Overview:

This project will consist of a solid waste transfer facility totaling approximately 19300 square feet. The buildings will consist of a Pre-engineered Metal Building (PEMB) approximately 175 feet in length by 100 feet in width with an eave height of 35 feet (175ft X 100ft X 35ft), and a two-story support building with a first floor office and second floor mezzanine area measuring approximately 30 feet in width by 30 feet in length with an eave height of 30ft (30ft X 30ft X 30ft). There will be a drive/under thru cantilevered canopy attached to the PEMB on the west side of the PEMB approximately 58 feet in length by 25 feet in width with an eave height of 27 feet (58ft X 25ft X 27ft). (Preliminary PEMB and Support Building floor plans are attached)

Structural Narrative

General:

The facility shall be classified as an Occupancy Category II, and designed for loading prescribed by the IBC and ASCE-7. All structural system sizes, quantities, types, etc. indicated in the following sections are for estimating and bidding purposes only. The design of all structural systems shall be delegated to the Contractor’s engineer who shall be licensed to practice in the Commonwealth of Virginia. Final building details, doors, equipment locations, push walls, bollards, canopies, and similar requirements shall be coordinated with the Owner and incorporated into the final design.

The Structural systems design will incorporate the requirements of the following building codes and guidelines:

- 2012 Virginia Uniform Statewide Building Code
  Including the all adopted codes and standards, some of which are shown below.
- 2012 ICC International Building Code
- ASCE/SEI 7-10
- AISC Steel Construction Manual, 14th Edition

A subsurface geotechnical investigation was completed and a report issued by Froehling & Roberson, INC. dated July 22, 2016 (See attached report). The recommendations provided in this report shall be used to design the foundation systems for the buildings.

Pre-Engineered Metal Building: (See preliminary floor plan)

The PEMB shall utilize clear span frames with no interior columns. The foundations shall bear 3 feet minimum below finish grade, and shall consist of 8 feet square by 16-inch-thick reinforced concrete spread footings at frame columns, and a continuous 3-foot-wide wall footing to support foundation walls. Foundation walls shall be 12-inch-thick reinforced concrete walls.

The floor slab shall be a 10-inch-thick reinforced concrete slab. The tipping floor shall include a two-inch thick hardened floor topping equal to L&M Emerytop 400 (or approved equal), and shall be installed per manufacturer’s direction. The hardened floor topping shall only be required in the area denoted on the building layout sketch. 8-foot-high reinforced concrete push walls will be required where indicated, and
shall be designed for the bucket break out force of a Cat 924 Loader times a 1.2 impact load multiplier. A metal wall liner panel shall be installed on top of the 4' concrete wall, and extend up 4'. The 8' push wall will not have a metal wall liner panel.

The PEMB roof construction will have an R-30 value, with a metal wall liner panel installed to protect this insulation on the roof.

**Canopy:** (See preliminary floor plan)

There will be a cantilevered drive/under thru canopy attached to the west side of the PEMB approximately 58 feet in length by 25 feet in width with an eave height of 27 feet (58ft X 25ft X 27ft). This must be a cantilevered canopy as supports are not allowed in the drive aisle. (See attached plans)

**Roll-up Doors:**

This facility will require five (5) industrial grade roll-up doors with electrical operators. (See preliminary floor plan for locations)

1. 14FT X 14FT Roll-up Doors
2. 10 FT X 10 FT Roll-up Doors
3. 24 FT X 24 FT Roll-up Doors

**Dock:**

All loading dock door thresholds shall have a continuous solid compression block. This is to prevent any solid waste material from existing the bottom of the door.

**Support Building:** (See preliminary floor plans)

The support building will be structurally separate from PEMB, and shall be constructed with 8-inch concrete masonry unit (CMU) load bearing walls, reinforced with #5 bars at 32 inches on center. The wall will be supported on 4-foot-wide 12 in thick continuous reinforced concrete footings. The building's first floor will be slab-on-grade consisting of 4-inch thick cast-in-place concrete. The slab will be placed on a 15-mil vapor barrier over 6” of compactable crushed aggregate. The slab will be reinforced with #4 bars at 16 inches on center each way in the middle of the slab. Control joints will be cut by an early entry dry-cutting system equal to "Soff-Cut" such that:

1. Each area bounded by control joints does not exceed 324 sf.
2. The distance between control joints does not exceed 18 feet in either direction.
3. The ratio of length to width of any area bounded by control joints does not exceed 2 to 1.

