ATTACHMENT C
PROCESS INF0RMATION

Table of Contents

Page C-

1. Process Information 1

1.1 CONTAINER STORAGE 1
1.1.1 Room 102 1
1.1.2 Room 103 2
1.1.3 Room 105 2
1.1.4 Room 106 2
1.1.5 Room 120 2
1.1.6 Room 121 2
1.1.7 Room 124 3
1.1.8 Exterior Storage Area 126 3
1.1.9 Exterior Canopy Area 127 3
1.1.10 Processing Area 122 3
1.1.11 Pack/Depack Consolidation/Repack Area 3
1.1.12 Processing Area 123 4
1.1.13 Loading Dock 100 4
1.1.14 Railcar loading/unloading Area 4
1.1.15 Aisle Spacing 4
1.1.16 Specific Requirements for Container Storage 5
[40 CFR 264.175(b)(5)] 6
1.2 TANK STORAGE 7
1.2.1 Flammable and Combustible Liquids 7
1.2.2 Corrosive Liquids 7
1.2.3 Stabilization Tanks 7
1.3 TANK SPECIFICATIONS 7
1.3.1 Flammable and Combustible Liquid Storage Tanks 7
1.3.2 Corrosive Liquid Storage Tanks 7
1.3.3 Stabilization Tanks 7
1.4 DESIGN AND INSTALLATION OF NEW TANK SYSTEMS 8
1.4.1 Corrosion Protection 8
1.4.2 Tank Containment Systems 8
1.4.3 Prevention of spills and overflows 8
1.4.4 Tank Assessment and Certification 9
1.5 TREATMENT ACTIVITIES 9
1.5.1 Fuel Blending 9
1.5.2 Stabilization 9

2. Other Related Waste Management Activities 1

2.1 WASTE CONSOLIDATION 1
2.2 TEN-DAY TRANSFER FACILITY 2
2.3 TRUCK-TO-TRUCK TANSFERS 2
2.4 TRANSIENT WASTE SHIPMENTS 2
2.5 BULK LOADING/UNLOADING AREA 3

List of Exhibits

Exhibit C-1	P&IDs for Depack Area
Exhibit C-2	P&ID for Railcar Unloading
Exhibit C-3	PFD & PID for Flammable Liquid/Fuel Blending Storage Tanks
Exhibit C-4	PI&Ds for Corrosive Liquid Storage Tanks
Exhibit C-5	PFD & PID for Stabilization

List of Appendices

Appendix C-A	Epoxy Floor Coating Technical Data
Appendix C-B	Architectural Drawings- Waste Management and Processing Building
Appendix C-C	Containment Calculations
Appendix C-D	Conceptual Process Design

1. Process Information

The hazardous waste management, treatment, and processing activities/units that require permitting under RCRA will include, waste storage in containers, waste storage in tanks, fuel blending in tanks, waste stabilization in tanks, and chemical oxidation in tanks. Storage of hazardous waste will be limited to less than one year. The waste management and processing building is approximately 50,000 square feet in size. Section 3 describes the units and activities that require RCRA permitting.

1.1 CONTAINER STORAGE

The waste management and processing building includes six, separate indoor, hazardous waste container storage areas, one exterior, canopied, compressed gas storage area, two interior processing areas, five interior pack/depack areas, one exterior canopied area used for waste processing and storage of roll-off bins, and one area used for waste stabilization. The six interior storage areas (rooms) and one exterior storage area are designed to segregate different waste types and incompatible wastes that are stored in the building. The entire concrete floor of the building is underlain with a high density polyethylene (HDPE) liner and the floor is sealed with an epoxy coating that is impenetrable by the hazardous wastes that are stored in the various rooms. The specifications for this sealant are provided in **Appendix C-A**.

The maximum indoor container storage capacity is the equivalent of 3,152 fifty-five gallon drums. However, containers that are stored at the Facility consist of a variety of new, recycled, or reconditioned containers authorized by the federal Department of Transportation (DOT) and include DOT-specification, DOT-approved and/or DOT-exempted containers. Containers may be constructed of metal, polypropylene, fiberboard, or other materials as allowed by DOT. Typical container sizes range from one gallon in capacity to Intermodal Bulk Containers (IBCs) up to 330 gallons in capacity and which are compatible with wastes they are holding. In addition, cubic yard boxes holding solid waste are periodically stored at the Facility.

The outdoor, canopy-covered, storage area for waste flammable gases is located at the facility at the northwest corner of the building. Cylinders may be contained in outer packaging such as drums, boxes, pails, etc. Cylinders that are not contained in outer packaging are nested using walls as support, nested and supported by other cylinders containing compatible gases, chained to support structures, or otherwise secured in a manner in conformance with industry standards.

Roll offs and dump trailers are periodically staged next to the stabilization tanks and under the outside canopy. Loaded, covered roll-offs and empty roll-offs are also be staged in the open yard. Architectural drawings for the hazardous waste building are provided as **Appendix C-B.**

1.1.1 Room 102

Room 102 is 3,240 square feet in size and is designed for the storage of flammable and combustible liquids and solids, excluding Class 1A flammable solids. The storage capacity of Room 102 is designed to store 13,200 gallons of flammable and combustible solids, and 18,480 gallons of flammable and combustible liquids. The cumulative total is 31,680 gallons. The storage capacity is based on 55-gallon drum equivalents. Solid hazardous wastes are stored in two piles for a total of 240 drums. Liquid

hazardous waste are stored in 21 racks, 16 drums per rack for a total of 336 drums. The cumulative storage capacity is 576 drums.

1.1.2 Room 103

Room 103 is 3,240 square feet in size and is designed for the storage of toxic and highly toxic liquids and solids. The storage capacity of Room 103 is designed to store the equivalent of 39,600 gallons. The storage capacity is based on a container size of 55-gallons stored on 4' X 4' pallets (4 drums to a pallet). Pallets are not double stacked. Wastes are stored in ten rows with 72 drums row. The cumulative 55-gallon container storage capacity is 720 drums.

1.1.3 Room 105

Room 105 is 4,320 square feet in size and is designed for the storage of corrosive liquids and solids. The storage capacity of Room 105 is designed to store the equivalent of 55,440 gallons. The storage capacity is based on a container size of 55-gallons stored on 4' X 4' pallets (4 drums to a pallet) and double-stacked a maximum of two pallets high. Wastes are stored in 14 rows and 18 pallets per double-stacked rows for a total of 1,008 drums.

1.1.4 Room 106

Room 106 is 1,080 square feet in size and is designed for the storage of oxidizers and organic peroxides, excluding Class 1 oxidizers. The storage capacity of Room 106 is designed to store the equivalent of 39.6 tons. The storage capacity is based on 55-gallon drums stored on 4' X 4' pallet (4 drums to a pallet) and double-stacked a maximum of two pallets high. Wastes are stored in two rows and 18 pallets per double-stacked row for a total of 144 drums for an equivalent of 7,920 gallons. The storage weight of 39.6 tons is based on 55 gallons per drum X 10 pounds per gallon.

1.1.5 Room 120

Room 120 is 756 square feet in size and is designed for the storage of pyrophoric liquids and solids. The storage capacity of Room 120 is designed to store the equivalent of approximately 353 cubic feet of pyrophoric wastes. The storage capacity is based on 55-gallon drums stored on 4' X 4' pallet (4 drums to a pallet). Drums are not double stacked. Wastes are stored in two rows and 6 pallets per row for a total of 48 drums. 353 cubic feet (13.1 cubic yards) of waste is based on 55 gallons per drum X 7.35 cubic feet per drum.

1.1.6 Room 121

Room 121 is 501 square feet in size and is designed for the storage of water reactive wastes. The storage capacity of Room 121 is designed to store the equivalent of approximately 470 cubic feet of water reactive wastes. The storage capacity is based on 55-gallon drums stored on 4' X 4' pallet (4 drums to a pallet) and double-stacked a maximum of two pallets high. Wastes are stored in two rows and 8 pallets per double-stacked row for a total of 64 drums. The design capacity of 470 cubic feet of waste is based on 55 gallons per drum X 7.35 cubic feet per drum.

1.1.7 Room 124

Room 124 is 3,402 square feet in size and is designed for the storage of all classes of flammable and combustible liquids and solids. The storage capacity of Room 124 is designed to store the equivalent of 32,560 gallons. The storage capacity is based on 55-gallon drums stored in 37 racks with 16 drums per rack for a total of 592 drums.

1.1.8 Exterior Storage Area 126

Exterior Storage Area 126 is 82 square feet in size and will be used for the storage of waste compressed gases. The area is designed with segregated storage spaces. Containers are segregated based on the primary hazards of flammable, pyrophoric, oxidizer, and toxic. Non-flammable and inert gases are also be stored in Area 126. All sizes of cylinders are stored in this area; however, the storage capacity is based on 75 cylinders with a capacity of 200 cubic feet each for a cumulative total 15,000 cubic feet (425 cubic meters).

1.1.9 Exterior Canopy Area 127

Exterior Canopy Area 127 is approximately 10,154 square feet in size and is used for waste processing and the storage of roll-off bins. A maximum of six, 40 cubic yard roll-off bins are stored in this area.

1.1.10 Processing Area 122

Interior processing area 122 is approximately 11,257 square feet in size and is used for staging and sampling containers, as well as transferring waste from container to container.

1.1.11 Pack/Depack Consolidation/Repack Area

The Depack, Consolidation/Repack area consists of five bays. Four of these bays are approximately 10 square feet in size each, for a total of 400 square feet. The fifth bay is approximately 144 square feet in size. The cumulative square footage of bays is 544 square feet.

These bays function like walk-in fume hoods, with air pulled from the building into the bay, through the working area of the bay, and out the hood vent to a scrubber. The contaminated air enters the bottom of the scrubber and flows upward. Scrubbing liquid is pumped to the top of the scrubber and flows downward through packing that maximizes the air/liquid contact. The liquid falls into a reservoir at the bottom of the scrubber which feeds the recirculation pump. The scrubbing liquid in each scrubber is selected to provide the maximum removal of the expected chemicals handled in that bay. The scrubbed air is either pulled directly through the fan or, if final polishing is required, through a carbon canister first. The carbon canister serves to remove contaminants down to a very low level by adsorption. The purified air leaving the fan is routed to a vent stack to the atmosphere.

One bay will be dedicated to handling acid chemicals, one bay to base chemicals, and the other three bays to organics and/or toxic chemicals. The design air flow for each bay fan will depend on the open face area of the bay as well as airflow design guidelines. Typical designs call for face velocities of 120 scfm/ft2, so for a 10 ft. x 10 ft. opening, a fan capable of 12,000 scfm is required. The fan head selected

will depend on the scrubber dimensions, if a carbon bed is installed, and whether the bay can be closed to create a negative pressure.

The scrubber and canister is constructed of fiber reinforced plastic (FRP) for maximum corrosion resistance. The scrubber has a reservoir to contain the scrubbing liquid, a recirculation pump, a makeup water line, and a purge line to a wastewater tank. The bays handling organic chemicals have dual carbon canisters in a lead/lag configuration to ensure breakthrough of hazardous contaminants does not occur. Finally, there is a vent stack to allow safe dispersion of the scrubbed air.

Special additives have been tailored to each scrubber reservoir to maximize the effectiveness of the scrubbing liquid. These include additives to handle H2S, hydrocarbons, ammonia, chlorine, acids, amines, SO2, mercaptans, DMDS, vinyl acetate, sewage odors, formaldehyde, phenol, and others. Carbon adsorption is particularly effective for removing chemicals such as: amines, acrylates, hydrocarbons, H2S, cyclohexane, EDC, isopropyl alcohol, naphtha, phenol, phosgene, and others.

Process and Instrumentation Diagrams (P&IDs) for these areas are included as **Exhibit C-1**.

1.1.12 Processing Area 123

Interior processing area 123 is approximately 7,707 square feet in size and is used for staging and sampling containers, as well as transferring waste from container to container.

1.1.13 Loading Dock 100

Loading Dock 100 is a five bay dock primarily used for loading/unloading of containers by the use of forklifts, pumps, bobcats, hand drum carts, pallet jacks, or other mechanical means. Hazardous wastes are “staged” in Dock 100 during the time between arrival and acceptance into the Facility or shipment from the Facility. There is a maximum of five trailers at any one time at the docks with an approximate maximum of 92, 55-gallon drums or drum equivalents (e.g., a 300-gallon IBC equals 6 X 55 gallons of capacity), or 5 bulk tank trucks with a maximum capacity of 5,200 gallons each. Aisle spacing is required while the containers are in the trailers during staging or during loading/unloading operations. The southernmost bay in Loading Dock 100 is periodically used as a 10-day transfer area.

1.1.14 Railcar loading/unloading Area

The railcar loading/unloading area is located north of the storage and treatment building at the rail spur on the north side of the site. Railcars are located on the rail spur, and tank trucks are either near the rail spur or in one of the containment areas adjacent to the tank farm. Liquids are bulked using pumps, hoses, and vacuum pumps, which are attended at all times when in service. Containers of hazardous waste are also loaded onto railcars for rail shipments at this location. No incompatibles are staged in the area at the same time. The design capacity of railcar Loading/unloading areas is four 30,000-gallon railcars. **Exhibit C-2** provides a P&ID for Railcar loading/unloading.

1.1.15 Aisle Spacing

[40 CFR 264.35]

Aisle spacing in each room varies based on the types of waste and size of the containers being stored; however, adequate aisle spacing is maintained in every room for the unobstructed movement of

personnel, fire protection equipment, spill control equipment, and decontamination equipment. Specific aisle spacing for each room is depicted in **Appendix C-B**.

1.1.16 Specific Requirements for Container Storage

[40 CFR 270.15]

1.1.16.1 Containment Systems

Each area of the waste management and processing building has its own dedicated containment system consisting of a concrete floor underlain with a HDPE liner and coated with a chemically resistant sealant and a containment curb that surrounds the perimeter of each storage room. The pathways between areas are also constructed with ramps to mitigate releases from migrating to an adjoining room.

Loading Dock 100 is approximately 65.58 feet wide by 105 feet long. The dock is recessed and sloped toward the waste management and process building. A blind catch basin is located at the low point of the dock to collect liquids from leaks and spills.

The containment system for the railcar loading/unloading area is 18 feet wide by 320 feet long by 10.5 inches deep to provide a containment capacity of 31,016 gallons which is sufficient to contain the total quantity released from a railcar with a 30,000 gallon capacity. A concrete loading/unloading apron 330' X 30' associated with the railcar loading and unloading is designed to catch spills and direct them toward the secondary containment.

1.1.16.2 Capacity of the Containment Systems

The containment systems for each of the indoor storage rooms have sufficient capacity to contain 10 percent of the maximum volume of liquid waste stored on each pad or the volume of the largest container, whichever is greater. Since the storage rooms are located indoors, containment capacity for run-on is not required.

The containment capacity of the railcar loading/unloading area is the entire volume of a single railcar (30,000 gallons) plus sufficient excess capacity to contain any run-on that might enter the railcar loading/unloading area containment system.

Containment calculations for the container storage rooms and the railcar containment system are provided in **Appendix C-C**.

1.1.16.3 Mitigating Contact with Rainwater and Spills

The indoor storage rooms are fully enclosed and roofed to protect the containers from contact with rainwater. Waste containers are stored on pallets to protect them from spill and releases. Further, the floors in each storage room are epoxy-coated to prevent the vertical migration of spilled materials.

The compressed gas cylinder area has been designed to include a canopy and continuous curbing to mitigate the potential for storm water run-on. However, a containment system for this storage area is not required because no free liquids are present **(40 CFR 270.15(b)**.

Bulk tankers stored in Loading Dock 100 are elevated and do not come in contact with spills or stormwater run on. Other containers are stored on containment pallets to protect them from spills and stormwater run on.

Railcars located at the railcar loading/unloading area are elevated and do not come in contact with spills or stormwater run on.

1.1.16.4 Removal of Accumulated Liquids from the Containment Systems
[40 CFR 264.175(b)(5)]

40 CFR 264.175(b)(5) requires that spilled or leaked waste and accumulated precipitation must be removed from the sump or collection area in as timely a manner as is necessary to prevent overflow of the collection system.

Appropriate response actions to clean up spills are implemented as soon as possible upon discovery of a spill or release. Precipitation which may inadvertently accumulate in the containment systems is removed within one operating day.

Liquid spills are absorbed using absorbent materials, which is transferred to an appropriate container and disposed of as hazardous waste. In some circumstances, larger spills are cleaned up using squeegees, wet/dry vacuums, and/or vacuum trucks. Precipitation is also be removed using similar methods.

1.1.16.5 Management of Ignitable and Reactive Wastes
[40 CFR 264.176]

All container storage units in which ignitable and reactive waste are stored are located greater than 50 feet from the property boundaries. Smoking is only be permitted in designated smoking areas. All hot work (e.g., welding, brazing) requires approval by the facility health & safety manager and is only be permitted upon issuance of a facility-issued hot work permit. Electrical work also requires approval by the facility health & safety manager and must be completed in accordance with the facility's lockout/tag out procedures.

1.1.16.6 Management of Incompatible Wastes

Incompatible wastes and materials are not placed into the same container, or in an unwashed container that previously held an incompatible waste or material. Analyses performed pursuant to the facility's waste analysis plan, knowledge of the waste, supplemental analyses, and compatibility information from chemical literature is reviewed as necessary prior to consolidating waste streams into the same container.

1.1.16.7 Air Emissions Control Equipment

Each container holding hazardous waste remains closed unless it is necessary to add or remove waste from the containers. The waste management and processing building has been designed with an air emissions control system. Air emissions standards are discussed is **Attachment I.**

1.2 TANK STORAGE

A total of 14 tanks are used at the facility for storage which are described below. Several of these tanks also be used to carry out the various treatment activities described in **Section 1.5**.

1.2.1 Flammable and Combustible Liquids

One, an outdoor tank farm is located on the north side of the waste management and processing building. The tank farm contains eight, 19,644-gallon, vertical, aboveground tanks that are used for the storage of flammable and combustible liquid wastes. These tanks are also used for fuel blending as described in **Section 1.5.1**.

1.2.2 Corrosive Liquids

One, outdoor tank farm is located on the east side of the building at its northeast corner. This tank farm contains two, 20,000-gallon tanks for the storage of corrosive wastes (one for acid and one for caustic).

1.2.3 Stabilization Tanks

Two, 80-cubic yard tanks are located in Bulk Loading Area 107 inside the building. These tanks are used for the microencapsulation of wastes to meet applicable land disposal restrictions in 40 CFR part 268 and for the neutralization of non-liquid wastes with high or low pH. Stabilized wastes are shipped to a permitted hazardous waste landfill for final disposal. The tanks are used for bulking of wastes for offsite treatment such as macroencapsulation.

1.3 TANK SPECIFICATIONS

1.3.1 Flammable and Combustible Liquid Storage Tanks

The eight flammable liquid storage tanks are vertical tanks with 19,466 gallons in capacity each. The tanks are constructed of coated carbon steel with dome/cone heads and flat bottoms. The tanks are equipped with mixers to facilitate fuel blending. The tanks will be operated at a 95% design capacity of 18,481 gallons each. A P&ID for the flammable liquid/fuel blending tanks is provided as **Exhibit C-3.**

1.3.2 Corrosive Liquid Storage Tanks

The two corrosive waste storage tanks are vertical tanks with 20,000 gallons in capacity each with dome/cone head and flat bottoms. The material for construction for the caustic tank is coated carbon steel. The material for construction for the acid tank is fiberglass reinforced plastic. The tanks will be operated at an 95% design capacity of 19,000 gallons each. **Exhibit C-4** provides P&IDs for the corrosive liquid storage tanks.

1.3.3 Stabilization Tanks

The two stabilization tanks are 80-cubic yard, below grade concrete tanks lined with ¾ inch carbon steel. Each tank is equipped with a sump to visually monitor for leaks from the steel containment.

1.4 DESIGN AND INSTALLATION OF NEW TANK SYSTEMS

[40 CFR 270.16/40 CFR 264.192]

The storage and treatment tanks have been designed and installed in compliance with the applicable sections of 40 CFR 270.16 & 40 CFR 264.192.

1.4.1 Corrosion Protection

[40 CFR 270.16(e)/40 CFR 264.192(f)]

Materials of construction for the storage and treatment tanks are compatible with the waste that is treated and stored. These includes coated carbon steel for storage and fuel blending of flammable and combustible wastes. Material of construction for the caustic storage tank is coated carbon steel and materials of construction for the acid storage tank is fiberglass reinforced plastic. The carbon steel tanks are also be painted in a light color to protect the steel from rusting and mitigate the deleterious effect of exposure to the sun.

1.4.2 Tank Containment Systems

[40 CFR 270.16(g)/40 CFR 264.193]

The containment systems for the two exterior tanks farms consists of concrete slab floors with continuous containment walls that surround the perimeters of the tank farms. The containment system is epoxy-coated to mitigate the vertical migration of spill and releases.

The containment system for the eight storage/fuel blending tanks has been designed and constructed to contain the entire volume of the largest tank (19,466 gallons) plus the precipitation from a 25-year, 24-hour rainfall event.

The containment system for the two 20,000 gallon corrosive waste storage tanks and two 12,500 gallon neutralization tanks has been designed and constructed to contain the entire volume of the largest tank (20,000 gallons) plus the precipitation from a 25-year, 24-hour rainfall event.

The design of the stabilization tanks essentially serve as double walled tanks. Each double-walled tank is capable of containing its entire 80-cubic yard volume. The tanks are located inside the hazardous waste management and processing building and are protected from run-on.

1.4.3 Prevention of spills and overflows

[40 CFR 270.16(i)/40 CFR 264.194)]

The tank systems will include check valves and/or dry disconnect couplings where appropriate for spill prevention control, high level alarms and high/high level alarms tied back to the loading pumps for automated shutdown of the pumping activities as overfill protection.

1.4.4 Tank Assessment and Certification

[40 CFR 270.16(a)/ 40 CFR 264.192(g)]

An independent engineer's report certifying the design and installation of the storage and treatment tanks attesting to the containment capacities of the tank containment systems will be submitted to ADEQ after installation of the tank systems has been completed.

1.5 TREATMENT ACTIVITIES

Treatment activities that are conducted at the facility are discussed in the following sections.

1.5.1 Fuel Blending

Fuel blending consists of combining compatible hazardous wastes having appropriate organic content to create a fuel that can be used to fire high-heat furnaces. The blending process is necessary to ensure that the BTU content, halogens, metals, and moisture meet the stipulated fuel specifications of the facility that will use the hazardous waste fuel.

Waste profiles for incoming wastes are carefully reviewed for EPA waste codes, composition, moisture content and BTU values. Wastes that qualify for fuel blending are limited to compatible EPA waste codes and consist of wastes with appropriate organic content. Generally, wastes accepted from several different sources are combined together to create larger batches of fuel. A process flow diagram (PFD) and process and instrumentation diagram (P&ID) for the fuel blending process are provided as **Exhibit C-3**. The eight storage tanks identified in **Section 1.2.1** will be used for fuel blending activities.

Liquid materials of various BTU value are received at the site via tank trucks or rail. The BTU value of the incoming material determines the blending tank into which the waste material pumped. Each fuel blending tank has a capacity of 19,644 gallons and is equipped with high level and high, high level controls which automatically shut down the pumps when activated. The tanks are manifolded together to allow transfer between blending tanks. Each tank is equipped with an agitator to facilitate the homogenous blending of the fuel.

Each blend tank is vented to the atmosphere. Each tank also vents to a vapor recovery system that routes vapors produced during loading/unloading activities back to the vessel of origin such that working losses resulting from loading/unloading operations are captured and contained.

The incoming product consists of any material with a suitable BTU value that will make it a candidate to be burned in a cement kiln. Blended product is loaded into tank trucks or rail cars for transfer to a cement kiln to augment their kiln fuels.

A P&ID for the flammable liquid/fuel blending tanks is provided as **Exhibit C-3.**

1.5.2 Stabilization

Stabilization is a process that results in the reduction of the mobility (or leachability) of hazardous components within a hazardous waste matrix. Stabilization is accomplished by inducing a chemical

reaction between the hazardous components and one or more reagents, such as cement, cement kiln dust, lime, fly ash or other pozzolanic materials.

Typical materials to be stabilized are inorganic wastewater treatment sludges (WWT), media with metals, contaminated soils, sand blast grit, incinerator ash, incinerator slag, emissions control dust and debris. These waste streams are chemically compatible and have no reactive properties.

Waste Profiles are carefully reviewed for EPA codes, components, and types of metals present to determine the stabilization recipe (type and quantity of reagents). Generally, bulk loads are processed as individual batches. Drummed or other small quantities of waste and bulk loads that have similar characteristics, non-conflicting EPA waste codes and the same stabilization recipe may be combined to increase the batch size for processing.

Wastewater from equipment wash down, corrosive wastewaters that have been neutralized onsite, or compatible hazardous and non-hazardous waste that have been received by the Facility may be used as the water source in the recipe. Alternatively, city water or non-hazardous site waters may be used to avoid code conflict.

Wastes such as inorganic wastewater treatment sludges (WWT), media with metals, contaminated soils, sand blast grit, incinerator ash, incinerator slag, emissions control dust, and debris are stabilized and/or neutralized with one or more reagents. Some of the reagents that are used are cement, cement kiln dust, lime, fly ash, and other pozzolanic materials. Wastewater from equipment wash down, corrosive wastewaters that have been neutralized onsite, or compatible hazardous and non-hazardous waste that have been received by the Facility may be used as the water source in the stabilization/neutralization recipe. Alternatively, city water or non-hazardous site waters may be used to avoid code conflict.

Wastes are dumped into one of two 80 cubic yard tanks (301 or 302), located inside Bulk Loading Area, Room 107. The wastes are dumped into the tanks primarily using dump trucks, and reagents are added primarily from supersacks with the help of an excavator. Other methods of addition for both may be employed. Water is added if required by the recipe and then the excavator that is stationed in between the 2 tanks mixes the components together.

The dumping and mixing of the wastes and reagents creates a dusty atmosphere inside the room. The incoming waste can also contain <500 ppm VOC by weight which can volatilize during processing. The Facility ensures that none of these contaminants escapes the room when doors open to allow people or vehicles inside. TO accomplish this, the room is maintained at a negative pressure with the use of an air handling system. The air handling system is not designed to ensure that chemicals are below threshold limits or to provide worker comfort. For personnel protection, workers will wear PPE and work inside the climate-controlled cabs of the heavy equipment.

Canopy-style hoods, HD-0301 and HD-0302, with poly curtains on three sides are located 20 ft above the two tanks to provide local ventilation of the stabilization area where the dust concentration is the highest. The canopy-style hoods with 3-enclosed sides have 24,000 cfm each for a total normal flow of 48,000 cfm to achieve a 100 fpm capture velocity.

To achieve a negative pressure in the room, control louvers in the building wall modulate the makeup air coming into the room. The louvers are sized to provide a 5% flow difference from the exhaust or 48,000

cfm x 0.95 = 45,600 cfm. According to the ACGIH Industrial Ventilation Manual, a good performance standard for the negative pressure differential is 0.04 +/- 0.02" wg. Room pressure gauges are installed for monitoring and for alarming upon high pressure. Based on the US EPA's Procedure T – Criteria for and Verification of a Permanent or Temporary Enclosure, the average facial velocity of air through all natural draft openings must be at least 200 fpm. Based on the exhaust flow rate, the sizes of the rollup doors, and the estimated louver free area, a maximum of one roll up door is opened at a time in order to maintain the 200 fpm requirement.

The air from the room is conveyed from the hoods through duct work to the F-0301 Dust Collector located outside the east wall of the room. The duct work is sized to ensure a velocity of 4000 fpm to prevent dust settling. The dust collector consists of multiple fabric filters contained within a housing that removes fine particulate matter from the exhaust air. The air flows from the outside of the bag-shaped filter to the inside of the filter and out the top. Particulate is deposited on the outside of the filter forming a dust cake. The filters are periodically cleaned with a brief pulse-jet of high pressure air that dislodges the cake and allows it to drop in the supersack or drum below the dust collector. Pulse-jet cleaning can be completed while the dust collector is in operation.

Typical air-to-cloth ratios or filtration velocities for cement, fly ash, lime, and similar materials range from 2.5 to 9 ft/min. The size of the dust collector is 32' long x 11' wide x 35' tall and has been designed based on an average filtration velocity of 5 ft/min, a required area of 11,000 ft2, with a 20% safety factor (48000 cfm x 120% = 57,600 cfm / 5 ft/min = 11,520 ft2). The efficiency of the dust collector ranges from 99 to 99.9%.

From the dust collector, the air is conveyed to the AD-0301 Carbon Adsorber system where VOC is removed.

From the carbon adsorber system, the air is conveyed through the blower and out to atmosphere. The blower has been sized to provide a flow of 57,600 cfm at a static pressure of TBD" wg, which accounts for a pressure drop in the hoods, ductwork, dust collector, and carbon beds.

The waste material to be stabilized arrives at the Facility in dump trailers, roll-off boxes, drums, pneumatic trailers, and other types of containers. The waste can be wet, sticky, cohesive, dusty and could contain rock, concrete, rags, wire, or other debris. A PFD and P&ID for the stabilization process are included as **Exhibit C-5**. The storage tanks identified in **Section 1.2.3** will be used for stabilization of wastes.

2. Other Related Waste Management Activities

Other related hazardous waste management activities that will be performed at the Facility for which a RCRA permit is not required are identified below.

Residuals generated in and removed from the evaporation unit will be properly characterized and managed as appropriate.

2.1 WASTE CONSOLIDATION

Consolidation (or "bulking") is a process performed to transfer wastes from several small containers (Depacking) to a single larger container or tank (Consolidation). Examples include:

- Transferring containers from one container to another without removing the waste from the container. An example of this is the transfer of aerosol cans from a 5-gallon bucket to a 55-gallon drum, moving a liquid in a lab pack into a larger lab pack, or transferring one-gallon cans of paint into a larger receptacle.
- Transferring the contents of small containers into a large container by pouring the liquids into the large container. The process consists of opening of the smaller receptacle and transferring the contents into a larger container. An example of this is the transfer of one-gallon containers of flammable liquids into a 55-gallon drum.
- Transferring the contents of containers typically 55-gallons or greater in volume into a tanker trailer or railcar or storage tank. This process involves the transfer of the materials by pumping from the smaller container into the larger container.

Consolidation operations will include the consolidation and/or bulking of both liquid hazardous waste and solid hazardous waste into DOT-approved containers. These containers will include, but will not be limited to portable tanks, intermodal bulk containers (i.e., totes), drums, various sized cubic yard boxes, tanker trucks, roll-off boxes, dump trailers, and rail cars (tankers and gondolas).

Consolidation (bulking) of wastes containing no free liquids will be conducted in:

- Bulk Loading Area 107;
- Bulk Storage Area 127;
- Interior Processing Area 122;
- Interior Processing Area 123;
- Hoods 115 through 119; and,
- The railcar loading/unloading area.

Consolidation of liquid wastes and wastes containing free liquids will be conducted in:

- Tanks 1 through 8 in Tank Farm No. 128;
- Tanks 9 and 10 in Tank Farm No. 125;

- Pump stations for fuel blending; and
- The railcar loading/unloading area.

Prior to performing consolidation of wastes, the facility will verify compatibility by conducting a real-time evaluation of the materials being consolidated as described in the Waste Analysis Plan depending on the type of consolidation being performed. The consolidation process is further described in **Section 1.6** of **Attachment D** - Waste Storage, Processing and Tracking Plan.

2.2 TEN-DAY TRANSFER FACILITY

During the normal course of transportation, the Facility may occasionally need to hold containerized wastes that are accepted from generators or other transporters temporarily without moving the containers into the permitted storage units. In this capacity, the Facility is designated as the hazardous waste transporter on the manifest, but not the designated treatment/storage/disposal facility.

As such, the Facility will be acting as a 10-day transfer facility, which is defined as any transportation-related facility. The designated 10-day transfer areas at the Facility include the southernmost bay in Loading Dock 100 and the 20 truck trailer parking spots located on the west side of the facility. These areas are limited to waste shipments where the Facility is only listed as the transporter on the accompanying manifest and not the designated TSDF.

2.3 TRUCK-TO-TRUCK TANSFERS

In connection with the Facility's 10-day transfer activities, it may be necessary to conduct truck-to-truck transfers of hazardous waste containers between two vehicles in a designated truck transfer area at the Facility. Truck-to-truck transfers are sometimes economically necessary to establish a full load of containers destined for the same designated treatment/storage/disposal facility.

Containers will be transferred directly from one vehicle to another. The materials involved in such transfers are shipments of hazardous waste which are manifested to a designated facility other than the Facility, and which does not show the Facility as the generator in Section 5 of the hazardous waste manifest or shipping document.

2.4 TRANSIENT WASTE SHIPMENTS

Transient Waste Shipments are hazardous wastes, typically consisting of soils or liquids, which will be delivered to the Facility in dump trailers, roll offs, or cargo tanks. With these shipments, the Facility is the designated TSDF, but the load will be shipped out to a final off-site disposal facility without the waste being removed from the vehicle while at the Facility.

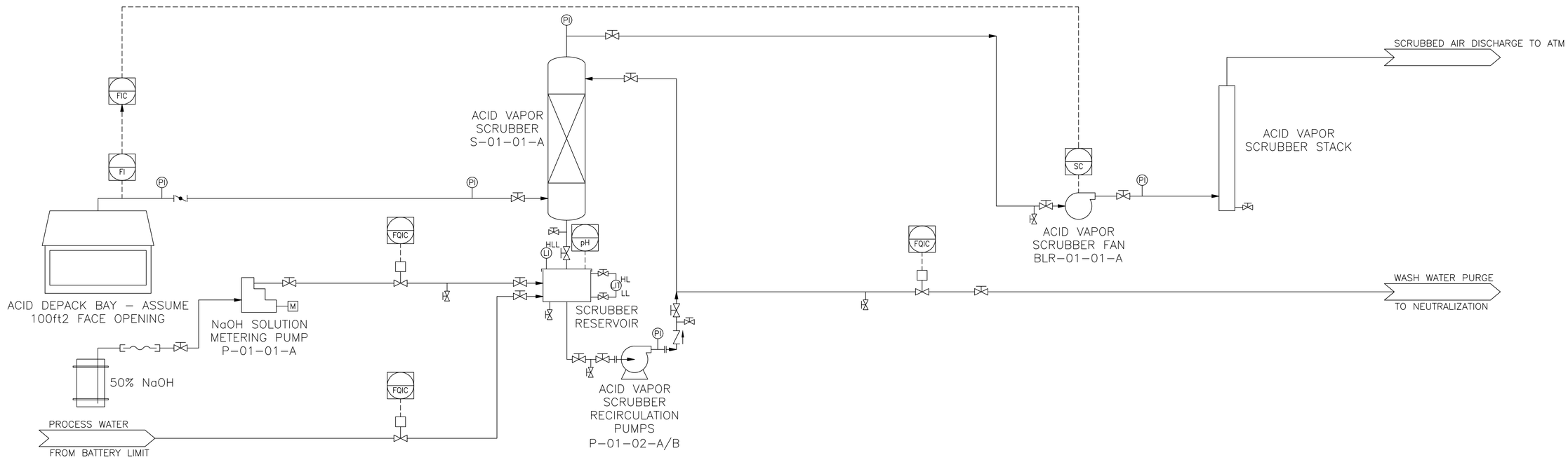
In some cases, containerized hazardous wastes in storage at the Facility will be combined with Transient Waste Shipments with compatible chemical and physical properties in order to make the shipment and disposal of wastes stored at the Facility more cost-effective.

In both scenarios, a new manifest is created identifying the Facility as the generator.

2.5 BULK LOADING/UNLOADING AREA

The bulk loading/unloading area (tanker truck and rail car) is located north of the storage and treatment building at the western end of the rail spur on the north side of the site. Liquid bulking is conducted by transfer via pipe bridge from the north tank farm. Railcars are located on the rail spur, and tank trucks are either near the rail spur or in one of the containment areas adjacent to the tank farm. Liquids are bulked using pumps, hoses, and vacuum pumps, which are attended at all times when in service. Containers of hazardous waste may be loaded onto railcars for rail shipments at this location. The procedures described in Section 8 of the Waste Analysis plan are followed to ensure that no incompatibles are staged in the area at the same time.

Exhibit C-1
Process & Instrumentation Diagrams for Depack Area



CONCEPTUAL DESIGN ONLY – NOT FOR CONSTRUCTION

REV	DATE	PROJECT NO.	DRWN	CHKD	ENGR	REVISION DESCRIPTION
A0	7/27/22	TRE-220301-CC	RAK	MJ	AEF	NEW DRAWIING – ISSUED FOR REGULATORY REVIEW

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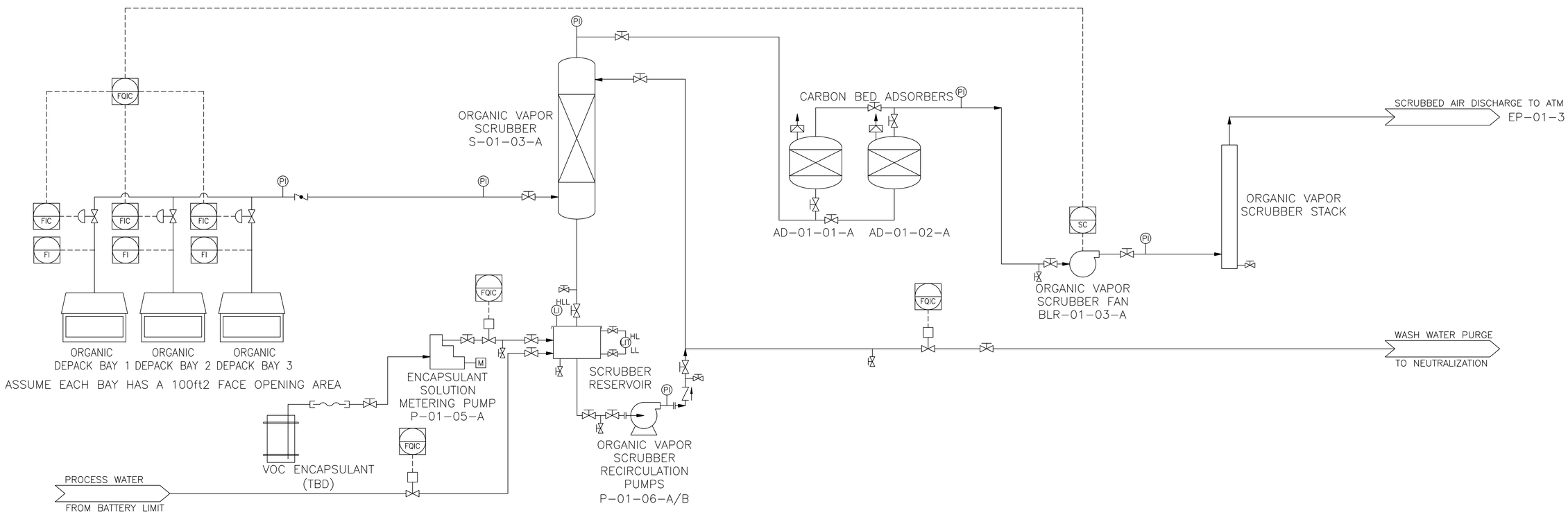
TRIUMVIRATE ENVIRONMENTAL

Drawing Title:
CASA GRANDE
ACID DEPACK BAY SCRUBBER SYSTEM
CONCEPTUAL PIPING & INSTRUMENTATION DIAGRAM

Drawn By: RAK	Checked By: MJ	App'd By: AEF
Date: 06/07/22	Date: 06/08/22	Date: 06/08/22
Scale: NONE	Drawing Number: P&ID -01-001	Revision: 0
Sheet 01 of 01		



CONCEPTUAL DESIGN ONLY – NOT FOR CONSTRUCTION

REV	DATE	PROJECT NO.	DRWN	CHKD	ENGR	REVISION DESCRIPTION
0	7/27/22	TRE-220301-CC	RAK	MJ	AEF	NEW DRAWIING – ISSUED FOR REGULATORY REVIEW

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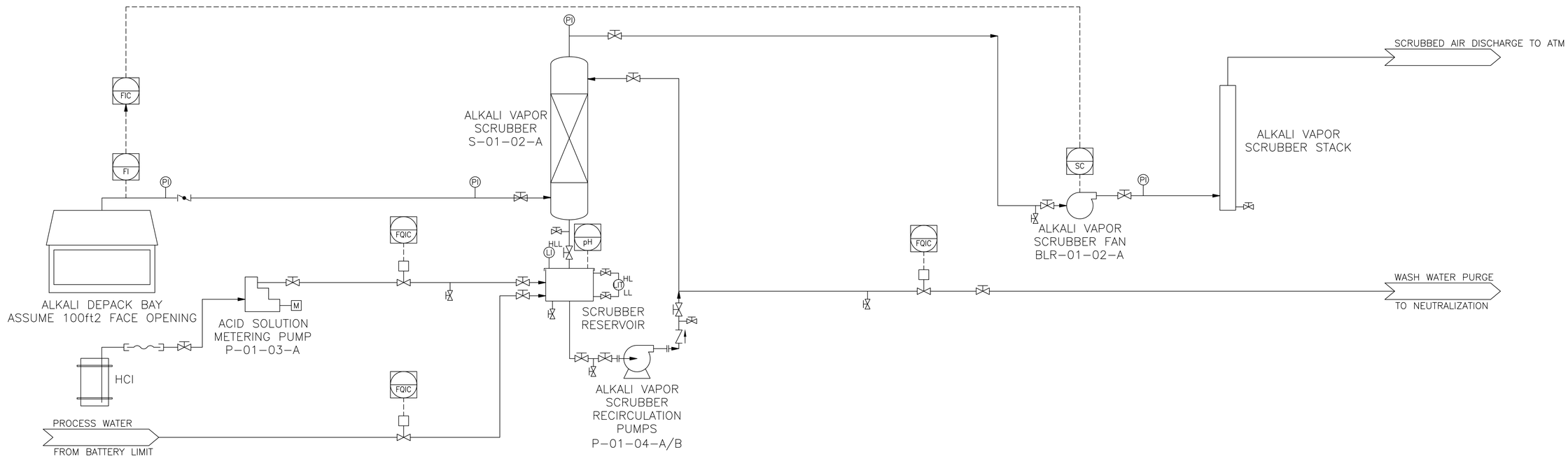
TRIUMVIRATE ENVIRONMENTAL

Drawing Title:
CASA GRANDE
ORGANIC DEPACK BAYS SCRUBBER SYSTEM
CONCEPTUAL PIPING
INSTRUMENTATION DIAGRAM

Drawn By: RAK	Checked By: MJ	App'd By: AEF
Date: 06/07/22	Date: 06/08/22	Date: 06/08/22

Scale: NONE
Drawing Number: P&ID -01-003
Revision: 0
Sheet 01 of 01



CONCEPTUAL DESIGN ONLY – NOT FOR CONSTRUCTION

REV	DATE	PROJECT NO.	DRWN	CHKD	ENGR	REVISION DESCRIPTION
0	7/27/22	TRE-220301-CC	RAK	MJ	AEF	NEW DRAWIING – ISSUED FOR REGULATORY REVIEW

PROCESS
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TRIUMVIRATE ENVIRONMENTAL

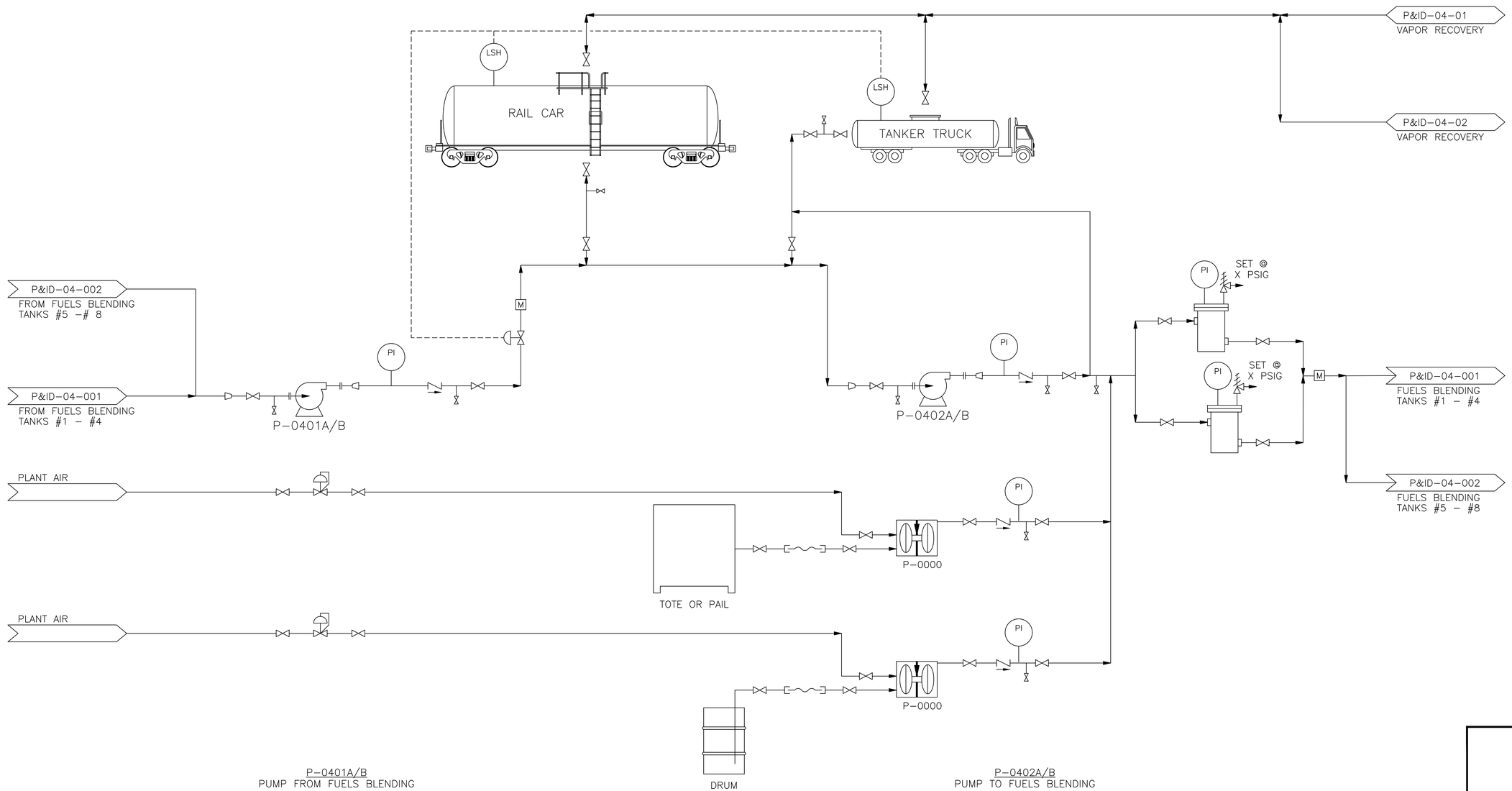
Drawing Title:
CASA GRANDE
ALKALI DEPACK BAY SCRUBBER SYSTEM
CONCEPTUAL PIPE &
INSTRUMENTATION DIAGRAM

Drawn By: RAK	Checked By: MJ	App'd By: AEF
Date: 06/07/22	Date: 06/08/22	Date: 06/08/22
Scale: NONE	Drawing Number: P&ID -01-002	Revision: 0
Sheet 01 of 01		

Exhibit C-2
Process & Instrumentation Diagram for Railcar Unloading

NOTES:

1. PROCESS ENGINEERING ASSOCIATES RECOMMENDS ADDING A PURGE SYSTEM FOR RAIL CARS AND TANKER TRUCKS TO ELIMINATE THE POTENTIAL OF OXYGEN BEING INTRODUCED INTO THE FUELS BLENDING TANKS DURING VEHICLE LOADING.



P-0401A/B
PUMP FROM FUELS BLENDING
MFG/MODEL:
DESIGN: PSIG @ °F
CAPACITY: 250 GPM @ TDN
MOC:
POWER: hp @ RPM

P-0402A/B
PUMP TO FUELS BLENDING
MFG/MODEL:
DESIGN: PSIG @ °F
CAPACITY: 250 GPM @ TDN
MOC:
POWER: hp @ RPM

CONCEPTUAL DESIGN ONLY – NOT FOR CONSTRUCTION

REV	DATE	PROJECT NO.	DRWN	CHKD	ENGR	REVISION DESCRIPTION
B	6/15/22	TRE-220212-CC	RAK	AEF	AEF	ADDED FUEL UNLOADING PUMP
A	5/31/22	TRE-220212-CC	RAK	AEF	MDW	NEW DRAWIING – ISSUED FOR REGULATORY REVIEW

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TRIUMVIRATE ENVIRONMENTAL

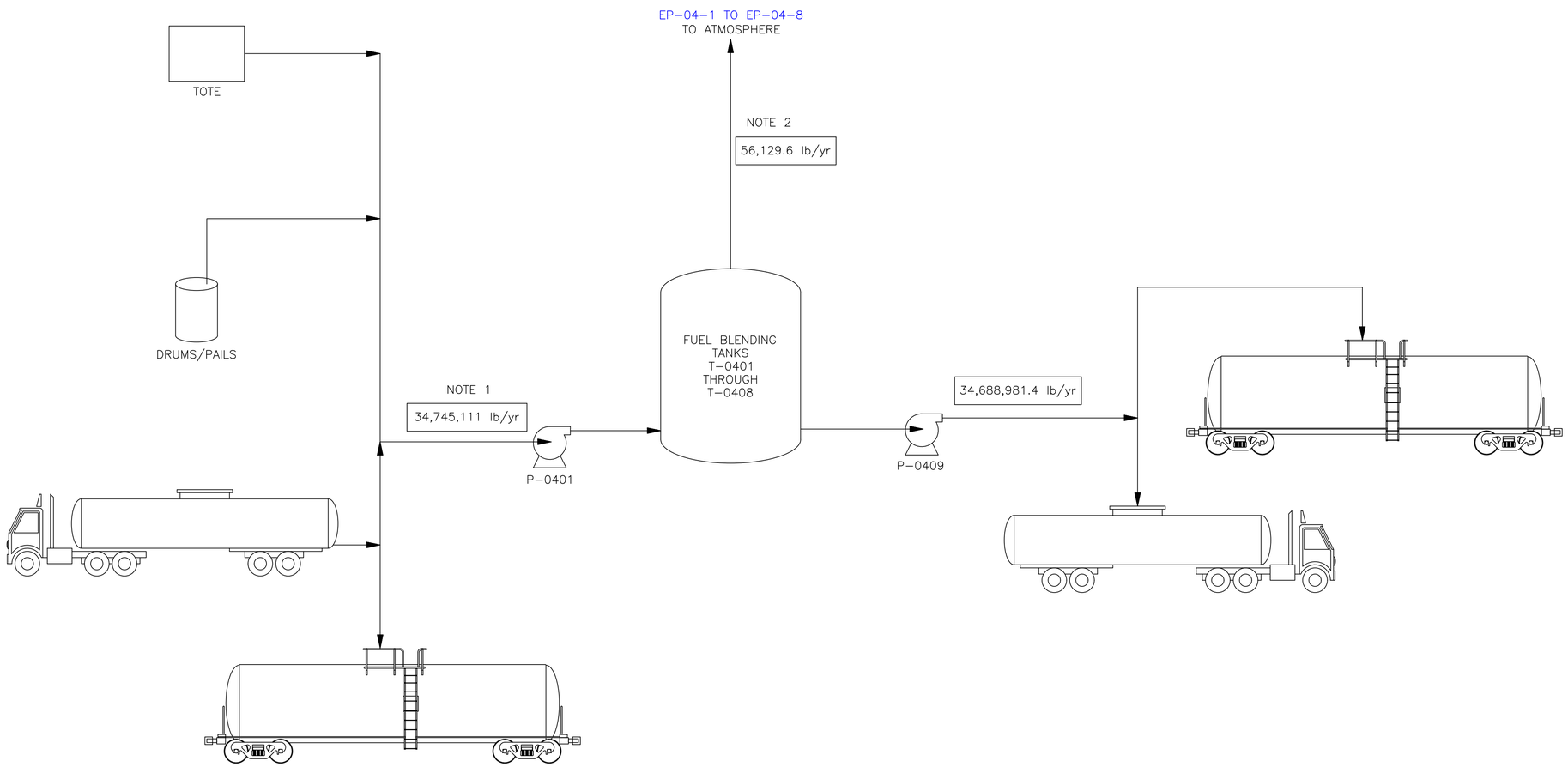
Drawing Title:
CASA GRANDE
FUELS BLENDING LOADING/UNLOADING AREA
P&ID

Drawn By: RAK	Checked By: AEF	App'd By: MDW
Date: 05/31/22	Date: 05/31/22	Date: 06/07/22
Scale: NONE	Drawing Number: P&ID -04-003	Revision: B
Sheet 01 of 01		

Exhibit C-3
Process Flow Diagram and
Process & Instrumentation Diagrams for
Flammable Liquid/Fuel Blending Storage Tanks

NOTES:

1. WORST CASE SCENARIO USING APPROXIMATELY 49.8% HEXANE AND 50.2% ISOPENTANE.
2. CALCULATING USING AP-42 TANK STANDING LOSSES METHODOLOGY.
3. VAPOR BALANCING LINES ARE NOT SHOWN FOR SIMPLICITY.



REV	DATE	PROJECT NO.	DRWN	CHKD	ENGR	REVISION DESCRIPTION
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0	7/27/22	TRE-220212-CC	RAK	AEF	MDW	NEW DRAWIING - ISSUED FOR REGULATORY REVIEW

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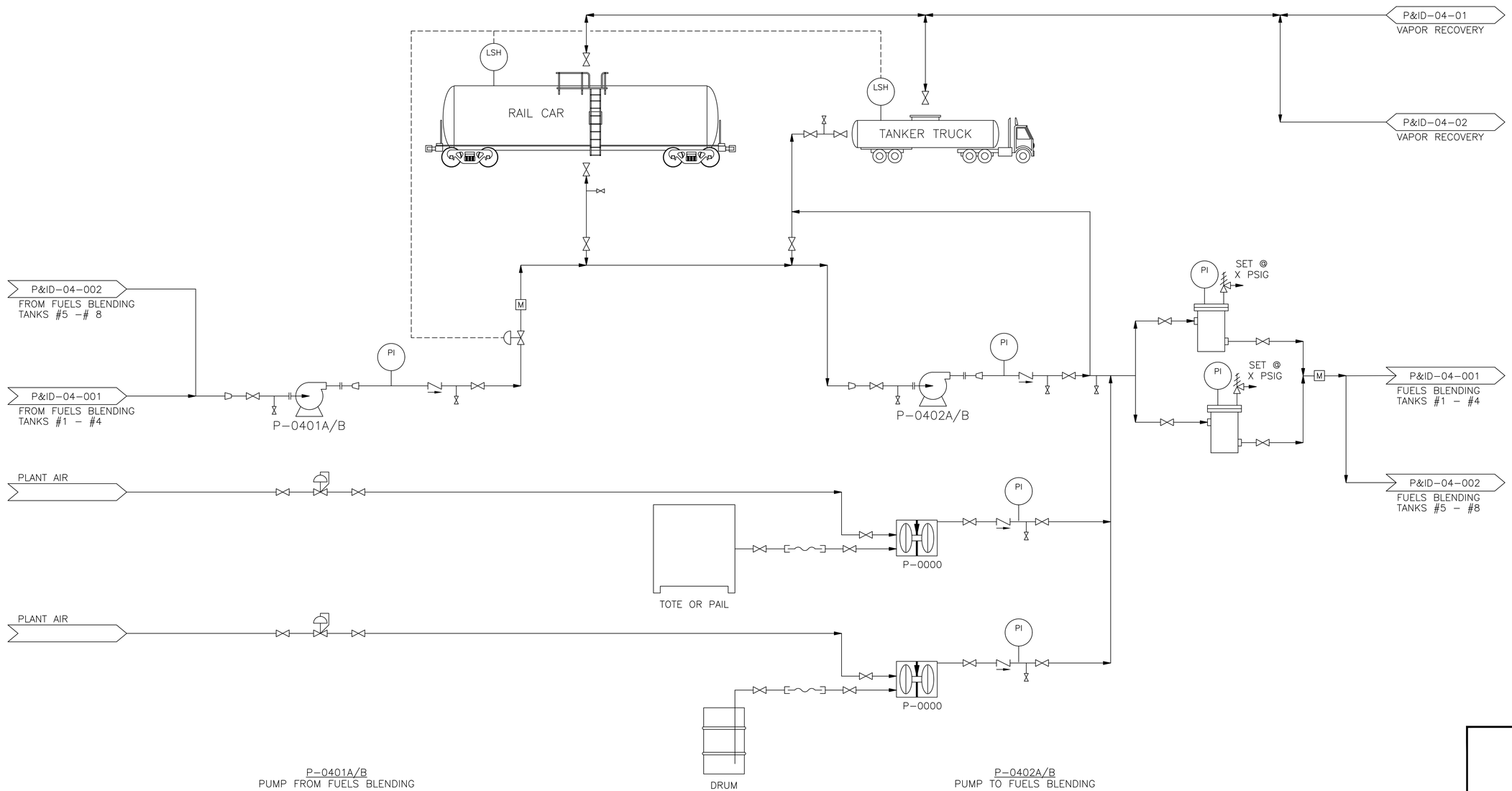
TRIUMVIRATE ENVIRONMENTAL

Drawing Title:
CASA GRANDE
FUELS BLENDING
CONCEPTUAL PROCESS FLOW DIAGRAM

Drawn By: RAK	Checked By: AEF	App'd By: MDW
Date: 05/10/22	Date: 05/10/22	Date: 05/10/22
Scale: NONE	Drawing Number: PFD-04-001	Revision: 0A
Sheet 01 of 01		

NOTES:

1. PROCESS ENGINEERING ASSOCIATES RECOMMENDS ADDING A PURGE SYSTEM FOR RAIL CARS AND TANKER TRUCKS TO ELIMINATE THE POTENTIAL OF OXYGEN BEING INTRODUCED INTO THE FUELS BLENDING TANKS DURING VEHICLE LOADING.



