,655	
TOTAL - SITEWORK						***46,655***
SUBTOTAL						***$918,118***

GENERAL CONDITIONS & REQUIREMENTS	12%	$110,174
GL INSURANCE	1.3%	$11,936
BONDS	1.8%	$16,526
GC - OVERHEAD & PROFIT	5%	$45,906
DESIGN AND PRICING CONTINGENCY	10%	$110,266
ESCALATION TO 1ST QUARTER 2026	3%	$36,388
OUTER CAPE PREMIUM	10%	$91,812
TARIFF PREMIUM	3%	$27,544

TOTAL - ALTERNATE 5	***$1,368,670***

PROJECT: NEW DEPARTMENT OF PUBLIC WORKS FACILITY
17 TOWN HALL
TRURO, MA 02666

GAA 22,205 SF

COSTPRO, INC.

Code	Item Description			Quantity	Unit Price	Total
	GENERAL SUMMARY					$
1.000000	GENERAL REQUIREMENTS (SEE BELOW)		0.0%	$0.00	/SF	0
2.000000	SITE CONSTRUCTION		27.2%	$170.60	/SF	3,788,224
3.000000	CONCRETE		8.0%	$50.17	/SF	1,114,105
4.000000	MASONRY		6.1%	$38.15	/SF	847,151
5.000000	METALS		4.2%	$26.19	/SF	581,446
6.000000	WOOD & PLASTIC		0.7%	$4.15	/SF	92,158
7.000000	THERMAL & MOISTURE PROTECTION		2.3%	$14.48	/SF	321,479
8.000000	DOORS & WINDOWS		2.9%	$17.97	/SF	399,085
9.000000	FINISHES		3.3%	$20.70	/SF	459,694
10.000000	SPECIALTIES		0.5%	$3.03	/SF	67,324
11.000000	EQUIPMENT		2.1%	$13.02	/SF	289,177
12.000000	FURNISHINGS		0.3%	$1.67	/SF	37,168
13.000000	SPECIAL CONSTRUCTION		14.7%	$92.40	/SF	2,051,641
14.000000	CONVEYING SYSTEMS		1.9%	$12.16	/SF	270,000
15.000000	MECHANICAL		16.4%	$102.61	/SF	2,278,458
16.000000	ELECTRICAL		9.5%	$59.32	/SF	1,317,130
		Subtotal		$626.63	/SF	$13,914,240
1.100000	GENERAL REQUIREMENTS				12.00%	1,669,709
		Subtotal		$701.82	/SF	15,583,949
1.200000	OVERHEAD & PROFIT				10.00%	1,558,395
		Subtotal		$772.00	/SF	17,142,344
1.300000	ESCALATION TO BID DATE	3/1/2026			8.86%	1,518,812
				$840.40	/SF	18,661,156
1.400000	ESCALATION TO MID POINT	3/1/2027			3.50%	653,140
		Subtotal		$869.82	/SF	19,314,296
1.600000	BOND				1.25%	241,429
		Subtotal		$880.69	/SF	19,555,725
1.700000	DESIGN & PRICE RESERVE				15.00%	2,933,359
		TOTAL COST		$1,012.79	/SF	$22,489,084

PROJECT: NEW DEPARTMENT OF PUBLIC WORKS FACILITY
17 TOWN HALL
TRURO, MA 02666

GAA 22,205 SF

COSTPRO, INC.

Code	Item Description		Quantity	Unit Price	Total
Alternate 1	Wash Bay Finishes & Equipment				$
1.100000	6" lightgage stud walls 16 ga. 16" cc		2,365 sf	6.45	15,254
1.100001	wall sheathing 5/8"cdx fire retardant, pressure treated		3,656 sf	6.05	22,119
1.100002	1/2" plastic washbay panels	ceiling	1,354 sf	6.76	9,153
1.100003	suspension system		1,354 sf	12.09	16,370
1.100004	1/2" plastic washbay panels		4,304 sf	6.40	27,546
1.100005	pvc furring strips		4,304 sf	4.53	19,497
1.100006	Manual Wash Equipment	allowance	1 ea	105,000.00	105,000
1.100007	Automatic Undercarriage Wash	allowance	1 ea	80,000.00	80,000
		Subtotal	$13.28 /SF		$294,939
	Markups			61.63%	181,760
Alternate 1	Wash Bay Finishes & Equipment	TOTAL COST	$21.47 /SF		$476,699
Alternate 2	Detached Storage Canopy				$
2.100000	demolish monitoring well		1 ea	492.35	492
2.100001	deep pile foundationss	allow	4,080 sf	54.16	220,973
2.100002	slab on grade	complete system	4,080 sf	18.61	75,929
2.100003	cmu & concrete knee wall	complete system	653 sf	122.27	79,842
2.100004	pre-engineered steel building	storage canopy	4,080 sf	81.13	331,010
		Subtotal	$173.59 /SF		$708,246
	Markups			61.63%	436,466
Alternate 2	Detached Storage Canopy	TOTAL COST	$280.57 /SF		$1,144,712
Alternate 3	Rooftop Solar Installation				$
3.100000	Rooftop Solar Installation	system	142 KW	3,538.17	502,420
		Subtotal	$22.63 /SF		$502,420
	Markups			61.63%	309,623
Alternate 3	Rooftop Solar Installation	TOTAL COST	$36.57 /SF		$812,043
Alternate 4	Ground Source Heat Pumps (GHSP)				$
4.100000	boreholes	system	30 tons	7,548.10	226,443
4.100001	heat exchangers	system	30 tons	8,523.57	255,707
		Subtotal	$21.71 /SF		$482,150
	Markups			61.63%	297,132
Alternate 4	Ground Source Heat Pumps (GHSP)	TOTAL COST	$35.09 /SF		$779,282

PROJECT: NEW DEPARTMENT OF PUBLIC WORKS FACILITY
17 TOWN HALL
TRURO, MA 02666

GAA 22,205 SF

COSTPRO, INC.

Code	Item Description		Quantity	Unit Price	Total
Alternate 5	Additional 5,000 SF of Fleet Storage				$
5.100000	Alternate Base Estimate		1 ls		24,553,352
	credits				
5.100001	Base Estimate		1 ls		22,489,084
Alternate 5	Additional 5,000 SF of Fleet Storage	TOTAL COST	$344.04 /SF		$2,064,269

Code	Item Description		Quantity	Unit	Price	Total
2.000000	SITE CONSTRUCTION					$
2.020000	EROSION & SEDIMENT CONTROL					
2.020001	6" crushed stone	constn entrance	1,381	sf	1.05	1,450
2.020002	filter fabric	constn entrance	1,381	sf	1.56	2,154
2.020004	silt fence/orange construction fence		1,428	lf	4.81	6,869
2.020005	filter sock	allow	1,428	lf	4.07	5,812
2.020006	catch basin infiltration filters		12	ea	639.27	7,671
2.020014	erosion control maintenance	constn season	2	ea	10,000.00	20,000
2.060000	SITE CLEARING					
2.060001	clear and grub site	general	0.54	acre	9,748.83	5,264
2.060008	tree removal	unsized	27	ea	868.34	23,445
2.060013	grub stump	unsized	27	ea	388.89	10,500
2.060014	strip & stockpile topsoil	8"	561	cy	10.65	5,975
2.100000	SITE PREPARATION					
	selective site demolition & relocation					
2.101007	sawcut asphalt paving		37	lf	4.56	169
2.101020	remove asphalt paving		38,127	sf	2.99	114,000
2.101021	remove sand & gravel surfacing		31,489	sf	2.01	63,293
2.101022	demolish concrete walks/pads/ramps		856	sf	3.17	2,714
2.101024	demolish wood stockade fence		124	lf	5.89	730
2.101025	demolish wood retaining walls		30	lf	17.89	537
2.101026	demolish wood steps		20	lfr	7.64	153
2.101028	demolish flagpole & bollards		1	ea	308.21	308
2.101030	remove and dispose of existing dumpster		1	ea	1,033.94	1,034
2.101031	demolish misc. minor items		80	hrs	85.59	6,847
2.101035	demolish DPW septic systems (2 ea)		1	ls	12,144.11	12,144
2.101038	demolish catch basin		4	ea	1,768.74	7,075
2.101039	demolish drain pipe	allow	200	lf	33.37	6,674
2.101043	demolish groundwater supply well		2	ea	984.70	1,969
2.101044	demolish monitoring well		1	ea	738.53	739
2.101045	protect monitoring well		5	ea	492.35	2,462
2.101046	electrical demolitions & disconnections		144	hrs	113.35	16,322
	building demolition					
2.101048	building demolition	sheds	202	sf	9.85	1,990
2.101049	building demolition	wood 1 story	1,141	sf	11.82	13,487
2.101050	building demolition	wood 2 story	5,433	sf	13.09	71,118
2.101051	building demolition	wood/conc. 1 story	3,472	sf	20.20	70,134
2.101052	building demolition	cmu 1 story	1,694	sf	17.89	30,306
2.101053	foundation removal		11,942	sf	10.73	128,138
2.101054	gravel fill		2,654	cy	27.70	73,516
	disposal of demolished materials					
2.101269	dumpster rental		26	weeks	727.58	18,917
2.101270	load & truck	10 mile round trip	520	cy	73.47	38,204
2.101271	dump charges		208	ton	94.29	19,612

Code	Item Description		Quantity	Unit	Unit Price	Total
2.200000	EARTHWORK					
2.200003	excavate unsuitable soils below new structures		1,737	cy	8.89	15,442
2.200006	imported structural fill material	slab on grade	1,737	cy	61.71	107,190
2.200007	rough grade site	site	115,284	sf	0.19	21,904
2.200008	rough grade	building	18,437	sf	0.24	4,425
2.200011	fine grade	building	18,437	sf	0.35	6,453
2.200014	fine grade	roads & walks	66,183	sf	0.31	20,517
2.200017	fine grade	pads	1,550	sf	0.35	543
2.200018	fine grade	bioretention	1,148	sf	0.53	608
2.200027	excavation for bioretention basins		122	cy	9.62	1,174
2.200044	trenching, bedding & backfill for 6" sewers		80	lf	23.65	1,892
2.200048	trenching, bedding & backfill for 12" drains		552	lf	23.65	13,055
2.200055	trenching, bedding & backfill for 6"water service		100	lf	23.65	2,365
2.200056	trenching, bedding & backfill for 8"water service		610	lf	23.65	14,427
2.200065	trenching for duct banks		263	lf	16.06	4,224
2.200066	trenching for grounding		120	lf	8.52	1,022
2.200071	excavate fire hydrant		1	cy	31.52	32
2.200074	compacted backfill around fire hydrant		1	cy	63.77	64
2.200080	excavation for structures	manholes	245	cy	29.93	7,333
2.200081	compacted backfill around structures	manholes	128	cy	63.77	8,163
2.200091	excavation for structures	storm chambers	1,222	cy	34.10	41,670
2.200096	excavation for footings	bollards	16	cy	40.54	649
2.200097	excavation for foundations	building	403	cy	40.54	16,338
2.200098	excavation for foundations	salt shed	144	cy	40.54	5,838
2.200100	compacted backfill around foundations	building	224	cy	75.52	16,916
2.200101	compacted backfill around foundations	salt shed	80	cy	75.52	6,042
2.200106	compacted granular fill under structures	building	683	cy	34.09	23,283
2.200116	hauling & disposal		3,340	cy	37.22	124,315
2.444000	CHAIN LINK FENCE					
2.444002	6'0" fence, chain link industrial	security	71	lf	57.53	4,085
2.444014	28'0" automatic sliding gate, chain link	security	1	ea	3,436.06	3,436
2.444015	gate operator		1	ea	6,232.86	6,233
2.513000	BITUMINOUS CONCRETE PAVING					
2.513007	12" compacted gravel base course		65,743	sf	0.94	61,798
2.513008	6" stone aggregate base course		65,743	sf	1.31	86,123
2.513015	2 1/2"asphaltic concrete binder course		65,743	sf	1.75	115,050
2.513017	1 3/4"asphaltic concrete wearing course		65,743	sf	1.39	91,383
2.513018	prime coat		65,743	sf	0.45	29,584
2.513019	tack coat		65,743	sf	0.23	15,121
2.513020	sealcoating		65,743	sf	0.30	19,723
2.513022	bituminous berm		664	lf	23.03	15,292
2.513024	vertical granite curbs		927	lf	54.60	50,614
2.513025	traffic control detail	N.I.C.	0	days	843.83	0
2.513026	temporary signage/barricades	N.I.C.	0	ls	799.08	0

Code	Item Description		Quantity	Unit Price	Total
2.570000	SANITARY SEWERS				
	sanitary waste				
2.570014	6" PVC gravity sewer pipe & fittings	allow	80 lf	20.36	1,629
2.570015	oil/sand trap	allow	1 ea	9,183.73	9,184
2.570016	septic system	allow	1 ea	184,594.86	184,595
2.570017	septic tight tank system u/g	allow	1 ea	47,081.67	47,082
2.570022	3" sch 80 PVC vent pipe	septic tank	4 lf	13.42	54
2.600000	WATER UTILITIES				
2.600254	8" tap into well water line		2 ea	1,383.02	2,766
2.600255	8" DI pipe		610 lf	229.52	140,007
2.600256	8" gate valve & box		2 ea	3,501.70	7,003
2.600260	8" DI bend	45 degree	5 ea	1,076.99	5,385
2.600261	8" DI tee		2 ea	2,383.51	4,767
2.600263	6" DI pipe		100 lf	205.98	20,598
2.600265	6" gate valve & box		1 ea	2,354.08	2,354
2.600268	6" DI bend	90 degree	1 ea	788.62	789
2.600271	fire hydrant assembly		1 ea	6,002.91	6,003
2.600272	indicator post		1 ea	2,972.03	2,972
2.600289	thrust blocks	see division 3.3	14 ea	0.00	0
	offsite work				
2.600565	offsite water well & water main.	allow	1 ls	420,000.00	420,000
2.721000	STORM DRAINS				
2.721001	manhole	DM	7 ea	7,417.76	51,924
2.721002	outlet control structure	OCS	3 ea	14,068.17	42,205
2.721003	manhole	SWTU	3 ea	13,428.71	40,286
2.721004	catch basins	CB	9 ea	6,138.83	55,249
2.721005	infiltration basin drain	OCSD	1 ea	6,138.83	6,139
2.721007	stormwater chamber system	A	1,719 sf	19.18	32,970
2.721008	stormwater chamber system	B	2,182 sf	19.18	41,851
2.721009	stormwater chamber system	C	1,600 sf	19.18	30,688
2.721027	12" drain pipe		552 lf	57.56	31,773
2.721028	12" flared end & rip rap level spresder		2 ea	4,859.91	9,720
2.721036	30 mils HDPE liner		1,148 sf	2.53	2,904
2.721037	6" loamy sand filter bed topping		446 sf	1.48	660
2.721038	18" sand filter bed		446 sf	2.96	1,320
2.721039	6" gravel bed	basin slopes	702 sf	0.58	407
2.721040	6" rip rap aprons	allow	336 sf	25.16	8,454
2.721042	rip rap check dam/storm weir	allow	80 sf	100.63	8,050
2.800000	SITE IMPROVEMENTS				
2.800023	paint parking stall	small job	13 ea	33.56	436
2.800024	paint parking stall	h/capped	1 ea	115.60	116
2.800025	pavement marking	gore lines	160 sf	2.58	413
2.800026	signs	h/capped	1 ea	404.87	405
2.800027	detectable warning pad	curb cut	10 sf	40.77	408
2.800028	traffic signs		10 ea	241.32	2,413
2.800040	ground set flagpoles		1 ea	6,574.93	6,575

Code	Item Description		Quantity	Unit Price	Total
	site structures				
2.800042	material storage bins (7 ea)		304 lf	456.62	138,812
2.800043	pre-engineered fabric membrane structure	salt shed	2,886 sf	145.11	418,787
2.900000	LANDSCAPING				
2.900005	amend & spread topsoil from stockpile		561 cy	12.71	7,130
2.900025	landscaping	allowance	1 ls	75,000.00	75,000
2.990000	MOBILIZATION				
2.900001	mobilization/demobilization		1 ls	161,883.00	161,883
2.000000	SITE WORK	TOTAL COST	$170.60 /SF		$3,788,224

Code	Item Description		Quantity	Unit Price	Total
3.000000	CONCRETE				$
3.200000	CONCRETE REINFORCEMENT				
3.200005	W4x4 W2.9xW2.9 welded wire mesh in slabs	mezzanine	3,768 sf	1.57	5,916
3.200006	W6x6 W6.0xW6.0 welded wire mesh in slabs	SOG	18,437 sf	1.63	30,052
3.300000	CAST-IN-PLACE CONCRETE				
3.300019	3" mezzanine slab concrete	lightweight	35 cy	364.15	12,745
3.300020	2" stair tread concrete	lightweight	1 cy	364.15	364
3.300021	2" landing concrete	lightweight	1 cy	364.15	364
3.300023	cure & finish		3,768 sf	1.93	7,272
	including forms, rebar & concrete	*4500 psi*			
3.300029	36" continuous footings, forms & rebar		67 cy	1,090.36	73,054
3.300030	form 6" footing shelf		604 lf	12.92	7,804
3.300031	isolated footings, forms & rebar		44 cy	722.65	31,797
3.300037	6" concrete slab on grade, forms & rebar		2,957 sf	10.41	30,782
3.300038	8" concrete slab on grade, forms & rebar		15,480 sf	13.18	204,026
3.300051	cure & finish		18,437 sf	1.93	35,583
3.300085	12" concrete walls, forms & rebar	foundations	3,020 sf	44.68	134,934
3.300092	8" concrete walls, forms & rebar	back-up wall	1,641 sf	42.42	69,611
3.300093	8" concrete walls, forms & rebar	fume knee wall	991 sf	42.42	42,038
3.300107	attached piers concrete, forms & rebar		7 cy	2,573.18	18,012
3.300113	6" concrete pads, forms & rebar	equipment	200 sf	23.78	4,756
3.300134	8x15" concrete locker base, forms & rebar		32 lf	59.09	1,891
3.300137	concrete floor sealer		15,480 sf	0.61	9,443
3.300163	concrete testing	allow (1 per 30 cy)	36 ea	335.63	12,083
	site concrete				
3.300165	36" continuous footings, forms & rebar	salt shed	24 cy	1,090.36	26,169
3.300166	12" concrete foundation walls, forms & rebar	salt shed	1,081 sf	44.68	48,299
3.300167	12" concrete exterior walls, forms & rebar	salt shed	1,402 sf	44.68	62,641
3.300168	concrete retaining walls		117 lf	792.58	92,732
3.300169	concrete walks		430 sf	16.60	7,138
3.300170	handicap curb cut		1 ea	960.16	960
3.300174	12" equipment pads	transformer	100 sf	51.84	5,184
3.300175	18" equipment pads	knockdown pad	1,201 sf	77.74	93,366
3.300179	18" equipment pads	generator	249 sf	77.74	19,357
3.300182	bollard footing	18" diam x 6'0"	41 ea	221.15	9,067
3.300184	fence post footing		9 ea	28.44	256
3.300185	light pole footing	allow	8 ea	851.11	6,809
2.800040	new flagpole footing		2 cy	1,090.36	2,181
3.300186	traffic sign footings		10 ea	313.37	3,134
3.300188	concrete thrust block	15"x15"x15"	14 ea	306.07	4,285
3.000000	CONCRETE	TOTAL COST	$50.17 /SF		$1,114,105

Code	Item Description		Quantity	Unit Price	Total
4.000000	MASONRY				$
4.200000	UNIT MASONRY				
4.220000	CONCRETE UNIT MASONRY				
4.221602	4" ground face masonry block veneer	exterior wall	2,023 sf	79.85	161,537
4.221603	4" bullnose		493 lf	16.85	8,307
4.221604	8" ground face masonry block veneer	fume knee wall	716 sf	85.35	61,111
4.221605	8" bullnose		134 lf	16.85	2,258
4.221608	8" cmu partition, #4@48" cc, grouted solid		8,811 sf	61.04	537,823
4.221622	scaffolding		11,550 sf	6.59	76,115
4.000000	MASONRY	TOTAL COST	$38.15 /SF		$847,151

Code	Item Description		Quantity	Unit Price	Total
5.000000	METAL MATERIALS, FINISHES AND FASTENINGS				$
5.410000	STRUCTURAL METAL STUD FRAMING				
5.410002	6" lightgage stud walls 16 ga. 16" cc		2,710 sf	7.42	20,108
5.410003	8" lightgage stud walls 16 ga. 16" cc	fume walls	3,124 sf	8.49	26,523
5.500000	METAL FABRICATIONS				
5.500033	*misc. metals*				
5.500034	misc. minor metals		22,205 sf	13.19	292,884
5.500035	welding crew	allow	40 hrs	225.71	9,028
5.500038	ladder, wall mounted w/safety post	aluminum	14 vlf	202.05	2,829
	site metals				
5.500054	bollards 6"x10'0 galv conc. filled	exterior	41 ea	1,278.97	52,438
5.520000	METALRAILINGS				
5.520001	guard rails	mezzanine	190 lf	180.73	34,339
5.520002	guard rails	stairs	129 lf	180.73	23,314
5.520003	6'0" swing gates		2 pair	1,648.97	3,298
5.520004	swing gate safety chains		12 lf	32.98	396
	short term special market conditions				
5.810401	shortages and tariffs			25%	116,289
5.000000	METAL MATERIALS	TOTAL COST	$26.19 /SF		$581,446

Code	Item Description		Quantity	Unit Price	Total
6.000000	WOOD & PLASTICS				$
6.105000	ROUGH CARPENTRY				
6.110000	WOOD FRAMING				
6.110001	pressure treated blocking	allowance	5.10 mbf	7,386.82	37,673
6.110023	1/2" pressure treated plywood sheathing	exterior walls	2,710 sf	6.65	18,022
	short term special market conditions				
6.110039	shortages and tariffs		40%		22,278
6.220000	MILLWORK MOLDINGS				
6.220806	moldings, window and door	trim set & stool	7 windows	315.43	2,208
6.220807	closet rod and shelf		12 lf	54.32	652
6.220811	misc finish carpentry		22,205 sf	0.51	11,325
6.000000	WOOD & PLASTICS	TOTAL COST	$4.15 /SF		$92,158
7.000000	MOISTURE-THERMAL CONTROL				$

Code	Item Description		Quantity	Unit Price	Total
7.115000	WATERPROOFING AND DAMPPROOFING				
7.110000	DAMPRPROOFING				
7.110001	liquid asphalt waterproofing, sprayed	foundation walls	4,101 sf	2.33	9,555
7.210000	BUILDING INSULATION				
7.210003	insulate hollow metal frames	exterior doors	163 lf	8.94	1,460
7.210006	2" polystyrene wall insulation, rigid	fume walls	991 sf	4.80	4,757
7.210007	2" polystyrene wall insulation, rigid	siding	1,301 sf	4.80	6,245
7.210008	3" polystyrene wall insulation, rigid	exterior walls	2,023 sf	6.27	12,684
7.210010	3" sprayed foam insulation	walls	3,124 sf	6.08	18,994
7.213000	FOUNDATION INSULATION				
7.213002	2" polystyrene insulation, rigid	slab on grade	18,437 sf	3.05	56,233
7.213005	3" R-15 rigid closed cell polystyrene insulation		3,020 sf	6.09	18,392
7.273000	AIR AND VAPOR BARRIERS				
7.273001	standard slab on grade - vapor barrier	15 mils	18,437 sf	0.37	6,822
7.273002	liquid asphalt waterproofing, sprayed	cmu/concrete	2,632 sf	2.33	6,133
7.273003	self-adhered	exterior walls	5,527 sf	5.74	31,726
7.273006	air barrier compliance testing	allow	1 ls	20,000.00	20,000
7.400000	PREFORMED ROOFING AND SIDING				
7.400004	cement fiber lap siding	6" exposure	942 sf	13.49	12,708
7.400006	cement fiber shingle siding	standard	321 sf	11.62	3,730
7.400010	8" cement fiber water table	stock	112 lf	17.74	1,987
7.400011	3" cement fiber trim		40 lf	14.19	568
7.400012	8" cement fiber trim		56 lf	17.74	993
7.620000	SHEET METAL FLASH & TRIM				
7.620004	through wall flashings		1,045 lf	14.55	15,205
7.700000	ROOF SPECIALTIES AND ACCESSORIES				
7.700012	snow guards	double rail pipe	650 lf	65.06	42,289
7.841000	PENETRATION FIRESTOPPING				
7.841001	firestopping		22,205 sf	0.47	10,436
7.920000	JOINT SEALERS				
7.920002	1/2" backer rod & sealant		2,090 lf	8.64	18,058
7.920003	joint fillers, sealants & caulking	sog/misc	22,205 sf	0.59	13,101
7.000000	MOISTURE-THERMAL CONTROL	TOTAL COST	$14.48 /SF		$321,479

Code	Item Description		Quantity	Unit Price	Total
8.000000	DOORS, WINDOWS AND GLASS				$
8.100000	METAL DOORS AND FRAMES				
8.120000	HOLLOW METAL FRAMES	*powder coat finish*			
8.120004	HM door frame exterior	3'4x7'2"	9 ea	578.32	5,205
8.120008	HM door frame	3'4x7'2	25 ea	635.44	15,886
8.120009	HM door frame	6'4x7'2	5 ea	771.10	3,856
8.130000	HM FLUSH DOORS	*powder coat finish*			
8.130002	HM door, insulated flush	3'0x7'2"	9 ea	946.02	8,514
8.130009	HM door, interior flush	3'0x7'2"	21 ea	779.43	16,368
8.130013	extra for half-glass	22"x32"	9 ea	386.74	3,481
8.416000	WOOD AND PLASTIC DOORS				
8.205402	1 3/4"interior solid core wood door	3x7	14 ea	541.43	7,580
8.205403	extra for half lite		4 ea	565.23	2,261
8.205404	extra for vision lite		1 ea	565.23	565
8.205405	extra for louver cutout		1 ea	583.08	583
8.361000	OVERHEAD SECTIONAL DOORS				
8.361011	overhead insulated steel door & frame	14'x14'	1 ea	8,967.80	8,968
8.361012	overhead insulated steel door & frame	16'x16'	2 ea	11,713.05	23,426
8.361013	overhead insulated steel door & frame	18'x16'	2 ea	13,177.18	26,354
8.361015	extra for double row of vision panels	14'	1 ea	2,016.49	2,016
8.361016	extra for double row of vision panels	16'	2 ea	2,304.56	4,609
8.361017	extra for double row of vision panels	18'	2 ea	2,592.63	5,185
8.361018	overhead full vision polycarbonate door, s,s. frame	16'x16'	2 ea	22,270.16	44,540
8.361019	extra for electric operators	1/2 hp	7 ea	2,736.92	19,158
8.400000	ENTRANCES AND STOREFRONTS				
8.410002	aluminum storefront entrance frame	6'0"x7'2 1/2"	1 ea	1,814.69	1,815
8.410003	storefront doors, preglazed		1 leaf	4,402.86	4,403
8.500000	METAL WINDOWS	*powder coat finish*			
8.510401	aluminum windows, single hung W1	4'0x5'0	11 ea	2,141.93	23,561
8.510402	aluminum windows, single hung W2	2'0x5'0	1 ea	1,070.97	1,071
8.710000	DOOR HARDWARE				
8.710001	finish hardware exterior door w/panic device		9 leaf	3,450.89	31,058
8.710002	finish hardware interior door		35 leaf	1,427.96	49,979
8.710003	aluminum threshold		27 lf	39.07	1,055

Code	Item Description		Quantity	Unit Price	Total
8.800000	GLAZING				
8.710001	1" tempered insulating glass in doors and sidelites		64 sf	77.35	4,950
8.950000	FIBERGLASS SANDWICH PANELS				
8.950001	Kalwall with fiberglass sandwich panels TP1	14'0x4'0	4 ea	6,508.53	26,034
8.950001	Kalwall with fiberglass sandwich panels TP2	16'0x4'0	4 ea	7,438.32	29,753
8.950001	Kalwall with fiberglass sandwich panels TP3	12'0x4'0	1 ea	5,578.74	5,579
8.950003	extra for operable hopper window	4'0x4'0	0 ea	594.98	0
8.000000	DOORS, WINDOWS AND GLASS	TOTAL COST	$17.97 /SF		$399,085

Code	Item Description		Quantity	Unit Price	Total
9.000000	FINISHES				$
9.110000	NON-LOAD BEARING STEEL FRAMING				
9.110004	2 1/2" metal studs 16 ga 16"cc	furring	505 sf	4.65	2,348
9.110005	3 5/8" metal studs 16 ga 16"cc	furring	454 sf	5.29	2,402
9.110006	3 5/8" metal studs 16 ga 16"cc	office partitions	4,460 sf	5.29	23,593
9.110007	6" metal studs 16 ga 16"cc	partitions	4,069 sf	6.45	26,245
9.250000	GYPSUM B0ARD SYSTEMS				
9.250002	suspended drywall soffit	G1	42 sf	13.05	548
9.250003	suspended drywall soffit furrdown	G1	21 lf	13.05	274
9.250004	suspended drywall ceiling, moisture resistant	G2	677 sf	13.30	9,004
9.250005	suspended drywall ceiling, 2hr fire rated	G3	212 sf	18.85	3,996
9.250009	5/8"" drywall on metal furring		959 sf	5.60	5,370
9.250011	5/8"" drywall on metal studs	exterior wall	2,389 sf	5.60	13,378
9.250012	5/8"" drywall on metal studs	fume walls	3,400 sf	5.60	19,040
9.250013	5/8"" drywall on metal studs	partitions	17,058 sf	5.60	95,525
9.300000	TILE				
9.300002	ceramic tile full height	wet walls	474 sf	28.00	13,272
9.300003	ceramic tile wainscot	toilets/lockers	841 sf	28.00	23,548
9.300004	ceramic tile base	toilets/lockers	173 lf	30.19	5,223
9.300005	ceramic tile bullnose trim	toilets/lockers	126 lf	30.19	3,804
9.510000	ACOUSTICAL CEILINGS				
9.510201	2x2 suspended ceilings	A1	2,317 sf	15.03	34,825
9.510202	2x2 suspended ceilings, moisture resistant	A2	433 sf	16.12	6,980
9.653000	RESILIENT BASE				
9.653001	rubber base	6"	996 lf	7.65	7,619
9.600000	FLOORING AND CARPET				
9.615106	resilient tile flooring corridor	LVT	542 sf	13.79	7,474
9.615107	resilient tile flooring	linoleum tile	2,279 sf	11.72	26,710
9.670000	FLUID APPLIED FLOORING				
9.672300	epoxy resin floor	toilets/lockers	648 sf	24.55	15,908
9.770000	SPECIAL WALL SURFACING				
9.773000	sanitary wall panels	jan. closet	88 sf	9.52	838

Code	Item Description		Quantity	Unit Price	Total
9.810000	ACOUSTICAL INSULATION				
9.811601	4" batt insulation in partition wall	accoustical	3,874 sf	2.84	11,002
9.811602	6" batt insulation in partition wall	accoustical	2,778 sf	3.11	8,640
9.900000	PAINTING AND COATINGS				
9.910000	EXTERIOR PAINTING				
9.910602	prep. & paint hydrant		1 ea	199.14	199
9.920000	INTERIOR PAINTING				
9.921000	paint all exposed surfaces		22,205 sf	4.14	91,929
9.000000	FINISHES	TOTAL COST	$20.70 /SF		$459,694

PROJECT: NEW DEPARTMENT OF PUBLIC WORKS FACILITY
17 TOWN HALL
TRURO, MA 02666

GAA 22,205 SF

COSTPRO, INC.