The building's second floor will consist of 4 inches of concrete on 0.6C (9/16 inch) 22-gauge steel floor deck, supported by 20K5 steel joists at 3 feet (maximum) on center.

The roof structure for the support building will consist of 1.5 inch 20-gauge steel deck on a 20K6 steel joists at 6 feet on center.

The lateral force resisting system for the support building will consist of reinforced masonry bearing walls.
Miscellaneous structural bracing and deck edge angle will be required.

**Structural Specification Items:**

**Concrete:**
Install concrete work in conformance with the requirements of the American Concrete Institute Standard ACI-318 (current edition). Provide concrete conforming to the following:

- Minimum 28-day compressive strength:
  - Footings: 3,000 psi
  - Walls: 4,000 psi
  - Slabs on grade: 4,000 psi
  - Walks: 4,000 psi
- Air entrainment: 4 to 6 % (Exterior Concrete only)
- Bar Reinforcing Steel: Grade 60
- Welded Wire Reinforcing: ASTM A185

**Structural Steel:**
Provide structural steel conforming to the requirements of the American Institute of Steel Construction (AISC) specification (current edition) and conforming to the following:

- W-Shapes: ASTM A992, Grade-50
- Channels and Angles: ASTM A36 or ASTM A572, Grade-50
- Plates and Bars: ASTM A36 or A572, grade-50
- Steel Tubing (HSS): ASTM A500, Grade B
- Steel Pipe: ASTM A53, E or S, Grade B
- Round HSS: ASTM A500, Grade B
- Structural Bolts: ASTM A325
- Anchor Rods: ASTM F1554, Grade 36/55, Weld-ability Supplement S1
- Anchor Bolts: ASTM F1554, Grade 36 L-bolts
- Shear Studs: ASTM A108 & AWS D1.1 - 7.3.1 Type-B

Provide shop priming for interior steel beams and for steel surfaces scheduled to receive High Performance Coatings or for structure located outside of the conditioned building envelope. Provide surface preparation SSPC-SP3 Power Tool Cleaning unless indicated otherwise for high performance coatings.

**Steel Joists:**

**Steel Deck:**
Provide steel deck design, fabrication, and erection in conformance with the specifications of the Steel Deck Institute (SDI) and the American Iron and Steel Institute (AISI).

**Design Loads:**

- Live Loads:
  - Roof: 30 psf
First Floor 100 psf
Elevated Floors 100 psf
Elevated Corridors 80 psf
Partition Allowance 15 psf (unreduced)

Snow Loads:
Ground Snow Load 42.5 psf

Wind Loads:
Design Wind Speed (Ultimate) 115 MPH

Special Inspections:
Special Inspections will be required per Chapter 17 of the International Building Code. Special inspectors shall be employed by the Owner. The Contractor shall coordinate the inspections during construction.

MECHANICAL NARRATIVE - prepared by Valley Engineering:

Overview:
The project will consist of a solid waste transfer facility approximately 19300 square feet.

The project will consist of a single-story solid waste transfer building, which will have approximately 17,500 square feet (GSF) and an attached two-story support building which will have approximately 900 square feet (GSF) office on the first floor and an equipment mezzanine on the second floor.

Mechanical systems for the Solid Waste Transfer Facility are described in the following section of this schematic narrative.

The MEP systems design will incorporate the requirements of the following building codes and guidelines:

- 2012 Virginia Uniform Statewide Building Code
- 2012 ICC International Building Code
- 2012 ICC International Mechanical Code
- 2012 ICC International Plumbing Code
- 2012 ICC International Energy Conservation Code
- 2012 ICC International Fire Code
- 2011 National Electrical Code NFPA 70
- 2010 National Fire Alarm Code NFPA 72
- ASHRAE Standard 62.1-2010: Ventilation for Acceptable Indoor Air Quality
- Applicable State and Local Ordinances

Heating Ventilating and Air Conditioning Systems:
The HVAC design shall provide a slight positive pressurization of the building to prevent infiltration of unconditioned outdoor air.

The wall construction will have a R-19 value and the roof construction will have a R-30 value.