P-0401A/B
PUMP FROM FUELS BLENDING
MFG/MODEL:
DESIGN: PSIG @ °F
CAPACITY: 250 GPM @ TDN
MOC:
POWER: hp @ RPM

P-0402A/B
PUMP TO FUELS BLENDING
MFG/MODEL:
DESIGN: PSIG @ °F
CAPACITY: 250 GPM @ TDN
MOC:
POWER: hp @ RPM

CONCEPTUAL DESIGN ONLY – NOT FOR CONSTRUCTION

REV	DATE	PROJECT NO.	DRWN	CHKD	ENGR	REVISION DESCRIPTION
B	6/15/22	TRE-220212-CC	RAK	AEF	AEF	ADDED FUEL UNLOADING PUMP
A	5/31/22	TRE-220212-CC	RAK	AEF	MDW	NEW DRAWIING – ISSUED FOR REGULATORY REVIEW

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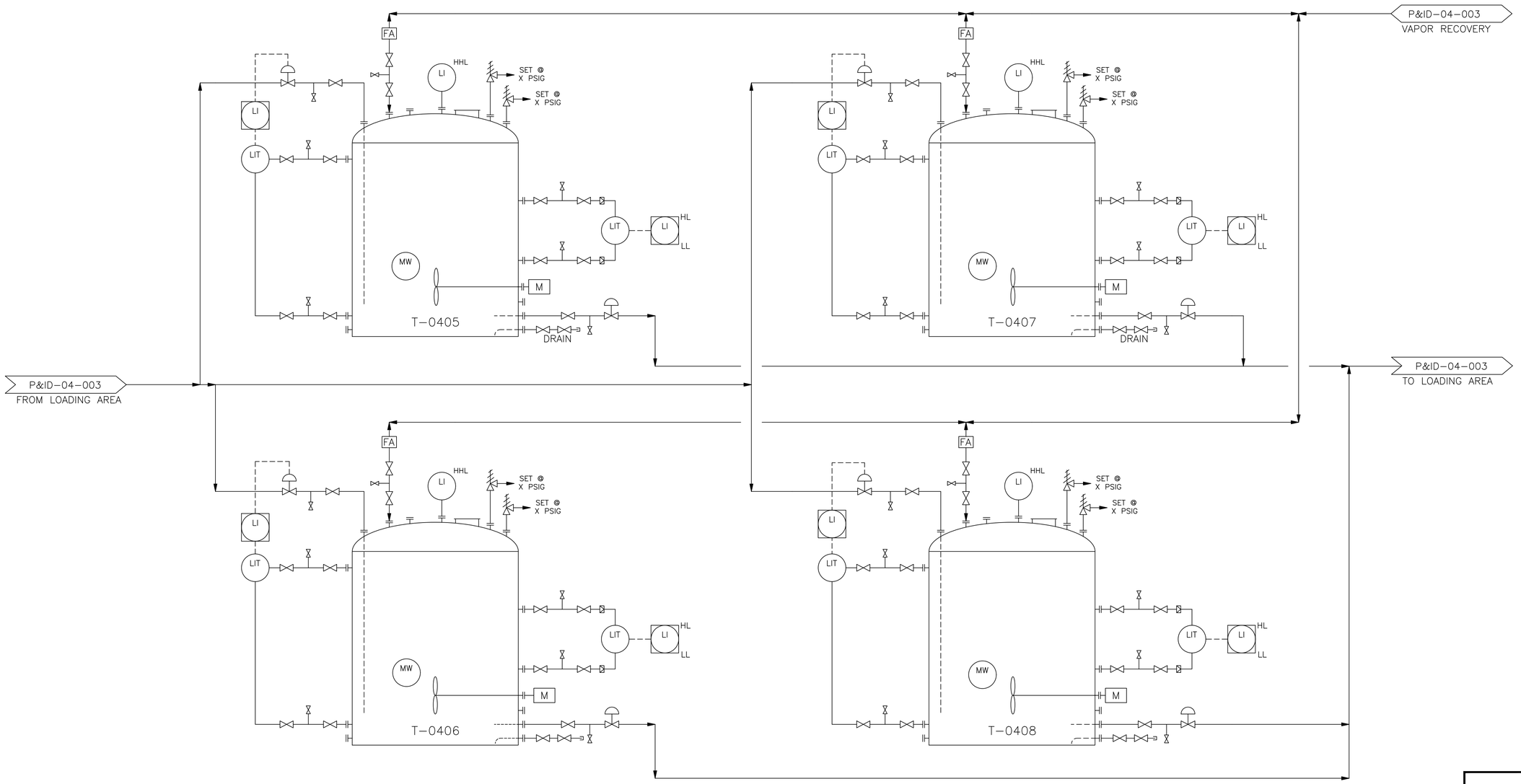
TRIUMVIRATE ENVIRONMENTAL

Drawing Title:
CASA GRANDE
FUELS BLENDING LOADING/UNLOADING AREA
P&ID

Drawn By: RAK	Checked By: AEF	App'd By: MDW
Date: 05/31/22	Date: 05/31/22	Date: 06/07/22
Scale: NONE	Drawing Number: P&ID -04-003	Revision: B
Sheet 01 of 01		



T-0405
FUELS BLENDING TANK #5
SIZE: 12'-0"x21'-6" T/T
DESIGN: ATMOSPHERE
MAWP:
CAPACITY: 19,454 GALLONS
TYPE: VERTICAL FLAT BOTTOM
MOC: 304SS
INSULATION: NONE

T-0406
FUELS BLENDING TANK #6
SIZE: 12'-0"x21'-6" T/T
DESIGN: ATMOSPHERE
MAWP:
CAPACITY: 19,454 GALLONS
TYPE: VERTICAL FLAT BOTTOM
MOC: 304SS
INSULATION: NONE

T-0407
FUELS BLENDING TANK #7
SIZE: 12'-0"x21'-6" T/T
DESIGN: ATMOSPHERE
MAWP:
CAPACITY: 19,454 GALLONS
TYPE: VERTICAL FLAT BOTTOM
MOC: 304SS
INSULATION: NONE

T-0408
FUELS BLENDING TANK #8
SIZE: 12'-0"x21'-6" T/T
DESIGN: ATMOSPHERE
MAWP:
CAPACITY: 19,454 GALLONS
TYPE: VERTICAL FLAT BOTTOM
MOC: 304SS
INSULATION: NONE

CONCEPTUAL DESIGN ONLY – NOT FOR CONSTRUCTION

REV	DATE	PROJECT NO.	DRWN	CHKD	ENGR	REVISION DESCRIPTION
0	5/26/22	TRE-220212-CC	RAK	AEF	MDW	NEW DRAWIING – ISSUED FOR REGULATORY REVIEW

PROCESS
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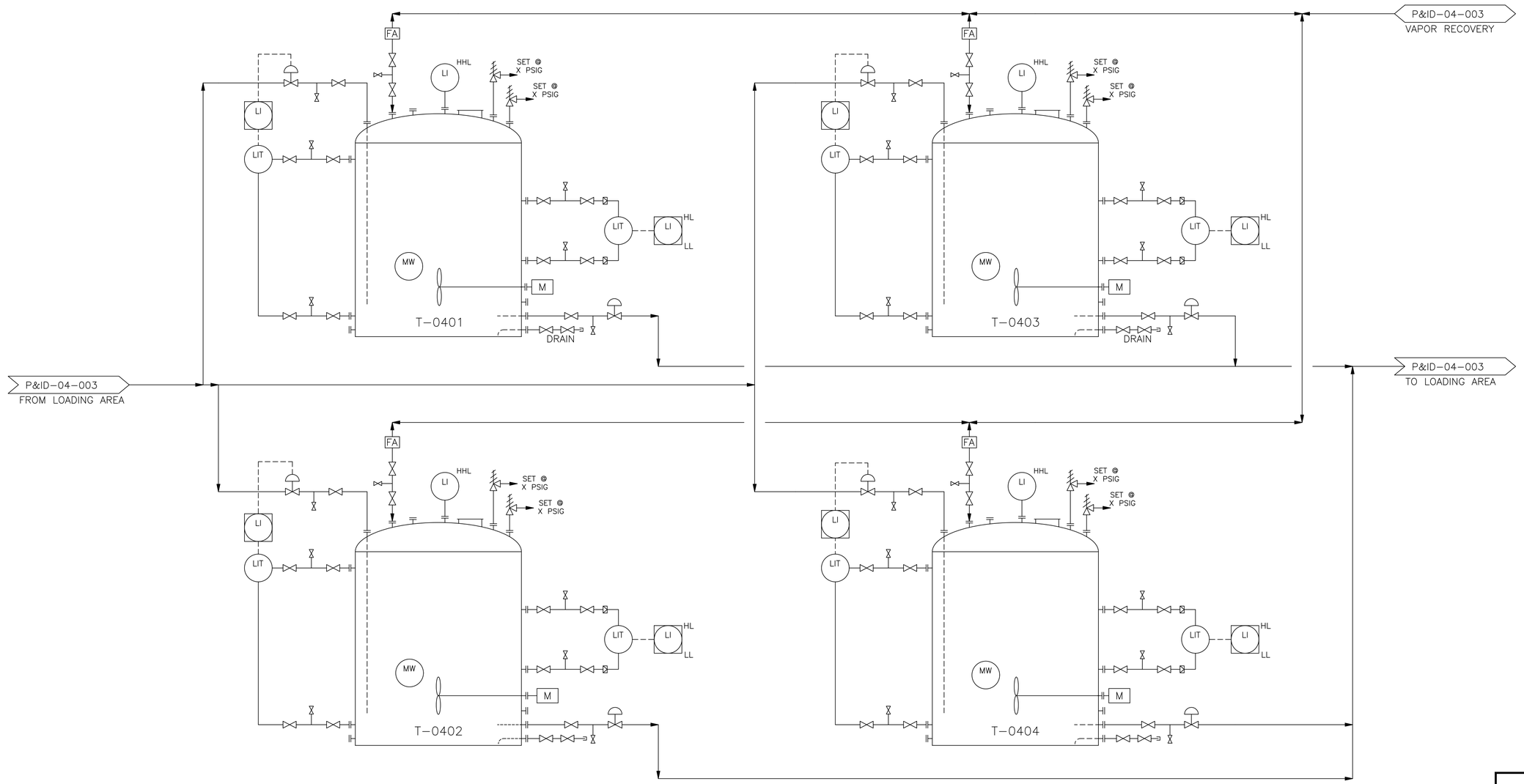
TRIUMVIRATE
ENVIRONMENTAL

Drawing Title:
CASA GRANDE
FUELS BLENDING TANKS #5 THRU #8
P&ID

Drawn By: RAK	Checked By: AEF	App'd By: MDW
Date: 05/25/22	Date: 05/25/22	Date: 06/07/22
Scale: NONE	Drawing Number: P&ID -04-002	Revision: 0
Sheet 01 of 01		



T-0401
FUELS BLENDING TANK #1
SIZE: 12'-0"x21'-6" T/T
DESIGN: ATMOSPHERE
MAWP:
CAPACITY: 19,454 GALLONS
TYPE: VERTICAL FLAT BOTTOM
MOC: 304SS
INSULATION: NONE

T-0402
FUELS BLENDING TANK #2
SIZE: 12'-0"x21'-6" T/T
DESIGN: ATMOSPHERE
MAWP:
CAPACITY: 19,454 GALLONS
TYPE: VERTICAL FLAT BOTTOM
MOC: 304SS
INSULATION: NONE

T-0403
FUELS BLENDING TANK #3
SIZE: 12'-0"x21'-6" T/T
DESIGN: ATMOSPHERE
MAWP:
CAPACITY: 19,454 GALLONS
TYPE: VERTICAL FLAT BOTTOM
MOC: 304SS
INSULATION: NONE

T-0404
FUELS BLENDING TANK #4
SIZE: 12'-0"x21'-6" T/T
DESIGN: ATMOSPHERE
MAWP:
CAPACITY: 19,454 GALLONS
TYPE: VERTICAL FLAT BOTTOM
MOC: 304SS
INSULATION: NONE

CONCEPTUAL DESIGN ONLY – NOT FOR CONSTRUCTION

REV	DATE	PROJECT NO.	DRWN	CHKD	ENGR	REVISION DESCRIPTION
A	5/18/22	TRE-220212-CC	RAK	AEF	MDW	NEW DRAWIING – ISSUED FOR REVIEW

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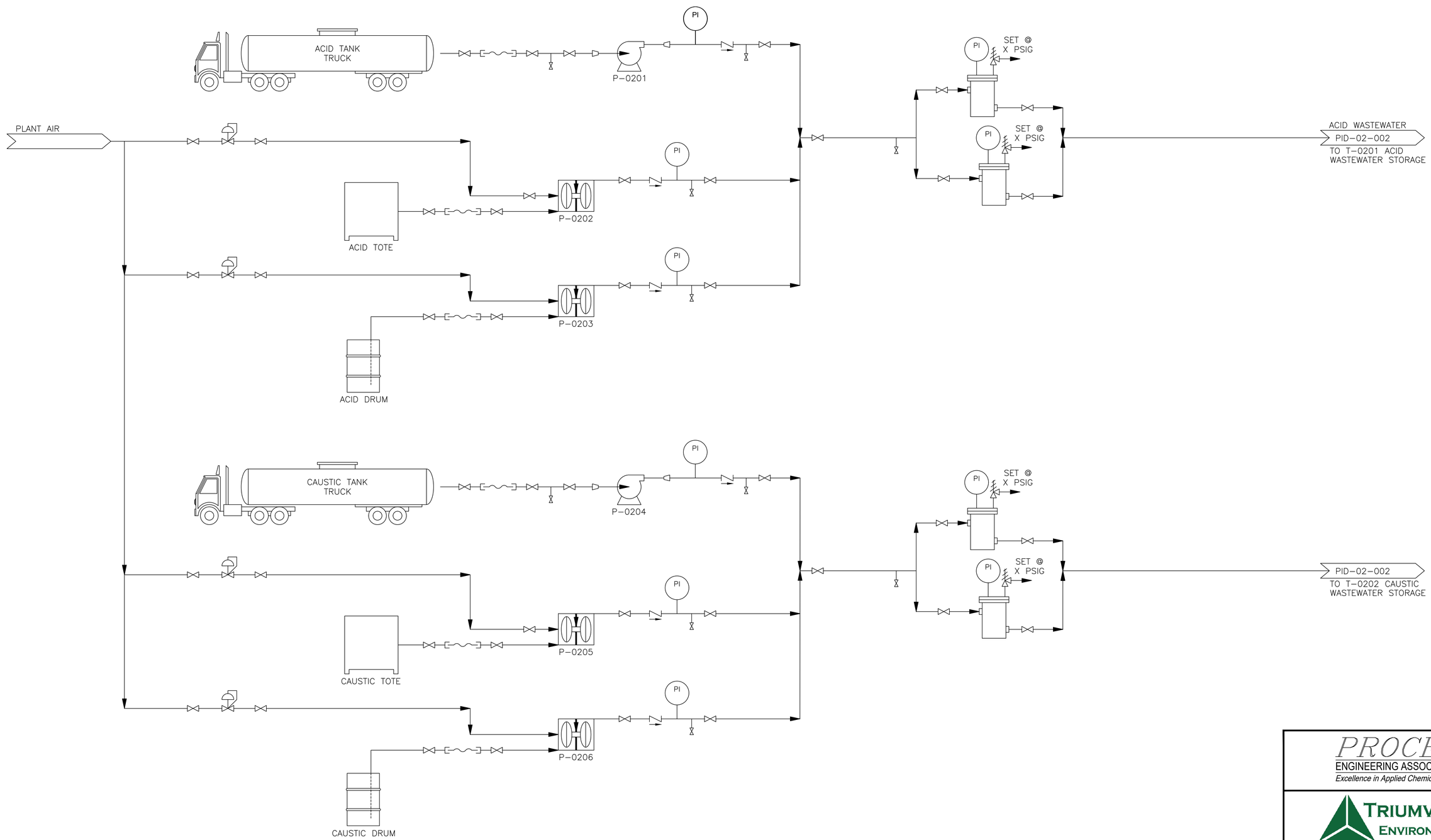
TRIUMVIRATE
ENVIRONMENTAL

Drawing Title:
CASA GRANDE
FUELS BLENDING TANKS #1 THRU #4
P&ID

Drawn By: RAK	Checked By: AEF	App'd By: MDW
Date: 05/25/22	Date: 05/25/22	Date: 06/07/22
Scale: NONE	Drawing Number: P&ID -04-001	Revision: A
Sheet 01 of 01		

Exhibit C-4
Process & Instrumentation Diagrams for Corrosive Liquid Storage Tanks



CONCEPTUAL DESIGN ONLY – NOT FOR CONSTRUCTION

REV	DATE	PROJECT NO.	DRWN	CHKD	ENGR	REVISION DESCRIPTION
0	7/14/22	TRE-220212-CC	RAK	AEF	MDW	NEW DRAWIING – ISSUED FOR REGULATORY REVIEW

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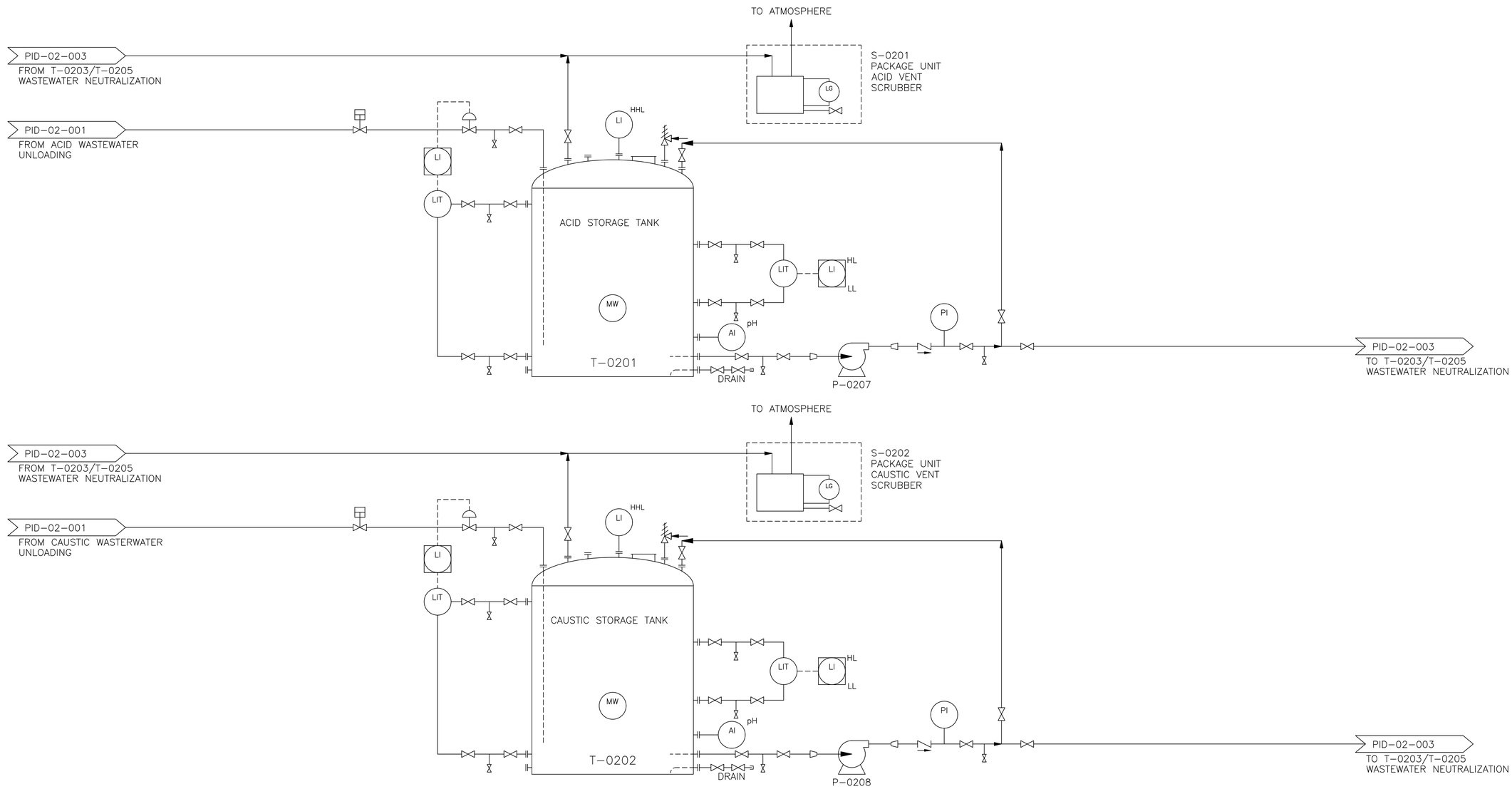
TRIUMVIRATE ENVIRONMENTAL

Drawing Title: CASA GRANDE WASTEWATER TREATMENT UNLOADING AREA P&ID

Drawn By: RAK	Checked By: AEF	App'd By: MDW
Date: 07/14/22	Date: 07/08/22	Date: 07/15/22
Scale: NONE	Drawing Number: PID -02-001	Revision: 0
Sheet 01 of 01		



CONCEPTUAL DESIGN ONLY – NOT FOR CONSTRUCTION

REV	DATE	PROJECT NO.	DRWN	CHKD	ENGR	REVISION DESCRIPTION
0	7/14/22	TRE-220212-CC	RAK	AEF	MDW	NEW DRAWIING – ISSUED FOR REGULATORY REVIEW

PROCESS
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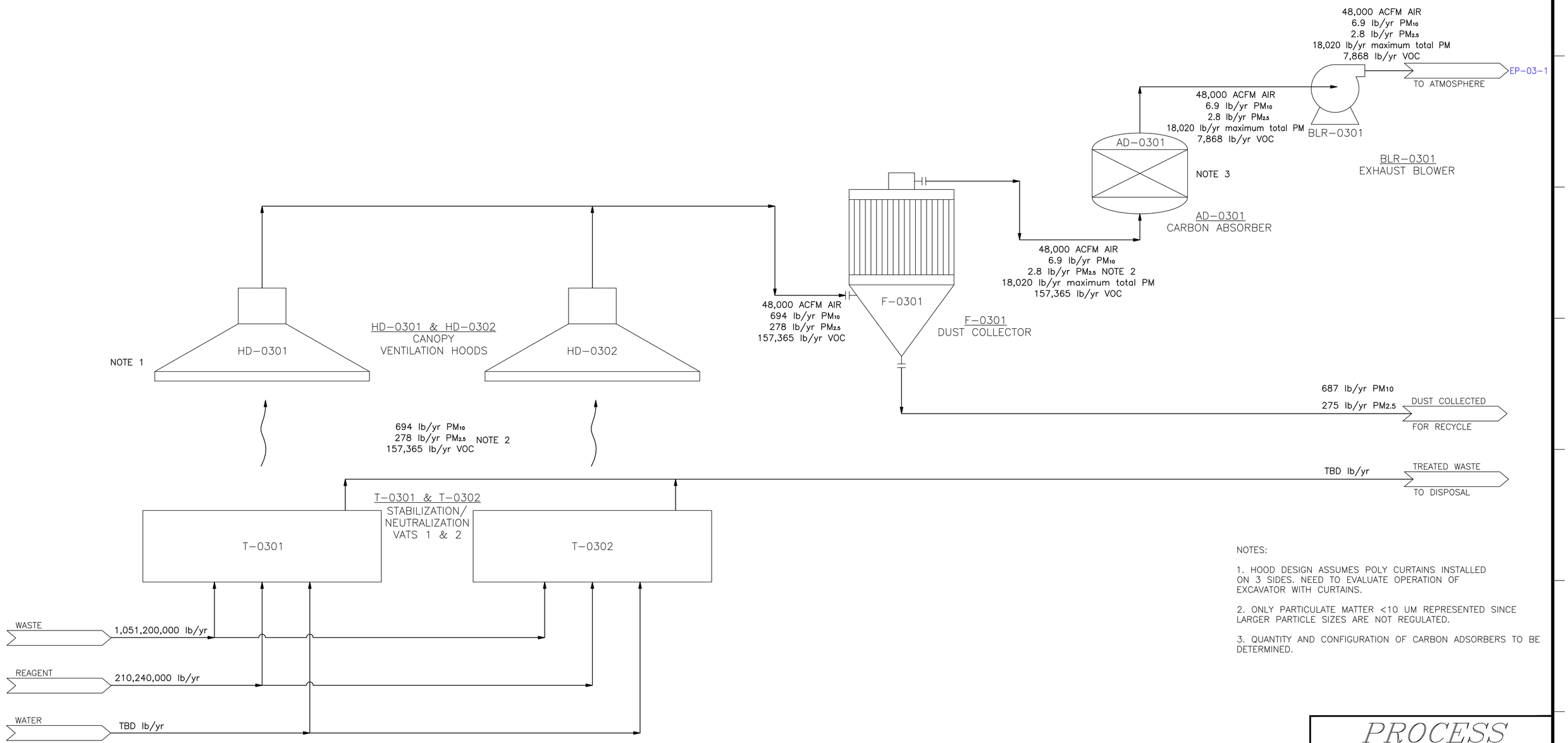
TRIUMVIRATE ENVIRONMENTAL

Drawing Title:
CASA GRANDE
WASTEWATER TREATMENT
NEUTRALIZATION STORAGE AREA
P&ID

Drawn By: RAK	Checked By: AEF	App'd By: MDW
Date: 07/14/22	Date: 07/08/22	Date: 07/15/22
Scale: NONE	Drawing Number: PID -02-002	Revision: 0
Sheet 01 of 01		

Exhibit C-5
Process Flow Diagram and
Process & Instrumentation Diagram
For Stabilization Tanks



NOTES:

1. HOOD DESIGN ASSUMES POLY CURTAINS INSTALLED ON 3 SIDES. NEED TO EVALUATE OPERATION OF EXCAVATOR WITH CURTAINS.

2. ONLY PARTICULATE MATTER <10 UM REPRESENTED SINCE LARGER PARTICLE SIZES ARE NOT REGULATED.

3. QUANTITY AND CONFIGURATION OF CARBON ADSORBERS TO BE DETERMINED.

REV	DATE	PROJECT NO.	DRWN	CHKD	ENGR	REVISION DESCRIPTION
0	7/27/22	TRE-220301-CC	RAK	KP	MDW	NEW DRAWIING – ISSUED FOR REGULATORY REVIEW

PROCESS
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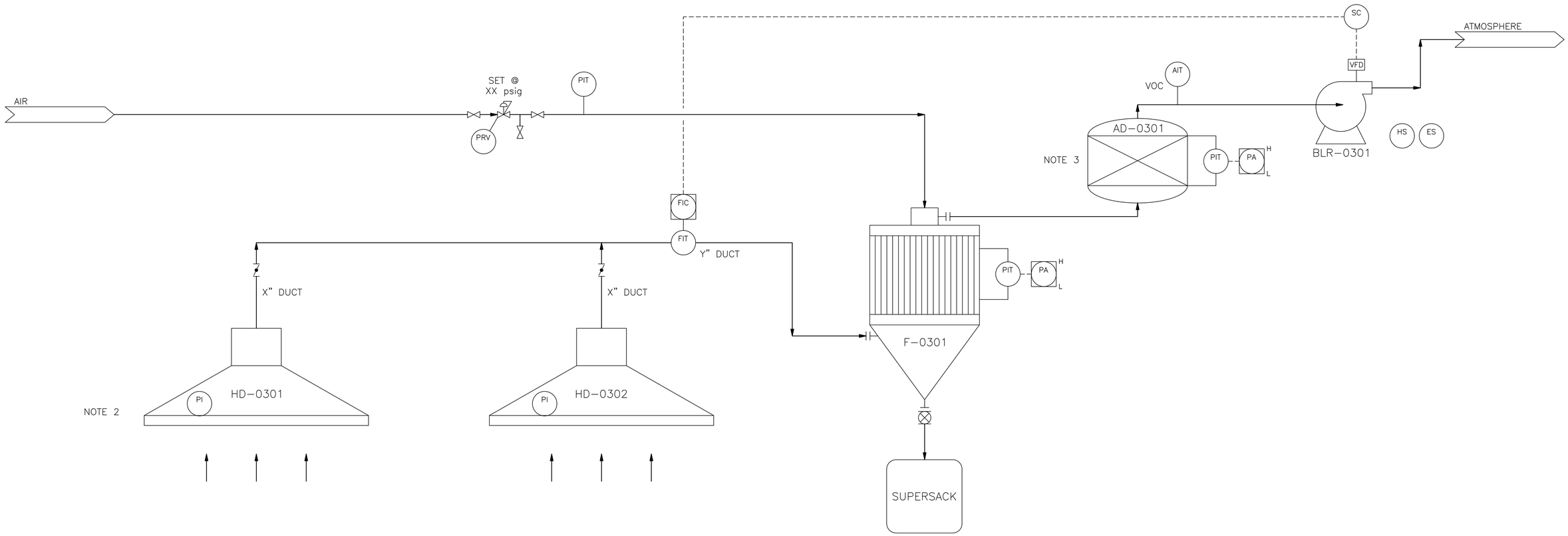
TRIUMVIRATE
ENVIRONMENTAL

Drawing Title:
CASA GRANDE, ARIZONA
STABILIZATION/NEUTRALIZATION AREA
CONCEPTUAL PROCESS FLOW DIAGRAM

Drawn By: RAK	Checked By: KP	App'd By: MDW
Date: 07/01/22	Date: 7/05/22	Date: 7/05/22
Scale: NONE	Drawing Number: PFD-03-001	Revision: 0
Sheet 01 of 01		



NOTES:

1. A NEGATIVE ROOM PRESSURE WILL BE MAINTAINED IN THE STABILIZATION/NEUTRALIZATION AREA (ROOM 107). LOUVERED OPENINGS IN THE BUILDING WILL BE INSTALLED TO REGULATE THE MAKE-UP AIR TO THE ROOM. REFERENCE BUILDING DRAWING XXX FOR MORE DETAILS.

2. HOOD DESIGN ASSUMES POLY CURTAINS INSTALLED ON 3 SIDES. NEED TO EVALUATE OPERATION OF EXCAVATOR WITH CURTAINS.

3. QUANTITY AND CONFIGURATION OF CARBON ADSORBERS TO BE DETERMINED.

T-0301 & T-0302
STABILIZATION/
NEUTRALIZATION
VATS 1 & 2
SIZE: 80 YD^3

HD-0301 & HD-0302
CANOPY
VENTILATION HOODS
SIZE: 18 FT X 12 FT
CAPTURE VELOCITY: 100 FPM
MOC: TBD
3 SIDES ENCLOSED
WITH CURTAINS

F-0301
DUST COLLECTOR
SIZE: APPROX. 32'L x 11'W x 35'H
DESIGN:
MAWP: 20" wg
CAPACITY: 57,600 cfm
TYPE: FABRIC FILTER/PULSE JET
MOC: COATED CARBON STEEL

AD-0301
CARBON ABSORBER
SIZE: 40'L x 8'W x 9.5'H
DESIGN:
MAWP: TBD
CAPACITY: 57,600 cfm
TYPE: DEEP BED VAPOR BOX
MOC: FRP

BLR-0301
EXHAUST BLOWER
MANUFACTURER/MODEL: TBD
DESIGN: TBD
CAPACITY: APPROX. 57,600 cfm @ 20" wg
MOC: CS
POWER: APPROX. 275 hp

CONCEPTUAL DESIGN ONLY – NOT FOR CONSTRUCTION

REV	DATE	PROJECT NO.	DRWN	CHKD	ENGR	REVISION DESCRIPTION
0	7/01/22	TRE-220301-CC	RAK	KP	MDW	NEW DRAWIING – ISSUED FOR REGULATORY REVIEW

PROCESS
ENGINEERING ASSOCIATES, LLC
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TRIUMVIRATE
ENVIRONMENTAL

Drawing Title: CASA GRANDE
STABILIZATION/NEUTRALIZATION AREA
VENTILATION SYSTEM
P&ID

Drawn By: RAK	Checked By: KP	App'd By: MDW
Date: 07/01/22	Date: 7/05/22	Date: 7/05/22
Scale: 1/8" = 1'-0"	Drawing Number: P&ID-03-001	Revision: 0
Sheet 01 of 01		

APPENDIX C-A
Epoxy Floor Coating Technical Data

Ucrete UD200SR

Slip resistant heavy duty resin floor finish

DESCRIPTION

Ucrete UD200SR is a unique heavy duty resin floor with exceptional resistance to aggressive chemicals, heavy impact and temperatures up to 150°C.

Ucrete UD200SR provides a medium textured protective floor finish suitable for applications in wet and dry process environments. It is dense and impervious, providing the ideal floor finish for applications in the food and beverage, pharmaceutical and chemical industries and wherever a robust, long lived floor is required.

Ucrete Industrial Flooring has been widely used throughout industry for more than 50 years, many of the older floors are still in service. A detailed project reference list is available upon request

FEATURES AND BENEFITS

- Expert installation by fully trained licensed applicators
- Non-tainting from the end of mixing, as tested by Campden BRI
- Does not support bacterial or mould growth
- Suitable for application on to 7 day old concrete and 3 day old polymer screed

PERFORMANCE DATA

AIR QUALITY

Ucrete has been awarded the Indoor Air Comfort Gold Label following extensive VOC emission chamber testing and auditing of quality management and production control procedures.

This demonstrates that Ucrete is an extremely clean product without any volatile compounds that might taint foodstuff or affect the well-being of personnel.

All Ucrete grades give very low emissions and conform to all the emissions requirements for indoor flooring systems in Europe including AgBB in Germany, Afsset in France, where they are rated A+ for VOC emissions (the cleanest rating), and M1 in Finland.

For further information please contact your local Master Builders Solutions representative.

NON TAINTING

Ucrete UD200SR is non-solvented and non tainting from the end of mixing, as tested by the Campden BRI.

RAPID INSTALLATION

Specifications are available that enable Ucrete UD200SR and primer to be installed and cured within a 12 hour application window. Being non tainting also, this makes it ideally suited for rapid refurbishment in the food industry.

SLIP RESISTANCE

The Ucrete UD200SR surface profiles have coefficient of friction as determined to EN 13036 Part 4 with 4S rubber on the wet floor as follows:

Ucrete UD200SR 50 - 60

The Ucrete UD200SR surface profiles conform to DIN51130 as follows:

Ucrete UD200SR R13 V4

Optimum slip resistance can only be maintained with regular cleaning.

TEMPERATURE RESISTANCE

The Ucrete UD200SR resins do not start to soften until temperatures above 130°C are exceeded. Specifications are available that are fully serviceable up to 130°C and resistant to occasional spillage up to 150°C.

Correctly installed, Ucrete UD200SR can withstand regular and routine discharges of boiling water, hot oils and fats.

CHEMICAL RESISTANCE

Ucrete UD200SR offers exceptional resistance to a wide range of chemical aggressors. For example Ucrete is resistant to the following commonly encountered chemicals:

Acetic Acid, 50%: As spirit vinegar widely used in the food industry, indicative of resistance to vinegar, sauces, etc.

Concentrated Lactic Acid @ 60°C: Indicative of resistance to milk and dairy products.

Oleic Acid, 100% @ 60°C: Representative of the organic acids formed by oxidation of vegetable and animal fats widely encountered in the food industry.

Concentrated Citric Acid: As found in citrus fruits and representative of the wider range of fruit acids which can rapidly degrade other resin floors.

Methanol, 100%: Representative of alcohols and the wider range of solvents used in the pharmaceutical industry.

A brand of MBCC GROUP

Ucrete UD200SR

Slip resistant heavy duty resin floor finish

Ucrete UD200SR is also resistant to a wide range of mineral oils, salts and inorganic acids, extensive chemical resistance tables are available upon request.
Note: some staining or discolouration may occur with some chemicals, depending upon the nature of the spillage and the standards of housekeeping employed.

IMPACT RESISTANCE

With high mechanical strengths and a low elastic modulus, Ucrete UD200SR is very resilient and able to withstand severe impact loads. While no material is indestructible and surface chipping may occur, brittle modes of failure resulting in cracking and disbondment are unknown with Ucrete floors.

SUBSTRATE MOISTURE TOLERANCE

Ucrete Industrial Flooring is extremely tolerant to residual substrate moisture and can be installed directly onto 7 day old concrete, or onto old good quality concretes with high moisture contents without the use of special primers, provided there is a functioning DPM within the structure.

This enables rapid construction programmes to be maintained and facilitates refurbishment work in wet process areas.

Epoxy surface DPMs should not be used as they soften under high temperature conditions and will lead to floor failure.

PERMEABILITY

Ucrete UD200SR exhibits zero absorption when tested to CP.BM2/67/2.

CLEANING & HYGIENE

Ucrete flooring systems are accredited for use in facilities operating HACCP based food safety systems.

Ucrete UD200SR is readily cleaned using industry standard cleaning chemicals and equipment.

Tests undertaken by Campden BRI on the removal of Acinetobacter Calcoaceticus and Listeria Monocytogenes concluded that the cleanability of Ucrete UD200SR 'compares well with the cleanability of food contact surfaces such as plastics and stainless steel'.

COLOURS

Ucrete UD200SR is available in eight standard colours:

Red	Orange	Yellow	Bright Yellow
Grey	Cream	Blue	Green/Brown
Green			

Ucrete floor systems have been formulated to provide the very highest chemical and heat resistance. As a direct result some yellowing of the installed floor will occur in areas of direct UV exposure. This is most apparent in lighter colours.

SPECIFICATION

The floor finish shall be Ucrete UD200SR from Master Builders Solutions UK Ltd of 19 Broad Ground Road, Redditch, Worcestershire, B98 8YP installed at 6/9/12* mm in accordance with the manufacturers' instructions.
*(select as required)

*A 6mm Ucrete UD200SR floor is fully resistant to liquid spillage and discharge up to 80ºC and can be lightly steam cleaned. Suitable for freezer temperatures down to -25ºC.

*A 9mm Ucrete UD200SR floor is fully resistant to high temperature spillage and discharge up to 120ºC and is fully steam cleanable. Suitable for freezer temperatures down to -40ºC.

*A 12mm Ucrete UD200SR floor is fully resistant to high temperature spillage and discharge up to 130ºC and occasional spillage up to 150ºC and is fully steam cleanable. Suitable for freezer temperatures down to -40ºC.

In extreme thermal shock environments a well designed substrate of good quality concrete is essential.

SUBSTRATE QUALITY

Concrete substrates should be visibly dry and have a minimum tensile strength of 1.5 MPa.

Refer to the guide 'The Design & Preparation of Substrates for Ucrete Industrial Flooring'

All joints in the substrate concrete subject to movement should be reflected through the Ucrete floor and sealed with a suitable sealant

COVERAGE

6mm: 13 – 15 kg/m^2
9mm: 19 – 22 kg/m^2
12mm: 24 kg/m^2

A brand of MBCC GROUP

Ucrete UD200SR

Slip resistant heavy duty resin floor finish

CURING
Normally Ucrete UD200SR floors can be put into service within 24 hours even at 8ºC. Specifications are available that can be put back into service after 5 hours at 10ºC.

UCRETE LICENSED APPLICATORS
To achieve the best floor possible with a professional installation, you must use one of our fully trained Ucrete Licensed Applicators.

BIM OBJECTS
All Ucrete products have a dedicated BIM object available to download from the NBS National BIM Library or Bimobject.

CLEANING
Regular cleaning and maintenance will enhance the life and appearance of any floor. Ucrete UD200SR is readily cleaned with industry standard cleaning chemicals and equipment. Please consult your local cleaning chemical or equipment supplier.

STORAGE
In covered warehouse conditions, above 5ºC and below 30ºC and out of direct sunlight. Materials must be raised off the floor and kept dry. Liquid components must be protected from frost.

WARNINGS AND PRECAUTIONS
In its cured state Ucrete is physiologically non-hazardous.

For normal flooring applications Ucrete does not require the use of respiratory protective equipment during installation.

Operatives should consult the CoSHH risk assessment and their work instructions.

HANDLING AND TRANSPORT
Usual preventive measures for the handling of chemical products should be observed when using this product, for example do not eat, smoke or drink while working and wash hands when taking a break or when the job is completed.

Specific safety information referring the handling and transport of this product can be found in the Material Safety Data Sheet. For full information on Health and Safety matters regarding this product the relevant Health and Safety Data Sheet should be consulted.

Disposal of product and its container should be carried out according to the local legislation in force. Responsibility for this lies with the final owner of the product.

CONTACT DETAILS
Master Builders Solutions UK Ltd,
19 Broad Ground Road
Lakeside
Redditch
Worcestershire
B98 8YP
Tel: +44 (0) 1527 512255
Fax +44 (0) 1527 503576
www.master-builders-solutions.com

A brand of MBCC GROUP

Ucrete UD200SR

Slip resistant heavy duty resin floor finish

Product Data	
Density	2090 kg/m³
Compressive strength (EN13892-2)	52 - 57 MPa
Tensile strength (BS6319 Part 7)	6 MPa
Flexural strength (EN13892-2)	14 MPa
Compressive modulus (BS 6319:Part 6)	3250 MPa
Adhesive strength to concrete (EN13892-8)	concrete failure
Coefficient of thermal expansion (ASTM C531:Part 4.05)	4×10^{-5} $^{o}C^{-1}$
Fire Testing (EN13501: Part 1)	$B_{FL} – S_1$

Note:- Samples cured for 28 days at 20 °C

Master Builders Solutions UK Ltd 19 Broad Ground Road Lakeside, Redditch Great Britain B98 8YP	
04	
01040368	
EN 13813:2002	
Synthetic resin screed material	
Reaction to fire:	$B_{FL} – S_1$
Release of corrosive substances:	NPD
Water permeability:	NPD
Mechanical resistance:	NPD
Wear resistance:	AR0,5
Bond strength:	B>2,0
Impact resistance:	IR>4
Sound insulation:	NPD
Sound absorption:	NPD
Thermal resistance:	NPD
Chemical resistance:	NPD
Electrical resistance:	NPD

A brand of MBCC GROUP

Ucrete UD200SR

Slip resistant heavy duty resin floor finish

Health and Safety
*For full information on Health and Safety matters regarding this product the relevant Health and Safety Data Sheet should be consulted.

The following general comments apply to all products.

As with all chemical products, care should be taken during use and storage to avoid contact with eyes, mouth, skin and foodstuffs, (which may also be tainted with vapour until the product is fully cured and dried). Treat splashes to eyes and skin immediately. If accidentally ingested, seek medical attention. Keep away from children and animals. Reseal containers after use.

Solvent Based Products
Use in well ventilated areas; avoid inhaling. Suitable respiratory equipment may be needed, eg when spraying. Can cause skin, eye irritation. Wear protective eye shields and gloves during use. Do not smoke or allow sparks or naked lights when stored or in use.

Resin Products
Can cause irritation, dermatitis or allergic reaction. Use protective equipment particularly for skin and eyes. Use only in well ventilated areas.

Spillage
Chemical products can cause damage; clean spillage immediately.

DISCLAIMER
"Master Builders Solutions UK Ltd" (the Company) endeavours to ensure that advice and information given in Product Data Sheets, Method Statements and Material Safety Data Sheets (all known as Product Literature) is accurate and correct. However, the Company has no control over the selection of its products for particular applications. It is important that any prospective customer, user or specifier, satisfies him/her-self that the product is suitable for the specific application. In this process, due regard should be taken of the nature and composition of the background/base and the ambient conditions both at the time of laying/applying/installing the material and when the completed work is to be brought into use.

Accordingly, no liability will be accepted by the Company for the selection, by others, of a product, which is inappropriate to a particular application.

Products are sold subject to the Company's standard conditions of sale and all customers, users and specifiers, should ensure that they examine the Company's latest Product Literature.

A brand of MBCC GROUP

APPENDIX C-B
Architectural Drawings- Waste Management and Processing Building

CLIENT:

TRIUMVIRATE
ENVIRONMENTAL

PROJECT TITLE:

INTEGRATED WASTE MANAGEMENT FACILITY

PROJECT ADDRESS:

LOTS 23 & 24 OF CENTRAL ARIZONA
CENTRAL ARIZONA COMMERCE PARK
73 S. COMMERCE DRIVE
CASA GRANDE, ARIZONA 85193

APRIL 2023
FM PROJECT NUMBER 20-200

G.S.S. Companies Inc.
"Building Arizona Since 1985"

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FM GROUP INC CONSULTANTS *Architectural Environmental Facilities Telecommunications*

G.S.S. Companies Inc.
"Building Arizona Since 1985"

FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED
WASTE
MANAGEMENT
FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
COVER SHEET

DATE
8-19-22
PROJECT NO.
20-200

CS-0.1

ABBREVIATIONS

@	-AT	LAM.	-LAMINATE (D)
A.C. or A/C	-AIR CONDITIONING	LAV.	-LAVATORY
ADDN.	-ADDITION (AL)	LB. or #	-POUND (S)
ADJ.	-ADJUST (ABLE)	LG.	-LONG
A.F.F.	-ABOVE FINISH FLOOR	LOC.	-LOCATION
ALUM.	-ALUMINUM	LT. or LGT.	-LIGHT
APPROX.	-APPROXIMATE	LAM.	-LAMINATE (D)
ARCH.	-ARCHITECT (URAL)	LAV.	-LAVATORY
AVG.	-AVERAGE	LB. or #	-POUND (S)
BLDG.	-BUILDING	LOC.	-LOCATION
BLK.	-BLOCK	LT. or LGT.	-LIGHT
B.	-BEAM	MAS.	-MASONRY
BOT.	-BOTTOM	MATL.	-MATERIAL
BRG.	-BEARING	MAX.	-MAXIMUM
BRK.	-BRICK	MECH.	-MECHANICAL
BTWN.	-BETWEEN	MEMB.	-MEMBRANE
CALCS.	-CALCULATIONS	MFR.	-MANUFACTURER
CEIL. or CLG.	-CEILING	MGR.	-MANAGER
CFT	-CONCRETE FLOOR PLAN		
CL. or CLR.	-CLEAR (ANCE)	MID.	-MIDDLE
C.M.U.	-CONCRETE MASONRY UNIT	MIN.	-MINIMUM
℄	-CENTER LINE	MISC.	-MISCELLANEOUS
COL.	-COLUMN	MPE	-MECHANICAL, PLUMBING, & ELECTRICAL
CONC.	-CONCRETE	MTD.	-MOUNT (ED, ING)
CONN.	-CONNECTION	MTL.	-METAL
CONSTR.	-CONSTRUCTION	N.	-NORTH
CONT.	-CONTINUE or CONTINUOUS	NA or N/A	-NOT APPLICABLE
CONTR.	-CONTRACTOR	N.E.C.	-NATIONAL ELECTRIC CODE
CPT SQ.	-CARPET SQUARE		
CT	-CERAMIC TILE		
CTR.	-CENTER	NIC	-NOT IN CONTRACT
CTRD.	-CENTERED	NO. or #	-NUMBER
DBL.	-DOUBLE	N.T.S.	-NOT TO SCALE
DEPT.	-DEPARTMENT	OA.	-OVERALL
DET. or DTL.	-DETAIL	OH.	-OVERHANG
DIA. or Ø	-DIAMETER	OPP.	-OPPOSITE
DIAG.	-DIAGONAL	P.C. or P/C	-PRECAST
DIM.	-DIMENSION (S)	PEN.	-PENETRATION
DISP.	-DISPENSER	PERP.	-PERPENDICULAR
DN.	-DOWN	P.L.	-PROPERTY LINE
DP.	-DEEP or DEPTH	PLAM	-PLASTIC LAMINATE
DWG.	-DRAWING (S)	PLYWD	-PLYWOOD
E.	-EAST	PR.	-PAIR
EA.	-EACH	PRELIM	-PRELIMINARY
ELECT.	-ELECTRIC (AL)	PROJ.	-PROJECT
EL. or ELEV.	-ELEVATION	PROP.	-PROPERTY
		PT	-PAINT
ENG.	-ENGINEER	R. or RAD.	-RADIUS
EQ.	-EQUAL	REF.	-REFERENCE
EQUIP.	-EQUIPMENT	R.D.	-ROOF DRAIN
EXIST.	-EXISTING	REINF.	-REINFORCE (ED, ING)
EXP.	-EXPANSION	RESIL.	-RESILIENT
EXT.	-EXTERIOR	REQD.	-REQUIRED
FAB.	-FABRICATE	R.O.W.	-RIGHT OF WAY
FND.	-FOUNDATION	S.	-SOUTH
F.F.	-FINISHED FLOOR	S.C.	-SOLID CORE
FIN.	-FINISH	SCHED.	-SCHEDULE
FL.	-FIRE LINE		
FLR.	-FLOOR	SECT.	-SECTION
FLOUR.	-FLOURESCENT	SH. or SHT.	-SHEET
FO.	-FIBER OPTIC CABLE	SH VIN	-SHEET VINYL
F.R.	-FIRE RESISTANT	SIM.	-SIMILAR
FRMG.	-FRAMING	SPEC.	-SPECIFICATION
FRP	-FIBER REINFORCED PANELS		
FT.	-FOOT or FEET	SQ.	-SQUARE
FTG.	-FOOTING	S.S. or S/S	-STAINLESS STEEL
GA.	-GAGE or GAUGE	STA.	-STATION
GALV.	-GALVANIZED	STD.	-STANDARD
G.C.	-GENERAL CONTRACTOR	STL.	-STEEL
GLU-LAM	-GLUE LAMINATED	STOR.	-STORAGE
GR. or GRD.	-GRADE	STRUCT.	-STRUCTURE (AL)
GRND.	-GROUND	SUSP.	-SUSPENDED
G.S.N.	-GENERAL STRUCTURAL NOTES	TEMP.	-TEMPERED
GWB	-GYPSUM WALL BOARD	THK.	-THICK (NESS)
GYP. BD.	-GYPSUM BOARD	THRU	-THROUGH
HORIZ. or HOR.	-HORIZONTAL	TR.	-TRUSS
HR.	-HOUR	TYP.	-TYPICAL
HT. or HGT.	-HEIGHT	U.B.C.	-UNIFORM BUILDING CODE
H.M.	-HOLLOW METAL	U.N.O.	-UNLESS NOTED OTHERWISE
HVAC	-HEATING, VENTING AND AIR CONDITIONING	VERT.	-VERTICAL
I.B.C.	-INTERNATIONAL BUILDING CODE	V.I.F.	-VERIFY IN FIELD
		VIN	-VINYL
IN.	-INCH	W.	-WEST
INCL.	-INCLUDE	W/	-WITH
INFO.	-INFORMATION	W/O	-WITHOUT
INSUL.	-INSULATION	W.C.	-WATER CLOSET
INT.	-INTERIOR	WD.	-WOOD
JAN.	-JANITOR	WIN.	-WINDOW
JT.	-JOINT	WSCT.	-WAINSCOT
KIT.	-KITCHEN		

SITE INFORMATION

PROJECT DATA

PROJECT INFORMATION

PROJECT NAME: INTEGRATED WASTE MANAGEMENT FACILITY

PROJECT DESCRIPTION: WE ARE PROPOSING A 25-ACRE WASTE MANAGEMENT FACILITY FOR MANAGING NON-HAZARDOUS, PLASTIC, BIOMEDICAL, AND HAZARDOUS WASTE. WE ARE PLANNING ON BUILDING THE PROJECT IN SEVERAL PHASES.

PHASE I BUILD OUT IS TO INCLUDE FIRE LANES, FIRE LINE LOOP AND HYDRANTS, SITE RETENTION, SITE SECURITY, FENCING AND ACCESS GATES AND STREET LANDSCAPING. IN ADDITION TO THE SITE WORK, WE PLAN TO CONSTRUCT TWO BUILDINGS.

THE FIRST BUILDING (B OCCUPANCY) IS A 7,000 SQUARE FOOT ADMINISTRATION OFFICE BUILDING WITH EXTERIOR ENCLOSED EMPLOYEE AND EMPLOYEE PARKING WITH SCREEN WALLS.

THE SECOND BUILDING IS AN NON-HAZARDOUS WASTE PROCESSING BUILDING ('F' OCCUPANCY). THIS BUILDING IS AT GRADE AND INCLUDES A BELOW GRADE DRIVE-THRU LOADING LANE FOR BULK TRANSPORTATION. THE BUILDING WILL BE OPEN ON THREE SIDES AND CLOSED FACING S. COMMERCE. NON-HAZARDOUS WASTES WILL BE BULKED AND / OR SOLIDIFIED TO MEET DISPOSAL REQUIREMENTS AT OFF-SITE LANDFILLS OR WASTE-TO-ENERGY FACILITIES. MATERIALS WILL BE STAGED AND SAMPLED TO VERIFY CONTENTS PRIOR TO PROCESSING WITH FORKLIFTS AND EXCAVATOR FOR MATERIAL HANDLING. COMMON MATERIALS TO BE PROCESSED INCLUDE OILS, GLYCOLS, GREASE, LATEX PAINTS, INKS, AND ADHESIVES.

PHASE II AND PHASE III BUILD OUT WILL BE UNDER A SEPARATE PERMIT. PHASE II AND PHASE III BUILD OUT TO INCLUDE PLASTIC, BIOMEDICAL, AND HAZARDOUS WASTE FACILITIES.

PROJECT LOCATION: 73 S. COMMERCE DR, CASA GRANDE, AZ 85193

PARCEL NUMBER: 503-48-1230 & 503-48-1240

LEGAL DESCRIPTION: LOTS 23 & 24 OF CENTRAL ARIZONA COMMERCE PARK CASA GRANDE, ARIZONA

JURISDICTION: CITY OF CASA GRANDE
PLANNING AND DEVELOPMENT
510 E. FLORENCE BLVD.
CASA GRANDE, AZ 85122
T: 520.421.8630

GOVERNING CODES

ALL WORK SHALL BE IN COMPLIANCE WITH, BUT NOT LIMITED TO THE REQUIREMENTS OF THE FOLLOWING AND ANY OTHER STATE AND LOCAL CODES HAVING JURISDICTION:

BUILDING:	2018 INTERNATIONAL BUILDING CODE (IBC)
PLUMBING:	2018 INTERNATIONAL PLUMBING CODE (IPC)
MECHANICAL:	2018 INTERNATIONAL MECHANICAL CODE (IMC)
FIRE:	2018 INTERNATIONAL FIRE CODE (IFC)
ELECTRICAL:	2017 NATIONAL ELECTRIC CODE
ENERGY:	2018 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
FUEL:	2018 INTERNATIONAL FUEL GAS CODE (IFC)
LOCAL:	CITY OF CASA GRANDE BUILDING AND TECHNICAL ADMINISTRATIVE CODE 2019 EDITION

DEFERRED SUBMITTALS

FIRE FIRE ALARM SYSTEM.

COVERED PARKING STRUCTURE.

UTILITIES

ELECTRICAL
ARIZONA POWER SERVICE (APS)
50 N. BROWN AVE, M.S. 4536
CASA GRANDE, ARIZONA 85222
CONTACT: MARCK LACKEY
PHONE: 623.975.5738

SANITARY SEWER & RECLAIMED WATER
CITY OF CASA GRANDE PUBLIC WORKS
3181 N CIVIC LEAR AVENUE
CASA GRANDE ARIZONA 85122
CONTACT: KEVIN LOUIS
PHONE: 520.421.8625
EMAIL: PUBLICWORKS@CASAGRANDEAZ.GOV

WATER
ARIZONA WATER COMPANY
318 N. MARSHALL STREET
CASA GRANDE ARIZONA 85122
CONTACT: MARK KIEREN
PHONE: 520.836.8785
FAX: 520.836.2850
EMAIL: CASAGRANDE@AZWATER.COM

RAILROAD
BURLINGTON NORTHERN SANTA FE
3165 S. ALMA SCHOOL RD SUITE 29
CHANDLER, AZ 85248
CONTACT: STEVEN S. BURKE, AIA
PHONE: 480.704.3506
FAX: 480.704.3505

SOUTHWEST GAS
CONTACT: NORA GALLEGOS
PHONE: 602.484.5649

CATV FIBER
COX COMMUNICATIONS
CONTACT: KIRSTEN VELDMAN
PHONE: 623.328.3425

COAXIAL FIBER
CENTURY LINK
PHONE: 480.768.4294

PROJECT DESIGN TEAM

ARCHITECT: *FM GROUP INC*
15974 NORTH 77TH STREET
SCOTTSDALE, ARIZONA 85260
CONTACT: MICHAEL STEVESON - A.I.A.
PHONE: 602.418.4009
FAX: 602.277.8288
EMAIL: msteveson@fmgroup.net

MECHANICAL AND ELECTRICAL ENGINEER:
ARDEBILI ENGINEERING
8100 E. INDIAN SCHOOL ROAD, SUITE 205
SCOTTSDALE, AZ 85251
CONTACT: OMID ARDEBILI
PHONE: 480.361.6269
FAX: 480.247.4993
EMAIL: OMID@ARDEBILIENG.COM

CIVIL: **RITOCH-POWELL & ASSOCIATES**
5727 N. 7TH STREET, SUITE 120
PHOENIX, ARIZONA 85014
PHONE: 602.263.1177

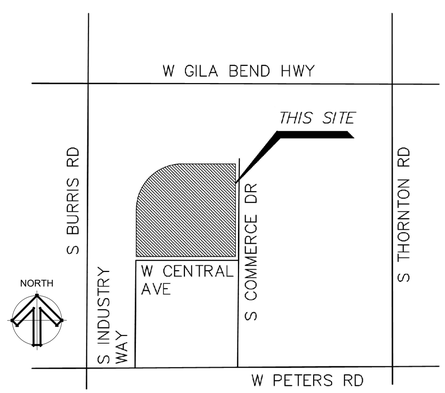
STRUCTURAL ENGINEER: (OFFICE AND SLAB)
TLCP STRUCTURAL INC.
2802 EAST INDIAN SCHOOL ROAD
PHOENIX, ARIZONA 85018
CONTACT: MICHAEL UNDERWOOD P.E.
PHONE: 602.553.8155
FAX: 602.553.8255
EMAIL: munderwood@tlcp-structural.com

LANDSCAPE ARCHITECT
STUDIO SPRAWL LANDSCAPE ARCHITECTURE
8321 E EVANS ROAD SUITE 101
SCOTTSDALE, AZ 85260
CONTACT: DAN ERLANDSON / TONY BURNS
PHONE: 480.361.9281
E: DAN@STUDIOSPRAWL.COM
E: TONY@STUDIOSPRAWL.COM

FIRE PROTECTION:
EJ FLOW TESTS
21505 NORTH 78TH AVE. SUITE 130
PEORIA, ARIZONA 85382
CONTACT: JOHN L. ECHEVERRI
PHONE: 602.999.7637

VICINITY MAP

NOT TO SCALE



OWNER:

TRIUMVIRATE ENVIROMENTAL
200 INNER BELT ROAD
SOMERVILLE, MA 02143
CONTACT: MIKE FARRELL
T: 617.594.1588
E: MFarrell@triumvirate.com

CONTRACTOR

GENERAL CONTRACTOR
GSS CO. INC.
8601 N. SCOTTSDALE RD. SUITE 140
SCOTTSDALE, ARIZONA 85258
CONTACT: DUNCAN McTAVISH
PHONE: 480.947.1515
FAX: 480.322.2256
EMAIL: duncan@gssco.com

RAILROAD SIDING
MOUNTAIN STATES CONTRACTING
4001 S. 34TH STREET
PHOENIX, AZ 85004
CONTACT: VERN VAN DE LOO
PHONE: 602.595.1575
FAX: 602.595.1708
EMAIL: vern@mscrr.com

G.S.S. Companies Inc.
"Building Arizona Since 1985"

FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
COVER SHEET
PROJECT INFORMATION

DATE
8-19-22
PROJECT NO.
20-200

CS-02

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SECTION 01010 - PROJECT PROCEDURES

REQUIREMENTS OF THE PROJECT PROCEDURES ARE MINIMUM STANDARDS.

ACCEPTANCE: SIGNING OF THE CONTRACT WILL BE DEEMED EVIDENCE THAT SITE AND DOCUMENTS HAVE BEEN EXAMINED AND THAT THE CONTRACTOR IS FAMILIAR WITH CONDITIONS UNDER WHICH WORK WILL BE DONE. BEGINNING OF WORK INDICATES ACCEPTANCE OF CONDITIONS UNDER WHICH WORK WILL BE DONE. EXTRA PAYMENTS WILL NOT BE AUTHORIZED FOR WORK THAT COULD HAVE BEEN DETERMINED BY A CAREFUL EXAMINATION OF THE SITE AND CONDITIONS.

JOB SUPERINTENDENT: A FULL TIME SUPERINTENDENT IS REQUIRED TO BE ON THE PROJECT AT ALL TIMES WORK IS PROGRESSING UNTIL IT IS COMPLETED AND ACCEPTED, UNLESS THE OWNER APPROVES OTHERWISE.

RESTRICTIONS OF AREAS OF OPERATIONS: ALL WORK DONE UNDER THIS CONTRACT SHALL PROCEED WITH DUE CARE FOR ALL SAFETY PRECAUTIONS FOR ALL PERSONNEL. CONTRACTOR SHALL ERECT SIGNS, BARRICADES, ETC., TO ENSURE SAFETY OF PERSONS WHO WILL BE IN THE IMMEDIATE VICINITY OF THE CONSTRUCTION SITE. CONTRACTORS SHALL LIMIT THEIR EMPLOYEES' ACTIVITIES STRICTLY TO THE CONSTRUCTION AREA. PARKING OF ALL VEHICLES OF ALL CONTRACTORS SHALL BE IN DESIGNATED LOCATIONS ONLY.

EXISTING CONDITIONS:
THE EXISTING UTILITIES AND OTHER CONDITIONS SHOWN OR REFERRED TO ON THE DRAWINGS OR IN THE SPECIFICATIONS WERE LOCATED FROM EXISTING DRAWINGS FOR THE CONSTRUCTION OF THE NEW WORK. NO OTHER MATERIAL FOR REFERENCE TO THE ACCURACY OF THE ACTUAL AND FINAL INSTALLATION IS AVAILABLE. WHILE IT MAY BE REASONABLE TO ASSUME THAT THE LOCATIONS ARE REASONABLY ACCURATE, THE CONTRACTOR SHOULD USE EXTREME CAUTION IN TRENCHING, BREAKING SLABS, ETC., IN THE EVENT THAT EXISTING UTILITIES ARE OTHER THAN AS MAY BE INDICATED ON THE DRAWINGS. THE ARCHITECT AND THE OWNER WILL BE NOT BE RESPONSIBLE FOR INJURIES TO WORKMEN, SUBCONTRACTORS, MATERIAL SUPPLIERS, ETC., RESULTING FROM THE CONTRACTOR'S LIABILITY TO MAINTAIN EXTREME CAUTION THROUGHOUT THE CONSTRUCTION PERIOD.

EXISTING ACTIVE SERVICE, WHEN ENCOUNTERED, SHALL BE PROTECTED AGAINST DAMAGE DUE TO DEMOLITION OR CONSTRUCTION WORK. WHERE NEW CONNECTIONS ARE TO BE MADE TO SUCH SERVICES, WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO KEEP SHUT DOWN TO AN ABSOLUTE MINIMUM. CONTRACTOR SHALL CONSULT WITH OWNER AS TO DATES, PROCEDURES, AND PERMISSIBLE DURATION OF SHUT DOWN PERIOD. DO NOT PREVENT OR DISTURB OPERATION OF OTHER SERVICES WHICH ARE TO REMAIN REGARDLESS OF THEIR LOCATION. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL COSTS RELATED TO SHUT DOWN OF EXISTING ACTIVE SERVICES INCLUDING BYPASS OR JUMPER INSTALLATIONS, FOR WORK PERFORMED UNDER THIS CONTRACT.

IF CONTRACTOR SHOULD ENCOUNTER UTILITIES OR SITE CONDITIONS NOT SHOWN ON AVAILABLE REFERENCE MATERIALS, IMMEDIATELY NOTIFY THE OWNER WHO WILL DIRECT CONTRACTOR IN REMOVAL, REPAIR, OR REROUTING OF UTILITIES AND RESOLUTION OF UNEXPECTED CONDITIONS. COST OF WORK WILL BE NEGOTIATED WITH CONTRACTOR BY THE OWNER.

CONTRACTOR SHALL BE RESPONSIBLE TO EXAMINE THE EXISTING BUILDING MATERIALS AND/OR SYSTEMS FOR THE POSSIBLE PRESENCE OF HAZARDOUS MATERIALS. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE OWNER OF ANY SUCH DISCOVERY.

LICENSES AND PERMITS: THE CONTRACTOR SHALL PAY FOR THE BUILDING PERMIT AND FEES TO UTILITIES, UNLESS THE OWNER APPROVES OTHERWISE. THE CONTRACTOR SHALL DETERMINE WHAT OTHER FEES, PERMITS OR LICENSES ARE REQUIRED IN CONNECTION WITH THE ACCOMPLISHMENT OF THE WORK UNDER THIS CONTRACT AND SHALL TAKE THE NECESSARY ACTION TO SECURE THE SAME AS REQUIRED, AND AT OR BEFORE THE COMPLETION OF THE WORK TRANSMIT THE SAME TO THE OWNER. NO WORK UNDER ANY CONTRACT WILL BE COMMENCED UNTIL THE REQUIRED PERMITS OR LICENSES ARE SECURED, EXCEPT WITH THE PERMISSION OF THE OWNER.

CLEANUP: CLEANUP OF NORMAL DEBRIS SHALL BE ACCOMPLISHED OFTEN ENOUGH TO EXPEDITE THE PROSECUTION OF THE CONSTRUCTION WORK WITH SPECIAL ATTENTION BEING SHOWN TO REMOVAL OF RUBBISH AT THE END OF EACH WEEK. CONTRACTOR SHALL ALSO MAINTAIN ADJACENT STREETS AND/OR PROPERTIES AFFECTED BY HIS WORK IN A CLEAN CONDITION. AFTER ALL CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED, LEAVE THE GROUNDS IN EVERY RESPECT READY FOR OCCUPANCY BY THE OWNER.

DUST AND POLLUTION CONTROL: CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO AVOID GENERATING EXCESSIVE DUST, INCLUDING WATERING OF SITE AS NECESSARY. DISPOSE OF ALL CHEMICALS, WASTE MATERIAL, DEBRIS, ETC., IN A LEGAL AND NONPOLLUTING MANNER.

END OF SECTION 01010

SECTION 01500 - TEMPORARY FACILITIES

TEMPORARY UTILITY SERVICES: THE TYPES OF SERVICES REQUIRED INCLUDE, BUT NOT BY WAY OF LIMITATION, WATER, SEWERAGE, SURFACE DRAINAGE, ELECTRICAL POWER AND TELEPHONES. WHERE POSSIBLE AND REASONABLE, CONNECT TO EXISTING UTILITIES FOR REQUIRED SERVICES, AND COMPLY WITH SERVICE COMPANIES' RECOMMENDATIONS ON MATERIALS AND METHODS, OR ENGAGE SERVICES COMPANIES TO INSTALL SERVICES. LOCATE AND RELOCATE SERVICES (AS NECESSARY) TO MINIMIZE INTERFERENCE WITH CONSTRUCTION OPERATIONS. CONTRACTOR SHALL PAY FOR ALL TEMPORARY UTILITY SERVICES UNLESS THE OWNER APPROVES OTHERWISE.

TEMPORARY SUPPORT FACILITIES: SANITARY FACILITIES SHALL BE PROVIDED BY THE CONTRACTOR AND MAINTAINED IN ACCORDANCE WITH OSHA STANDARDS. PROVIDE SEPARATE FACILITIES FOR MALE AND FEMALE WORKERS, SHOULD BOTH BE EMPLOYED IN ANY CAPACITY AT SITE.

SECURITY/PROTECTION PROVISIONS: THE TYPES OF TEMPORARY SECURITY AND PROTECTION PROVISIONS REQUIRED INCLUDE, BUT NOT BY WAY OF LIMITATION, FIRE PROTECTION, BARRICADES, WARNING SIGNS/LIGHTS, SITE ENCLOSURE FENCE, BUILDING ENCLOSURE/LOCKUP, WATCHMAN SERVICE, PERSONNEL SECURITY PROGRAM (THEFT PROTECTION), ENVIRONMENTAL PROTECTION, AND SIMILAR PROVISIONS INTENDED TO MINIMIZE PROPERTY LOSSES, PERSONAL INJURIES AND CLAIMS FOR DAMAGES AT PROJECT SITE.

CONSTRUCTION FENCE: BEFORE CONSTRUCTION OPERATIONS BEGIN, CONTRACTOR SHALL PROVIDE A CHAIN LINK CONSTRUCTION FENCE, SEVEN FOOT MINIMUM HEIGHT, AROUND THE ENTIRE PERIMETER OF THE CONSTRUCTION AREA OR AS OTHERWISE SHOWN ON THE DRAWINGS. PROVIDE GATES AS REQUIRED FOR ACCESS WITH NECESSARY HARDWARE, INCLUDING HASPS AND PADLOCKS. FENCE SHALL BE MAINTAINED IN A STABLE AND SECURE MANNER FOR THE DURATION OF ITS USE.