Code	Item Description		Quantity	Unit Price	Total
10.000000	SPECIALTIES				$
10.100000	VISUAL DISPLAY UNITS				
10.110401	bulletin board/peg board	allow	1 ea	392.08	392
10.210000	COMPARTMENTS AND CUBICLES				
10.210001	ADA partitions, phenolic		1 ea	2,804.90	2,805
10.210002	standard partitions, phenolic		2 ea	2,623.94	5,248
10.300000	FIREPLACES, EXT. SPECIALTIES AND FLAGPOLES				
10.305402	ground set flagpoles		1 ea	7,240.66	7,241
10.140000	SIGNAGE				
10.140003	town seal	48" diam	1 ea	1,516.63	1,517
10.140004	wall mounted aluminum exterior letters	12"	27 ea	153.82	4,153
10.140005	signs	allow	44 ea	102.54	4,512
10.140006	bronze dedication plaque	20"x30"	1 ea	4,493.87	4,494
10.280000	TOILET AND BATH ACCESSORIES				
10.280013	napkin disposal bin, recessed		3 ea	446.37	1,339
10.280014	feminine hygene dispenser		2 ea	741.94	1,484
10.280015	grab bars 42"		8 ea	107.97	864
10.280016	mop strip		1 ea	126.67	127
10.280017	janitor shelving		1 ea	150.80	151
10.280018	paper towel dispenser, surface mtd	install only (OFCI)	5 ea	45.24	226
10.280019	waste receptacle, semi-recessed		5 ea	542.88	2,714
10.280020	robe hooks		5 ea	54.29	271
10.280021	soap dispenser, surface mtd	install only (OFCI)	5 ea	36.19	181
10.280022	toilet roll holder; single roll	install only (OFCI)	5 ea	24.13	121
10.280024	vanity mirror tilting	18"x30"	5 ea	271.44	1,357
10.280025	shower curtain		2 ea	54.29	109
10.280026	shower curtain rod		2 ea	137.53	275
10.440000	FIRE PROTECTION SPECIALTIES				
10.440001	fire extinguishers, 30lb dry chemical	allow	8 ea	1,417.53	11,340
10.500000	LOCKERS, PROTECTIVE COVERS AND POSTAL SPECIALTIES				
10.500003	lockers	18"x24" sloped top	16 ea	972.67	15,563
10.500006	48" locker bench		1 ea	608.03	608
10.500009	locker room bench pedestals		2 ea	115.82	232
10.000000	SPECIALTIES	TOTAL COST	$3.03 /SF		$67,324

Code	Item Description		Quantity	Unit Price	Total
11.000000	EQUIPMENT				$
11.110000	VEHICLE SERVICE EQUIPMENT				
11.104000	Overhead Fluid Distribution and Waste Fluid Colle	allowance	1 ea	135,000.00	135,000
11.104001	exhaust equipment	allowance	1 ea	19,954.61	19,955
11.104002	Storage Shelving/Benches/Racks - Defer Partial	allowance	1 ea	55,000.00	55,000
11.104003	Miscellaneous Shop and Support Equipment	allowance	1 ea	75,000.00	75,000
11.221600	TELLER & SERVICE EQUIPMENT				
11.104000	48" transaction window	vestibule	1 ea	4,222.43	4,222
11.400000	FOOD SERVICE, RESIDENTIAL, DARKROOM, ATHLETIC EQUIPMENT				
11.400001	food service equipment/appliances	OFOI	0 ea	0.00	0
11.000000	EQUIPMENT	TOTAL COST	$13.02 /SF		$289,177

Code	Item Description		Quantity	Unit Price	Total
12.000000	FURNISHINGS				$
12.210000	WINDOW TREATMENT				
12.210003	aluminum blinds	windows	230 sf	11.46	2,636
12.210004	aluminum blinds	entrance storefront	21 sf	11.46	241
12.350000	MANUFACTURED WOOD CASEWORK				
12.350006	kitchen base unit	p/lam	10 lf	470.50	4,705
12.350007	ADA sink unit		3 lf	470.50	1,412
12.350008	ADA cooktop unit		3 lf	470.50	1,412
12.350009	18" high wall unit	p/lam	3 lf	416.21	1,249
12.350010	36" high wall unit	p/lam	13 lf	428.28	5,568
12.350014	ADA vanity unit		10 lf	470.50	4,705
12.350016	12" solid surface transaction counter		4 lf	109.18	437
12.350018	25" solid surface countertops w/splash		26 lf	218.36	5,677
12.350019	cutout for sink	solid surface	4 ea	179.75	719
12.350020	cutout for cooktop	solid surface	4 ea	361.92	1,448
12.480000	FLOOR MATS AND FRAMES				
12.480001	recessed aluminum entry grille		56 sf	124.26	6,959
12.510000	OFFICE FURNITURE				
12.510006	office furnishings	OFOI	0 ls	0.00	0
12.000000	FURNISHINGS	TOTAL COST	$1.67 /SF		$37,168

Code	Item Description		Quantity	Unit Price	Total
13.000000	SPECIAL CONSTRUCTION				$
13.340000	FABRICATED ENGINEERED STRUCTURES				
13.340001	pre-engineered steel building	building & canopy	17,787 sf	97.36	1,731,742
13.340002	pre-engineered steel building	mezzanines	3,768 sf	73.02	275,139
13.340003	pre-engineered steel building	stairs	118 sf	146.03	17,232
13.340004	pre-engineered steel building	landing	53 sf	146.03	7,740
13.340007	premium for custom colors		1 ls	19,787.69	19,788
13.000000	SPECIAL CONSTRUCTION	TOTAL COST	$92.40 /SF		$2,051,641

Code	Item Description		Quantity	Unit Price	Total
14.000000	CONVEYING SYSTEMS				$
14.450000	VEHICLE LIFTS				
14.400001	Heavy Duty Mobile Column Lifts		1 ea	95,000.00	95,000
14.400002	Two Post Vehicle Lift (16,000 lb)		1 ea	65,000.00	65,000
14.600000	HOISTS AND CRANES				
14.600001	Bridge Crane	allowance	1 ea	110,000.00	110,000
14.000000	CONVEYING SYSTEMS	TOTAL COST	$12.16 /SF		$270,000

PROJECT: NEW DEPARTMENT OF PUBLIC WORKS FACILITY
17 TOWN HALL
TRURO, MA 02666

GAA 22,205 SF

COSTPRO, INC.

Code	Item Description		Quantity	Unit Price	Total
15.000000	MECHANICAL SUMMARY				$
15.100000	PLUMBING		$25.26	/SF	$560,911
15.400000	FIRE PROTECTION		$34.88	/SF	$774,500
15.500000	HVAC		$42.47	/SF	$943,047
15.000000	MECHANICAL SUMMARY	TOTAL COST	$102.61	/SF	$2,278,458

PROJECT: NEW DEPARTMENT OF PUBLIC WORKS FACILITY
17 TOWN HALL
TRURO, MA 02666

GAA 22,205 SF

COSTPRO, INC.

Code	Item Description		Quantity	Unit Price	Total
15.100000	PLUMBING				$
	systems				
15.100001	indentification for plumbing piping and equipment		22,205 sf	0.35	7,772
15.100002	plumbing insulation		22,205 sf	3.54	78,606
15.100003	facility natural gas piping		22,205 sf	1.05	23,315
15.100004	domestic water piping		22,205 sf	4.57	101,477
15.100005	domestic and non-domestic water piping specialties		22,205 sf	0.37	8,216
15.100006	domestic water pumps		22,205 sf	0.19	4,219
15.100007	sanitary waste and vent piping		22,205 sf	1.92	42,634
15.100008	sanitary waste piping specialties		22,205 sf	3.74	83,047
15.100009	general service compressed air systems		22,205 sf	0.75	16,654
15.100010	fuel-fired domestic water heaters		22,205 sf	1.26	27,978
	fixures including rough-in				
15.100199	water cooler		1 ea	2,730.74	2,731
15.100210	wall hydrant; frostproof vaccuum breaker	3/4"	4 ea	419.26	1,677
15.100216	lavatory, wall hung ADA vitreous china	wall hung	2 ea	3,030.88	6,062
15.100217	lavatory, countertop ADA vitreous china	countertop	3 ea	2,006.86	6,021
15.100218	24x24" service sink	floor	1 ea	5,355.54	5,356
15.100219	single bowl sink, s.s.		1 ea	2,854.33	2,854
15.100223	shower		2 ea	3,648.83	7,298
15.100225	urinal		1 ea	2,271.69	2,272
15.100227	water closet	wall mount	5 ea	3,001.46	15,007
15.100228	shower stall, fiberglass	36"x36"	2 ea	2,766.05	5,532
15.400000	PLUMBING	TOTAL COST	$25.26 /SF		$560,911

Code	Item Description		Quantity	Unit Price	Total
15.400000	FIRE PROTECTION				$
	systems				
15.400001	water-based fire-suppression systems		22,205 sf	12.89	286,222
15.400002	fire pump & vault		1 ea	88,278.12	88,278
15.400003	storage cistern	50,000 gal.	1 ea	400,000.00	400,000
15.400000	FIRE PROTECTION	TOTAL COST	$34.88 /SF		$774,500

Code	Item Description		Quantity	Unit Price	Total
15.500000	HVAC				$
	systems				
15.500001	general provisions for heating, ventilating and air conditioning		22,205 sf	0.66	14,655
15.500002	identification for hvac piping and equipment		22,205 sf	0.35	7,772
15.500003	testing, adjusting, and balancing for hvac		22,205 sf	1.27	28,200
15.500004	hvac instrumentation and controls		22,205 sf	3.83	85,045
15.500005	hydronic piping		22,205 sf	5.27	117,020
15.500006	hydronic pumps		22,205 sf	1.81	40,191
15.500007	hvac water treatment		22,205 sf	0.06	1,332
15.500008	metal ducts		22,205 sf	11.59	257,356
15.500009	hvac fans		22,205 sf	4.65	103,253
15.500010	air terminal units		22,205 sf	1.33	29,533
15.500011	special exhaust systems		22,205 sf	0.50	11,103
15.500012	diffusers, registers and grilles		22,205 sf	2.15	47,741
15.500013	air outlets and inlets		22,205 sf	0.34	7,550
15.500014	heating boilers		22,205 sf	1.31	29,089
15.500015	heat exchangers		22,205 sf	0.17	3,775
15.500016	packaged compressor and condensing units		22,205 sf	0.96	21,317
15.500017	air to air energy recovery equipment		22,205 sf	0.88	19,540
15.500018	indoor central station air handling units		22,205 sf	5.02	111,469
15.500019	unit heaters		22,205 sf	0.32	7,106
15.500000	HVAC	TOTAL COST	$42.47 /SF		$943,047

Code	Item Description		Quantity	Unit Price	Total
16.000000	ELECTRICAL				$
	systems				
15.500001	low voltage electrical power conductors and cables		22,205 sf	6.43	142,778
15.500002	raceway and boxes for electrical systems		20,305 sf	4.16	84,469
15.500002	motor connections		20,305 sf	0.42	8,528
15.500002	lighting control devices (includes wire & comduit)		20,305 sf	0.62	12,589
15.500002	medium voltage switchgear		20,305 sf	1.40	28,427
15.500002	panelboards		20,305 sf	2.05	41,625
15.500002	wiring devices		20,305 sf	8.47	171,983
15.500002	interior lighting		20,305 sf	6.06	123,048
15.500002	exterior lighting		20,305 sf	2.15	43,656
15.500002	communications		20,305 sf	0.74	15,026
15.500002	electronic safety & security	N.I.C.	20,305 sf	0.00	0
15.500002	fire alarm		20,305 sf	5.42	110,053
16.000000	ELECTRICAL	TOTAL COST	$59.32 /SF		$1,317,130

SECTION IV

Zoning & Permitting

55 Walkers Brook Drive, Suite 100, Reading, MA 01867
Tel: 978.532.1900

MEMORANDUM

TO: Truro Department of Public Works

FROM: Weston & Sampson, Inc.

DATE: April 22, 2025

SUBJECT: Schematic Design: 24 Town Hall Road, Zoning and Permitting Analysis Memo

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SITE INFORMATION:

Parameter	Information	Notes:
Site Address:	24 Town Hall Road	
Map/Lot:	46-269-0	
Size (acres):	223,898 SF	
Zoning District	Residential	
Book/Page:	92/23	

ZONING INFORMATION:

Zoning District: Residential

Zoning Map Date: 2009 Open Space & Recreation Plan

Zoning By-Law Date: April 2014

Overlay Districts:

District	Applicable	Notes:
Water Resources Protection District	Yes	Water Supply Well, IWPA
Flood Plain District	No	
Affordable Rental Housing Overlay District	No	
Solar Farm Overlay District	No	

DIMENSIONAL REGULATIONS:

DIMENSION	Required	Notes:
Minimum lot size (square feet)	33,750 sf	
Minimum lot frontage	150 ft	
Minimum Front setback	25 ft	
Minimum Side setback	25 ft	
Maximum Building Height	2 stories, 30	*5a
Building Height	3	

Note 5a. Except buildings which do not have gable, hip, or gambrel roofs; for these buildings, a ridge or hip maximum height shall not exceed twenty-three (23) ft as measured to the highest point of the roof structure.

PERMITTING SUMMARY:

1) Site Plan Review (Commercial Development), Truro Planning Board

- Required for building permits, for site clearing, filling, grading, material delivery or construction. *Per Zoning Section 70.1.D.1.*
- Need waiver for smaller Parking Stall Dimensions (9'x18') per *Zoning Section 30.9.G.4.*

2) Truro Historical Commission and/or Historic Review Board

- Project is located within the historic "Hill of Churches" area.
- Project should be confirmed with Truro Historical Commission under the "Preserving Historic Properties Bylaw." The Historical Commission can determine a building "significant" if it is over 75 years old. Per the property record card for 24 Town Hall Road, we have one building on site (Building 5) that is exactly 75 years old. See below:
  Building 1 Year Built: 2004 (style: gov building)
  Buidling 2 Year Built: 1970 (style: storage garage)
  Building 3 Year Built: 1980 (style: storage garage)
  Building 4 Year Built: 1966 (style: office building)
  Building 5 Year Built: 1950 (style: storage garage)

GENERAL NOTES:

1) This zoning and permitting analysis review does not include construction permits such as Building, Electrical, Demo permits, etc.

2) See Environmental Receptor Map, the entire site falls within the coastal zone, but not in any coastal resource area (such as marshes, dunes, beaches, barrier beaches, and banks), FEMA Flood Zone or an Outstanding Resource Water (ORW). This project may need to be reviewed with the Mass Office of Coastal Management Zone (CZM) if federal permits are filed.

3) See Human Receptor Map, the shading that covers the whole map represents the historic Hill of Churches area. The town hall building itself is a historic structure, represented by a faint red dot. The pink circle represents an IWPA, the blue circle represents a DEP Approved Zone I, and the red dot represents an existing Public Water Supply.

4) This parcel is **not** located within the FEMA Flood Hazard Zone.

5) See Water Resource Protection Map, the site is located within the Water Resources Protection District.

DESIGN AND PERMITTING CONSIDERATIONS:

TRURO ZONING BYLAWS:

SECTION 30 Use Regulations	
30.2 Use Table	
Institutional, Municipal Use: Permitted	Permitted
30.4 Water Resource Protection District	
C. Site Design Requirements 1. Runoff shall be directed toward vegetated swales or basins for surface infiltration. Catch basins and piped storm sewers shall be used only where other methods are infeasible. 2. Where the premises are partially outside the Water Resource Protection District, site design shall maximize protection of groundwater through siting potential pollution sources such as on-site disposal systems outside of the District, to the extent feasible.	Stormwater design requirements
30.9 Parking	
C. Off Street Parking Schedule**:** 5. No parking shall be delineated within any Town or State Road. 6. Where the calculation of required parking spaces results in a fractional number, the number shall be rounded up to the next whole number.	
Institutional, Municipal Use: • 1 space per employee maximum shift, plus • 1 space per each 3 seats in area of public assembly	Parking requirements
F. Location Requirements 2. No parking area shall be located within ten (10) feet of a street line and ten (10) feet from a side or rear property line	
G. Design Requirements 2. In a given storm event the first inch of rainfall, known as the "first flush," contains approximately ninety percent (90%) of all contaminants; therefore this portion of runoff shall be contained on the lot. Stormwater runoff shall be directed in such a way as to recharge the groundwater beneath the lot and in such a manner as to not increase the flow of runoff into wetlands.	Stormwater design requirements
4. Design Criteria 45^{o}: 9' x 17.5' 60^{o}: 9' x 19' 90^{o}: **9' x 20'**	Parking Stall requirements – Need waiver for 9'x18' stalls

SECTION 50 Area and Height Regulations	
50.1 Regulations Table	
50.1.B B. Exceptions to height limitations may be authorized by Board of Appeals by special permit.	
SECTION 70 Site Plan Review	
D. Site Alteration - Violation of the Bylaw	
1. No building permit, site clearing, filling, grading, material deliveries or construction shall be initiated on any site to which this section applies until the required Commercial or Residential Site Plan approval is obtained from the Planning Board. 2. Nothing herein shall be construed to prohibit such site clearing or altering as may be necessary to conduct such pre-development studies as geotechnical tests, soil borings, wetlands determination, percolation tests for septic systems as required by the Board of Health, or other similar tests required by any Town Bylaw or regulation of the Commonwealth.	Site Plan Review Requirement
70.3 Commercial Development	
A. Commercial Site Plan Review is required for: 1. Any construction, alteration, expansion, or modification of any properties, structures, and uses other than that of single or two family residences and their accessory uses and structures. 2. All other projects specifically requiring site plan approval or review as stated in other sections of this Zoning Bylaw.	Site Plan Review Commercial Requirement
SECTION 90 Bounds of Zoning Districts	
90.5. Overlay Districts	
A. Water Resource Protection District. The Water Resource Protection Districts for the Town of Truro shall be determined from the following atlas which is on file with the Truro Town Clerk: “Zones of Contribution to public supply wells and water table contours, December 1990.” Land in a Water Resource Protection District may be used for any purpose otherwise permitted in the underlying district, subject to the restrictions in § 30.4 of this bylaw.	Yes the site falls within the Water Resource Protection District

Path: \\wse03.local\WSE\Depts\Water\Water Resources Group\GIS - Constraints Mapping\Truro\DPW\GIS\GIS.aprx **User:** GasparA **Saved:** 4/9/2025 10:06 AM **Opened:** 4/9/2025 10:20 AM

N
W E
S

200 100 0 200 Feet

Coastal Zone

Data Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

Legend

- Work Area
- Hydrologic Connection

Streams
- Perennial Stream
- Intermittent Stream

DEP Wetland Areas
- Marsh/Bog
- Wooded marsh
- Cranberry Bog
- Salt Marsh
- Open Water
- Reservoir (with PWSID)
- Tidal Flats
- Beach/Dune
- Article 97 Land
- ACECs

NHESP Estimated Habitats of Rare Wildlife
- NHESP Estimated Habitats of Rare Wildlife
- NHESP Priority Habitats of Rare Species

NHESP Certified Vernal Pools
- NHESP Certified Vernal Pools
- NHESP Potential Vernal Pools
- Cold Water Fisheries

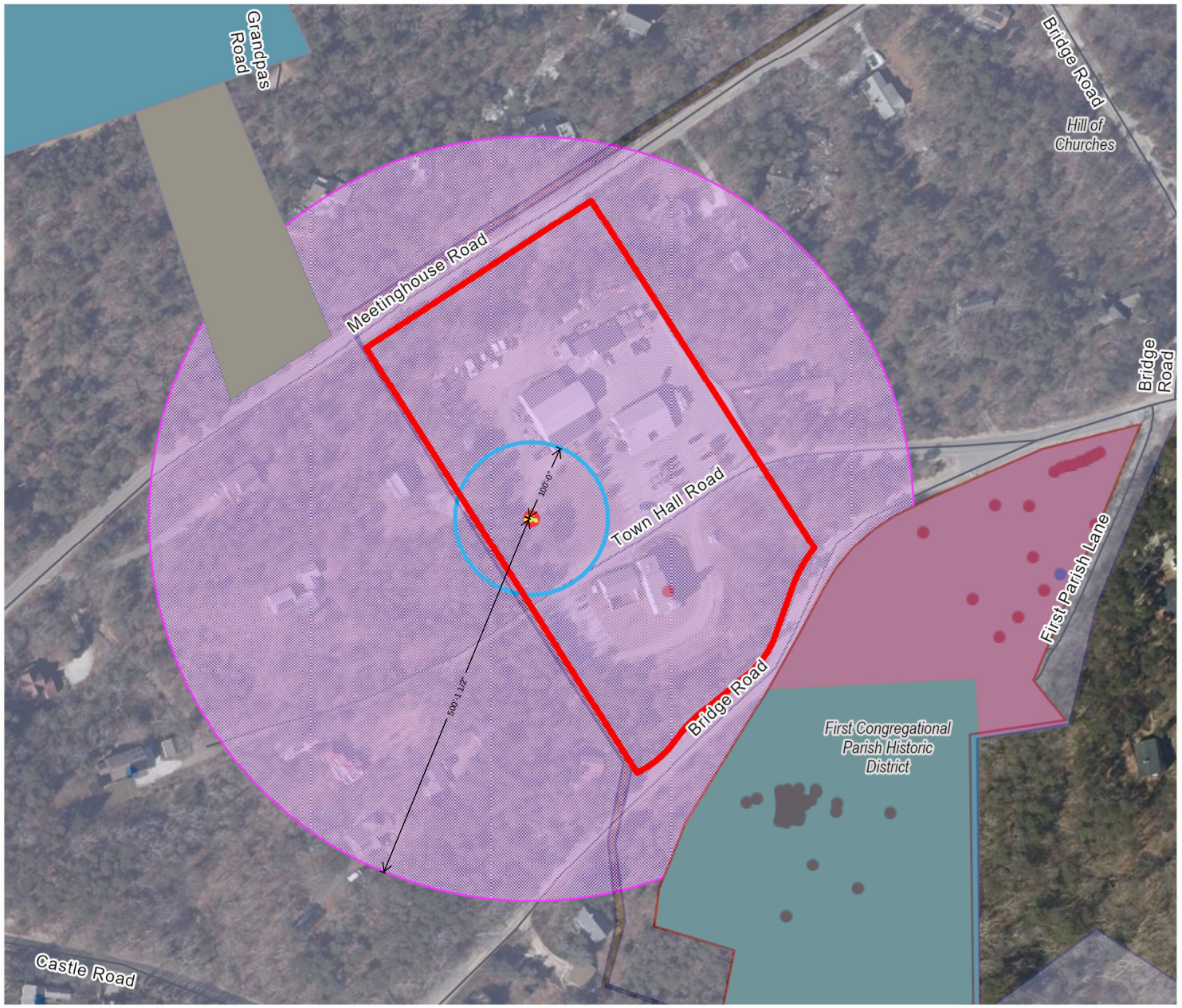
Outstanding Resource Waters
- Public Water Supply Contributor
- ORW for ACEC
- ORW for both Water Supply and Other

FEMA National Flood Hazard Layer
- 1% Annual Chance Flood Hazard
- Regulatory Floodway
- Area of Undetermined Flood Hazard
- 0.2% Annual Chance Flood Hazard
- Area with Reduced Risk Due to Levee
- Area Not Included

FIGURE 1

24 Town Hall Road
Truro, MA
Environmental
Receptors Map

Weston & Sampson



Castle Hill Snow Village Area

N
W E
S

200 100 0 200
Feet

Data Source: Office of Geographic and Environmental Information (MassGIS), Commonwealth of Massachusetts Executive Office of Environmental Affairs

Legend

- Work Area
- MassHistoric Commission Inventory (Points)
  - National Register of Historic Places ✓
  - Preservation Restriction
  - Massachusetts Historic Landmark
  - Local Historic District
  - NRHP and LHD
  - Inventoried Property
- MassHistoric Commission Inventory (Areas)
  - National Register of Historic Places
  - Preservation Restriction
  - Massachusetts Historic Landmark
  - Local Historic District
  - NRHP and LHD
  - Inventoried Property
- MassHistoric Commission Towns
  - Survey Pending
  - No Survey Pending
- Type II Surfacewater Discharge Permit
- AUL Sites
- Tier Classified Sites
  - TIERI
  - TIERII
  - TIER1D
- Protected and Recreation Open Space
  - State-State Dispute
  - State-Non-Profit Dispute
  - State-Municipal Dispute
  - State-Private Dispute
  - Private-Private Dispute
  - Public Non-Profit
- County
- Federal
- Conservation Organization
- Land Trust
- Municipal
- Private Non-Profit
- Other
- Private
- State
- Unknown
- <all other values>
- Public Water Supplies
  - Community Groundwater Source
  - Surface Water Intake
  - Non-Community Groundwater Source ✓
  - Emergency Surface Water
  - DEP Approved Zone I ✓
  - DEP Approved Zone II
  - IWPA ✓
- Surface Water Protection Areas
  - Surface Water Protection Areas - Zone A
  - Surface Water Protection Areas - Zone B
  - Surface Water Protection Areas - Zone C
  - DEP Approved Zone I
- BWP Landfills by Status
  - Inactive
  - Closed
  - Active