The heating, ventilating and air conditioning systems shall be designed to produce the desired space temperature, humidity, pressurization, and air quality conditions while employing the following design criteria.

### Weather Conditions:

<table>
<thead>
<tr>
<th>Site Location</th>
<th>Harrisonburg, Virginia</th>
</tr>
</thead>
<tbody>
<tr>
<td>1325 ft. Elev.</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Climatic Location</th>
<th>Roanoke, Virginia</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Season</th>
<th>Dry Bulb Temperature¹</th>
<th>Wet Bulb Temperature¹</th>
</tr>
</thead>
<tbody>
<tr>
<td>Summer</td>
<td>91°F</td>
<td>74°F</td>
</tr>
<tr>
<td>Winter</td>
<td>16°F</td>
<td></td>
</tr>
</tbody>
</table>

¹ Source: ASHRAE 2013 Fundamentals 99.0% Design Condition

<table>
<thead>
<tr>
<th>Wind Speed</th>
<th>17.9 mph wind³</th>
</tr>
</thead>
</table>

³ Source: ASHRAE 2013 Fundamentals 1.0% Design Condition

### Building Operating Schedule

The facility is expected to operate twelve (12) hours per day, five days a week.

### Internal Heat Gains

Lighting loads will be based on the design standards defined hereinafter and the minimum requirements of ASHRAE/IESNA 90.1 2010.

a. Office Lighting – 1.5 Watts per square foot minimum or as required by lighting design.
b. General Lighting – 2.0 Watts per square foot minimum or as required by lighting design.
c. General Equipment – 0.5 Watts per square foot or as determined by specific equipment in each room

The proposed material handling area is not conditioned. Ventilation will be provided with sidewall propeller exhaust fans and intake louvers on opposite walls.

The proposed office area HVAC to be supplied a 2.5-ton heat pump system with auxiliary electric heat coil. Exterior condenser unit and indoor A-Coil with blower. Supply duct shall be galvanized steel; 2-inch
pressure class. Ductwork trunk shall be sized to accommodate future capacity for the second floor and a blanked off future connection point shall be provided.

Low pressure ductwork shall convey air to ceiling diffusers.

Ceiling diffusers shall be aluminum construction. Supply registers shall be aluminum construction, double deflection type. Return and exhaust grilles shall be aluminum construction with a perforated face.

Return ductwork shall be low pressure galvanized steel. A return plenum shall be utilized; however, ducted transfers will be required at each room to allow airflow into central corridor plenums.

Exhaust ductwork shall be low pressure galvanized steel.

All supply ductwork shall be externally wrapped with 2.2” thick fiberglass blanket insulation with aluminum skin vapor barrier facing and 0.27 K factor. Exhaust ductwork shall be un-insulated except for 5’ of duct from the roof deck and the 5’ section of insulated duct shall match the return duct insulation specifications.

Toilets and janitors’ closets shall be exhausted to the outdoors through a ducted central exhaust system. Electrical rooms shall be provided with conditioned air to offset heat gains from electrical equipment.

Condensate Piping:
Condensate piping at Rooftop Units shall be Type L hard copper. Fittings shall be copper solder joint fittings, 150 pound ANSI B16.22-73. Joints shall be solder, ASTM B32-78 tin-antimony 95-5.

ELECTRICAL NARRATIVE - prepared by Valley Engineering:

Overview:

The project will consist of a single-story solid waste transfer building, which will have approximately 17,500 square feet (GSF) and an attached two-story office building which will have approximately 900 square feet (GSF) per floor.

Electrical systems for the Solid Waste Transfer Facility are described in the following section of this schematic narrative. The narrative accounts for the base electrical systems of the Shell and Core of the building.

The design of the electrical systems for this building shall comply with the building codes and guidelines listed below:

- 2012 ICC International Building Code
- 2012 ICC International Energy Conservation Code
- 2012 ICC International Fire Code
Main Service:
A new 600A, 480/277V, 3-phase, 4-wire service will be installed on the mezzanine located above the office inside the space. The new service will be fed underground from the power company transformer to the power company service equipment located on the exterior of the building. A single building meter will be provided on the exterior of the building located next to the power company service equipment.