BUILDING ENCLOSURE AND LOCKUP: AT EARLIEST POSSIBLE DATE, SECURE BUILDING AGAINST UNAUTHORIZED ENTRANCE AT TIMES WHEN PERSONNEL ARE NOT WORKING. PROVIDE SECURE TEMPORARY ENCLOSURES WITH LOCKED ENTRANCES. CONTRACTOR SHALL MAINTAIN PROVISIONS FOR CLOSING AND LOCKING WORKING AREA AND FACILITIES AT THE CLOSE OF EACH DAY. COORDINATE THIS REQUIREMENT WITH OWNER TO ENSURE SECURITY OF THE FACILITIES.

FIRE EXTINGUISHERS: PROVIDE TYPES, SIZES, NUMBERS AND LOCATIONS AS WOULD BE REASONABLY EFFECTIVE IN EXTINGUISHING FIRES DURING EARLY STAGES, BY PERSONNEL AT PROJECT SITE.

END OF SECTION 01500

SECTION 01631 - PRODUCTS AND SUBSTITUTIONS

THE OWNER AND ARCHITECT HAVE IN GOOD FAITH REVIEWED ALL SPECIFIED PRODUCTS AND EQUIPMENT FOR THIS SPECIFIC DESIGN. THE FOLLOWING DEFINITIONS HAVE BEEN UTILIZED TO CONVEY THE OWNER'S CHOICES FOR PRODUCTS AND EQUIPMENT.

- THE TERM PRODUCT, AS USED HEREIN, INCLUDES THE TERMS "MATERIAL," "EQUIPMENT," "SYSTEM," AND IS AN "OPEN SPECIFIED" PRODUCT.
- THE TERM NAMED PRODUCTS ARE PRODUCTS IDENTIFIED BY USE OF THE MANUFACTURER'S NAME FOR A PRODUCT, INCLUDING SUCH ITEMS AS A MAKE OR MODEL DESIGNATION, AS RECORDED IN PUBLISHED PRODUCT LITERATURE, OF THE LATEST ISSUE AS OF THE DATE OF THE CONTRACT DOCUMENTS. NO SUBSTITUTION IS ALLOWED UNLESS "OR EQUIVALENT" IS NOTED.

END OF SECTION 01631

SECTION 01700 - PROJECT CLOSEOUT

FINAL CLEANING:
PROVIDE FINAL CLEANING OF THE WORK, AT TIME INDICATED, CONSISTING OF CLEANING EACH SURFACE OR UNIT OF WORK TO NORMAL "CLEAN" CONDITION EXPECTED FOR A FIRST-CLASS BUILDING CLEANING AND MAINTENANCE PROGRAM. COMPLY WITH MANUFACTURER'S INSTRUCTIONS FOR CLEANING OPERATIONS. THE FOLLOWING ARE EXAMPLES, BUT NOT BY WAY OF LIMITATION, OF CLEANING LEVELS REQUIRED:

- REMOVE LABELS WHICH ARE NOT REQUIRED AS PERMANENT LABELS.
- CLEAN TRANSPARENT MATERIALS, INCLUDING MIRRORS AND WINDOW/DOOR GLASS, TO A POLISHED CONDITION, REMOVING SUBSTANCES WHICH ARE NOTICEABLE AS VISION-OBSCURING MATERIALS. REPLACE BROKEN GLASS AND DAMAGED TRANSPARENT MATERIALS.
- CLEAN EXPOSED EXTERIOR AND INTERIOR HARD-SURFACED FINISHES, TO A DIRT-FREE CONDITION, FREE OF DUST, STAINS, FILMS AND SIMILAR NOTICEABLE DISTRACTING SUBSTANCES. EXCEPT AS OTHERWISE INDICATED, AVOID DISTURBANCE OF NATURAL WEATHERING OF EXTERIOR SURFACES. RESTORE REFLECTIVE SURFACES TO ORIGINAL REFLECTIVE CONDITION.
- WIPE SURFACES OF MECHANICAL AND ELECTRICAL EQUIPMENT CLEAN, INCLUDING ELEVATOR EQUIPMENT AND SIMILAR EQUIPMENT; REMOVE EXCESS LUBRICATION AND OTHER SUBSTANCES.
- REMOVE DEBRIS AND SURFACE DUST FROM LIMITED-ACCESS SPACES INCLUDING ROOFS, PLENUMS, AND SIMILAR SPACES.
- CLEAN INTERIOR CONCRETE FLOORS USING BROOM AND DAMP MOP. SWEEP EXTERIOR CONCRETE SURFACES AND REMOVE ALL DIRT, GREASE, AND OTHER DELETERIOUS MATERIALS CAUSED BY CONSTRUCTION PROCESSES.
- CLEAN LIGHT FIXTURES AND LAMPS SO AS TO FUNCTION WITH FULL EFFICIENCY.
- CLEAN PROJECT SITE (YARD AND GROUNDS), INCLUDING LANDSCAPE DEVELOPMENT AREAS, OF LITTER AND FOREIGN SUBSTANCES. SWEEP PAVED AREAS TO A BROOM-CLEAN CONDITION AND REMOVE STAINS, PETROCHEMICAL SPILLS AND OTHER FOREIGN DEPOSITS. RAKE GROUNDS WHICH ARE NEITHER PLANTED NOR PAVED, TO A SMOOTH, EVEN-TEXTURED SURFACE. LEAVE ACCESS ROUTES TO SITE IN CONDITION IN WHICH THEY WERE FOUND AT BEGINNING OF PROJECT.

END OF SECTION 01700

SECTION 02230 - SITE CLEARING

REFER TO CIVIL ENGINEERING SPECIFICATIONS.

END OF SECTION 02230

SECTION 02300 - EARTHWORK

REFER TO CIVIL ENGINEERING SPECIFICATIONS.

END OF SECTION 02300

SECTION 02820 - GALVINAL FABRIC ON GALVANIZED FRAMEWORK CHAIN LINK FENCE

MATERIALS:
STRUCTURAL STEEL SHALL CONFORM TO ASTM A36 (FY = 36,000 PSI) UNLESS OTHERWISE NOTED.

SHAPE INDICATED AS "HIGH STRENGTH" OR "GRADE 50" SHALL BE ASTM A572, GRADE 50.

STEEL TUBE COLUMNS SHALL CONFORM TO ASTM A500, GRADE B (FY = 46 KSI).

WELDING RODS SHALL CONFORM TO AWS A5.0, E70 SERIES, LOW HYDROGEN TYPE.

SECTIONS SHALL BE OF DIMENSIONS, WEIGHT AND DESIGN AS INDICATED, ASSEMBLED COMPLETE AT THE SHOP, WITH BASE PLATES AND OTHER DETAILED MATERIALS ATTACHED.

ALL MATERIAL MUST BE NEW, OF UNIFORM QUALITY, SUITABLE AND WITHOUT DEFECTS AFFECTING THE STRENGTH OR SERVICE OF THE STRUCTURE.

CHAIN LINK FENCE FRAMING
INSTALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPROVED SUBMITTALS. COMPLY WITH ASTM F567. INSTALL MATERIALS IN PROPER RELATION WITH ADJACENT CONSTRUCTION AND WITH UNIFORM APPEARANCE. COORDINATE WITH WORK OF OTHER SECTIONS.

CUT PIPE WITH PIPE-CUTTERS ONLY. CUTTING WITH BACKSAWS IS NOT ACCEPTABLE. TACK WELD GATES FOR STRENGTH. USE SPRING LOADED LATCHES, NOT YOKES.

RESTORE OR REPLACE DAMAGED COMPONENTS. CLEAN AND PROTECT WORK FROM DAMAGE.

END OF SECTION 02820

SECTION 03300 - CAST-IN-PLACE CONCRETE

REFER TO STRUCTURAL ENGINEERING SPECIFICATIONS.

END OF SECTION 03300

SECTION 04800 - MASONRY ASSEMBLIES

REFER TO STRUCTURAL ENGINEERING SPECIFICATIONS.

END OF SECTION 04800

SECTION 05510 - METAL STAIRS

REFER TO STRUCTURAL ENGINEERING SPECIFICATIONS.

END OF SECTION 05510

SECTION 05520 - HANDRAILS AND RAILINGS

REFER TO STRUCTURAL ENGINEERING SPECIFICATIONS.

END OF SECTION 05520

SECTION 06100 - ROUGH CARPENTRY

SUMMARY: TYPES OF WORK IN THIS SECTION INCLUDE ROUGH CARPENTRY FOR:

- WOOD GROUNDS, NAILERS, AND BLOCKING: PROVIDE WOOD FOR SUPPORT OR ATTACHMENT OF OTHER WORK INCLUDING ROOFTOP EQUIPMENT CURBS AND SUPPORT BASES, CANT STRIPS, BUCKS, NAILERS, BLOCKING, GROUNDS, STRIPPING, AND SIMILAR MEMBERS.
- PLYWOOD BACKING PANELS: FOR MOUNTING ELECTRICAL OR TELEPHONE EQUIPMENT, PROVIDE FIRE-RETARDANT TREATED PLYWOOD PANELS WITH GRADE DESIGNATION APA C-D PLUGGED INT WITH EXTERIOR GLUE, IN THICKNESS INDICATED, OR, IF NOT OTHERWISE INDICATED, NOT LESS THAN 1/2 INCH.

LUMBER STANDARDS: MANUFACTURE LUMBER TO COMPLY WITH PS 20 "AMERICAN SOFTWOOD LUMBER STANDARD" AND WITH APPLICABLE GRADING RULES OF INSPECTION AGENCIES CERTIFIED BY AMERICAN LUMBER STANDARDS COMMITTEE'S (ALSC) BOARD OF REVIEW.

INSPECTION AGENCIES: INSPECTION AGENCIES AND THE ABBREVIATIONS USED TO REFERENCE WITH LUMBER GRADES AND SPECIES INCLUDE THE FOLLOWING:

- WCLIB - WEST COAST LUMBER INSPECTION BUREAU.
- WWPA - WESTERN WOOD PRODUCTS ASSOCIATION.

NOMINAL SIZES ARE INDICATED, EXCEPT AS SHOWN BY DETAIL DIMENSIONS. PROVIDE ACTUAL SIZES AS REQUIRED BY PS 20, FOR MOISTURE CONTENT SPECIFIED FOR EACH USE.

- PROVIDE DRESSED LUMBER, S4S, UNLESS OTHERWISE INDICATED.
- PROVIDE MOISTURE CONTENT OF 19% OR LESS AT TIME OF ENCLOSURE FOR LUMBER 2 INCHES OR LESS IN NOMINAL THICKNESS WITH THE INDICATION OF "S-DRY" OR "S-GRN" ON THE GRADE STAMP.

FASTENERS AND ANCHORAGES: PROVIDE SIZE, TYPE, MATERIAL AND FINISH AS INDICATED AND AS RECOMMENDED BY APPLICABLE STANDARDS, COMPLYING WITH APPLICABLE FEDERAL SPECIFICATIONS FOR NAILS, STAPLES, SCREWS, BOLTS, NUTS, WASHERS, AND ANCHORING DEVICES.

WOOD TREATMENT BY PRESSURE PROCESS:
PRESERVATIVE TREATMENT: WHERE LUMBER OR PLYWOOD IS SPECIFIED HEREIN TO BE TREATED, COMPLY WITH APPLICABLE REQUIREMENTS OF AWPA STANDARDS C2 (LUMBER) AND C9 (PLYWOOD) AND OF AWPB STANDARDS LISTED BELOW. MARK EACH TREATED ITEM WITH THE AWPB QUALITY MARK REQUIREMENTS.

PRESSURE-TREAT ABOVE-GROUND ITEMS WITH WATER-BORNE PRESERVATIVES TO COMPLY WITH AWPB LP-2. AFTER TREATMENT, KILN-DRY LUMBER AND PLYWOOD TO MAXIMUM MOISTURE CONTENT, RESPECTIVELY, OF 19 PERCENT AND 15 PERCENT. TREAT INDICATED ITEMS AND THE FOLLOWING:

- WOOD CANTS, NAILERS, CURBS, EQUIPMENT SUPPORT BASES, BLOCKING, STRIPPING, AND SIMILAR MEMBERS IN CONNECTION WITH ROOFING, FLASHING, VAPOR BARRIERS AND WATERPROOFING.
- WOOD SILLS, SLEEPERS, BLOCKING, FURRING, STRIPPING.
- COMPLETE FABRICATION OF TREATED ITEMS PRIOR TO TREATMENT, WHERE POSSIBLE. IF CUT AFTER TREATMENT, COAT CUT SURFACES WITH HEAVY BRUSH COAT OF SAME CHEMICAL USED FOR TREATMENT AND TO COMPLY WITH AWPA M4. INSPECT EACH PIECE OF LUMBER OR PLYWOOD AFTER DRYING AND DISCARD DAMAGED OR DEFECTIVE PIECES.

FIRE-RETARDANT TREATMENT: WHERE WOOD OCCURS WITHIN A FIRE-RATED ASSEMBLY OR WHERE FIRE-RETARDANT TREATED WOOD IS INDICATED, PRESSURE IMPREGNATE LUMBER AND PLYWOOD WITH FIRE-RETARDANT CHEMICALS TO COMPLY WITH AWPA C20 AND C27, RESPECTIVELY, FOR TREATMENT TYPE INDICATED BELOW; IDENTIFY FIRE TREATED LUMBER WITH APPROPRIATE CLASSIFICATION MARKING OF UNDERWRITERS LABORATORIES INC., U. S. TESTING, TIMBER PRODUCTS INSPECTION, OR OTHER TESTING AND INSPECTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.

INSTALLATION - GENERAL:
DISCARD UNITS OF MATERIAL WITH DEFECTS WHICH MIGHT IMPAIR QUALITY OF WORK, AND UNITS WHICH ARE TOO SMALL TO USE IN FABRICATING WORK WITH MINIMUM JOINTS OR OPTIMUM JOINT ARRANGEMENT.

SET CARPENTRY WORK TO REQUIRED LEVELS AND LINES, WITH MEMBERS PLUMB AND TRUE TO LINE AND CUT AND FITTED. ATTACH TO SUBSTRATES AS REQUIRED TO SUPPORT APPLIED LOADING. COUNTERSINK BOLTS AND NUTS FLUSH WITH SURFACES, UNLESS OTHERWISE INDICATED. BUILD INTO MASONRY DURING INSTALLATION OF MASONRY WORK. WHERE POSSIBLE, ANCHOR TO FORMWORK BEFORE CONCRETE PLACEMENT.

END OF SECTION 06100

SECTION 07200 - INSULATION

SUMMARY:
EXTENT OF INSULATION IS SHOWN ON DRAWINGS. APPLICATION OF INSULATION SPECIFIED IN THIS SECTION IS:

- BLANKET-TYPE BUILDING INSULATION. APPLICATION: INTERIOR WALL CAVITY.
- EXTRUDED POLYSTYRENE, RIGID. APPLICATION: INTERIOR WALL CAVITY AND UNDERSIDE OF ROOFS.
- SOUND ATTENUATION INSULATION.

ACCESSORIES:

- ADHESIVES AND MECHANICAL ANCHORS AND CLIPS.
- PROTECTION BOARD.
- CRACK SEALERS AND TAPES.

QUALITY ASSURANCE:
THERMAL RESISTIVITY: WHERE THERMAL RESISTIVITY PROPERTIES OF INSULATION MATERIALS ARE DESIGNATED BY R-VALUES, THEY REPRESENT THE RATE OF HEAT FLOW THROUGH A HOMOGENOUS MATERIAL EXACTLY 1" THICK, MEASURED BY TEST METHOD INCLUDED IN REFERENCED MATERIAL STANDARD OR OTHERWISE INDICATED. THEY ARE EXPRESSED BY THE TEMPERATURE DIFFERENCE IN DEGREES F BETWEEN THE TWO EXPOSED FACES REQUIRED TO CAUSE ONE BTU TO FLOW THROUGH ONE SQUARE FOOT PER HOUR AT MEAN TEMPERATURES INDICATED.

FIRE AND INSURANCE RATINGS: PROVIDE INSULATION MATERIALS WHICH ARE IDENTICAL TO THOSE WHOSE FIRE PERFORMANCE CHARACTERISTICS, AS LISTED FOR EACH MATERIAL OR ASSEMBLY OF WHICH INSULATION IS A PART, HAVE BEEN DETERMINED BY TESTING, PER METHODS INDICATED BELOW, BY UL OR OTHER TESTING AND INSPECTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.
SURFACING BURNING CHARACTERISTICS: ASTM E84.
FIRE RESISTANCE RATINGS: ASTM E119.

INSULATING MATERIALS:
GENERAL: PROVIDE INSULATING MATERIALS WHICH COMPLY WITH REQUIREMENTS INDICATED FOR MATERIALS, COMPLIANCE WITH REFERENCED STANDARDS, AND OTHER CHARACTERISTICS.

THERMAL FOIL-FACED BATTS: THERMAL INSULATION PRODUCED BY A LIGHT-DENSITY MINERAL FIBER TYPE WITH FOIL-FACE COMPLYING WITH ASTM C553 FOR TYPE I:
MINERAL FIBER TYPE: FIBERS MANUFACTURED FROM GLASS.
THICKNESS: TO ATTAIN MINIMUM R-VALUE OF 11.

UNFACED BATTS: ACOUSTICAL PERFORMANCE PRODUCED BY A LIGHT-DENSITY MINERAL FIBER TYPE COMPLYING WITH ASTM 553 FOR TYPE 1.

INSPECTION AND PREPARATION:
REQUIRE INSTALLER TO EXAMINE SUBSTRATES AND CONDITIONS UNDER WHICH INSULATION WORK IS TO BE PERFORMED. A SATISFACTORY SUBSTRATE IS ONE THAT COMPLIES WITH REQUIREMENTS OF THE SECTION IN WHICH SUBSTRATE AND RELATED WORK IS SPECIFIED. OBTAIN INSTALLER'S WRITTEN REPORT LISTING CONDITIONS DETRIMENTAL TO PERFORMANCE OF WORK IN THIS SECTION. DO NOT PROCEED WITH INSTALLATION OF INSULATION UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

CLEAN SUBSTRATES OF SUBSTANCES HARMFUL TO INSULATIONS OR VAPOR RETARDERS, INCLUDING REMOVAL OF PROJECTIONS WHICH MIGHT PUNCTURE VAPOR RETARDERS.

INSTALLATION - GENERAL:
INSTALL MATERIALS AND SYSTEMS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPROVED SUBMITTALS.

INSTALL MATERIALS AND SYSTEMS IN PROPER RELATION WITH ADJACENT CONSTRUCTION. COORDINATE WITH WORK OR OTHER SECTIONS. PROVIDE FULL THICKNESS IN ONE LAYER OVER ENTIRE AREA, TIGHTLY-FITTING AROUND PENETRATIONS.

POUR LOOSE INSULATION INTO CAVITIES INDICATED; PROVIDE UNIFORM COVERAGE AT CORRECT DENSITY AND THICKNESS. INSTALL VAPOR RETARDER OVER ENTIRE AREA OF INSIDE FACE OF EXTERIOR WALLS AND ELSEWHERE AS INDICATED. SEAL ALL SEAMS AND AROUND PERIMETER AND PENETRATIONS WITH DUCT TAPE TO FORM A CONTINUOUS VAPOR RETARDER FREE OF HOLES.

PROTECT INSTALLED INSULATION AND VAPOR RETARDER.

END OF SECTION 07200

SECTION 08110 - HOLLOW METAL DOORS AND FRAMES

SUMMARY:
EXTENT OF HOLLOW METAL DOORS AND FRAMES IS SHOWN ON DRAWINGS AND IN SCHEDULES. TYPE OF DOORS AND FRAMES SPECIFIED IN THIS SECTION INCLUDE:

- EXTERIOR HOLLOW METAL DOORS AND/OR FRAMES.
- INTERIOR HOLLOW METAL DOORS AND/OR FRAMES.
- RATED INTERIOR HOLLOW METAL DOORS AND/OR FRAMES.

QUALITY ASSURANCE:
PROVIDE FRAMES COMPLYING WITH STEEL DOOR INSTITUTE "RECOMMENDED SPECIFICATIONS: STANDARD STEEL DOORS AND FRAMES" (SDI-100) AND AS HEREIN SPECIFIED.

FIRE-RATED ASSEMBLIES: PROVIDE FIRE-RATED FRAME ASSEMBLIES INVESTIGATED AND TESTED AS FIRE DOOR ASSEMBLIES, COMPLETE WITH TYPE OF HARDWARE TO BE USED. IDENTIFY EACH UNIT DOOR WITH RECOGNIZED TESTING LABORATORY LABELS, INDICATING APPLICABLE FIRE RATING. CONSTRUCT AND INSTALL ASSEMBLIES TO COMPLY WITH NEPA STANDARD NO. 80, AND AS HEREIN SPECIFIED.

HOT-ROLLED STEEL SHEETS AND STRIP: COMMERCIAL QUALITY CARBON STEEL, PICKLED AND OILED, COMPLYING WITH ASTM A569 AND ASTM A568.

COLD-ROLLED STEEL SHEETS: COMMERCIAL QUALITY CARBON STEEL, COMPLYING WITH ASTM A366 AND ASTM A568.

GALVANIZED STEEL SHEETS: ZINC-COATED CARBON STEEL SHEETS OF COMMERCIAL QUALITY, COMPLYING WITH ASTM A526, WITH ASTM A525, G60 ZINC COATING, MILL PHOSPHATIZED.

WIPE COAT GALVANIZED PRODUCTS, IN ACCORDANCE WITH ASTM A525M AND A526, ARE ACCEPTABLE.

SUPPORTS AND ANCHORS: FABRICATE OF NOT LESS THAN 18 GAUGE GALVANIZED SHEET STEEL.

INSERTS, BOLTS AND FASTENERS: MANUFACTURER'S STANDARD UNITS, EXCEPT HOT-DIP GALVANIZE ITEMS TO BE BUILT INTO EXTERIOR WALLS, COMPLYING WITH ASTM A153, CLASS C OR D, AS APPLICABLE.

SHOP-APPLIED PAINT:
PRIMER: RUST-INHIBITIVE ENAMEL OR PAINT, EITHER AIR-DRYING OR BAKING, SUITABLE AS A BASE FOR SPECIFIED FINISH PAINTS.

FABRICATION - GENERAL:
STEEL FRAMES:
PROVIDE METAL FRAMES FOR DOORS, TRANSOMS, SIDELIGHTS, BORROWED LIGHTS, WINDOWS, "STOREFRONT," AND OTHER OPENINGS, OF TYPES AND STYLES AS SHOWN ON DRAWINGS AND SCHEDULES. CONCEAL FASTENINGS AS MUCH AS POSSIBLE.

FABRICATE FRAMES WITH MITERED AND CONTINUOUSLY WELDED CORNERS, SANDED SMOOTH; KNOCK-DOWN FRAMES ARE NOT ACCEPTABLE.

- FRAMES FOR ALL EXTERIOR OPENINGS SHALL BE NO LESS THAN 14 GAUGE GALVANIZED STEEL.
- FRAMES FOR ALL INTERIOR OPENINGS SHALL BE NO LESS THAN 16 GAUGE STEEL, EXCEPT THAT FOR OPENINGS MORE THAN 4 FEET IN WIDTH, FRAMES SHALL BE 14 GAUGE.

DOOR SILENCERS: EXCEPT ON WEATHER-STRIPPED DOOR FRAMES, DRILL STOPS TO RECEIVE SCHEDULED SILENCERS.

FINISH HARDWARE PREPARATION:
PREPARE FRAMES TO RECEIVE FINISH HARDWARE IN ACCORDANCE WITH FINAL FINISH HARDWARE SCHEDULE AND TEMPLATES PROVIDED BY HARDWARE SUPPLIER. COMPLY WITH APPLICABLE REQUIREMENTS OF ANSI A 115 SERIES SPECIFICATIONS FOR FRAME PREPARATION FOR HARDWARE.

REINFORCE FRAMES TO RECEIVE SURFACE-APPLIED HARDWARE. DRILLING AND TAPPING FOR SURFACE-APPLIED FINISH HARDWARE MAY BE DONE AT PROJECT SITE.

LOCATE FINISH HARDWARE AS SHOWN ON FINAL SHOP DRAWINGS AND IN ACCORDANCE WITH "RECOMMENDED LOCATIONS FOR BUILDER'S HARDWARE," PUBLISHED BY DOOR AND HARDWARE INSTITUTE.

SHOP PAINTING:
CLEAN, TREAT, AND PAINT EXPOSED SURFACES OF HOLLOW METAL FRAME UNITS, INCLUDING GALVANIZED SURFACES.

CLEAN STEEL SURFACES OF MILL SCALE, RUST, OIL, GREASE, DIRT, AND OTHER FOREIGN MATERIALS BEFORE APPLICATION OF PAINT.

END OF SECTION 08110

SECTION 08210 - WOOD DOORS

SUMMARY:
EXTENT OF WOOD DOORS IS SHOWN ON DRAWINGS AND IN SCHEDULES. TYPES OF DOORS REQUIRED INCLUDE THE FOLLOWING:

- SOLID CORE FLUSH WOOD DOORS WITH WOOD VENEER OR PAINT GRADE FACES.
- WOOD TRANSOM PANELS.

QUALITY ASSURANCE:
QUALITY STANDARDS: COMPLY WITH THE FOLLOWING STANDARDS:

- NWWDA QUALITY STANDARD: I.S.1 "INDUSTRY STANDARD FOR WOOD FLUSH DOORS," OF NATIONAL WOOD WINDOW AND DOOR ASSOCIATION (NWWDA).
- AWI QUALITY STANDARDS: "ARCHITECTURAL WOODWORK QUALITY STANDARDS" INCLUDING SECTION 1300 "ARCHITECTURAL FLUSH DOORS," OF ARCHITECTURAL WOODWORK INSTITUTE (AWI) FOR GRADE OF DOOR, CORE CONSTRUCTION, FINISH AND OTHER REQUIREMENTS EXCEEDING THOSE OF NWWDA QUALITY STANDARD.

NWWDA QUALITY MARKING: MARK EACH WOOD DOOR WITH NWWDA WOOD FLUSH DOOR CERTIFICATION HALLMARK CERTIFYING COMPLIANCE WITH APPLICABLE REQUIREMENTS OF NWWDA I.S.1 SERIES.

FIRE-RATED WOOD DOORS: PROVIDE WOOD DOORS WHICH ARE IDENTICAL IN MATERIALS AND CONSTRUCTION TO UNITS TESTED IN DOOR AND FRAME ASSEMBLIES PER ASTM E152 AND WHICH ARE LABELED AND LISTED FOR RATINGS INDICATED BY UL, WARNOCK HERSEY OR OTHER TESTING AND INSPECTION AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.

MANUFACTURER: OBTAIN DOORS FROM A SINGLE MANUFACTURER.

PRODUCT DELIVERY, STORAGE AND HANDLING:
PROTECT DOORS DURING TRANSIT, STORAGE, AND HANDLING TO PREVENT DAMAGE, SOILING, AND DETERIORATION. COMPLY WITH REQUIREMENTS OF REFERENCED STANDARDS AND RECOMMENDATIONS OF NWWDA PAMPHLET, "HOW TO STORE, HANDLE, FINISH, INSTALL, AND MAINTAIN WOOD DOORS," AS WELL AS WITH MANUFACTURER'S INSTRUCTIONS.

DOOR MANUFACTURER'S WARRANTY: SUBMIT WRITTEN AGREEMENT ON DOOR MANUFACTURER'S STANDARD FORM SIGNED BY MANUFACTURER, INSTALLER AND CONTRACTOR, AGREEING TO REPAIR OR REPLACE DEFECTIVE DOORS WHICH HAVE WARPED (BOW, CUP OR TWIST) OR THAT SHOW TELEGRAPHING OF CORE CONSTRUCTION IN FACE VENEERS, OR DO NOT CONFORM TO TOLERANCE LIMITATIONS OF REFERENCED QUALITY STANDARDS.

- WARRANTY SHALL ALSO INCLUDE REINSTALLATION WHICH MAY BE REQUIRED DUE TO REPAIR OR REPLACEMENT OF DEFECTIVE DOORS WHERE DEFECT WAS NOT APPARENT PRIOR TO HANGING.
- WARRANTY SHALL BE IN EFFECT DURING FOLLOWING PERIODS OF TIME AFTER DATE OF SUBSTANTIAL COMPLETION.
- SOLID CORE INTERIOR DOORS: LIFE OF INSTALLATION.
- SOLID CORE EXTERIOR DOORS: 2 YEARS.

INTERIOR FLUSH WOOD DOORS:
SOLID CORE DOORS: COMPLY WITH THE FOLLOWING REQUIREMENTS:

- FACES: TRANSPARENT FINISH (INTERIOR): PLAIN SAWN RED OAK.
  - PAINT GRADE (EXTERIOR): MEDIUM DENSITY OVERLAY PLYWOOD.
  - TRANSOM PANELS: TO MATCH DOOR OVER WHICH INSTALLED (PAINT GRADE OR VENEER).

AWI GRADE: CUSTOM

- VENEER MATCH: RANDOM.
- CONSTRUCTION: SLC-5 OR SLC-77 (GLUED BLOCK CORE, 5- OR 7-PLY).
  (NOTE: NO "9-PLY" DOORS PERMITTED.)
- THICKNESS: 1-3/4".
- ADHESIVES: TYPE 1 FOR INTERIOR DOORS, TYPE 1 CERTIFIED (ALL GLUE LINES TYPE 1) FOR EXTERIOR DOORS.

FIRE-RATED SOLID CORE DOORS: COMPLY WITH THE FOLLOWING REQUIREMENTS:
PROVIDE FACES AND GRADE TO MATCH NON-RATED DOORS.

- CONSTRUCTION: MANUFACTURER'S MINERAL CORE CONSTRUCTION AS REQUIRED TO PROVIDE FIRE-RESISTANCE RATING INDICATED. PROVIDE LOCK BLOCK 5" X 12" WHEN BORED, UNIT OR MORTISE LOCK IS USED. PROVIDE TWO LOCK BLOCKS FOR EXIT DEVICES. PROVIDE 6" TOP RAIL FOR DOORS WITH CLOSERS.

END OF SECTION 08210

SECTION 08330 - OVERHEAD COILING DOORS AND GRILLES

SUBMITTALS:

- PRODUCT DATA: SUBMIT MANUFACTURER'S PRODUCT DATA AND INSTALLATION INSTRUCTIONS FOR EACH MATERIAL AND PRODUCT USED.
- SHOP DRAWINGS: SUBMIT SHOP DRAWINGS INDICATING MATERIAL CHARACTERISTICS, DETAILS OF CONSTRUCTION, CONNECTIONS, AND RELATIONSHIP WITH ADJACENT CONSTRUCTION.
  COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS, WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

FIRE-RATED ASSEMBLIES: NFPA 80, AND ACCEPTABLE TESTING AGENCY LISTING.

MATERIALS:

- TYPE: STANDARD SERVICE DOOR, FIRE-RATED.
- DOOR CURTAIN: GALVANIZED STEEL SHEET.
- MOUNTING: BETWEEN THE JAMBS.
- STAINLESS STEEL FINISH: NO. 4 SATIN FINISH.

INSTALL MATERIALS AND SYSTEMS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPROVED SUBMITTALS. INSTALL MATERIALS AND SYSTEMS IN PROPER RELATION WITH ADJACENT CONSTRUCTION AND WITH UNIFORM APPEARANCE. COORDINATE WITH WORK OF OTHER SECTIONS.

INSTALL ASSEMBLIES COMPLETE WITH ALL HARDWARE, ANCHORS, INSERTS, SUPPORTS, AND ACCESSORIES. TEST AND ADJUST OPERATION.

INSTALL FIRE-RATED DOORS TO COMPLY WITH NFPA 80.

PROVIDE WEATHER STRIPPING AND WINDLOCKS FOR DOORS INSTALLED IN EXTERIOR WALLS.

RESTORE DAMAGED FINISHES AND TEST FOR PROPER OPERATION. CLEAN AND PROTECT WORK FROM DAMAGE.

END OF SECTION 08330

SECTION 08411 - ALUMINUM-FRAMED STOREFRONTS

SHOW DESIGN LOADS, INCLUDING WIND LOADS AND SEISMIC LOADS, ON DRAWINGS.

STRUCTURAL PERFORMANCE: PROVIDE SYSTEMS, INCLUDING ANCHORAGE, CAPABLE OF WITHSTANDING LOADS INDICATED.

STRUCTURAL TESTING: SYSTEMS TESTED ACCORDING TO ASTM E330 AT 150 PERCENT OF INWARD AND OUTWARD WIND-LOAD DESIGN PRESSURES DO NOT EVIDENCE MATERIAL FAILURES, STRUCTURAL DISTRESS, DEFLECTION FAILURES, OR PERMANENT DEFORMATION OF MAIN FRAMING MEMBERS EXCEEDING 0.2 PERCENT OF CLEAR SPAN.

AIR INFILTRATION: LIMITED TO 0.06 CFM/SQ. FT. (0.3 L/S PER SQ. M) OF SYSTEM SURFACE AREA WHEN TESTED ACCORDING TO ASTM E283.

WATER PENETRATION: SYSTEMS DO NOT EVIDENCE WATER LEAKAGE WHEN TESTED ACCORDING TO ASTM E331 AT MINIMUM DIFFERENTIAL PRESSURE OF 20 PERCENT OF INWARD ACTING WIND LOAD DESIGN PRESSURE.

SUBMITTALS: PRODUCT DATA, SHOP DRAWINGS, AND COLOR SAMPLES.

FOR ENTRANCE SYSTEMS, INCLUDE HARDWARE SCHEDULE AND LOCATIONS.

REFER TO DOOR SCHEDULE FOR SITE-SPECIFIC PRODUCT AND EXECUTION. DRAWING INFORMATION SUPERSEDES SPECIFICATIONS HEREIN.

ALUMINUM-FRAMED STOREFRONTS

ALUMINUM: ASTM B209 (ASTM B209M) SHEET; ASTM B221 (ASTM B221M) EXTRUSIONS.

ALUMINUM FRAMING: SOUTHWEST ALUMINUM IGC 4S1 NON-THERMALLY BROKEN 2" X 4-1/2" CENTER SET GLAZING SYSTEM FOR 1" INSULATED GLASS.

GLAZING: SPECIFIED IN DIVISION 8 SECTION "GLAZING."

SEALANTS AND JOINT FILLERS: FOR JOINTS AT PERIMETER OF SYSTEMS AS SPECIFIED IN DIVISION 7 SECTION "JOINT SEALANTS."

DOORS: 1-3/4" (44.5 MM) THICK GLAZED DOORS WITH MINIMUM 0.125" (3.2 MM) THICK, EXTRUDED TUBULAR RAIL AND STILE MEMBERS, MECHANICALLY FASTENED CORNERS WITH REINFORCING BRACKETS THAT ARE DEEP PENETRATION AND FILLET WELDED OR THAT INCORPORATE CONCEALED TIE-RODS, SNAP-ON EXTRUDED-ALUMINUM GLAZING STOPS, AND PREFORMED GASKETS.

EXTERIOR DOORS: PROVIDE COMPRESSION WEATHER STRIPPING AT FIXED STOPS. AT OTHER LOCATIONS, PROVIDE SLIDING WEATHER STRIPPING RETAINED IN ADJUSTABLE STRIP MORTISED INTO DOOR EDGE.

HARDWARE: AS SPECIFIED IN DIVISION 8 SECTION "DOOR HARDWARE."

FASTENERS AND ACCESSORIES: COMPATIBLE WITH ADJACENT MATERIALS, CORROSION-RESISTANT, NON-STAINING, AND NON-BLEEDING. USE CONCEALED FASTENERS EXCEPT FOR APPLICATION OF DOOR HARDWARE.

FABRICATION: FABRICATE FRAMING IN PROFILES INDICATED FOR FLUSH GLAZING (WITHOUT PROJECTING STOPS). PROVIDE SUBFRAMES AND REINFORCING OF TYPES INDICATED OR, IF NOT INDICATED, AS REQUIRED FOR A COMPLETE SYSTEM. FACTORY ASSEMBLY COMPONENTS TO GREATEST EXTENT POSSIBLE. DISASSEMBLE COMPONENTS ONLY AS NECESSARY FOR SHIPMENT AND INSTALLATION.

DOOR FRAMING: REINFORCE TO SUPPORT IMPOSED LOADS. FACTORY ASSEMBLE DOOR AND FRAME UNITS AND FACTORY INSTALL HARDWARE TO GREATEST EXTENT POSSIBLE. REINFORCE DOOR AND FRAME UNITS FOR HARDWARE INDICATED. CUT, DRILL, AND TAP FOR FACTORY-INSTALLED HARDWARE BEFORE FINISHING COMPONENTS.

CLASS I ANODIC FINISHES BELOW ARE HEAVIER THAN CLASS II FINISHES AND ARE RECOMMENDED FOR EXTERIOR APPLICATIONS.

ALUMINUM FINISH: COMPLY WITH NAAMMS "METAL FINISHES MANUAL FOR ARCHITECTURAL AND METAL PRODUCTS." DARK BRONZE, ANODIZED FINISH, SOUTHWEST ALUMINUM STANDARD.

INSTALLATION:
ISOLATE METAL SURFACES IN CONTACT WITH INCOMPATIBLE METAL OR CORROSIVE SUBSTRATES, INCLUDING WOOD, BY PAINTING CONTACT SURFACES WITH BITUMINOUS COATING OR PRIMER, OR BY APPLYING SEALANT OR TAPE RECOMMENDED BY MANUFACTURER.

INSTALL COMPONENTS TO PROVIDE A WEATHERPROOF SYSTEM.

INSTALL FRAMING COMPONENTS TRUE IN ALIGNMENT WITH ESTABLISHED LINES AND GRADES TO THE FOLLOWING TOLERANCES:

- VARIATION FROM PLANE: LIMIT TO 1/8 INCH IN 12 FEET (3 MM IN 3.7 M); 1/4 INCH (6 MM) OVER TOTAL LENGTH.
- ALIGNMENT: FOR SURFACES ABUTTING IN LINE, LIMIT OFFSET TO 1/16 INCH (1.5 MM). FOR SURFACES MEETING AT CORNERS, LIMIT OFFSET TO 1/32 INCH (0.8 MM).
- DIAGONAL MEASUREMENTS: LIMIT DIFFERENCE BETWEEN DIAGONAL MEASUREMENTS TO 1/8 INCH (3 MM).
  INSTALL DOORS WITHOUT WARP OR RACK. ADJUST DOORS AND HARDWARE TO PROVIDE TIGHT FIT AT CONTACT POINTS AND SMOOTH OPERATION.

END OF SECTION 08411

SECTION 08800 - GLASS AND GLAZING

SUBMITTALS: SUBMIT SHOP DRAWINGS, PRODUCT DATA, AND 12 INCH (300 MM) SQUARE SAMPLES.

COMPLY WITH WRITTEN INSTRUCTIONS OF GLASS PRODUCT MANUFACTURERS, GANA'S "GLAZING MANUAL" AND PUBLICATIONS OF GANA, AAMA, AND SIGMA AS APPLICABLE TO PRODUCTS INDICATED, UNLESS MORE STRINGENT REQUIREMENTS ARE INDICATED.

INSULATING-GLASS UNITS: PERMANENTLY MARK WITH APPROPRIATE CERTIFICATION LABEL OF ONE OF THE INSPECTING AND TESTING AGENCIES INDICATED BELOW.

COMPLY WITH COMBINED RECOMMENDATIONS OF MANUFACTURERS OF GLASS, SEALANTS, GASKETS, AND OTHER GLAZING MATERIALS UNLESS MORE STRINGENT REQUIREMENTS ARE CONTAINED IN GANA'S "GLAZING MANUAL."

SET GLASS LITES IN EACH SERIES WITH UNIFORM PATTERN, DRAW, BOW, AND SIMILAR CHARACTERISTICS.

FLOAT GLASS: ASTM C1036, TYPE I, CLASS 2 GREEN TINED, USED ON THE EXTERIOR OF THE INSULATED UNITS.

HEAT-TREATED FLOAT GLASS: ASTM C1048, CONDITION WITH LOW-E COATING ON THE INTERIOR NUMBER 3 SURFACE.

TEMPERED GLASS: GLAZING UNITS LOCATED WITHIN 48" OF AN EXTERIOR DOOR, AND GLASS UNITS WITHIN 24" OF THE FINISH FLOOR.

COATED GLASS: ASTM C1048, CONDITION C, TYPE I, CLASS WITH LOW-E COATING ON THE INTERIOR NUMBER 3 SURFACE.

MIRROR GLASS: ASTM C1036, TYPE I, CLASS 1, SILVER COATED PER FS DDM411C, 6.0 MM THICK, WITH EDGES SEAMED.

USE: INTERIOR AND EXTERIOR OPENINGS, AS NOTED ON DRAWINGS.

GLAZING SEALANTS AND COMPONENTS:
GENERAL: FOR GLAZING USE GLAZING COLOR OF EXPOSED SEALANT/COMPOUND SELECTED FROM MANUFACTURER'S STANDARD COLORS. COMPLY WITH MANUFACTURER'S RECOMMENDATIONS FOR SELECTION OF HARDNESS, DEPENDING UPON THE LOCATION OF EACH APPLICATION, CONDITIONS AT TIME OF INSTALLATION, AND PERFORMANCE REQUIREMENTS AS INDICATED. SELECT MATERIALS, AND VARIATION OR MODIFICATIONS, CAREFULLY FOR COMPATIBILITY WITH SURFACES CONTACTED IN THE INSTALLATION.

1-PART SILICONE RUBBER GLAZING SEALANT: ELASTOMERIC SILICONE SEALANT COMPLYING WITH FS TT-S-001543, CLASS A, NONSAG. PROVIDE ACID TYPE RECOMMENDED BY MANUFACTURER WHERE ONLY NONPOROUS BOND SURFACES ARE CONTACTED; PROVIDE NONACID TYPE RECOMMENDED BY MANUFACTURER WHERE ONE OF MORE POROUS BOND SURFACES ARE CONTACTED.

PREFORMED BUTYL-POLYISOBUTYLENE GLAZING TAPE: PROVIDE MANUFACTURER'S STANDARD SOLVENT-FREE BUTYL-POLYISOBUTYLENE FORMULATION WITH A SOLIDS CONTENT OF 100 PERCENT, COMPLYING WITH AAMA A 804.1, I EXTRUDED TAPE FORM, NON-STAINING AND NON-MIGRATING IN CONTACT WITH NONPOROUS SURFACES, PACKAGED ON ROLLS WITH A RELEASE PAPER ON ONE SIDE, WITH OR WITHOUT CONTINUOUS SPACER ROD AS RECOMMENDED BY MANUFACTURER WHERE ONE OR MORE POROUS BOND SURFACES ARE CONTACTED.

MISCELLANEOUS GLAZING MATERIALS: CLEANERS, PRIMERS AND SEALERS: TYPE RECOMMENDED BY SEALANT MANUFACTURER.

SETTING BLOCKS: NEOPRENE OR EPDM, 80-90 DUROMETER HARDNESS WITH PROVEN COMPATIBILITY WITH SEALANTS USED.

SPACERS: NEOPRENE OR EPDM, 40-50 DUROMETER HARDNESS WITH PROVEN COMPATIBILITY WITH SEALANTS USED.

COMPRESSIBLE FILLER (ROD): CLOSED-CELL OR WATERPROOF-JACKETED ROD STOCK OF SYNTHETIC RUBBER OR PLASTIC FOAM, PROVEN TO BE COMPATIBLE WITH SEALANTS USED, FLEXIBLE AND RESILIENT, WITH 5-10 PSI COMPRESSION STRENGTH FOR 25% DEFLECTION.

STANDARDS AND PERFORMANCE:
WATERTIGHT AND AIRTIGHT INSTALLATION OF EACH GLASS PRODUCT IS REQUIRED. EACH INSTALLATION MUST WITHSTAND NORMAL TEMPERATURE CHANGES, WIND LOADING, IMPACT LOADING, WITHOUT FAILURE INCLUDING LOSS OR BREAKAGE OF GLASS, FAILURE OF SEALANTS OR GASKETS TO REMAIN WATERTIGHT AND AIRTIGHT, DETERIORATION OF GLAZING MATERIALS AND OTHER DEFECTS IN THE WORK.

GLAZING CHANNEL DIMENSIONS AS SHOWN ARE INTENDED TO PROVIDE FOR NECESSARY BITE ON GLASS, MINIMUM EDGE CLEARANCE, AND ADEQUATE SEALANT THICKNESSES, WITH REASONABLE TOLERANCES. ADJUST AS REQUIRED BY JOB CONDITIONS AT TIME OF INSTALLATION.

COMPLY WITH COMBINED RECOMMENDATIONS AND TECHNICAL REPORTS BY MANUFACTURERS OF GLASS AND GLAZING PRODUCTS AS USED IN EACH GLAZING CHANNEL, AND WITH RECOMMENDATIONS OF FLAT GLASS MARKETING ASSOCIATION "GLAZING MANUAL," EXCEPT WHERE MORE STRINGENT REQUIREMENTS ARE INDICATED.

END OF SECTION 08800

SECTION 09250 - GYPSUM DRYWALL

SUMMARY:
EXTENT OF WORK IS SHOWN ON DRAWINGS.

DESCRIPTION OF WORK:
TYPES OF WORK INCLUDE:

- GYPSUM DRYWALL INCLUDING SCREW-TYPE METAL SUPPORT SYSTEM.
- GYPSUM BACKING BOARDS FOR APPLICATION OF OTHER FINISHES.
- DRYWALL FINISHING (JOINT TAPE-AND-COMPOUND TREATMENT AND TEXTURING).

FIRE-RESISTANCE RATING: WHERE GYPSUM DRYWALL SYSTEMS WITH FIRE-RESISTANCE RATINGS ARE INDICATED, PROVIDE MATERIALS AND INSTALLATIONS WHICH ARE IDENTICAL WITH THOSE OF APPLICABLE ASSEMBLIES TESTED PER ASTM E119 BY FIRE TESTING LABORATORIES ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION.

GYPSUM BOARD STANDARD: COMPLY WITH APPLICABLE REQUIREMENTS OF ANSI/ASTM C840 FOR APPLICATION AND FINISHING OF GYPSUM BOARD, UNLESS OTHERWISE INDICATED.

STEEL FRAMING STANDARD: COMPLY WITH APPLICABLE REQUIREMENTS OF ASTM C754 FOR INSTALLATION OF STEEL FRAMING FOR GYPSUM BOARD AND LATEST EDITION OF THE SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS, BY THE AMERICAN IRON AND STEEL INSTITUTE.

USING GYPSUM BOARD FOR WALLS AND CEILINGS: GA-201-85.

GYPSUM BOARD TERMINOLOGY STANDARD: GA-505 BY GYPSUM ASSOCIATION.

METAL SUPPORT MATERIALS
CEILING SUPPORT MATERIALS AND SYSTEMS:
GENERAL: SIZE CEILING SUPPORT COMPONENTS TO COMPLY WITH ASTM C754 UNLESS OTHERWISE INDICATED.

MAIN RUNNERS: STEEL CHANNELS WITH RUST INHIBITIVE PAINT FINISH, HOT OR COLD-ROLLED.

HANGER WIRE: ASTM A641, SOFT, CLASS 1 GALVANIZED, 8 GAUGE.

HANGER ANCHORAGE DEVICES: SCREWS, CLIPS, BOLTS, OR OTHER DEVICES APPLICABLE TO THE INDICATED METHOD OF STRUCTURAL ANCHORAGE FOR CEILING HANGERS AND WHOSE SUITABILITY FOR USE INTENDED HAS BEEN PROVEN THOUGH STANDARD CONSTRUCTION PRACTICES OR BY CERTIFIED TEST DATA. SIZE DEVICES FOR 3X CALCULATED LOAD SUPPORTED.

NOTE: CONTRACTOR MAY USE A DIRECT CEILING SUPPORT SYSTEM SUCH AS DONN RIGID X GRID SYSTEM.

WALL/PARTITION SUPPORT MATERIALS:
STUDS: ASTM C645.
DEPTH OF SECTION: 3-5/8", OR AS OTHERWISE INDICATED.
THICKNESS: 25 GAUGE, EXCEPT 20 GAUGE AT ALL TOILET ROOM PARTITIONS AND AS OTHERWISE INDICATED ON WALL TYPES SCHEDULE.
RUNNERS: MATCH STUDS, TYPE RECOMMENDED BY STUD MANUFACTURER FOR FLOOR AND CEILING SUPPORT OF STUDS, AND FOR VERTICAL ABUTMENT OF DRYWALL WORK AT OTHER WORK.

STEEL RIGID FURRING CHANNELS: ASTM C645, HAT-SHAPED, 7/8" DEPTH, UNLESS OTHERWISE SHOWN.

PARTITION MATERIALS:
GYPSUM WALLBOARD: ASTM C36, OF TYPES, EDGE CONFIGURATION, AND THICKNESS INDICATED BELOW, IN MAXIMUM LENGTHS AVAILABLE TO MINIMIZE END-TO-END BUTT JOINTS.

- TYPE: TYPE X, FIRE RESISTANT OR FIRE RESISTANT/ MOISTURE RESISTANT, AS SCHEDULED.
- THICKNESS: 5/8"

END OF SECTION 09250

SECTION 09300 - TILE

TILE: ANSI A 137.1

TILE SETTING MATERIALS: ANSI A 118 SERIES STANDARD SPECIFICATIONS.

TILE INSTALLATION: ANSI 108 SERIES STANDARD SPECIFICATIONS AND TILE COUNCIL OF AMERICA, HANDBOOK FOR CERAMIC TILE INSTALLATION.

TILE APPLICATIONS: INTERIOR WALL TILE OVER WATER-RESISTANT GYPSUM WALLBOARD.

COMPLY WITH TILE COUNCIL OF AMERICA AND ANSI STANDARD SPECIFICATIONS FOR INSTALLATION FOR SUBSTRATE AND INSTALLATION REQUIRED. COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

INSTALL WATERPROOF MEMBRANE IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.

LAY TILE IN GRID PATTERN WITH ALIGNMENT GRIDS. LAYOUT TILE TO PROVIDE UNIFORM JOINT WIDTHS AND TO MINIMIZE CUTTING; DO NOT USE LESS THAN 1/2 TILE UNITS.

PROVIDE SEALANT JOINTS WHERE RECOMMENDED BY TCA AND APPROVED BY ARCHITECT.

GROUT AND CURE, CLEAN AND PROTECT.

END OF SECTION 09300

SECTION 09510 - ACOUSTICAL CEILINGS

SUMMARY:
EXTENT OF ACOUSTICAL CEILING IS SHOWN AND SCHEDULED ON DRAWINGS. TYPE OF ACOUSTICAL CEILING SPECIFIED IN THIS SECTION IS THE FOLLOWING:

- ACOUSTICAL LAY-IN PANEL CEILINGS, EXPOSED SUSPENSION.
- VINYL FACE-LAMINATED, LAY-IN PANEL CEILING, EXPOSED SUSPENSION.

UL FIRE HAZARD CLASSIFICATION: WHERE ACOUSTICAL CEILINGS ARE INDICATED TO COMPLY WITH FIRE HAZARD CLASSIFICATION FOR FLAME SPREAD AND INCLUDING FUEL CONTRIBUTION AND SMOKE DEVELOPMENT CLASSIFICATIONS WHERE INDICATED, PROVIDE ACOUSTICAL MATERIALS WHICH HAVE BEEN TESTED, RATED AND LABELED BY UL FOR INDICATED RATINGS AS LISTED IN "CLASSIFIED BUILDING MATERIALS INDEX" BY UL.

CLASSIFICATION: MAXIMUM OF 25 FOR FLAME SPREAD, FUEL CONTRIBUTED, AND SMOKE DEVELOPED.

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TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE

SPECIFICATIONS

DATE
8-19-22
PROJECT NO.
20-200

CS-04

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CEILING UNITS:

LAY-IN ACOUSTICAL PANELS:

GENERAL: PROVIDE MANUFACTURER'S LAY-IN ACOUSTICAL PANELS OF TYPE SPECIFIED. PRODUCTS SPECIFIED ARE INTENDED TO SET A STANDARD OF QUALITY AND PERFORMANCE FOR THE WORK.

MINERAL FIBER ACOUSTICAL PANELS: PROVIDE UNITS OF NOMINAL THICKNESS INDICATED AND CONFORMING TO FED. SPEC. SS-S-118B, TYPE III, CLASS A, NRC MINIMUM 0.50.

LAY-IN CEILING SUSPENSION MATERIALS:
GENERAL: COMPLY WITH ASTM C635, AS APPLICABLE.

VINYL FACE-LAMINATED: ASTM E1264, TYPE XII, FORM 1, PATTERN E (UNPERFORATED).
COORDINATE WITH OTHER WORK SUPPORTED BY OR PENETRATING THROUGH CEILINGS, INCLUDING LIGHT FIXTURES, HVAC EQUIPMENT, AND PARTITION SYSTEM.

STRUCTURAL CLASS: HEAVY-DUTY SYSTEM.

ATTACHMENT DEVICES: SIZE FOR 5 TIMES DESIGN LOAD INDICATED IN ASTM C635, TABLE 1, DIRECT HUNG.

HANGER WIRES: GALVANIZED CARBON STEEL, ASTM A641, SOFT TEMPER, PRE-STRETCHED, YIELD-STRESS LOAD OF AT LEAST 3 TIMES DESIGN LOAD, BUT NOT LESS THAN 12 GAUGE (0.0106")

TYPE OF SYSTEM: ATTACH TO STRUCTURAL MEMBERS ONLY, EITHER DIRECT-HUNG OR INDIRECT-HUNG SUSPENSION SYSTEM, AT CONTRACTOR'S OPTION.

CARRYING AND CROSS CHANNELS: 1-1/2" STEEL CHANNELS, HOT-ROLLED OR COLD-ROLLED, NOT LESS THAN 0.0475 LBS. PER LIN. FT.

EDGE MOLDINGS: MANUFACTURER'S STANDARD CHANNEL MOLDING FOR EDGES AND PENETRATIONS OF CEILINGS, WITH SINGLE FLANGE OF MOLDING EXPOSED, WHITE.

EXPOSED SUSPENSION SYSTEM: MANUFACTURER'S STANDARD EXPOSED RUNNERS, CROSS-RUNNERS AND ACCESSORIES, OF TYPES AND PROFILES INDICATED, WITH EXPOSED CROSS-RUNNERS COPED TO LAY FLUSH WITH MAIN RUNNERS.

FINISH OF EXPOSED MEMBERS: PROVIDE UNIFORM FACTORY-APPLIED FINISH ON EXPOSED SURFACES OF CEILING SUSPENSION SYSTEM, INCLUDING MOLDINGS, TRIM, AND ACCESSORIES.

COLOR: WHITE (GRID TO MATCH CEILING PANEL COLOR).

INSPECTION:
INSTALLER MUST EXAMINE CONDITIONS UNDER WHICH ACOUSTICAL CEILING WORK IS TO BE PERFORMED AND MUST NOTIFY CONTRACTOR IN WRITING OF UNSATISFACTORY CONDITIONS. DO NOT PROCEED WITH WORK UNTIL UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED IN MANNER ACCEPTABLE TO INSTALLER.

PREPARATION:
MEASURE EACH CEILING AREA AND ESTABLISH LAYOUT OF ACOUSTICAL UNITS TO BALANCE BORDER WIDTHS AT OPPOSITE EDGES OF EACH CEILING. COMPLY WITH REFLECTED CEILING PLANS WHEREVER POSSIBLE.

END OF SECTION 09510

SECTION 09650 - RESILIENT FLOORING (VINYL)

EXTRA STOCK: SUBMIT EXTRA STOCK EQUAL TO 2% OF TOTAL USED.

PERFORMANCE: FIRE PERFORMANCE MEETING REQUIREMENTS OF BUILDING CODE AND LOCAL AUTHORITIES.

VINYL COMPOSITION TILE FLOORING:
- VINYL COMPOSITION TILE: ASTM F1066, CLASS 2 THROUGH-PATTERN.
- MANUFACTURER: ARMSTRONG, IMPERIAL TEXTURE STANDARD EXCELON.
- SIZE: 12 BY 12 INCHES.
- THICKNESS: 1/8 INCH.

VINYL COMPOSITION SHEET FLOORING:
- VINYL COMPOSITION TILE: ASTM F1303 WITH LOW ODOR VOC MASTIC ADHESIVE.
- MANUFACTURER: ARMSTRONG, SPECIALTY FLOORING SAFEGUARD HYDRI.
- THICKNESS: 0.080 INCHES (2.0 MM).

COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. INSTALL IN PROPER RELATION TO ADJACENT WORK.

PREPARE SURFACES BY CLEANING, LEVELING, AND PRIMING AS REQUIRED. TEST ADHESIVE FOR BOND BEFORE GENERAL INSTALLATION. LEVEL TO 1/8' IN 10' TOLERANCE.

TILE FLOORING: INSTALL TILE WITH TIGHT JOINTS AND WITH ONE-WAY PATTERN. LAYOUT TO PREVENT LESS THAN 1/2 TILE UNITS.

SHEET FLOORING: INSTALL SHEETS WITH TIGHT JOINTS AND PATTERN IN ADJOINING AREAS RUNNING IN THE SAME DIRECTION. LAYOUT TO MINIMIZE SEAMS AS APPROVED.

CLEAN, POLISH, AND PROTECT.

END OF SECTION 09650

SECTION 09653 - RESILIENT BASE AND ACCESSORIES

SUBMIT EXTRA STOCK EQUAL TO 2% OF TOTAL USED.

COMPLY WITH GOVERNING CODES AND REGULATIONS. PROVIDE PRODUCTS OF ACCEPTABLE MANUFACTURERS, WHICH HAVE BEEN IN SATISFACTORY USE IN SIMILAR SERVICE FOR THREE YEARS. USE EXPERIENCED INSTALLERS. DELIVER, HANDLE, AND STORE MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

PERFORMANCE: FIRE PERFORMANCE MEETING REQUIREMENTS OF BUILDING CODE AND LOCAL AUTHORITIES.

RESILIENT WALL BASE:
- STANDARD: ASTM F1861.
- TYPE: TS (RUBBER, VULCANIZED THERMOSET).
- THICKNESS: 0.125 INCH.
- HEIGHT: 4 INCHES.

INSTALLATION ACCESSORIES:
- CONCRETE SLAB PRIMER: NON-STAINING TYPE.
- TROWELABLE UNDERLAYMENT AND PATCHING COMPOUNDS: LATEX-MODIFIED, PORTLAND-CEMENT-BASED FORMULATION.
- STAIR TREAD NOSE FILLER: TWO-PART EPOXY COMPOUND.
- ADHESIVES: WATER-RESISTANT TYPE.

COMPLY WITH MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS. INSTALL IN PROPER RELATION TO ADJACENT WORK.

INSTALL BASE AND ACCESSORIES TO MINIMIZE JOINTS. INSTALL BASE WITH JOINTS AS FAR FROM CORNERS AS PRACTICAL.

CLEAN, POLISH, AND PROTECT.

END OF SECTION 09653

SECTION 09684 - CARPET TILE

EXTRA STOCK: SUBMIT EXTRA STOCK EQUAL TO 2% OF TOTAL USED.

CARPET TILE:
- MATERIAL: HIGH-PERFORMANCE NYLON BONDED TO RESILIENT BACKING.
- MATERIAL: SELECTED BY ALLOWANCE.
- INSTALLATION METHOD: GLUE-DOWN.

AUXILIARY MATERIALS:
- EDGE GUARDS.
- ADHESIVES, CEMENTS, AND FASTENERS.
- LEVELING COMPOUND.

COMPLY WITH RECOMMENDATIONS OF CARPET AND RUG INSTITUTE "SPECIFIER'S HANDBOOK".

PREPARE SURFACES AND INSTALL MATERIALS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS AND APPROVED SUBMITTALS. CLEAN, PATCH, AND LEVEL SUBSTRATE. INSTALL MATERIALS IN PROPER RELATION WITH ADJACENT CONSTRUCTION AND WITH UNIFORM APPEARANCE. COORDINATE WITH WORK OF OTHER SECTIONS.

INSTALL EDGE GUARDS AND REDUCER STRIPS AS REQUIRED; CLEAN AND PROTECT.

END OF SECTION 09684

SECTION 09700 - WALL SURFACES

SUMMARY:
EXTENT OF INTERIOR WALL SURFACES SHOWN ON DRAWINGS. WORK TO INCLUDE:
- PRE-FINISHED PANELS.

QUALITY STANDARDS: EXCEPT AS OTHERWISE SHOWN OR SPECIFIED, COMPLY WITH SPECIFIED PROVISIONS OF THE FOLLOWING:
- ARCHITECTURAL WOODWORK INSTITUTE (AWI) "QUALITY STANDARDS".
- ALL WOODWORK SHALL BE BUILT TO AWI "CUSTOM" GRADE SPECIFICATIONS.
- B209-04 STANDARD SPECIFICATION FOR ALUMINUM AND ALUMINUM ALLOY SHEETS.

WALL SURFACING MATERIALS:

FRP PANELS: FIBERGLASS REINFORCED POLYESTER PANELS EQUAL TO MARLITE PEBBLE CORPORATION. PROVIDE MANUFACTURER'S COLOR-INTEGRATED PVC TRIM MOLDINGS, ADHESIVE, AND CAULK FOR A COMPLETE INSTALLATION.

PREPARATION:
CONDITION WOODWORK TO AVERAGE PREVAILING HUMIDITY CONDITIONS IN INSTALLATION AREAS PRIOR TO INSTALLING.

END OF SECTION 09700

SECTION 09900 - PAINTING

SUMMARY: PAINT ALL EXPOSED SURFACES, NEW, UNLESS OTHERWISE INDICATED. PAINT THE BACKSIDE OF ACCESS PANELS.

DO NOT PAINT PRE-FINISHED ITEMS, FINISHED METAL SURFACES, OPERATING PARTS, LABELS, AND MATERIALS OBVIOUSLY INTENDED TO BE LEFT EXPOSED SUCH AS BRICK AND TILE.

UNLESS OTHERWISE INDICATED DO NOT PAINT CONCEALED SURFACES.

SUBMITTALS: PRODUCT DATA AND COLOR SAMPLES.

MOCKUPS: FULL-COAT FINISH SAMPLE (BENCHMARK SAMPLE) OF EACH TYPE OF COATING, SUBSTRATE, COLOR, AND FINISH REQUIRED IN AREA OF NOT LESS THAN 100 SQ. FT (9 SQ.M). COMPLY WITH PDCA P5.

OBTAIN BLOCK FILLERS, PRIMERS, AND UNDERCOAT MATERIALS FOR EACH COATING SYSTEM FROM THE SAME MANUFACTURER AS THE FINISH COATS.

EXTRA MATERIALS: DELIVER TO OWNER A 1-GAL. (3.8 L) CONTAINER PROPERLY LABELED AND SEALED, OF EACH COLOR AND TYPE OF FINISH COAT PAINT USED ON PROJECT.

REFER TO FINISH PLAN, BUILDING ELEVATIONS, AND FINISH SCHEDULE FOR SITE-SPECIFIC PRODUCT AND EXECUTION. DRAWING INFORMATION SUPERSEDES SPECIFICATIONS HEREIN.

COMPLY WITH PAINT MANUFACTURER'S WRITTEN INSTRUCTIONS FOR SURFACE PREPARATION, ENVIRONMENTAL AND SUBSTRATE CONDITIONS, PRODUCT MIXING, AND APPLICATION.