FIGURE 2

24 Town Hall Road
Truro, MA

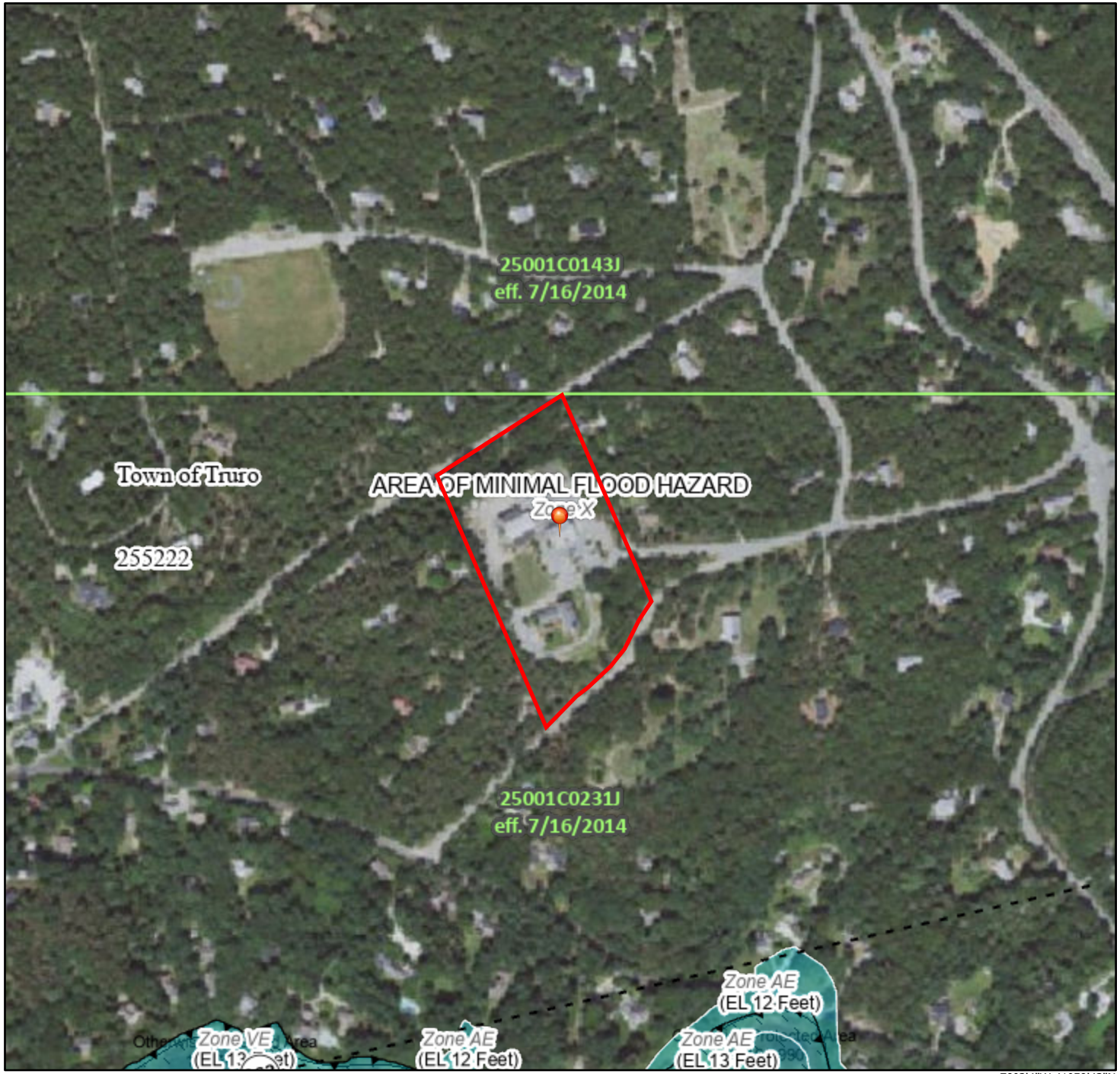
Human Receptor Map

Weston & Sampson

National Flood Hazard Layer FIRMette

FEMA

70°3'41"W 42°0'10"N



0 250 500 1,000 1,500 2,000 Feet

1:6,000

70°3'4"W 41°59'43"N

Basemap Imagery Source: USGS National Map 2023

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth *Zone AE, AO, AH, VE, AR*
- Regulatory Floodway

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

OTHER FEATURES
- 20.2 Cross Sections with 1% Annual Chance
- 17.5 Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 4/11/2025 at 8:59 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

0 1 2 Miles

ATLANTIC OCEAN

PAMET GROUNDWATER LENS

CAPE COD BAY

CHEQUESSETT GROUNDWATER LENS

PROVINCETOWN

East Harbor

Moon Pond

Pilgrim Pond

Great Swamp

Site Location:
24 Town Hall Road

Little Pamet River

Pamet Harbor

Pamet River

Pamet River

Great Pond
Round Pond
Snow Pond
Ryder Pond

Round Pond
Sough Pond
Horseleech Pond

WELLFLEET

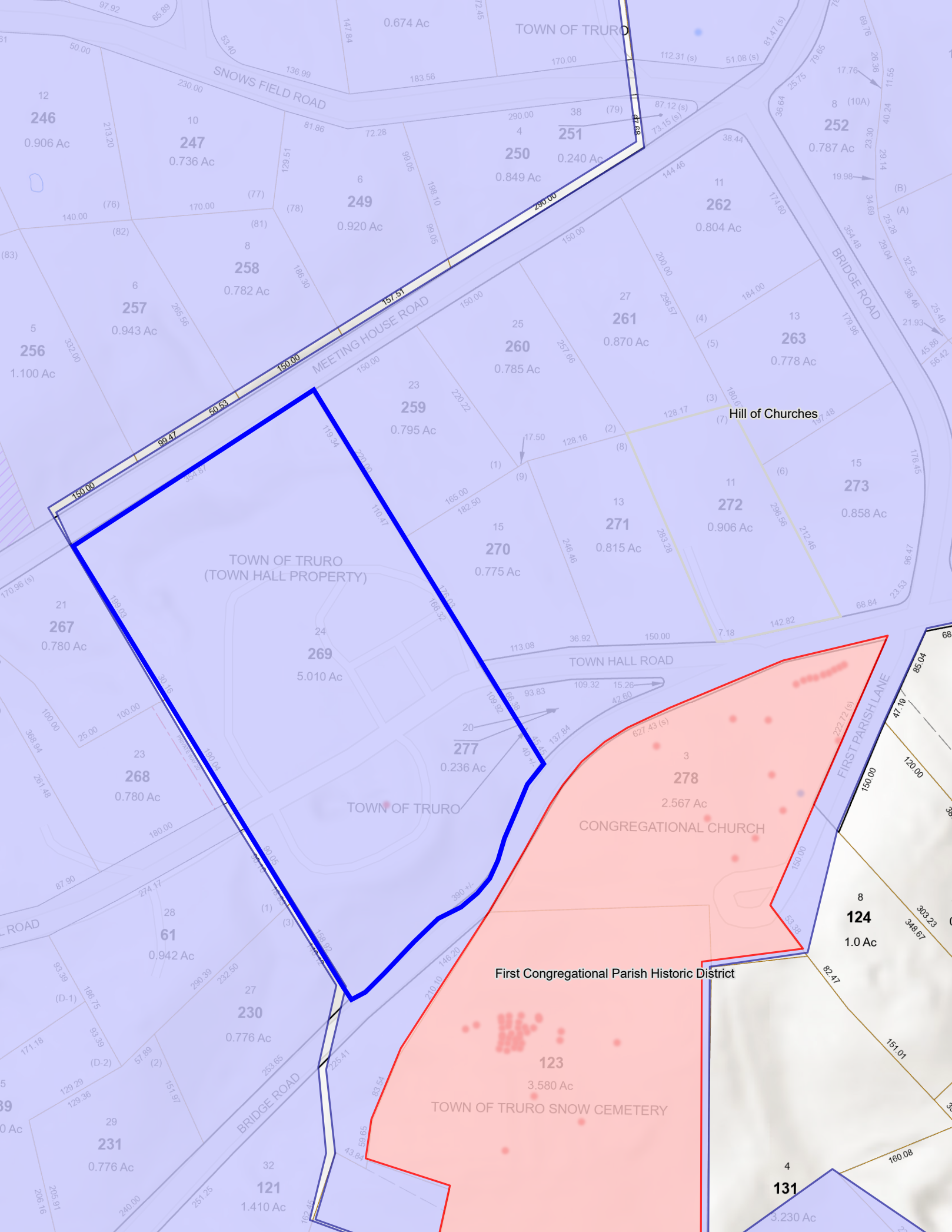
6 6A 6 6 6 4 4 6 8

January 19, 2009
Map Compilation and Design: MapWorks
MAPSatWORK@aol.com
Environmetal Data Source: MassGIS
Groundwater Contours Source: Cape Cod Commission

- Water Supply Well
- Zone 2 - Area of Contribution to Public Water Supply Well
- Interim Well Head Protection Area
- Approximate Depth to Groundwater (1 foot contour interval)
- Wetlands
- FEMA Flood Hazard Area V Zone
- FEMA Flood Hazard Area A Zone
- FEMA Q3 Flood Hazard Zone
- 200 Foot River Protection Act Buffer
- Open Water
- Outstanding Resource Waters (Watershed areas afforded protection under Massachusetts Surface Water Quality Standards of 1995)

MAP 5 - WATER RESOURCES

Town of Truro - 2009 Open Space and Recreation Plan


Hill of Churches
First Congregational Parish Historic District
TOWN OF TRURO
(TOWN HALL PROPERTY)
269
5.010 Ac
TOWN OF TRURO
277
0.236 Ac
278
2.567 Ac
CONGREGATIONAL CHURCH
123
3.580 Ac
TOWN OF TRURO SNOW CEMETERY
124
1.0 Ac
131
3.230 Ac
121
1.410 Ac
MEETING HOUSE ROAD
SNOWS FIELD ROAD
TOWN HALL ROAD
BRIDGE ROAD
FIRST PARISH LANE
246
0.906 Ac
247
0.736 Ac
250
0.849 Ac
251
0.240 Ac
252
0.787 Ac
249
0.920 Ac
258
0.782 Ac
257
0.943 Ac
256
1.100 Ac
260
0.785 Ac
259
0.795 Ac
261
0.870 Ac
262
0.804 Ac
263
0.778 Ac
270
0.775 Ac
271
0.815 Ac
272
0.906 Ac
273
0.858 Ac
267
0.780 Ac
268
0.780 Ac
61
0.942 Ac
230
0.776 Ac
231
0.776 Ac
0.674 Ac
TOWN OF TRURO

SECTION V

Program Documents

USER GROUP PROGRAM NEEDS

Truro, MA; Public Works Facility

1/10/2025

DIVISION	TITLE / NAME	TYPE	PRIVATE OFFICE	WORKSTATIONS IN SHARED OFFICE	LOCKERS	MUSTER	PARKING
DPW Administration	DPW Director (Jarrod Cabral)	Admin	✓		Full	1	1
3 FT	Office Manager (Mike Kaelberer)	Admin		✓	Full	1	1
	Project Manager (future)	Admin		✓	Full	1	1
DPW Workforce	Tim King	Workforce			Full		1
9 FT	Chris Lucy	Workforce			Full	1	1
	Peter Morris	Workforce			Full	1	1
	Lee Russel	Workforce			Full	1	1
	Jeff Holway	Workforce			Full	1	1
	Mike Locke	Workforce			Full	1	1
	Kyle Halvorson	Workforce			Full	1	1
	Jeff Falk	Workforce			Full	1	1
	Alex Riese	Workforce			Full	1	1
Transfer Station	Matt Peterson	Workforce				1	
3 FT	Joe Martello	Workforce				1	
	Paul Iannuzzo	Workforce				1	
Additional Personnel	Contractor	Contractor					
during Emergency Events	Contractor	Contractor					
12 as needed	Contractor	Contractor					
	Contractor	Contractor					
	Contractor	Contractor					
	Contractor	Contractor					
	Contractor	Contractor					
	Contractor	Contractor					
	Contractor	Contractor					
	Contractor	Contractor					
	Contractor	Contractor					
	Contractor	Contractor					
	Contractor	Contractor					

TOTALS:	ADMIN	OFFICE	WORKSTATIONS	FULL	MUSTER	STAFF
	3	1	2	12	14	12
	WORKFORCE			**HALF**		
	12			0		
	CONTRACTOR					
	12					

TRURO DPW
VEHICLE AND EQUIPMENT INVENTORY

updated: 5/21/2025

WSE ID #	TOWN ID #	DIVISION	MODEL TYPE	MAKE / MODEL	SIZE	FLEET TYPE	DIMENSIONS			STORAGE NEEDS			
							LENGTH	WIDTH	SF	STALL	FLOOR	CANOPY	OUTSIDE
1	T-29	DPW	TRUCK	PETERBILT 389	LARGE	VEHICLE	28	10	280	●			
2		DPW	TRACTOR	PETERBILT	LARGE	VEHICLE	28	10	280	●			
3		DPW	TRUCK	INTERNATIONAL 7400	LARGE	VEHICLE	28	10	280	●			
4		DPW	DUMP TRUCK	INTERNATIONAL 7400	LARGE	VEHICLE	24	9	216	●			
5	T-3	DPW	PICK UP TRUCK	FORD F450	MEDIUM	VEHICLE	21	8	168	●			
6		DPW	DUMP TRUCK	FORD F450	MEDIUM	VEHICLE	21	8		●			
7	T-6	DPW	PICK UP	FORD F350	SMALL	VEHICLE	18	8	144	●			
8	S-1	DPW	PICK UP	FORD F350	SMALL	VEHICLE	18	8	144	●			
9		DPW	DUMP TRUCK		LARGE	VEHICLE	24	9	216	●			
10	T-8	DPW	PICK UP	FORD F-350	SMALL	VEHICLE	18	8	144	●			
11	T-4	DPW	PICK UP	FORD F350	SMALL	VEHICLE	18	8	144	●			
12	T-2	DPW	PICK UP	FORD F350	SMALL	VEHICLE	18	8	144	●			
13	T-9	DPW	PICK UP	FORD F350	SMALL	VEHICLE	18	8	144	●			
14		DPW	PICK UP	FORD F350	SMALL	VEHICLE	18	8	144	●			
15		DPW	VAN	E150 ECONOLINE	SMALL	VEHICLE	18	8	144	●			
16		DPW	SWEEPER	ELGIN	LARGE	VEHICLE	26	9	234	●			
17		DPW	EXCAVATOR	JOHN DEERE 130G	LARGE	EQUIPMENT	21	9	189			●	
18		DPW	LOADER	JOHN DEERE	LARGE	EQUIPMENT	25	9	225			●	
19		DPW	LIFT	JLG 600S	LARGE	EQUIPMENT	30	9	270			●	

TRURO DPW
VEHICLE AND EQUIPMENT INVENTORY

WSE ID #	TOWN ID #	DIVISION	MODEL TYPE	MAKE / MODEL	SIZE	FLEET TYPE	DIMENSIONS			STORAGE NEEDS			
							LENGTH	WIDTH	SF	STALL	FLOOR	CANOPY	OUTSIDE
20		DPW	GENERATOR BOX TRAILER		MEDIUM	ATTACHMENT	15	6	90		●		
21		DPW	GENERATOR TRAILER		MEDIUM	ATTACHMENT	12	4	48		●		
22		DPW	WOOD CHIPPER	BANDIT	OBLONG	ATTACHMENT	12	5	60		●		
23		DPW	TRAILER	TIMPTE	MEDIUM	ATTACHMENT	24	8	192			●	
24		DPW	TRAILER	CAM	MEDIUM	ATTACHMENT	21	8	168			●	
25		DPW	TRAILER	KAUFMAN	MEDIUM	ATTACHMENT	24	8	192			●	
26		DPW	TRAILER	INTERSTATE	LARGE	ATTACHMENT	30	9	270			●	
27		DPW	TRAILER	BENCE	MEDIUM	ATTACHMENT	18	8	144			●	
28		DPW	TRAILER		SMALL	ATTACHMENT	14	6	84			●	
29		DPW/TS	TRASH TRACTOR	SPECTOR	X-LARGE	off site	36	10	360				
30		DPW/TS	TRASH TRACTOR	SPECTOR	X-LARGE	off site	36	10	360				
31		DPW/TS	TRASH TRACTOR	SPECTOR	X-LARGE	off site	36	10	360				
32		DPW/TS	TRASH TRACTOR	SPECTOR	X-LARGE	off site	36	10	360				
33		DPW/TS	TRASH TRACTOR	WARREN	X-LARGE	off site	36	10	360				
34		DPW	RIDE MOWER	JOHN DEERE	SMALL	EQUIPMENT	4	6	24		●		
35		DPW		HYSTER	SMALL	EQUIPMENT	7	5	35		●		
36		DPW	SKID STEER	JOHN DEERE 323E	SMALL	EQUIPMENT	7	5	35		●		
37		DPW	RIDE MOWER	TORO	SMALL	EQUIPMENT	7	5	35		●		
38		DPW	RIDE MOWER	TORO	SMALL	EQUIPMENT	7	5	35		●		
39		DPW	RIDE MOWER	BOB CAT	SMALL	EQUIPMENT	7	5	35		●		
40		DPW	??		X-SMALL	EQUIPMENT	4	3	12		●		
41		DPW	PUSH MOWER		X-SMALL	EQUIPMENT	4	3	12		●		
42		DPW	PAINT MACHINE		X-SMALL	EQUIPMENT	4	3	12		●		
43		DPW	POWER WASHER		X-SMALL	EQUIPMENT	3	3	9		●		
44		DPW	WALK BEHIND SAW	EDCO	X-SMALL	EQUIPMENT	3	4	12		●		
45		DPW	LIFT	JLG	SMALL	EQUIPMENT	6	4	24		●		
46		DPW	FORKLIFT	YALE	SMALL	EQUIPMENT	6	3	18		●		
47		DPW	MOWER	TIGER	X-SMALL	EQUIPMENT	3	4	12		●		

WSE ID #	TOWN ID #	DIVISION	MODEL TYPE	MAKE / MODEL	SIZE	FLEET TYPE	DIMENSIONS			STORAGE NEEDS			
							LENGTH	WIDTH	SF	STALL	FLOOR	CANOPY	OUTSIDE
48		DPW	WING PLOW			ATTACHMENT	9	12	108		●		
49		DPW	WING PLOW			ATTACHMENT	9	12	108		●		
50		DPW	WING PLOW			ATTACHMENT	9	12	108		●		
51		DPW	STANDARD PLOW			ATTACHMENT	5	9	45		●		
52		DPW	STANDARD PLOW			ATTACHMENT	5	9	45		●		
53		DPW	STANDARD PLOW			ATTACHMENT	5	9	45		●		
54		DPW	STANDARD PLOW			ATTACHMENT	5	9	45		●		
55		DPW	STANDARD PLOW			ATTACHMENT	5	9	45		●		
56		DPW	STANDARD PLOW			ATTACHMENT	5	9	45		●		
57		DPW	STANDARD PLOW			ATTACHMENT	5	9	45		●		
58		DPW	STANDARD PLOW			ATTACHMENT	5	9	45		●		
59		DPW	PLOW (ORANGE)			ATTACHMENT	8	11	88		●		
60		DPW	LOADER PLOW			ATTACHMENT	4	9	36			●	
61		DPW	LOADER PLOW			ATTACHMENT	3	4	12			●	
62		DPW	SANDER BODY			ATTACHMENT	5	3	15			●	
63		DPW	SANDER BODY			ATTACHMENT	5	3	15			●	
64		DPW	SANDER BODY			ATTACHMENT	5	3	15			●	
65		DPW	FORKLIFT		SMALL	EQUIPMENT	12	5	60			●	
		TRANSFER STATION	TRACTOR	WHGM-ACLACL									
		TRANSFER STATION	TRACTOR	INTERNATIONAL									
		TRANSFER STATION	LOADER	JOHN DEERE 544H									

Town of Truro
Department of Public Works
Space Needs Summary

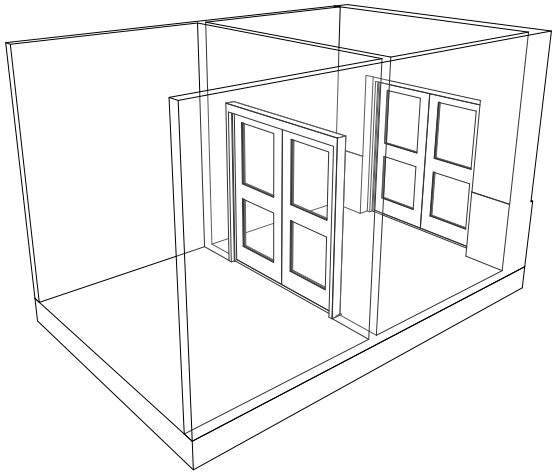
Building Requirements 1/10/2025

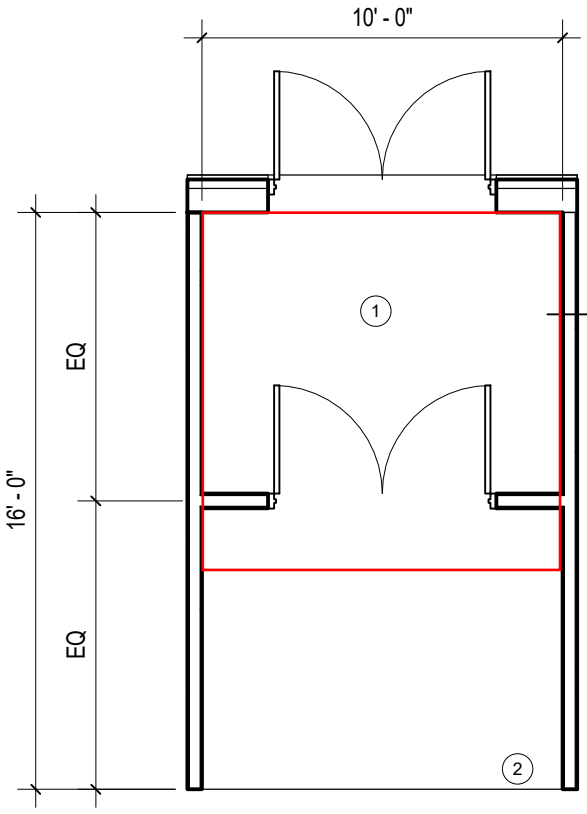
Area	Description	Original Size (SF)	Rev 1 Size (SF)	Rev 2 Size (SF)	Rev 3 Size (SF)	R & C Size (SF)	Notes
Office & Office Support Areas	Vestibule/Waiting/Reception	220	160	100	100	100	
	Admin Open Office (2 Admin Staff)	120	100	100	100	**200**	10 x 10 workstations
	DPW Director	224	196	180	180	180	
	Copy/File/Mail Area	225	120	96	96	96	
	File Storage	225	180	120	120	120	
	Conference Room	320	224	224	224	224	
	Small Supply Closet	24	24	24	24	24	
	Large Supply Closet	168	120	100	100	100	
	Telephone / Data Room	120	100	100	100	100	
	Janitor Closet	36	36	36	36	36	
	Subtotal:	1,682	1,260	1,080	1,080	1,180	
	Area Grossing Factor (10%):	168	126	102	102	102	
	Circulation (10%):	185	139	118	118	118	
	TOTAL:	**2,035**	**1,525**	**1,300**	**1,300**	**1,400**	
Employee Facilities	Male Locker/Shower/Toilet	540	540	460	460	460	
	Female Locker/Shower/Toilet	180	180	160	160	160	
	Muster Room	480	440	440	440	440	
	Break/Training/Muster Room Storage Closet	120	100	80	80	80	
	Report Writing Room	120	100	80	80	80	
	Main Electric Room	140	120	100	100	100	will need mechanical utility space
	Plumbing/Fire Protection Room	192	120	100	100	100	TBD what type of energy system
	Subtotal:	1,772	1,600	1,420	1,420	1,420	
	Area Grossing Factor (10%):	177	160	130	130	130	
	Circulation (10%):	195	176	150	150	150	
	TOTAL:	**2,144**	**1,936**	**1,700**	**1,700**	**1,700**	
Work Shops & Material Storage	Sign Shop	500	320	320	290	290	
	Carpentry Shop	1,400	1,155	1,050	1,160	1,160	
	Shop Support Office	144	120	100	100	100	
	~~Material / Supply Storage (Custodial)~~	400	320	320	-	-	
	~~Equipment Storage Bay (Custodial)~~	1,120	980	850	-	-	
	Subtotal:	3,564	2,895	2,640	1,550	1,550	
	Area Grossing Factor (5%):	178	145	128	78	78	
	Circulation (5%):	187	152	132	72	72	
	TOTAL:	**3,929**	**3,192**	**2,900**	**1,700**	**1,700**	

Town of Truro
Department of Public Works
Space Needs Summary

Building Requirements 1/10/2025

Area	Description	Original Size (SF)	Rev 1 Size (SF)	Rev 2 Size (SF)	Rev 3 Size (SF)	R & C Size (SF)	Notes
Vehicle Maintenance	Welding Area	600	480	360	360	360	
	Maintenance Equipment/Material Storage	500	320	320	250	250	
	~~Maintenance Bay~~	1,100	1,000	1,000	-	-	
	Maintenance Bay	1,100	1,000	1,000	1,000	1,000	
	Maintenance Bay	1,600	1,200	1,200	1,200	1,200	
	Fluid Storage Room	256	196	196	196	196	
	Maintenance Office / Reference Room	120	120	120	120	120	
	Maintenance Workshop	180	144	144	144	144	
	Maintenance Tire Storage & Shop	396	108	108	108	108	
	Parts Storage Room	750	450	450	440	440	
	Subtotal:	6,602	5,018	4,898	3,818	3,818	
	Area Grossing Factor (5%):	330	251	245	191	191	
	Circulation (5%):	347	263	257	191	191	
	TOTAL:	**7,279**	**5,532**	**5,400**	**4,200**	**4,200**	
Wash Area	Wash Bay	1,650	1,250	1,250	1,250	1,250	
	Wash Equipment Room	100	100	100	100	100	
	Subtotal:	1,750	1,350	1,350	1,350	1,350	
	Circulation:	n/a	n/a	n/a	n/a	n/a	
	TOTAL:	**1,750**	**1,350**	**1,350**	**1,350**	**1,350**	
Vehicle and Equipment Storage	Vehicle / Equipment Storage	18,620	18,050	16,150	9,430		
	Subtotal:	18,620	18,050	16,150	9,430		
	Area Grossing Factor (5%):	931	903	808	470		
	Circulation:	n/a	n/a	n/a	n/a		
** double as assembly space for Town Meetings. Sized to fit +/- 900 ppl. Assembly Group A-3	**TOTAL:**	**19,551**	**18,953**	**16,958**	**9,900**		
	Option 1: Drive-in/back-out (separate)						
	Large Fleet Storage Garage (9 diesel trucks)					6,480	48 x 135
	Small Fleet Storage Garage (7 gas trucks)					3,850	35 x 110
	Canopy					*3,600*	
Concentrated chairs only - not fixed	Subtotal:					10,330	
	Area Grossing Factor (5%):					517	
	Option 1 Total					**10,847**	
7 net sf/occ 900 occ x 7 sf/occ= 6,300 sf minimum							
	Option 2: Drive-in/back-out (combined)						
	Fleet Storage Garage					11,070	82 x 135
	Canopy					*2,460*	
stage: 12 x 24 +/-	Subtotal:					11,070	
	Area Grossing Factor (5%):					554	
	Option 2 Total					**11,624**	
	Option 3: Drive-Thru						open corner for mech. Room?
	Fleet Storage Garage					12,825	95 x 135
	Canopy					*4,050*	
	Subtotal:					12,825	
	Area Grossing Factor (5%):					641	
	Option 3 Total					**13,466**	
	TOTAL:	**36,689**	**32,487**	**29,608**	**20,150**	**21,196**	Option 1
						21,973	Option 2
						23,816	Option 3





1 Vestibule - 160sf
3/16" = 1'-0"

ROOM FINISHES

FLOORS: CERAMIC

WALLS: GWB PAINTED

CEILING: 2' X 2' ACT TILE

MEP/DATA REQUIREMENTS

HEATING

COOLING

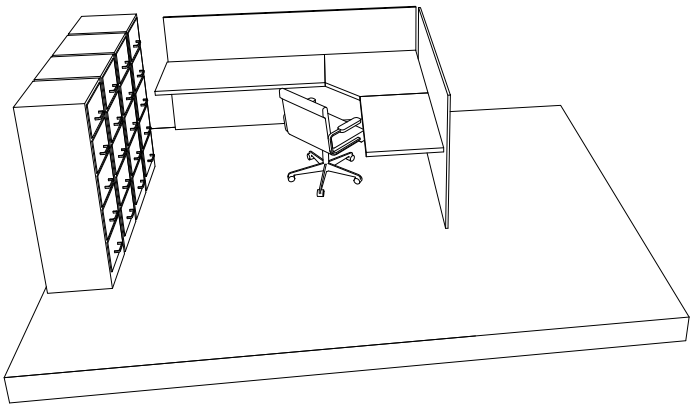
DUPLEX ELECTRICAL OUTLETS

DATA OUTLET JACKS

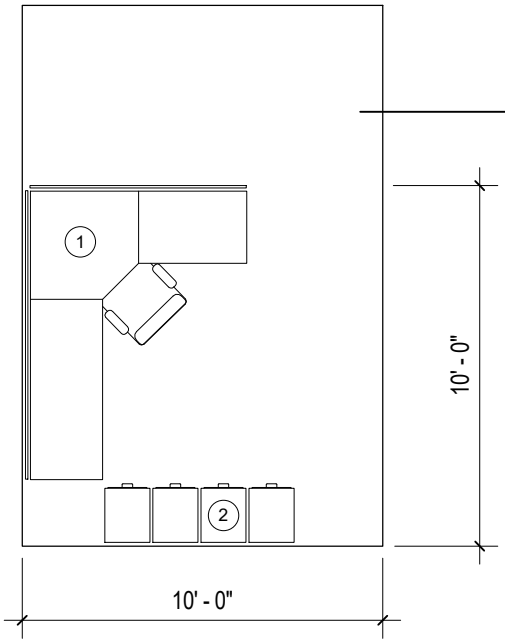
COMPONENTS:

1. VESTIBULE
2. OPEN TO ADMIN

DRAFT



Add one (1) additional staff space



1 Admin Open Office - 100sf
3/16" = 1'-0"

ROOM FINISHES

FLOORS: CARPET TILE

WALLS: GWB PAINTED

CEILING: 2' X 2' ACT TILE

MEP/DATA REQUIREMENTS

HEATING

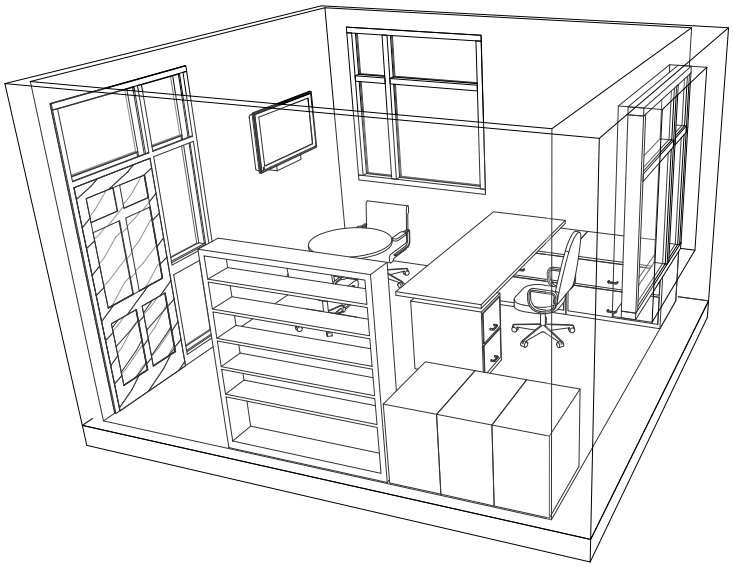
COOLING

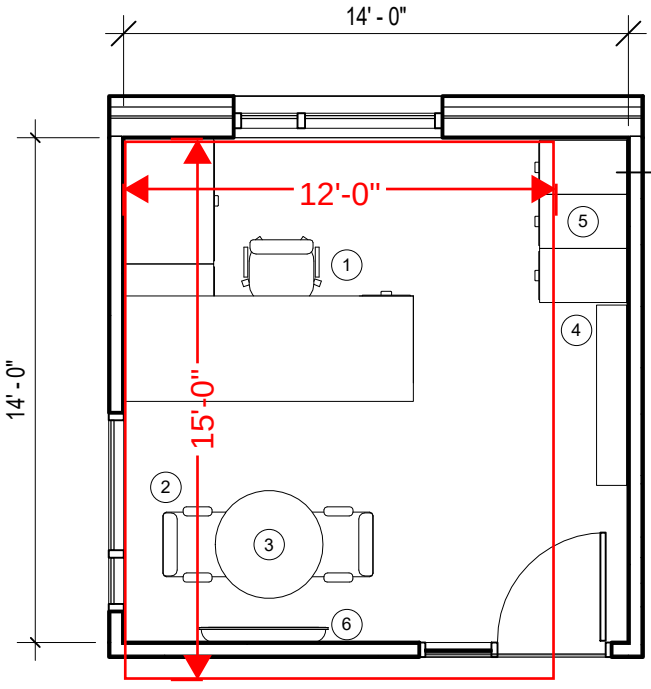
DUPLEX ELECTRICAL OUTLETS

COMPONENTS:

1. CHAIR & DESK
2. FILE CABINETS

DRAFT





1 DPW Director Office - 196sf
3/16" = 1'-0"

ROOM FINISHES

FLOORS: CARPET TILE

WALLS: GWB PAINTED

CEILING: 2X2 ACT TILE

MEP/DATA REQUIREMENTS

HEATING

COOLING

DUPLEX ELECTRICAL OUTLETS

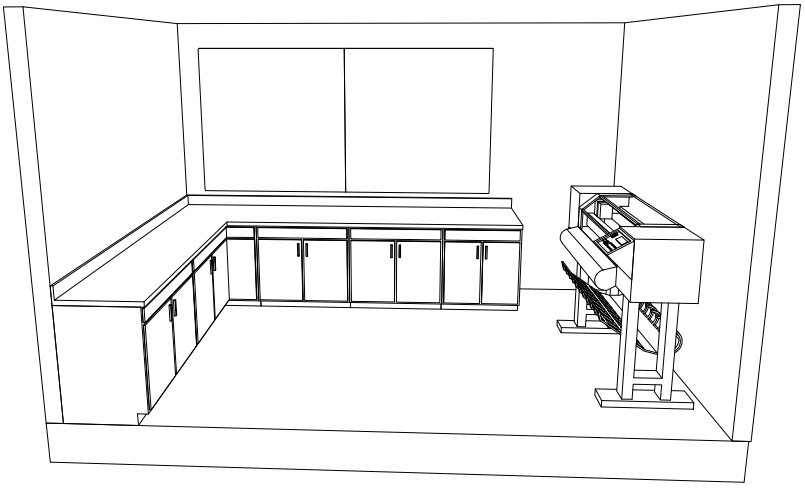
DATA OUTLET JACKS

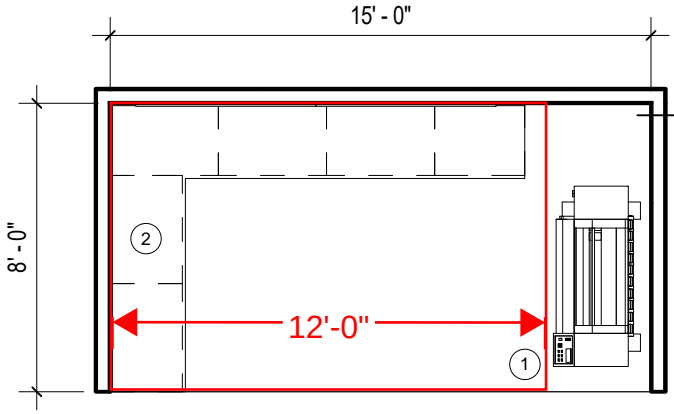
COAX/HDMI CABLING

COMPONENTS:

1. EXECUTIVE CHAIR & DESK
2. GUEST CHAIRS
3. CONFERENCE TABLE & CHAIRS
4. BOOKCASE
5. FILE CABINETS
6. FLAT SCREEN TV

DRAFT





1 Copy/File Room - 120sf
3/16" = 1'-0"

ROOM FINISHES

FLOORS: CARPET TILE

WALLS: GWB PAINTED

CEILING: 2X2 ACT TILE

MEP/DATA REQUIREMENTS

HEATING

COOLING

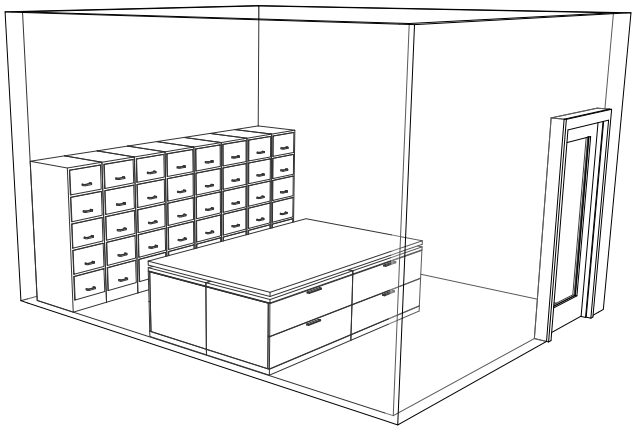
DUPLEX ELECTRICAL OUTLETS

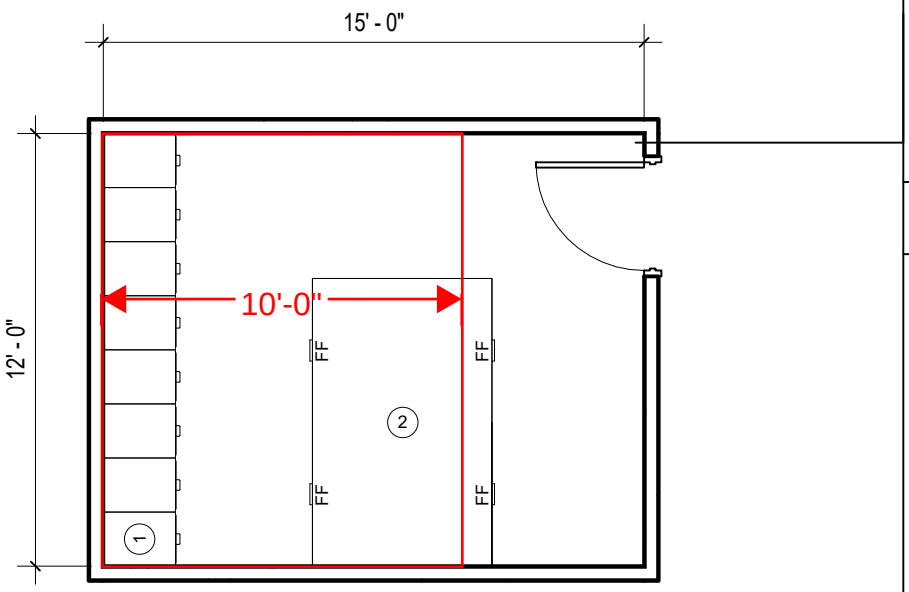
DATA OUTLET JACKS

COMPONENTS:

1. COPY MACHINE/PRINTER
2. WORK COUNTER & BASE CABINETS (BELOW)
3. BULLETIN BOARD

DRAFT





1 File Storage Area - 180sf
3/16" = 1'-0"

ROOM FINISHES

FLOORS: RESILIENT FLOORING

WALLS: GWB PAINTED

CEILING: ACT TILES

MEP/DATA REQUIREMENTS

HEATING

COOLING

DUPLEX ELECTRICAL OUTLETS

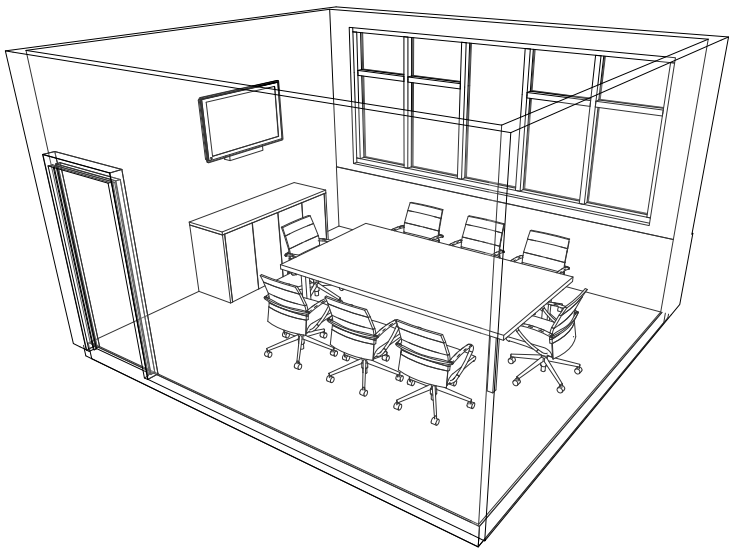
DATA OUTLET JACKS

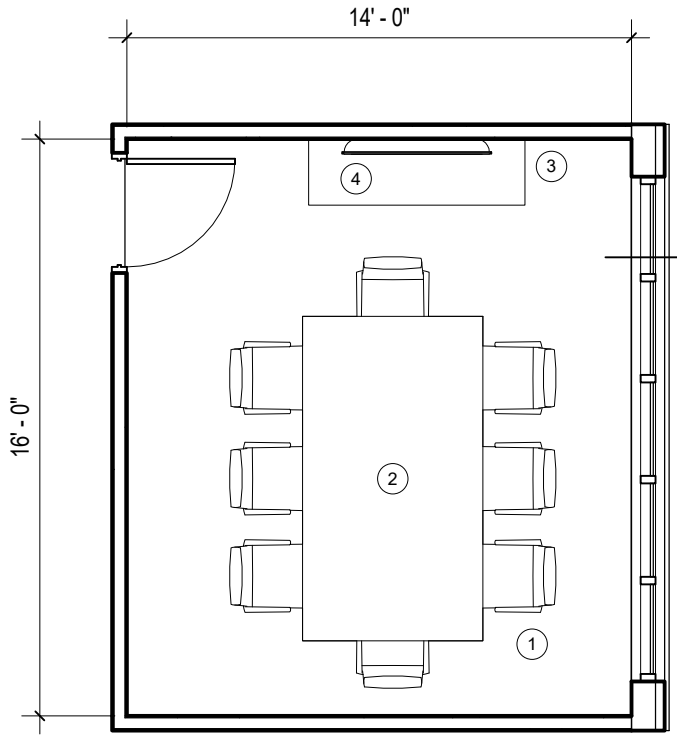
COMPONENTS:

1. FILE CABINETS
2. (4) FLAT FILES (BELOW)
   WITH TABLE TOP (ABOVE)

DRAFT

Weston & Sampson	TRURO JAN 2019	**File Storage - 180sf** 120sf	A5





1 Conference Room - 224sf
3/16" = 1'-0"

ROOM FINISHES

FLOORS: CARPET TILE

WALLS: GWB PAINTED

CEILING: 2' x 2' AC T Tiles

MEP/DATA REQUIREMENTS

HEATING

COOLING

DUPLEX ELECTRICAL OUTLETS

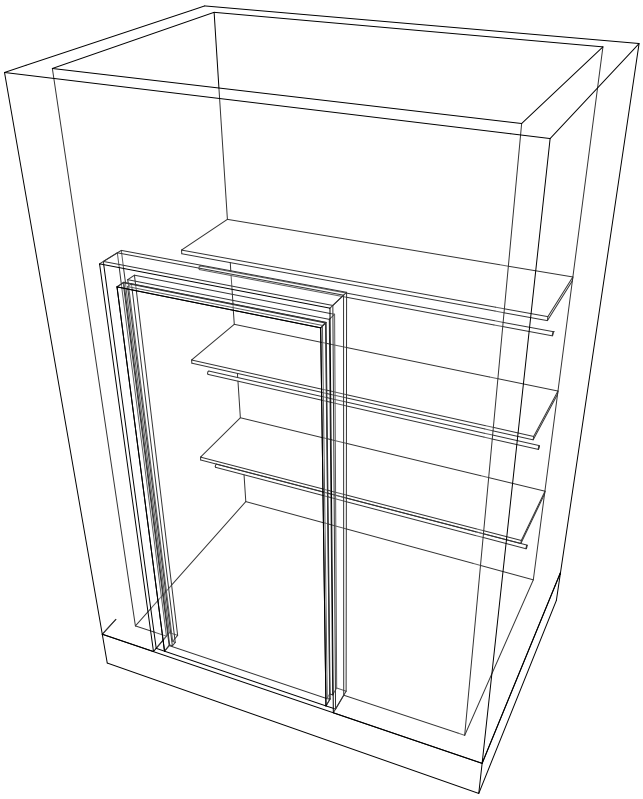
DATA OUTLET JACKS

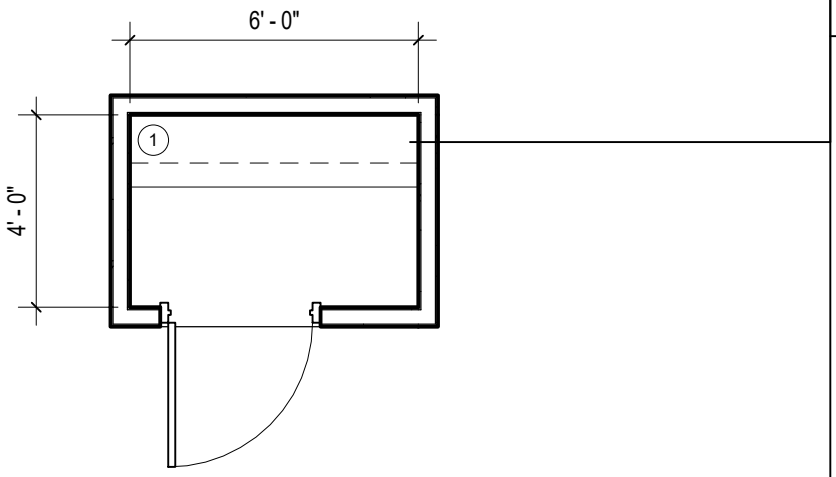
COAX/HDMI CABLING

COMPONENTS:

1. (8) EXECUTIVE CHAIR
2. CONFERENCE TABLE
3. CREDENZA
4. FLAT SCREEN TV

DRAFT





1 Small Supply Closet - 24sf
1/4" = 1'-0"

ROOM FINISHES

FLOORS: CARPET TILE

WALLS: GWB PAINTED

CEILING: 2' X 2' ACT TILE

MEP/DATA REQUIREMENTS

HEATING

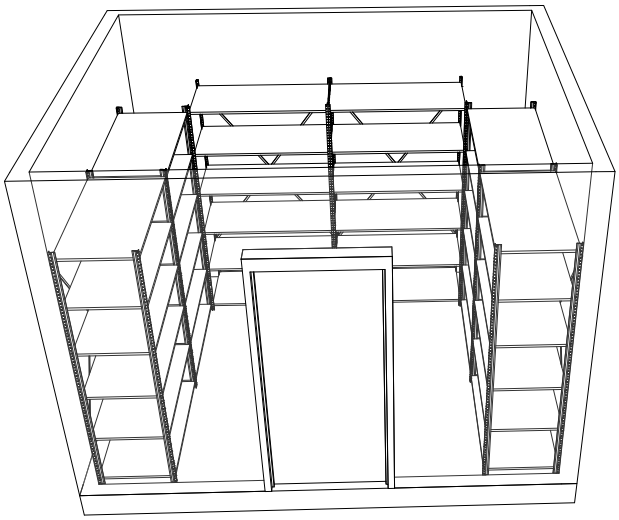
COOLING

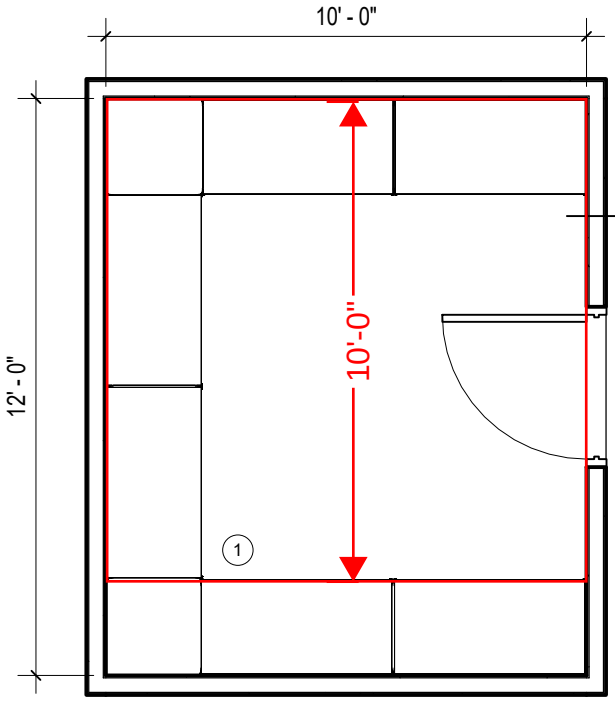
DUPLEX ELECTRICAL OUTLETS

COMPONENTS:

1. WALL MOUNTED SHELVING

DRAFT





1 Large Supply Closet 120sf
1/4" = 1'-0"

ROOM FINISHES

FLOORS: CARPET TILE

WALLS: GWB PAINTED

CEILING: 2' X 2' ACT TILE

MEP/DATA REQUIREMENTS

HEATING

COOLING

DUPLEX ELECTRICAL OUTLETS

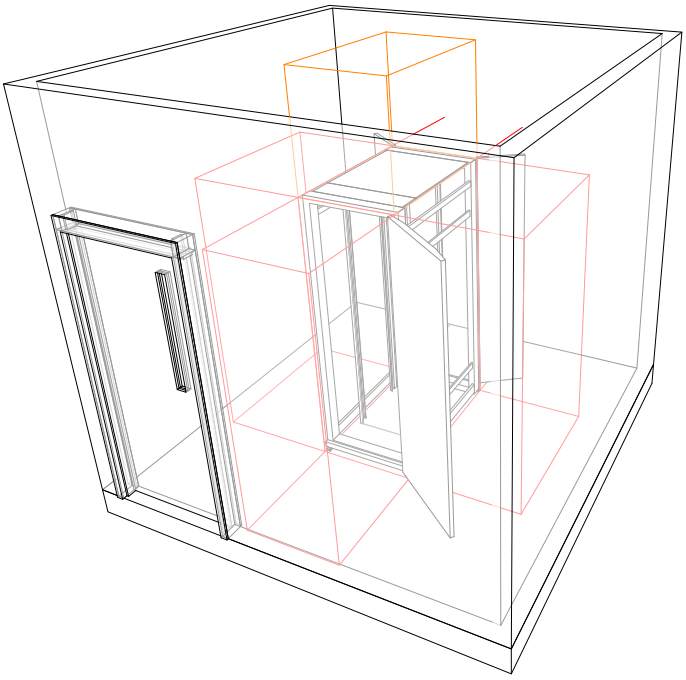
DATA OUTLET JACKS

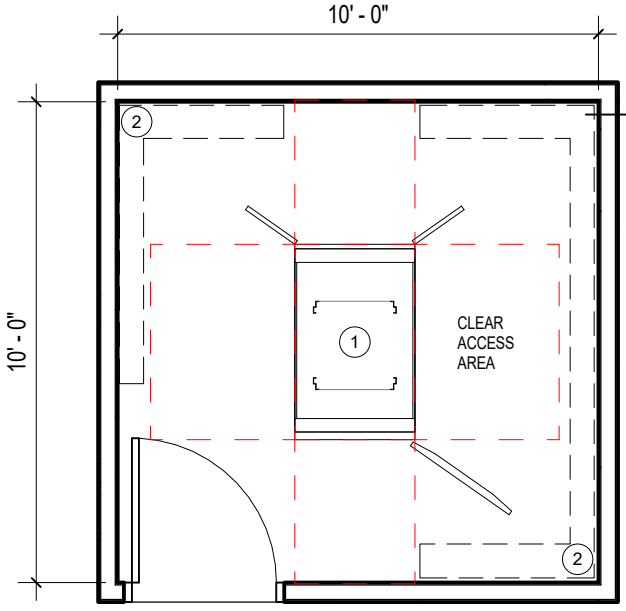
COMPONENTS:

1. UTILITY SHELVING

NOTE:
SIZED TO BE CONVERTED INTO
A FUTURE OFFICE IF NEEDED

DRAFT





1 Telephone/Data Room - 100 sf
1/4" = 1'-0"

ROOM FINISHES

FLOORS: RESILIENT FLOORING

WALLS: GWB PAINTED

CEILING: OPEN TO ABOVE

MEP/DATA REQUIREMENTS

DUPLEX ELECTRICAL OUTLETS

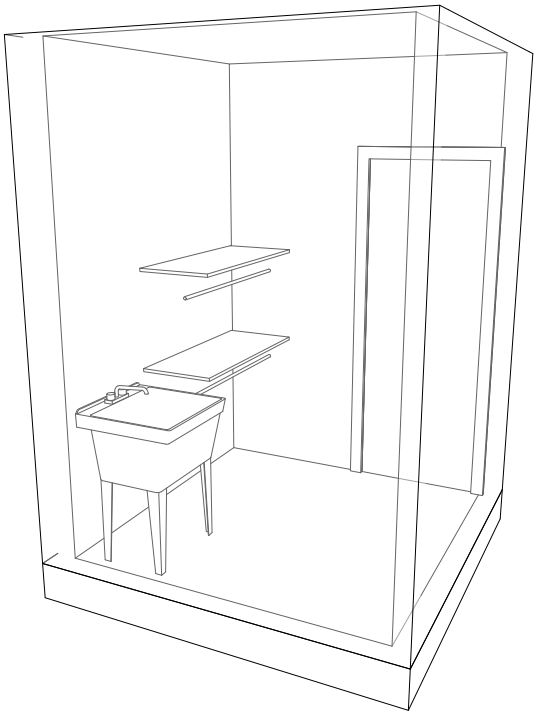
DATA OUTLET JACKS

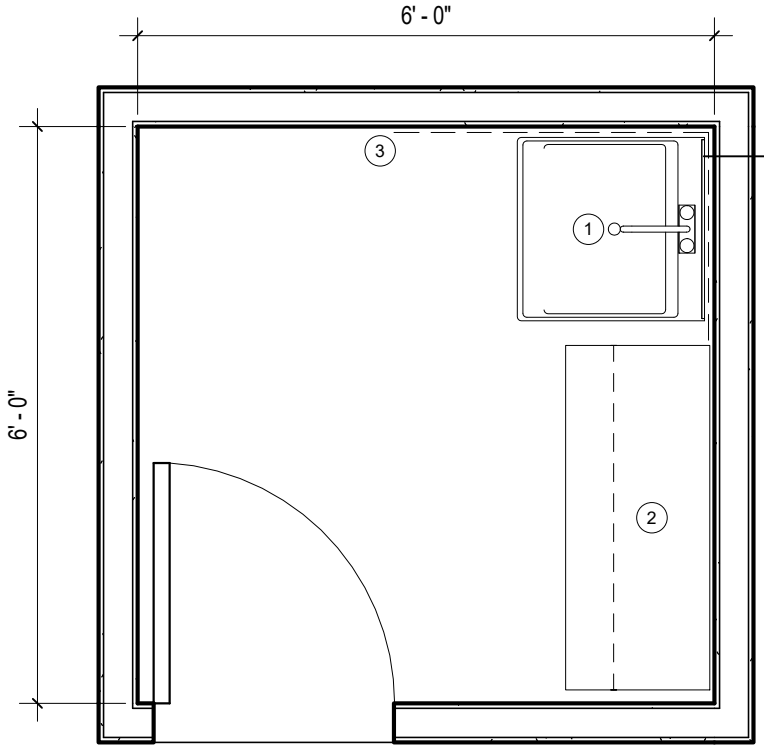
RACKMOUNTED POWER

COMPONENTS:

1. DATA RACK
2. PLYWOOD BACKER BOARD FOR BUILDING SYSTEM COMPONENTS (SECURITY, CABLE, ETC.)

DRAFT





1 Janitor Closet - 36sf
1/2" = 1'-0"

ROOM FINISHES

FLOORS: RESILIENT FLOORING

WALLS: GWB PAINTED

CEILING: 2X2 ACT TILE

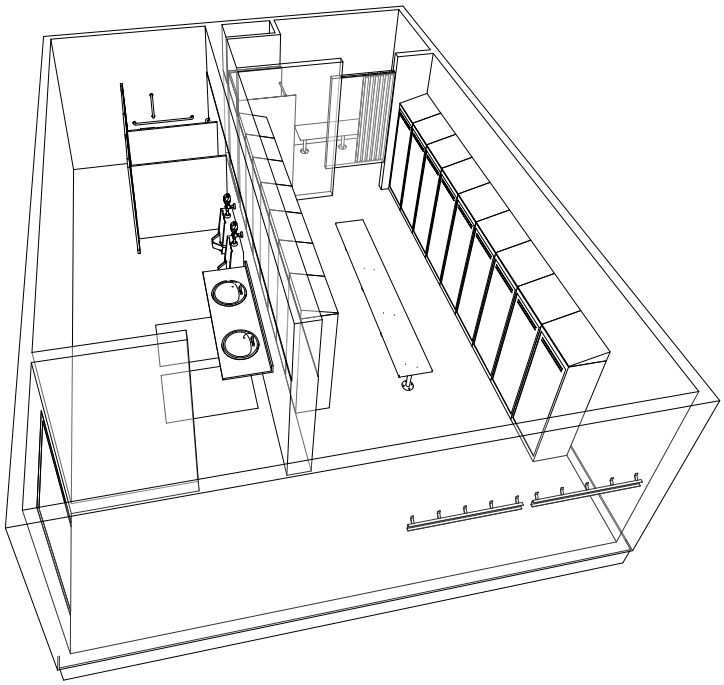
MEP/DATA REQUIREMENTS

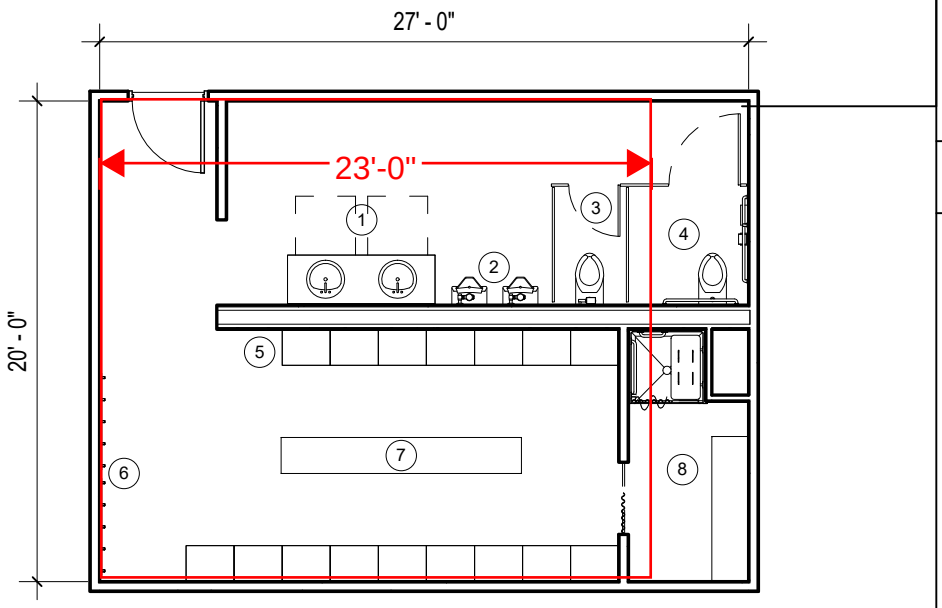
GFI DUPLEX ELECTRICAL OUTLETS

COMPONENTS:

1. UTILITY SINK
2. SHELF WITH POLE
3. FRP PANELING AT SINK

DRAFT





1 Male Locker/Shower/Toilet 540sf
1/8" = 1'-0"

460sf

ROOM FINISHES

FLOORS: RESINOUS FLOORING

WALLS: CERAMIC TILE / GWB PAINTED

CEILING: ACT TILE

MEP/DATA REQUIREMENTS

HEATING

COOLING

SEPARATE TOILET ROOM EXHAUST

GFI DUPLEX ELECTRICAL OUTLETS

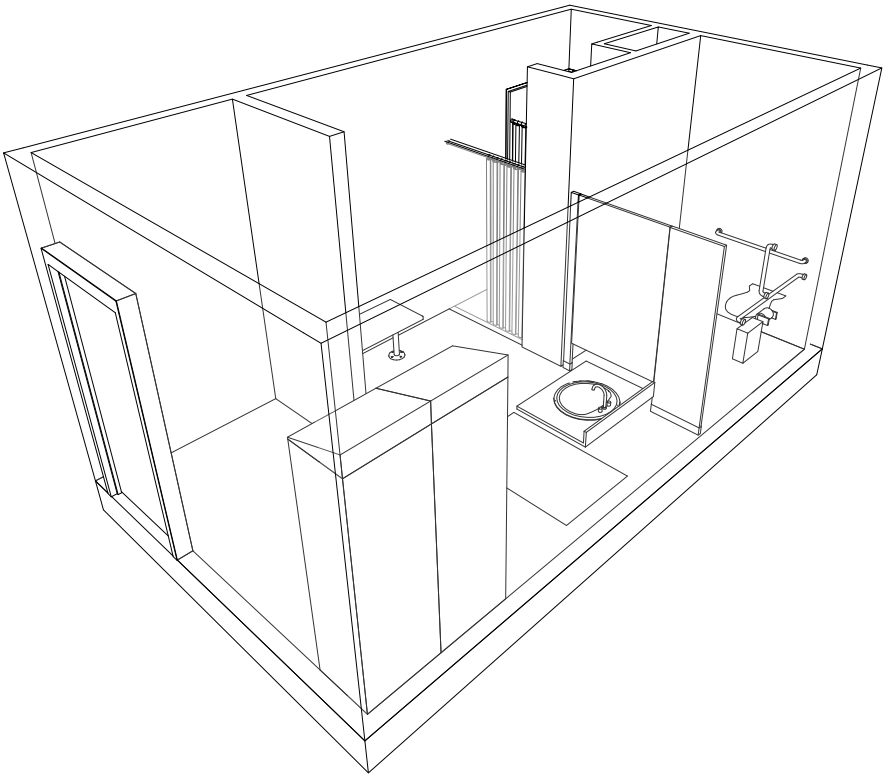
TRAP PRIMERS

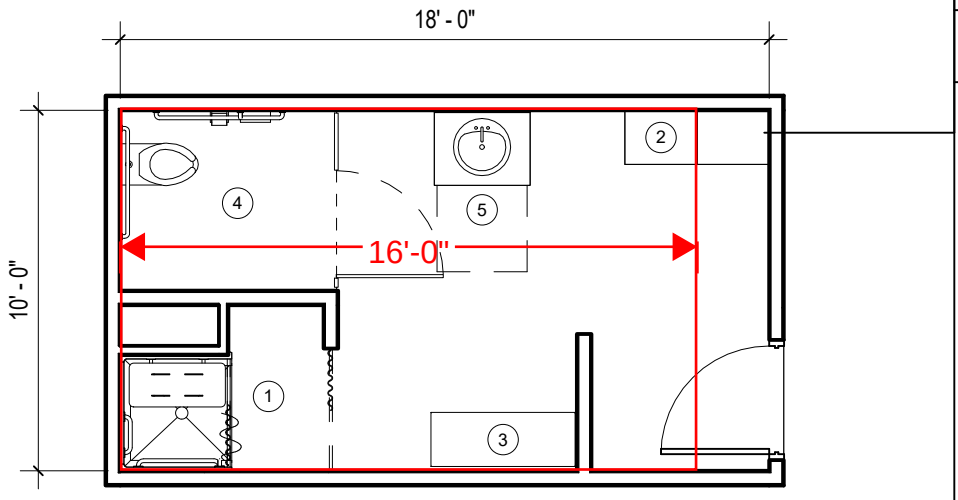
FLOOR DRAINS

COMPONENTS:

1. COUNTER & SINKS
2. URINAL (2)
3. STANDARD TOILET
4. ADA TOILET
5. (16) 18" X 24" LOCKERS
6. WET GEAR AREA
7. BENCH
8. ADA SHOWER

DRAFT





1 Female Locker/Shower/Toilet 180sf
3/16" = 1'-0"

160sf

ROOM FINISHES

FLOORS: RESINOUS EPOXY FLOOR

WALLS: CERAMIC TILES & GWB PAINTED

CEILING: MOISTURE RESISTANT ACT TILES

MEP/DATA REQUIREMENTS

HEATING

COOLING

SEPARATE TOILET ROOM EXHAUST

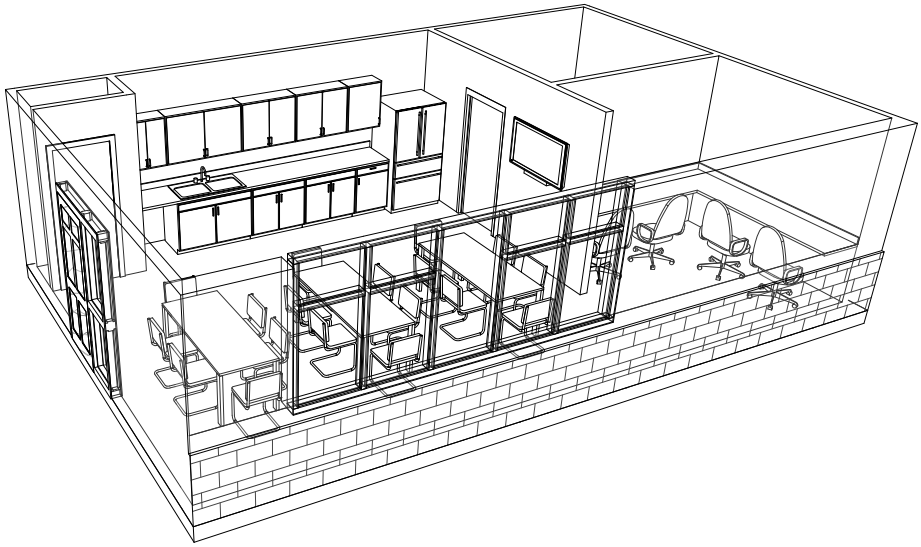
GFI ELECTRICAL OUTLETS

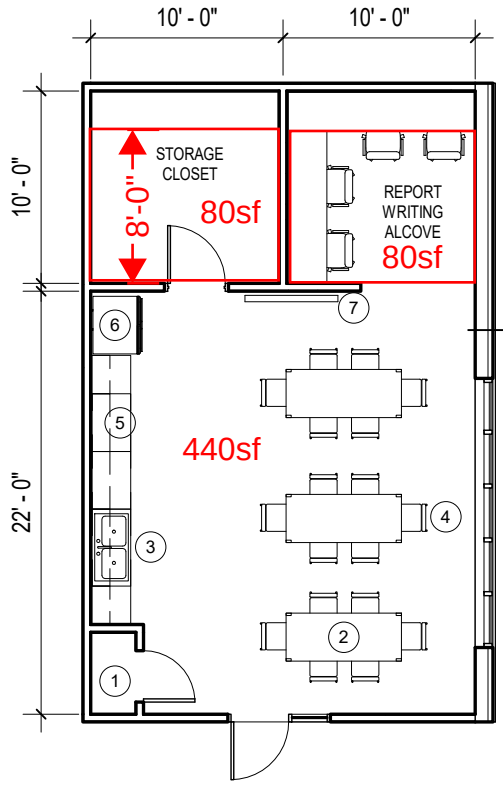
COMPONENTS:

1. ADA SHOWER STALL
2. (2) 18" X 24" LOCKERS
3. BENCH
4. ADA TOILET
5. COUNTER & SINK

DRAFT

Weston & Sampson	TRURO JAN 2019	**Female Locker/Shower/Toilet - 180sf**	B2





1 Muster Room/Storage/Report Writing - 640sf
1" = 10'-0"

600sf

ROOM FINISHES

FLOORS: RESILIENT FLOORING

WALLS: GWB PAINTED

CEILING: 2X2 ACT TILE

MEP/DATA REQUIREMENTS

HEATING

COOLING

DUPLEX ELECTRICAL OUTLETS

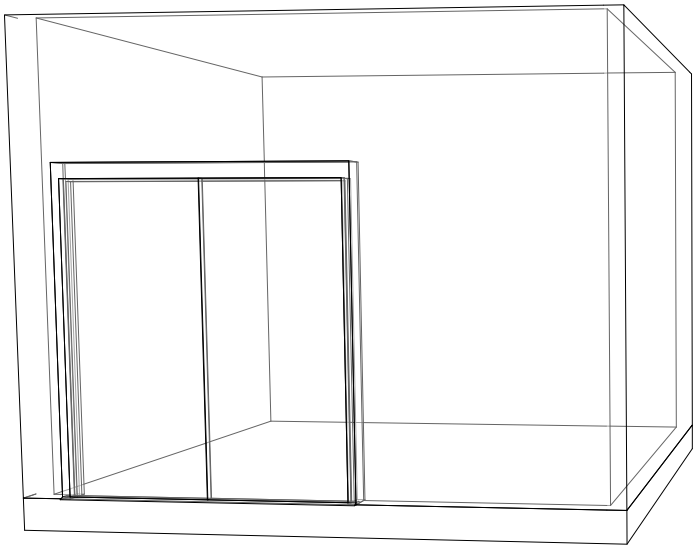
DATA OUTLET JACKS

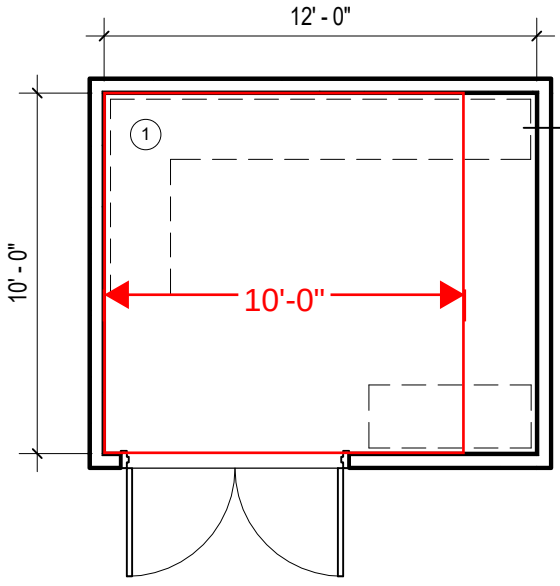
COAX/HDMI CABLING

COMPONENTS:

1. PANTRY
2. (3) 6' LONG TABLES
3. DOUBLE SINK
4. (18) CHAIRS
5. COUNTER & CABINETS
6. REFRIGERATOR
7. FLAT SCREEN TV

DRAFT





1 Main Electric Room - 120sf
3/16" = 1'-0"

100sf

ROOM FINISHES

FLOORS: CONCRETE

WALLS: GWB PAINTED

CEILING: OPEN TO STRUCTURE

MEP/DATA REQUIREMENTS

HEATING

COOLING

DUPLEX ELECTRICAL OUTLETS

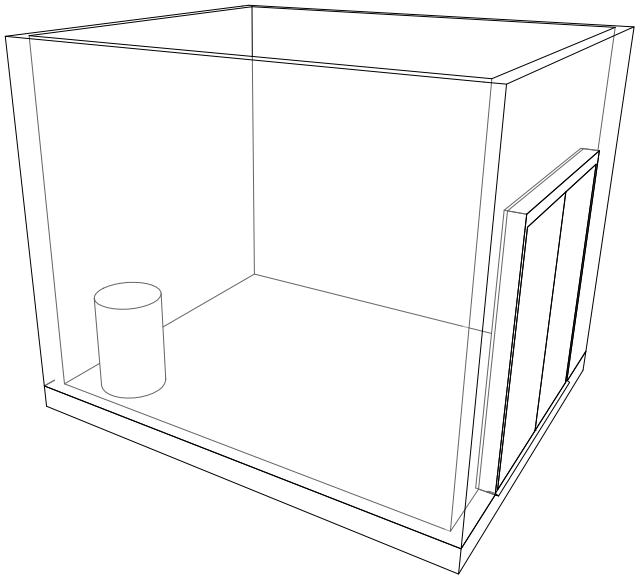
DATA OUTLET JACKS

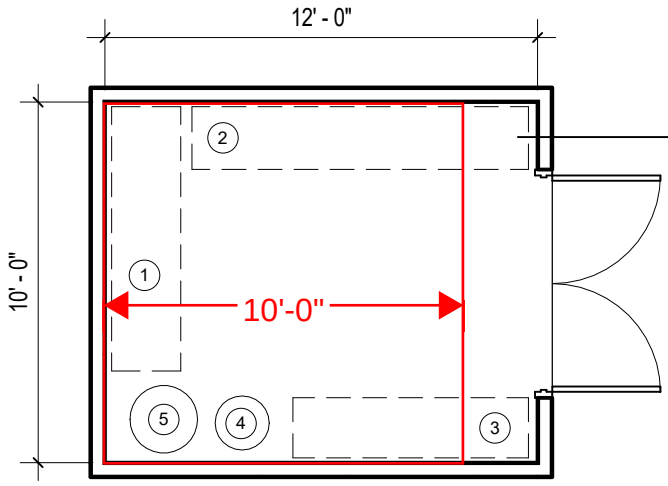
SEPARATE EXHAUST

COMPONENTS:

1. WALL MOUNTED PANELS

DRAFT





1 Plumbing/Fire Protection Room - 120sf
3/16" = 1'-0"

100sf

ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: CMU PAINTED

CEILING: OVEN TO STRUCTURE

MEP/DATA REQUIREMENTS

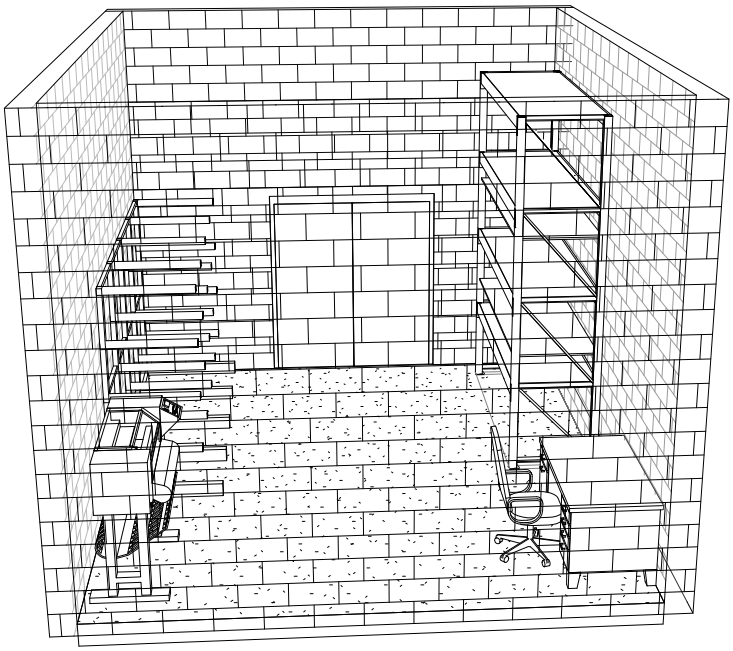
DUPLEX ELECTRICAL OUTLETS

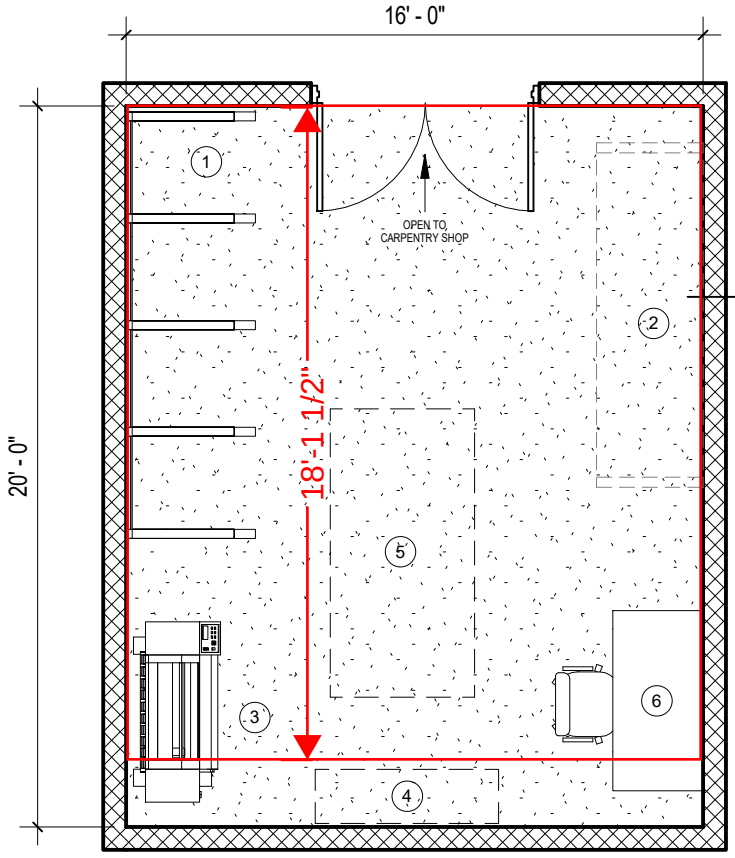
FLOOR DRAIN

COMPONENTS:

1. FIRE PROTECTION SERVICE (DRY & WET) CHECK VALVE ASSEMBLY
2. DOMESTIC SERVICE METER & REDUCED PRESSURE BACKFLOW PREVENTER
3. TEMPERED WATER CONTROL PANEL & MIXING VALVES
4. EXPANSION TANK
5. WATER HEATER

DRAFT





1 Sign Shop - 320sf 290sf
3/16" = 1'-0"

ROOM FINISHES

FLOORS: RESILIENT FLOORING

WALLS: CMU PAINTED

CEILING: OPEN

MEP/DATA REQUIREMENTS

HEATING

COOLING

DUPLEX ELECTRICAL OUTLETS

DATA OUTLET JACKS

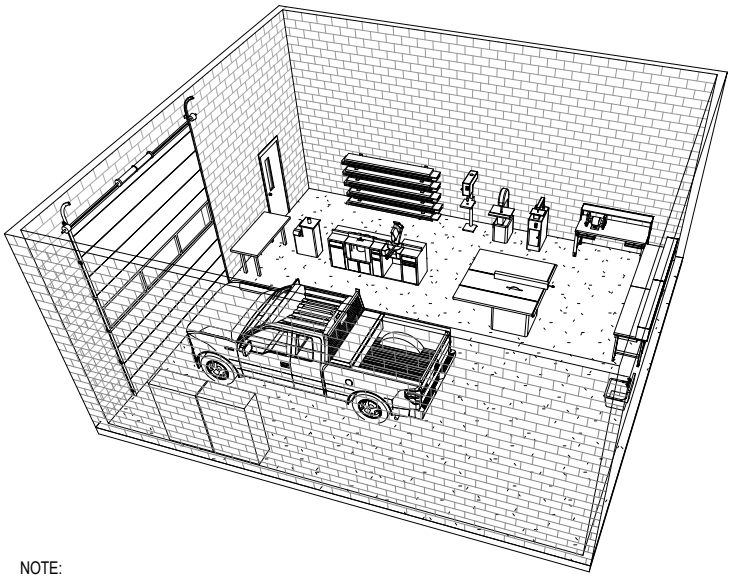
COMPRESSED AIR PROVISIONS

COMPONENTS:

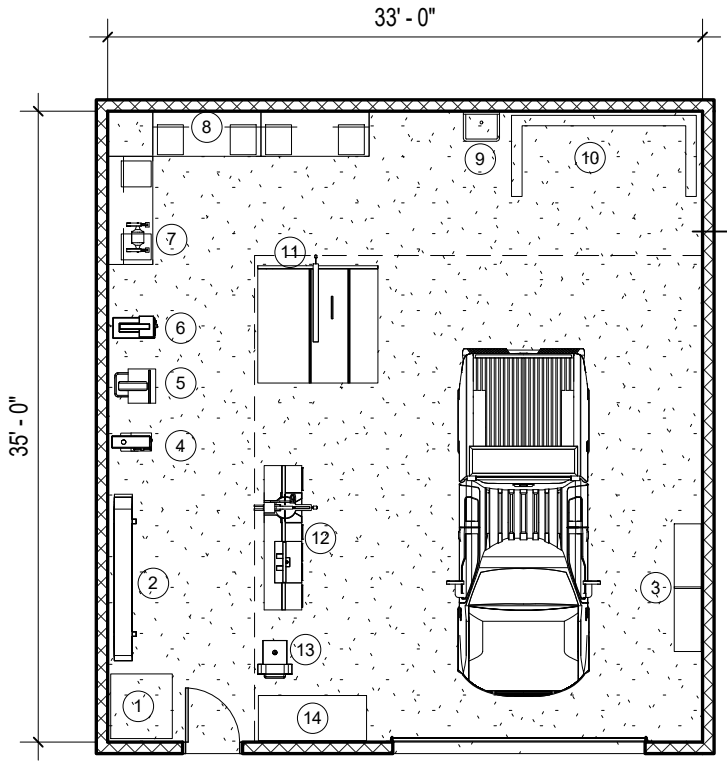
1. 42" DEEP STORAGE RACK FOR BLANKS,
   SHEET VINYL & ROLL VINYL
2. HEAVY DUTY SHELVING
3. PLOTTER
4. HANGING VINYL ROLLS
5. ROLL PRESS TABLE
6. DESK & CHAIR

DRAFT

Weston & Sampson	TRURO JAN 2019	**Sign Shop - 320sf**	C1



NOTE:
EQUIP. LIST IS FOR PLANNING PURPOSED ONLY. FINAL CARPENTRY EQUIP. TO BE COORDINATED WITH TOWN



1 Carpentry Shop - 1155sf
3/32" = 1'-0"

ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: CMU PAINTED

CEILING: OPEN

MEP/DATA REQUIREMENTS

HEATING

VENTILATION

DUPLEX ELECTRICAL OUTLETS

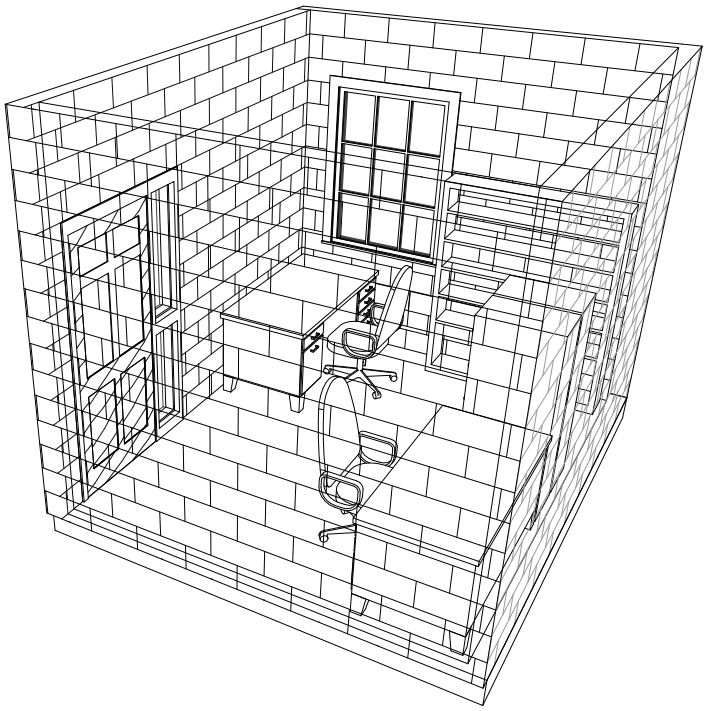
DATA OUTLET JACKS

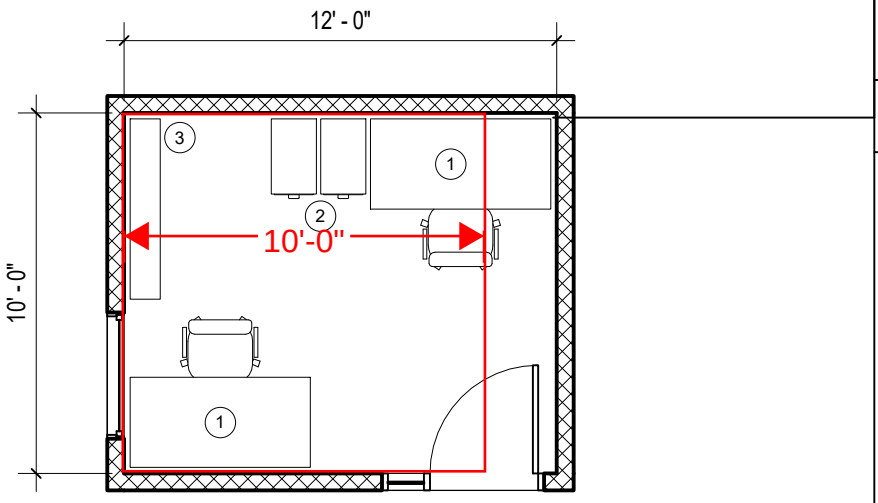
DUST COLLECTION SYSTEM

COMPONENTS:

1. DUST COLLECTION SYSTEM
2. LUMBER SORAGE
3. FLAMMABLE CABINETS
4. DRILL PRESS
5. BAND SAW
6. JIG SAW
7. BENCH MOUNTED GRINDER
8. WORK BENCH
9. SHOP SINK
10. SMALL PARTS PAINT BOOTH
11. TABLE SAW
12. MITER SAW
13. DRUM SANDER
14. ASSEMBLY TABLE

DRAFT





1 Shop Support Office - 120sf
3/16" = 1'-0"

100sf

ROOM FINISHES

FLOORS: RESILIENT FLOORING

WALLS: CMU PAINTED

CEILING: 2' x 2' ACT TILES

MEP/DATA REQUIREMENTS

HEATING

COOLING (MINI-SPLIT)

DUPLEX ELECTRICAL OUTLETS

DATA OUTLET JACKS

COMPONENTS:

1. DESK & CHAIR
2. FILE CABINETS
3. BOOKCASE

DRAFT

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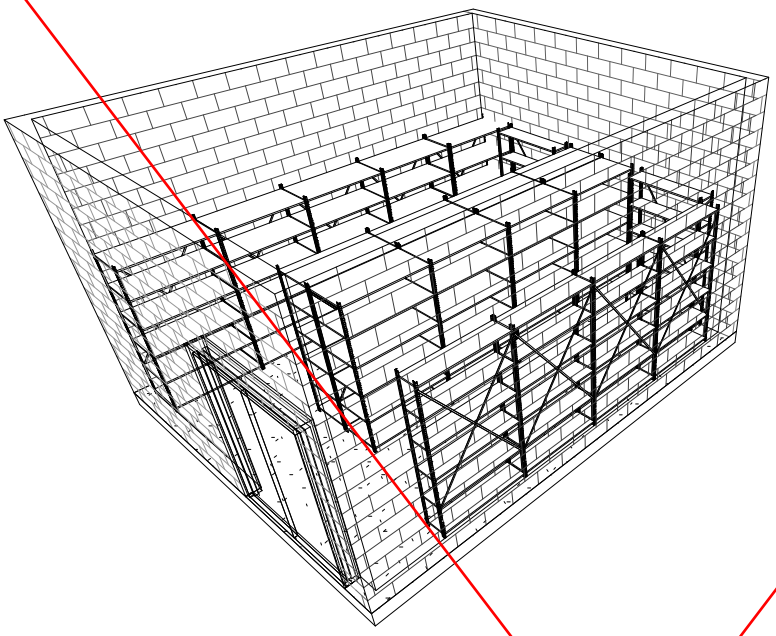