Normal Power Distribution:
A new 600A, 480/277V, 3-phase, 4-wire, service entrance rated, main circuit breaker “MDP” panel will be located on the mezzanine. This panel shall have a short-circuit rating of 65 KAIC. This panel will provide power to a 45 kVA 480 to 208/120V, 3-phase, 4 wire step down transformer and also serve as the power panel for all 480/277V circuit requirements. The mezzanine 208/120V power panel “M-1” (150 amperes, 3-phase, 4-wire) shall be fed by the 45Kva transformer. The first floor office power panel “P-1”, will be fed by the mezzanine power panel “M-1.”

Typical receptacle and tele/data outlet placement:

Typical office
Minimum of four duplex receptacles; one on each wall (coordinate exact locations and quantity with owner)
Two telephone/data outlets; on two different walls

Corridor
Minimum of one duplex receptacle

Restroom(s)
One duplex GFCI receptacle adjacent to each vanity/sink above counter height

Tipping Floor/Bale Staging Area
Duplex GFCI receptacles are to be located above the 4 Foot concrete wall so a 50’ cord can reach from anywhere along that 4 Foot wall perimeter
No receptacles are to be located around the “Push Wall” perimeter (See Floor Plan)

Exterior at building entrances
At least one duplex GFCI receptacle located at each entrance

Lighting Fixtures:
Occupancy sensors shall be used in rooms for lighting controls. Occupancy sensors shall not be used in janitor’s closets, equipment rooms, or any other area critical to employee safety.

Lighting Fixtures Selections:
2’x4’ Recessed Direct
   Office/Meeting Room/Corridor/Kitchenette/Restroom
   Recessed LED
   Direct/Indirect

4’ Industrial Strip
   Electrical/Mechanical Mezzanine
   Pendant/Surface Fluorescent or LED
   Wire Guard

Exit
   Emergency Egress Paths
   Surface Mounted
   Single or Double Faced
   High Impact Thermoplastic
   RED LED
   Battery Backup

4’ Wall Direct/Indirect
   Stairwells
   Surface LED
   33% Perforated
   Battery Backup for Stairwells

Wall Packs
   Building Exterior
   Surface LED
   Neutral White Color Temperature (4000K)

High Bay LED Pendant
   Tipping Floor
   Hook and Cord mounted from structure
   LED IP rated to withstand moisture, dust, and chemical contact
   Provide fixture quantity and layout to provide approximately 30 foot-candles average at
   30” above finished floor

Design Criteria:

Types of Conduit Systems:
Definitions
   EMT: Electrical metallic tubing.
   FMC: Flexible metal conduit.
   IMC: Intermediate metal conduit.
   LFMC: Liquid tight flexible metal conduit.
   RNC: Rigid nonmetallic conduit.

Conduit Systems:
1. Indoors
   a. Exposed: EMT.
   b. Exposed and Subject to Sever Damage: Rigid Steel.
   c. Concealed: EMT.
   d. Connection to Vibrating Equipment: FMC, except LFMC in damp or wet locations.
   e. Damp or Wet Locations: IMC.
2. Outdoors
   a. Exposed: Rigid Steel.
   b. Concealed Aboveground: IMC.
   c. Underground: RNC Schedule 40-PVC.
   d. Connection to Vibrating Equipment: LFMC

Conductor Systems:
1. Conductors and Cables
   a. Conductors: Copper.
   b. Conductor Insulation: Types THHN-THWN.
2. Conductor and Insulation Application
   a. Exposed Feeders: Type THHN-THWN, single conductors in raceway.
   b. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-THWN, single conductors in raceway.
   c. Feeders Concealed in Concrete, below Slabs-On-Grade, and underground: Type THHN-THWN, single conductors in raceway.
   d. Exposed Branch Circuits, Including in Crawlspace: Type THHN-THWN, single conductors in raceway.
   e. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.
   f. Branch Circuits Concealed in Concrete, below Slabs-On-Grade, and underground: Type THHN-THWN, single conductors in raceway.
   g. Class 1 & 2 Control Circuits: Type THHN-THWN, in raceway.