EXTERIOR PAINT APPLICATION SCHEDULE
CONCRETE, STUCCO, AND MASONRY: AS FOLLOWS:
- BUILDING AND SITE MASONRY FENCES:
  - GRAY REGULAR CMU: CLEAR ACRYLIC SEALER
  - SPLIT-FACED CMU: STAIN PER SPECIFIED COLORS, FOLLOW WITH CLEAR ACRYLIC SEALER.

FERROUS METAL: AS FOLLOWS:
- FLAT, ALKYD ENAMEL: TWO COATS OVER RUST-INHIBITIVE PRIMER.

HOLLOW METAL DOORS, FRAMES, AND COILING DOORS: AS FOLLOWS:
- SEMIGLOSS, ACRYLIC ENAMEL: TWO COATS OVER PRIMER.

INTERIOR PAINT APPLICATION SCHEDULE

CONCRETE AND MASONRY: AS FOLLOWS:
- ODORLESS, FLAT ALKYD: TWO COATS OVER PRIMER.

CONCRETE MASONRY UNITS: AS FOLLOWS:
- FLAT ACRYLIC: TWO COATS OVER BLOCK FILLER.

GYPSUM BOARD: AS FOLLOWS:
- FLAT ACRYLIC: TWO COATS OVER PRIMER, ALL LOCATIONS EXCEPT RESTROOMS, KITCHEN, AND COMPUTER ROOM.
- ELASTOMERIC: WALLS OF COMPUTER ROOMS 112, 113, 114, 119, AND 110.

FERROUS METAL: AS FOLLOWS:
- FLAT ACRYLIC: TWO COATS OVER PRIMER.

ZINC-COATED METAL: AS FOLLOWS:
- FLAT ACRYLIC: TWO COATS OVER PRIMER.

END OF SECTION 09900

SECTION 10520 - FIRE EXTINGUISHERS AND CABINETS

SUMMARY:
THE EXTENT OF THIS WORK IS SHOWN ON DRAWINGS.

DEFINITION: "FIRE EXTINGUISHERS" IN THIS SECTION REFERS TO UNITS WHICH CAN BE HAND-CARRIED AS OPPOSED TO THOSE WHICH ARE EQUIPPED WITH WHEELS OR TO FIXED-FIRE EXTINGUISHING SYSTEMS, UNLESS OTHERWISE INDICATED.

TYPES OF PRODUCTS IN THIS SECTION INCLUDE:
- FIRE EXTINGUISHERS.
- FIRE EXTINGUISHER CABINETS.

QUALITY ASSURANCE:
PROVIDE PORTABLE FIRE EXTINGUISHERS, CABINETS, AND ACCESSORIES BY ONE MANUFACTURER, UNLESS OTHERWISE ACCEPTABLE TO ARCHITECT.

UL LISTED PRODUCTS: PROVIDE NEW PORTABLE FIRE EXTINGUISHERS WHICH ARE UL-LISTED AND BEAR UL "LISTING MARK" FOR TYPE, RATING, AND CLASSIFICATION OF EXTINGUISHER INDICATED.

SUBMITTALS:
PRODUCT DATA: SUBMIT MANUFACTURER'S TECHNICAL DATA AND INSTALLATION INSTRUCTIONS FOR ALL PORTABLE FIRE EXTINGUISHERS REQUIRED. FOR FIRE EXTINGUISHER CABINETS, INCLUDE ROUGHING-IN DIMENSIONS, AND DETAILS SHOWING MOUNTING METHODS, RELATIONSHIPS TO SURROUNDING CONSTRUCTION, DOOR HARDWARE, CABINET TYPE AND MATERIALS, TRIM STYLE AND DOOR CONSTRUCTION, STYLE MATERIALS.

FIRE EXTINGUISHERS
GENERAL: PROVIDE FIRE EXTINGUISHERS FOR EACH EXTINGUISHER CABINET WHICH COMPLY WITH REQUIREMENTS OF GOVERNING AUTHORITIES. ABBREVIATIONS INDICATED BELOW ARE TO IDENTIFY EXTINGUISHER TYPES RELATED TO UL CLASSIFICATION AND RATINGS SYSTEM AND NOT, NECESSARILY, TO TYPE AN AMOUNT OF EXTINGUISHING MATERIAL CONTAINED IN EXTINGUISHER.

DRY CHEMICAL TYPE: UL-RATED 40-B:C, 10-LB NOMINAL CAPACITY, IN ENAMELED STEEL CONTAINER, FOR CLASS A, CLASS B, AND CLASS C FIRES.
- USE: KITCHEN

MULTI-PURPOSE DRY CHEMICAL TYPE: UL-RATED, IN ENAMELED STEEL CONTAINER, WITH BRASS VALVE AND STAINLESS STEEL HANDLE, FOR CLASS A, CLASS B, AND CLASS C FIRES.
- USE: TYPICAL AREAS, 4A-60B:C, NOMINAL 10 LBS. CAPACITY.

PROVIDE STEEL HANDLES AND BRASS VALVES FOR ALL EXTINGUISHERS.

FIRE EXTINGUISHER CABINETS:
GENERAL: PROVIDE FIRE EXTINGUISHER CABINETS WHERE INDICATED, OF SUITABLE SIZE FOR HOUSING FIRE EXTINGUISHERS OF TYPES AND CAPACITIES INDICATED.

CONSTRUCTION: MANUFACTURER'S STANDARD ENAMELED STEEL BOX, WITH TRIM, FRAME, DOOR, AND HARDWARE TO SUIT CABINET TYPE, TRIM STYLE, AND DOOR STYLE INDICATED. WELD ALL JOINTS AND GRIND SMOOTH. MITER AND WELD PERIMETER DOOR FRAMES.

CABINET TYPE: SUITABLE FOR MOUNTING CONDITIONS INDICATED, OF THE FOLLOWING TYPE:
- SEMI-RECESSED MOUNTED: CABINET BOX PARTIALLY RECESSED INTO WALL.
- SURFACE MOUNTED: CABINET MOUNTED DIRECTLY TO WALL.

TRIM STYLE: FABRICATE TRIM IN ONE PIECE WITH CORNERS MITERED, WELDED, AND GROUND SMOOTH.
- SEMI-RECESSED BOX EXPOSED TRIM: ROLLED TRIM WITH NEATLY MITERED CORNERS WITH 2-1/2" RETURN TO WALL.

DOOR MATERIAL AND CONSTRUCTION: MANUFACTURER'S STANDARD DOOR CONSTRUCTION, OF MATERIAL INDICATED, COORDINATED WITH CABINET TYPES AND TRIM STYLES SELECTED. STANDARD STEEL WITH TUBULAR FRAMES AND WHITE BAKED ENAMEL FINISH, WITH METAL EDGE REINFORCING AT HINGE JAMB AND AT LATCH.

END OF SECTION 10520

SECTION 10800 - TOILET ACCESSORIES

SUMMARY:
EXTENT OF EACH TYPE OF TOILET ACCESSORY IS SHOWN ON DRAWINGS AND SCHEDULES. REQUIRED ACCESSORIES INCLUDE:
- SOAP DISPENSERS.
- TOILET PAPER DISPENSERS.
- FEMININE NAPKIN DISPENSERS AND DISPOSERS.
- ELECTRIC HAND DRIERS.
- PAPER TOWEL DISPENSERS.
- HANDICAP GRAB BARS.
- MIRRORS.
- PAPER TOWEL DISPENSERS AND DISPOSERS.
- CORNER GUARDS.

ELECTRICAL WORK REQUIRED FOR INSTALLATION OF HAND DRIERS IS SPECIFIED IN DIVISION 16.

QUALITY ASSURANCE:
INSERTS AND ANCHORAGES: FURNISH INSERTS AND ANCHORING DEVICES WHICH MUST BE SET IN CONCRETE OR BUILT INTO MASONRY; COORDINATE DELIVERY WITH OTHER WORK TO AVOID DELAY.

ACCESSORY LOCATIONS: COORDINATE ACCESSORY LOCATIONS WITH OTHER WORK TO AVOID INTERFERENCE AND TO ASSURE PROPER OPERATION AND SERVICING OF ACCESSORY UNITS.

PRODUCTS: PROVIDE PRODUCTS OF SAME MANUFACTURER FOR EACH TYPE OF ACCESSORY UNIT AND FOR UNITS EXPOSED IN SAME AREAS, UNLESS OTHERWISE ACCEPTABLE TO ARCHITECT.

PRODUCTS ARE SPECIFIED BY NUMBERS OF PARTICULAR MANUFACTURERS IN ORDER TO SET A STANDARD OF QUALITY AND DESIGN. NO UNFAIR LIMITATION OF COMPETITION IS INTENDED BY THIS ACTION. PROVIDE PRODUCTS AS SPECIFIED OR PROVIDE EQUAL APPROVED PRODUCTS BY ANOTHER MANUFACTURER.

MATERIALS:
STAINLESS STEEL: ASI TYPE 302/304, WITH FINISH AS INDICATED, 22 GAUGE MINIMUM, UNLESS OTHERWISE INDICATED.

GRAY IRON CASTINGS: ASTM A48, CLASS 30.

BRASS: LEADED AND UNLEADED, FLAT PRODUCTS, FS QQ-B-613; RODS, SHAPES, FORGINGS, AND FLAT PRODUCTS WITH FINISHED EDGES, FS QQ-B-626.

SHEET STEEL: COLD ROLLED, COMMERCIAL QUALITY ASTM A366, 20 GAUGE MINIMUM, UNLESS OTHERWISE INDICATED; SURFACE PREPARATION AND METAL PRETREATMENT AS REQUIRED FOR APPLIED FINISH.

GALVANIZED STEEL SHEET: ASTM A527, G60.

GALVANIZED STEEL MOUNTING DEVICES: ASTM A386, HOT-DIP GALVANIZED AFTER FABRICATION.

FASTENERS: SCREWS, BOLTS, AND OTHER DEVICES OF SAME MATERIAL AS ACCESSORY UNIT OR OF GALVANIZED STEEL WHERE CONCEALED.

PLYWOOD BACKING BOARDS: AS SPECIFIED IN SECTION 06100 - ROUGH CARPENTRY.

FABRICATION:
GENERAL: STAMPED NAMES OR LABELS ON EXPOSED FACES OF TOILET ACCESSORY UNITS ARE NOT PERMITTED. WHEREVER LOCKS ARE REQUIRED FOR A PARTICULAR TYPE OF TOILET ACCESSORY, PROVIDE SAME KEYING THROUGHOUT PROJECT. FURNISH TWO KEYS FOR EACH LOCK.

SURFACE-MOUNTED TOILET ACCESSORIES:
GENERAL: EXCEPT WHERE OTHERWISE INDICATED, FABRICATE UNITS WITH TIGHT SEAMS AND JOINTS, EXPOSED EDGES ROLLED. HANG DOORS OR ACCESS PANELS WITH CONTINUOUS PIANO HINGE OR MINIMUM OF TWO 1-1/2" PIN HINGES OF SAME METAL AS UNIT CABINET. PROVIDE CONCEALED ANCHORAGE WHEREVER POSSIBLE.

END OF SECTION 10800

SECTION 15000 - MECHANICAL

REFER TO MECHANICAL AND PLUMBING ENGINEERING SPECIFICATIONS.

END OF SECTION 15000

SECTION 16000 - ELECTRICAL

REFER TO ELECTRICAL ENGINEERING SPECIFICATIONS.

END OF SECTION 16000

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SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE

SPECIFICATIONS

DATE
8-19-22
PROJECT NO.
20-200

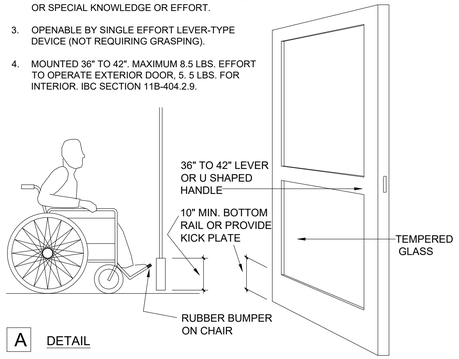
CS-0.5

DOOR TYPE:

1. MINIMUM 10" HIGH SMOOTH SURFACE AT DOOR BOTTOM, EITHER ATTACHED PANEL OR BOTTOM RAIL.

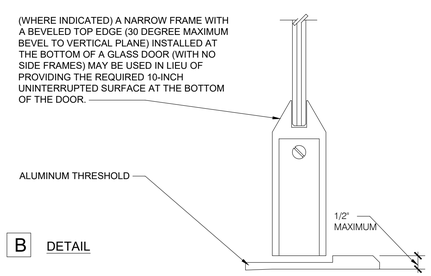
HARDWARE:

2. OPENABLE FROM INSIDE WITHOUT USE OF KEY OR SPECIAL KNOWLEDGE OR EFFORT.
3. OPENABLE BY SINGLE EFFORT LEVER-TYPE DEVICE (NOT REQUIRING GRASPING).
4. MOUNTED 36" TO 42". MAXIMUM 8.5 LBS. EFFORT TO OPERATE EXTERIOR DOOR, 5. 5 LBS. FOR INTERIOR. IBC SECTION 11B-404.2.9.



A DETAIL

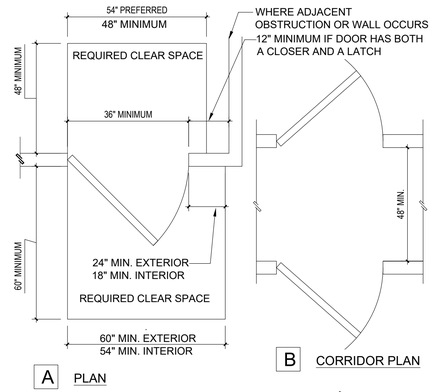
(WHERE INDICATED) A NARROW FRAME WITH A BEVELED TOP EDGE (30 DEGREE MAXIMUM BEVEL TO VERTICAL PLANE) INSTALLED AT THE BOTTOM OF A GLASS DOOR (WITH NO SIDE FRAMES) MAY BE USED IN LIEU OF PROVIDING THE REQUIRED 10-INCH UNINTERRUPTED SURFACE AT THE BOTTOM OF THE DOOR.



B DETAIL

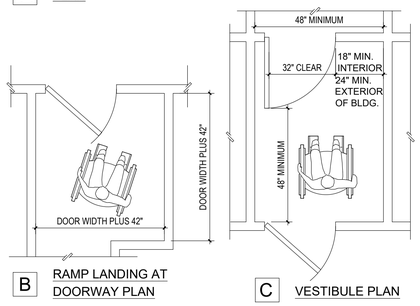
18 DOOR

SCALE: 12" = 1'-0"



A PLAN

B CORRIDOR PLAN



B RAMP LANDING AT DOORWAY PLAN

C VESTIBULE PLAN

DOOR ACCESSIBILITY NOTES

DOOR OPENINGS SHALL PROVIDE A CLEAR WIDTH OF 32 INCHES (813 MM) MINIMUM. CLEAR OPENINGS OF DOORWAYS WITH SWINGING DOORS SHALL BE MEASURED BETWEEN THE FACE OF THE DOOR AND THE STOP, WITH THE DOOR OPEN 90 DEGREES. OPENINGS MORE THAN 24 INCHES (610 MM) DEEP SHALL PROVIDE A CLEAR OPENING OF 36 INCHES (915 MM) MINIMUM. THERE SHALL BE NO PROJECTIONS INTO THE REQUIRED CLEAR OPENING WIDTH LOWER THAN 34 INCHES (865 MM) ABOVE THE FINISH FLOOR OR GROUND. PROJECTIONS INTO THE CLEAR OPENING WIDTH BETWEEN 34 INCHES (865 MM) AND 80 INCHES (2030 MM) ABOVE THE FINISH FLOOR OR GROUND SHALL NOT EXCEED 4 INCHES (100 MM).

EXCEPTIONS:

1. IN ALTERATIONS, A PROJECTION OF 5/8 INCH (16 MM) MAXIMUM INTO THE REQUIRED CLEAR WIDTH SHALL BE PERMITTED FOR THE LATCH SIDE STOP.
2. DOOR CLOSERS AND DOOR STOPS SHALL BE PERMITTED TO BE 78 INCHES (1980 MM) MINIMUM ABOVE THE FINISH FLOOR OR GROUND.

MINIMUM MANEUVERING CLEARANCES AT DOORS AND GATES SHALL COMPLY WITH 2010 ADAAG MANEUVERING CLEARANCES SHALL EXTEND THE FULL WIDTH OF THE DOORWAY AND THE REQUIRED LATCH SIDE OR HINGE SIDE CLEARANCE.

THRESHOLDS, IF PROVIDED AT DOORWAYS, SHALL BE ½ INCH (13 MM) HIGH MAXIMUM.

EXCEPTION: EXISTING OR ALTERED THRESHOLDS ¾ INCH (19 MM) HIGH MAXIMUM THAT HAVE A BEVELED EDGE ON EACH SIDE WITH A SLOPE NOT STEEPER THAN 1:2

DOOR CLOSERS AND GATE CLOSERS SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 90 DEGREES, THE TIME REQUIRED TO MOVE THE DOOR TO A POSITION OF 12 DEGREES FROM THE LATCH IS 5 SECONDS MINIMUM.

THE FORCE FOR PUSHING OR PULLING OPEN A DOOR OR GATE OTHER THAN FIRE DOORS SHALL BE AS FOLLOWS:

1. INTERIOR HINGED DOORS AND GATES: 5 POUNDS (22.2 N) MAXIMUM.
2. SLIDING OR FOLDING DOORS: 5 POUNDS (22.2 N) MAXIMUM.
3. REQUIRED FIRE DOORS: THE MINIMUM OPENING FORCE ALLOWABLE BY THE APPROPRIATE ADMINISTRATIVE AUTHORITY, NOT TO EXCEED 15 POUNDS (66.7 N).

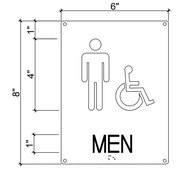
THESE FORCES DO NOT APPLY TO THE FORCE REQUIRED TO RETRACT LATCH BOLTS OR DISENGAGE OTHER DEVICES THAT HOLD THE DOOR OR GATE IN A CLOSED POSITION.

CONTROL & DEVICE ACCESSIBILITY

CLEAR FLOOR SPACE. A CLEAR FLOOR OR GROUND SPACE COMPLYING WITH 2010 ADAAG SHALL BE PROVIDED WITH 2% MAX RUNNING & CROSS SLOPES.

HEIGHT. OPERABLE PARTS SHALL BE PLACED WITHIN 34" - 48"

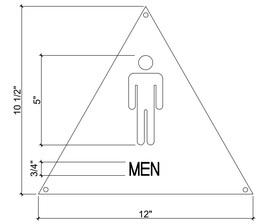
OPERABLE PARTS OPERATION. OPERABLE PARTS SHALL BE OPERABLE WITH ONE HAND AND SHALL NOT REQUIRE TIGHT GRASPING, PINCHING, OR TWISTING OF THE WRIST. THE FORCE REQUIRED TO ACTIVATE OPERABLE PARTS SHALL BE 5 POUNDS (22.2 N) MAXIMUM.



SIGN TYPE B - ADA RESTROOM FOOTNOTES

.06 STAINLESS STEEL, 1/16" RADIUS CORNERS DIE-CUT W/BURR SIDE DOWN. EMBOSSED TEXT RAISED MIN. 1/32" EMBOSSED DOMED CALIFORNIA GRADE 2 BRAILLE MIN. 1/40". EPOXY POWDER COATED BLUE BACKGROUND W/ WHITE COPY.

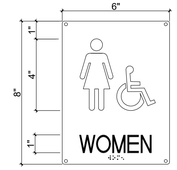
MOUNTING:
(4) TAMPER RESISTANT SCREWS & VHB 3M ADHESIVE.
LOCATE ON WAL ADJACENT TO THE LATCH SIDE O THE DOOR, 48 INCHES MIN. A.F.F. FROM THE LOWEST POINT OF BRAILLE AND 60 INCHES MAX. A.F.F. FROM HIGHEST LINE OF RAISED CHARCTERS.



SIGN TYPE A - TITLE 24 MEN

.25" ALUMINUM W/ EPOXY POWDER COATED BLUE BACKGROUND W/ WHITE GRAPHICS.

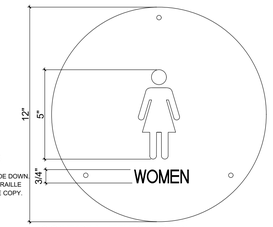
MOUNTING:
(3) TAMPER RESISTANT SCREWS & VHB 3M ADHESIVE.
LOCATE CENTERED HORIZONTALLY ON THE SANITARY FACILITY DOOR AT A HEIGHT OF 60 INCHES A.F.F. MEASURED TO CENTER OF THE SYMBOL.



SIGN TYPE B - ADA RESTROOM FOOTNOTES

.06 STAINLESS STEEL, 1/16" RADIUS CORNERS DIE-CUT W/BURR SIDE DOWN. EMBOSSED TEXT RAISED MIN. 1/32" EMBOSSED DOMED GRADE 2 BRAILLE MIN. 1/40". EPOXY POWDER COATED BLUE BACKGROUND W/ WHITE COPY.

MOUNTING:
(4) TAMPER RESISTANT SCREWS & VHB 3M ADHESIVE.
LOCATE ON WAL ADJACENT TO THE LATCH SIDE O THE DOOR, 48 INCHES MIN. A.F.F. FROM THE LOWEST POINT OF BRAILLE AND 60 INCHES MAX. A.F.F. FROM HIGHEST LINE OF RAISED CHARCTERS.



SIGN TYPE A - TITLE 24 WOMEN

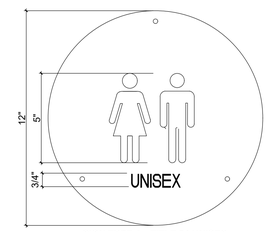
.25" ALUMINUM W/ EPOXY POWDER COATED BLUE BACKGROUND W/ WHITE GRAPHICS.

MOUNTING:
(3) TAMPER RESISTANT SCREWS & VHB 3M ADHESIVE.
LOCATE CENTERED HORIZONTALLY ON THE SANITARY FACILITY DOOR AT A HEIGHT OF 60 INCHES A.F.F. MEASURED TO CENTER OF THE SYMBOL.

SIGN TYPE B - ADA RESTROOM FOOTNOTES

.06 STAINLESS STEEL, 1/16" RADIUS CORNERS DIE-CUT W/BURR SIDE DOWN. EMBOSSED TEXT RAISED MIN. 1/32" EMBOSSED DOMED CALIFORNIA GRADE 2 BRAILLE MIN. 1/40". EPOXY POWDER COATED BLUE BACKGROUND W/ WHITE COPY.

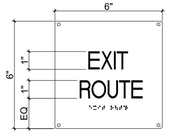
MOUNTING:
(4) TAMPER RESISTANT SCREWS & VHB 3M ADHESIVE.
LOCATE ON WAL ADJACENT TO THE LATCH SIDE O THE DOOR, 48 INCHES MIN. A.F.F. FROM THE LOWEST POINT OF BRAILLE AND 60 INCH



SIGN TYPE A - TITLE 24 UNISEX

.25" ALUMINUM W/ EPOXY POWDER COATED BLUE BACKGROUND W/ WHITE GRAPHICS.

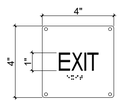
MOUNTING:
(3) TAMPER RESISTANT SCREWS & VHB 3M ADHESIVE.
LOCATE CENTERED HORIZONTALLY ON THE SANITARY FACILITY DOOR AT A HEIGHT OF 60 INCHES A.F.F. MEASURED TO CENTER OF THE SYMBOL.



SIGN TYPE D - EXIT ROUTE ID.

.04 STAINLESS STEEL, 1/16" RADIUS CORNERS DIE-CUT W/BURR SIDE DOWN. EMBOSSED TEXT RAISED MIN. 1/32" EMBOSSED DOMED GRADE 2 BRAILLE MIN. 1/40". EPOXY POWDER COATED BLUE BACKGROUND W/ WHITE COPY.

MOUNTING:
(4) TAMPER RESISTANT SCREWS & VHB 3M ADHESIVE.



SIGN TYPE D - EXIT ID.

.04 STAINLESS STEEL, 1/16" RADIUS CORNERS DIE-CUT W/BURR SIDE DOWN. EMBOSSED TEXT RAISED MIN. 1/32" EMBOSSED DOMED GRADE 2 BRAILLE MIN. 1/40". EPOXY POWDER COATED BLUE BACKGROUND W/ WHITE COPY.

MOUNTING:
(4) TAMPER RESISTANT SCREWS & VHB 3M ADHESIVE.

TACTILE SIGNAGE

A. WHEN SIGNS IDENTIFY A PERMANENT ROOM OR SPACE OF A BUILDING OR SITE, OR WHEN SIGNS DIRECT OR GIVE INFORMATION ABOUT A PERMANENT ROOM OR SPACE OF A BUILDING OR SITE, CORRESPONDING TACTILE SIGNAGE SHALL BE INSTALLED.
B. WHEN SIGNS IDENTIFY, OR GIVE INFORMATION ABOUT ACCESSIBLE ELEMENTS AND FEATURE OF A BUILDING OR SITE, THEY SHALL INCLUDE THE APPROPRIATE SYMBOL OF ACCESSIBILITY OR PICTOGRAM, WITH THE EQUIVALENT VISUAL AND TACTILE DESCRIPTION PLACED DIRECTLY BELOW THE PICTOGRAM. THE OUTSIDE BORDER OF THE PICTOGRAM SHALL BE MINIMUM 6" IN HEIGHT.
C. VISUAL CHARACTERS SHALL BE UPPERCASE, STANDARD SANS SERIF FONT. THE HEIGHT OF VISUAL CHARACTERS SHALL BE A MINIMUM 5/8" PLUS 1/8" PER FOOT OF VIEWING DISTANCE OVER SIX FEET. CHARACTER WIDTH SHALL BE 55% MINIMUM AND 110% MAXIMUM OF THE HEIGHT OF THE CHARACTER. CHARACTER STROKE WIDTH OF VISUAL ONLY CHARACTERS SHALL BE A MINIMUM OF 10% OF THE CHARACTER HEIGHT, AND A MAXIMUM OF 30%. TACTILE SIGNAGE DUPLICATING THE INFORMATION SHALL BE PROVIDED, EITHER AS PART OF THE VISUAL SIGN OR A SEPARATE TACTILE SIGN PROVIDED.
D. TACTILE CHARACTERS SHALL BE UPPERCASE, STANDARD SANS SERIF FONT, RAISED 1/32" OFF THE BACKGROUND. THE HEIGHT OF TACTILE CHARACTERS SHALL BE BETWEEN 5/8" AND 2". CHARACTER WIDTH SHALL BE 55% MINIMUM AND 110% MAXIMUM OF THE HEIGHT OF THE CHARACTER. CHARACTER STROKE WIDTH SHALL BE A MINIMUM OF 10% OF THE CHARACTER HEIGHT, AND A MAXIMUM OF 15%. CHARACTERS SHALL BE ACCOMPANIED BY GRADE 2 BRAILLE.
E. GRADE 2 BRAILLE SHALL HAVE DOMED OR ROUNDED DOTS RAISED 1/40" OFF THE BACKGROUND, WITH DOTS SPACED 1/10" WITH-IN CELLS, AND 2/10" SPACED BETWEEN CELLS. (OR SPACED PER ANSI TABLE 703.5)
F. TACTILE SIGNS SHALL BE MOUNTED 48" MINIMUM, AND 60" MAXIMUM ABOVE THE FLOOR TO THE CENTERLINE OF THE SIGN. AN 18" X 18" CLEAR SPACE IS REQUIRED IN FRONT OF THE TACTILE SIGN, BEYOND THE ARC OF ANY DOOR SWING. WHERE SIGNS ARE MOUNTED AT DOORS, THE SIGN SHALL BE ON THE LATCH SIDE OF THE DOOR. WHERE SIGNS ARE MOUNTED AT DOUBLE DOORS, OR WHERE THERE IS NO WALL SPACE, THE SIGN SHALL BE MOUNTED ON THE NEAREST ADJACENT WALL, PREFERABLY THE RIGHT SIDE.
G. CHARACTERS AND SYMBOLS SHALL CONTRAST WITH THEIR BACKGROUND. CHARACTERS, SYMBOLS AND BACKGROUNDS SHALL HAVE A NON-GLARE FINISH.

8 ACCESSIBLE SIGN & PICTOGRAMS

SCALE: 12" = 1'-0"

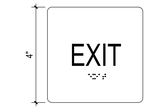
INTERNATIONAL ACCESSIBILITY SYMBOL

RAISED

UNISEX RESTROOM

PROPORTIONS

INTERNATIONAL SIGN OF ACCESSIBILITY



SIGN COLORS PER OTF SPECS - CONTRASTING ORANGE ON WHITE

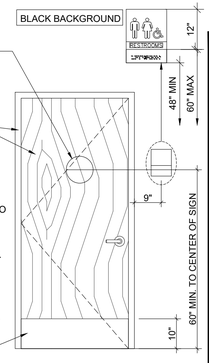
ADA IDENTIFICATION SIGN

DOOR AND FRAME REFER TO DOOR SCHEDULE

ACCESSIBLE SIGNAGE NOTES

1. CHARACTERS AND SYMBOLS SHALL CONTRAST WITH THEIR BLACK BACKGROUND.
2. IDENTIFICATION SYMBOLS ARE TO BE CENTERED ON DOOR 60" ABOVE FLOOR AND ARE TO BE DISTINCTLY DIFFERENT FROM DOOR IN COLOR AND CONTRAST.
3. PROVIDE ROOM IDENTIFICATION SIGN ON DOOR.
4. LETTERS AND NUMBERS ON SIGNS SHALL BE SHALL BE SANS-SERIF UPPERCASE CHARACTERS ACCOMPANIED BY GRADE 2 BRAILLE.

KICKPLATE ON BOTH SIDES



NOTE:
"IF ANY EXISTING ACCESSIBILITY ELEMENTS ARE NOT IN COMPLIANCE WITH CURRENT CODE REQUIREMENTS, THEY SHALL BE UPGRADED TO THE ACCESSIBILITY REQUIREMENTS SHOWN ON THIS PLANS".

LETTERS AND NUMBERS:

1. LETTERS AND NUMBERS ON SIGNS SHALL BE RAISED 1/32" MINIMUM AND SHALL BE SANS-SERIF UPPERCASE CHARACTERS ACCOMPANIED BY GRADE 2 BRAILLE.
2. RAISED CHARACTERS OR SYMBOLS SHALL BE A MINIMUM OF 5/8" HIGH.
3. PICTORIAL SYMBOL SIGNS (PICTOGRAMS) SHALL BE ACCOMPANIED BY THE EQUIVALENT VERBAL DESCRIPTION PLACED DIRECTLY BELOW THE PICTOGRAM. THE BORDER DIMENSION OF THE PICTOGRAM SHALL BE A MINIMUM OF 6" IN HEIGHT.
4. CHARACTERS AND SYMBOLS SHALL CONTRAST WITH THEIR BACKGROUND, EITHER LIGHT CHARACTERS ON A DARK BACKGROUND OR DARK CHARACTERS ON A LIGHT BACKGROUND.
5 CHARACTER HEIGHT MEASURED VERTICALLY FROM THE BASELINE OF THE CHARACTER SHALL BE 5/8" MINIMUM AND 2" MAXIMUM BASED ON THE HEIGHT OF UPPERCASE "I"
6. CONTRACTED GRADE 2 BRAILLE SHALL BE USED WHEREVER BRAILLE SYMBOLS ARE SPECIFICALLY REQUIRED IN OTHER PORTIONS OF THESE REGULATIONS. DOTS SHALL BE 1/10" ON CENTERS IN EACH CELL WITH 2/10" SPACE BETWEEN CELLS. DOTS SHALL BE RAISED A MINIMUM OF 1/40" ABOVE THE BACKGROUND.

SIGN LOCATIONS:

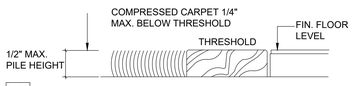
7. ALL BUILDING ENTRANCES THAT ARE ACCESSIBLE TO AND USABLE BY PERSONS WITH DISABILITIES AND AT EVERY MAJOR JUNCTION ALONG OR LEADING TO AN ACCESSIBLE ROUTE OF TRAVEL SHALL BE IDENTIFIED WITH A SIGN DISPLAYING THE INTERNATIONAL SYMBOL OF ACCESSIBILITY AND WITH ADDITIONAL DIRECTIONAL SIGNS, AS REQUIRED, TO BE VISIBLE TO PERSONS ALONG APPROACHING PEDESTRIAN WAYS.
8. WHEN PERMANENT IDENTIFICATION IS PROVIDED FOR ROOMS AND SPACES, RAISED LETTERS SHALL BE PROVIDED AND SHALL BE ACCOMPANIED BY BRAILLE. SIGNS SHALL BE INSTALLED ON THE WALL ADJACENT TO THE LATCH OUTSIDE OF THE DOOR. WHERE THERE IS NO WALL SPACE ON THE LATCH SIDE, INCLUDING AT LEAF DOORS, SIGNS SHALL BE PLACE ON THE NEAREST ADJACENT WALL, PREFERABLY ON THE RIGHT. MOUNTING HEIGHT SHALL BE 60" ABOVE THE FINISH FLOOR TO THE CENTERLINE OF THE SIGN. MOUNTING LOCATION SHALL BE DETERMINED SO THAT THE PERSON MAY APPROACH WITHIN 3" OF THE SIGNAGE WITHOUT ENCOUNTERING PROTRUDING OBJECTS OR STANDING WITHIN THE SWING OF A DOOR.
9. ADDITIONAL DIRECTIONAL SIGNS ALONG ACCESSIBLE PATH OF TRAVEL ARE REQUIRED.
10. BUILDINGS REMODELED TO PROVIDE ACCESSIBLE SANITARY FACILITIES FOR PUBLIC USE SHALL HAVE INFORMATION POSTED IN THE LOBBY AS PART OF THE BUILDING DIRECTORY.

INTERNATIONAL SYMBOL OF ACCESSIBILITY:

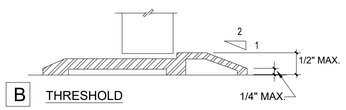
11. STANDARD USED TO IDENTIFY ACCESSIBLE FACILITIES.
12. WHITE FIGURE ON BLUE BACKGROUND, COLOR # 15090 ON FEDERAL STANDARD # 595A.
13. WHEN ENFORCING AGENCY DETERMINES, IF APPROPRIATE, SPECIAL DESIGNS AND COLORS MAY BE APPROVED.

BRAILLE:

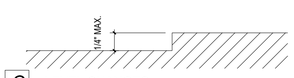
14. USE CONTRASTED GRADE 2 BRAILLE. DOTS TO BE 0.1 INCH ON CENTER IN EACH CELL.
16. 0.2 INCH SPACE BETWEEN CELLS.
17. DOTS RAISED MINIMUM 0.025 INCH ABOVE BACKGROUND.



A TRANSITION BETWEEN FLOOR FINISHES



B THRESHOLD



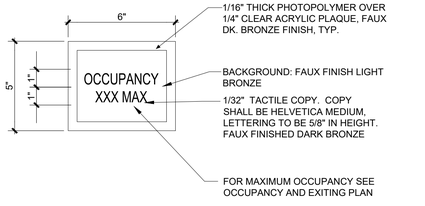
C LEVEL CHANGES

NOTES:

1. 1/2" MAXIMUM TOTAL HEIGHT WITH 1/4" MAXIMUM VERTICAL CHANGE AT EDGE.
2. 1 : 2 SLOPED BEVEL REQUIRED IF LEVEL CHANGE IS OVER 1/4" VERTICAL LEVEL CHANGE.
3. 1/4" MAXIMUM VERTICAL LEVEL CHANGE.

19 THRESHOLD/LEVEL CHANGES

SCALE: 12" = 1'-0"



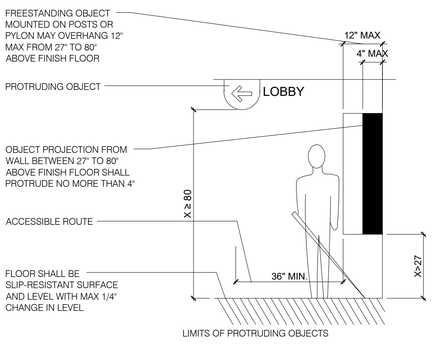
NOTE: PLAQUES SHALL BE MATTE CLEAR COATED WITH CLEAR POLYURETHANE AFTER LETTERING, SYMBOLS & GRAPHIC APPLIED, TYP. SIGNS MOUNT WITH VHB TAPE AND SILICONE ADHESIVE. SIGN SHALL BE POSTED IN A CONSPICUOUS PLACE NEAR THE MAIN EXIT OR EXIT ACCESS DOORWAY FROM THE ROOM.

20 OCCUPANCY SIGN

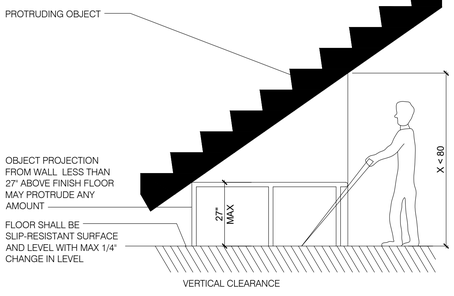
SCALE: N.T.S.

14 DOOR CLEARANCE SPACE

SCALE: 12" = 1'-0"



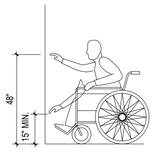
LIMITS OF PROTRUDING OBJECTS



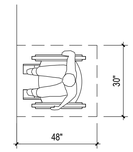
VERTICAL CLEARANCE

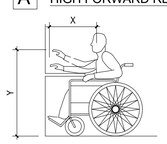
16 PROTRUDING OBJECTS

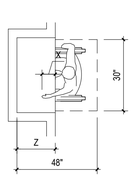
SCALE: N.T.S.



A HIGH FORWARD REACH LIMIT



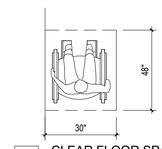




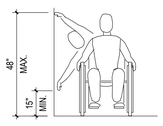
NOTES:

1. WHEN X < 20 INCHES, THEN Y SHALL BE 48 INCHES MAXIMUM.
2. WHEN X IS 20 TO 25 INCHES, THEN Y SHALL BE 44 INCHES MAXIMUM.

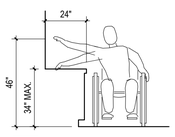
B MAXIMUM FORWARD REACH OVER AN OBSTRUCTION



C CLEAR FLOOR SPACE PARALLEL APPROACH



D HIGH AND LOW SIDE REACH LIMITS



E MAXIMUM SIDE REACH OVER AN OBSTRUCTION

10 REACH RANGES

SCALE: 12" = 1'-0"

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G.S.S. Companies Inc.
"Building Arizona Since 1985"

FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

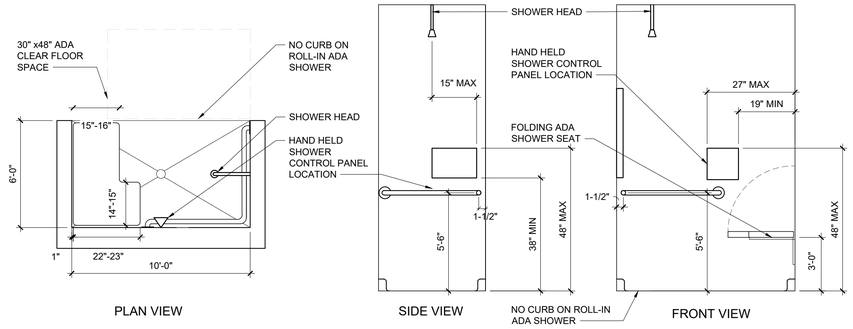
PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE

COVER SHEET
ACCESSIBILITY

DATE
8-19-22
PROJECT NO.
20-200

CS-0.6

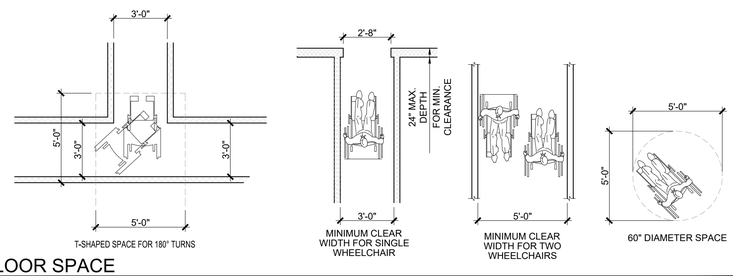


NOTES:
1. SHOWER FLOOR SLOPE SHALL NOT EXCEEDS 2% IN ALL DIRECTIONS & DRAIN GRATE OPENINGS SHALL NOT EXCEED 1/4" & MUST BE FLUSH W/ FINISHED FLOOR.
2. SHOWERS SHALL BE FINISHED WITH A SMOOTH, NON-ABSORBANT SURFACE SUCH AS PORTLAND CEMENT, CONCRETE, CERAMIC TILE OR OTHER APPROVED MATERIAL TO A HEIGHT OF NOT LESS THAN 70" ABOVE THE DRAIN INLET. MATERIALS OTHER THAN STRUCTURAL ELEMENTS USED IN SUCH WALLS SHALL BE A TYPE OF WHICH IS NOT ADVERSELY AFFECTED BY MOISTURE.
3. SINGLE LEVER SHOWER CONTROLS SHALL BE OPERABLE WITH A MAXIMUM FORCE OF 5 LBS & NOT MOUNTED MORE THAN 40" ABOVE FLOOR.
4. THE SHOWER SEAT SHALL BE STRONG ENOUGH TO WITHSTAND A MAX. LOAD OF 250 LBS & WHEN IN THE FOLDED POSITION SHALL NOT EXTEND BEYOND THE WALL MORE THAN 6"
5. TRANSFER-TYPE SHOWER COMPARTMENTS SHALL HAVE A CLEAR INSIDE DIMENSION OF 60" IN WIDTH AND 36" IN DEPTH, MEASURED AT THE CENTER POINT OF OPPOSING SIDES. AN ENTRY 36" MINIMUM IN WIDTH SHALL BE PROVIDED. A CLEARANCE OF 48" MINIMUM IN LENGTH MEASURED PERPENDICULAR FROM THE CONTROL WALL, AND 36" MINIMUM IN DEPTH SHALL BE PROVIDED ADJACENT TO THE OPEN FACE OF THE COMPARTMENT.

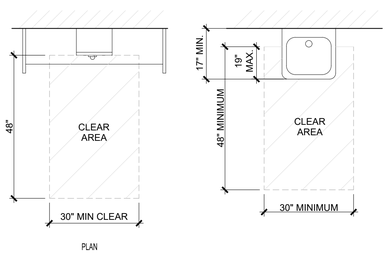
NOTE:
HAND HELD SHOWER SPRAY UNIT WITH A HOSE AT LEAST 60" LONG THAT CAN BE USED AS A FIXED HEAD AND A HAND HELD SHOWER (48" MAX).

A.D.A COMPLIANT SHOWER ENCLOSURE WITH SEAT

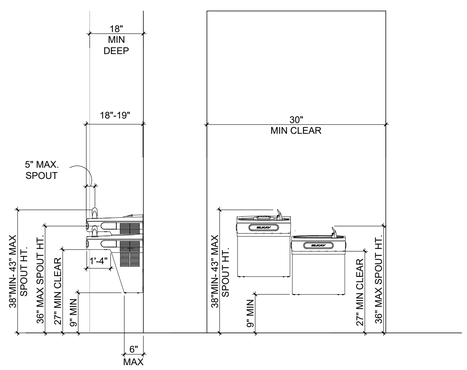
15 ACCESSIBLE SHOWER
SCALE: NTS



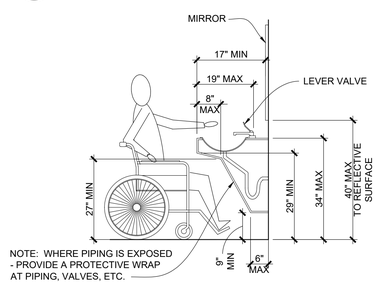
14 CLEAR FLOOR SPACE
SCALE: NTS



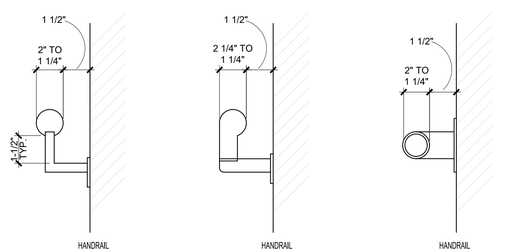
13 CLEAR FLOOR SPACE
SCALE: NTS



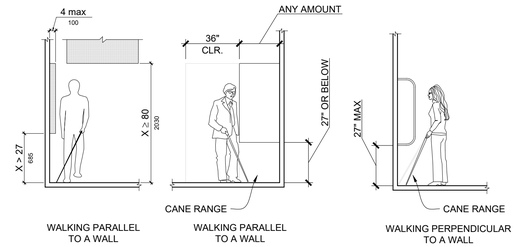
11 DRINKING FOUNTAIN
SCALE: NTS

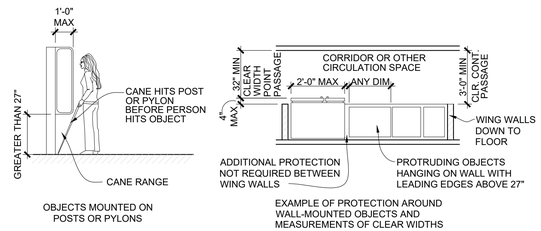


12 LAVATORY CLEARANCES
SCALE: NTS

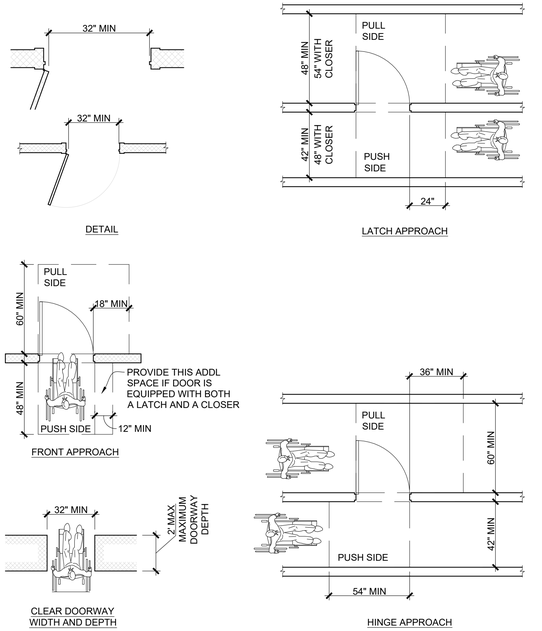


10 SIZE AND SPACING OF HANDRAILS AND GRAB BARS
SCALE: NTS

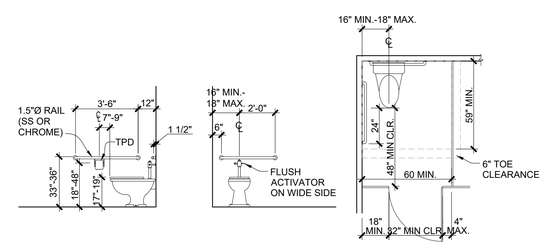




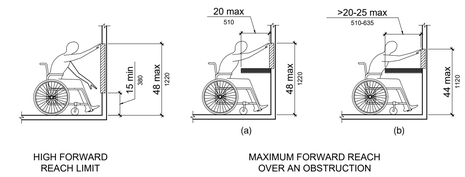
9 PROTRUDING OBJECTS
SCALE: NTS



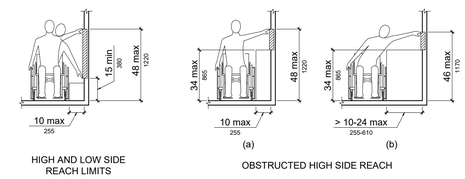
8 MANEUVERING CLEARANCES AT DOORWAY/DOORS
SCALE: NTS



7 RESTROOM CLEARANCES
SCALE: NTS



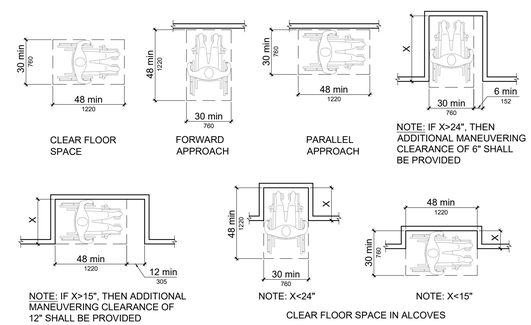
6 FORWARD REACH
SCALE: NTS



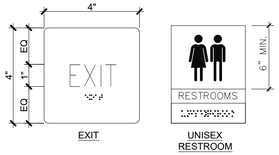
5 SIDE REACH
SCALE: NTS

NOTE:
CHANGES IN LEVEL GREATER THAN 1/2" SHALL BE BY MEANS OF A RAMP.

4 CHANGE IN LEVEL
SCALE: NTS

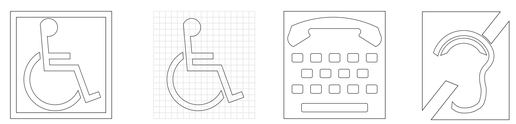


3 MANEUVERING ACCESS
SCALE: NTS



BRAILLE SHALL BE MOUNTED 48" MINIMUM, AND 60" MAXIMUM ABOVE THE FLOOR, MEASURED TO THE BASELINE OF THE BRAILLE CELLS. RAISED CHARACTERS SHALL BE 48" MINIMUM TO THE BASELINE OF THE LOWEST RAISED CHARACTER AND 60" MAXIMUM TO THE BASELINE OF THE HIGHEST RAISED CHARACTER. AN 18" X 18" CLEAR SPACE IS REQUIRED IN FRONT OF THE TACTILE SIGN, BEYOND THE ARC OF ANY DOOR SWING.

2 TACTILE SIGNAGE
SCALE: NTS



PROPORTIONS INTERNATIONAL SYMBOL OF ACCESSIBILITY — INTERNATIONAL TDD SYMBOL — INTERNATIONAL SYMBOL OF OF ACCESS FOR HEARING LOSS

1 INTERNATIONAL SYMBOLS
SCALE: NTS

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G.S.S. Companies Inc.
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FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260
TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
COVER SHEET
ACCESSIBILITY

DATE
8-19-22
PROJECT NO.
20-200

CS-0.6

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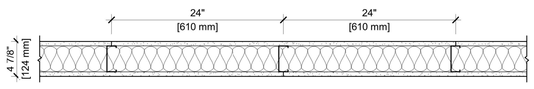
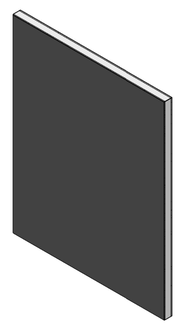
DESIGN NO. UL U419

FIRE RATING:	1 HOUR
STC RATING:	49
SOUND TEST:	USG-190432
SYSTEM THICKNESS:	4-7/8" [124 MM]
LOCATION:	INTERIOR
FRAMING TYPE:	STEEL STUD (NONLOAD-BEARING)





ASSEMBLY REQUIREMENTS:

GYPSUM PANELS:	ONE LAYER 5/8" [15.9 MM] SHEETROCK® GYPSUM PANEL (UL TYPE SCX)
STEEL STUDS:	3-5/8" [92 MM] STEEL STUDS, EQ25 (0.015"), 24" [610 MM] O.C.
INSULATION:	3-1/2" [89 MM] FIBERGLASS INSULATION
GYPSUM PANELS:	ONE LAYER 5/8" [15.9 MM] SHEETROCK® GYPSUM PANEL (UL TYPE SCX)

GENERAL WALL NOTES:

1. REFER TO APPLICABLE CODES REQUIREMENTS TO ENSURE COMPLIANCE PRIOR TO CONSTRUCTION.
2. FOR THE MOST UP-TO-DATE DETAILS, INCLUDING CONSTRUCTION VARIATIONS, REFER TO THE PUBLISHED DESIGN.
3. WHERE DESIGN NO. INDICATES "PER", THE FIRE RATING IS BASED ON LABORATORY TEST DATA OF THE REFERENCED SIMILARLY CONSTRUCTED ASSEMBLIES.
4. STUD SIZES AND INSULATION THICKNESS ARE MINIMUM UNLESS OTHERWISE STATED IN THE PUBLISHED ASSEMBLY.
5. STUD AND FASTENER SPACINGS ARE MAXIMUM UNLESS OTHERWISE STATED IN THE PUBLISHED ASSEMBLY.
6. PANEL ORIENTATION SHALL BE AS SPECIFIED IN THE PUBLISHED DESIGN.
7. FIRE-RATINGS ARE FROM BOTH SIDES UNLESS OTHERWISE STATED.
8. FIRE-RATINGS ARE MAINTAINED WITH ONE OR MORE OF THE FOLLOWING MODIFICATIONS: INCREASE STUD DEPTH, INCREASE STUD MATERIAL THICKNESS, DECREASE STUD SPACING, DECREASE FASTENER SPACING, INCREASE INSULATION THICKNESS UP TO CAVITY DEPTH.
9. WHERE ACOUSTICAL PERFORMANCE IS PROVIDED IN AN ESTIMATED RANGE, THE VALUES ARE BASED ON LABORATORY TEST DATA OF SIMILARLY CONSTRUCTED ASSEMBLIES.
10. SOUND-RATINGS ARE MAINTAINED WITH ONE OR MORE OF THE FOLLOWING MODIFICATIONS: INCREASE STUD DEPTH, DECREASE STUD MATERIAL THICKNESS, INCREASE STUD SPACING, INCREASE FASTENER SPACING, INCREASE INSULATION THICKNESS UP TO CAVITY DEPTH. MODIFICATIONS MUST NOT EXCEED LIMITATIONS OF FIRE RATING.

USG CGC

USG Corporation
550 West Adams Street
Chicago, IL 60661 USA
www.USG.com
T. 800-USG4YOU

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UL U419

ISSUE RECORD:
Revision Date
10/05/2021 11:49:22 PM

SHEET INFORMATION:
SN-P-1-02

2 1 HOUR FIRE WALL ASSEMBLY
SCALE: N.T.S.

BXUV - FIRE RESISTANCE RATINGS - ANSI/UL 263 CERTIFIED FOR UNITED STATES
BXUV7 - FIRE RESISTANCE RATINGS - CAN/ULC-S101 CERTIFIED FOR CANADA

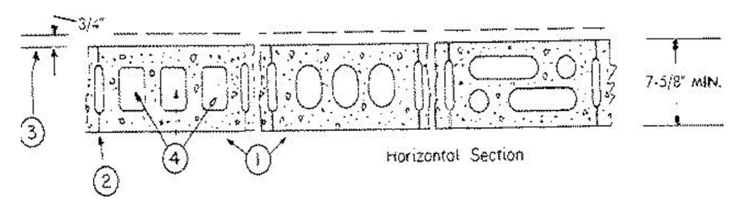
DESIGN NO. U905
DECEMBER 20, 2018

BEARING WALL RATING — 2 HR.

NONBEARING WALL RATING — 2 HR.

THIS DESIGN WAS EVALUATED USING A LOAD DESIGN METHOD OTHER THAN THE LIMIT STATES DESIGN METHOD (E.G., WORKING STRESS DESIGN METHOD). FOR JURISDICTIONS EMPLOYING THE LIMIT STATES DESIGN METHOD, SUCH AS CANADA, A LOAD RESTRICTION FACTOR SHALL BE USED — SEE GUIDE BXUV OR BXUV7

* INDICATES SUCH PRODUCTS SHALL BEAR THE UL OR CUL CERTIFICATION MARK FOR JURISDICTIONS EMPLOYING THE UL OR CUL CERTIFICATION (SUCH AS CANADA), RESPECTIVELY.



1. **CONCRETE BLOCKS* — VARIOUS DESIGNS. CLASSIFICATION D-2 (2 HR). SEE CONCRETE BLOCKS CATEGORY FOR LIST OF ELIGIBLE MANUFACTURERS.**
2. **MORTAR — BLOCKS LAID IN FULL BED OF MORTAR, NOM. 3/8 IN. THICK, OF NOT LESS THAN 2-1/4 AND NOT MORE THAN 3-1/2 PARTS OF CLEAN SHARP SAND TO 1 PART PORTLAND CEMENT (PROPORTIONED BY VOLUME) AND NOT MORE THAN 50 PERCENT HYDRATED LIME (BY CEMENT VOLUME). VERTICAL JOINTS STAGGERED.**
3. **PORTLAND CEMENT STUCCO OR GYPSUM PLASTER — ADD 1/2 HR TO CLASSIFICATION IF USED. WHERE COMBUSTIBLE MEMBERS ARE FRAMED IN WALL, PLASTER OR STUCCO MUST BE APPLIED ON THE FACE OPPOSITE FRAMING TO ACHIEVE A MAX. CLASSIFICATION OF 1-1/2 HR. ATTACHED TO CONCRETE BLOCKS (ITEM 1).**
4. **LOOSE MASONRY FILL — IF ALL CORE SPACES ARE FILLED WITH LOOSE DRY EXPANDED SLAG, EXPANDED CLAY OR SHALE (ROTARY KILN PROCESS), WATER REPELLANT VERMICULITE MASONRY FILL INSULATION, OR SILICONE TREATED PERLITE LOOSE FILL INSULATION ADD 2 HR TO CLASSIFICATION.**
5. **FOAMED PLASTIC* — (OPTIONAL-NOT SHOWN) — 1-1/2 IN. THICK MAX, 4 FT WIDE SHEATHING ATTACHED TO CONCRETE BLOCKS (ITEM 1)**

   ATLAS ROOFING CORP — "ENERGYSHIELD PRO WALL INSULATION", "ENERGYSHIELD PRO 2 WALL INSULATION", ENERGYSHIELD CGF PRO AND ENERGYSHIELD PLY PRO

   CARLISLE COATINGS & WATERPROOFING INC — TYPE R2+ SHEATHE

   FIRESTONE BUILDING PRODUCTS CO L L C — "ENVERGE™ CI FOIL EXTERIOR WALL INSULATION" AND "ENVERGE™ CI GLASS EXTERIOR WALL INSULATION"

   HUNTER PANELS — TYPES XCI-CLASS A, XCI 286

   RMAX OPERATING L L C — "TSX-8500", "TSX-8510", "THERMASHEATH-XP", "ECOMAXCI", "THERMASHEATH-3", "DURASHEATH-3"

   THE DOW CHEMICAL CO — TYPES THERMAX SHEATHING, THERMAX LIGHT DUTY INSULATION, THERMAX HEAVY DUTY INSULATION, THERMAX METAL BUILDING BOARD, THERMAX WHITE FINISH INSULATION, THERMAX CI EXTERIOR INSULATION, THERMAX XARMOR CI EXTERIOR INSULATION, THERMAX IH INSULATION, THERMAX PLUS LINER PANEL, THERMAX HEAVY DUTY PLUS (HDP) AND TUFF-R™ CI INSULATION

5A. **BUILDING UNITS — AS AN ALTERNATE TO ITEMS 5, MIN. 1-IN THICK POLYISOCYANURATE COMPOSITE FOAMED PLASTIC INSULATION BOARDS, NOM. 48 BY 48 OR 96 IN.**
   RMAX OPERATING L L C — "THERMASHEATH-SI", "ECOBASECI", "THERMABASE-CI", "ECOMAXCI FR PLY"

* **INDICATES SUCH PRODUCTS SHALL BEAR THE UL OR CUL CERTIFICATION MARK FOR JURISDICTIONS EMPLOYING THE UL OR CUL CERTIFICATION (SUCH AS CANADA), RESPECTIVELY.**

1 2 HOUR FIRE WALL ASSEMBLY
SCALE: N.T.S.

G.S.S. Companies Inc.
"Building Arizona Since 1985"

FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
TWO HOUR FIRE WALL

DATE
8-19-22
PROJECT NO.
20-200

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UL Product iQ®

BXUV.P711 - Fire-resistance Ratings - ANSI/UL 263

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- Authorities Having Jurisdiction should be consulted before construction.
- Fire resistance assemblies and products are developed by the design submitter and have been investigated by UL for compliance with applicable requirements. The published information cannot always address every construction nuance encountered in the field.
- When field issues arise, it is recommended the first contact for assistance be the technical service staff provided by the product manufacturer noted for the design. Users of fire resistance assemblies are advised to consult the general Guide Information for each product category and each group of assemblies. The Guide Information includes specifics concerning alternate materials and alternate methods of construction.
- Only products which bear UL's Mark are considered Certified.

Fire-resistance Ratings - ANSI/UL 263

BXUV - Fire Resistance Ratings - ANSI/UL 263 Certified for United States

BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

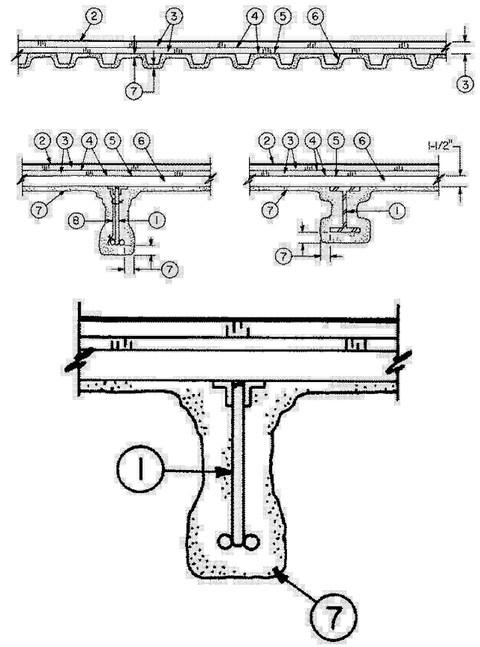
See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

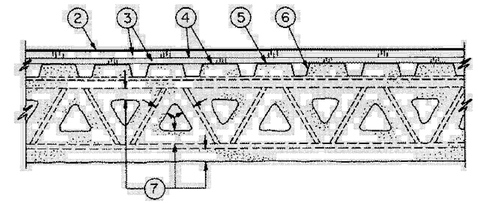
Design No. P711

November 22, 2022

Restrained Assembly Ratings — 1, 1-1/2 or 2 Hr. (See Items 3, 7 and 8A)
Unrestrained Assembly Ratings — 1, 1-1/2 or 2 Hr. (See Items 3, 7 and 8A)
Unrestrained Beam Rating — 1, 1-1/2 or 2 Hr. (See Items 7 and 8A)
Restricted Load Condition — See Item 1A
This design was evaluated using a load design method other than the Limit States Design Method (e.g., Working Stress Design Method). For jurisdictions employing the Limit States Design Method, such as Canada, a load restriction factor shall be used — See Guide BXUV or BXUV7

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**





1. **Beam —** W6x16 min size. As alternate to steel beams, Joist girders — (Not shown)— 20 in. min depth and 13 lb per lin ft min weight.

1A. **Steel Joists —** Types 10J4, 10H4, 12J4, 14J7 or 14K4 min size.
NOTE: Design load shall stress 10H4 joist to a max tensile stress of 22 KSI.

2. **Roof Covering* —** Consisting of hot mopped or cold application materials compatible with insulation(s) described herein which provide Class A, B or C coverings. See Roofing Materials and Systems Directory-Roof Covering Materials(TEVT).

2A. **In lieu of Item 2, roof covering consisting of single-ply Roofing Membrane* —** that is either ballasted, adhered or mechanically attached as permitted under the respective manufacturer's Classification. See Fire Resistance Directory-Roofing Membranes (CHCI).

2B. **Metal Roof Deck Panels —** (Not shown) — In addition to or in lieu of Items 2 or 2A, the roof covering may consist of a mechanically fastened metal roof deck panel assembly. See Fire Resistance Directory-Metal Roof Deck Panels (CETW).