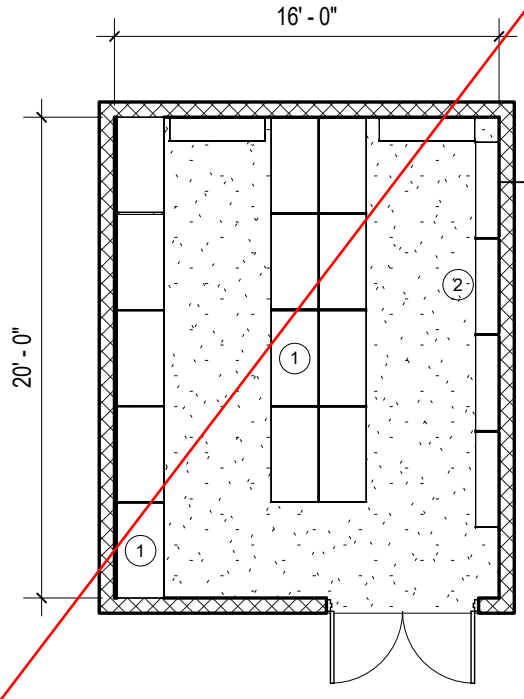

1 Material/Supply Storage (Custodial) - 320sf
1/8" = 1'-0"

ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: CMU PAINTED

CEILING: OPEN TO STRUCTURE

MEP/DATA REQUIREMENTS

HEATING

VENTILATION

DUPLEX ELECTRICAL OUTLETS

COMPONENTS:

1. 24" DEEP UTILITY SHELVING
2. 12" DEEP UTILITY SHELVING

DRAFT

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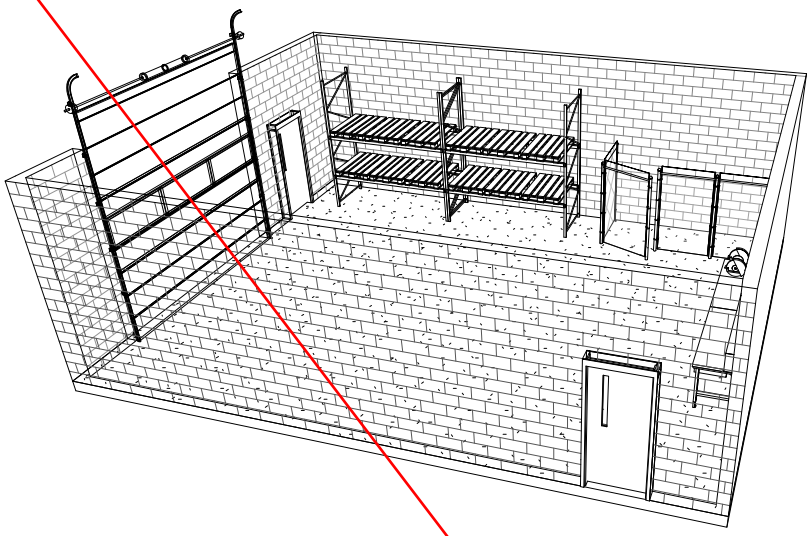
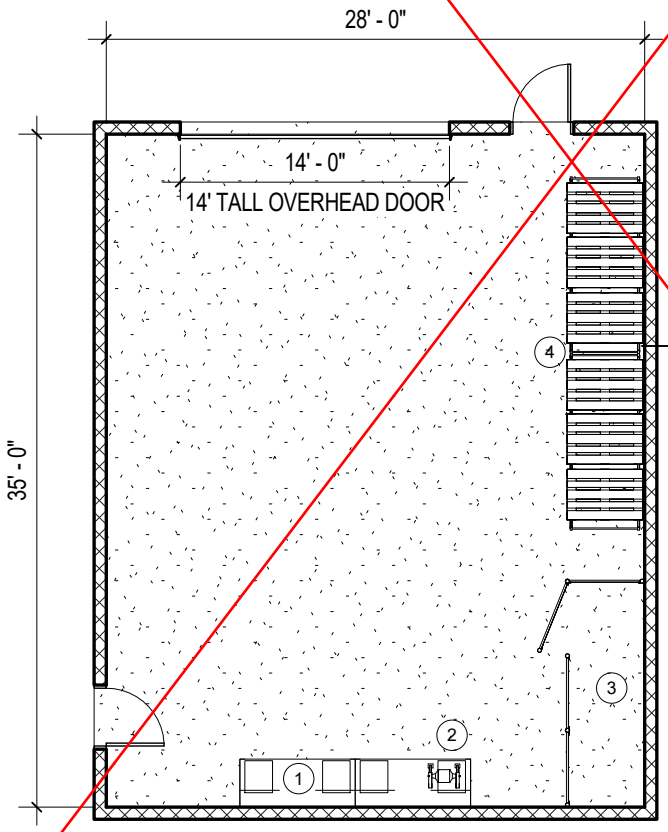




1 Material/Supply Storage Shop (Carpentry Maint.) - 980sf
1" = 10'-0"

ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: CMU PAINTED

CEILING: OPEN TO STRUCTURE

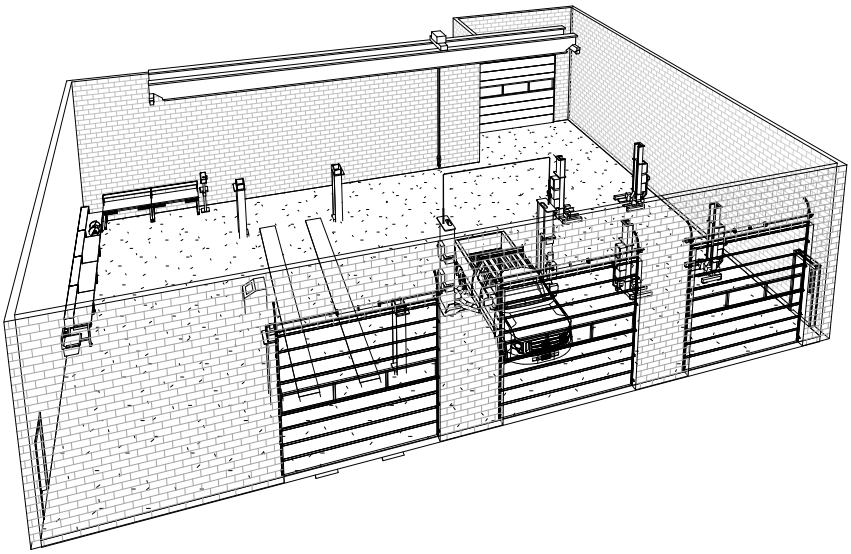
MEP/DATA REQUIREMENTS

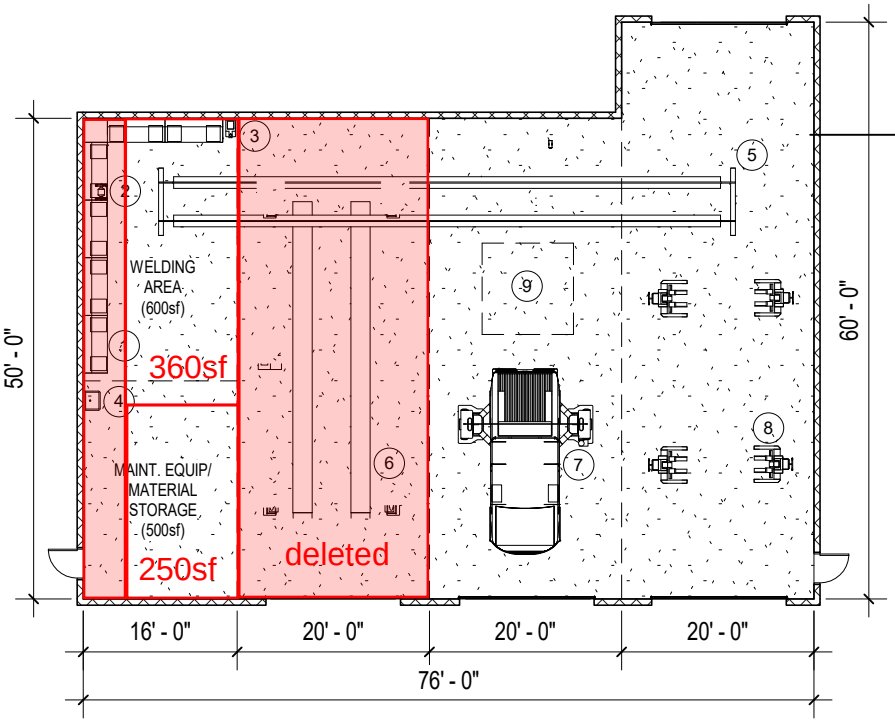
DUPLEX ELECTRICAL OUTLETS

COMPONENTS:

1. WORK BENCH
2. TABLE GRINDER
3. SECURED STORAGE CAGE
4. PALLET RACKS (2)

DRAFT





Vehicle/Equipment Maintenance Bays - 4000sf

1 1" = 20'-0"

2,810sf

ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: CONCRETE BLOCK (PAINTED)

CEILING: OPEN

MEP/DATA REQUIREMENTS

DUPLEX ELECTRICAL OUTLETS

DATA OUTLET JACKS

SPECIALTY EQUIP ELEC. OUTLETS

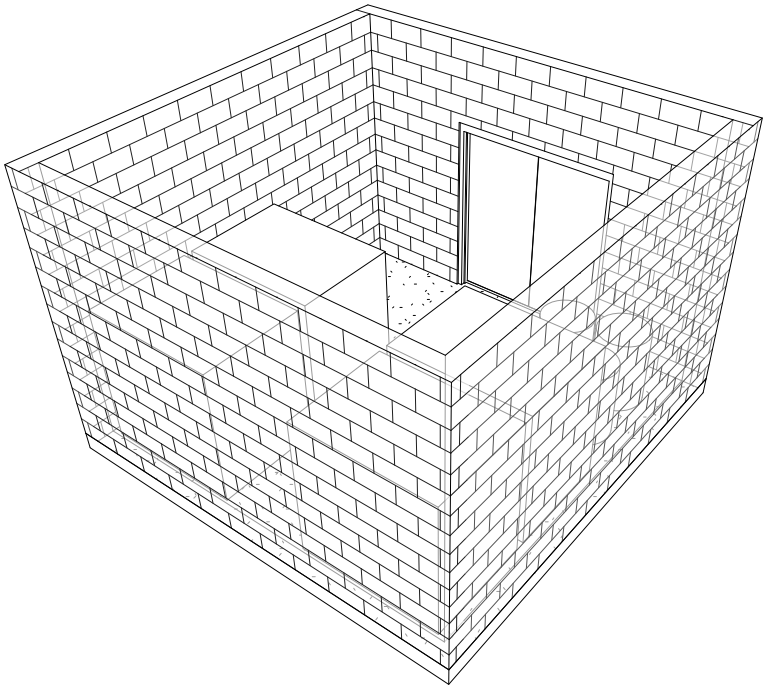
HEATING (RADIANT FLOOR HEATING)

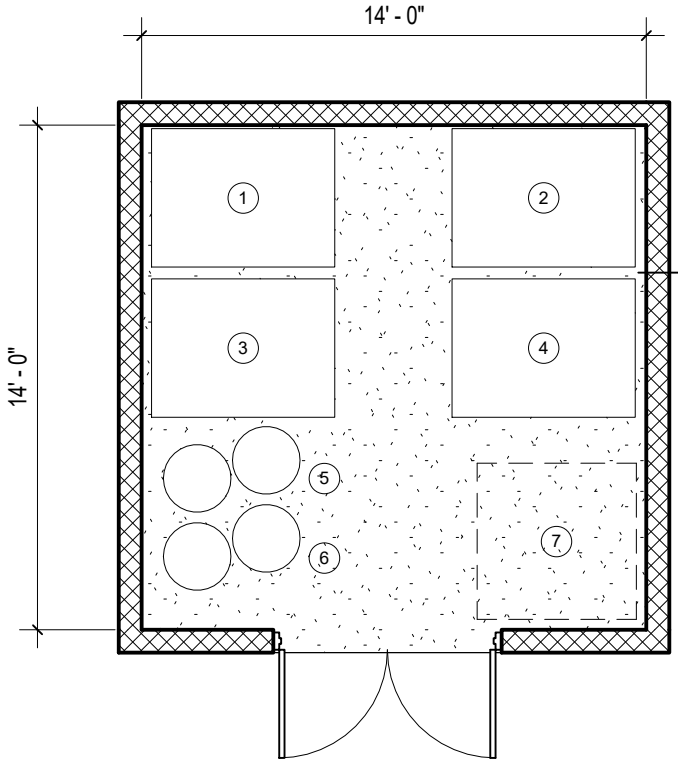
VENTILATION

COMPONENTS:

1. WORK BENCH
2. GRINDER
3. DRILL PRESS
4. SERVICE SINK
5. INDUSTRIAL BRIDGE CRANE
6. RECESSED PLATFORM LIFT
7. 2-POST LIGHT DUTY LIFT
8. PORTABLE POST LIFT
9. SMALL EQUIPMENT PLATFORM LIFT

DRAFT





1 Fluids Room - 196sf
3/16" = 1'-0"

ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: CMU PAINTED

CEILING: GWB PAINTED

MEP/DATA REQUIREMENTS

HEATING

DEDICATED EXHAUST SYSTEM

GFI ELECTRICAL OUTLETS

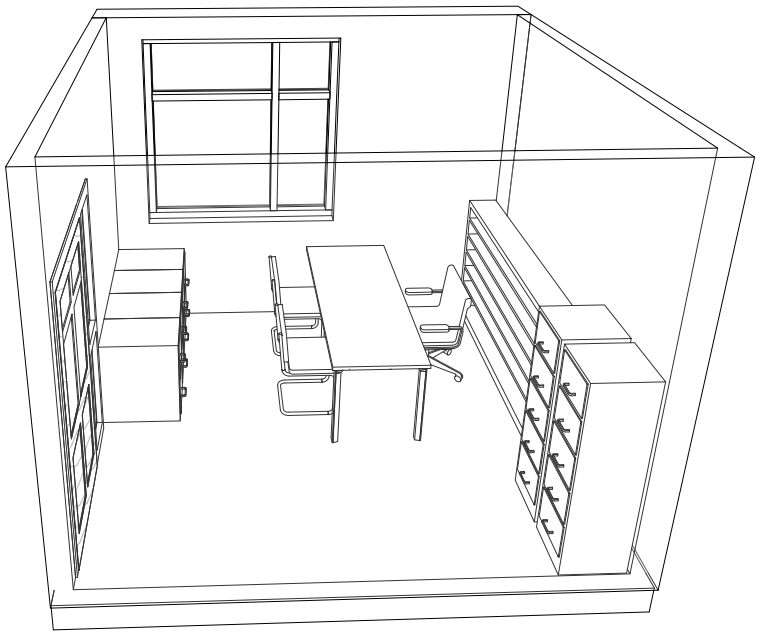
COMPRESSED AIR FOR PNEUMATIC PUMPS

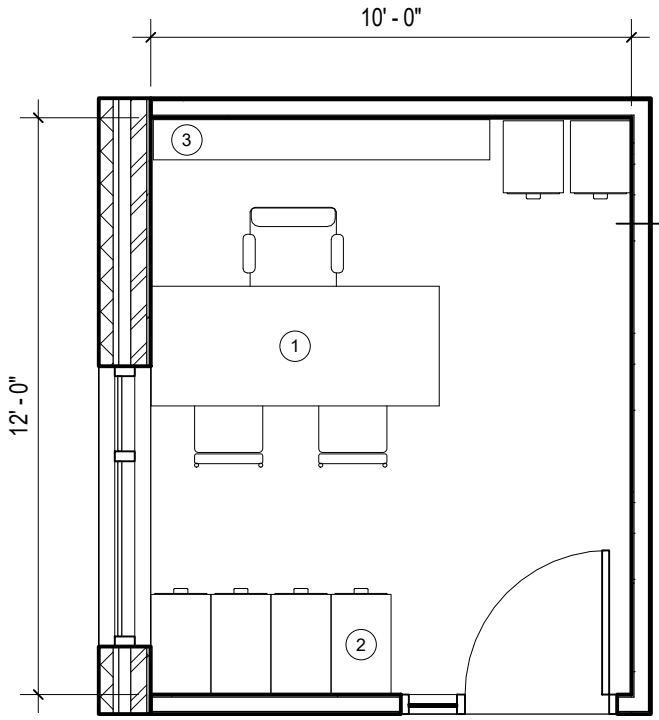
CONTAINMENT SUMP

COMPONENTS:

1. WASTE OIL (BULK)
2. WASTE ANFR (BULK)
3. MOTOR OIL (BULK)
4. MOTOR OIL (BULK)
5. HYDRAULIC OIL (55 GAL)
6. ANFR (55 GAL)
7. SPARE STORAGE

DRAFT





Maintenance Office/Reference Room - 120sf

1 1/4" = 1'-0"

ROOM FINISHES

FLOORS: RESILIENT FLOORING

WALLS: GWB PAINTED

CEILING: 2x2 act tile

MEP/DATA REQUIREMENTS

DUPLEX ELECTRICAL OUTLETS

DATA OUTLET JACKS

HEATING

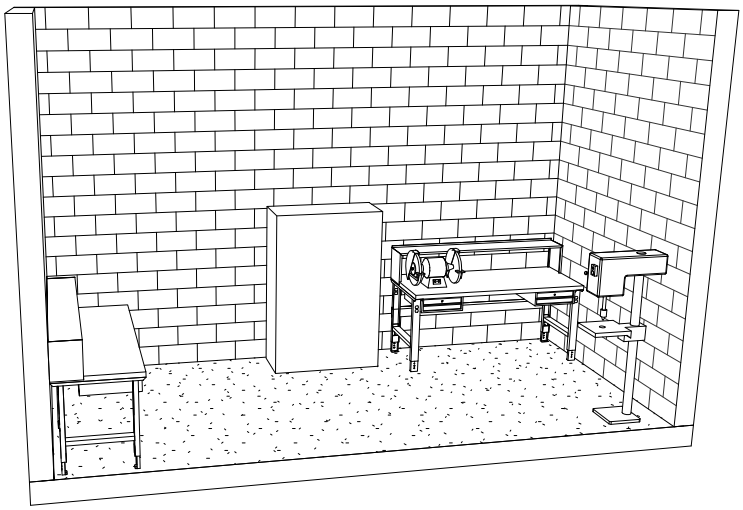
COOLING (MINI-SPLIT)

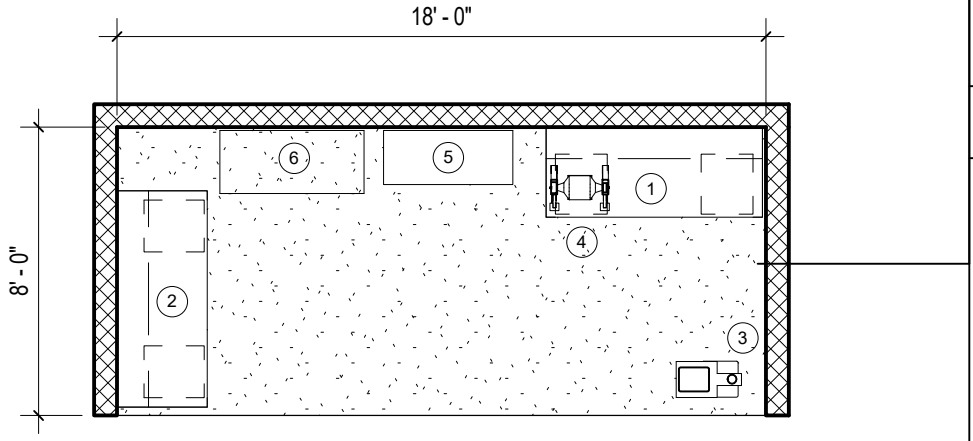
COMPONENTS:

1. DESK & TASK CHAIRS
2. FILE CABINETS
3. BOOKCASE

DRAFT

Weston & Sampson	TRURO JAN 2019	**Maintenance Office / Reference Room - 120sf**	D3





1 Maintenance Workshop - 144sf
3/16" = 1'-0"

ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: CMU PAINTED

CEILING: OPEN TO ABOVE

MEP/DATA REQUIREMENTS

HEATING

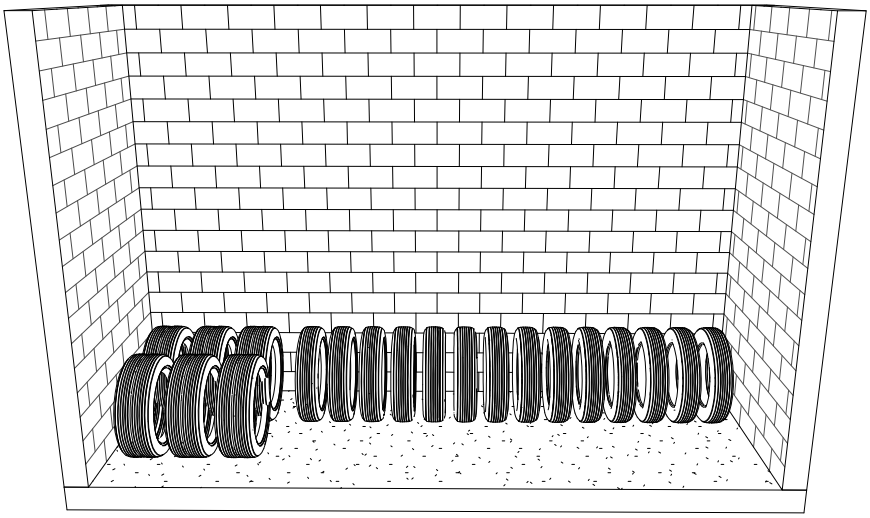
VENTILATION

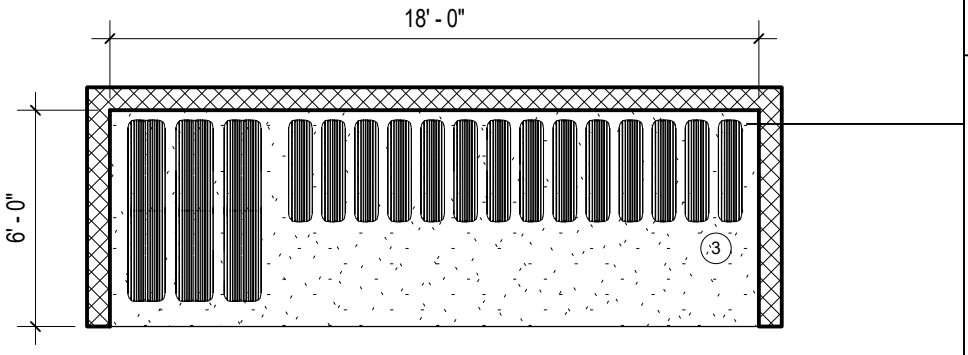
SPECIALTY EQUIP. ELEC. OUTLETS

COMPONENTS:

1. WORK BENCH
2. CHOP SAW WORK BENCH
3. DRILL PRESS
4. TABLE GRINDER
5. PARTS CLEANER
6. HYDRAULIC PRESS

DRAFT





1 Maintenance Tire Storage & Shop - 108sf
3/16" = 1'-0"

ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: CMU PAINTED

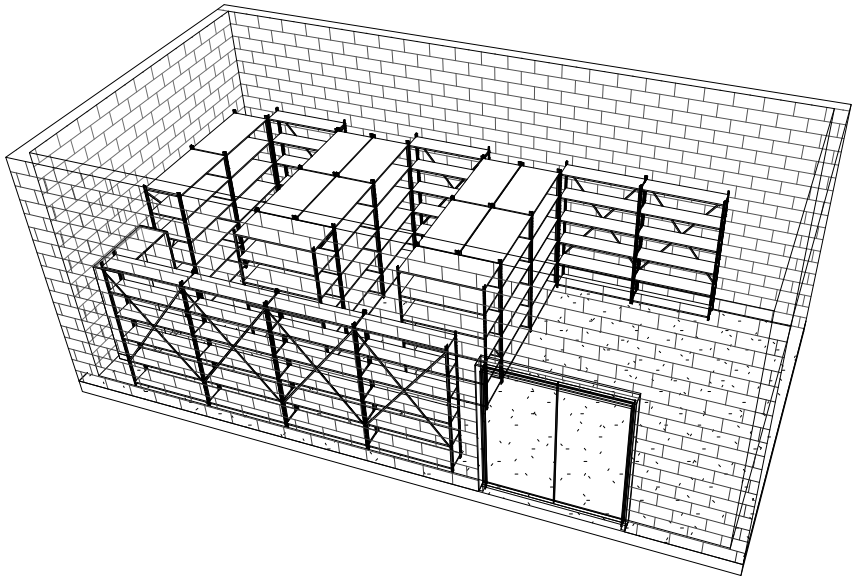
CEILING: OPEN TO STRUCTURE

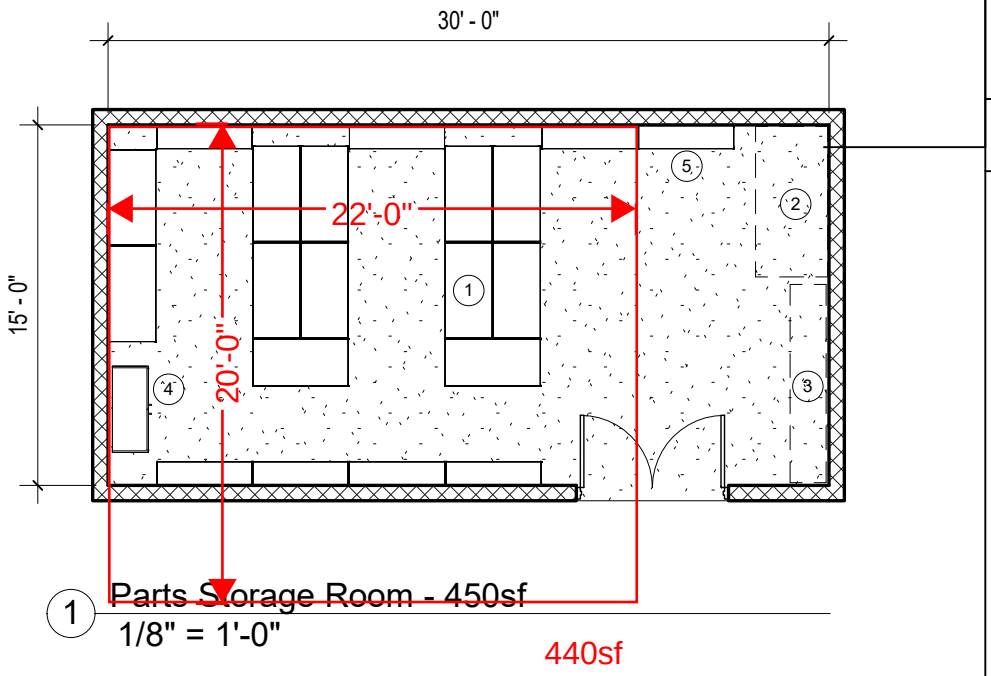
MEP/DATA REQUIREMENTS

COMPONENTS:

1. TIRE STORAGE

DRAFT





ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: CMU PAINTED

CEILING: OPEN TO STRUCTURE

MEP/DATA REQUIREMENTS

DUPLEX ELECTRICAL OUTLETS

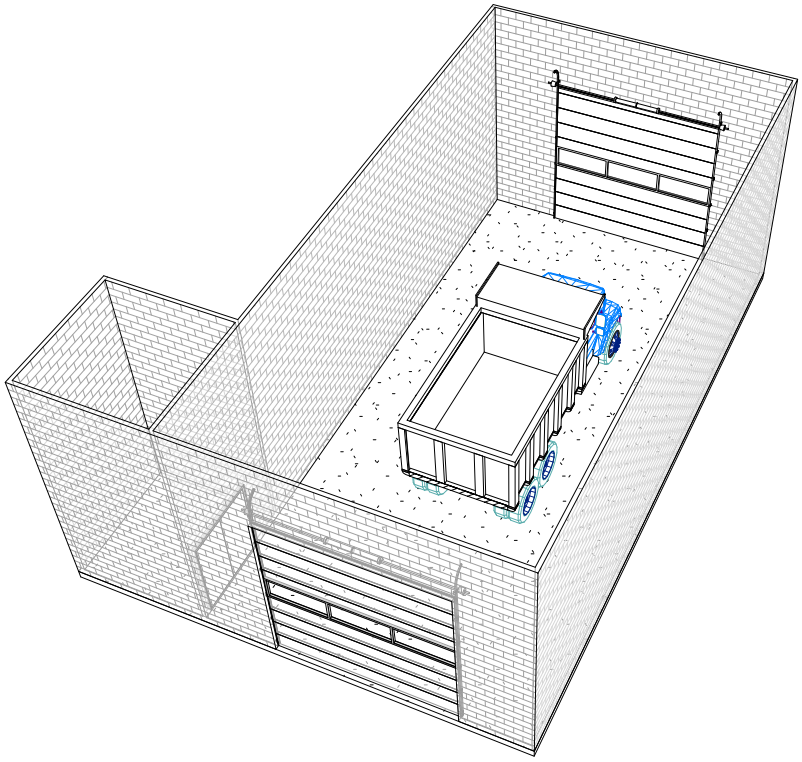
HEATING

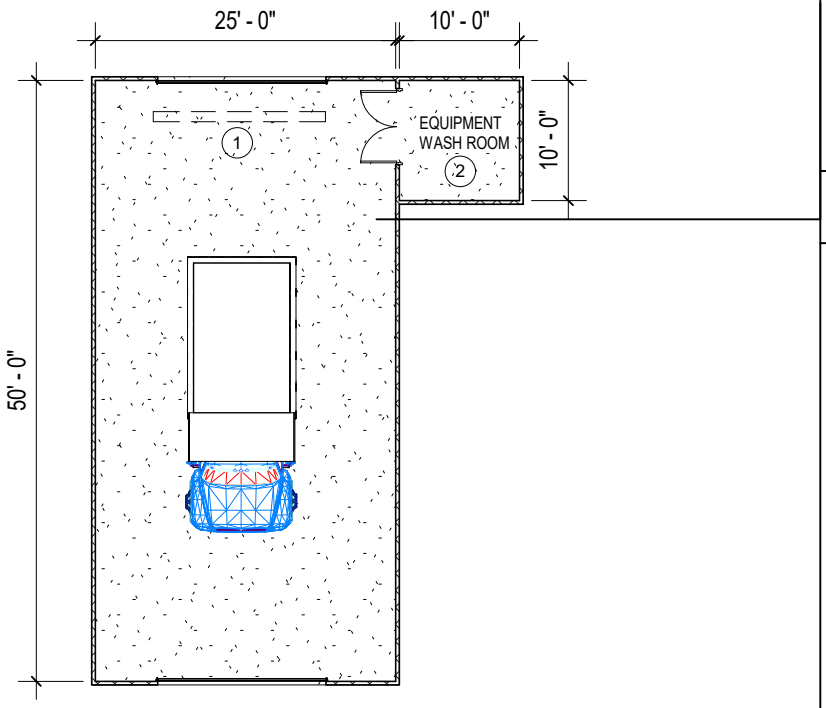
VENTILATION

COMPONENTS:

1. HEAVY DUTY SHELVING (48" W X 24" D X 84" H)
2. SMALL PARTS BIN
3. WALL STORAGE
4. FLAMMABLE CABINET
5. HEAVY DUTY SHELVING (48" W X 12" D X 84" H)

DRAFT





1 Vehicle & Equipment Wash Bay - 1350sf
1/16" = 1'-0"

ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: PVC PANELS

CEILING: PVC PANELS

MEP/DATA REQUIREMENTS

2" WATER SUPPLY

HEATING

VENTILATION

WATERPROOF DEVICES

GFI ELECTRICAL OUTLETS

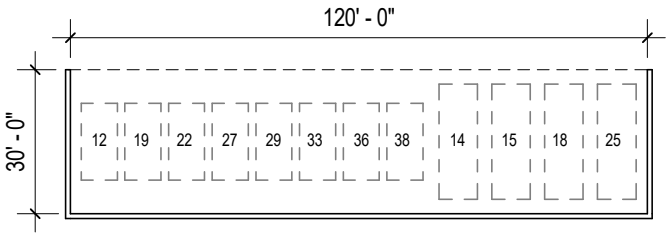
COMPONENTS:

1. UNDERCARRIAGE WASH
2. MANUAL WASH EQUIP. PACKAGE

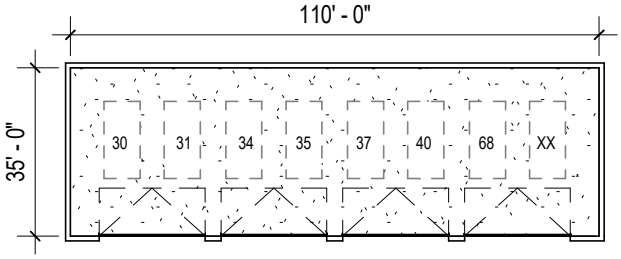
DRAFT

Weston & Sampson	TRURO JAN 2019	**Vehicle & Equipment Wash Bay - 1350sf**	E1

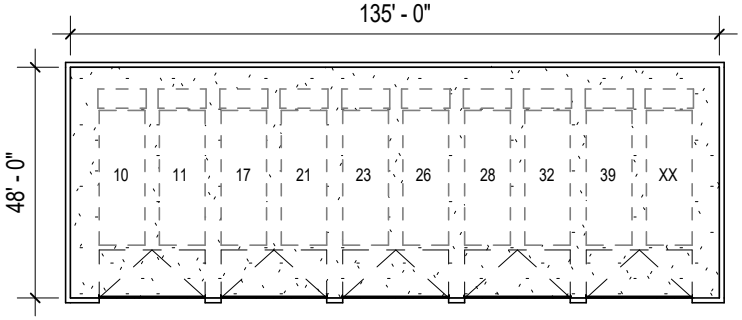
OPEN CANOPY - 3,600 SF



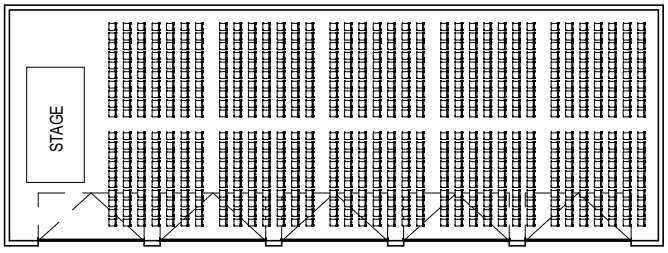
SMALL FLEET STORAGE GARAGE - 3,850 SF



LARGE FLEET STORAGE GARAGE - 6,480 SF



LARGE FLEET STORAGE GARAGE; ASSEMBLY SPACE FOR TOWN MEETINGS



1 Vehicle Storage Garages & Canopy - 10,330sf + 3,600sf
1" = 40'-0"

ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: CMU TO 3'-4", METAL PANEL (ABOVE)

CEILING: FABRIC LINER

MEP/DATA REQUIREMENTS

SMALL FLEET STORAGE GARAGE:
TEL/DATA
VENTILATION

LARGE FLEET STORAGE GARAGE:
TEL/DATA
MINIMALLY CONDITIONED
VENTILATION

Assembly use could trigger requirements for:
- Egress
- Occupancy Loads
- Fire Protection
- Accessibility
- Ventilation
- Toilet Facilities

COMPONENTS:

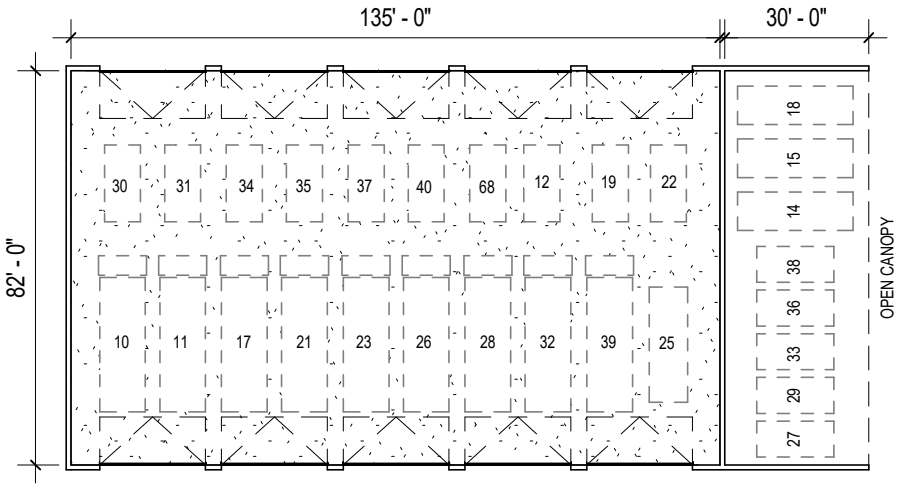
CANOPY:
(4) EQUIPMENT
(8) TRAILERS

SMALL FLEET STORAGE GARAGE:
(8) SMALL TRUCKS (GAS)

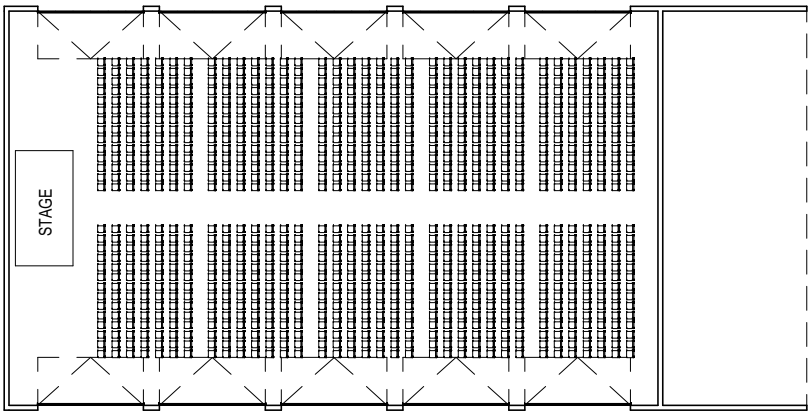
LARGE FLEET STORAGE GARAGE:
(10) LARGE TRUCKS (DIESEL)

ASSEMBLY SPACE FOR TOWN MEETINGS
STAGE
(700) CHAIRS FOR RESIDENTS

DRAFT



FLEET STORAGE GARAGE; ASSEMBLY SPACE FOR TOWN MEETINGS



1 Vehicle Storage Garage & Canopy - 11,070sf + 2,460sf
1" = 40'-0"

ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: CMU TO 3'-4", METAL PANEL (ABOVE)

CEILING: FABRIC LINER

MEP/DATA REQUIREMENTS

TEL/DATA
MINIMALLY CONDITIONED VENTILATION

Assembly use could trigger requirements for:
- Egress
- Occupancy Loads
- Fire Protection
- Accessibility
- Ventilation

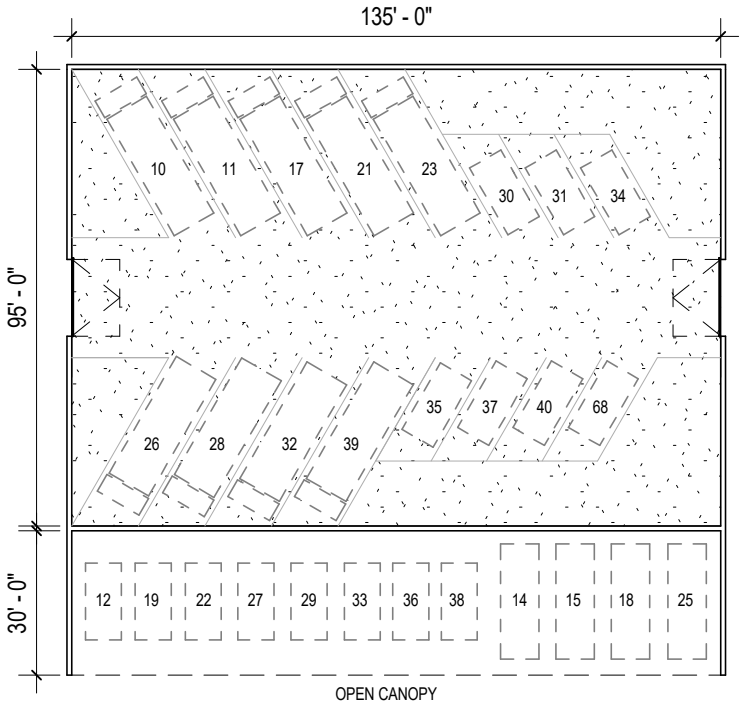
COMPONENTS:

FLEET STORAGE GARAGE:
(9) LARGE TRUCKS (DIESEL)
(7) SMALL TRUCKS (GAS)

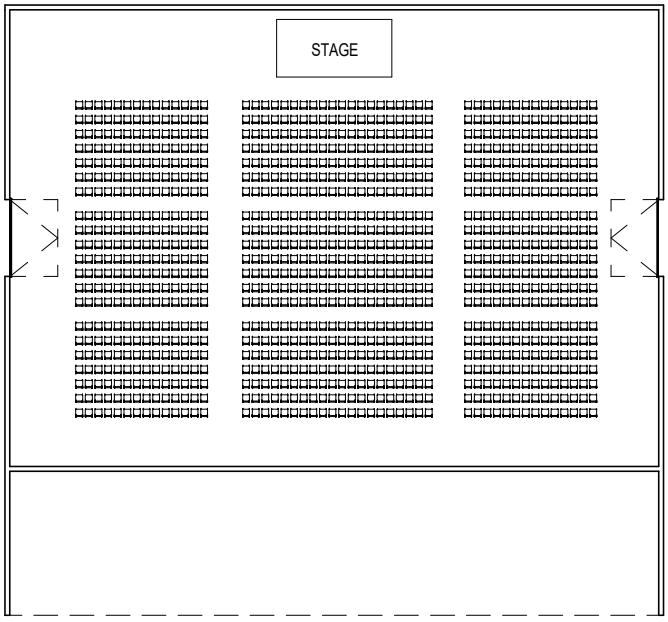
CANOPY:
(4) EQUIPMENT
(8) TRAILERS

ASSEMBLY SPACE FOR TOWN MEETINGS
STAGE
(980) CHAIRS FOR RESIDENTS

DRAFT



FLEET STORAGE GARAGE; ASSEMBLY SPACE FOR TOWN MEETINGS



Vehicle Storage Garage & Canopy - 12,825sf + 4,050sf

1 1" = 40'-0"

ROOM FINISHES

FLOORS: SEALED CONCRETE

WALLS: CMU TO 3'-4", METAL PANEL (ABOVE)

CEILING: FABRIC LINER

MEP/DATA REQUIREMENTS

TEL/DATA
MINIMALLY CONDITIONED VENTILATION

Assembly use could trigger requirements for:
- Egress
- Occupancy Loads
- Fire Protection
- Accessibility
- Ventilation

COMPONENTS:

FLEET STORAGE GARAGE:
(9) LARGE TRUCKS (DIESEL)
(7) SMALL TRUCKS (GAS)
OPEN FLOOR SPACE FOR SMALL EQUIP.

CANOPY:
(4) EQUIPMENT
(8) TRAILERS

ASSEMBLY SPACE FOR TOWN MEETINGS
STAGE
(1,008) CHAIRS FOR RESIDENTS

DRAFT

SECTION VI

Sustainable Design Documents

Climate Resilience Design Standards Tool Project Report

Truro DPW
Date Created: 2/25/2025 10:26:11 AM
Created By: DONAHUED@WSEINC.COM
Date Report Generated: 2/25/2025 8:54:58 PM
Tool Version: Version 1.4
Project Contact Information: Della Donahue (donahue.della@wseinc.com)

Project Summary

Link to Project

Estimated Capital Cost: TBD
End of Useful Life Year: 2086
Project within mapped Environmental Justice neighborhood: No

Ecosystem Service Benefits	Scores
Project Score	Moderate
Exposure	**Scores**
Sea Level Rise/Storm Surge	Not Exposed
Extreme Precipitation - Stormwater Flooding	High Exposure
Extreme Precipitation - Riverine Flooding	Not Exposed
Extreme Heat	High Exposure

Asset Preliminary Climate Risk Rating Summary

Number of Assets: 1

Asset Risk	Sea Level Rise/Storm Surge	Extreme Precipitation - Stormwater Flooding	Extreme Precipitation - Riverine Flooding	Extreme Heat
Public Works Facility, Storage Canopy, Salt Shed & Material Bins, and Fuel Island	Low Risk	High Risk	Low Risk	High Risk

Climate Resilience Design Standards Summary

	Target Planning Horizon	Intermediate Planning Horizon	Percentile	Return Period	Tier
Sea Level Rise/Storm Surge					
Public Works Facility, Storage Canopy, Salt Shed & Material Bins, and Fuel Island					
Extreme Precipitation					
Public Works Facility, Storage Canopy, Salt Shed & Material Bins, and Fuel Island	2070			100-yr (1%)	Tier 3
Extreme Heat					
Public Works Facility, Storage Canopy, Salt Shed & Material Bins, and Fuel Island	2070		90th		Tier 3

Scoring Rationale - Project Exposure Score

The purpose of the Exposure Score output is to provide a preliminary assessment of whether the overall project site and subsequent assets are exposed to impacts of natural hazard events and/or future impacts of climate change. For each climate parameter, the Tool will calculate one of the following exposure ratings: Not Exposed, Low Exposure, Moderate Exposure, or High Exposure. The rationale behind the exposure rating is provided below.

Sea Level Rise/Storm Surge

This project received a "Not Exposed" because of the following:

- Not located within the predicted mean high water shoreline by 2030
- No historic coastal flooding at project site
- Not located within the Massachusetts Coast Flood Risk Model (MC-FRM)

Extreme Precipitation - Stormwater Flooding

This project received a "High Exposure" because of the following:

- Increased impervious area
- Maximum annual daily rainfall exceeds 10 inches within the overall project's useful life
- Existing impervious area of the project site is greater than 50%
- No historic flooding at project site

Extreme Precipitation - Riverine Flooding

This project received a "Not Exposed" because of the following:

- No historic riverine flooding at project site
- The project is not within a mapped FEMA floodplain [outside of the Massachusetts Coast Flood Risk Model (MC-FRM)]
- Project is more than 500ft from a waterbody
- Project is not likely susceptible to riverine erosion

Extreme Heat

This project received a "High Exposure" because of the following:

- Not located within 100 ft of existing water body
- Increased impervious area
- Existing trees are being removed as part of the proposed project
- Existing impervious area of the project site is greater than 50%
- 10 to 30 day increase in days over 90 deg. F within project's useful life

Scoring Rationale - Asset Preliminary Climate Risk Rating

A Preliminary Climate Risk Rating is determined for each infrastructure and building asset by considering the overall project Exposure Score and responses to Step 4 questions provided by the user in the Tool. Natural Resource assets do not receive a risk rating. The following factors are what influenced the risk ratings for each asset.

Asset - Public Works Facility, Storage Canopy, Salt Shed & Material Bins, and Fuel Island
Primary asset criticality factors influencing risk ratings for this asset:

- Asset must be operable at all times, even during natural hazard event
- Loss/inoperability of the asset would have regional impacts
- The building/facility provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
- Inoperability of the asset would be expected to result in possible loss of life
- Inoperability will result in debilitating cascading impacts that will render other facilities, assets, or buildings inoperable and/or prevent the functionality of major regional or statewide facilities and/or delivery of critical services
- Spills and/or releases of hazardous materials would be moderately difficult to clean up

Project Climate Resilience Design Standards Output

Climate Resilience Design Standards and Guidance are recommended for each asset and climate parameter. The Design Standards for each climate parameter include the following: recommended planning horizon (target and/or intermediate), recommended return period (Sea Level Rise/Storm Surge and Precipitation) or percentile (Heat), and a list of applicable design criteria that are likely to be affected by climate change. Some design criteria have numerical values associated with the recommended return period and planning horizon, while others have tiered methodologies with step-by-step instructions on how to estimate design values given the other recommended design standards.

Asset: Public Works Facility, Storage Canopy, Salt Shed & Material Bins, and Fuel Island — Building/Facility

Sea Level Rise/Storm Surge — Low Risk

Applicable Design Criteria

Projected Tidal Datums: NOT APPLICABLE

Projected Water Surface Elevation: NOT APPLICABLE

Projected Wave Action Water Elevation: NOT APPLICABLE

Projected Wave Heights: NOT APPLICABLE

Projected Duration of Flooding: NOT APPLICABLE

Projected Design Flood Velocity: NOT APPLICABLE

Projected Scour & Erosion: NOT APPLICABLE

Extreme Precipitation — High Risk

Target Planning Horizon: 2070
Return Period: 100-yr (1%)

LIMITATIONS: The recommended Standards for Total Precipitation Depth & Peak Intensity are determined by the user drawn polygon and relationships as defined in the Supporting Documents. The projected Total Precipitation Depth values provided through the Tool are based on the climate projections developed by Cornell University as part of EEA's Massachusetts Climate and Hydrologic Risk Project, GIS-based data as of 10/15/21. For additional information on the methodology of these precipitation outputs, see Supporting Documents.

While Total Precipitation Depth & Peak Intensity for 24-hour Design Storms are useful to inform planning and design, it is recommended to also consider additional longer- and shorter-duration precipitation events and intensities in accordance with best practices. Longer-duration, lower-intensity storms allow time for infiltration and reduce the load on infrastructure over the duration of the storm. Shorter-duration, higher-intensity storms often have higher runoff volumes because the water does not have enough time to infiltrate infrastructure systems (e.g., catch basins) and may overflow or back up during such storms, resulting in flooding. In the Northeast, short-duration high intensity rain events are becoming more frequent, and there is often little early warning for these events, making it difficult to plan operationally. While the Tool does not provide recommended design standards for these scenarios, users should still consider both short- and long-duration precipitation events and how they may impact the asset.

The projected values, standards, and guidance provided within this Tool may be used to inform plans and designs, but they do not provide guarantees for future conditions or resilience. The projected values are not to be considered final or appropriate for construction documents without supporting engineering analyses. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence.

Applicable Design Criteria

Tiered Methodology: Tier 3

Projected Total Precipitation Depth & Peak Intensity for 24-hr Design Storms: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Return Period (Design Storm)	Projected 24-hr Total Precipitation Depth (inches)	Step-by-Step Methodology for Peak Intensity
Public Works Facility, Storage Canopy, Salt Shed & Material Bins, and Fuel Island	2070	100-Year (1%)	9.1	Downloadable Methodology PDF

Projected Riverine Peak Discharge & Peak Flood Elevation: NOT APPLICABLE

Extreme Heat High Risk

Target Planning Horizon: 2070
Percentile: 90th Percentile

LIMITATIONS: The recommended standards are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Applicable Design Criteria

Projected Annual/Summer/Winter Average Temperatures: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Percentile	Projected Annual Average Temperature [°F]	Projected Summer Average Temperature [°F]	Projected Winter Average Temperature [°F]
Public Works Facility, Storage Canopy, Salt Shed & Material Bins, and Fuel Island	2070	90th	60.65	78.47	42.71

LIMITATIONS: The recommended Standards for Projected Average Annual/Summer/Winter Temperature are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Projected Growing Degree Days: NOT APPLICABLE

Projected Days Per Year With Max Temp > 95°F, >90°F, <32°F: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Percentile	Projected Days with Max Temp >95°F (days)	Projected Days with Max Temp >90°F (days)	Projected Days with Max Temp <32°F (days)
Public Works Facility, Storage Canopy, Salt Shed & Material Bins, and Fuel Island	2070	90th	9	35	42

LIMITATIONS: The recommended Standards for ProjectedÂ Days per Year with Max Temp >95Â°F, >90Â°F, <32Â°F are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Projected Number of Heat Waves Per Year & Average Heat Wave Duration: APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Percentile	Projected Number of Heat Waves Per Year (events)	Projected Average Heat Wave Duration (days)
Public Works Facility, Storage Canopy, Salt Shed & Material Bins, and Fuel Island	2070	90th	0	4

LIMITATIONS: The recommended Standards for ProjectedÂ Number of Heat Waves Per Year and Average Heat Wave DurationÂ are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Projected Cooling Degree Days & Heating Degree Days (base = 65°F): APPLICABLE

Asset Name	Recommended Planning Horizon	Recommended Percentile	Projected Cooling Degree Days (base = 65°) (degree days)	Projected Heating Degree Days (base = 65°) (degree days)
Public Works Facility, Storage Canopy, Salt Shed & Material Bins, and Fuel Island	2070	90th	1749	3338

LIMITATIONS: The recommended Standards for ProjectedÂ Cooling Degree Days and Heating Degree DaysÂ are determined by the user-drawn polygon and relationships as defined in the supporting Section Documents. The guidance provided within this Tool may be used to inform plans and designs, but is not comprehensive and does not provide guarantees for resilience. The guidance provided within this Tool is intended to be general and users are encouraged to do their own due diligence. One avenue to seek more information would be to access the comprehensive temperature and precipitation projections including additional return periods, time horizons, and seasons at the Climate Projections Dashboard.

Projected Heat Index: APPLICABLE
Methodology to Estimate Projected Values : Tier 3

Project Inputs

Core Project Information

Name:	Truro DPW
Given the expected useful life of the project, through what year do you estimate the project to last (i.e. before a major reconstruction/renovation)?	2086
Location of Project:	Truro
Estimated Capital Cost:	TBD
Who is the Submitting Entity?	Private Other Weston & Sampson Della Donahue (donahue.della@wseinc.com)
Is this project being submitted as part of a state grant application?	No
Which grant program?	
What stage are you in your project lifecycle?	Planning
Is climate resiliency a core objective of this project?	No
Is this project being submitted as part of the state capital planning process?	No
Is this project being submitted as part of a regulatory review process or permitting?	No
Brief Project Description:	New Public Works Facility for the town of Truro.

Project Ecosystem Service Benefits

Factors Influencing Output

- ✓ Project reduces storm damage
- ✓ Project protects public water supply
- ✓ Project promotes decarbonization
- ✓ Project improves water quality
- ✓ Project remediates existing sources of pollution
- ✓ Project improves air quality
- ✓ Project prevents pollution

Factors to Improve Output

- ✓ Incorporate nature-based solutions that may provide flood protection
- ✓ Incorporate green infrastructure or nature-based solutions that recharge groundwater
- ✓ Incorporate green infrastructure to filter stormwater
- ✓ Incorporate nature-based solutions that sequester carbon carbon
- ✓ Increase biodiversity, protect critical habitat for species, manage invasive populations, and/or provide connectivity to other habitats
- ✓ Preserve, enhance, and/or restore coastal shellfish habitats
- ✓ Incorporate vegetation that provides pollinator habitat
- ✓ Increase plants, trees, and/or other vegetation to provide oxygen production
- ✓ Incorporate education and/or protect cultural resources as part of your project

Is the primary purpose of this project ecological restoration?

No

Project Benefits

Provides flood protection through nature-based solutions	Maybe
Reduces storm damage	Yes
Recharges groundwater	Maybe
Protects public water supply	Yes
Filters stormwater using green infrastructure	Maybe
Improves water quality	Yes
Promotes decarbonization	Yes
Enables carbon sequestration	Maybe
Provides oxygen production	Maybe
Improves air quality	Yes
Prevents pollution	Yes
Remediates existing sources of pollution	Yes
Protects fisheries, wildlife, and plant habitat	Maybe
Protects land containing shellfish	Maybe
Provides pollinator habitat	Maybe
Provides recreation	No
Provides cultural resources/education	Maybe

Project Climate Hazard Exposure

Is the primary purpose of this project ecological restoration?	No
Does the project site have a history of coastal flooding?	No
Does the project site have a history of flooding during extreme precipitation events (unrelated to water/sewer damages)?	No
Does the project site have a history of riverine flooding?	No
Does the project result in a net increase in impervious area of the site?	Yes

Are existing trees being removed as part of the proposed project?	Yes

Project Assets

Asset: Public Works Facility, Storage Canopy, Salt Shed & Material Bins, and Fuel Island
Asset Type: Typically Occupied
Asset Sub-Type: Emergency operations/response building (fire, police, etc.)
Construction Type: New Construction
Construction Year: 2026
Useful Life: 60

Identify the length of time the asset can be inaccessible/inoperable without significant consequences.
Building must be accessible/operable at all times, even during natural hazard event

Identify the geographic area directly affected by permanent loss or significant inoperability of the building/facility.
Impacts would be regional (more than one municipality and/or surrounding region)

Identify the population directly served that would be affected by the permanent loss of use or inoperability of the building/facility.
Less than 10,000 people

Identify if the building/facility provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.
The building/facility provides services to populations that reside within Environmental Justice neighborhoods or climate vulnerable populations.

If the building/facility became inoperable for longer than acceptable in Question 1, how, if at all, would it be expected to impact people's health and safety?
Inoperability of the building/facility would be expected to result in possible loss of life

If there are hazardous materials in your building/facility, what are the extent of impacts related to spills/releases of these materials?
Spills and/or releases of hazardous materials would be moderately difficult to clean up

If the building/facility became inoperable for longer than acceptable in Question 1, what are the impacts on other facilities, assets, and/or infrastructure?
Debilitating – Inoperability will result in cascading impacts that will render other facilities, assets, or buildings inoperable and/or prevent the functionality of major regional or statewide facilities and/or delivery of critical services

If this building/facility was damaged beyond repair, how much would it approximately cost to replace?
Between $10 million and $30 million

Is this a recreational facility which can be vacated during a natural hazard event?
No

If the building/facility became inoperable for longer than acceptable in Question 1, what are the public and/or social services impacts?
Few alternative programs and/or services are available to support the community

If the building/facility became inoperable for longer than acceptable in Question 1, what are the environmental impacts related to natural resources?
No impact on surrounding natural resources is expected

If the building/facility became inoperable for longer than acceptable in Question 1, what are the impacts to government services (i.e. the building is not able to serve or operate its intended users or function)?
Loss of building may reduce the ability to maintain some government services, while a majority of services will still exist.