Standards of Design:
1. Voltage Drop: Conductors for branch circuits are sized to prevent a voltage drop exceeding 3 percent at the farthest outlet of power, heating, and lighting loads, or combination of such loads, and where the maximum total voltage drop on both feeders and branch circuits to the farthest outlet does not exceed 5 percent.
2. Receptacles shall be 20A specification grade.
3. All wiring devices connected to an emergency circuit shall be factory finished red in color and all wiring devices connected to a normal circuit shall be factory finished ivory in color.
4. Device cover plates shall be brushed stainless steel and engraved with the panel name and circuit number.
5. Minimum conduit size shall be 3/4”.
6. Minimum wire size shall be #12AWG.
7. All branch circuits shall be provided with dedicated neutrals.
8. All new power distribution equipment shall match the base building distribution equipment manufacturer.

Grounding:
1. An equipment grounding conductor sized in accordance with the NEC shall be installed with all feeders and branch circuits.
2. A grounding electrode conductor shall be provided at all separately derived systems and as required by the linear accelerator equipment manufacturer.
3. A 3/4”x10’ copper-clad ground rod shall be installed at each new column for the building addition. Connect ground rods to building steel. The new addition shall be connected to the existing building main grounding system.

Fire Alarm System:

Fire Alarm system not required pursuant to the 2012 Virginia Construction Code, Section(s) 907.2.2 and 907.2.4

Cable Television System, Security System, Telecommunication/Data Systems:

Except as noted below, these systems will be furnished and installed by the Owner or the Owner’s vendors. The electrical contractor’s scope of work for these systems includes: telephone, data network, security, cable TV, and satellite TV. The electrical contractor will install back-boxes and 3/4” conduit stub-ups to the nearest accessible corridor ceiling space for these systems along with cable supports above corridor ceilings and sleeves through walls to deck. The Contractor will also provide back-boxes and conduits for architecturally specified low voltage systems such as access control (keypads and magnetic locks) and power operated doors (push plates).

Wiring Methods:

Types of Conduit Systems:

Definitions
- EMT: Electrical metallic tubing.
- FMC: Flexible metal conduit.
- IMC: Intermediate metal conduit.
- LFMC: Liquid-tight flexible metal conduit.
- RNC: Rigid nonmetallic conduit.

Outdoors
- Exposed: Rigid Steel.
- Concealed Aboveground: IMC.
- Underground: RNC EPC-40-PVC.
- Connection to Vibrating Equipment: LFMC

Indoors
- Exposed: EMT.
- Exposed and Subject to Sever Damage: Rigid Steel.
- Concealed: EMT.
- Connection to Vibrating Equipment: FMC, except LFMC in damp or wet locations.
- Damp or Wet Locations: IMC.

Types of Conductor Systems:

Conductors and Cables
- Conductors: Copper.
- Conductor Insulation: Types THHN-THWN.
- Multi-conductor Cable: Metal-clad cable, Type MC with ground wire.
Conductor and Insulation Application

Service Entrance: Type THHN-THWN, single conductors in raceway.
Exposed Feeders: Type THHN-THWN, single conductors in raceway.
Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspace: Type THHN-THWN, single conductors in raceway.
Feeders Concealed in Concrete, below Slabs-On-Grade, and underground: Type THHN-THWN, single conductors in raceway.
Exposed Branch Circuits, Including in Crawlspace: Type THHN-THWN, single conductors in raceway.
Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.
Branch Circuits Concealed in Concrete, below Slabs-On-Grade, and underground: Type THHN-THWN, single conductors in raceway.
Class 1 & 2 Control Circuits: Type THHN-THWN, in raceway.

Generator:
At this point in time a generator will not be required.

Lightning protection system:
A lightning protection system (optional) shall be provided for the building. The system, if provided, shall comply with both UL and NFPA.

PLUMBING NARRATIVE - prepared by Valley Engineering:

Overview:
The project will consist of a single-story solid waste transfer building, which will have approximately 17,500 square feet (GSF) and an attached two-story support building which will have approximately a 900 square feet (GSF) office on the first floor and mezzanine on the second floor.

Plumbing systems for the Solid Waste Transfer Facility are described in the following section of this schematic narrative.

The design of plumbing systems for this building shall comply with the building codes and guidelines listed below:

- 2012 ICC International Building Code
- 2012 ICC International Mechanical Code
- 2012 ICC International Plumbing Code
- 2012 ICC International Fire Code
- 2012 Virginia Uniform Statewide Building Code

Plumbing Systems:
The following site utilities shall be provided to the new addition:
1. 6” Sanitary (PEMB)
2. 4” Sanitary (Support Bldg.)
3. 2” Domestic Cold Water
4. 6” Sprinkler System Main
Sanitary:
1. PVC DWV above and below grade.
2. PEMB: Connect trench drains (4” each) to 6” sanitary to oil interceptor noted on civil plans.
3. PEMB Provide 6” main with 4” branch connections to floor sinks with removable sediment baskets evenly spaced throughout the tipping floor (50 max between drains). Drain 6” sanitary to oil interceptor noted on civil plans.