3. **Roof Insulation —** May consist of the following:
A. **Mineral and Fiber Boards* —** Min thickness 3/4 in. for the 1 and 1-1/2 hr. assembly ratings and 1-3/4 in. for the 2 hr. assembly rating. Min thickness is 1-3/4 in. when Item 2A or 2B are used. Min thickness is 3/4 in. otherwise. Max thickness 4-7/8 in. To be applied in two or more layers with adhesive applied between layers of boards and to vapor retarder or roof deck if vapor retarder is not used. As an alternate, the first layer of insulation may be attached to the roof deck by self drilling, self tapping steel screws pierced through 3-1/4 in. hexagonal steel plates spaced min. 15 in. O.C. The min cover of Spray-Applied Fire Resistive Materials to the end of the screw shall be 1/2 in. The second layer of insulation may be secured to the first layer with 30 lb of hot mopping asphalt per 100 sq. ft. Each layer of board to be offset in both directions from layer below a min of 6 in. A secondary membrane consisting of Type G1 or G2 mats or Type 15 felt may be used between layers of roof insulation. Secondary membrane secured in place with 25 lb. of hot mopping asphalt per 100 sq ft. Insulation may be installed in a single layer if the Restrained and Unrestrained Assembly Ratings are limited to 1 hr or if a 5/8 in. thick layer of gypsum sheathing is placed on the steel roof deck units. Joints between insulation and sheathing shall be staggered.
ROCKWOOL — MonoBoard™, MonoBoard™ Plus, "MonoBoard Plus S", TopRock®DD, TopRock® DD Plus or TopRock DD Plus S.

SOPREMA INC — SopraRock®DD and SopraRock®DD Plus.

B. **Gypsum Board —** (Classified or Unclassified, not shown) — 5/8 in. thick gypsum wallboard, min weight 2.0 psf, may be used with the above insulation to obtain various Unrestrained and Restrained Assembly Ratings as described in Item 7. Installed perpendicular to the steel roof deck with joints staggered and occurring over the crests of the roof deck. Secured to the roof deck with adhesive (Item 4) or with asphalt applied to a min of 50 percent of the crest surface at a rate of 12 to 15 lbs per 100 sq ft or with mechanical fasteners. If mechanical fasteners are used, the end of the fastener shall be covered with a min 1/2 in. of Spray-Applied Fire Resistive Materials.

4. **Adhesive* —** Optional — Adhesive may be used to attach each layer of roof insulation. The adhesive may be applied in 1/2 in. wide ribbons approx. 6 in. OC at 0.4 gal/100 sq ft. In lieu of adhesive, the first layer of roof insulation may be secured with asphalt applied to a min of 50 percent of the crests surface at a rate of 12 to 15 lbs. per 100 sq ft or with mechanical fasteners. If mechanical fasteners are used, the fastener shall not penetrate through the Spray-Applied Fire Resistive Materials.
See Adhesives (BYWR) category for names of Classified companies

5. **Sheathing Material* —** Optional. Vinyl film or paper scrim vapor barrier applied with adhesive or laid loosely on the steel roof deck, overlapped approx 2 in. at sides.
See Sheathing Material (CHIZ) category for names of Classified companies.

5A. **Sheathing Material* —** (Optional) — A self-adhered rubberized asphalt roofing underlayment membrane which may be placed on top of the gypsum wallboard (Item 3B) or on the roof insulation (Item 3A).
GCP APPLIED TECHNOLOGIES INC — Grace Ice and Water Shield, Grace Ice and Water Shield-HT®, Grace Select, Grace Ultra, and Grace Basik.

6. **Steel Roof Deck —** Unclassified - Min 1-1/2 in. deep and 18 in. wide, galv fluted steel deck. Min gauge is 22 MSG. Ends overlapped at supports min 1-1/2 in. and welded to supports min 12 in. OC. Adjacent units button-punched or welded together at midspan along side joints; or **Classified Steel Floor and Form Units* —** Noncomposite 1-1/2 in. deep, min. 24 in. wide, galv fluted steel deck. Min gauge is 22 MSG. Ends overlapped at supports min 1-1/2 in. and welded to supports a max 12 in. OC. Adjacent units button-punched or welded together at midspan along side joints.
ASC STEEL DECK, DIV OF ASC PROFILES L L C — Types BH-36, BHN-36, BHN-35-1/4, DGB-36, B-36, BN-36, BN-35-1/4, NH-32, NHN-32, DGN-32, N-32, and NN-32. All units may be galvanized or Prime Shield™. Non-cellular decks may be vented designated with a "V" suffix to the product name.

CANAM GROUP INC — Type P-3606 or P-3615; 36 in. wide Types 1.5B, 1.5BI; 24 in. wide Types 3N, 3NI.

CANAM STEEL CORP — Types B, BI, F, NS and NI. Units may be ptd/ptd.

INTSEL STEEL EAST LLC — 36 in. wide Type 1.5" B-DECK/ROOF, 24 in. wide Type N-DECK/ROOF.

MARLYN STEEL DECKS INC — Types B, F, N, NV .

NEW MILLENNIUM BUILDING SYSTEMS L L C — Type B, BD, BI, F, FD, N, ND, NW32 and NW32I. Units may be phos/painted or galvanized.

ROOF DECK INC — Type A, B-1, B-2 or F.

VERCO DECKING INC - A NUCOR CO — Deck types PLB, HSB, PLN3, HSN3, PLN, N; FORMLOK™ deck types PLB, B, PLN3, N3, PLN, N. Units may be galvanized or phos./ptd. Deck may be vented or non-vented.

VULCRAFT, DIV OF NUCOR CORP — Types 1.5B, 1.5BI, 1.5PLB, 1.5F, 3N, 3NI, 3.0PLN, 3NL-32, 3NI-32, 3PLN-32. Units may be ptd/ptd; Types BW, B High Strength, BW High Strength, N. Units may be phd/ptd.

7. **Spray-Applied Fire Resistive Materials* —** Applied by mixing with water and spraying in more than one coat to a final thickness as shown above and in the table below, to steel surfaces which must be clean and free of dirt, loose scale and oil. Min avg and min ind density of 15/14 pcf respectively. Min avg and min ind density of 19/18 pcf respectively for Types 7GP and 7HD.
For method of density determination, refer to Design Information Section.

For the W6x16 wide flange beams, the thickness of Spray-Applied Fire Resistive Materials shall be 7/8 in. for the 1 hr Unrestrained Beam Rating, 1-3/8 in. for the 1-1/2 hr Unrestrained Beam Rating, and 1-1/2 in. for the 2 hr Unrestrained Beam Rating.

The joist protection shall be applied in the manner and at the thicknesses shown below:

Note: When metal lath is required, as indicated below, full thickness of Spray-Applied Fire Resistive Materials is to be applied over the entire support including lath.

Min Joist Size	Type of Application	Restrained Assembly Rating Hr	Unrestrained Assembly Rating Hr	Unrestrained Beam Rating Hr	Thkns of Spray Applied Fire Resistive Mtl In.
14J7	Direct	1	1	1	1-1/2
10J4, 10H4	Direct	1	1	1	1-3/4
10J4, 10H4	Direct	1-1/2	1-1/2	1-1/2	2-1/4
10J4, 10H4	Direct	2	2	2	2-7/16
12J4, 14K4	Direct	1	1	1	2
12J4, 14K4	Direct	1-1/2	1-1/2	1-1/2	2-1/4
12J4, 14K4	Direct	2	2	2	2-7/16
12J4, 14K4	Lath	1-1/2	1 1/2	1-1/2	1-3/4
12J4, 14K4	Lath	2	2	2	1-7/8

When W6x16 beams and min size 12J4, 14J7 or 14K4 joists are used, thickness of the spray-applied resistive material applied to the roof deck units shall be:

Restrained or Unrestrained Assembly Rating Hr	Thk of Spray Applied Fire Resistive Mtl Applied to Deck	
	w/Gypsum Sheathing	w/o Gypsum Sheathing
1	1-3/16	1-1/4
1-1/2	1-3/16	1-1/2
2	1-7/16	1-3/4

When min size 10J4 or 10H4 joists are used, thickness of spray-applied resistive material applied to the roof deck units, with or without gypsum sheathing, shall be:

Restrained or Unrestrained Assembly Rating Hr	Thkns of Spray Applied Fire Resistive Mtl on Steel Deck In.
1	1-3/8
1-1/2	1-5/8
2	1-7/8

GCP KOREA INC — Types MK-6/CBF, MK-6/ED, MK-6/HY, MK-6s, Monokote Acoustic 1.

PYROK INC — Type LD.

SOUTHWEST FIREPROOFING PRODUCTS CO — Types 4, 5, 5EF, 5GP, 5MD, 7GP, 7HD, 8EF, 8GP, 8MD, 9EF, 9GP, 9MD.

GCP APPLIED TECHNOLOGIES INC — Types MK-6/HY, MK-6s, Monokote Acoustic 1, RG.

8. **Metal Lath —** (Optional) — Where required, the diamond mesh, 3/8 in. expanded steel lath, 1.7 to 3.4 lb/sq yd is secured to one side of each steel joist with No. 18 SWG galv steel wire at joist web and bottom chord members, spaced 15 in. OC max. Where not required, the optional use of metal lath described and fastened as above, may be used to facilitate the spray application of Spray-Applied Fire Resistive Materials on steel bar joists and trusses. In this application, the metal lath is to be fully covered with Spray-Applied Fire Resistive Materials with no minimum thickness required.

8A. **Nonmetallic fabric mesh —** (Optional, not shown) — As an alternate to metal lath, glass fiber fabric mesh weighing approximately 2.5 oz/sq yd, polypropylene fabric mesh weighing approximately 1.25 oz/sq yd or equivalent, may be used to facilitate the spray application. The mesh is secured to one side of each joist web member. The method of attaching the mesh must be sufficient to hold the mesh and the spray-applied resistive materials in place during application until it has cured. An acceptable method of attaching the mesh is by embedding the mesh in min 1/4 in. long beads of hot melted glue. The beads of glue shall be spaced a max of 12 in. O.C. along the top chord of the bar joist. Another method to secure the mesh is by 1-1/4 in. long by 1/2 in. wide hairpin clips formed from No. 18 SWG or heavier steel wire.

9. **Bridging —** (Not shown) — In accordance with AISC current specifications. Continuous steel angles, min. size 1-1/4 by 1-1/4 by 1/8 in. welded to top and bottom chords. Bridging coated with 2-1/4 in. thickness of spray-applied resistive materials for the 1 or 1-1/2 h Assembly and Beam Rating and 2-7/16 in. for the 2 h Assembly and Beam Ratings.

10. **Metal Lath —** (Not Shown) — Where Type 7HD is applied to steel deck, 3/8 in. metal ribbed lath weighing 3.4 lb/yd^2 shall be secured to the underside of the steel deck (ribs upward) with S-12 by 3/8 in. long pan head, self-tapping steel screws spaced 12 in. OC in all directions. Steel screws shall be fitted with 1/2 in. diameter steel washers. Adjacent pieces of lath shall be overlapped 1 in. min.

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Last Updated on 2022-11-22

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1 RATED BEAM
SCALE: N.T.S.

G.S.S. Companies Inc.
"Building Arizona Since 1985"

FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
RATED BEAM

DATE
8-19-22
PROJECT NO.
20-200

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BXUV.Y641 - Fire-resistance Ratings - ANSI/UL 263

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BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

See General Information for Fire-resistance Ratings - ANSI/UL 263 Certified for United States
Design Criteria and Allowable Variances

See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada
Design Criteria and Allowable Variances

Design No. Y641

January 08, 2020

Ratings — 1, 1-1/2, and 2 Hr. (See Item 3)

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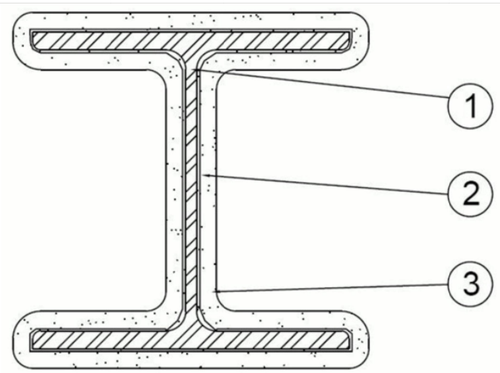

1. **Steel Column —** Min. W6x16 wide flange steel column. Columns shall be free of dirt, loose scale and oil.

2. **Primer Coating —** Approx. dry film thickness of 2 mil thickness of Sherwin Williams type Kem Bond HS prim

3. **Mastic and Intumescent Coatings* —** One component spray material applied in one or more coats as described in the application instructions to the thicknesses shown below. Thicknesses below include the 2 mil c primer.

Minimum Required Thickness (mil) for Hourly Rating Period (min)

W/D	HP/A	60	90	120
0.58	231	110	202	322
0.63	213	110	195	310
0.68	197	110	189	297
0.73	184	76	182	285
0.78	172	74	175	272
0.83	161	72	169	260
0.88	152	70	162	248
0.93	144	69	155	235
0.98	137	67	149	223
1.00	134	66	146	218
1.03	130	65	144	215
1.08	124	65	142	211
1.13	119	64	139	207
1.18	114	63	136	202
1.23	109	62	133	198
1.28	105	61	131	194
1.33	101	60	128	189
1.38	97	59	125	185
1.43	94	58	123	181
1.48	91	57	120	176
1.53	88	57	117	172
1.58	85	56	114	168
1.63	82	55	112	163
1.68	80	54	109	159
1.73	77	53	106	155
1.78	75	52	103	150
1.83	73	51	101	146
1.88	71	50	98	142
1.93	69	49	95	137
1.98	68	49	92	133
2.03	66	48	90	129
2.08	64	47	87	124
2.13	63	46	84	120
2.18	61	45	82	116
2.23	60	44	79	111
2.28	59	43	76	107
2.33	58	42	73	103
2.38	56	41	71	98
2.43	55	41	68	94
2.48	54	40	65	89
2.52	53	39	63	86

INTERNATIONAL COATINGS GROUP INC — Type FBL-200. Investigated for Conditioned Interior Space Purpose and Interior General Purpose Use.

4. **Topcoat —** (Not Shown) — Sherwin Williams type DTM acrylic top coat applied at a minimum thickness of 6 mil over the intumescent material.

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2020-01-08

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G.S.S. Companies Inc.
"Building Arizona Since 1985"

FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
RATED COLUMN

DATE
8-19-22
PROJECT NO.
20-200

G0.09

1 RATED COLUMN
SCALE: N.T.S.

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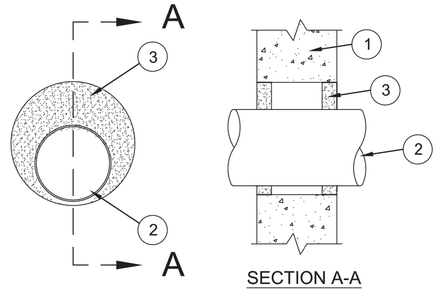
System No. W-J-1232
August 01, 2013
ANSI/UL1479 (ASTM E814)
F Ratings – 2 Hr
T Rating – 1/2 Hr
L Rating at Ambient - Less than 1 CFM/sq ft
L Rating at 400 F - Less than 1 CFM/sq ft
CAN/ULC S115
F Ratings – 2 Hr
FT Rating – 1/2 Hr
FH Ratings – 2 Hr
FTH Rating – 1/2 Hr
L Rating at Ambient - Less than 1 CFM/sq ft
L Rating at 400 F - Less than 1 CFM/sq ft



SECTION A-A

1. **Wall Assembly** – Min 6 in. (152 mm) thick reinforced lightweight or normal weight (100-150 pcf or 1600 - 2400 kg/m³) concrete wall. Wall may also be constructed of any UL Classified **Concrete Blocks***. Max diam of opening is 12-1/2 in. (318 mm).
   See **Concrete Blocks** (CAZT) in the Fire Resistance Directory for names of manufacturers.
2. **Through-Penetrant** – One metallic pipe, conduit or tubing installed either concentrically or eccentrically within the firestop system. The annular space between pipe, conduit or tubing and periphery of opening shall be min of 1/2 in. (13 mm) to max 3-3/8 in. (86 mm). Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
   A. **Steel Pipe** – Nom 8 in. (203 mm) diam (or smaller) Schedule 10 (or heavier) steel pipe.
   B. **Iron Pipe** – Nom 8 in. (203 mm) diam (or smaller) service weight (or heavier) cast iron soil pipe, nom 12 in. diam (or smaller) or Class 50 (or heavier) ductile iron pressure pipe.
   C. **Conduit** – Nom 6 in. (152 mm) diam (or smaller) steel conduit or nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing.
   D. **Copper Tubing** – Nom 4 in. (102 mm) diam (or smaller) Type L (or heavier) copper tubing.
   E. **Copper Pipe** – Nom 4 in. (102 mm) diam (or smaller) Regular (or heavier) copper pipe.
3. **Fill, Void or Cavity Material*** – **Foam** – Min 1-1/4 in. (32 mm) thickness of fill material applied within the annulus, flush with both surfaces of wall.
   3M COMPANY – Fire Barrier Rated Foam, FIP 1-Step

*Bearing the UL Classification Mark

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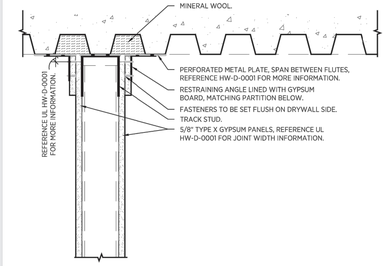
CONVENTIONAL WALL DYNAMIC JOINT SYSTEMS CONT.

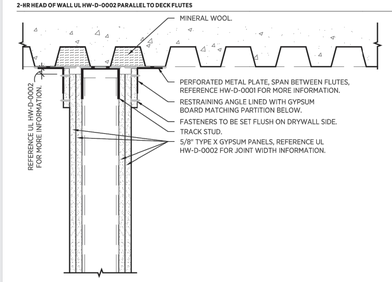
SELECT YOUR SYSTEM

Reference the UL Online Certifications Directory at ul.com for the most up-to-date information, material designations, thicknesses and fire ratings.

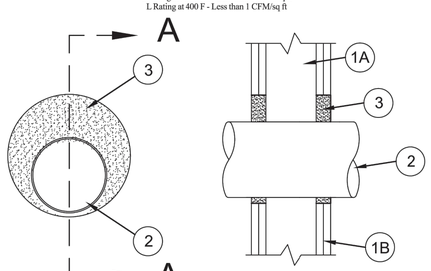
1-HR HEAD OF WALL UL HW-D-0001 PARALLEL TO DECK FLUTES



2-HR HEAD OF WALL UL HW-D-0002 PARALLEL TO DECK FLUTES



System No. W-L-1479
August 01, 2013
ANSI/UL1479 (ASTM E814)
F Ratings – 2 Hr
T Rating – 1/2 Hr
L Rating at Ambient - Less than 1 CFM/sq ft
L Rating at 400 F - Less than 1 CFM/sq ft
CAN/ULC S115
F Ratings – 2 Hr
FT Rating – 1/2 Hr
FH Ratings – 2 Hr
FTH Rating – 1/2 Hr
L Rating at Ambient - Less than 1 CFM/sq ft
L Rating at 400 F - Less than 1 CFM/sq ft



SECTION A-A

1. **Wall Assembly** – The 2 hr fire-rated gypsum board/stud wall assembly shall be constructed of the materials and in the manner described in the individual U400, V400 or W400 Series Wall or Partition Designs in the UL Fire Resistance Directory and shall include the following construction features:
   A. **Studs** – Wall framing shall consist of min 3-1/2 in. (89 mm) wide steel studs spaced max 24 in. (610 mm) OC.
   B. **Gypsum Board*** – Min two layers of 5/8 in. gypsum board attached to studs with fasteners, as specified in the individual U400, V400 or W400 Series design. Max diam of opening is 12-1/2 in. (318 mm).
2. **Through-Penetrant** – One metallic pipe, conduit or tubing installed either concentrically or eccentrically within the firestop system. The annular space between pipe, conduit or tubing and periphery of opening shall be min of 1/2 in. (13 mm) to max 3-3/8 in. (86 mm). Pipe, conduit or tubing to be rigidly supported on both sides of wall assembly. The following types and sizes of metallic pipes, conduits or tubing may be used:
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   B. **Iron Pipe** – Nom 8 in. (203 mm) diam (or smaller) service weight (or heavier) cast iron soil pipe, nom 12 in. diam (or smaller) or Class 50 (or heavier) ductile iron pressure pipe.
   C. **Conduit** – Nom 6 in. (152 mm) diam (or smaller) steel conduit or nom 4 in. (102 mm) diam (or smaller) steel electrical metallic tubing.
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   3M COMPANY – Fire Barrier Rated Foam, FIP 1-Step

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5 THROUGH WALL PENETRATION
SCALE: N.T.S.

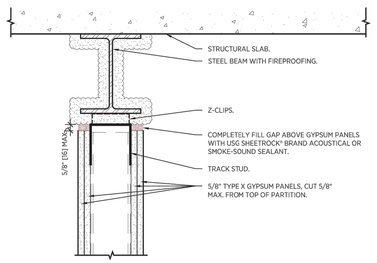
4 THROUGH WALL PENETRATION
SCALE: N.T.S.

CONVENTIONAL WALL DYNAMIC JOINT SYSTEMS CONT.

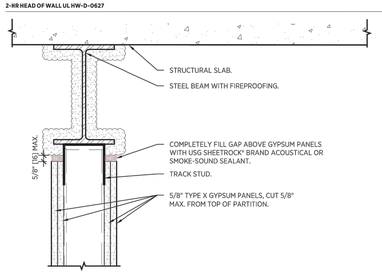
SELECT YOUR SYSTEM

Reference the UL Online Certifications Directory at ul.com for the most up-to-date information, material designations, thicknesses and fire ratings.

2-HR HEAD OF WALL UL HW-D-0626



2-HR HEAD OF WALL UL HW-D-0627



3 TOP OF WALL CONNECTION
SCALE: N.T.S.

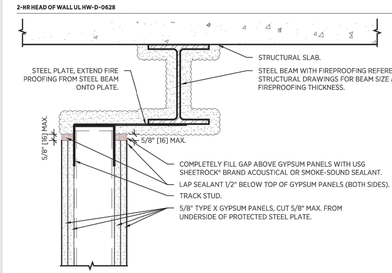
2 TOP OF WALL CONNECTION
SCALE: N.T.S.

CONVENTIONAL WALL DYNAMIC JOINT SYSTEMS CONT.

SELECT YOUR SYSTEM

Reference the UL Online Certifications Directory at ul.com for the most up-to-date information, material designations, thicknesses and fire ratings.

2-HR HEAD OF WALL UL HW-D-0628



1 TOP OF WALL CONNECTION
SCALE: N.T.S.

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15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260
TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

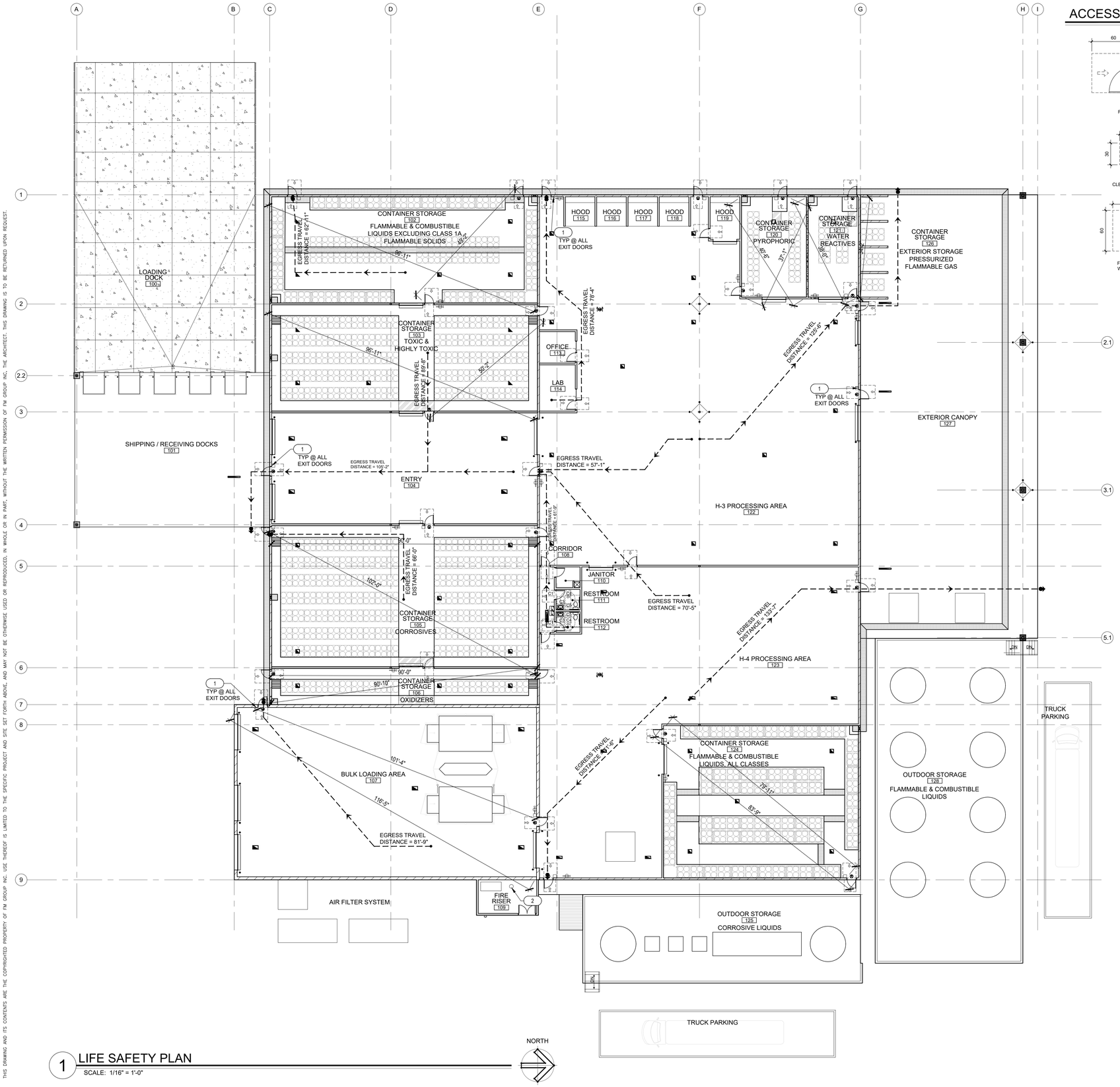
REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
FIRE DETAILS

DATE
8-19-22
PROJECT NO.
20-200

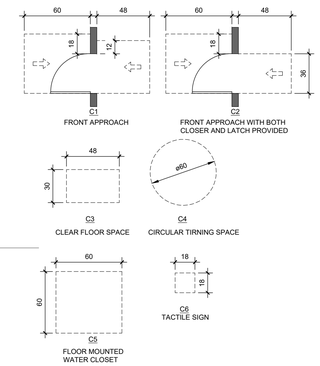
G010



1 LIFE SAFETY PLAN

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

ACCESSIBILITY MINIM. CLEARANCES



GENERAL NOTES - LIFE SAFETY PLAN NOTES

A. FIRE EXTINGUISHERS:
1. CONTRACTOR TO PROVIDE A SUFFICIENT NUMBER OF 2A10BC RATED FIRE EXTINGUISHERS DURING CONSTRUCTION SO THAT ALL PORTIONS OF THE BUILDING ARE WITHIN 75FT. TRAVEL DISTANCE OF SAID EXTINGUISHER & SO THAT OF FLOOR SPACE OR PORTION THEREOF.
2. PROVIDE FIRE EXTINGUISHERS AS REQUIRED BY FIRE DEPARTMENT FIELD INSPECTOR DURING CONSTRUCTION & FOR COMPLETED PROJECT.

B. EXIT DOORS:
1. ALL EXIT DOORS SHALL SWING IN THE DIRECTION OF TRAVEL.
2. ALL EXIT DOORS SHALL BE OPENABLE FROM THE INSIDE WITHOUT SPECIAL KNOWLEDGE OR EFFORT (NO BOLTS, NO SLIDING BOLTS, ETC.).
3. ALL EXIT DOORS & INTERVENING DOORS ON THE EXIT PATH, IF PROVIDED WITH A LOCK OR LATCH, MUST SHOW "THIS DOOR TO REMAIN UNLOCKED AT ALL TIMES DURING OPEN BUSINESS HOURS" SIGNAGE. MUST ALSO BE PROVIDED WITH PANIC HARDWARE.
4. PROVIDE ILLUMINATED EXIT SIGNS ABOVE EXITS W/ MIN. 3/4" X 6" LETTERS LIGHTENED ON CONTRASTING BACKGROUND.

C. EXIT SIGNS & SIGNAGE:
1. EXIT SIGNS SHALL BE INTERNALLY OR EXTERNALLY ILLUMINATED.
2. EXIT SIGNS ILLUMINATED BY AN EXTERNAL SOURCE SHALL HAVE AN INTENSITY OF NOT LESS THAN 5FT CANDLES (54 LUX).
3. INTERNALLY ILLUMINATED SIGNS SHALL BE LISTED & LABELED & SHALL BE INSTALLED IN ACCORDANCE W/ MANUFACTURER'S INSTRUCTIONS AND SECTION 2702.
4. EXIT SIGNS SHALL BE ILLUMINATED AT ALL TIMES. (1011.3).
5. EXIT SIGNS SHALL BE CONNECTED TO AN EMERGENCY POWER SYSTEM THAT WILL PROVIDE AN ILLUMINATION OF NOT LESS THAN 90MIN. IN CASE OF PRIMARY POWER LOSS (1011.6.3).
6. ADDITIONAL EXIT SIGNS SHALL BE PROVIDED AS/IF DIRECTED BY THE CITY INSPECTOR.
7. EXIT SIGNAGE SHALL BE PROVIDED & MAINTAINED FOR CORRIDORS & AISLE WAYS LEADING TO EXITS IN ACCORDANCE WITH STATE CODE. SIGNAGE SHALL STATE: "OBSTRUCTIONS, INCLUDING STORAGE, SHALL NOT BE PLACED IN THE REQUIRED WIDTH OF AN EXIT OR EXIT PASSAGEWAY".
8. AN OCCUPANT LOAD SIGN SHALL BE POSTED IN EACH ASSEMBLY ROOM HAVING AN OCCUPANT CONTENT OF 50 OR MORE. SIGN IS TO BE POSTED NEAR ENTRANCE, CCORDINATE LOCATION OF SUCH SIGN WITH FIRE MARSHALL. SIGN TO BE PROVIDED AND INSTALLED BY OWNER VENDOR.

D. EGRESS & EGRESS EMERGENCY LIGHTING:
1. THE MEANS OF EGRESS, INCLUDING THE EXIT DISCHARGE, SHALL BE ILLUMINATED AT ALL TIMES WHEN THE BUILDING SPACE SERVED BY THE MEANS OF EGRESS IS OCCUPIED.
2. THE MEANS OF EGRESS ILLUMINATION LEVEL SHALL NOT BE LESS THAN 1FT CANDLE AT THE WALKING SURFACE.
3. THE POWER SUPPLY FOR MEANS OF EGRESS ILLUMINATION SHALL NORMALLY BE PROVIDED BY THE PREMISES ELECTRICAL SUPPLY. IN THE EVENT OF SUPPLY FAILURE, AN EMERGENCY ELECTRICAL SYSTEM SHALL AUTOMATICALLY ILLUMINATE.
4. EMERGENCY & EXIT LIGHTING SHALL COMPLY WITH THE BUILDING CODE AS AMENDED BY THE CITY CONSTRUCTION ORDINANCE.
5. MAINTAIN A MIN. OF 44" WITHIN AISLES TO EXITS OR PUBLIC WAYS..

E. FINISHES & DECORATIONS:
1. FINISHES SHALL NOT EXCEED CLASS C
2. FINISHES SHALL NOT EXCEED CLASS C INTERIOR WALL & CEILING FINISHES MATERIALS SHALL NOT EXCEED A FLAME SPREAD INDEX RATING OF 76-200; SMOKE DEVELOPED INDEX OF 0-450
3. ANY DECORATIONS SHALL BE NON-COMBUSTIBLE OR FLAME PROOFED IN AN APPROVED MANNER.

KEYNOTES

X

1. WALL MOUNTED TACTILE EXIT SIGN, REFER TO CS-05.
2. FIRE RISER
3. FIRE DEPARTMENT CONNECTION

LEGEND - LIFE SAFETY PLAN

- EXIT SIGN, CONFIRM LOCATION CONFIRM LOCATION WITH FIRE MARSHAL
- INTERIOR & EXTERIOR EMERGENCY LIGHT
- EXIT (END POINT)
- EGRESS PATH OF TRAVEL - 100' MAX ALLOWED
- FIRE EXTINGUISHER - LARSENS MODEL #AL-2409-5R, VERIFY FINAL PLACEMENT WITH FIRE OFFICIAL

EGRESS REQUIREMENTS

1016.2 TRAVEL DISTANCE

1. MAXIMUM TRAVEL DISTANCE IN A BUILDING EQUIPPED WITH AN AUTOMATIC SPRINKLER SYSTEM THROUGHOUT - NO TRAVEL THROUGHOUT THE BUILDING EXCEEDS 100 FT

NOTES:
1. EGRESS PATH REPRESENTED ARE FREE OBSTRUCTION FLOOR PLAN.
2. REPRESENTED EGRESS PATH IS MIN. 36" WIDE CLEAR TO EXIT DOOR.

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FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260
TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REGISTERED ARCHITECT
CERTIFICATE NO. 22478
MICHAEL E. STEVESON
Date Signed 06/12/2022
ARIZONA U.S.A.
Expires June 30, 2023

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
HAZARDOUS BUILDING
LIFE SAFEETY PLAN
PHASE II

DATE
8-19-22
PROJECT NO.
20-200

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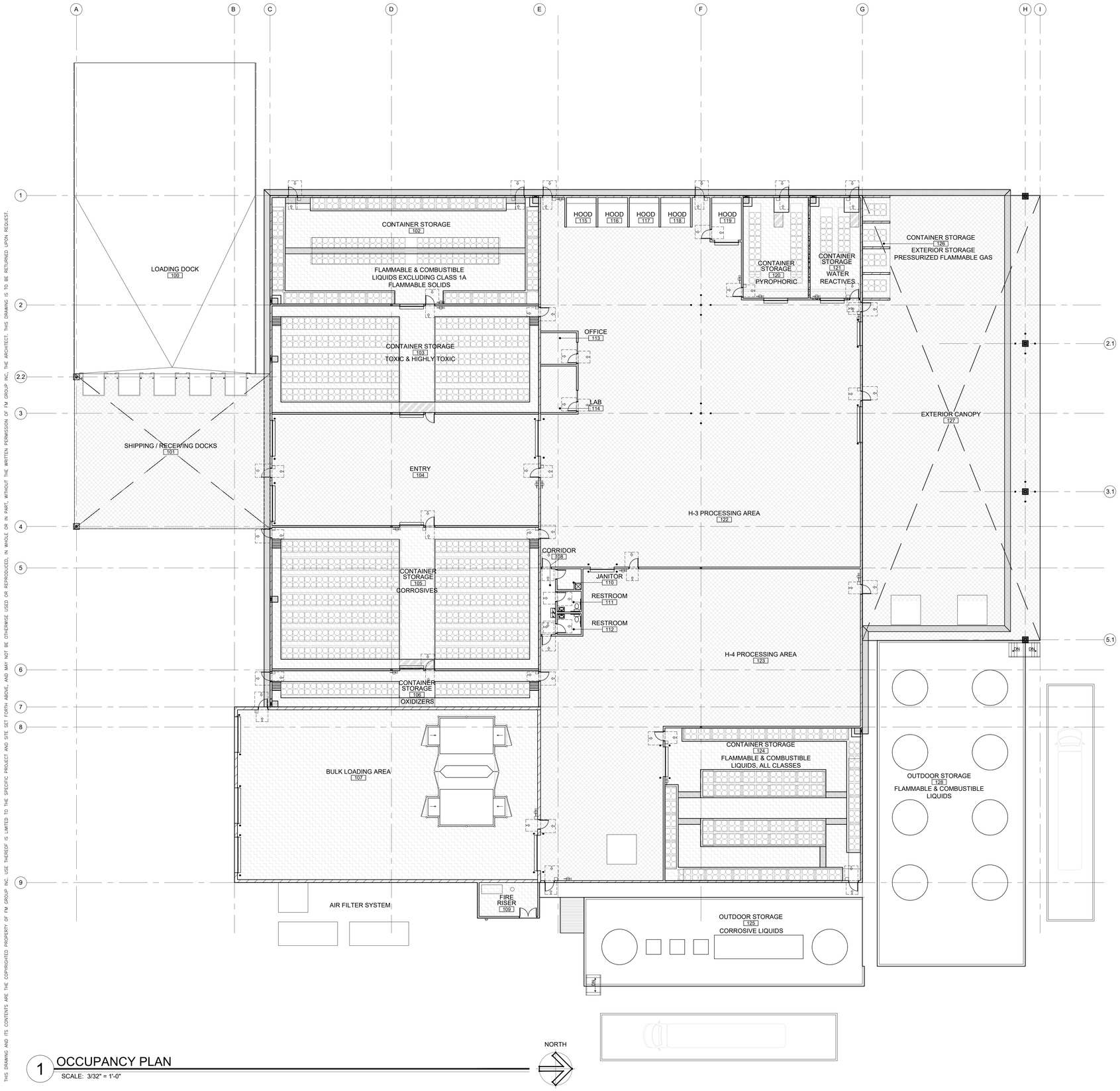

1 OCCUPANCY PLAN

SCALE: 3/32" = 1'-0"

STORAGE ROOM NOTES

ROOM 102
OCCUPANCY CLASS: H-3
STORAGE:
FLAMMABLE & COMBUSTIBLE LIQUIDS, EXCLUDING CLASS 1A
FLAMMABLE SOLIDS

ROOM 103
OCCUPANCY CLASS: H-4
STORAGE OF TOXIC & HIGHLY TOXIC
MAX. ALLOWED STORAGE: NO LIMIT

ROOM 105
OCCUPANCY CLASS: H-4
STORAGE OF CORROSIVES
MAX ALLOWED STORAGE: NO LIMIT

ROOM 106
OCCUPANCY CLASS: H-3
STORAGE:
OXIDIZER CLASS 2 AND CLASS 3 OR
ORGANIC PEROXIDES CLASS 2, CLASS 3, CLASS 4, OR CLASS 5
MAX ALLOWED STORAGE:
CLASS 2: 100 TONS / PILE; 200 TONS / BLDG
CLASS 3: 30 TONS / PILE; 1200 TONS / BLDG

ROOM 120
OCCUPANCY CLASS: H-2
STORAGE:
PYROPHORIC SOLIDS & LIQUIDS
NO PYROPHORIC GASES
MAX. ALLOWED STORAGE:
QUANTITY: 2000 CUBIC FEET (272 - 55GALLON DRUMS)
MAX. AREA PER PILE: 100 SF (4' WIDE X 25' LONG)
MAX. PILE HEIGHT: 5' (NO STACKED CONTAINERS)

ROOM 121
OCCUPANCY CLASS: H-2
STORAGE OF WATER REACTIVE:
CLASS 3
CLASS 2
CLASS 1 SOLIDS & LIQUIDS
MAX. ALLOWED STORAGE:
CLASS 3: 1 TON
CLASS 2: 25 TONS
CLASS 1: NO LIMIT

ROOM 124
OCCUPANCY CLASS: H-3
STORAGE:
FLAMMABLE & COMBUSTIBLE LIQUIDS, ALL CLASSES

ROOM 126
OCCUPANCY CLASS: H2
STORAGE: PRESSURIZED FLAMMABLE GAS

OCCUPANCY CALCULATIONS

USE	AREA	LOAD FACTOR	OCCUPANTS
FACTORY WAREHOUSE	36,328 SF	1:500	73
SHIPPING / STORAGE / UTILITY	20,700SF	1:300	69
OFFICE	365 SF	1:300	2
RESTROOM	113 SF	NO LOAD	NO LOAD
CORRIDOR	110 SF	NO LOAD	NO LOAD

TOTAL OCCUPANTS, OFFICE BUILDING: 140

OCCUPANCY CLASSIFICATION

FACTORY INDUSTRIAL WAREHOUSE
LOAD FACTOR: 1:500 S.F. GROSS

STORAGE / SHIPPING / UTILITY
LOAD FACTOR: 1:300 S.F. GROSS

OFFICE
LOAD FACTOR: 1:100 S.F. GROSS

RESTROOM
NO LOAD

CORRIDOR
NO LOAD

PLUMBING FIXTURES

USE	OCCUPANT LOAD	REQUIRED WC/URNL	REQUIRED LAVS	REQUIRED DRNK FTNS*
FACTORY INDUSTRIAL WAREHOUSE	61	0.61	0.61	1
STORAGE / SHIPPING / UTILITY	61	0.61	0.61	0
TOTAL REQUIRED		2	2	1
TOTAL PROVIDE		2	2	1

UNISEX ACCESSIBLE RESTROOM
TOILETS PROVIDED = ...2
LAVATORIES PROVIDED =.....2

MOP SINK = ...1
DRINKING FOUNTAIN = ...1

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TRIUMVIRATE ENVIRONMENTAL

INTEGRATED
WASTE
MANAGEMENT
FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
HAZARDOUS BUILDING
OCCUPANCY PLAN
PHASE II

DATE
8-19-22
PROJECT NO.
20-200

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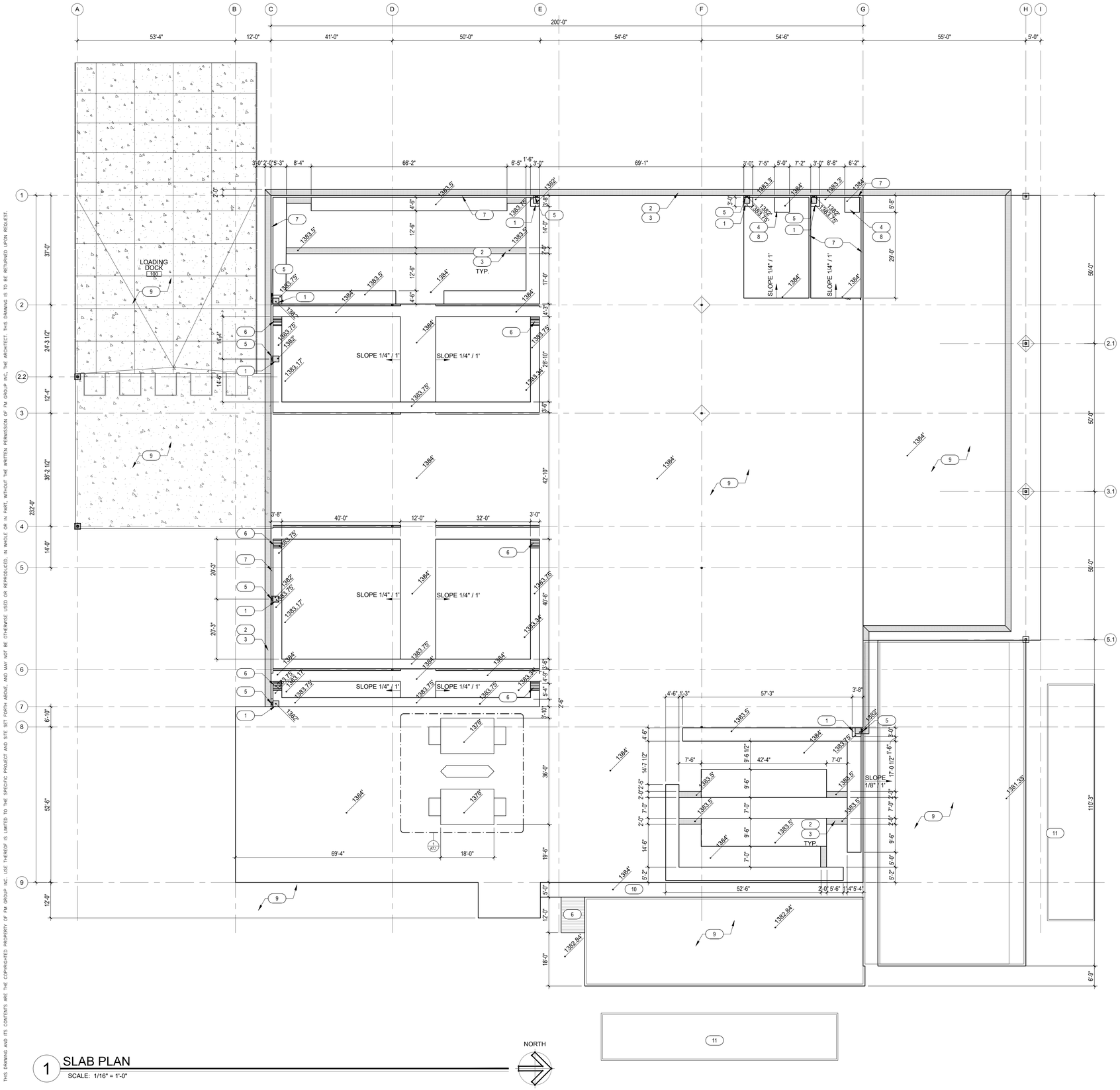

1 SLAB PLAN
SCALE: 1/16" = 1'-0"

NORTH

GENERAL NOTES

A. PROPOSED BUILDING IS A RAISED DOCK HEIGHT CONCRETE SLAB METAL BUILDING WITH EXTERIOR STEEL COLUMNS AND ROOF TRUSSES
B. EXTERIOR WALL: CMU WAINSCOT WITH FULL HEIGHT STEEL WALL PANEL SYSTEM
C. BUILDING WILL BE SUPPORTED WITH CODE REQUIRED RESTROOMS, UTILITY, AND FIRE RISER ROOMS ALONG WITH AN OFFICE
D. ENVELOPE CONSTRUCTION: R-19 EXTERIOR WALLS AND R-19 WITH R-11 LS AT ROOF DECK
E. THIS BUILDING WILL TREAT HAZARDOUS WASTE BY VARIOUS MEANS PRIOR TO CONSOLIDATION INTO TANKS OR LARGER CONTAINERS FOR FINAL DISPOSAL / RECYCLING BY TRUCK OR RAIL
F. BUILDING WILL BE CONDITIONED WITH ROOF TOP EVAPORATIVE COOLERS AND PANEL HEATERS

KEYNOTES

1. CATCH BASIN
2. TRENCH DRAIN
3. STEEL GRATE WITH OPENING SHALL NOT ALLOW THE PASSAGE A SPHERE MORE THAN 1/2" DIAMETER.
4. CONCRETE LANDING
5. 2'-0"X2'-0" FOUNDATION OPENING
6. RAMP WITH 8.3% MAX RUNNING SLOPE AND 2% MAX CROSS SLOPE
7. CONCRETE CURB
8. SLEEVES IN CONCRETE, AS NEEDED FOR REMOVABLE RAMP
9. CONCRETE SLAB WITH EXPANSION JOINTS OVER 20 MIL MIN BCI CONTAINMENT LINER OR EQUAL, SEE STRUCTURAL
10. CONCRETE WALKWAY
11. TRUCK PARKING WITH BERM OVER 20 MIL MIN BCI CONTAINMENT LINER OR EQUAL

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TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
HAZARDOUS BUILDING SLAB PLAN PHASE II

DATE
8-19-22
PROJECT NO.
20-200

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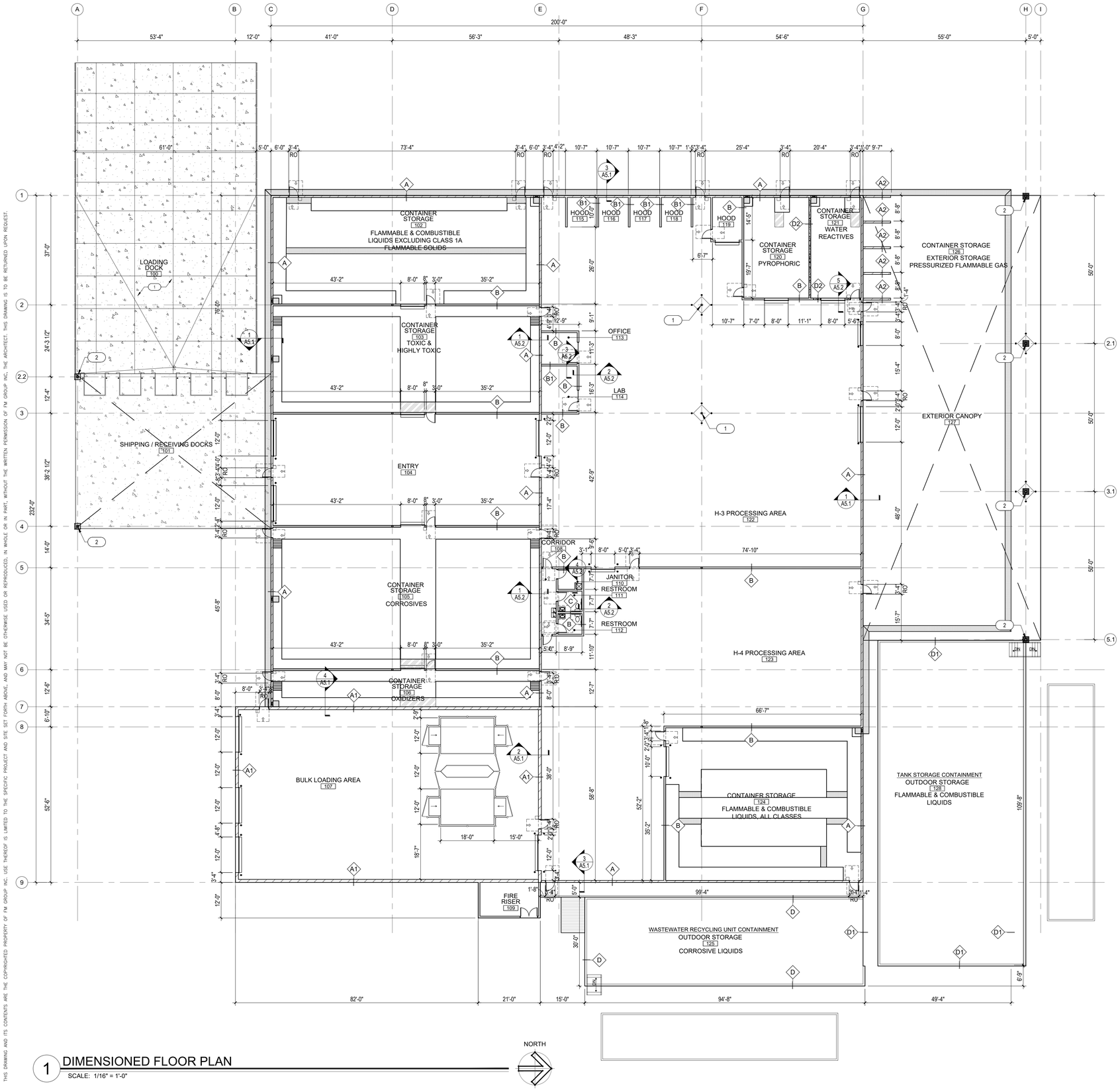

1 DIMENSIONED FLOOR PLAN

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

NORTH

GENERAL NOTES

A. BUILDING WILL BE SUPPORTED WITH CODE REQUIRED RESTROOMS, UTILITY, AND FIRE RISER ROOMS ALONG WITH AN OFFICE
B. THIS BUILDING WILL TREAT HAZARDOUS WASTE BY VARIOUS MEANS PRIOR TO CONSOLIDATION INTO TANKS OR LARGER CONTAINERS FOR FINAL DISPOSAL / RECYCLING BY TRUCK OR RAIL
C. BUILDING WILL BE CONDITIONED WITH ROOF TOP EVAPORATIVE COOLERS AND PANEL HEATERS
D. ALL DOORS ARE 4" OFF CORNER UNLESS OTHERWISE NOTED

WALL LEGEND

KEY	SYMBOL	DESCRIPTION
A		2 HOUR WALL - U905 8"x8"x16" CMU BLOCK, REFER TO STRUCTURAL
A1		2 HOUR WALL - U905 12"x8"x16" CMU BLOCK, REFER TO STRUCTURAL
A2		2 HOUR WALL, PARTIAL HEIGHT WALL - U905 6'-0" TALL 8"x8"x16" CMU BLOCK, REFER TO STRUCTURAL
B		1 HOUR WALL - U419 INTERIOR PARTITION: 5/8" TYPE 'X' GYP. BD. ON ONE SIDE OF 6" x 20Ga. METAL STUDS @ 16"o.c. RUN GYP. BD. TO UNDERSIDE OF GYP. BD. CEILING OR 6" ABOVE T-BAR CEILING AS APPLICABLE. *USE NUCOR LINER PANEL ON BUILDING SIDE.
B1		INTERIOR PARTITION: 5/8" TYPE 'X' GYP. BD. ON ONE SIDE OF 6" x 20Ga. METAL STUDS @ 16"o.c. RUN GYP. BD. TO UNDERSIDE OF GYP. BD. CEILING OR 6" ABOVE T-BAR CEILING AS APPLICABLE.
C		PLUMBING PARTITION - PARTIAL HEIGHT WALL: 5/8" TYPE 'X' GYP. BD. ON BOTH SIDES OF 6" x 20Ga. METAL STUDS @ 16"o.c. STUDS SHALL BE EXTENDED TO 6" ABOVE HIGHEST ADJACENT CEILING. SCREW GYP. BD. TO STUDS @ 8"o.c. AT VERTICAL EDGES @ 12"o.c. INTERMEDIATED STUDS. IF GYP. BD. IS APPLIED HORIZONTALLY STAGGER HORIZONTAL JOINTS WITH THOSE ON THE OPPOSITE SIDE. USE WATER RESISTANT GYP. BD ON RESTROOM SIDE.
D		CONCRETE WALL - 2'-0" HEIGHT CONTAINMENT WALL: CONCRETE CONTAINMENT WALL, EPOXY ON STORAGE SIDE; REFER TO STRUCTURAL
D1		CONCRETE WALL - 2'-8" HEIGHT HEIGHT CONTAINMENT WALL: CONCRETE CONTAINMENT WALL, EPOXY ON STORAGE SIDE; REFER TO STRUCTURAL
D2		CONCRETE WALL - 10'-0" HEIGHT HEIGHT CONTAINMENT WALL: CONCRETE CONTAINMENT WALL; REFER TO STRUCTURAL

KEYNOTES

X

1. 1 HOUR RATED STEEL COLUMN, SPRAY PER FIRE DETAIL 1/G0.09
2. 1 HOUR RATED COLUMN, STEEL COLUMN WRAPPED WITH CMU BLOCK

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FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
HAZARDOUS BUILDING
DIMENSIONED FLOOR PLAN
PHASE II

DATE
8-19-22
PROJECT NO.
20-200

A2.0

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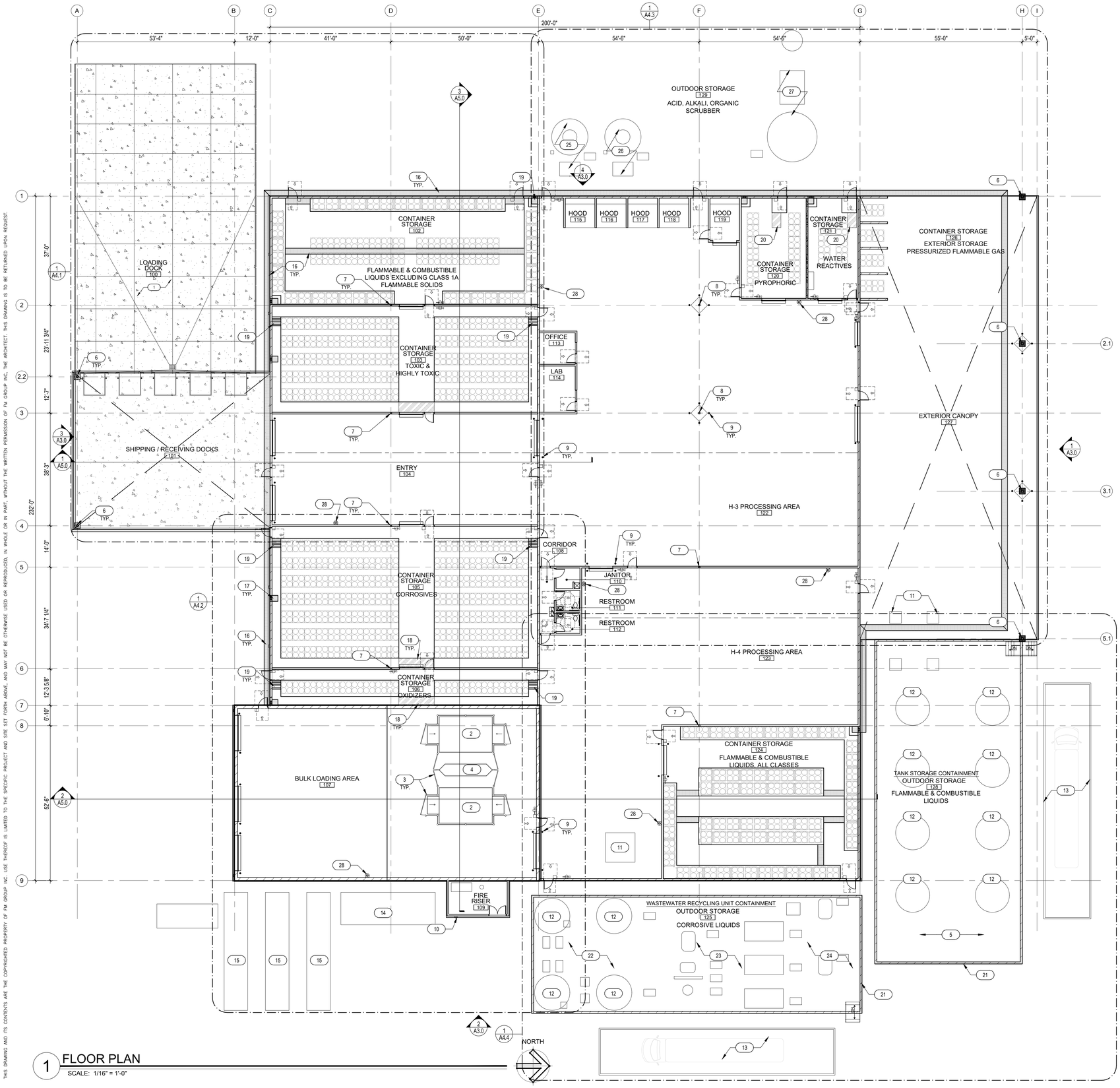

1 FLOOR PLAN
SCALE: 1/16" = 1'-0"

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GENERAL NOTES

A. PROPOSED BUILDING IS A RAISED DOCK HEIGHT CONCRETE SLAB METAL BUILDING WITH EXTERIOR STEEL COLUMNS AND ROOF TRUSSES
B. EXTERIOR WALL: CMU WAINSCOT WITH FULL HEIGHT STEEL WALL PANEL SYSTEM
C. BUILDING WILL BE SUPPORTED WITH CODE REQUIRED RESTROOMS, UTILITY, AND FIRE RISER ROOMS ALONG WITH AN OFFICE
D. ENVELOPE CONSTRUCTION: R-19 EXTERIOR WALLS AND R-19 WITH R-11 LS AT ROOF DECK
E. THIS BUILDING WILL TREAT HAZARDOUS WASTE BY VARIOUS MEANS PRIOR TO CONSOLIDATION INTO TANKS OR LARGER CONTAINERS FOR FINAL DISPOSAL / RECYCLING BY TRUCK OR RAIL
F. BUILDING WILL BE CONDITIONED WITH ROOF TOP EVAPORATIVE COOLERS AND PANEL HEATERS

KEYNOTES

(X)

1. RECESSED DOCK WITH 42" HIGH GUARDRAIL AND CURBS
2. 8'-0" DEEP SEALED LINED CONCRETE PIT
3. 42" HIGH GUARDRAIL AND ACCESS GATES @ PERIMETER OF PIT
4. RAISED CONCRETE TRACK-HOE GUIDE
5. TRUCK / RAIL LOADING / UNLOADING
6. STEEL COLUMN WRAPPED WITH CMU
7. STEEL COLUMN
8. STEEL COLUMN WRAPPED WITH GYP BOARD
9. 36" HIGH STEEL PIPE BOLLARD
10. PROPOSED FIRE RISER ROOM & FIRE DEPARTMENT CONNECTION
11. PUMP STATION
12. 20,000 GALLON TANK
13. TRUCK CONTAINMENT
14. DUST CONTROL SYSTEM
15. CARBON STORAGE
16. TRENCH DRAIN WITH STEEL GRATE
17. CATCH BASIN
18. 1/2" STEEL PLATE
19. RAMP WITH 8.3% RUNNING SLOPE AND 2% CROSS SLOPE, MAX
20. REMOVABLE ADA RAMP WITH 8.3% RUNNING SLOPE AND 2% MAX CROSS SLOPE, MAX
21. LINED CONCRETE CONTAINMENT WALL
22. NEUTRALIZATION AREA
23. STEAM STRIPPER AREA
24. EVAPORATOR AREA
25. ACID DEPACK BAY SCRUBBER SYSTEM
26. ALKALI DEPACK BAY SCRUBBER SYSTEM
27. ORGANIC DEPACK BAY SCRUBBER SYSTEM
28. SAFETY SHOWER & EYE WASH STATION

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INTEGRATED WASTE MANAGEMENT FACILITY

REGISTERED ARCHITECT
CERTIFICATE NO. 22478
MICHAEL E. STEVESON
09/25/2023
Date Signed
ARIZONA, U.S.A.
EXPIRES June 30, 2024

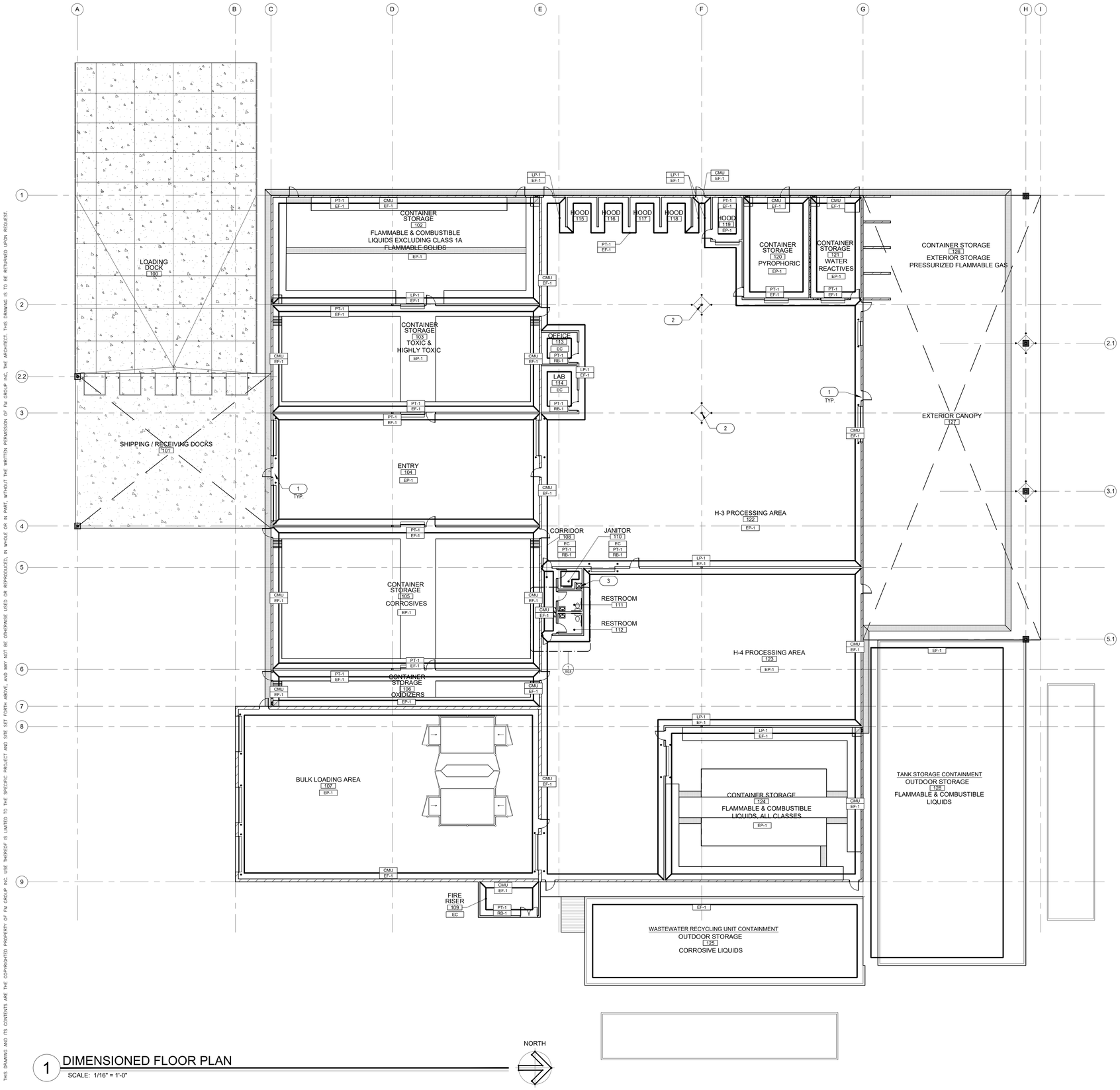
REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
HAZARDOUS BUILDING
FLOOR PLAN
PHASE II

DATE
8-19-22
PROJECT NO.
20-200

A2.2



1 DIMENSIONED FLOOR PLAN
SCALE: 1/16" = 1'-0"

GENERAL NOTES

A. REFER TO WALL SECTIONS AND ELEVATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
B. INTERIOR WALL AND CEILING FINISH MATERIALS SHALL BE INSTALLED IN ACCORDANCE WITH ALL APPLICABLE CODES AND MANUFACTURER'S SPECIFICATIONS.
C. TAPE, BED, FLOAT & SAND GYP. BD. JOINTS. FINISH TO A LITE ROLLED TEXTURE LEVEL 4 AT ALL PAINTED AREAS. PAINT (1) COAT OF PRIMER AND (2) COATS OF COLOR.
D. G.C. SHALL PROVIDE BLOCKING FOR ALL WALL MOUNTED / RECESSED ITEMS (U.N.O.).
E. CHANGES IN LEVEL UP TO 1/4" BETWEEN DIFFERENT FLOOR FINISHES CAN BE MADE VERTICAL AND WITHOUT EDGE TREATMENT. CHANGES IN LEVEL OF 1/4" - 1/2" SHALL BE MADE WITH A BEVELED TRANSITION OR OTHER MATERIAL WITH A SLOPE NO GREATER THAN 1:2. CHANGES IN LEVEL GREATER THAN 1/2" SHALL BE ACCOMPLISHED BY MEANS OF A RAMP. VERIFY FINISH OF TRANSITION STRIP MATERIAL WITH OWNER. G.C. SHALL FURNISH & INSTALL TRANSITION STRIP.
F. ALL GROUT TO CONTAIN ACRYLIC ADDITIVE SEALER.
G. ALL MATERIALS APPLIED TO WALL AND CEILING SHALL BE TESTED AS SPECIFIED IN SECTION 803.
H. ALL MATERIALS TO BE CLASS 'C' MIN. AND HAVE A FLAME SPREAD INDEX OF 76-200 AND A SMOKE DEVELOPED INDEX OF 0-450.