If the building/facility became inoperable for longer than acceptable in Question 1, what are the impacts to loss of confidence in government (i.e. the building is not able to serve or operate its intended users or function)?
Loss of confidence in government agency

Report Comments

N/A

Date: March 13, 2025
Project: Truro DPW Facility Design

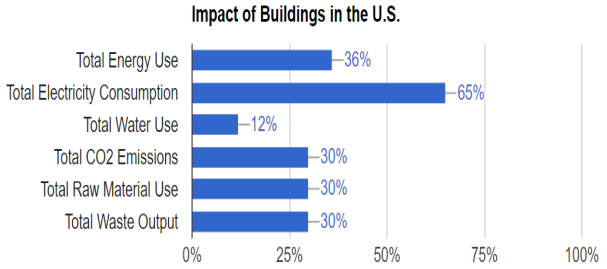
Purpose

The Sustainable Design Catalog is a guiding document to discuss goals that will establish the framework for design, construction and operational standards during all phases of the project. The initiatives discussed will then be formatted into a Sustainable Design Goals Memorandum to drive project decisions going forward.

Background

Who focus on buildings? Because they:

- use resources (energy, water, raw materials, etc.)
- generate waste (construction, occupancy, demolition)
- emit harmful atmospheric emissions
- change the function of land (i.e. the ability of that land to absorb/capture water into the ground)



Source: www.wbdg.org/design-objectives/sustainable

The pillars of sustainable design are to conserve critical resources; prevent environmental degradation caused by facilities and infrastructure throughout their life cycle; and create environments that are healthy, comfortable, and productive.

Optimize Site Potential

Optimize Energy Use

Protect & Conserve Water

Optimize Material Use and Spatial Design

Enhance Indoor Environmental Quality

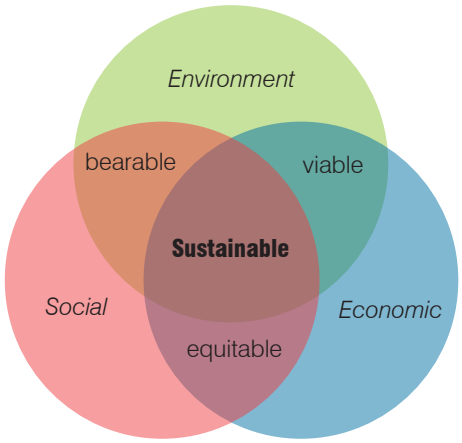
Optimize Operational & Maintenance Practices

Introduction

The sustainable considerations are organized into four categories:

1. Site Scale Design
2. Building Scale Design
3. Occupant Scale Design
4. Construction & Operational

Three Pillars of Sustainability:



Each concept varies in regards to:
- benefits & co-benefits; who / what
- cost savings; immediate and long-term
- cost implications; no-cost vs. expensive

The various concepts are explained in further detail on the following pages.
Please review and consider these initiatives and provide feedback in regards to this project.

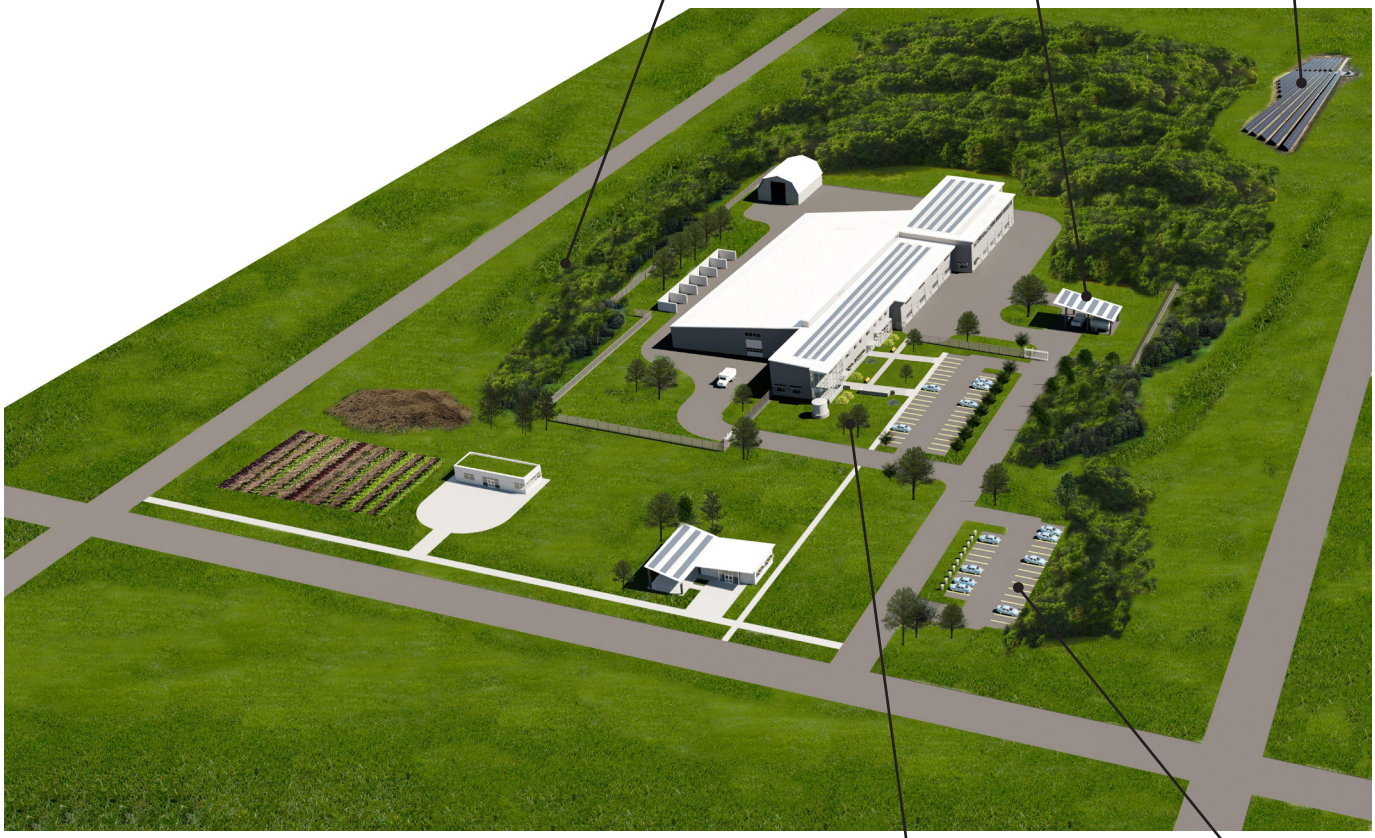
Background Town Information / Context:

- Truro Municipal Decarbonization Roadmap (December 2024)
- Decarbonization Reports (November 2024)
  - » Beach Office
  - » Community Center
  - » Public Library
  - » Public Safety
  - » Recreation Field House
  - » Town Hall
  - » Transfer Station
  - » Central School
- FAQs Municipal Opt In Specialized Energy Code
- Climate Action Committee Charge (2019)
- Energy Reduction Plan (2011)
-
-

SITE DESIGN

* The graphic does not represent the proposed facility design.
It is a conceptual building to help provide a visual and diagram concepts.

Public Amenities:
- Compost
- Community Garden
- Plaza
- Bike Storage
- Information Kiosk



Location:
- Proximity to commuter stations
- Proximity to other municipal buildings

1. SITE SCALE DESIGN CONSIDERATIONS

a. **Green Infrastructure:** systems and practices that use or mimic natural processes that result in the infiltration, evapotranspiration or use of stormwater.

Goal	Description	Capital Cost	Design Fee
✓		$ - $$$	$ - $$$

Benefits:

- Manage stormwater
- Protect drinking water
- Mitigate heat island effect
- Protect ecosystems/habitats
- Provide interior cooling

Implementation:

- Bioswales
- Rain garden
- Rainwater collection
- Green roof

b. **Vegetative Shading:** the use of landscaping / plants to provide shade.

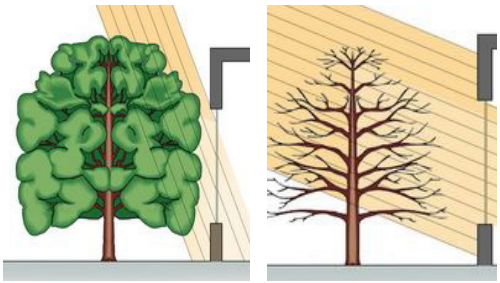
Goal	Description	Capital Cost	Design Fee
✓		$	$

Benefits:

- Provide site & interior cooling
- Manage stormwater
- Mitigate heat island effect
- Support biodiversity

Implementation:

- Tree selection
- Site landscape design
- Coordination with glazing



c. **Electric Vehicle (EV) Charging Stations:** for public access & employee use.

Goal	Description	Capital Cost	Design Fee
✓	Specialized Energy Code requirements.	$ - $$	$ - $$

Benefits:

- Contribute to infrastructure
- Reduce emissions

Implementation:

- Quantify # of stations
- Rebate opportunities
- Combine with solar canopy

d. **Public Amenities:** on-site infrastructure / services for community benefit.

Goal	Description	Capital Cost	Design Fee
✔	Doesn't have to fall on DPW; opportunity to engage with stakeholders / community.	$ - $$	$ - $$

Benefits:

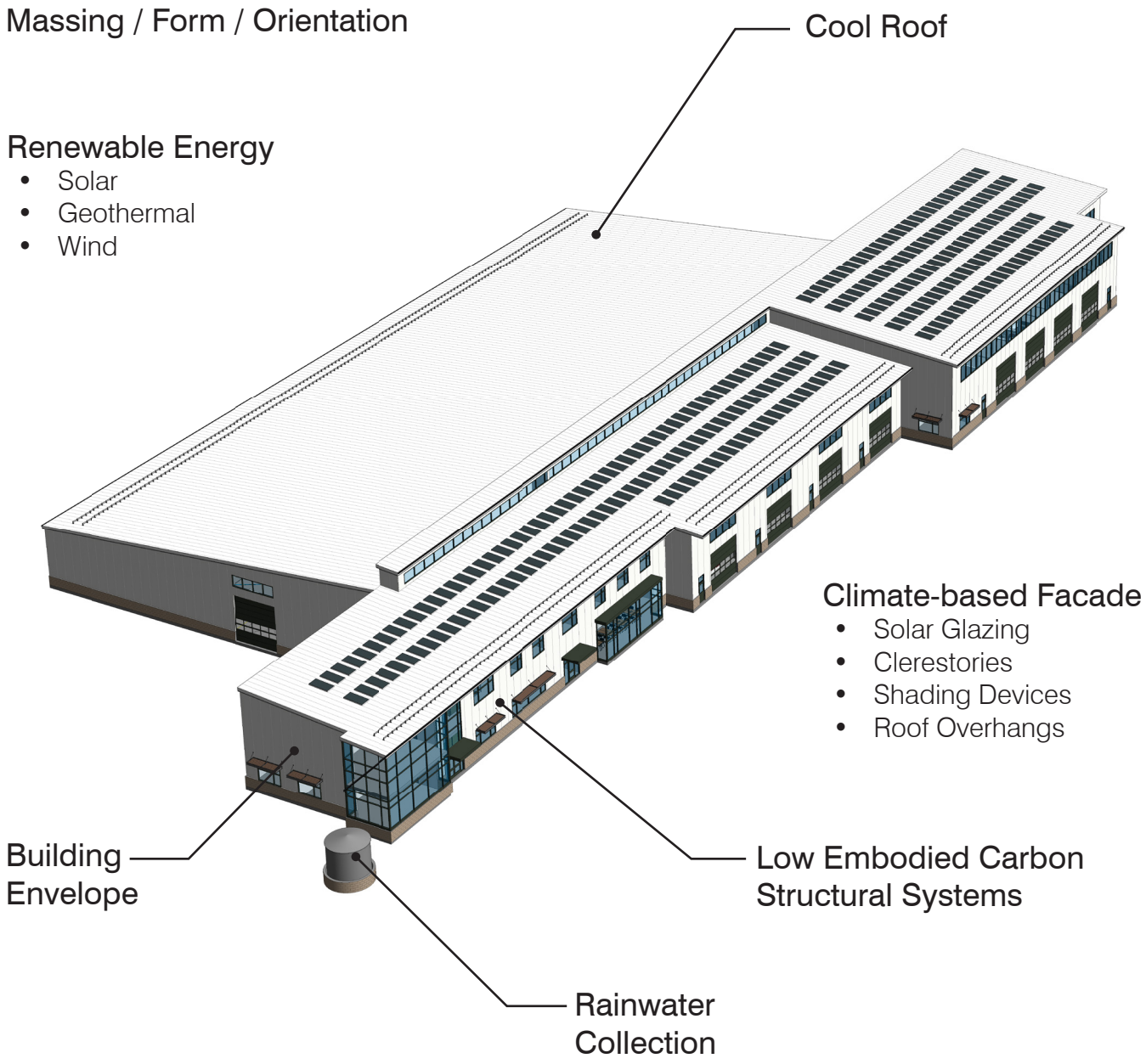
- Community connectedness
- Increased public support
- Educational value
- Promote healthy lifestyle
- Reduce emissions

Implementation:

- Salt / sand pick-up
- Compost drop-off / pick-up
- Community garden
- Walking trails
- Informational kiosk
- Bike storage

BUILDING DESIGN

* The graphic does not represent the proposed facility design.
It is a conceptual building to help provide a visual and diagram concepts.



2. BUILDING SCALE DESIGN CONSIDERATIONS

a. **Massing, Form & Orientation:** the practice of facing, shaping, and sizing a building to maximize aspects of its surroundings.

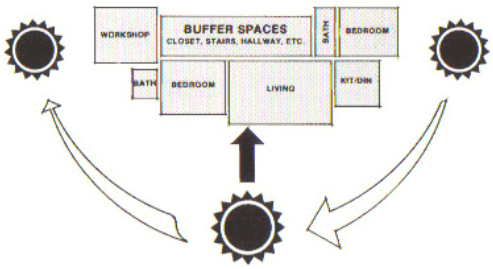
Goal	Description	Capital Cost	Design Fee
✓		N/A	N/A

Benefits:

- Solar energy production
- Heating & cooling
- Ventilation
- Daylighting

Implementation:

- Combine with glazing
- Consider spatial programming
- Cross / stack ventilation
- Position louvers accordingly
- Consider solar roof design



b. **Building Envelope Design & Climate-based Facade:** roof, wall and slab assembly; acts in response to external factors to support desired indoor environmental conditions.

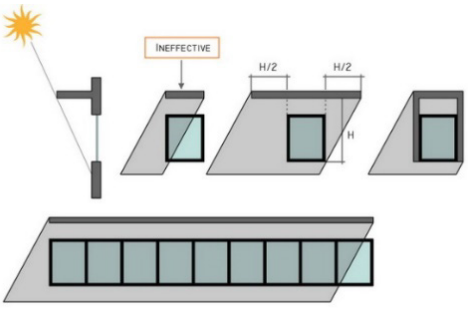
Goal	Description	Capital Cost	Design Fee
✓	Specialized Energy Code requirements.	$ - $$$	N/A

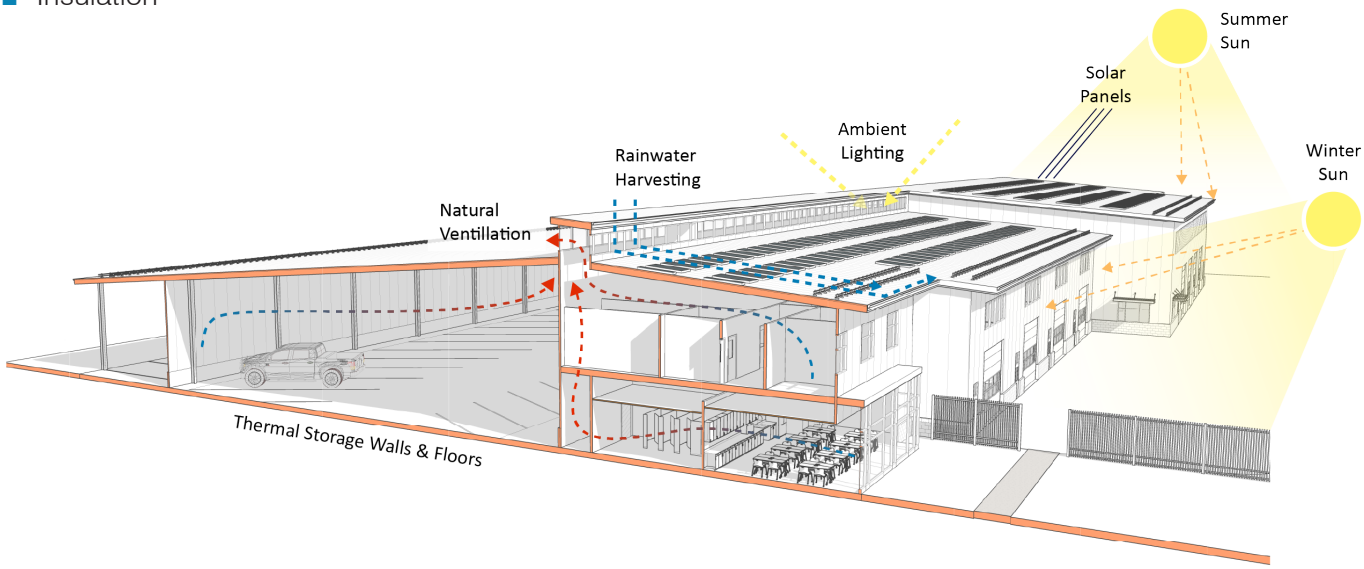
Benefits:

- Energy efficiency
- Cost savings
- Heating & Cooling
- Ventilation
- Daylighting
- Insulation

Implementation:

- Superinsulation
- Air tightness
- Shading devices
- Glazing design





c. **Cool Roof:** combines solar reflectance and thermal emittance to maintain cool building interiors.

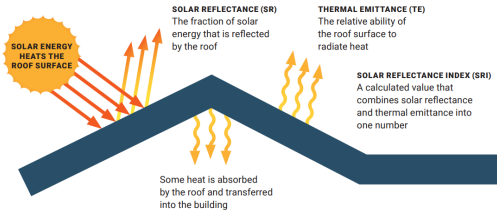
Goal	Description	Capital Cost	Design Fee
✔		N/A	N/A

Benefits:

- Reduced cooling loads
- Mitigates Heat Island Effect
- Cost savings

Implementation:

- Reflective material selection



d. **Water Catchment & Storage System:** Collecting & reutilizing rainwater.

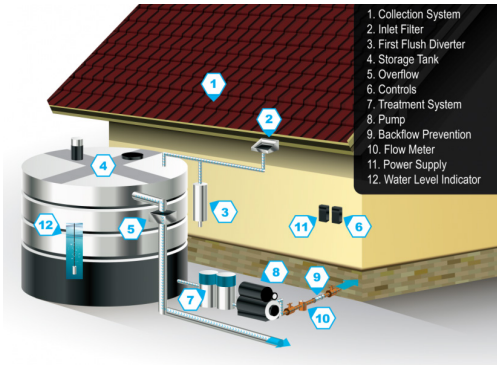
Goal	Description	Capital Cost	Design Fee
✔		$ - $$$	$ - $$$

Benefits:

- Conserve potable water
- Relieve stress on stormwater
- Support site irrigation
- Support fleet wash off

Implementation:

- Gutters / drainage design
- Storage tanks / cisterns
- System integration



e. **On-Site Renewable Energy:** the production of clean, renewable energy from natural sources like...

Goal	Description	Capital Cost	Design Fee
✔		$$ - $$$	$ - $$

Benefits:

- Energy efficiency
- Reduce energy costs
- Reduce carbon footprint
- Incentives

Implementation:

- Photovoltaic system
- Geothermal
- Wind turbines
- Battery energy storage

f. **Low Carbon Structural Systems:** the integration of lower carbon structural systems and materials.

Goal	Description	Capital Cost	Design Fee
✔		$ - $$$	$ - $$$

Benefits:

- Reduce embodied carbon content
- Potential for enhanced material performance
- Potential for lower labor costs

Implementation:

- Cement reduction
- Integrate wood framing
- Design optimization and efficiency at conventionally framed areas
- Specifications
- Review Environmental Product Declarations (EPDs)
- Reduce building footprint

OCCUPANT DESIGN

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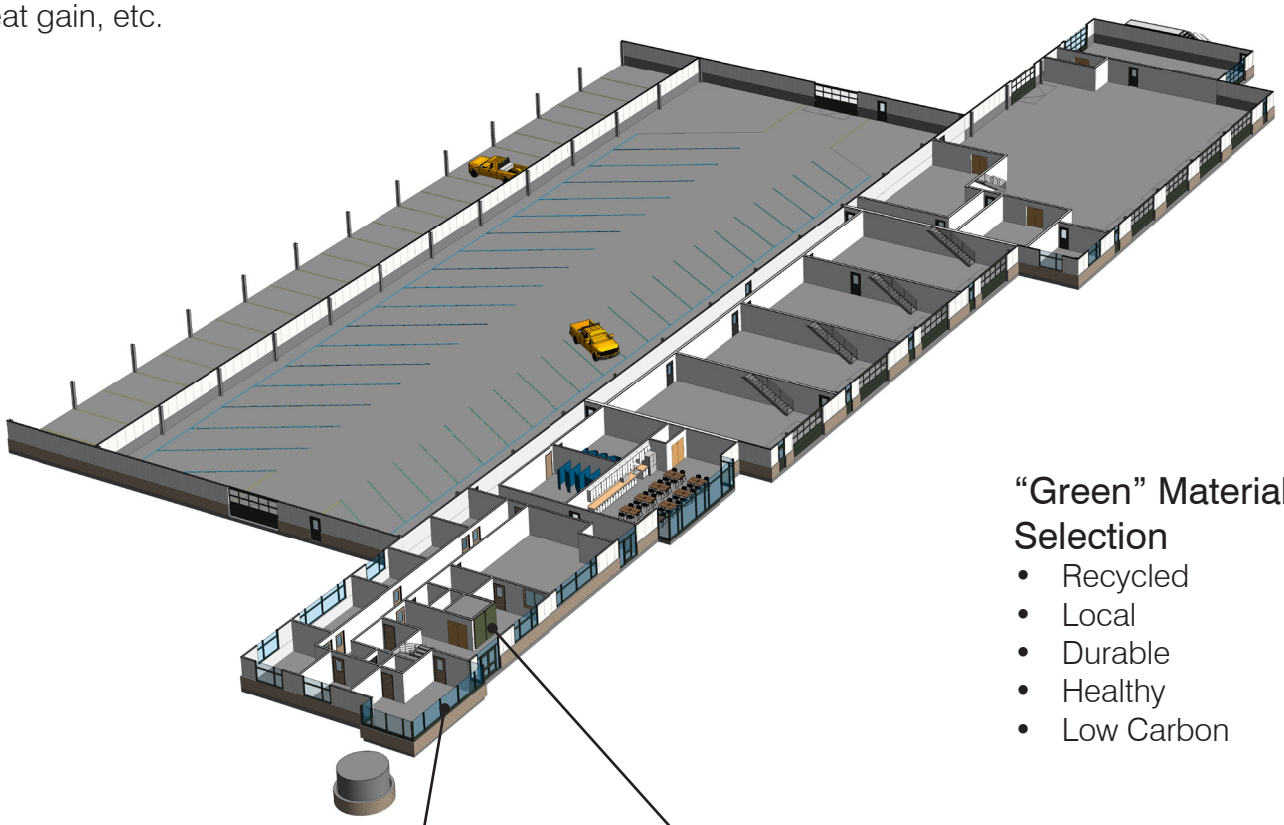
Building Systems Design

- HVAC
- Electric
- Plumbing

* Passive design strategies for daylighting, ventilation, solar heat gain, etc.

Building Fixtures / Product Selection

- Energy Efficiency
- Water Conservation



"Green" Material Selection

- Recycled
- Local
- Durable
- Healthy
- Low Carbon

3. OCCUPANT SCALE DESIGN CONSIDERATIONS

a. **"Green" Material Selection:** sourcing non-toxic, natural, low carbon, and sustainable materials that support a healthy relationship between buildings, occupants and surroundings.

Goal	Description	Capital Cost	Design Fee
✔		$ - $$	$ - $$

Benefits:

- Conserves resources
- Support local businesses & circular economic thinking
- Minimize maintenance and replacement needs
- Improve employee retention / performance
- Reduce carbon footprint
- Indoor environmental quality

Implementation:

- Source recycled
- Source local
- Select durability
- Select healthy
- Review EPDs
- Life Cycle Assessment

Life Cycle Stages		
PRODUCT	A1	Extraction, Production
	A2	Transport
	A3	Manufacturing
CONSTRUCTION	A4	Transport
	A5	Construction, Installation
USE	B1	Use
	B2	Maintenance
	B3	Repair
	B4	Replacement
	B5	Refurbishment
	B6	Energy Use
	B7	Water Use
END OF LIFE	C1	Demolition
	C2	Transport
	C3	Processing
	C4	Disposal

b. **Product / Fixture Selection:** optimizing energy and water use.

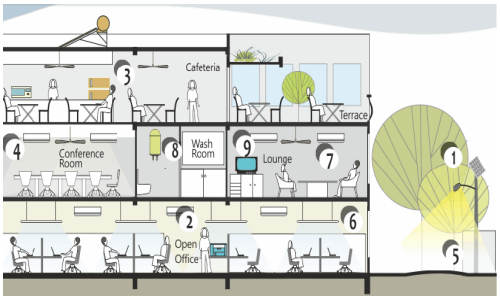
Goal	Description	Capital Cost	Design Fee
✔		N/A	N/A

Benefits:

- Reduce energy loads
- Reduce energy costs
- Reduce water consumption
- Reduce water costs

Implementation:

- Energy efficient appliances
- Low-flow/dual flush fixtures



c. **Building System Design:** optimizing operational loads.

Goal	Description	Capital Cost	Design Fee
✔	Specialized Energy Code requirements.	$ - $$	$ - $$

Benefits:

- Reduce operational loads
- Reduce operational costs
- Reduce carbon footprint
- Incentives

Implementation:

- Electrical system design
- Mechanical system design
- Plumbing system design

OVERVIEW

1. Site Scale Design Consideration
    a. Green Infrastructure
        Image Source: Stormwater Elements, National Association of City Transportation Officials, accessed 27 June 2022, https://nacto.org/publication/urban-street-stormwater-guide/stormwater-elements/
        Resource: https://www.epa.gov/green-infrastructure/what-green-infrastructure
        Resource: https://www.massaudubon.org/content/download/19237/272597/file/LID-fact-sheet-3-lid-techniques_revised.pdf
    b. Vegetative Shading
        Image Source: Val Aiken, Shading, Carbon Neutral Design Project, AIA, Society of Building Science Educators, accessed 27 June 2022, https://www.tboake.com/carbon-aia/strategies1b.html
        Resource: http://www.2030palette.org/vegetative-cooling/
    c. Electric Vehicle (EV) Charging Stations
        Image Source: Weston & Sampson
    d. Public Amenities
        Image Source: Sand and Salt Available Free to Residents February 2018, Photo of Residential Salt/Sand Bin, Norwell DPW, accessed 1 August 2022, https://norwelldpw.com/sand-salt-for-residents
        Image Source: Handi-Hut, Photo of Bike Shelter, accessed 28 June 2022, https://www.handi-hut.com/products/bike-shelters/
2. Building Scale Design Considerations
    a. Orientation & Form
        Image Source: Passive Solar Heating & Cooling Manual, Floor Plan Diagram, Arizona Solar Center, access 27 June 2022, https://azsolarcenter.org/passive-solar-heating-cooling-manual-part-2-of-4
    b. Building Envelope Design & Climate-based Facade
        Image Source: Della Donahue June 2022, Perspective Section Diagram, Weston & Sampson
        Image Source: Val Aiken, Shading, Carbon Neutral Design Project, AIA, Society of Building Science Educators, accessed 27 June 2022, https://www.tboake.com/carbon-aia/strategies1b.html
        Resource: http://www.2030palette.org/building-facades/
        Resource: https://www.wbdg.org/guides-specifications/building-envelope-design-guide
    c. Cool Roof
        Image Source: Understanding the Solar Reflectance Index July 2022, Cool Roof Rating Council, accessed 1 August 2022, https://coolroofs.org/documents/CRRC-SRI-Document_2022-07-12.pdf?
        Resource: http://www.2030palette.org/cool-roof/
    d. Water Catchment & Storage System
        Image Source: Water-Efficient Technology Opportunity: Rainwater Harvesting Systems, The Office of Energy Efficiency & Renewable Energy, accessed 27 June 2022 https://www.energy.gov/eere/femp/water-efficient-technology-opportunity-rainwater-harvesting-systems
        Resource: http://www.2030palette.org/water-catchment-and-storage/
    e. On-site Renewable Energy
        Image Source: Weston & Sampson
    f. Low Carbon Structural Systems
        Image Source: https://newenergyworks.com/glulams

3. Occupant Scale Design Considerations

a. "Green" Material Selection

Image Source: Life Cycle Assessment and Buildings, Building Life Cycle Stages (adapted from ISO 21931 and EN 15978), https://sftool.gov/plan/403/life-cycle-assessment-buildings

Resource: living-future.org/lbc/red-list/

b. Product / Fixture Selection

Image Source: Efficient Appliances, Knowledge Centre, Net Zero Energy Buildings, accessed 12 July 2022, https://nzebnew.pivotaldesign.biz/knowledge-centre/efficient-appliances/

Resource: www.energystar.gov/products/products_list

c. Building System Design

Image Source: Weston & Sampson