Storm Drainage:
1. The PEMB will be served by gutter and downspout continuous along the exterior. Gutters shall have multiple short sections of downspout, turning down and into the building just below the eave, for connection to gravity storm mains along both sides of the building. Provide downspout boots/transition fittings as required for complete operable system. Provide watertight seal where downspout/piping transitions into the building. Gravity lines (anticipated height 30’ or higher) will drain toward the support building, tie together and turn down into the top of the 12,000 gallon storage tank shown on Civil plans. Provide two first flush filters, one in each corner for the wall adjoining the PEMB and support building. Pipe overflow discharge from first flush filters to the exterior, 24” above grade. See Civil plans for coordination and additional information on rainwater harvesting system.
2. Support Bldg.: Individually piped primary and secondary drainage systems (4” Max) are required. Include roof drains, overflow drains, overflow scuppers, and piping. Primary drain shall be piped in the second floor ceiling to the exterior and turn down into the top of the 12,000 gallon storage tank shown on Civil plans. See Civil plans for coordination and additional information on rainwater harvesting system.
4. Support Bldg.: Secondary storm (overflow) drainage piping will be provided independent multiple leaders running through the building addition and discharging to grade. (Discharge approximately 24” AFG.)
5. PVC DWV above and below grade.

Domestic Cold Water:
1. Copper Pipe, Type L hard throughout. Fittings shall be copper solder joint fittings, 150 pound ANSI B16.22-73. Joints shall be lead free solder, ASTM B32-78 tin-antimony 95-5.
2. Backflow prevention – dual 2” Reduced Pressure Zone backflow preventers shall be provided at service entrance.
3. Ball valves, lead free bronze with stainless trim, extended handles where required for insulation thickness.
   a. Full port throughout.
4. Insulation – ½” heavy density fiberglass pipe insulation with SSL vapor barrier jacket throughout.
5. Recessed nickel bronze wall hydrants every 100’ along the building exterior.
6. All piping, valves, backflow preventers, and accessories shall comply with the 2011 Reduction of Lead in Drinking Water Act

Domestic Hot Water:
1. Copper Pipe, Type L throughout with cast copper fittings. Solder joints.
2. Ball valves, lead free bronze with stainless trim, extended handles where required for insulation thickness.
a. Full port throughout.
3. Insulation – 1” heavy density fiberglass pipe insulation with SSL vapor barrier jacket throughout.
4. 60-gallon electric water heater.
   a. One (1) ASSE 1070 compliant master mixing valve.
5. All piping, valves, backflow preventers, and accessories shall comply with the 2011 Reduction of Lead in Drinking Water Act

Wall Hydrants and Hose Bibbs:
1. Support Bldg.: One (1) ¾” key operated wall hydrant located on the face of the building every 100 feet.
2. Isolation ball valve for each wall hydrant.
3. PEMB: Post/Yard hydrants mounted approximately 3’ above floor, every 75 feet along building interior, with crushed stone drainage basin.
   a. Provide 1” DCW main below frost depth around PEMB perimeter, with above grade shutoff valve, servicing yard hydrants. This system shall be fed from the rainwater harvesting system.
   b. Provide ASSE 1013 rated backflow preventer for any supplemental makeup water required for the rainwater harvesting system. See Civil plans for coordination and additional information on rainwater harvesting system.
   c. Provide bollards at each hydrant location for protection from equipment and other damage.
   d. Drainage basin shall be below slab. Finished slab shall be sealed continuous for waterproof operation. Provide underslab drainage as required.

Plumbing Fixtures
1. Plumbing fixtures will be provided where indicated on the architectural drawings. Fixture trim will be consistent with the intended use.
   b. Vitreous China Wall Mount lavatories, commercial solid brass faucets (Single Toilets).
   c. Stainless Steel Sinks (double and single bowl), commercial solid brass faucets, (Break Rooms, Work Areas).
   d. Concrete/marble janitors closet sinks with stainless steel trim, commercial solid brass faucet with bucket hook, mop hangers, hose, hose hanger.
2. Public lavatories and sinks require tempered water and shall be provided with a below deck mixing valve.