ROOM FINISH LEGEND

MARK	DESCRIPTION	MANUFACTURER	NAME / COLOR	TYPE / SIZE	RMKS
BASE					
RB-1	RUBBER BASE	MANNINGTON - BURKE COLLECTION	ACCORD 523 "BLACKBROWN"	4" COVE	-
EF-1	INDUSTRIAL EPOXY WITH 6" MIN INTEGRAL COVE BASE	ARMOR GARAGE	GRAY	6" MIN COVE	1, 2
FLOOR					
EP-1	INDUSTRIAL EPOXY WITH 6" MIN INTEGRAL COVE BASE	ARMOR GARAGE	GRAY	-	-
EC	EXPOSED CONCRETE	-	-	-	3
WALL/WALL PROTECTION					
CT-3	CERAMIC TILE	DAL TILE	CHORD CH23 RHYTHM BROWN, UNPOLISHED	12"X24"	5, 6, 8
CT-4	CERAMIC TILE	DAL TILE	ARTICULO AR09 "EDITORIAL WHITE"	12"X24"	5, 7
LP-1	METAL BUILDING LINER PANEL	-	-	-	-
PAINT/STAIN					
PT-1	WALL/CEILING PAINT	SHERWIN WILLIAMS	SW 7570, "EGRET WHITE"	-	4
PT-6	DOORS & FRAMES	SHERWIN WILLIAMS	SW 7069, "IRON ORE"	-	-
TRIM/DETAILS					
TRM-2	TILE EDGE TRIM	SCHLUTER	QUADEC, STAINLESS STEEL	-	-
CEILING TILE					
ACT-1	ACOUSTIC CEILING TILE	USG - CLIMAPLUS	"WHITE," SLB 414 / DX/DXL (A)	-	4

REMARKS
1. RUN EPOXY MINIMUM 6" UP WALL
2. RUN EPOXY TO TOP OF ALL CONCRETE CONTAINMENT WALLS
3. CLEAR URETHANE SEALER.
4. SEE RCP FOR LOCATION.
5. USE TRM-2 AT ALL EXPOSED VERTICAL AND HORIZONTAL EDGES OF CERAMIC WALL TILE.
6. USE GT-1, 3/16" GROUT JOINT.
7. USE GT-2, 3/8" GROUT JOINT.
8. WAINSCOT WALL: CT-1 TO 4'-0" A.F.F., 12" C-2 TRIM, PT-1 ABOVE, SEE INTERIOR ELEVATIONS

KEY NOTES

X

1. ADA THRESHOLD, ALL EXTERIOR DOORS
2. STEEL COLUMN, 1 HOUR FIRE RATED SPRAY FOAM
3. INSTALL FRP-1 FROM TOP OF SINK TO FINISH CEILING AT 3 WALLS AROUND MOP SINK.
4. TRANSITION STRIP TRM-3

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INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
HAZARDOUS BUILDING
DIMENSIONED FLOOR PLAN
PHASE II

DATE
8-19-22
PROJECT NO.
20-200

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1 REFLECTED CEILING PLAN

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

NORTH

GENERAL NOTES

A. PROPOSED BUILDING IS A CONCRETE SLAB ON GRADE, METAL BUILDING WITH EXTERIOR STEEL COLUMNS AND ROOF TRUSSES.
B. ONLY EXTERIOR WALL IS EAST WALL FACING SOUTH COMMERCE - CMU WAINSCOT WITH FULL HEIGHT STEEL WALL PANEL SYSTEM.
C. BUILDING SHALL BE SUPPORTED WITH CODE REQUIRED RESTROOMS, UTILITY, AND FIRE RISER ROOMS.
D. BUILDING IS USED AS WASTE TRANSFER FACILITY OF NON-HAZARDOUS MATERIALS.
E. BUILDING SHALL BE PROTECTED WITH A DRY FIRE SPRINKLER SYSTEM
F. BUILDING IS NOT ON ENCLOSED STRUCTURE - NO BUILDING INSULATION IN WALL NOR ROOF DECK.

KEYNOTES

(X)

1. 1 HOUR RATED ROOF ASSEMBLY
2. HOOD, REFER TO MECHANICAL

LEGEND

- 10"X22 1/2" SUSPENDED HIGH BAY LED LIGHTING
- 10"X22 1/2" SUSPENDED HIGH BAY LED LIGHTING, EMERGENCY FIXTURE
- 16"X16" SUSPENDED HIGH BAY HAZARDOUS LOCATION LED LIGHTING
- 10"X22 1/2" SUSPENDED HIGH BAY HAZARDOUS LOCATION LED LIGHTING, EMERGENCY FIXTURE
- 4" VANDAL RESISTANT LED LIGHTING
- 4" VANDAL RESISTANT EMERGENCY LED LIGHTING
- 24" SURFACE MOUNTED LED LIGHTING, ACRYLIC FROSTED LENS
- 24" SURFACE MOUNTED EMERGENCY LED LIGHTING, ACRYLIC FROSTED LENS
- EXTERIOR WALL PACK
- GYP BOARD CEILING, PAINT
- CEMENT CEILING
- ILLUMINATED EXIT LIGHT/SIGN

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TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REGISTERED ARCHITECT
CERTIFICATE NO.
22478
MICHAEL E. STEVESON
Date Signed 06/12/2022
ARIZONA, U.S.A.
Expires June 30, 2024

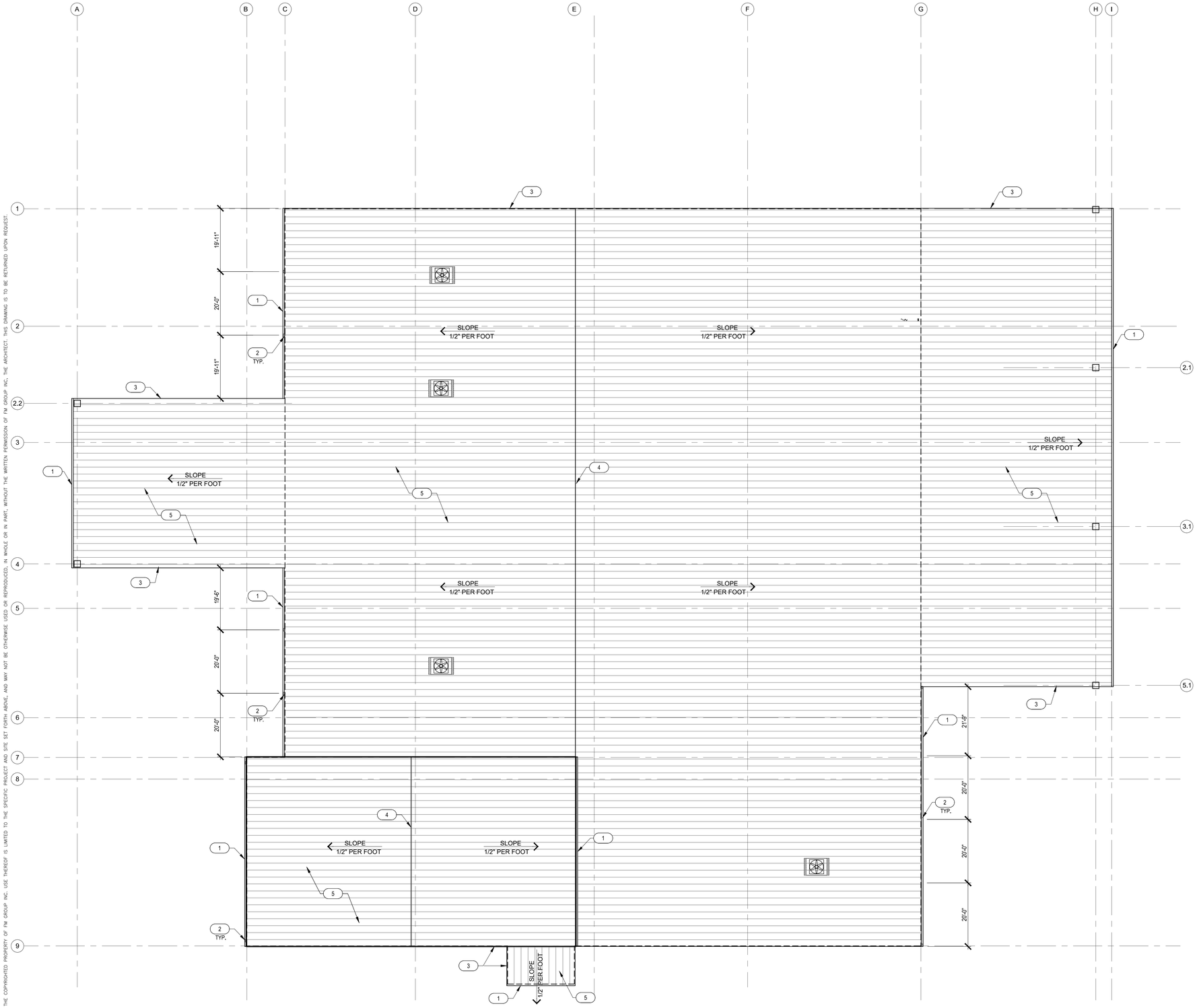
REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
HAZARDOUS BUILDING REFLECTED CEILING PLAN

DATE
8-19-22
PROJECT NO.
20-200

A2.4



1 ROOF PLAN

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

NORTH

GENERAL NOTES

A. PROPOSED BUILDING IS A CONCRETE SLAB ON GRADE, METAL BUILDING WITH EXTERIOR STEEL COLUMNS AND ROOF TRUSSES.
B. ONLY EXTERIOR WALL IS EAST WALL FACING SOUTH COMMERCE - CMU WAINSCOT WITH FULL HEIGHT STEEL WALL PANEL SYSTEM.
C. BUILDING SHALL BE SUPPORTED WITH CODE REQUIRED RESTROOMS, UTILITY, AND FIRE RISER ROOMS.
D. BUILDING IS USED AS WASTE TRANSFER FACILITY OF NON-HAZARDOUS MATERIALS.
E. BUILDING SHALL BE PROTECTED WITH A DRY FIRE SPRINKLER SYSTEM
F. BUILDING IS NOT ON ENCLOSED STRUCTURE - NO BUILDING INSULATION IN WALL NOR ROOF DECK.

KEYNOTES

X

1. 10" METAL GUTTER SYSTEM6"x 10" METAL DOWNSPOUTS
2. CONTINUOUS GALVANIZED METAL FASCIA
3. METAL RIDGE VENT, SEE STRUCTURAL
4. 26 GA. STANDING SEAM METAL ROOF, SEE STRUCTURAL
5. MECHANICAL UNITS, SEE MECHANICAL

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MANAGEMENT
FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
HAZARDOUS BUILDING
ROOF PLAN

DATE
8-19-22
PROJECT NO.
20-200

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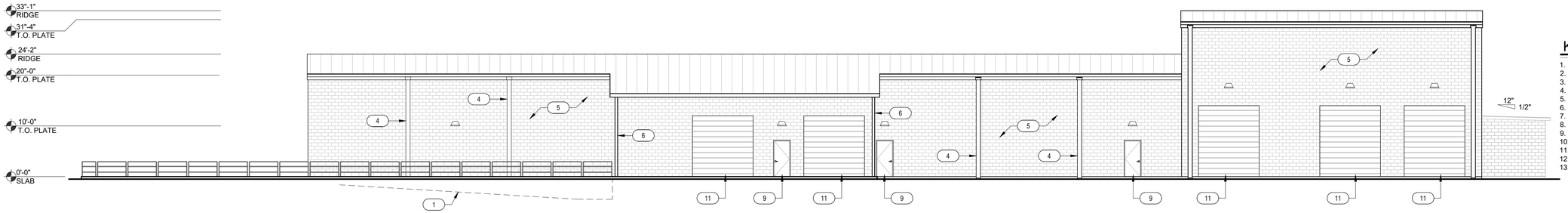
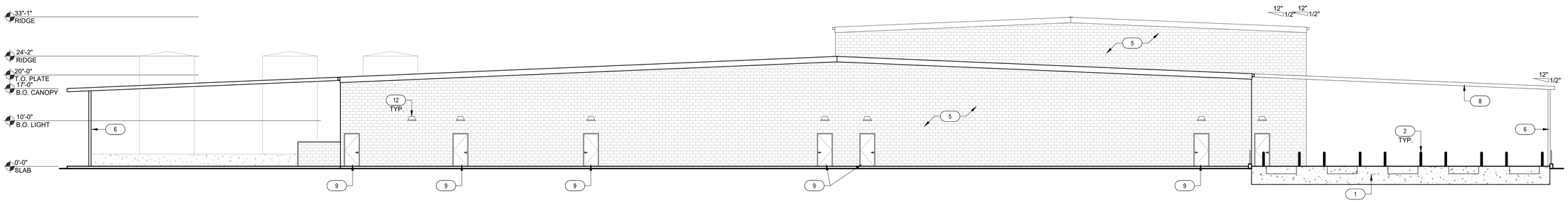


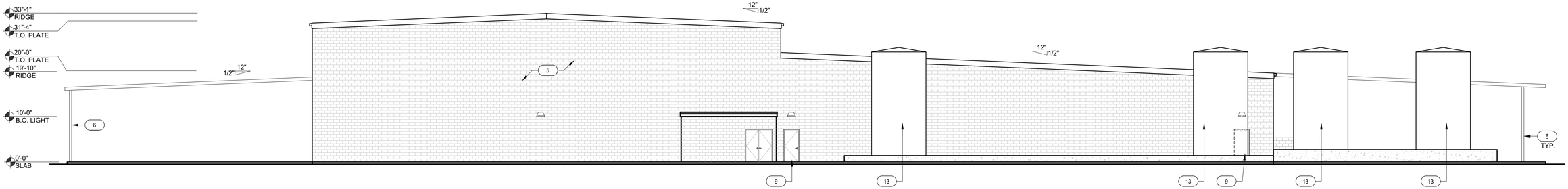
3 EXTERIOR ELEVATION - SOUTH

SCALE: 3/32" = 1'-0"



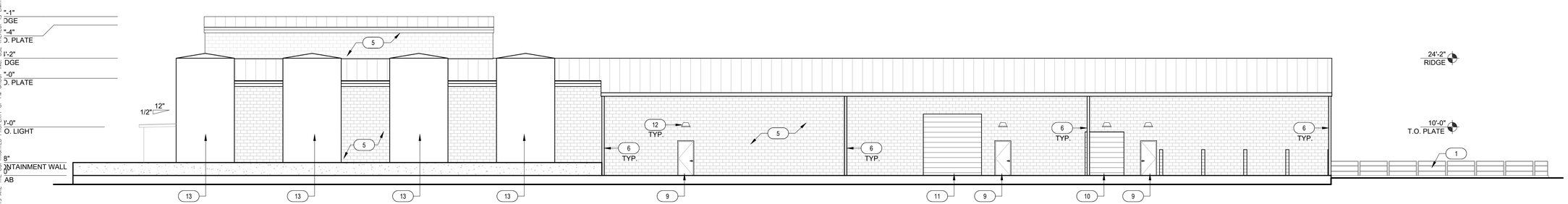
4 EXTERIOR ELEVATION - WEST

SCALE: 3/32" = 1'-0"



2 EXTERIOR ELEVATION - EAST

SCALE: 3/32" = 1'-0"



1 EXTERIOR ELEVATION - NORTH

SCALE: 3/32" = 1'-0"

KEYED NOTES

1. RECESSED DOCK W/ 36" HIGH GUARDRAIL & CURBS
2. 36" HIGH STEEL PIPE BOLLARD
3. RAISED CONCRETE TRACK-HOE GUIDE
4. DOWNSPOUT
5. CMU WALL CONSTRUCTION
6. STEEL COLUMNS
7. CENTER SUPPORT STEEL COLUMN
8. SHADE CANOPY
9. HOLLOW METAL DOOR & FRAME
10. 8' WIDE X 9' HIGH INSULATED DOCK DOOR
11. 12' WIDE X 14' HIGH INSULATED OVERHEAD DOOR
12. WALL MOUNT LED LIGHT FIXTURES - SEE ELECTRICAL DWG'S
13. 20,000 GALLON STORAGE TANKS

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REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
HAZARDOUS BUILDING EXTERIOR ELEVATIONS

DATE
8-19-22
PROJECT NO.
20-200

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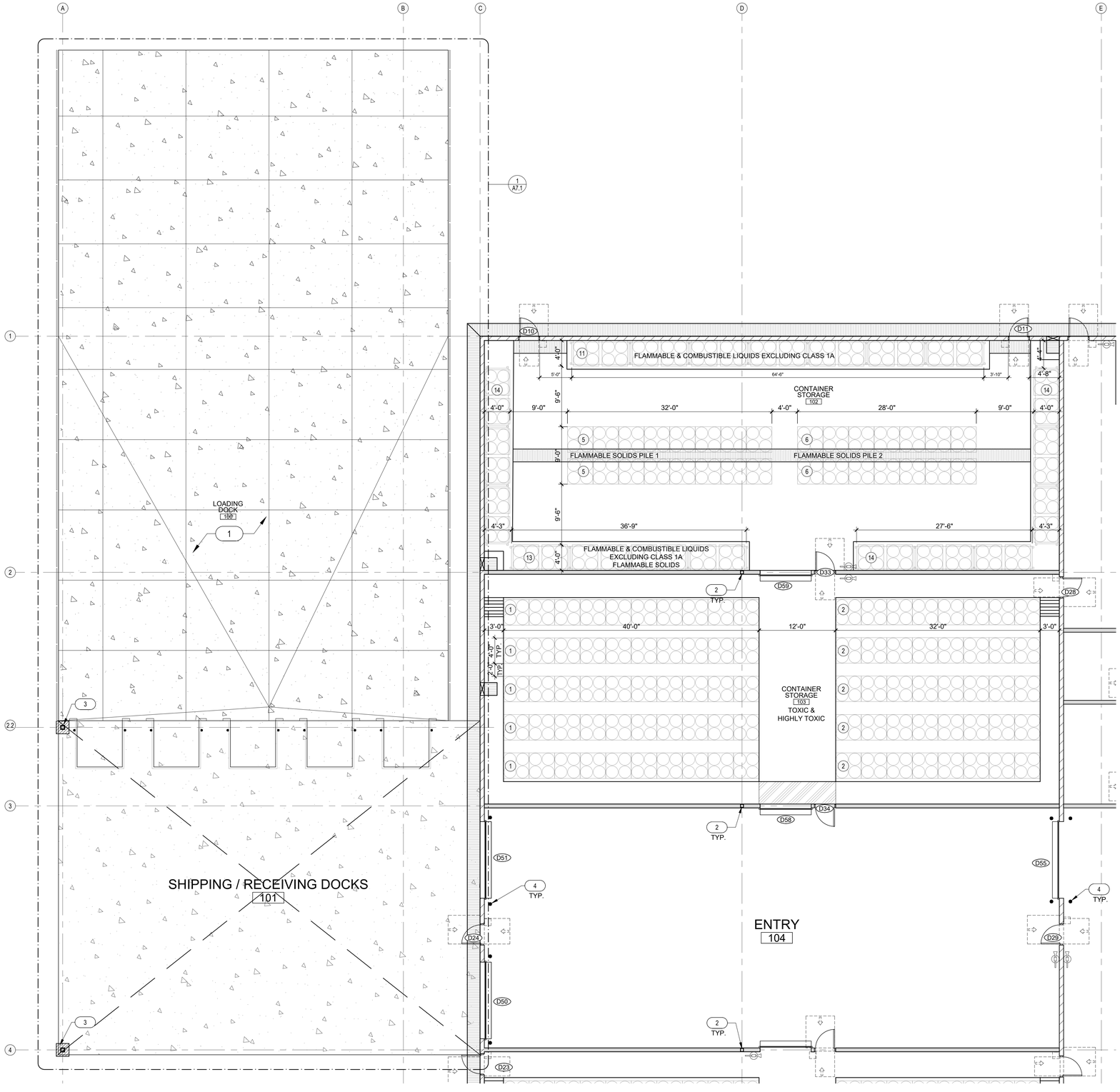

1 ENLARGED FLOOR PLAN

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

NORTH

102 STORAGE ROOM NOTES

OCCUPANCY CLASS: H-3
STORAGE:
FLAMMABLE & COMBUSTIBLE LIQUIDS EXCLUDING CLASS 1-A
FLAMMABLE SOLIDS INCLUDING MAGNESIUM

ACTUAL STORAGE FLAMMABLE SOLID:
PILES: 2
DRUMS / PILE: 112 & 128
QUANTITY PER PILE: 7040, 940 CF (1 GAL - 0.1336 CUBIC FEET)
TOTAL DRUMS: 240
TOTAL QTY: 13,200 GALS
LIMITED TO 6 DRUMS
ACTUAL STORAGE FLAMMABLE & COMBUSTIBLE LIQUIDS EXCEPT CLASSES 1A
MAX QUANTITY: NO LIMIT (IFC 5704.3.8.1)
NUMBER OF RACKS: 20
DRUMS PER RACK: 16
QUANTITY PER RACK: 880 GALS
TOTAL DRUMS: 320
TOTAL QUANTITY: 17,600 GALS
CONTAINMENT
412 CU.FT. REQUIRED (30,800 GAL = 4117 CU.FT X 10%)
817.5 CU.FT. PROVIDED

ROOM AREA: 3240 SF
OCCUPANT LOAD: 7 @ 1/500
NUMBER OF EXITS:
2 BASED ON OCCUPANT LOAD
2 BASED ON COMMON PATH OF TRAVEL

LIQUID-TIGHT FLOOR
EXPLOSION CONTROL NOT REQUIRED NO CLASS 1-A OR USE OF CLASS I-B (TABLE 414.5.1)
SPILL CONTROL REQUIRED (IFC 5704.3.8.2)
SECONDARY CONTROL REQUIRED (IFC 5704.3.8.2)
ELECTRICAL WIRING AND EQUIPMENT SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH SECTION 604 AND NFPA 70. (IFC 5703.1)
PORTABLE FIRE EXTINGUISHER REQUIRED 4A:80B:C ON 50' MAX SPACING OR 4A:40B:C ON 30' MAX SPACING (IFC 5703.3.3.1)
VENTILATED AT A RATE OF NOT LESS THAN 0.25 CFM PER SQUARE FOOT OF FLOOR AREA OVER THE STORAGE AREA. (IFC 5704.3.8.3)
EITHER 11/2-INCH (38 MM) LINED OR 1-INCH (25 MM) HARD RUBBER HOSE LINES SHALL BE PROVIDED IN SUFFICIENT NUMBER TO REACH ALL LIQUID STORAGE AREAS AND SHALL BE IN ACCORDANCE WITH SECTION 903 OR 905. (IFC 5704.3.8.5)
NOTE: VERIFY WITH LOCAL FIRE MARSHAL
NOTE: DRUMS WITH FLAMMABLE LIQUIES STACKED 1 HIGH UNLESS IN RACKING.

TWO HOUR EXTERIOR WALLS
DOORS: 1 HR WALL 3/4 HR
2 HR WALL 1-1/2 HR
4 HR WALL 3 HR (MUST HAVE DOOR IN ALL 4 HR WALLS)

AN APPROVED MANUAL EMERGENCY ALARM SYSTEM SHALL BE PROVIDED IN BUILDINGS, ROOMS OR AREAS USED FOR STORAGE OF HAZARDOUS MATERIALS. EMERGENCY ALARM-INITIATING DEVICES SHALL BE INSTALLED OUTSIDE OF EACH INTERIOR EXIT OR EXIT ACCESS DOOR OF STORAGE BUILDINGS, ROOMS OR AREAS. ACTIVATION OF AN EMERGENCY ALARM-INITIATING DEVICE SHALL SOUND A LOCAL ALARM TO ALERT OCCUPANTS OF AN EMERGENCY SITUATION INVOLVING HAZARDOUS MATERIALS. EMERGENCY OR STANDBY POWER SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 2702.2.

AN APPROVED AUTOMATIC ALARM SHALL BE PROVIDED TO INDICATE A LEAK IN A STORAGE TANK AND ROOM. AN APPROVED SIGN SHALL BE POSTED ON EVERY ENTRY DOOR TO THE TANK STORAGE ROOM INDICATING THE POTENTIAL HAZARD OF THE INTERIOR ROOM ENVIRONMENT, OR THE SIGN SHALL STATE: WARNING, WHEN ALARM SOUNDS, THE ENVIRONMENT WITHIN THE ROOM MAY BE HAZARDOUS. THE LEAKAGE ALARM SHALL BE SUPERVISED IN ACCORDANCE WITH CHAPTER 9 TO TRANSMIT A TROUBLE SIGNAL.

103 STORAGE ROOM NOTES

OCCUPANCY CLASS: H-4
STORAGE OF TOXIC AND HIGHLY TOXIC
MAX. ALLOWED STORAGE: NO LIMIT
MAX. CONTAINER SIZE: 55 GAL

ACTUAL STORAGE:
DRUMS PER ROW: 80 & 64
GALLONS PER ROW: 4,400 GALS & 3520 GAL
NO. ROWS: 10
TOTAL AMOUNT: 720 DRUMS
GALLONS PER ROOM: 39,600 GALLONS
CONTAINMENT:
529 CU.FT. REQUIRED (39,600 GALS = 5,294 CU.FT. X 10%)
688 CU.FT. PROVIDED

ROOM AREA: 3240 SF
OCCUPANT LOAD: 7 @ 1/500
NUMBER OF EXITS:
2 BASED ON OCCUPANT LOAD
2 BASED ON COMMON PATH OF TRAVEL
LIQUID-TIGHT FLOOR
SECONDARY CONTAINMENT REQUIRED

AN APPROVED MANUAL EMERGENCY ALARM SYSTEM SHALL BE PROVIDED IN BUILDINGS, ROOMS OR AREAS USED FOR STORAGE OF HAZARDOUS MATERIALS. EMERGENCY ALARM-INITIATING DEVICES SHALL BE INSTALLED OUTSIDE OF EACH INTERIOR EXIT OR EXIT ACCESS DOOR OF STORAGE BUILDINGS, ROOMS OR AREAS. ACTIVATION OF AN EMERGENCY ALARM-INITIATING DEVICE SHALL SOUND A LOCAL ALARM TO ALERT OCCUPANTS OF AN EMERGENCY SITUATION INVOLVING HAZARDOUS MATERIALS. EMERGENCY OR STANDBY POWER SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 2702.2.

STORAGE ZONES (X)

1. 4'X4' PALLET
(4) DRUMS/PALLET
(2) PALLETS HIGH
(10) STACKS OF PALLETS
TOTAL 80 DRUMS

2. 4'X4' PALLET
(4) DRUMS/PALLET
(2) PALLETS HIGH
(8) STACKS OF PALLETS
TOTAL 64 DRUMS

3. 4'X4' PALLET
(4) DRUMS/PALLET
(1) PALLET HIGH
(6) PALLETS
TOTAL 24 DRUMS

4. 4'X4' PALLET
(4) DRUMS/PALLET
(2) PALLETS HIGH
(4) STACKS OF PALLETS
TOTAL 32 DRUMS

5. 4'X4' PALLET
(4) DRUMS/PALLET
(2) PALLET HIGH
(8) PALLETS
TOTAL 64 DRUMS

6. 4'X4' PALLET
(4) DRUMS/PALLET
(1) PALLET HIGH
(7) PALLETS
TOTAL 56 DRUMS

10. SPRINKLERED RACK
(16) DRUMS/RACK
(9) RACKS
TOTAL 144 DRUMS

11. SPRINKLERED RACK
(16) DRUMS/RACK
(7) RACKS
TOTAL 112 DRUMS

12. SPRINKLERED RACK
(16) DRUMS/RACK
(6) RACKS
TOTAL 96 DRUMS

13. SPRINKLERED RACK
(16) DRUMS/RACK
(4) RACKS
TOTAL 64 DRUMS

14. SPRINKLERED RACK
(16) DRUMS/RACK
(3) RACKS
TOTAL 48 DRUMS

15. SPRINKLERED RACK
(16) DRUMS/RACK
(9) RACKS
TOTAL 144 DRUMS

KEYNOTES (X)

1. RECESSED DOCK WITH 42" HIGH GUARDRAIL AND CURBS - SEE SHEET A7.0
2. STEEL COLUMN
3. STEEL COLUMN INSIDE 2'-0" x 2'-0" CMU COLUMN, SEE STRUCTURAL DRAWINGS
4. 36" HIGH STEEL PIPE BOLLARD

DOOR & WINDOW LEGEND

#	DOOR TAG. REFER TO SCHEDULE ON SHEET A6.0
-	WINDOW TAG. REFER TO SCHEDULE ON SHEET A6.0

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FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
ENLARGED CONTAINER STORAGE CORROSIVES PLAN (103) PHASE II

DATE
03.30.2021
PROJECT NO.
20-200

A4.1

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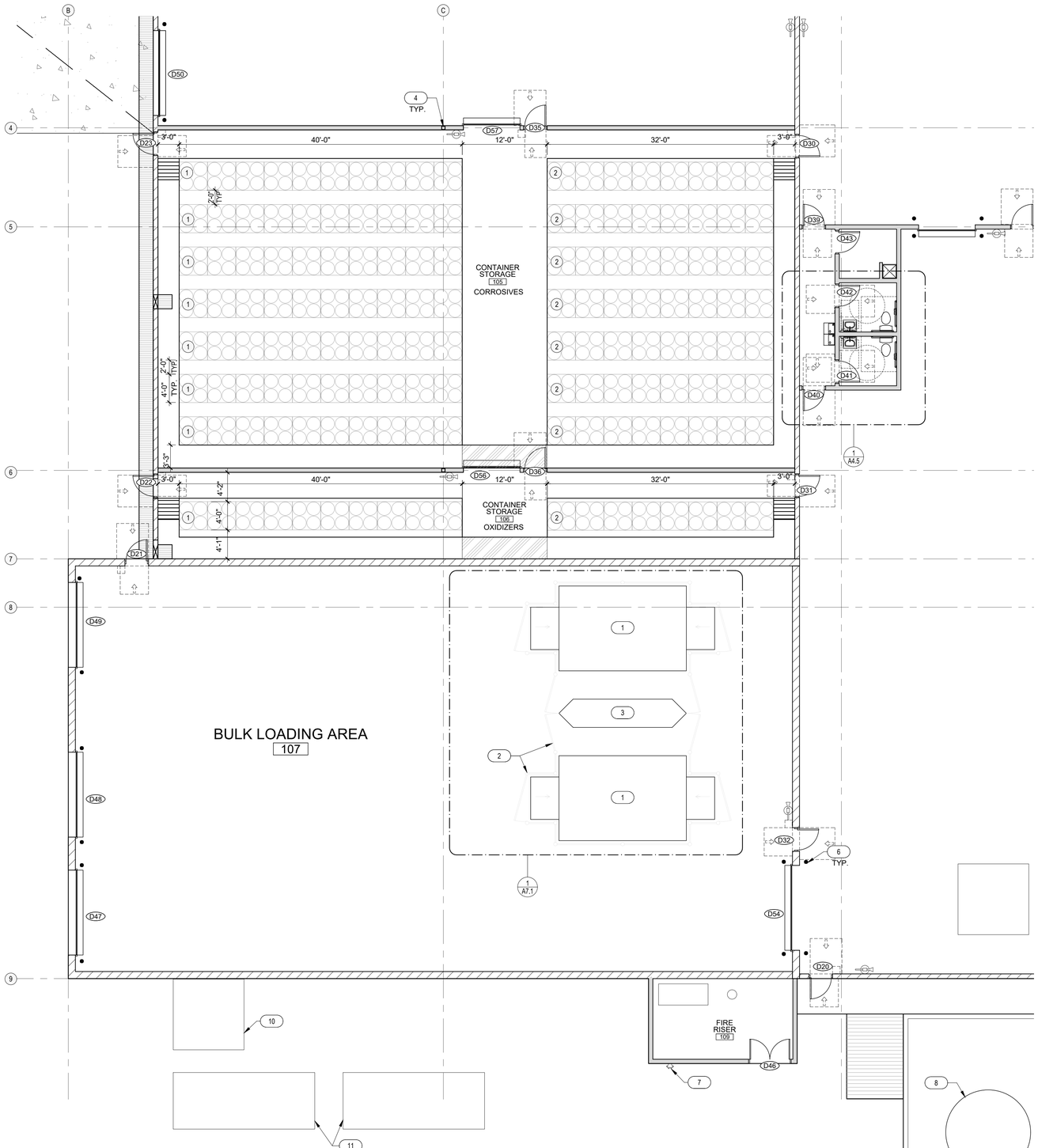

1 ENLARGED FLOOR PLAN

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

ROOM 105 STORAGE ROOM NOTES

OCCUPANCY CLASS: H-4
STORAGE OF CORROSIVES
MAX ALLOWED STORAGE: NO LIMIT
MAX CONTAINER SIZE: 55 GAL

ACTUAL STORAGE:
DRUMS PER ROW: 80 & 64
GALLONS PER ROW: 4,400 GALS & 3520 GALS
NO. ROWS: 14
TOTAL AMOUNT: 1,008 DRUMS
GALLONS PER ROOM: 55,440 GALS
CONTAINMENT
741 CU.FT. REQUIRED (55,440 GAL = 7411.25 CU.FT. X 10%)
876 CU.FT. PROVIDED

ROOM AREA: 4300 SF
OCCUPANT LOAD: 9 @ 1/500
NUMBER OF EXITS:
2 BASED ON OCCUPANT LOAD
2 BASED ON COMMON PATH OF TRAVEL
LIQUID-TIGHT FLOOR (IFC 5004.12 & 5404.1.2)
SPILL CONTROL REQUIRED FOR LIQUIDS (IFC 5004.2.1)
SECONDARY CONTAINMENT REQUIRED (IFC 5004.2.1)
MONITORING SYSTEM REQUIRED (IFC 5004.2.2.5)
VENTILATION SHALL BE PROVIDED WITH MECHANICAL EXHAUST VENTILATION OR NATURAL VENTILATION WHERE NATURAL VENTILATION CAN BE SHOWN TO BE ACCEPTABLE FOR THE MATERIALS AS STORED. (IFC 5004.3)

AN APPROVED MANUAL EMERGENCY ALARM SYSTEM SHALL BE PROVIDED IN BUILDINGS, ROOMS OR AREAS USED FOR STORAGE OF HAZARDOUS MATERIALS. EMERGENCY ALARM-INITIATING DEVICES SHALL BE INSTALLED OUTSIDE OF EACH INTERIOR EXIT OR EXIT ACCESS DOOR OF STORAGE BUILDINGS, ROOMS OR AREAS. ACTIVATION OF AN EMERGENCY ALARM-INITIATING DEVICE SHALL SOUND A LOCAL ALARM TO ALERT OCCUPANTS OF AN EMERGENCY SITUATION INVOLVING HAZARDOUS MATERIALS. EMERGENCY OR STANDBY POWER SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 2702.2.

ROOM 106 STORAGE ROOM NOTES

OCCUPANCY CLASS: H-3
NO CLASS 1 OR CLASS 4 OXIDIZERS TO BE STORED
STORAGE:
OXIDIZER CLASS 2 AND CLASS 3 OR
ORGANIC PEROXIDES CLASS 2, CLASS 3, CLASS 4, OR CLASS 5

MAX ALLOWED STORAGE:
OXIDIZERS
CLASS 2: 100 TONS / PILE; 200 TONS / BLDG (IFC TABLE 6304.1.5(1))
CLASS 3: 30 TONS / PILE; 1200 TONS / BLDG (IFC TABLE 6304.1.5(2))
ORGANIC PEROXIDES
CLASS II: 25 TONS (IFC TABLE 5003.8.2)
CLASS III: 50 TONS (IFC TABLE 5003.8.2)
CLASS IV: NO LIMIT
CLASS V: NO LIMIT
ACTUAL STORAGE:
DRUMS PER PILE: 80 & 64
WEIGHT PER 80 DRUM PILE: 22 TONS (80 X 55 GALS X 10 LBS)
WEIGHT PER 64 DRUM PILE: 17.6 TONS (64 X 55 GALS X 10 LBS)
MAX PILE HEIGHT: TWO DRUMS
NUMBER OF PILES: 2
TOTAL AMOUNT: 144 DRUMS
TOTAL GALLONS: (144 X 55 GALS) 7,920 GALS
TOTAL WEIGHT: 39.6 TONS
CONTAINMENT:
102 CB.FT. REQUIRED (7,920 GALS = 1,019 CU.FT. X 10%)
117 CB.FT. PROVIDED

ROOM AREA: 1100 SF
OCCUPANT LOAD: 2 @ 1/500
NUMBER OF EXITS:
1 BASED ON OCCUPANT LOAD
2 BASED ON COMMON PATH OF TRAVEL
LIQUID TIGHT AND NON-COMBUSTIBLE FLOOR (IFC 5004.12 & 6204.1.3)
ELECTRICAL PER NFPA 70 (IFC 5003.9.4) AND CLASS I OR II ORGANIC PEROXIDES SHALL COMPLY WITH THE REQUIREMENTS FOR ELECTRICAL CLASS I, DIVISION 2 LOCATIONS. (IFC 6204.1.4)
SPRINKLER SYSTEM PER NFPA 400 (IFC 6304.1.2)
SPILL CONTROL REQUIRED (IFC 5004.2.1)
SECONDARY CONTAINMENT REQUIRED (IFC 5004.2.2)
SMOKE DETECTION SYSTEM SHALL SOUND A LOCAL ALARM (IFC 6204.1.5 & 6304.1.4)

OXIDIZERS CLASS 2 & 3 AND ORGANIC PEROXIDES CLASS 2, CLASS 3, CLASS 4, OR CLASS 5 ARE COMPATIBLE AND MAY BE MIXED IN STORAGE. THE ROOM MEETS THE MOST LIMITING DESIGN CRITERIA FOR EACH MATERIAL AND EACH CLASS AND WILL NOT EXCEED THE MAXIMUM ALLOWED QUANTITY

AN APPROVED MANUAL EMERGENCY ALARM SYSTEM SHALL BE PROVIDED IN BUILDINGS, ROOMS OR AREAS USED FOR STORAGE OF HAZARDOUS MATERIALS. EMERGENCY ALARM-INITIATING DEVICES SHALL BE INSTALLED OUTSIDE OF EACH INTERIOR EXIT OR EXIT ACCESS DOOR OF STORAGE BUILDINGS, ROOMS OR AREAS. ACTIVATION OF AN EMERGENCY ALARM-INITIATING DEVICE SHALL SOUND A LOCAL ALARM TO ALERT OCCUPANTS OF AN EMERGENCY SITUATION INVOLVING HAZARDOUS MATERIALS. EMERGENCY OR STANDBY POWER SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 2702.2.

STORAGE ZONES (X)

1. 4'X4' PALLET
   (4) DRUMS/PALLET
   (2) PALLETS HIGH
   (10) STACKS OF PALLETS
   TOTAL 80 DRUMS
2. 4'X4' PALLET
   (4) DRUMS/PALLET
   (2) PALLETS HIGH
   (8) STACKS OF PALLETS
   TOTAL 64 DRUMS
3. 4'X4' PALLET
   (4) DRUMS/PALLET
   (1) PALLET HIGH
   (6) PALLETS
   TOTAL 24 DRUMS
4. 4'X4' PALLET
   (4) DRUMS/PALLET
   (2) PALLETS HIGH
   (4) STACKS OF PALLETS
   TOTAL 32 DRUMS
5. 4'X4' PALLET
   (4) DRUMS/PALLET
   (2) PALLET HIGH
   (8) PALLETS
   TOTAL 64 DRUMS
6. 4'X4' PALLET
   (4) DRUMS/PALLET
   (1) PALLET HIGH
   (7) PALLETS
   TOTAL 56 DRUMS
10. SPRINKLERED RACK
    (16) DRUMS/RACK
    (9) RACKS
    TOTAL 144 DRUMS
11. SPRINKLERED RACK
    (16) DRUMS/RACK
    (7) RACKS
    TOTAL 112 DRUMS
12. SPRINKLERED RACK
    (16) DRUMS/RACK
    (6) RACKS
    TOTAL 96 DRUMS
13. SPRINKLERED RACK
    (16) DRUMS/RACK
    (4) RACKS
    TOTAL 64 DRUMS
14. SPRINKLERED RACK
    (16) DRUMS/RACK
    (3) RACKS
    TOTAL 48 DRUMS
15. SPRINKLERED RACK
    (16) DRUMS/RACK
    (9) RACKS
    TOTAL 144 DRUMS

KEYNOTES (X)

1. 8'-0" DEEP SEALED CONCRETE PIT
2. 42" HIGH GUARDRAIL AND ACCESS GATES @ PERIMETER OF PIT
3. RAISED CONCRETE TRACK-HOE GUIDE
4. STEEL COLUMN
5. CENTER SUPPORT STEEL COLUMN
6. 36" HIGH STEEL PIPE BOLLARD
7. PROPOSED FIRE RISER & SIAMESE CONNECTION
8. 20,000 GALLON TANK
9. TRUCK CONTAINMENT
10. DUST CONTROL
11. CARBON STORAGE

DOOR & WINDOW LEGEND

#	DOOR TAG. REFER TO SCHEDULE ON SHEET A6.0
-	WINDOW TAG. REFER TO SCHEDULE ON SHEET A6.0

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FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260
TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
ENLARGED CONTAINER STORAGE PLAN OXIDIZERS PHASE II

DATE
8-19-22
PROJECT NO.
20-200

A4.2

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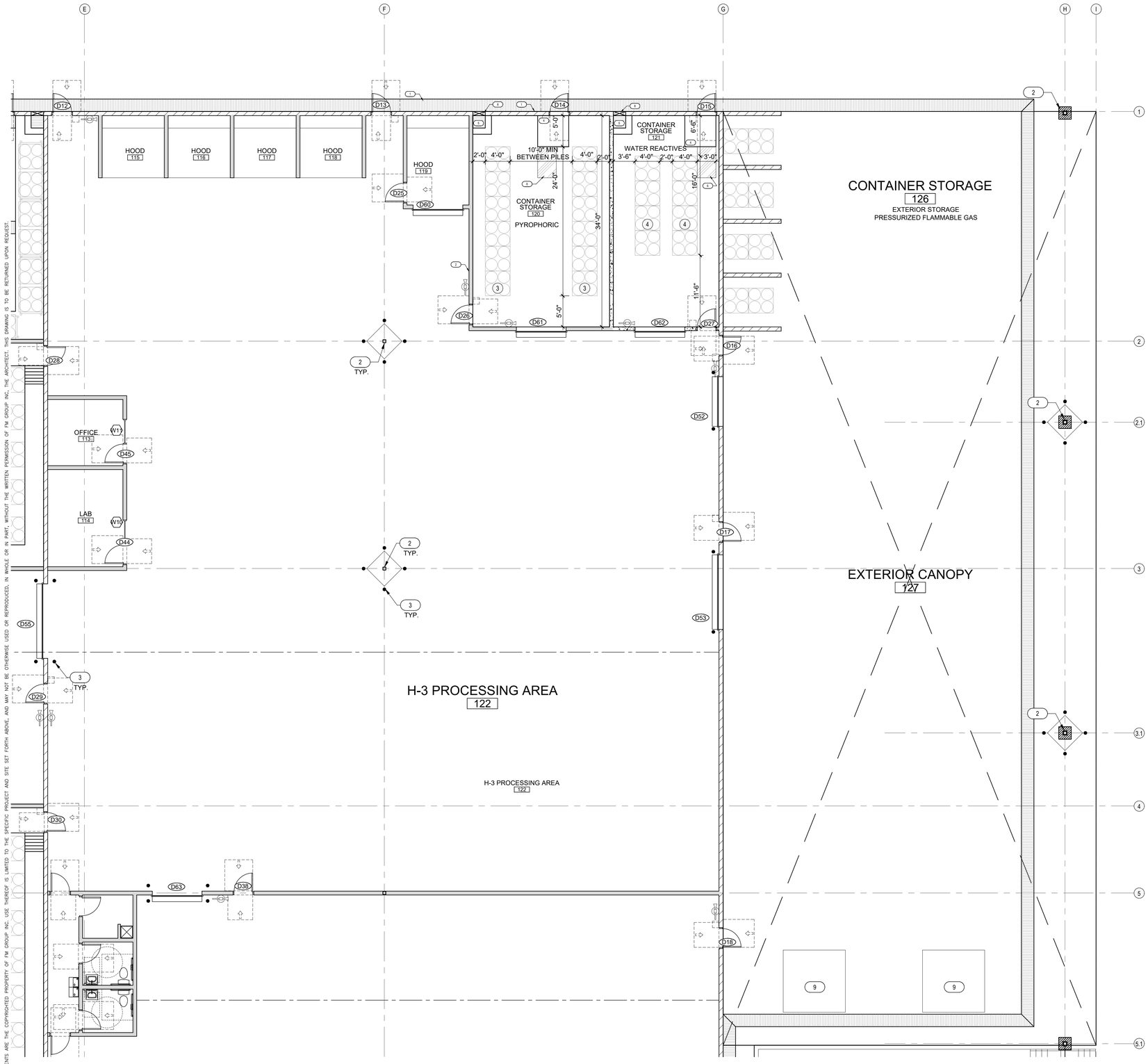

1 ENLARGED FLOOR PLAN

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

120 STORAGE ROOM NOTES

OCCUPANCY CLASS: H-2
STORAGE:
PYROPHORIC SOLIDS & LIQUIDS
NO PYROPHORIC GASES
NO SILANE GAS, AND GAS MIXTURES WITH A SILANE CONCENTRATION OF 1.37 PERCENT OR MORE BY VOLUME, SHALL BE IN ACCORDANCE WITH CGA G-13.

MAX. CONTAINER SIZE: 55 GAL
MAX. ALLOWED STORAGE:
QUANTITY: 2500 CUBIC FEET (7.35 CF/DRUMS = 340 DRUMS) (IFC TABLE 6404.2.1)
MAX. AREA PER PILE: 100 SF (4' WIDE X 25' LONG) (IFC 6404.1.2)
MAX. PILE HEIGHT: 5' (NO STACKED CONTAINERS) (IFC 6404.1.2)
ACTUAL STORAGE:
PILES: TWO
ACTUAL AMOUNT: 24 DRUMS PER PILE
TOTAL DRUMS: 48 TOTAL
2,640 GALS TOTAL
CONTAINMENT:
35 CU.FT. REQUIRED (2640 GAL = 353 CU.FT. X 10%)
55 CU.FT. PROVIDED

ROOM AREA: 682 SF
OCCUPANT LOAD: 1.5 @ 1/500
NUMBER OF EXITS:
1 BASED ON OCCUPANT LOAD
2 BASED ON COMMON PATH OF TRAVEL

LIQUID-TIGHT FLOOR (IFC 6404.1.1)
SPILL CONTROL REQUIRED: (IFC 5004.2.1) SPILL CONTROL TO PREVENT THE FLOW OF LIQUIDS TO ADJOINING AREAS. FLOORS IN INDOOR LOCATIONS SHALL BE CONSTRUCTED TO CONTAIN A SPILL FROM THE LARGEST SINGLE VESSEL
SECONDARY CONTAINMENT REQUIRED: (IFC TABLE 5004.2.2)
SECONDARY CONTAINMENT FOR INDOOR STORAGE AREAS SHALL BE DESIGNED TO CONTAIN A SPILL FROM THE LARGEST VESSEL (55 GALS) PLUS THE DESIGN FLOW VOLUME OF FIRE PROTECTION WATER CALCULATED TO DISCHARGE FROM THE FIRE-EXTINGUISHING SYSTEM OVER THE MINIMUM REQUIRED SYSTEM DESIGN AREA OR AREA OF THE ROOM OR AREA IN WHICH THE STORAGE IS LOCATED, WHICHEVER IS SMALLER. THE CONTAINMENT CAPACITY SHALL BE DESIGNED TO CONTAIN THE FLOW FOR A PERIOD OF 20 MINUTES.
MONITORING. (IFC 5004.2.2.5) AN APPROVED MONITORING METHOD SHALL BE PROVIDED TO DETECT HAZARDOUS MATERIALS IN THE SECONDARY CONTAINMENT SYSTEM. THE MONITORING METHOD IS ALLOWED TO BE VISUAL INSPECTION OF THE PRIMARY OR SECONDARY CONTAINMENT, OR OTHER APPROVED MEANS. WHERE SECONDARY CONTAINMENT IS SUBJECT TO THE INTRUSION OF WATER, A MONITORING METHOD FOR DETECTING WATER SHALL BE PROVIDED. WHERE MONITORING DEVICES ARE PROVIDED, THEY SHALL BE CONNECTED TO APPROVED VISUAL OR AUDIBLE ALARMS.

121 STORAGE ROOM NOTES

OCCUPANCY CLASS: H-2
STORAGE OF WATER REACTIVE:
CLASS 3
CLASS 2
CLASS 1 SOLIDS & LIQUIDS
NO DETONABLE WATER REACTIVE SOLIDS OR LIQUIDS
MAX. ALLOWED STORAGE:
CLASS 3: 1 TON (IFC 5003.8.2) IN WATER TIGHT CONTAINERS IFC 6704.1.4)
CLASS 2: 25 TONS (IFC 5003.8.2)
CLASS 1: NO LIMIT (IFC 5003.8.2)
MAX CONTAINER SIZE: 55 GALS
MAX. PER PILE: 500 CUBIC FEET (68 - 55 GALLON DRUMS)
NO. PILES: ONE

ACTUAL STORAGE
ACTUAL AMOUNT: 64 DRUMS
QUANTITY: 3,520 GALS
470 CU.FT.
CONTAINMENT:
47 CU.FT. REQUIRED (3,520 GALS = 470 CU.FT. X 10%)
55 CU.FT. PROVIDED

ROOM AREA: 527 SF
OCCUPANT LOAD: 1 @ 1/500
NUMBER OF EXITS:
1 BASED ON OCCUPANT LOAD
2 BASED ON COMMON PATH OF TRAVEL
ACCESSIBLE EXIT DOORS
DOOR SWING IN DIRECTION OF TRAVEL

CONTAINMENT REQUIRED: (IFC 5004.2.1) SPILL CONTROL TO PREVENT THE FLOW OF LIQUIDS TO ADJOINING AREAS. FLOORS IN INDOOR LOCATIONS AND SIMILAR SURFACES IN OUTDOOR LOCATIONS SHALL BE CONSTRUCTED TO CONTAIN A SPILL FROM THE LARGEST SINGLE VESSEL
SECONDARY CONTAINMENT REQUIRED: (IFC TABLE 5004.2.2) SECONDARY CONTAINMENT FOR INDOOR STORAGE AREAS SHALL BE DESIGNED TO CONTAIN A SPILL FROM THE LARGEST VESSEL (55 GALS) PLUS THE DESIGN FLOW VOLUME OF FIRE PROTECTION WATER CALCULATED TO DISCHARGE FROM THE FIRE-EXTINGUISHING SYSTEM OVER THE MINIMUM REQUIRED SYSTEM DESIGN AREA OR AREA OF THE ROOM OR AREA IN WHICH THE STORAGE IS LOCATED, WHICHEVER IS SMALLER. THE CONTAINMENT CAPACITY SHALL BE DESIGNED TO CONTAIN THE FLOW FOR A PERIOD OF 20 MINUTES.
MONITORING: (IFC 5004.2.2.5) AN APPROVED MONITORING METHOD SHALL BE PROVIDED TO DETECT HAZARDOUS MATERIALS IN THE SECONDARY CONTAINMENT SYSTEM. THE MONITORING METHOD IS ALLOWED TO BE VISUAL INSPECTION OF THE PRIMARY OR SECONDARY CONTAINMENT, OR OTHER APPROVED MEANS. WHERE SECONDARY CONTAINMENT IS SUBJECT TO THE INTRUSION OF WATER, A MONITORING METHOD FOR DETECTING WATER SHALL BE PROVIDED. WHERE MONITORING DEVICES ARE PROVIDED, THEY SHALL BE CONNECTED TO APPROVED VISUAL OR AUDIBLE ALARMS.
WATERPROOF ROOM (IFC 6704.1.3)
LIQUID-TIGHT FLOOR (IFC 6704.1.2)
EXPLOSION PROOF ROOM PER IFC 911, NFPA 69 AND NFPA 495 (IFC 6704.1.6 & TABLE 911.1); EXPLOSION (DEFLAGRATION) VENTING (PER 911.2) OR EXPLOSION (DEFLAGRATION) PREVENTION SYSTEMS (PER NFPA 69)
ELECTRICAL PER NFPA 70 (IFC 5002.9.6)
VENTILATION REQUIRED: (IFC 5004.3) INDOOR STORAGE AREAS AND STORAGE BUILDINGS SHALL BE PROVIDED WITH MECHANICAL EXHAUST VENTILATION OR NATURAL VENTILATION WHERE NATURAL VENTILATION CAN BE SHOWN TO BE ACCEPTABLE FOR THE MATERIALS AS STORED.
EMERGENCY ALARM REQUIRED. (IFC 5004.9) AN APPROVED MANUAL EMERGENCY ALARM SYSTEM SHALL BE PROVIDED IN BUILDINGS, ROOMS OR AREAS USED FOR STORAGE OF HAZARDOUS MATERIALS. EMERGENCY ALARM-INITIATING DEVICES SHALL BE INSTALLED OUTSIDE OF EACH INTERIOR EXIT OR EXIT ACCESS DOOR OF STORAGE BUILDINGS, ROOMS OR AREAS. ACTIVATION OF AN EMERGENCY ALARM-INITIATING DEVICE SHALL SOUND A LOCAL ALARM TO ALERT OCCUPANTS OF AN EMERGENCY SITUATION INVOLVING HAZARDOUS MATERIALS. EMERGENCY OR STANDBY POWER SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 2702.2. (IFC 1203)

STORAGE ZONES (X)

1. 4'X4' PALLET
(4) DRUMS/PALLET
(2) PALLETS HIGH
(10) STACKS OF PALLETS
TOTAL 80 DRUMS
2. 4'X4' PALLET
(4) DRUMS/PALLET
(2) PALLETS HIGH
(8) STACKS OF PALLETS
TOTAL 64 DRUMS
3. 4'X4' PALLET
(4) DRUMS/PALLET
(1) PALLET HIGH
(6) PALLETS
TOTAL 24 DRUMS
4. 4'X4' PALLET
(4) DRUMS/PALLET
(2) PALLETS HIGH
(4) STACKS OF PALLETS
TOTAL 32 DRUMS
5. 4'X4' PALLET
(4) DRUMS/PALLET
(2) PALLET HIGH
(8) PALLETS
TOTAL 64 DRUMS
6. 4'X4' PALLET
(4) DRUMS/PALLET
(1) PALLET HIGH
(7) PALLETS
TOTAL 56 DRUMS
10. SPRINKLERED RACK
(16) DRUMS/RACK
(9) RACKS
TOTAL 144 DRUMS
11. SPRINKLERED RACK
(16) DRUMS/RACK
(7) RACKS
TOTAL 112 DRUMS
12. SPRINKLERED RACK
(16) DRUMS/RACK
(6) RACKS
TOTAL 96 DRUMS
13. SPRINKLERED RACK
(16) DRUMS/RACK
(4) RACKS
TOTAL 64 DRUMS
14. SPRINKLERED RACK
(16) DRUMS/RACK
(3) RACKS
TOTAL 48 DRUMS
15. SPRINKLERED RACK
(16) DRUMS/RACK
(9) RACKS
TOTAL 144 DRUMS

KEYNOTES (X)

1. STEEL COLUMN
2. CENTER SUPPORT STEEL COLUMN
3. 36" HIGH STEEL PIPE BOLLARD
4. 5'X5' CONCRETE LANDING
5. 2'X2'X2' CATCH BASIN
6. REMOVABLE ACCESSIBLE RAMP
7. 2'X2'X2' TRENCH DRAIN OPENINGS IN GRATE NO WIDER THAN 1/2"
8. 2'X2'X2' FOUNDATION OPENING WITH SCREEN
9. PUMP STATION

DOOR & WINDOW LEGEND

(#)	DOOR TAG. REFER TO SCHEDULE ON SHEET A6.0
(◇)	WINDOW TAG. REFER TO SCHEDULE ON SHEET A6.0

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15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
ENLARGED CONTAINER STORAGE PLAN PYROPHORIC PHASE II

DATE
8-19-22
PROJECT NO.
20-200

A4.3

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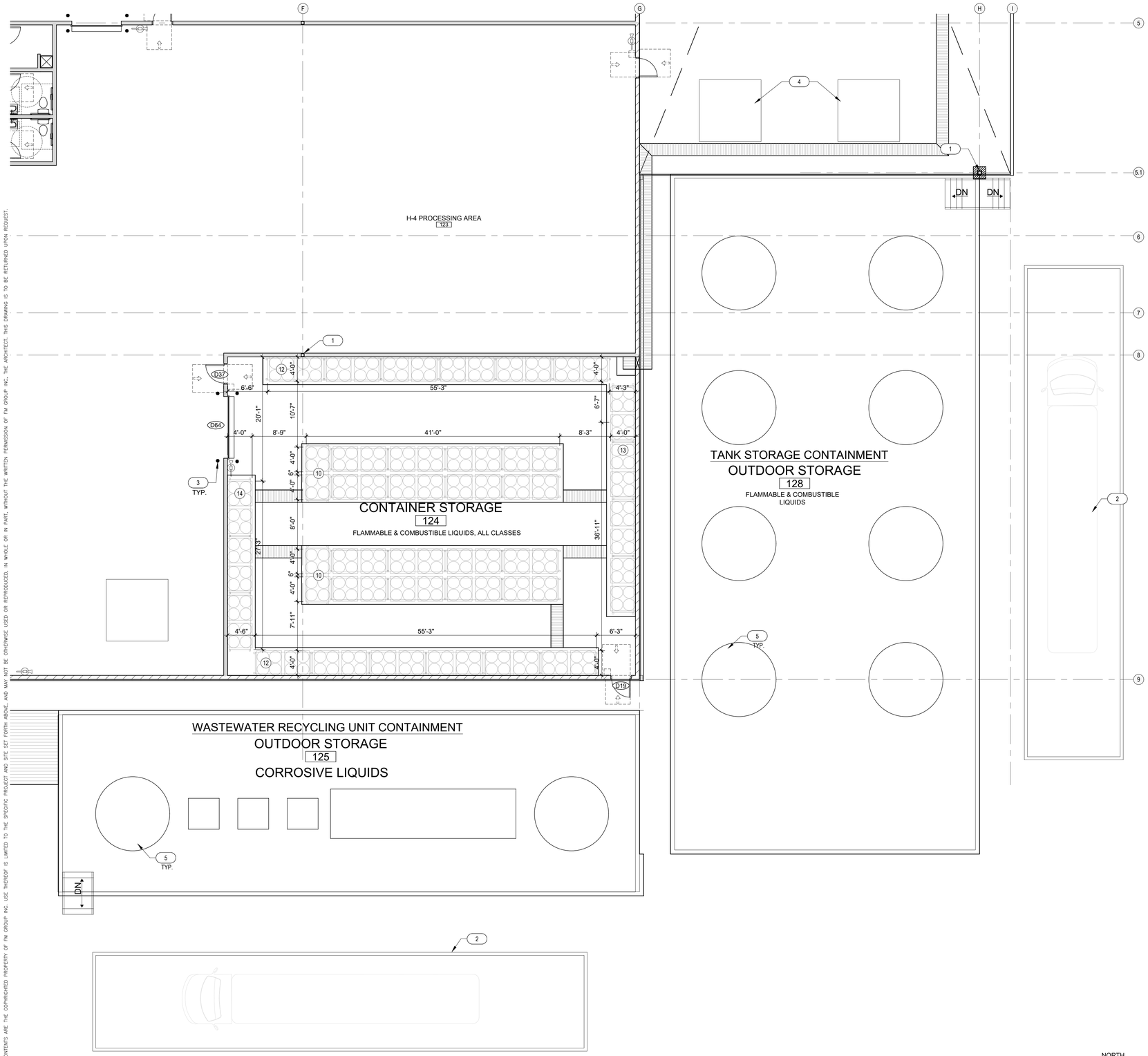

1 ENLARGED FLOOR PLAN

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

NORTH

124 STORAGE ROOM NOTES

OCCUPANCY CLASS: H-3
STORAGE: FLAMMABLE & COMBUSTIBLE LIQUIDS

ACTUAL STORAGE FLAMMABLE & COMBUSTIBLE LIQUIDS ALL CLASSES
- DRUMS PER RACK: 16
- NUMBER OF RACKS: 37
- QUANTITY PER RACK: 880 GALS (MAX ALLOWED CLASS 1-A 3,000 GAL)
- TOTAL DRUMS: 592
- TOTAL QUANTITY: 32,560 GALS

CONTAINMENT:
- 435 CU.FT. REQUIRED (32560 GAL = 4353 CU.FT. X 10%)
- 1,283 CU.FT. PROVIDED

ROOM AREA: 3,402 SF (51'-6'x66'-0")
OCCUPANT LOAD: 6 @ 1/500
NUMBER OF EXITS:
- 2 BASED ON OCCUPANT LOAD
- 2 BASED ON COMMON PATH OF TRAVEL

LIQUID-TIGHT FLOOR
EXPLOSION CONTROL REQUIRED CLASS 1-A LIQUIDS
ELECTRICAL CLASSIFICATION NOT REQUIRED
SPECIAL FIRE EXTINGUISHER REQUIRED
VENTILATED AT A RATE OF NOT LESS THAN 0.25 CFM PER SQUARE FOOT OF FLOOR AREA OVER THE STORAGE AREA.
EITHER 11/2-INCH (38 MM) LINED OR 1-INCH (25 MM) HARD RUBBER HOSE LINES SHALL BE PROVIDED IN SUFFICIENT NUMBER TO REACH ALL LIQUID STORAGE AREAS AND SHALL BE IN ACCORDANCE WITH SECTION 903 OR 905.
NOTE: DRUMS STACKED 1 HIGH UNLESS IN RACKS, ALL DRUMS IN RACKS

AN APPROVED MANUAL EMERGENCY ALARM SYSTEM SHALL BE PROVIDED IN BUILDINGS, ROOMS OR AREAS USED FOR STORAGE OF HAZARDOUS MATERIALS. EMERGENCY ALARM-INITIATING DEVICES SHALL BE INSTALLED OUTSIDE OF EACH INTERIOR EXIT OR EXIT ACCESS DOOR OF STORAGE BUILDINGS, ROOMS OR AREAS. ACTIVATION OF AN EMERGENCY ALARM-INITIATING DEVICE SHALL SOUND A LOCAL ALARM TO ALERT OCCUPANTS OF AN EMERGENCY SITUATION INVOLVING HAZARDOUS MATERIALS. EMERGENCY OR STANDBY POWER SHALL BE PROVIDED IN ACCORDANCE WITH SECTION 2702.2.

AN APPROVED AUTOMATIC ALARM SHALL BE PROVIDED TO INDICATE A LEAK IN A STORAGE TANK AND ROOM. AN APPROVED SIGN SHALL BE POSTED ON EVERY ENTRY DOOR TO THE TANK STORAGE ROOM INDICATING THE POTENTIAL HAZARD OF THE INTERIOR ROOM ENVIRONMENT, OR THE SIGN SHALL STATE: WARNING, WHEN ALARM SOUNDS, THE ENVIRONMENT WITHIN THE ROOM MAY BE HAZARDOUS. THE LEAKAGE ALARM SHALL BE SUPERVISED IN ACCORDANCE WITH CHAPTER 9 TO TRANSMIT A TROUBLE SIGNAL.

125 OUTDOOR STORAGE

OCCUPANCY CLASS: H-4
STORAGE: CORROSIVE LIQUIDS

ACTUAL STORAGE FLAMMABLE & COMBUSTIBLE LIQUIDS ALL CLASSES
- STORAGE TANK: 20,000 GALLON CAPACITY
- NUMBER OF TANKS: 2
- TOTAL QUANTITY: 40,000 GALLONS

CONTAINMENT:
- 2,941 CU.FT. REQUIRED (20,000 GAL = 2,674 CU.FT. X 110%)
- 3,388 CU.FT. PROVIDED

CONTAINMENT AREA: 4,274 SQ.FT.

128 OUTDOOR STORAGE

OCCUPANCY CLASS: H-3
STORAGE: FLAMMABLE & COMBUSTIBLE LIQUIDS

ACTUAL STORAGE FLAMMABLE & COMBUSTIBLE LIQUIDS ALL CLASSES
- STORAGE TANK: 20,000 GALLON CAPACITY
- NUMBER OF TANKS: 8
- TOTAL QUANTITY: 160,000 GALLONS

CONTAINMENT:
- 2,941 CU.FT. REQUIRED (20,000 GAL = 2,674 CU.FT. X 110%)
- 12,314 CU.FT. PROVIDED

CONTAINMENT AREA: 5,500 SF

STORAGE ZONES (X)

1. 4'X4' PALLET
   (4) DRUMS/PALLET
   (2) PALLETS HIGH
   (10) STACKS OF PALLETS
   TOTAL 80 DRUMS
2. 4'X4' PALLET
   (4) DRUMS/PALLET
   (2) PALLETS HIGH
   (8) STACKS OF PALLETS
   TOTAL 64 DRUMS
3. 4'X4' PALLET
   (4) DRUMS/PALLET
   (1) PALLET HIGH
   (6) PALLETS
   TOTAL 24 DRUMS
4. 4'X4' PALLET
   (4) DRUMS/PALLET
   (2) PALLETS HIGH
   (4) STACKS OF PALLETS
   TOTAL 32 DRUMS
5. 4'X4' PALLET
   (4) DRUMS/PALLET
   (2) PALLET HIGH
   (8) PALLETS
   TOTAL 64 DRUMS
6. 4'X4' PALLET
   (4) DRUMS/PALLET
   (1) PALLET HIGH
   (7) PALLETS
   TOTAL 56 DRUMS
10. SPRINKLERED RACK
    (16) DRUMS/RACK
    (9) RACKS
    TOTAL 144 DRUMS
11. SPRINKLERED RACK
    (16) DRUMS/RACK
    (7) RACKS
    TOTAL 112 DRUMS
12. SPRINKLERED RACK
    (16) DRUMS/RACK
    (6) RACKS
    TOTAL 96 DRUMS
13. SPRINKLERED RACK
    (16) DRUMS/RACK
    (4) RACKS
    TOTAL 64 DRUMS
14. SPRINKLERED RACK
    (16) DRUMS/RACK
    (3) RACKS
    TOTAL 48 DRUMS
15. SPRINKLERED RACK
    (16) DRUMS/RACK
    (9) RACKS
    TOTAL 144 DRUMS

KEYNOTES (X)

1. STEEL COLUMN
2. TRUCK CONTAINMENT
3. 36" HIGH STEEL PIPE BOLLARD
4. PUMP STATION
5. 20,000 GALLON TANK

DOOR & WINDOW LEGEND

#	DOOR TAG. REFER TO SCHEDULE ON SHEET A6.0
-	WINDOW TAG. REFER TO SCHEDULE ON SHEET A6.0

G.S.S. Companies Inc.
"Building Arizona Since 1985"

FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
ENLARGED CONTAINER STORAGE PLAN (124) PHASE II

DATE
8-19-22
PROJECT NO.
20-200

A4.4

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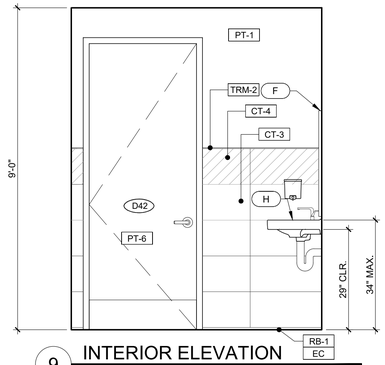
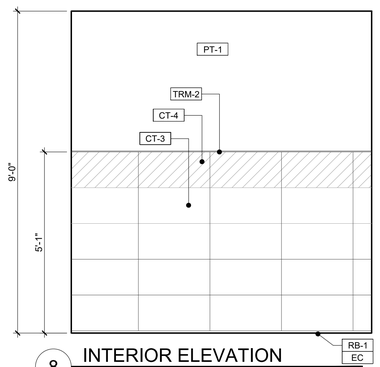
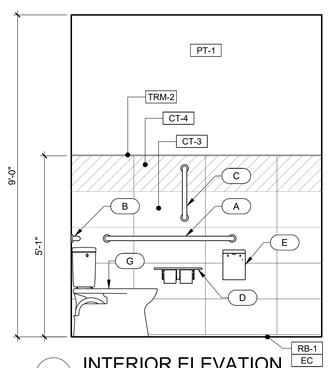


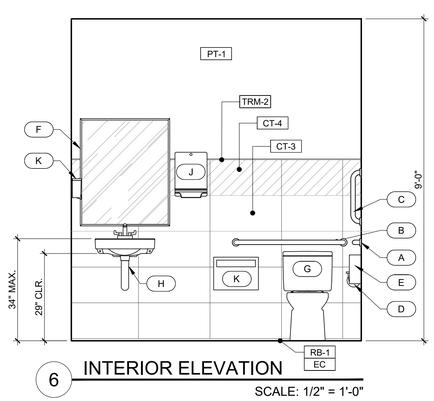
9 INTERIOR ELEVATION
SCALE: 1/2" = 1'-0"



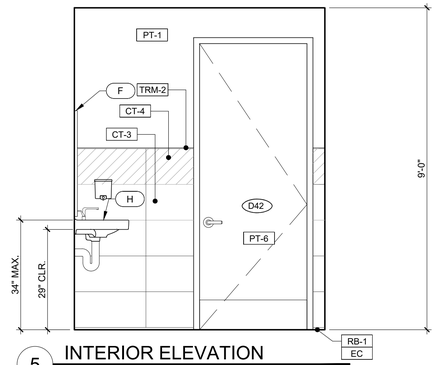
8 INTERIOR ELEVATION
SCALE: 1/2" = 1'-0"



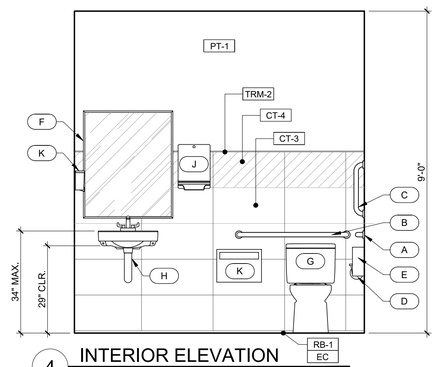
7 INTERIOR ELEVATION
SCALE: 1/2" = 1'-0"



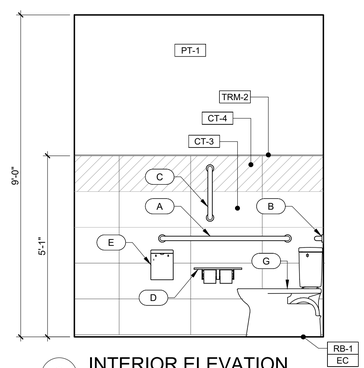
6 INTERIOR ELEVATION
SCALE: 1/2" = 1'-0"



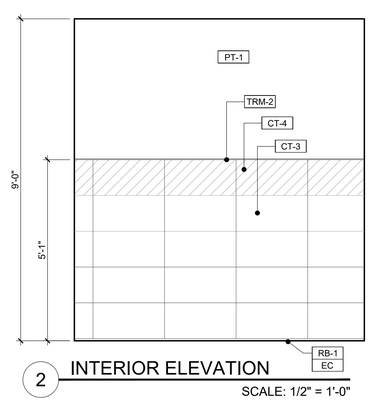
5 INTERIOR ELEVATION
SCALE: 1/2" = 1'-0"



4 INTERIOR ELEVATION
SCALE: 1/2" = 1'-0"



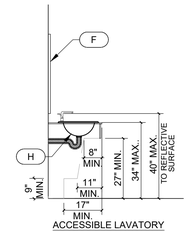
3 INTERIOR ELEVATION
SCALE: 1/2" = 1'-0"



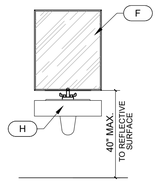
2 INTERIOR ELEVATION
SCALE: 1/2" = 1'-0"

TYPICAL FIXTURE & ACCESSORY MOUNTING HEIGHTS

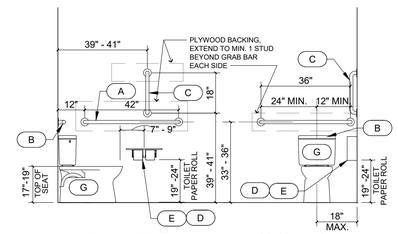
NOTE:
FLUSH CONTROLS SHALL BE AUTOMATIC OR HAND OPERATED AND LOCATED ON OPEN SIDE OF WATER CLOSET. HAND OPERATED FLUSH CONTROLS SHALL COMPLY WITH ANSI SECTION 309.



ACCESSIBLE LAVATORY SIDE ELEVATION

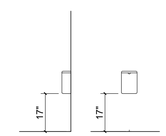


ACCESSIBLE MIRROR ELEVATION



ACCESSIBLE TOILET SIDE ELEVATION

ACCESSIBLE TOILET FRONT ELEVATION



SANITARY NAPKIN DISPOSAL

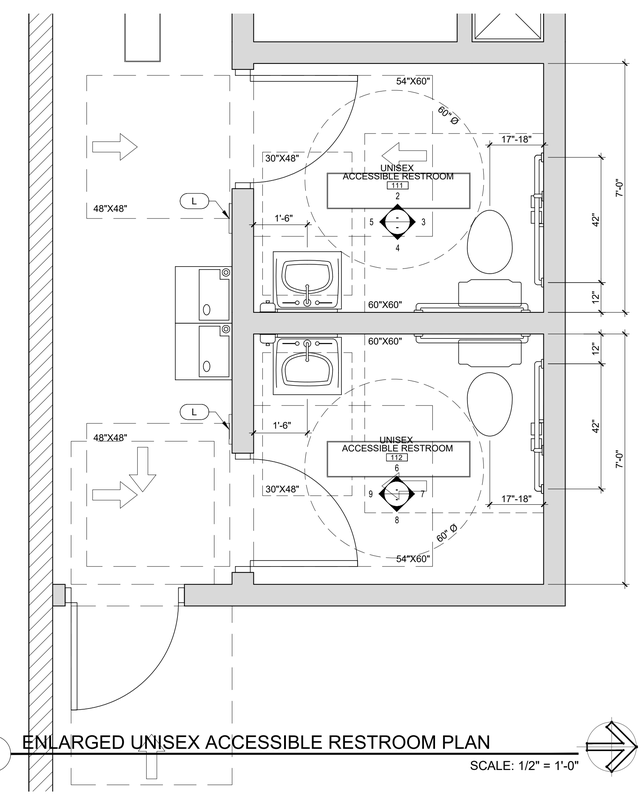
GENERAL NOTES

A. SEE FINISH SCHEDULE SHEET A1.3 FOR FINISHES
B. SEE PLUMBING PLANS FOR ADDITIONAL FIXTURE INFORMATION.

ACCESSORY FIXTURES

NOTE: NOT ALL FIXTURES USED (X-X)

KEY	DESCRIPTION	MANUFACTURER	MODEL #	FINISH	MOUNTING
A	42" GRAB BAR	BOBRICK	B-5806	STAINLESS STEEL	SURFACE
B	36" GRAB BAR	BOBRICK	B-5806	STAINLESS STEEL	SURFACE
C	18" VERTICAL GRAB BAR	BOBRICK	B-6806	STAINLESS STEEL	SURFACE
D	TOILET TISSUE DISPENSER (HC)	BOBRICK	B-2840	STAINLESS STEEL	SURFACE
E	SANITARY NAPKIN DISPOSAL	BOBRICK	B-270	STAINLESS STEEL	SURFACE
F	FRAME MIRROR 30"X36"	BRADLEY	780-3036	CLEAR	SURFACE
G	TOILET	-	-	-	-
H	SINK	-	-	-	-
I	SOAP DISPENSER	-	-	-	-
J	PAPER TOWEL DISPENSER	-	-	-	-
K	TOILET SEAT COVER DISPENSER	-	-	-	-
L	ADA SIGN - WALL MOUNTED	-	-	-	-



1 ENLARGED UNISEX ACCESSIBLE RESTROOM PLAN
SCALE: 1/2" = 1'-0"

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FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260
TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
ENLARGED UNISEX ACCESSIBLE RESTROOM

DATE
8-19-22
PROJECT NO.
20-200

A4.5

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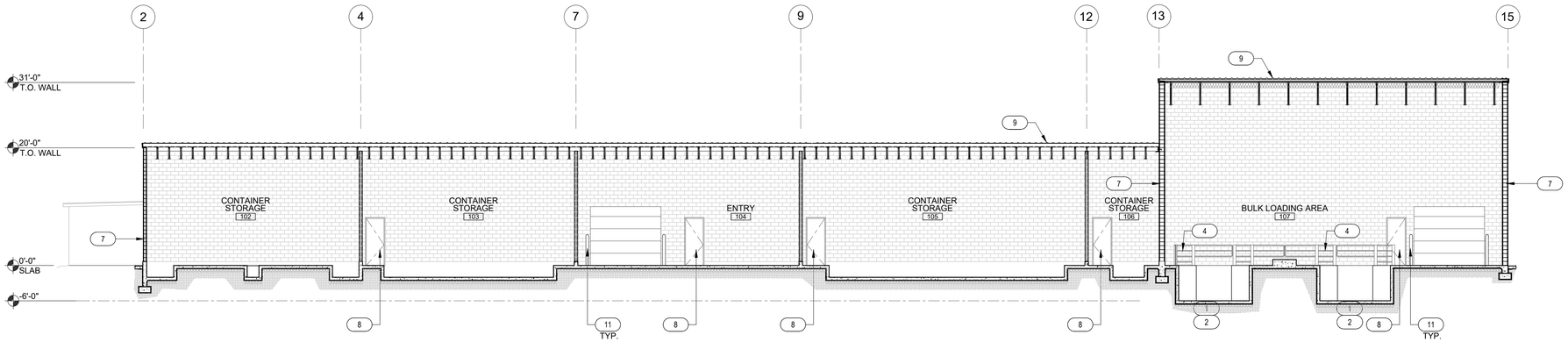
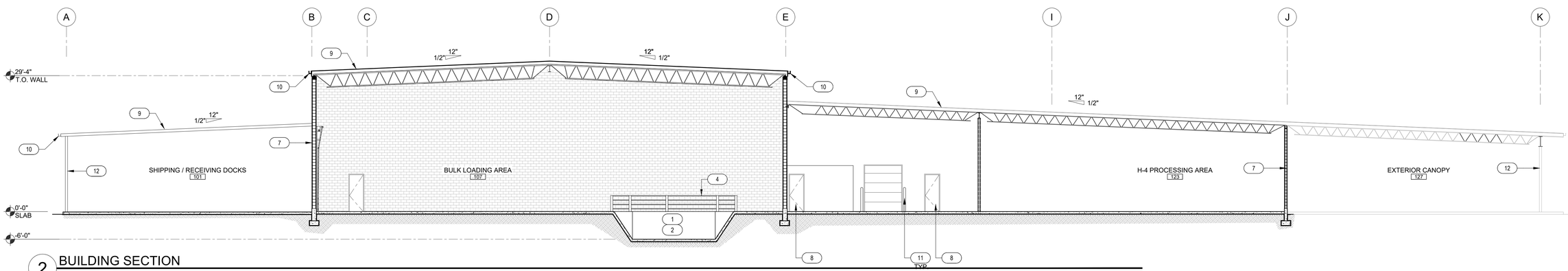


3 BUILDING SECTION

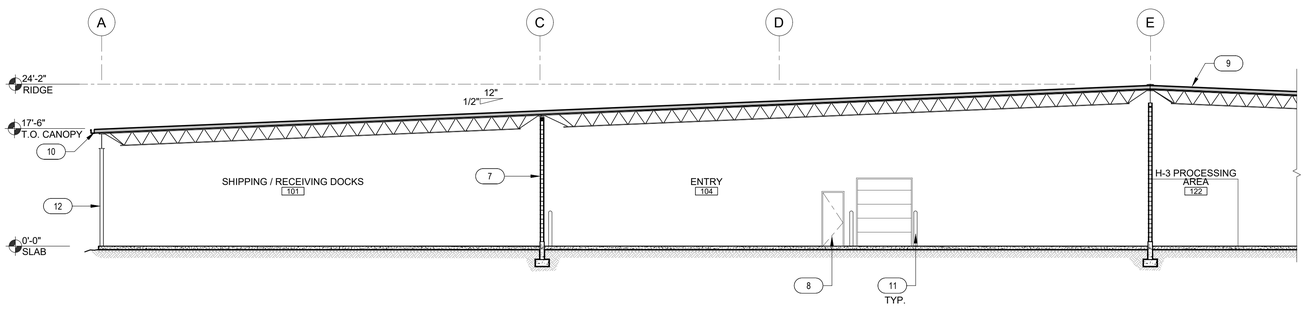
SCALE: 3/32" = 1'-0"

20. PATIO FENCE



2 BUILDING SECTION

SCALE: 3/32" = 1'-0"



1 BUILDING SECTION

SCALE: 3/32" = 1'-0"

GENERAL NOTES

A. ALL GUARDRAILS & ACCESS GATES PAINTED SW 7069 - IRON ORE
B. ALL HOLLOW METAL DOORS & FRAMES PAINTED SW 7069 - IRON ORE
C. ALL STEEL COLUMNS & STEEL ROOF FRAMING PAINTED SW 7069 - IRON ORE
D. ALL ROOF GUTTER & DOWNSPOUT - TO MATCH CMU

ENERGY

*BUILDING IS NOT A CONDITIONED SPACE
ENERGY ZONE 2

ROOF, INSULATION ABOVE DECK	R-25
WALLS, MASS	
UNHEATED SLAB	
FIXED FENESTRATION	U.5
ENTRANCE DOOR	0.83

KEYNOTES

X

1. 8'-0" DEEP SEALED CONCRETE PIT
2. WELDED 1/2" STEEL PLATE PIT LINER
3. RAISED CONCRETE TRACK-HOE GUIDE
4. 42" HIGH GUARDRAIL AND ACCESS GATES @ PERIMETER OF PIT
5. NOT USED
6. CENTER SUPPORT STEEL COLUMN
7. CMU WALL
8. HOLLOW METAL DOOR & FRAME, PAINT
9. 26 GA STANDING SEAM METAL ROOF - SEE STRUCTURAL DWG'S
10. 10" METAL GUTTER - SEE METAL BUILDING DWG'S
11. 6" STEEL BOLLARD, PAINT
12. STEEL COLUMN - SEE METAL BUILDING DRAWINGS
13. 3 5/8" 20 GA. MTL. STUDS @ 16" O.C. WITH BATT. INSUL.
14. STEEL BEAMS - SEE STRUCTURAL DWG'S

G.S.S. Companies Inc.
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TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
HAZARDOUS BUILDING SECTIONS

DATE
8-19-22
PROJECT NO.
20-200

A5.0

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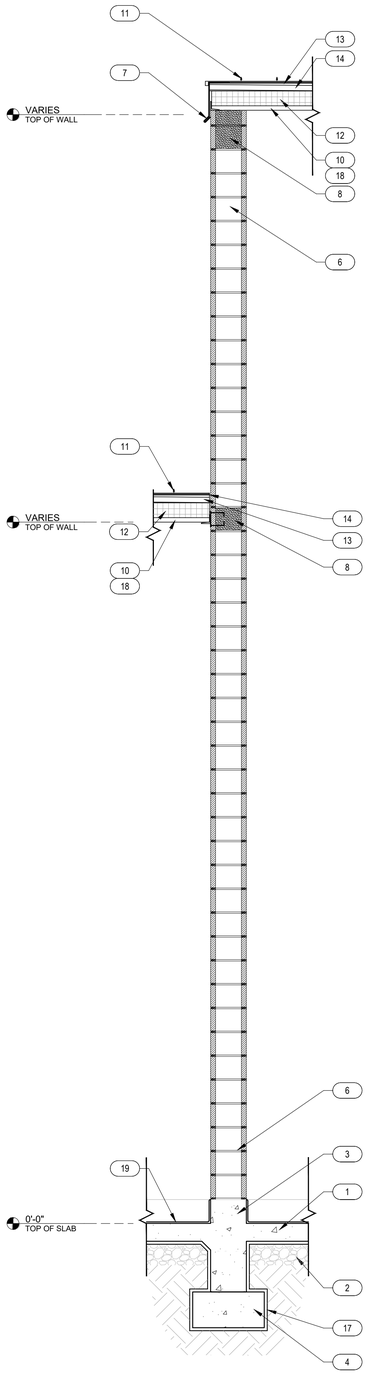
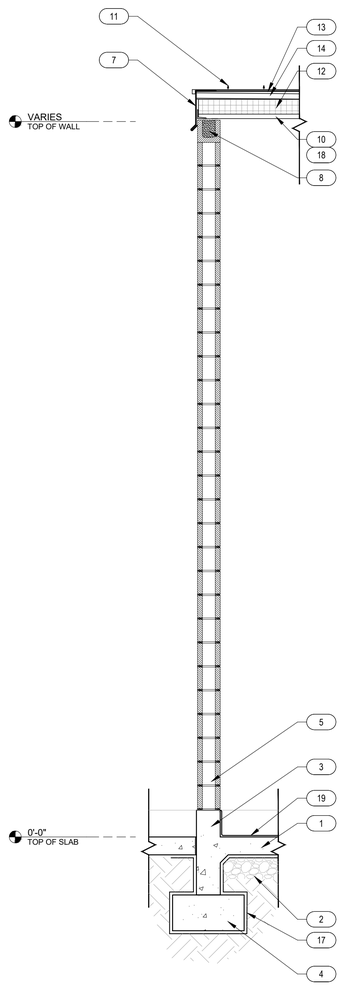
KEYNOTES

X

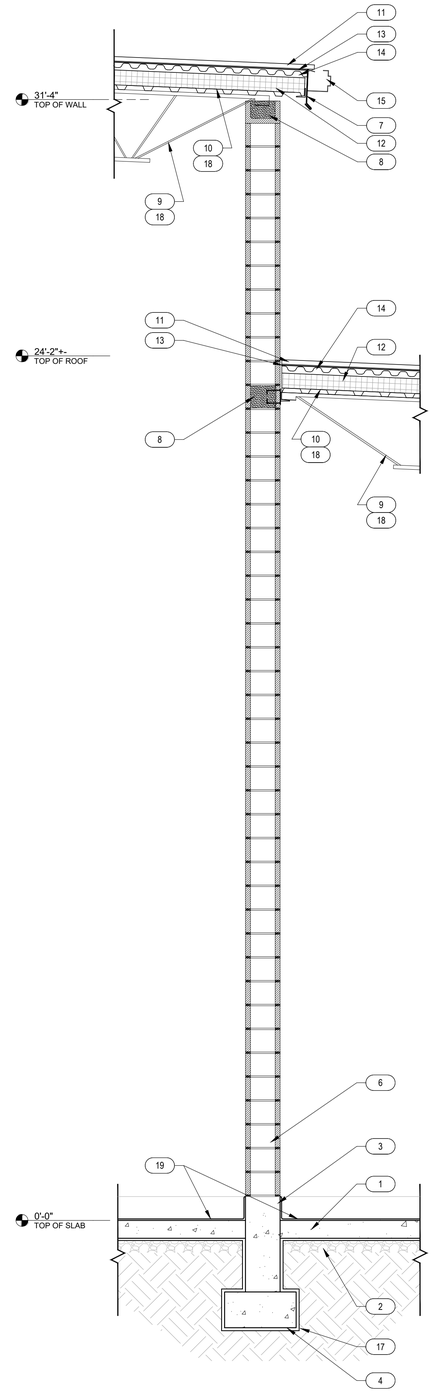
1. CAST IN PLACE CONCRETE SLAB - SEE STRUCTURAL
2. THICK AGGREGATE BASED COURSE, SEE STRUCTURAL
3. CONCRETE CONTAINMENT CURB, SEE STRUCTURAL
4. CONCRETE FOOTING, SEE STRUCTURAL
5. 8"X8"X16" CONCRETE MASONRY UNIT
6. 12"X8"X16" CONCRETE MASONRY UNIT
7. CONTINUOUS FASCIA - SEE DETAIL 2/1A6.0
8. CONTINUOUS GROUTED BOND BEAM - SEE STRUCTURAL
9. STEEL JOIST, SEE STRUCTURAL
10. METAL DECK, SEE STRUCTURAL
11. STANDING SEAM METAL ROOF PANEL
12. MINERAL OR FIBER BOARD INSULATION, SEE BUILDING SECTION
13. ICE AND WATER BARRIER
14. 24 GA CORRUGATED SHEATHING
15. 10" GALVANIZED METAL GUTTER, SEE DETAIL 3/A6.0
16. 6X10 GALVANIZED METAL DOWNSPOUT W/ BRACKET ATTACHMENT
17. 20 MIL VAPOR BARRIER, SEE BUILDING SECTIONS
18. SPRAY ON CEMENTATION MIXTURE
19. FINISH FLOOR, SEE FINISH LEGEND



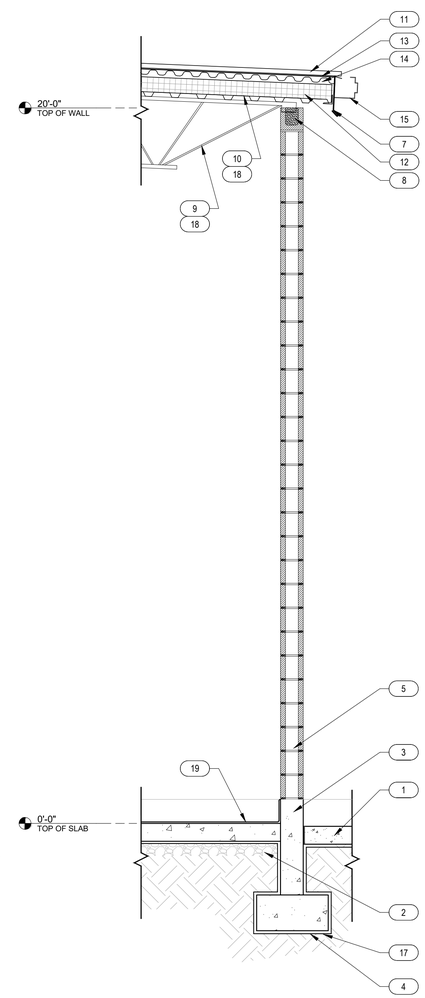
4 WALL SECTION
SCALE: 1/2" = 1'-0"



3 WALL SECTION
SCALE: 1/2" = 1'-0"



2 WALL SECTION
SCALE: 1/2" = 1'-0"



1 WALL SECTION
SCALE: 1/2" = 1'-0"

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TRIUMVIRATE ENVIRONMENTAL

INTEGRATED
WASTE
MANAGEMENT
FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
HAZARDOUS
BUILDING
WALL SECTIONS

DATE
8-19-22
PROJECT NO.
20-200

A5.1

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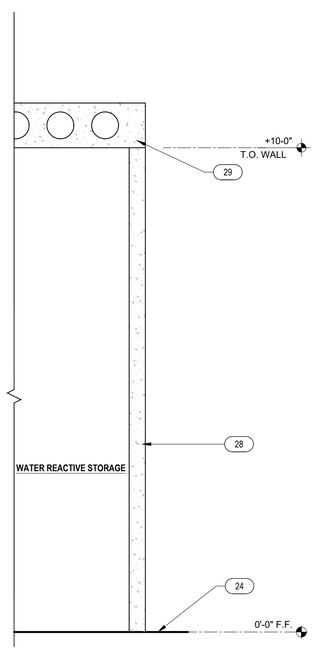
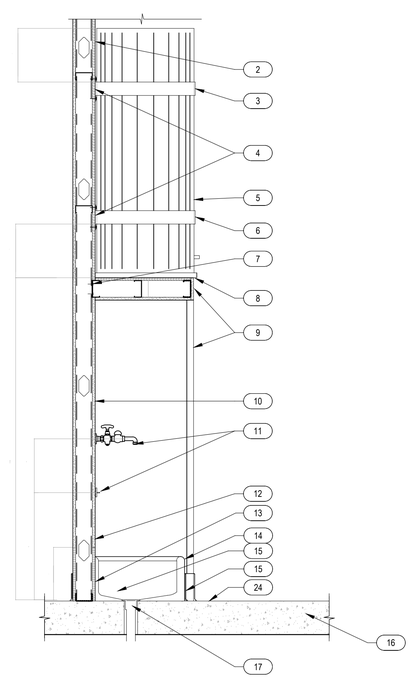
KEYNOTES

X

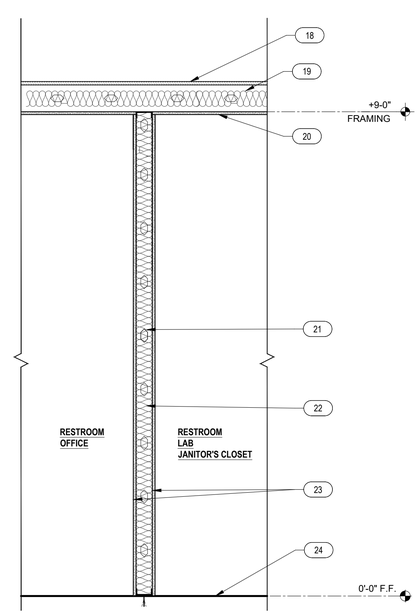
1. NOT USED
2. SCHEDULED (FRP-1) OVER 5/8" MARINE GRADE FRT PLYWOOD OVER METAL STUD FRAMING PER WALL LEGEND
3. 20 GA. X 3" WIDE STRAP TIE WITH (2) #10 SCREWS INTO STEEL STUD / BLOCKING
4. 20 GA. STEEL STUD BLOCKING WITH (2) #10 SCREWS AT EACH END
5. NEW SCHEDULED WATER HEATER WITH S/S DRIP PAN & DRAIN TO BELOW SINK, REFER TO PLUMBING DRAWINGS FOR ADDITIONAL INFO.
6. 20 GA. X 3" WIDE STRAP TIE WITH (2) #10 SCREWS INTO STEEL STUD / BLOCKING
7. (2) #10 SCREWS AT EACH STUD
8. SCHEDULED FRP OVER 3/4" MARINE GRADE FRP PLYWOOD OVER 6" STEEL STUD FRAMING
9. S/S CORNER GUARDS
10. SCHEDULED FRP WALL PANLES OVER 5/8" TYPE "X" M.R. GYP. BOARD
11. FAUCET AND HOSE CLIP, REFER TO FS DRAWINGS
12. 5/8" COMPETITIONS BOARD 12" HIGH WITH 5/8" TYPE 'X' M.R. GYP. BOARD ABOVE, OVER METAL STUD FRAMING
13. INSTALL WATERPROOFING BELOW ENTIRE MOP SINK AREA AND EXTEND UP PERIMETER OF WALLS 8" MIN.
14. MOP SINK WITH S/S COUNTER-FLASHING ON ALL FOUR SIDES OF SILL
15. RUBBER COVE BASE
16. (E) CONCRETE SLAB
17. CENTER DRAIN. REFER TO PLUMBING DRAWINGS.
18. 3/4" FIRE RATED PLYWOOD SHEATHING
19. 6" 20 GA. METAL STUD JOISTS
20. GYP. BD. CEILING P-1
21. R-21 MINERAL WOOL BATT INSULATION
22. 6" X20 GA. METAL STUDS AT 16" O.C.
23. 5/8" TYPE 'X' GYP. BD. EACH SIDE. M.R. BD. IN WET AREAS
24. CONCRETE SLAB
25. 6" RIM JOIST
26. NUCOR LINER PANEL EXTERIOR SIDE
27. CMU BLOCK
28. CONCRETE WALL, SEE STRUCTURAL
29. PRE-CAST CONCRETE SLAB, SEE STRUCTURAL



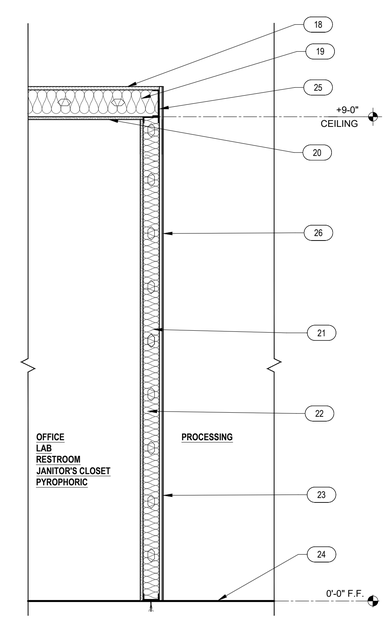
5 SECTION @WATER HEATER
SCALE: 3/4" = 1'-0"



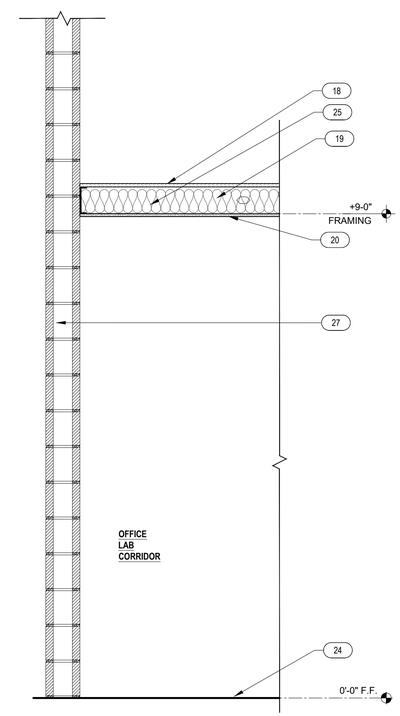
4 SECTION @WATER HEATER
SCALE: 3/4" = 1'-0"



3 WALL SECTION - TYPE 'D'
SCALE: 3/4" = 1'-0"



2 WALL SECTION - TYPE 'B'
SCALE: 3/4" = 1'-0"



1 WALL SECTION - TYPE 'C'
SCALE: 3/4" = 1'-0"

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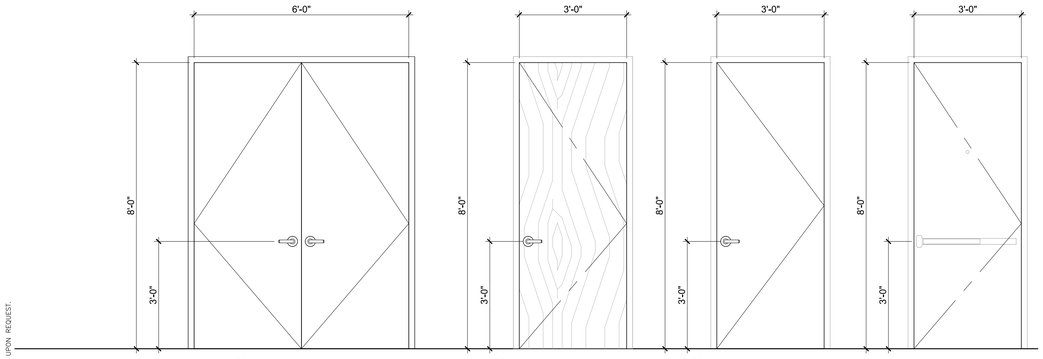
20-200

A5.2

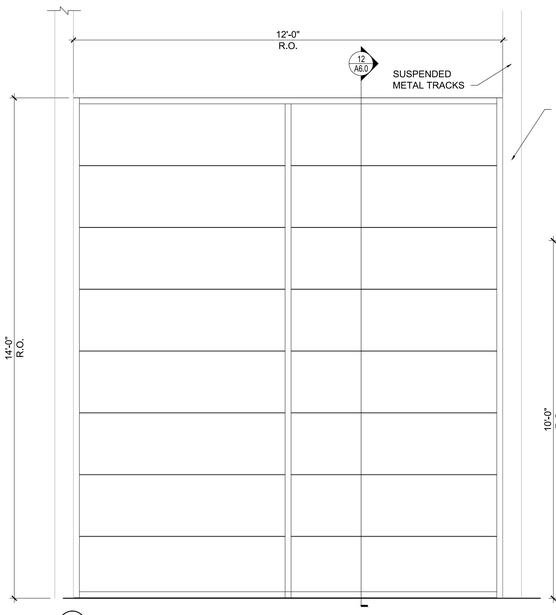


D HOLLOW METAL DOOR EXTERIOR

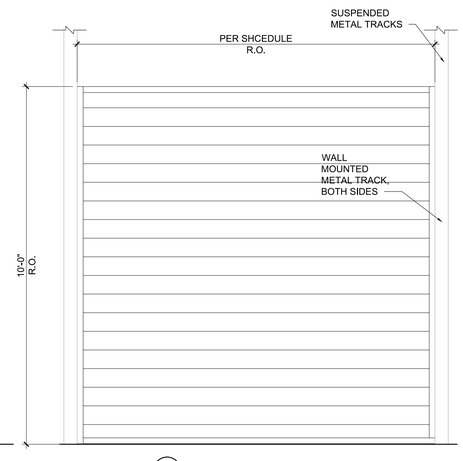
C HOLLOW METAL DOOR

B HOLLOW METAL DOOR

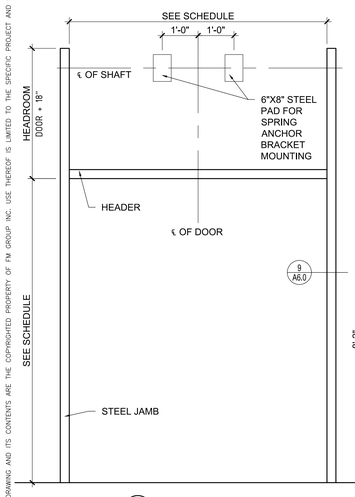
A HOLLOW METAL DOOR



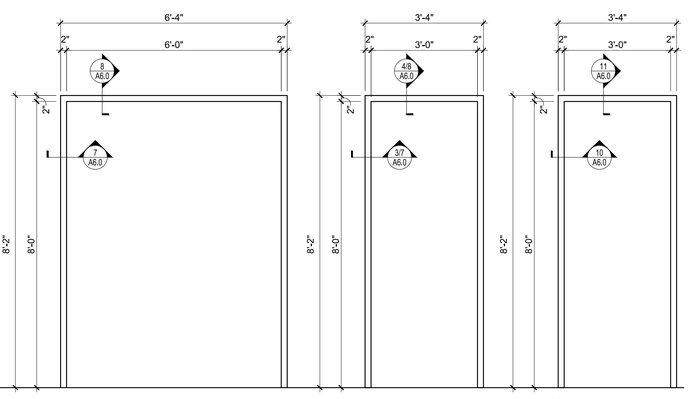
G STEEL SECTIONAL OVERHEAD DOOR



H ROLLING FIRE-RATED OVERHEAD DOOR



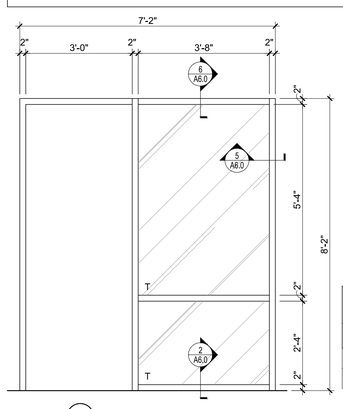
MF5 OVERHEAD DOOR FRAME



MF4 ALUMINUM FRAME

MF3 HOLLOW METAL FRAME

MF2 ALUMINUM FRAME



AA ALUMINUM FRAME & SIDE LITE

DOOR AND FRAME SCHEDULE

NO.	DOOR TYPE	DOOR SIZE WIDTH	DOOR SIZE HEIGTH	DOOR MATERIAL	FRAME TYPE	FRAME MATERIAL	HARDWARE LOCKSET	HARDWARE HINGES	HARDWARE CLOSER	ACCESSORIES	REMARKS	FIRE RATING
D10	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D11	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D12	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D13	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D14	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D15	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D16	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D17	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D18	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D19	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D20	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D21	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	SW	2, 3, 4, 8	-
D22	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D23	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D24	A	3'-0"	8'-0"	HM	MF3	HM	LS1	H1	SC1	-	2, 3, 4, 8	-
D25	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D26	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D27	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D28	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D29	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D30	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D31	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D32	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	SW	3, 4, 10	45 MIN
D33	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D34	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D35	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D36	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D37	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D38	A	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3, 4, 10	45 MIN
D39	B	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3	-
D40	B	3'-0"	8'-0"	HM	MF3	HM	-	H1	SC1	-	3	-
D41	B	3'-0"	8'-0"	HM	MF3	HM	LS3	H1	SC1	FS	1, 3	-
D42	B	3'-0"	8'-0"	HM	MF3	HM	LS3	H1	SC1	FS	1, 3	-
D43	B	3'-0"	8'-0"	HM	MF3	HM	-	H1	-	-	3	-
D44	C	3'-0"	8'-0"	SC	MF2	AL	LS1	H1	-	FS	3, 5	-
D45	C	3'-0"	8'-0"	SC	MF2	AL	LS1	H1	-	FS	3, 5	-
D46	D	(2)3'-0"	8'-0"	HM	MF4	HM	-	H1	-	AST, FB	3	-
D47	G	12'-0"	14'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	2, 6, 9, 11	-
D48	G	12'-0"	14'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	2, 6, 9, 11	-
D49	G	12'-0"	14'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	2, 6, 9, 11	-
D50	G	12'-0"	14'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	2, 6, 9	-
D51	G	12'-0"	14'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	2, 6, 9	-
D52	G	12'-0"	14'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	2, 6, 9	-
D53	G	12'-0"	14'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	2, 6, 9	-
D54	G	12'-0"	14'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	6, 7, 11	45 MIN
D55	G	12'-0"	14'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	6, 7, 11	45 MIN
D56	H	8'-0"	10'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	6, 7, 11	45 MIN
D57	H	8'-0"	10'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	6, 7, 11	45 MIN
D58	H	8'-0"	10'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	6, 7, 11	45 MIN
D59	H	8'-0"	10'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	6, 7, 11	45 MIN
D60	H	8'-0"	10'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	6, 7, 11	45 MIN
D61	H	8'-0"	10'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	6, 7, 11	45 MIN
D62	H	8'-0"	10'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	6, 7, 11	45 MIN
D63	H	8'-0"	10'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	6, 7, 11	45 MIN
D64	H	10'-0"	10'-0"	STEEL	MF5	STEEL	-	-	-	PER MANUFACTURER	6, 7, 11	45 MIN

REMARKS

1. A.D.A. SIGNAGE REQUIRED, REFER TO 8/CS-05
2. WEATHERSTRIPPING
3. ALL DOORS SHALL HAVE 4 BUTT HINGES U.N.O.
4. PANIC HARDWARE WITH CRASHBAR
5. DOOR IS COMPONENT OF STOREFRONT SYSTEM
6. FRAME IS TRACK COMPONENT OF OVERHEAD DOOR
7. FUSEABLE LINK
8. ENERGY REQUIREMENT: EXTERIOR HOLLOW METAL - 18 GA., INSULATED U 0.61 RATING
9. ENERGY REQUIREMENT: STEEL SECTIONAL OVERHEAD DOOR - INSULATED R 4.75 MIN.
10. ADA THRESHOLD
11. GARAGE DOOR THRESHOLD

ABBREVIATIONS

AL	DARK BRONZE ALUMINUM
GL	GLASS
T	TEMPERED GLASS
SC	SOLID CORE WOOD DOOR
HM	HOLLOW METAL
ALUM	ALUMINUM

DOOR AND FRAME LEGEND

DOOR		
MATERIAL	SC	SOLID CORE WOOD
	HM	HOLLOW METAL
	AL	ALUMINUM STOREFRONT
FRAME		
MATERIAL	AL	ALUMINUM
	HM	HOLLOW METAL
HARDWARE		
LOCKSET	LS1	SCHLAGE: AL50PD-626 "SATURN-SATIN CHROMIUM PLATED" (ENTRANCE/OFFICE LOCK)
	LS2	SCHLAGE: AL80PD-626 "SATURN-SATIN CHROMIUM PLATED" (STOREROOM LOCK)
	LS3	SCHLAGE: AL40S-626 "SATURN-SATIN CHROMIUM PLATED" (BATH/BEDROOM PRIVACY LOCK)
	LS4	SCHLAGE: AL10S-626 "SATURN-SATIN CHROMIUM PLATED" (PASSAGE LOCK)
	LS5	ADAMS RITE: 8310 SERIES MORTISE EXIT DEVICE (CLEAR ANODIZED FINISH)
	LS6	ADAMS RITE: 8420 SERIES MORTISE EXIT DEVICE (DARK BRONZE ANODIZED FINISH)
HINGES	H1	BB OR HAGER: (1) SET OF (3) HINGES - BALL BEARING - 3 1/2" x 3 1/2" - STANDARD WEIGHT, FULL MORTISE, SQUARE CORNER - US26D (DULL CHROMIUM) - NON REMOVABLE PINS
	H2	PBB: (1) SET OF (3) HINGES - PLAIN BEARING - 3 1/2" x 3 1/2" STANDARD WEIGHT, FULL MORTISE, SQUARE CORNER - US26D (DULL CHROMIUM) - NON REMOVABLE PINS
	H3	PBB: (1) SET OF (3) HINGES - PLAIN BEARING - 4 1/2" x 4" STANDARD WEGHT, FULL MORTISE, SQUARE CORNER - US10D (BRONZE SATIN) - NON REMOVABLE PINS
CLOSER	SC1	LCN: 4040 SERIES SELF-CLOSER - 610 (SATIN BRONZE FINISH)
ACCESSORIES		
	FS	IVES: DOME FLOOR STOP FS13 - US26D (SATIN CHROMIUM FINISH)/HAGER: DOME STOP 242F-US26D OR EQUAL
	KP	IVES: KICK PLATE 8400 SERIES - 8"H x 34"W B3E - S32D (STAINLESS STEEL)
	THR	PEMKO: 171 SADDLE THRESHOLD - 5" WIDE x 1/2" HIGH
	AST	PEMKO: 335_S "T" ASTRAGAL WITH SILICONE INSERT
	FB	IVES: FB31P AUTOMATIC FLUSH BOLT PAIR FOR METAL DOORS
	SW	PEMKO: 411APKL36 AUTOMATIC DOOR BOTTOM, 36" DOOR

WINDOW SCHEDULE

WIN #	KEY	LOCATION	SIZE W x H	GLASS THICK	GLASS TYPE	FRAME	FINISH	REMARKS
W10	AA	LAB	4'-0"X8'-2	1"	TEMPERED	AL	DK-BZ	-
W11	AA	OFFICE	4'-0"X8'-2	1"	TEMPERED	AL	DK-BZ	-

GENERAL NOTES

A. ALL DOOR HANDLES TO BE LEVER TYPE PER STATE AND LOCAL ACCESSIBILITY REQUIREMENTS. EGRESS DOORS SHALL BE READILY OPENABLE FROM THE EGRESS SIDE WITHOUT THE USE OF A KEY OR ANY SPECIAL KNOWLEDGE OR EFFORT.

B. DOOR CLOSERS SHALL BE ADJUSTED SO THAT FROM AN OPEN POSITION OF 90 DEGREES, THE TIME REQUIRED TO MOVE THE DOOR TO AN OPEN POSITION OF 12 DEGREES WILL BE 5 SECONDS MINIMUM.

C. ANSI 404.2.8 DOOR–OPENING FORCE. FIRE DOORS SHALL HAVE THE MINIMUM OPENING FORCE ALLOWABLE BY THE APPROPRIATE ADMINISTRATIVE AUTHORITY. THE FORCE FOR PUSHING OR PULLING OPEN DOORS OTHER THAN FIRE DOORS SHALL BE AS FOLLOWS:
1. INTERIOR HINGED DOOR: 5.0 POUNDS (22.2 N) MAXIMUM
2. SLIDING OR FOLDING DOOR: 5.0 POUNDS (22.2 N) MAXIMUM

THESE FORCES DO NOT APPLY TO THE FORCE REQUIRED TO RETRACT LATCH BOLTS OR DISENGAGE OTHER DEVICES THAT HOLD THE DOOR IN A CLOSED POSITION.

D. MAIN EXIT DOOR (WITHOUT PANIC HARDWARE) TO HAVE DURABLE SIGNAGE ABOVE DOOR IN 1" HIGH LETTERS ON CONTRASTING BACKGROUND STATING: "THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED".

E. PANIC HARDWARE SHALL BE PROVIDED ON THE EXIT DOORS SERVING ROOMS, CORRIDORS, OR STAIRWAYS HANDLING AN OCCUPANT CAPACITY OF 50 OR MORE PERSONS, FROM GROUP A OCCUPANCY. ONLY PANIC HARDWARE APPROVED BY THE STATE FIRE MARSHALL SHALL BE INSTALLED.

I. LATCHING AND LOCKING DOORS THAT ARE HAND ACTIVATED AND WHICH ARE IN THE PATH OF TRAVEL SHALL BE OPERABLE WITH A SINGLE EFFORT BY LEVER TYPE HARDWARE, PANIC BARS, PUSH-PULL ACTIVATING BARS OR OTHER HARDWARE DESIGNED TO PROVIDE PASSAGE WITHOUT REQUIRING THE ABILITY TO GRASP THE OPENING HARDWARE. LOCKED EXIT DOORS SHALL OPERATE AS ABOVE IN EGRESS DIRECTION.

J. HAND-ACTIVATED DOOR OPENING HARDWARE TO BE CENTERED BETWEEN 30" AND 44" ABOVE THE FLOOR.

K. EVERY DOORWAY WHICH IS LOCATED WITHIN AN ACCESSIBLE PATH OF TRAVEL SHALL BE OF A SIZE AS TO PERMIT THE INSTALLATION OF A DOOR NOT LESS THAN 3'-0" IN WIDTH & NOT LESS THAN 6'-8" IN HEIGHT. WHEN INSTALLED, EXIT DOORS SHALL BE CAPABLE OF OPENING SO THAT THE CLEAR WIDTH OF THE EXIT IS NOT LESS THAT 32", MEASURED BETWEEN THE FACE OF THE DOOR AND THE OPPOSITE STOP.

L. MINIMUM MANEUVERING CLEARANCES AT DOORS SHALL BE AS SHOWN ON SHEET CS-05. THE FLOOR OR GROUND AREA WITHIN THE REQUIRED CLEARANCES SHALL BE LEVEL & CLEAR.

M. THERE SHALL BE A LEVEL AND CLR. FLR. OR LANDING ON EACH SIDE OF A DOOR. THE LEVEL AREA SHALL HAVE A LENGTH IN THE DIRECTION OF DOOR SWING OF AT LEAST 60" AND THE LENGTH OPPOSITE THE DIRECTION OF DOOR SWING OF 48" AS MEASURED AT RIGHT ANGLES TO THE PLANE OF THE WIDTH OF THE LEVEL AREA ON THE SIDE TO WHICH THE DOOR SWINGS SHALL EXTEND A MINIMUM OF 24" PAST THE STRIKE EDGE OF THE DOOR FOR EXT. DOORS AND A MINIMUM OF 18" PAST THE STRIKE EDGE FOR INTERIOR DOORS.

N. THE FLOOR OR LANDING SHALL BE NOT MORE THAN 1/2" LOWER THAN THE THRESHOLD OF THE DOORWAY.

O. DOORS SHALL NOT PROJECT MORE THAN 7" INTO THE REQUIRED CORRIDOR WIDTH WHEN FULLY OPENED OR MORE THAN ONE HALF INTO THE REQUIRED WIDTH WHEN IN ANY POSITION.

P. WHERE A PAIR OF DOORS IS UTILIZED, AT LEAST ONE OF THE DOORS SHALL PROVIDE A CLEAR, UNOBSTRUCTED OPENING WIDTH OF 32" WITH THE LEAF POSITIONED AT AN ANGLE OF 90° FROM ITS CLOSED POSITION.

Q. EXIT DOORS SHALL SWING IN THE DIRECTION OF EXIT TRAVEL.

G.S.S. Companies Inc.
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FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED
WASTE
MANAGEMENT
FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
DOOR & WINDOW SCHEDULE

DATE
8-19-22
PROJECT NO.
20-200

A6.0

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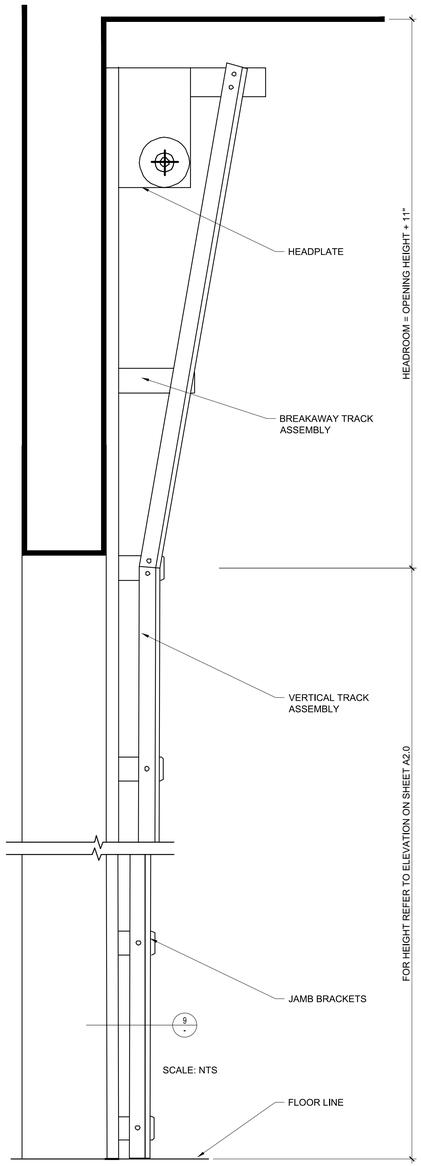
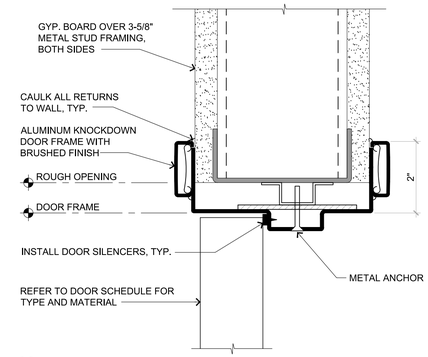
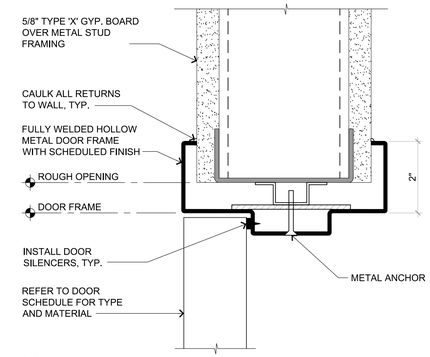


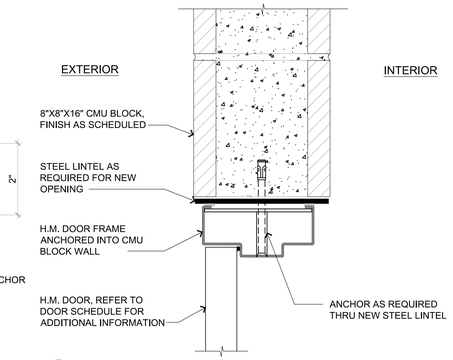
12 STEEL ROLL DOWN GATE SECTION
SCALE: N.T.S.