FIRE PROTECTION NARRATIVE - prepared by Valley Engineering:

Overview:

The project will consist of a single-story solid waste transfer building, which will have approximately 17,500 square feet (GSF) and an attached two-story office building which will have approximately 900 square feet (GSF) per floor.

Fire protection systems for the Solid Waste Transfer Facility are described in the following section of this schematic narrative.
The design of fire protection systems for this building shall comply with the building codes and guidelines listed below:

- 2012 Virginia Uniform Statewide Building Code
- 2010 Standard for the Installation of Sprinkler Systems NFPA 13
- 2011 National Electrical Code NFPA 70
- 2007 National Fire Alarm Code NFPA 72
- 2002 Standard for the Installation of Air-Conditioning and Ventilating Systems NFPA 90A

**Building Hazard Classification:**
Group B/F-1 Business/Factory (Moderate Hazard) Occupancy Group

**Sprinkler System Criteria:**
1. A 6” fire protection main shall be provided for the facility.
2. Sprinkler piping and sprinkler heads shall be provided according to the following criteria:
   a. Protection area shall not exceed 225 sf per head per Chapter 5 of NFPA 13.
   b. PEMB: Protection area shall not exceed 120 sf per head per Chapter 5 of NFPA 13.

**Standpipe Criteria:**
Not required.

**Sprinkler Design Densities:**
1. Light hazard - 0.10 gallons per minute (GPM) per SF over the hydraulically most remote 1,500 SF.
   a. For areas such as exam rooms, office areas, public areas, corridors, lobbies, and public elevator lobbies
2. Ordinary hazard Group II - 0.20 GPM per SF over the hydraulically most remote 3,000 SF.
   a. For areas such as storage rooms, mechanical rooms, electrical switchgear, and transfer rooms.
   b. For the PEMB in its entirety.

**HVAC Systems:**
1. Smoke detectors in HVAC systems shall be installed and controlled as required in Chapter 4 of NFPA 90A.

**Incoming Fire Service:**
1. A 6” sprinkler main shall be provided for the facility.
2. Vertical RPDA backflow preventer at service entrance.
3. Remote post mounted Fire Department Connection for alternate supply to PEMB and support building.

**Standpipe:**
Standpipe risers are not required for this project.

**Sprinkler:**
1. Support Bldg.: Fully sprinkled wet sprinkler system.
2. Designed and installed according to NFPA 13.
3. Sprinkler Heads
   a. Fully recessed sprinklers shall be provided in all hard ceiling areas.
   b. Semi-recessed sprinklers will be provided in all suspended acoustical tile areas.
   c. Upright brass pendants will be provided in mechanical areas, and areas without ceilings.
4. PEMB: Dry pipe system according to NFPA 13:
   a. Provide 3 HP air compressor for pressure maintenance and system recharging.
   b. Upright brass pendants will be provided in warehouse areas, and areas without ceilings.
5. Materials:
   a. Wet pipe: Standard-Weight, Black-Steel Pipe: ASTM A 53/A 53M, Type E, Grade B. 2” threaded ends for piping 2” NPS or less.
   b. Wet pipe: Standard-Weight, Black-Steel Pipe: ASTM A 53/A 53M, Type E, Grade B. Cut or rolled grooved ends for piping 2-1/2” NPS or larger.
   c. Dry pipe: Standard-Weight, Galvanized-Steel Pipe: ASTM A 53/A 53M, Type E, Grade B. 2” threaded ends for piping 2” NPS or less.
   d. Dry pipe: Standard-Weight, Galvanized-Steel Pipe: ASTM A 53/A 53M, Type E, Grade B. Cut or rolled grooved ends for piping 2-1/2” NPS or larger.

FIRE ALARM SYSTEMS NARRATIVE - prepared by Valley Engineering:

Overview:

Building Hazard Classification:
Occupancy Group: B Business/Factory (Moderate Hazard)

Fire Alarm System Overview:

Fire Alarm system not required pursuant to the 2012 Virginia Construction Code, Section(s) 907.2.2 and 907.2.4.