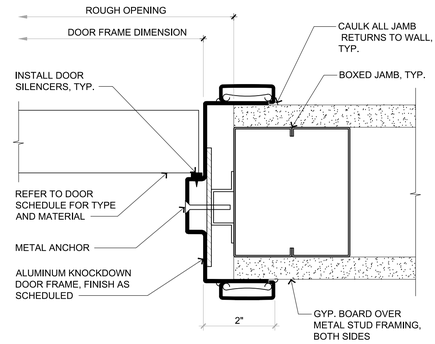
11 TYPICAL INTERIOR DOOR HEADER
SCALE: 6" = 1'-0"



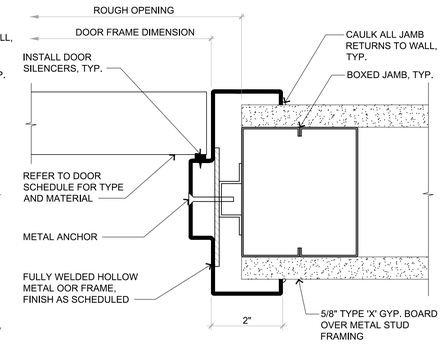
8 TYPICAL INTERIOR DOOR HEADER
SCALE: 6" = 1'-0"



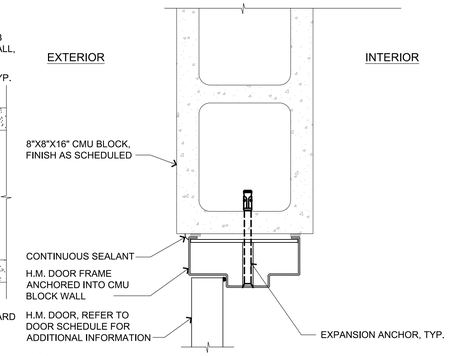
4 DOOR HEADER AT CMU WALL
SCALE: 3" = 1'-0"



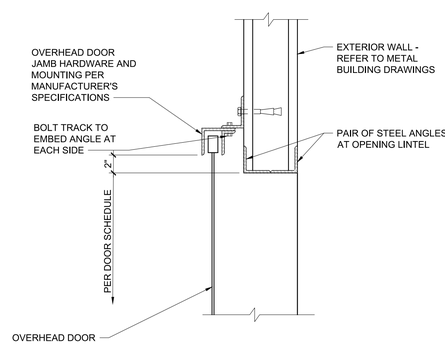
10 TYPICAL INTERIOR DOOR JAMB
SCALE: 6" = 1'-0"



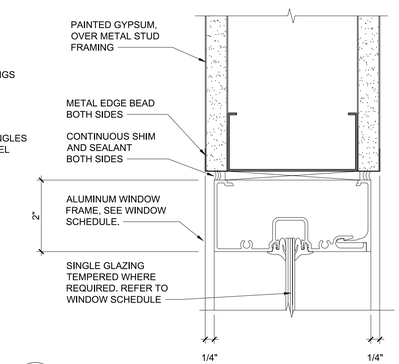
7 TYPICAL INTERIOR DOOR JAMB
SCALE: 6" = 1'-0"



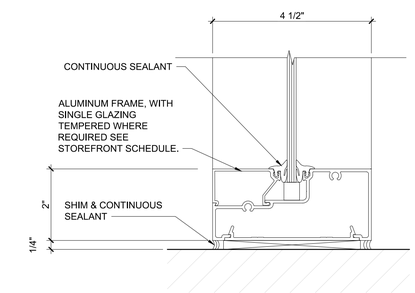
3 DOOR JAMB AT CMU WALL
SCALE: 3" = 1'-0"



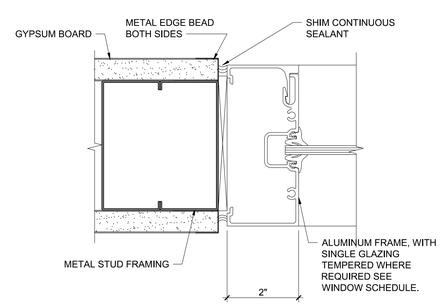
9 JAMB AT STEEL ROLL DOWN GATE
SCALE: 1-1/2" = 1'-0"



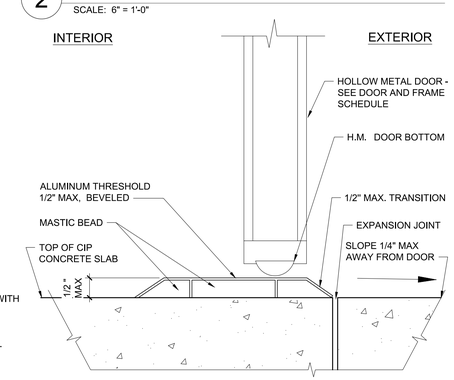
6 INTERIOR WINDOW HEADER - SECTION
SCALE: 6" = 1'-0"



2 INTERIOR WINDOW @ SILL - SECTION
SCALE: 6" = 1'-0"



5 INTERIOR WINDOW JAMB - PLAN
SCALE: 6" = 1'-0"



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

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INTEGRATED WASTE MANAGEMENT FACILITY

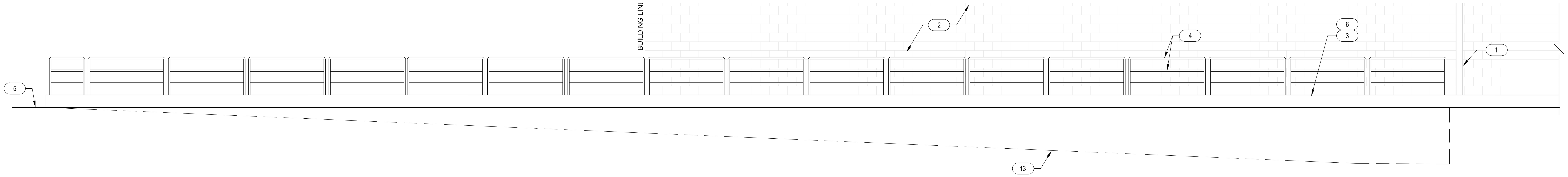
REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
DOOR AND WINDOW DETAILS

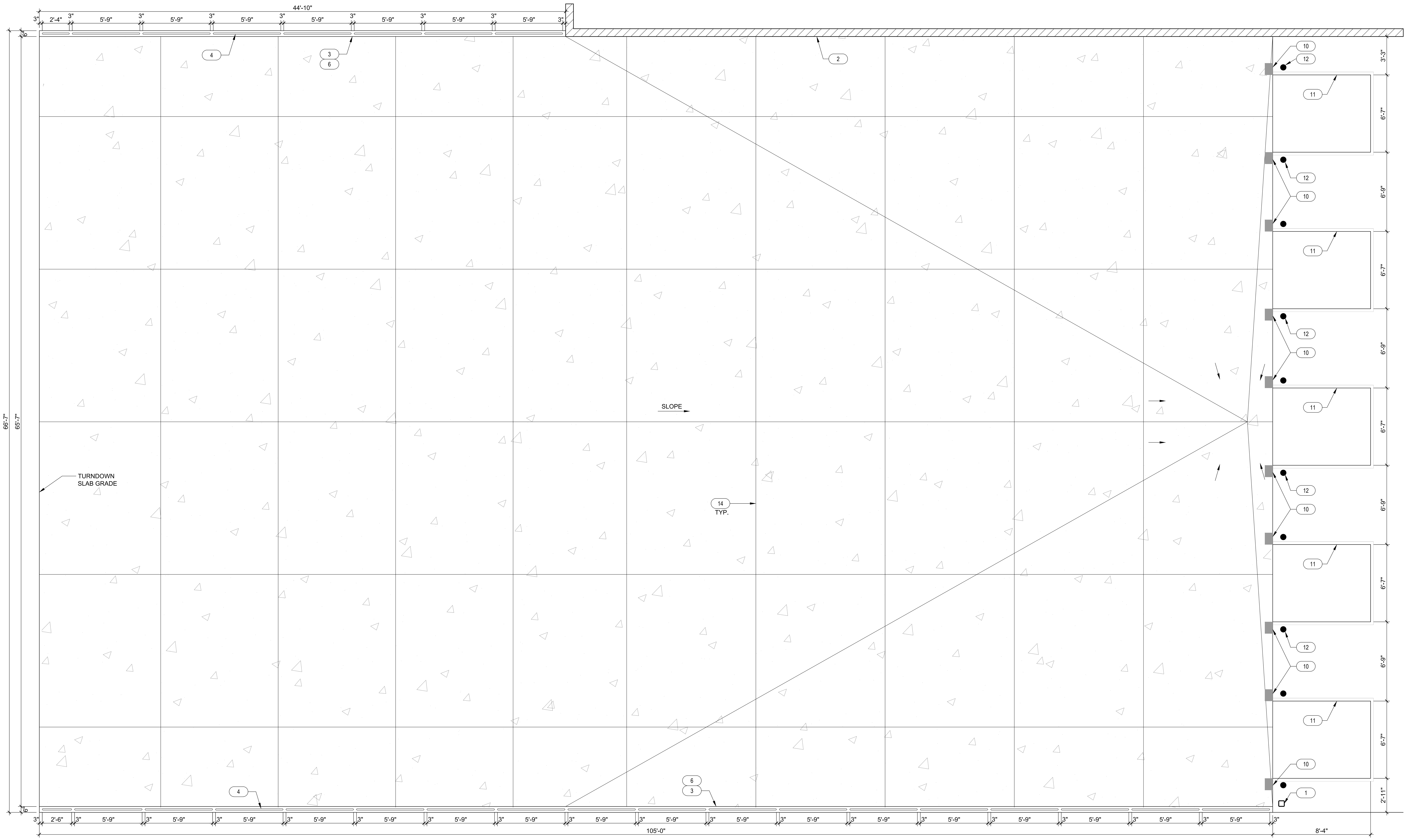
DATE
8-19-22
PROJECT NO.
20-200

A6.1



2 LOADING DOCK ELEVATION

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



1 LOADING DOCK FLOOR PLAN

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

KEYNOTES NOT ALL NOTES APPLIES TO THIS SHEET (X)

1. STEEL COLUMN.
2. CMU BLOCK BUILDING WALL.
3. CONCRETE CURB.
4. 1-1/2" METAL GUARD-RAIL PAINTED DARK BRONZE.
5. ASPHALT PAVEMENT IN FRONT - REFER TO CIVIL DWG'S.
6. CONCRETE RETAINING WALL - REFER TO STRUCTURAL DWG'S.
7. THICKENED CONCRETE SLAB - REFER TO STRUCTURAL DWG'S.
8. CATCH BASIN REFER TO CIVIL.
9. STEEL OVERHEAD DOOR - REFER TO DOOR SCHEDULE.
10. LOADING DOCK BUMPER.
11. EDGE OF LOADING DOCK PIT.
12. 36" HIGH STEEL PIPE BOLLARD, CONCRETE FILLED AND PAINTED.
13. THICKENED CONCRETE SLAB BEYOND - REFER TO STRUCTURAL DWG'S.
14. EXPANSION JOINTS.

G.S.S. Companies Inc.
"Building Arizona Since 1985"

FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
RECESSED LOADING DOCK

DATE
8-19-22
PROJECT NO.
20-200

A7.0

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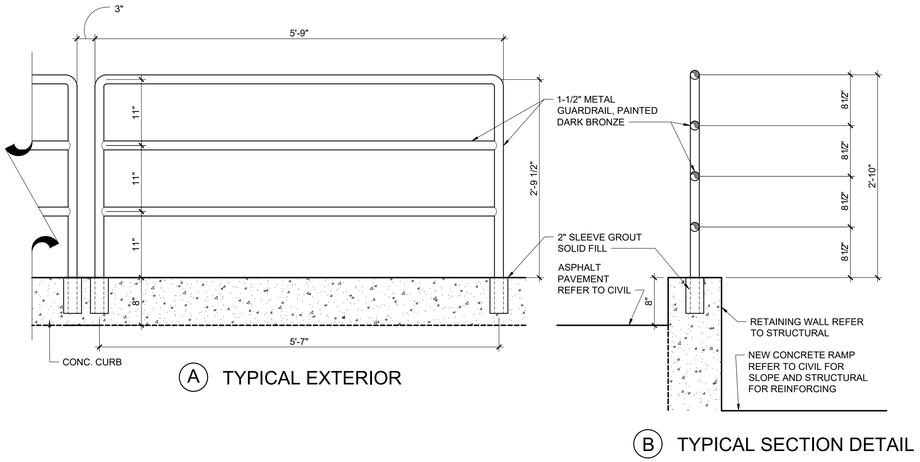
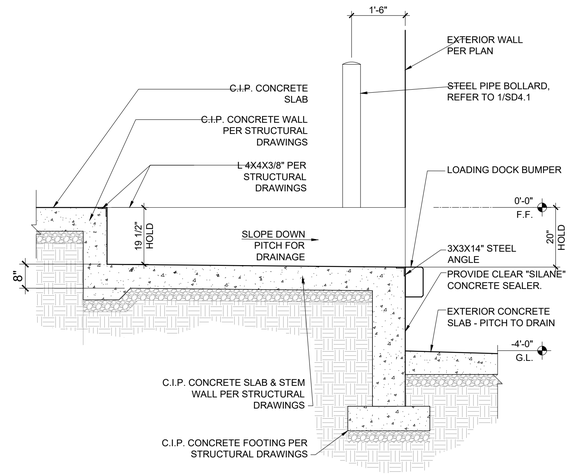


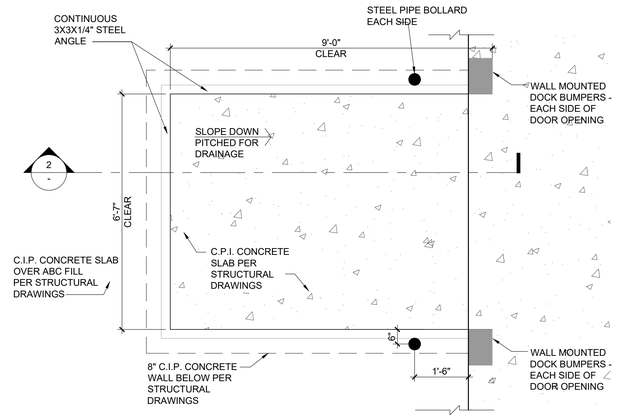
6 GUARDRAIL DETAIL (RECESSED LOADING DOCK)

SCALE: 1" = 1'-0"



5 LOADING DOCK SECTION

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

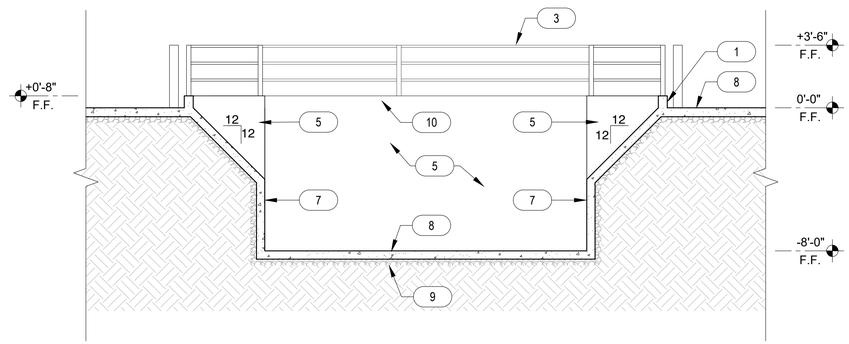


4 LOADING DOCK ENLARGED PLAN

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

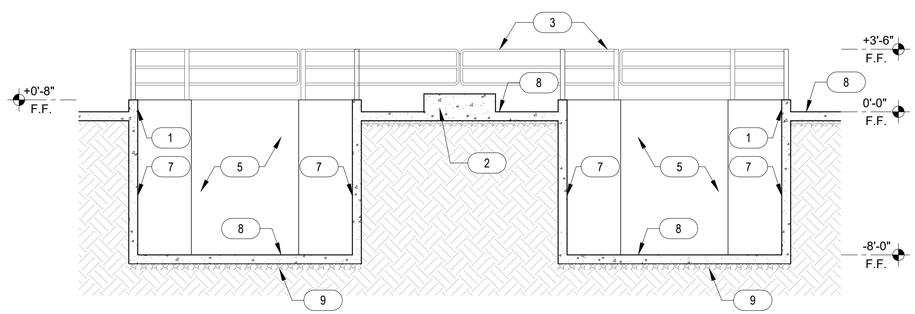
KEYNOTES NOT ALL NOTES APPLIES TO THIS SHEET X

1. CONCRETE CURB - SEE STRUCTURAL DWG'S
2. RAISED CONCRETE TRACK-HOE GUIDE
3. 42" HIGH GUARDRAIL AND ACCESS GATES @ PERIMETER OF PIT
4. 8'-0" DEEP SEALED CONCRETE PIT
5. WELDED 3/4" STEEL PLATE PIT LINER
6. 42" HIGH GUARDRAIL @ LOADING TUNNEL
7. CONCRETE WALL - SEE STRUCTURAL DRAWINGS
8. CONCRETE SLAB - SEE STRUCTURAL DRAWINGS
9. SUB-GRADE PER GEOTECH & STRUCTURAL REQUIREMENTS



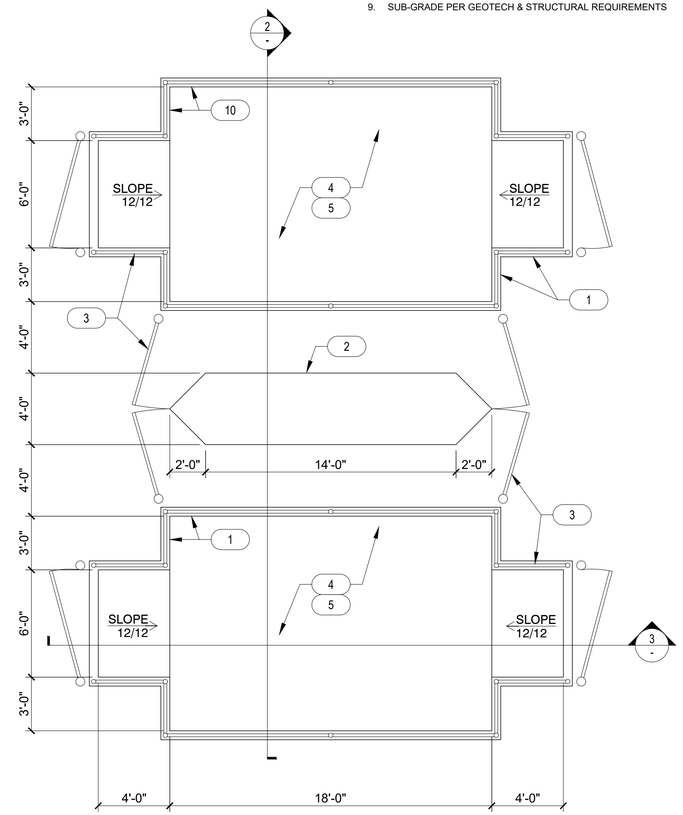
3 CONCRETE PIT SECTION

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



2 CONCRETE PIT SECTION

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



1 CONCRETE PIT FLOOR PLAN

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

G.S.S. Companies Inc.
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73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE

DOCK DETAILS

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8-19-22
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20-200

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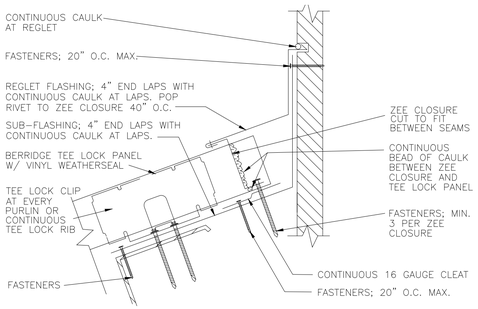
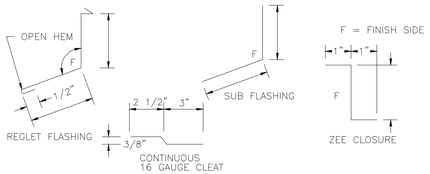
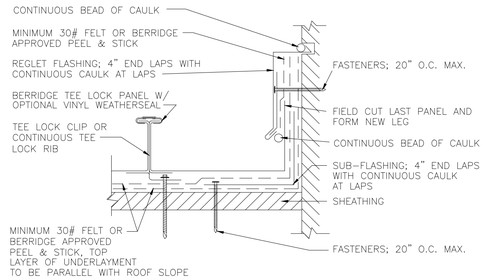


1. FIELD CUT ZEE CLOSURE TO FIT BETWEEN PANEL SEAMS
2. REFERENCE BERRIDGE'S WEB SITE FOR APPROVED UNDERLAYMENT AND CAULK TYPES CONSULT BERRIDGE MANUFACTURING'S ENGINEERING DEPARTMENT REGARDING FASTENER TYPE & CLIP SPACING (REFERENCE PAGE TLI-5 FOR MINIMUM FASTENER REQUIREMENTS)

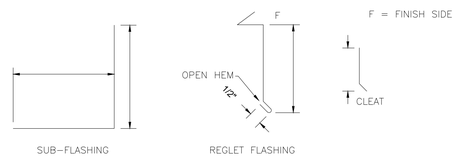


7 HEAD WALL

NOT TO SCALE

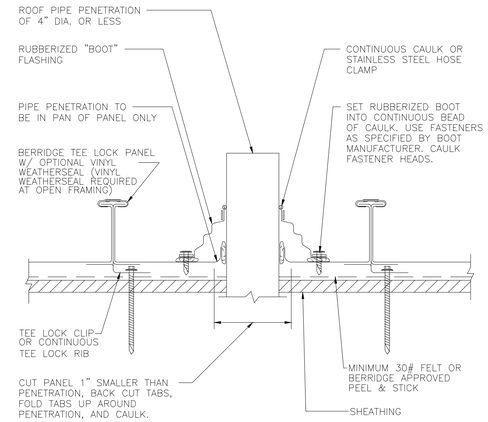


1. FIELD CUT AND FORM LAST PANEL INTO CLOSURE CHANNEL, PANEL MUST BE CONTINUOUS FROM RIDGE TO EAVE.
2. SOLID SHEATHING (BY OTHERS) TO MEET ENGINEERING AND ARCHITECTURAL SPECIFICATIONS IN STRENGTH FOR HOLDING POWER OF FASTENERS, MINIMUM REQUIREMENTS PAGE TLI-1.
3. REFERENCE BERRIDGE'S WEB SITE FOR APPROVED UNDERLAYMENT AND CAULK TYPES CONSULT BERRIDGE MANUFACTURING'S ENGINEERING DEPARTMENT REGARDING FASTENER TYPE & CLIP SPACING (REFERENCE PAGE TLI-5 FOR MINIMUM FASTENER REQUIREMENTS)



6 RAKE DETAIL

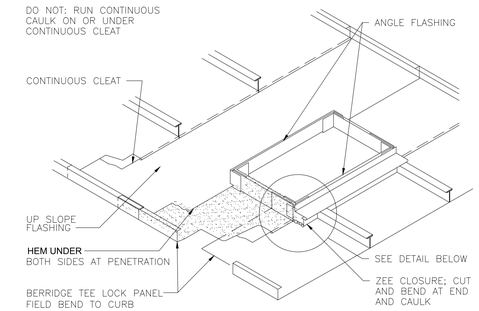
NOT TO SCALE



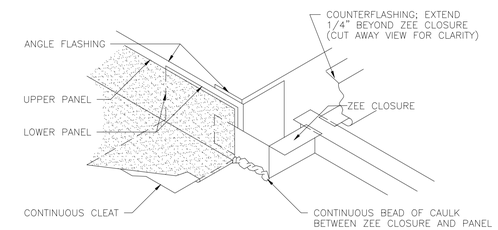
1. CUT HOLE TO ALLOW FOR THERMAL MOVEMENT IF PANELS ARE 30'-0" OR LONGER.
2. IF PIPE IS MADE OF METAL, IT MUST BE PAINTED TO PREVENT RUST RUN-OFF FROM STAINING PANELS.
3. POSITION SQUARE BASED BOOTS IN A DIAMOND ORIENTATION WHERE POSSIBLE TO AID IN DIVERTING WATER.

4 PIPE PENETRATION DETAIL

NOT TO SCALE

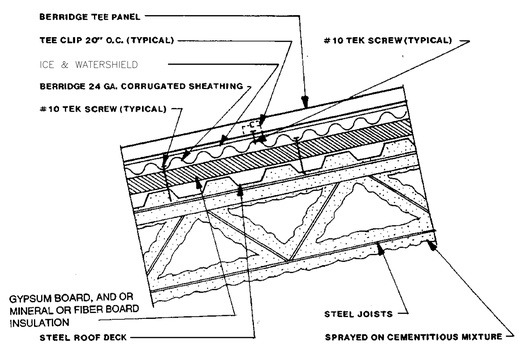


1. SOLID SHEATHING AND VINYL WEATHERSEAL IS REQUIRED AT THIS CONDITION WHEN THE TEE LOCK PANEL IS USED OVER OPEN FRAMING (ALSO SEE DETAIL TL-85).



2 MECHANICAL CURBING

NOT TO SCALE



STEEL JOISTS W/ SPRAYED-ON CEMENTITIOUS MIX:

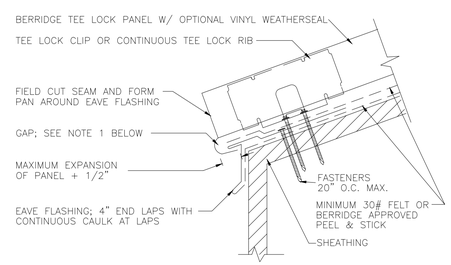
THIS ASSEMBLY QUALIFIES FOR U.L. DESIGN NO. P701, P711, P713, P715, P717, P814, P803, P819 AND P821 USING SPRAYED-ON FIBER IN LIEU OF CEMENTITIOUS MIXTURE

GENERAL NOTES:

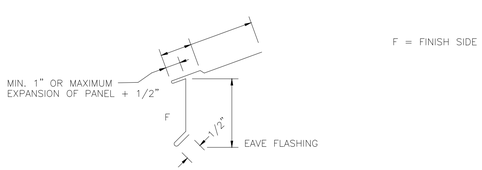
1. IN ORDER TO QUALIFY FOR A FIRE-RESISTANT RATING, THE ROOF SYSTEM CANNOT MAKE A PENETRATION IN THE INSULATION SYSTEM. THE TEE PANEL, IN ORDER TO MAKE A POSITIVE ATTACHMENT, MUST BE ATTACHED TO A CORRUGATED SUBSTRATE (IF THE INSULATION SYSTEM HAS NO NAILABLE SURFACE). THE CORRUGATED SUBSTRATE IS TO BE MOUNTED DIRECTLY TO THE INSULATION SYSTEM WITH FASTENERS FASTENED THROUGH INTO THE STRUCTURAL STEEL DECK.
2. ADDITIONAL INFORMATION REGARDING THESE ASSEMBLIES IS AVAILABLE IN THE U.L. FIRE RESISTANCE DIRECTORY.

7 TEE PANEL WITH STEEL JOISTS

NOT TO SCALE

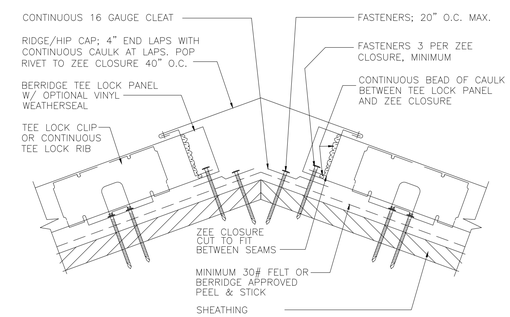


1. THE "GAP" BETWEEN EAVE FLASHING AND PANEL (SEE DETAIL ABOVE) CAN BE INCREASED TO ALLOW FOR LINEAR EXPANSION AND CONTRACTION OF PANELS. NOTE 1/2" OF PANEL PAN MUST BE ENGAGED WITH EAVE FLASHING WHEN PANEL HAS EXPANDED TO ITS MAXIMUM LENGTH REFER TO NOMINAL LINEAR EXPANSION CHART.
2. GAP BETWEEN EAVE FLASHING AND PANEL MUST BE ADJUSTED TO SUIT TEMPERATURE DURING INSTALLATION.
3. SOLID SHEATHING (BY OTHERS) TO MEET ENGINEERING AND ARCHITECTURAL SPECIFICATIONS IN STRENGTH FOR HOLDING POWER OF FASTENERS, MINIMUM REQUIREMENTS PAGE TLI-1.
4. REFERENCE BERRIDGE'S WEB SITE FOR APPROVED UNDERLAYMENT AND CAULK TYPES CONSULT BERRIDGE MANUFACTURING'S ENGINEERING DEPARTMENT REGARDING FASTENER TYPE & CLIP SPACING (REFERENCE PAGE TLI-5 FOR MINIMUM FASTENER REQUIREMENTS)



5 EAVE DETAIL

NOT TO SCALE



1. FIELD CUT ZEE CLOSURE TO FIT BETWEEN PANEL SEAMS
2. SOLID SHEATHING (BY OTHERS) TO MEET ENGINEERING AND ARCHITECTURAL SPECIFICATIONS IN STRENGTH FOR HOLDING POWER OF FASTENERS, MINIMUM REQUIREMENTS PAGE TLI-1.
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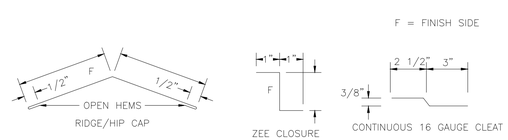
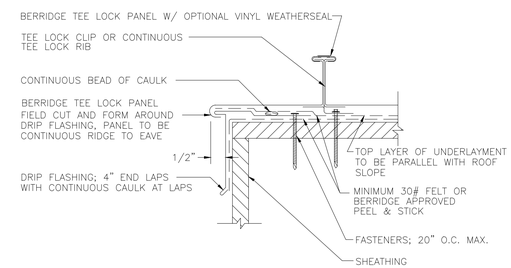


3 RIDGE DETAIL

NOT TO SCALE



1. FIELD CUT AND FORM LAST PANEL AROUND DRIP FLASHING. PANEL MUST BE CONTINUOUS FROM RIDGE TO EAVE.
2. SOLID SHEATHING (BY OTHERS) TO MEET ENGINEERING AND ARCHITECTURAL SPECIFICATIONS IN STRENGTH FOR HOLDING POWER OF FASTENERS, MINIMUM REQUIREMENTS PAGE TLI-1.
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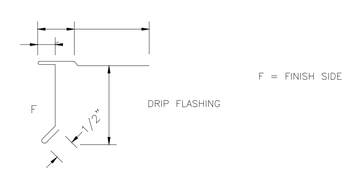

1 GABLE DETAIL

NOT TO SCALE

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G.S.S. Corporate Inc.
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FM GROUP INC
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SCOTTSDALE AZ 85260
TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

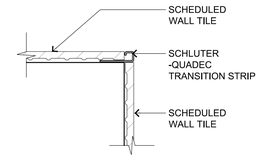
REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
ROOF DETAILS

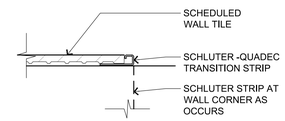
DATE
8-19-22
PROJECT NO.
20-200

A8.0



SCHLUTER-'QUADEC' TRANSITION STRIP		
TILE SIZE	QUADEC STRIP#	FINISH
1/4"	Q60E	S/S
5/16"	Q80E	S/S
3/8"	Q100E	S/S

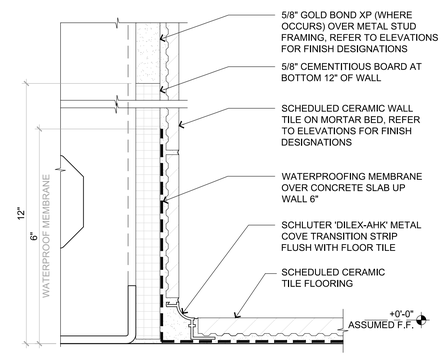
B **WALL TILE AT OUTSIDE CORNER**



A **WALL TILE TERMINATION**

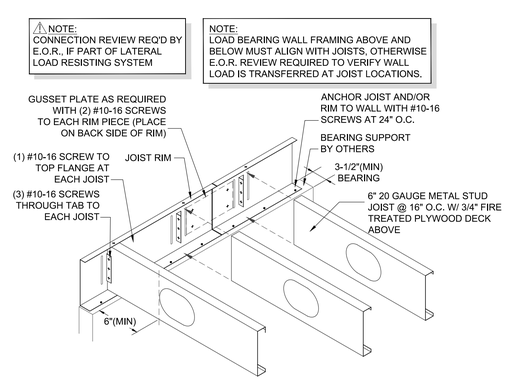
6 WALL TILE TRANSITIONS

SCALE: 6" = 1'-0"



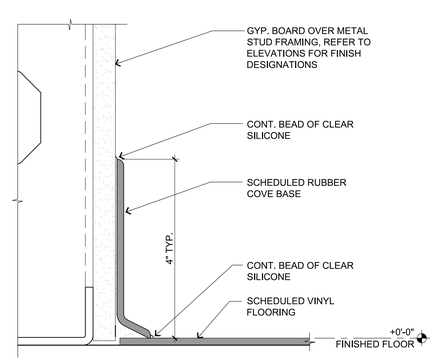
5 SCHULTER COVE BASE AT WALL TILE

SCALE: 6" = 1'-0"



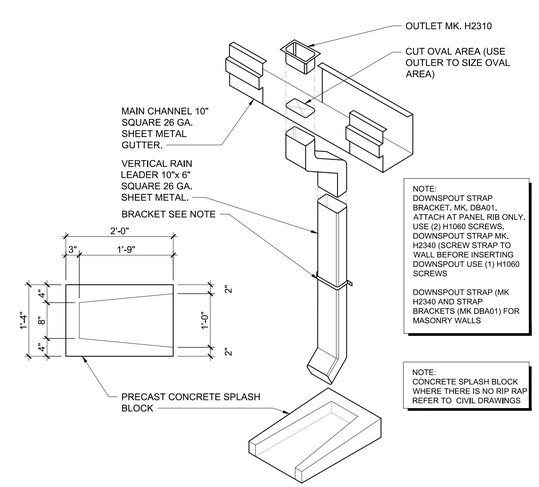
7 GYB. BD. CEILING FRAMING

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



4 RUBBER WALL BASE

SCALE: 6" = 1'-0"



1 GUTTER & DOWNSPOUT DIAGRAM

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

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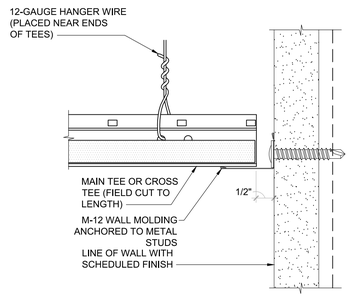
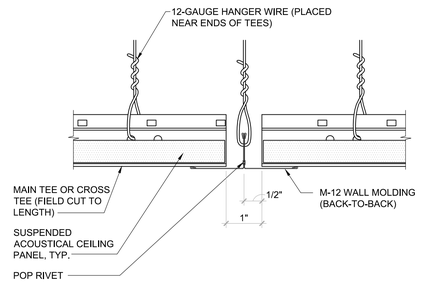


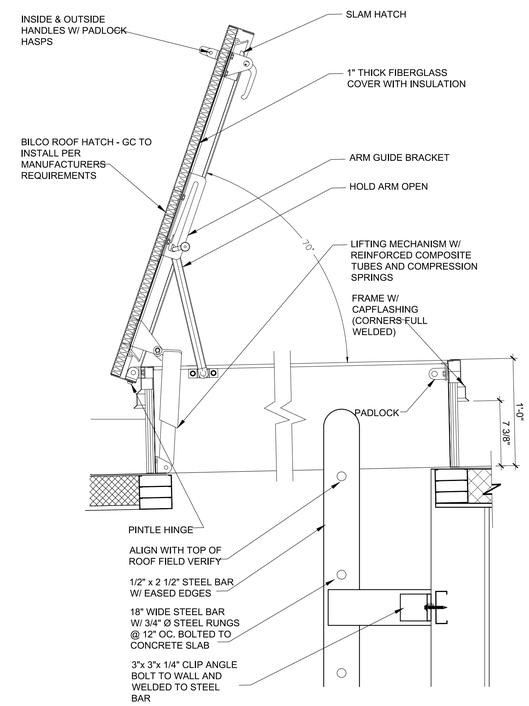
9 CEILING JOINT AT WALL DETAIL

SCALE: 6" = 1'-0"



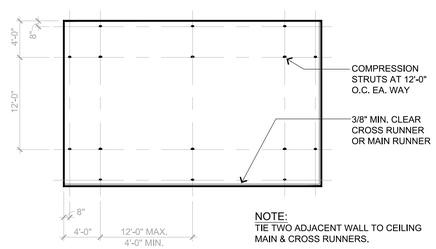
6 CEILING JOINT DETAIL

SCALE: 6" = 1'-0"



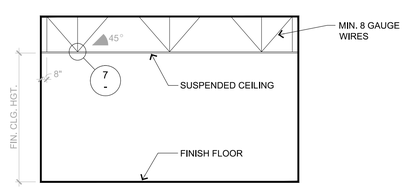
5 ROOF ACCESS HATCH

SCALE: 3" = 1'-0"



NOTE:
TIE TWO ADJACENT WALL TO CEILING MAIN & CROSS RUNNERS.

PLAN



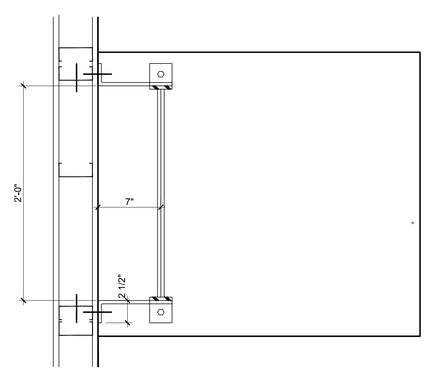
ELEVATION

NOTE:
FOR ROOMS LARGER THAN 25' X 25', A 2" 'DONN' WALL ANGLE SHALL BE USED AT TWO INTERSECTING SIDES, OPPOSITE THE TWO SIDES ATTACHED TO STANDARD WALL ANGLE.

IN LIEU OF THE ABOVE, A STABILIZER BAR MAY BE USED ABOVE GRID OR GRID MAY BE TIED TOGETHER WITH 18 GA. WIRE FROM RUNNER TO RUNNER, CONTINUOUSLY AT THE TWO SIDES.

4 TYPICAL CEILING SUSPENSION SYSTEM

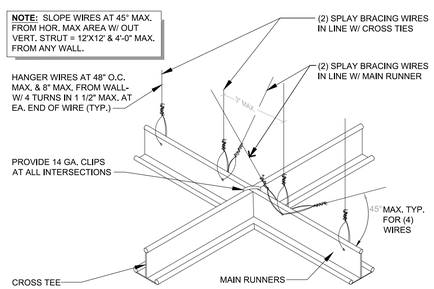
SCALE: N.T.S.



4 ROOF ACCESS HATCH

SCALE: 3" = 1'-0"

NOTE: SLOPE WIRES AT 45° MAX. FROM HOR. MAX AREA W/ OUT VERT. STRUT = 12'X12' & 4'-0" MAX. FROM ANY WALL.



NOTE:
PROVIDE HANGER WIRE AT EA. CORNER OF LIGHT FIXTURE (TYP.)

7 SUSPENDED LAY-IN ACOUSTIC CEILING

SCALE: N.T.S.

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FM GROUP INC
15974 N. 77th ST., STE 100
SCOTTSDALE AZ 85260

TRIUMVIRATE ENVIRONMENTAL

INTEGRATED WASTE MANAGEMENT FACILITY

REVISIONS

PROJECT ADDRESS
73 S. COMMERCE DR
CASA GRANDE, AZ

TITLE
DETAILS

DATE
8-19-22
PROJECT NO.
20-200

A8.2

APPENDIX C-C
Containment Calculations

Containment Calculations

Client:

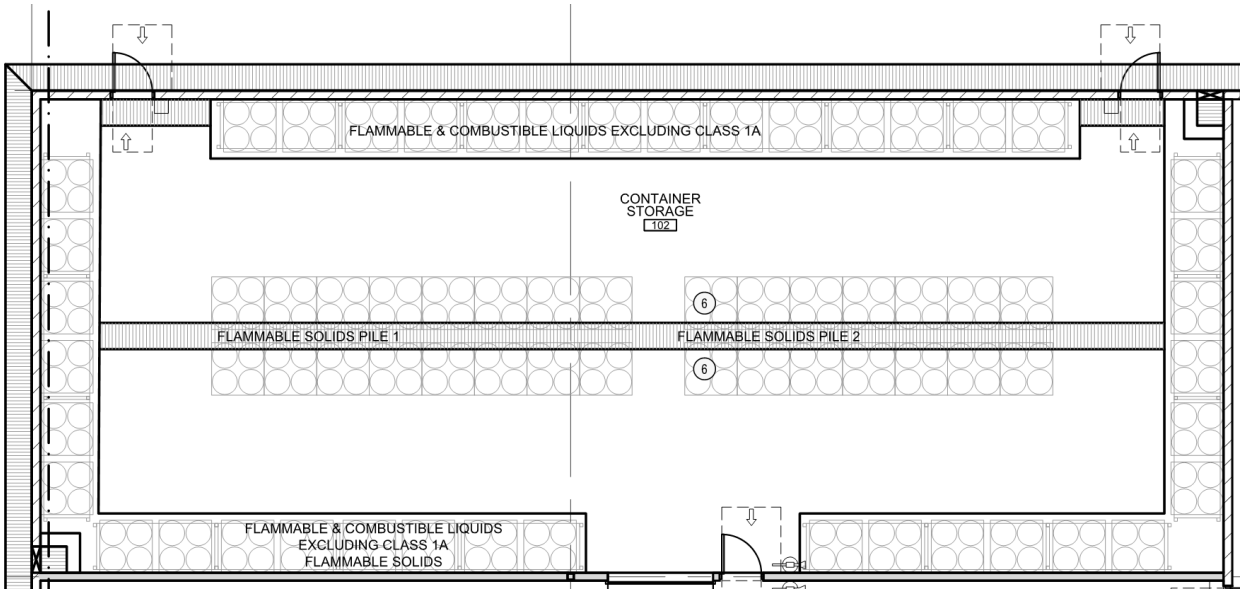
Triumvirate Environmental
Integrated Waste Management Facility

Project Address:

LOTS 23 & 24 OF CENTRAL ARIZONA CENTRAL ARIZONA COMMERCE PARK
73 S. COMMERCE DRIVE
CASA GRANDE, ARIZONA 85193

REGISTERED ARCHITECT
CERTIFICATE NO.
22478
MICHAEL E.
STEVESON
05/26/2023
Date Signed
ARIZONA, U.S.A.
EXPIRES June 30, 2024

ROOM 102

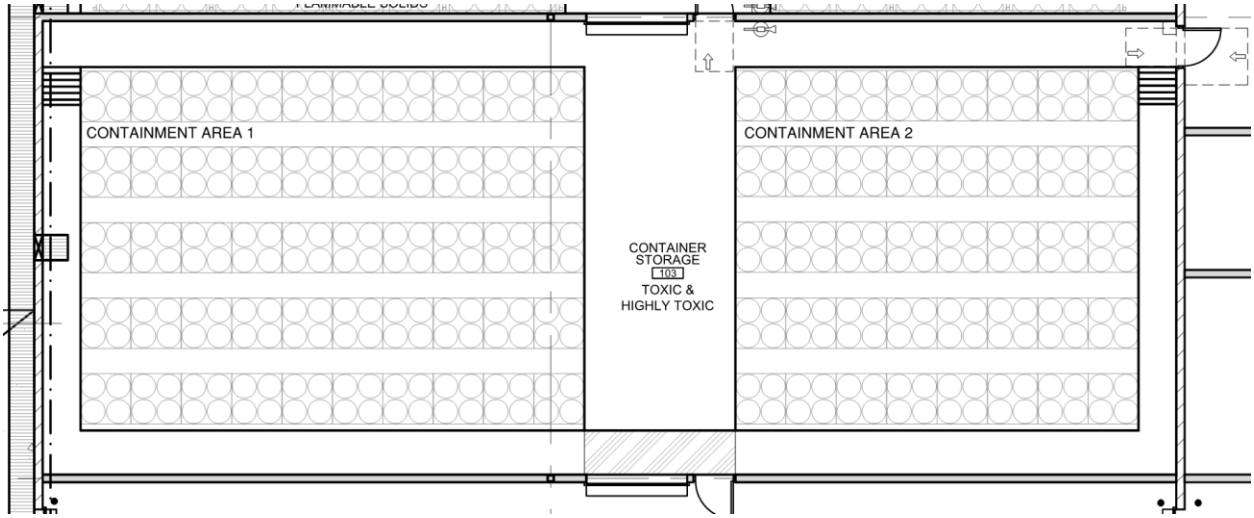


1090 sq.ft. of trench drain

Total Containment: 1090 * .75 feet depth = **817.5 cubic feet = 615 gallons**

ROOM 103

Room Layout



Room Cross Section

Containment Area 1

Containment = 484 cubic feet

Drum Displacement

10,614 cu.in. * 2 drums = 21,229 cu.in. = 12 cubic feet

12 cubic feet * 5 rows = 60 cu.ft. total displacement

Pallet displacement = 1.2 cu.ft.

(6*1.2) + 0.9 + 0.6 + 0.3 = 9 cu.ft.

9 cubic feet * 5 rows = 45 cu.ft. total displacement

Total Containment: 484 cu.ft. – 60 cu.ft. - 45 cu.ft. = **379 cu.ft.**

Containment Area 2

Containment = 307 cu.ft.

Drum Displacement

3655 cu.in. * 2 drums = 7311 cu.in. = 4 cu ft

4 cubic feet * 5 rows = 20 cu.ft. total displacement

Pallet displacement = 1.2 cu.ft.

(4*1.2) + 0.9 + 0.6 + 0.3 = 6.6 cubic feet

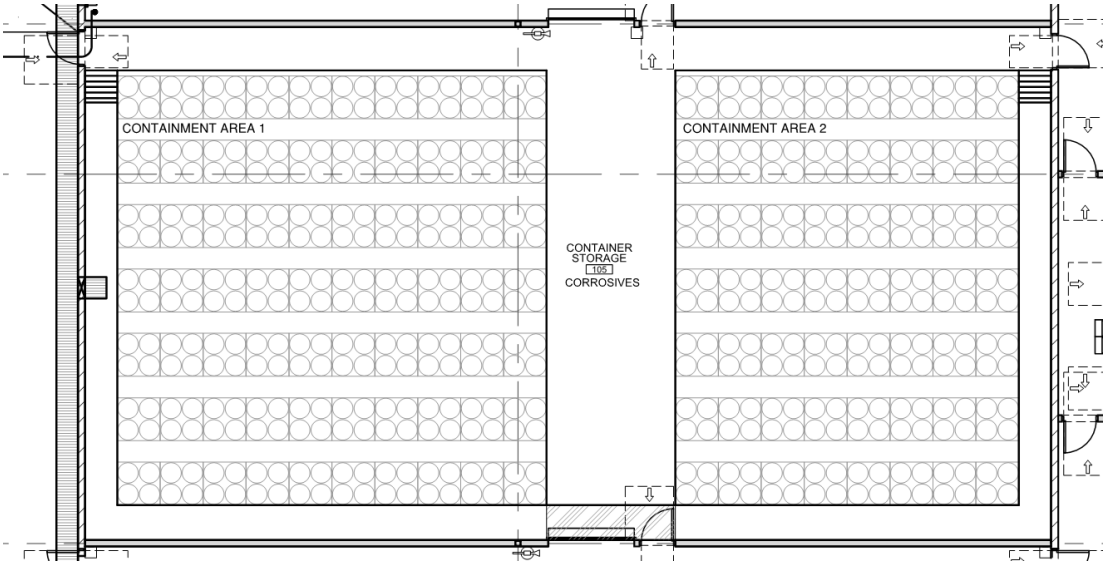
6.6 cubic feet * 5 rows = 33 cu.ft. total displacement

Total Containment = 307 cu.ft. – 20 cu.ft. – 33 cu.ft. = **254 cu.ft.**

Total Room Containment = 379 cu.ft. + 254 cu.ft. = **688 cu.ft. = 5,147 gallons**

ROOM 105

Room Layout



Room Cross Section

Containment Area 1

Containment = 672 cubic feet

Drum Displacement

10,614 cu.in. * 2 drums = 21,229 cu.in. = 12 cubic feet

12 cubic feet * 7 rows = 84 cu.ft. total displacement

Pallet displacement = 1.2 cu.ft.

(6*1.2) 7.2 + 0.9 + 0.6 + 0.3 = 9 cu.ft.

9 cu.ft. * 7 rows = 63 cu.ft. displacement

Total Containment = 672 cu.ft. - 84 cu.ft. – 63 cu.ft. = **525 cu.ft.**

Containment Area 2

Containment = 429 cu.ft.

Drum Displacement

3655 cu.in. * 2 = 7311 cu.in. = 4 cu ft

4 cu.ft. * 7 rows = 32 cu.ft. total displacement

Pallet Displacement = 1.2 cu.ft.

(4*1.2) + 0.9 + 0.6 + 0.3 = 6.6 cu.ft.

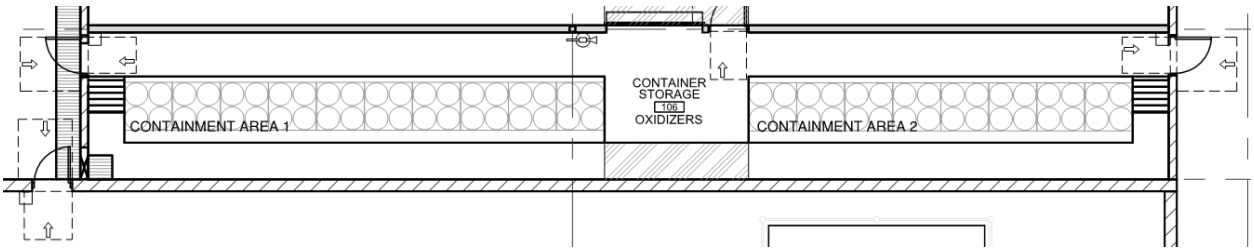
6.6 cu.ft. * 7 rows = 46 cu.ft. total displacement

Total Containment = 429 cu.ft. – 32 cu.ft. – 46 cu.ft. = **351 cu.ft.**

Total Room Containment = 525+ 351 = **876 cu.ft. = 6,553 gallons**

ROOM 106

Room Layout



Room Cross Section

Containment Area 1

Containment = 91 cu.ft.

Drum Displacement: 10,614 cu.in. * 2 = 21229 cu.in. = 12 cu.ft.

Pallet displacement = 6*1.2 = 7.2 cu.ft. + 0.9 + 0.6 + 0.3 = 9 cu.ft.

Total Containment = 91 - 12 - 9 = **70 cu.ft.**

Containment Area 2

Containment = 58 cu.ft.

Drum Displacement

(1142.57 + 934.83 + 747.09 + 519.35 +311.61) = 3655 cu.in. * 2 = 7311 cu.in. = 4 cu ft

Pallet displacement = 1.2 cu.ft.

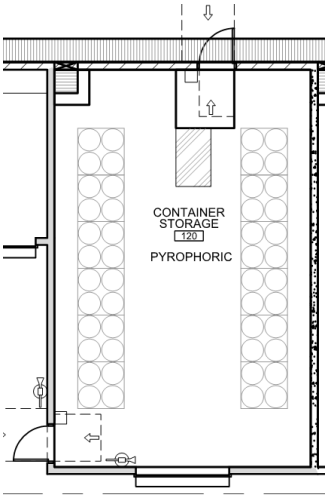
(4*1.2) + 0.9 + 0.6 + 0.3 = 6.6 cubic feet

Total Containment = 58 – 4 – 6.6 = **47 cu.ft.**

Total Room Containment = 70 cu.ft. + 47 = **117 cu.ft. = 524 gallons**

ROOM 120

Room Layout



Containment = 85 cubic feet

Pallet displacement = 1.2 cu.ft.

0.9 + 0.6 + 0.3 = 2 cu.ft.

2 cubic feet * 2 rows = 4 cu.ft. total displacement

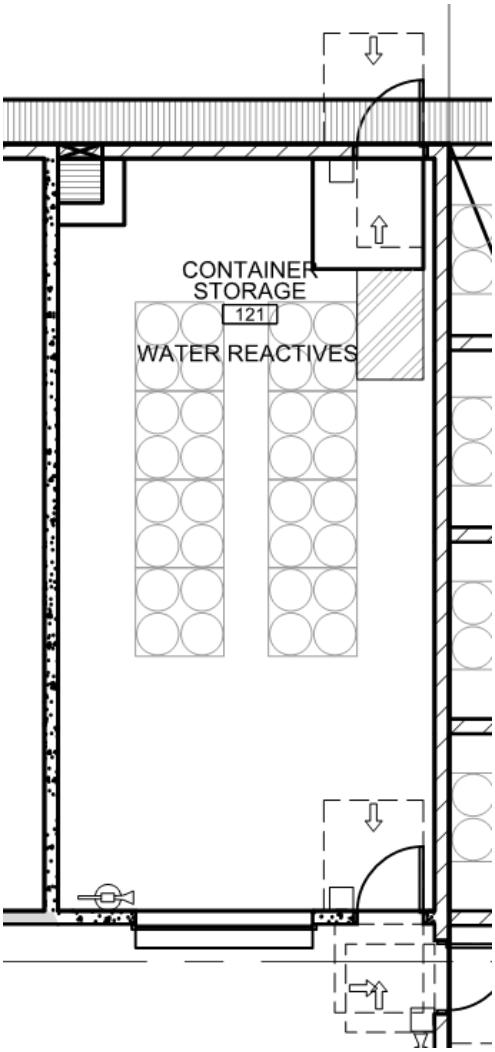
Catch Basin = 7 cu.ft.

Door Landing = 19 cu.ft.

Total Containment = 85 cu.ft. - 4 cu.ft. - 7 cu.ft. – 19 cu.ft. = **55 cu.ft. = 411 gallons**

ROOM 121

Room Layout



Containment = 85 cu.ft.

Pallet displacement = 1.2 cu.ft.

0.9 + 0.6 + 0.3 = 2 cu.ft.

2 cu.ft. * 2 rows = 4 cu.ft. total displacement

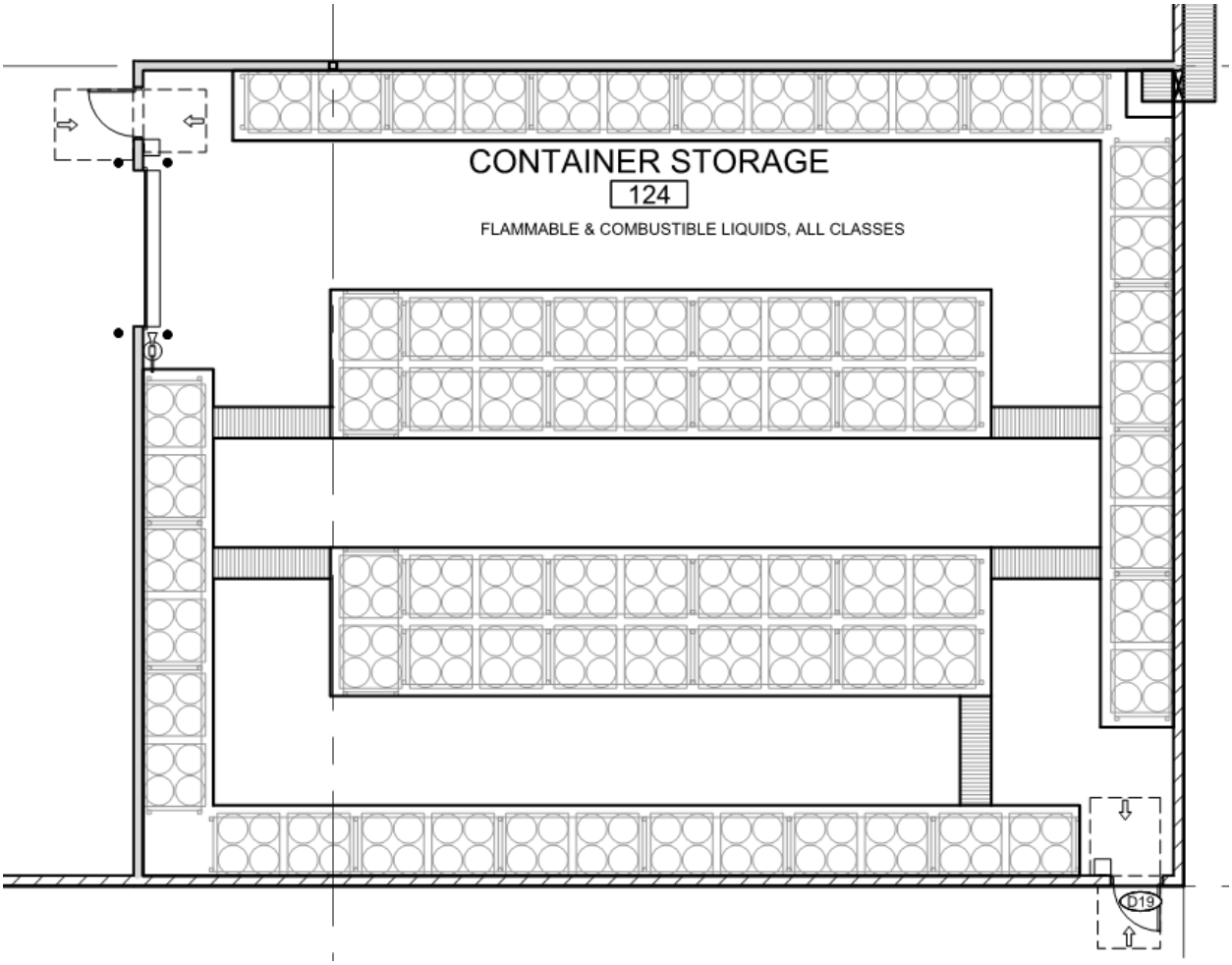
Catch Basin = 7 cu.ft.

Door Landing = 19 cu.ft.

Total Containment = 85 - 4 - 7 – 19 = **55 cu.ft. = 411 gallons**

ROOM 124

Room Layout

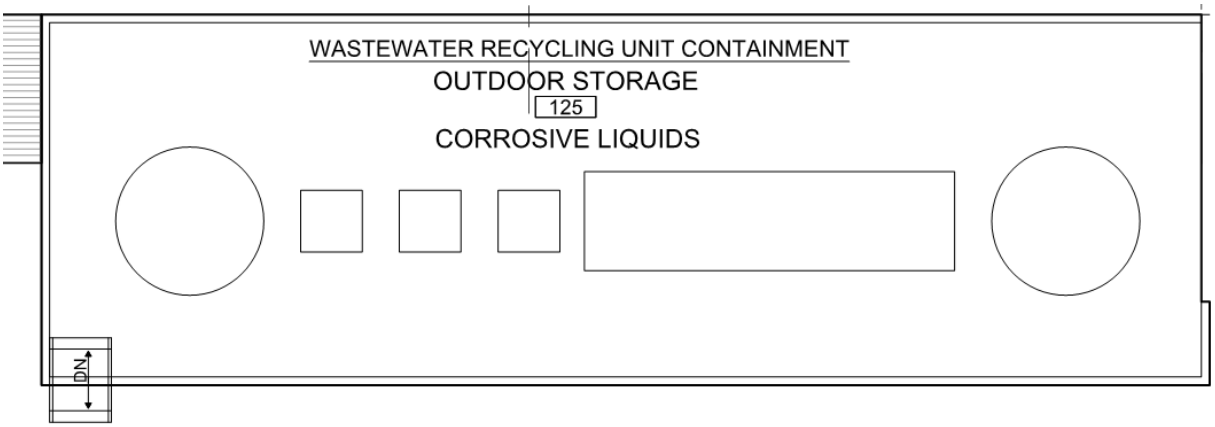


1710 sq.ft. of trench drain

Total Containment: 1710 * .75 feet = **1,283 cu.ft. = 9,598 gallons**

ROOM 125

Room Layout



Containment: 2,678 sq.ft.

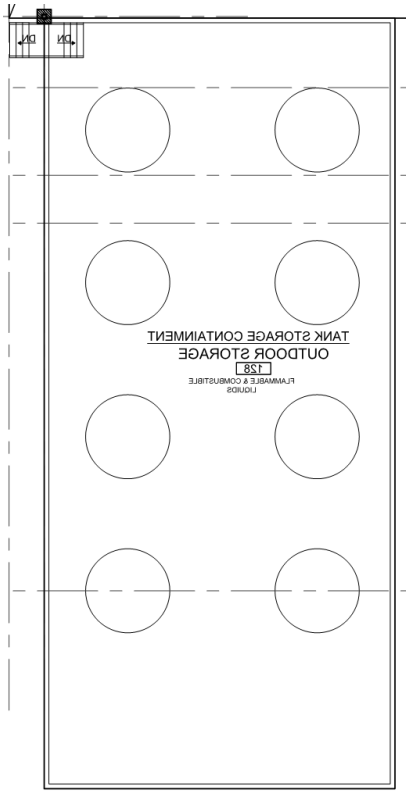
2678 * 2 feet = 5,356 cu.ft

Equipment Displacement: 226 + 50 + 50 + 50 + 480 + 226 = 1,082 cu.ft.

Total Containment = 5,356 sq.ft. – 1,082 sq.ft. = **4,274 cu.ft. = 31,972 gallons**

ROOM 128

Room Layout



Containment Area: 5,500 sq.ft.

5,500 * 2.6 = 14,666 cu.ft.

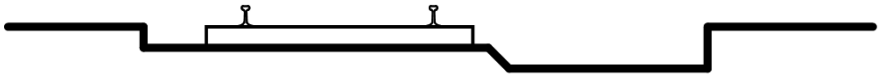
Tank Displacement = 294 cu.ft.

8 tanks * 294 = 2,352 cu.ft.

Containment = 14,666 – 2,352 = **12,314 cu.ft. = 92,115 gallons**

Rail Containment

Rail Cross Section



Containment: 16.4 sq.ft.

320 feet * 16.4 sq.ft. = 5,248 cu.ft.

Railroad Tie Displacement

62 cu.in.

140 ties * 62 cu.in = 8,680 cu.in. = 5 cu.ft.

Total Containment: 5,248 cu.ft. – 5 cu.ft. = **5,243 cu.ft. = 39,220 gallons**

APPENDIX C-D
Conceptual Process Design

PROCESS
ENGINEERING ASSOCIATES, LLC
"Excellence in Applied Chemical Engineering"

CASA GRANDE, ARIZONA FACILITY

CONCEPTUAL PROCESS DESIGN

DESIGN BASIS

TRIUMVIRATE
ENVIRONMENTAL

TRIUMVIRATE ENVIRONMENTAL
SOMERVILLE, MA

Process Project No:
TRE-220301-CC

Rev.	Date	Prepared by	Comments
0C	07/16/2022	A.FELKER	For Design

700 S. Illinois Ave., Suite A-202 □ Oak Ridge, Tennessee 37830 □ (865) 220-8722

CONTENTS

1. SCOPE / OVERVIEW 4
2. GENERAL INFORMATION 5
2.1. Objective 5
2.2. Units of Measurement 6
2.3. Unit Numbering 7
2.4. Drawing Identification 7
2.5. Equipment Identification 8
2.6. P&ID Instrumentation Symbols and Identification 10
2.7. Design Codes and Standards 10
3. PLANT DEFINITION 11
3.1. Depack/ Consolidation/Repack 11
3.2. Wastewater Neutralization Tanks 17
3.3. Wastewater Concentration System 21
3.4. Neutralization/Stabilization Vats 23
3.5. Fuels Blending 28
4. SITE INFORMATION 30
4.1. Location and Elevation 30
4.2. Ambient Design Temperature 30
5. EQUIPMENT AND DESIGN DATA 31
5.1. Pressure Vessels 31
5.2. Column Design 33
5.3. Heat Exchangers 33
5.4. Pumps 34
5.5. Blowers 34
5.6. Piping 35
5.7. Instruments and Control 37
5.8. Civil/Structural 37
6. UTILITY DESIGN DATA 38
6.1. Electrical 38

6.2. Steam and Condensate 38
6.3. Cooling/Chilled Water 38
6.4. Process Water (Water Makeup) 38
6.5. Instrument Air 38
7. Site Location 39

1. SCOPE / OVERVIEW

This document is intended to supply Triumvirate with the basic information required to proceed with a conceptual process design for select areas at their planned Casa Grande, Arizona hazardous waste treatment facility. Triumvirate will provide the expected "design to" conditions for worst case feed streams for the site. If "design to" conditions are not available from Triumvirate, PROCESS will make recommendations and assumptions related to the missing data. The information produced during conceptual process design activities will be used for permitting and will serve as the foundation for future design work. Triumvirate will ultimately be responsible for detailed design, equipment procurement, installation, and construction.

2. GENERAL INFORMATION

2.1. Objective

This document establishes a uniform set of design basis assumptions for a hazardous waste treatment facility that is planned to be installed in Casa Grande, Arizona. The areas that are a part of this conceptual process design are:

- Ventilation Scrubber Systems for depacking/consolidation/repacking operations
- Wastewater Neutralization Tanks
- Wastewater Concentration system (downstream of wastewater neutralization)
- Air Handling System for negative pressure in a room with 2 x 80 yd^3 open top tanks
- Fuels Blending Tanks

This document outlines the utility interfaces; feed stream expected rates and compositions; and product compositions based on minimum "perform to" requirement and "design to" requirement. These design basis assumptions are used to develop a mass and energy balance per the minimum performance condition and the design condition. This design basis is also useful for guiding the development of process flow diagrams; preliminary piping and instrumentation diagrams; equipment sizing; and equipment and instrument specifications. This design basis is subject to review and approval by key stakeholders and will be revised on an as needed basis. This design basis was prepared for review and approval by Process Engineering Associates, LLC with input and data supplied by Triumvirate.

2.2. Units of Measurement

Standard units of measure for design, display, and reporting are as follows:

Table 1: Typical Engineering Units

Property	Primary Unit(s)
Temperature	°F
Pressure	psia or psig
Mass	lb
Volume	Gallons
Flow, Gases	ft^3/hr
Flow, Liquids	gal/min (or gpm)
Flow, Enthalpy	BTU/hr
Power, Electrical	hp
Power, Thermal	BTU
Equipment Dimensions	in, ft
Pipe Diameter, Length	in, ft
Density	lb/ft^3
Viscosity	cP
Heat Transfer Coefficient	BTU/ft^2-°F
Enthalpy, Mass	BTU/lb
Heat Capacity	BTU/lb-°F

2.3. Unit Numbering

PROCESS will assign individual Process Units/Areas the following Unit Numbers:

Unit	Unit Number
Depack/Repack/Consolidation	01
Wastewater Treatment (Neutralization/Evaporation)	02
Stabilization/Neutralization Pits	03
Fuels Blending	04
Miscellaneous Process	05
Utilities	09

2.4. Drawing Identification

2.4.1. PFD Drawing Numbering

PROCESS will assign sequential numerical PFD Sheet numbers, beginning with 001, by Unit Number. PFD Sheets will be numbered as shown below:

PFD Designation	-	**Unit Number**	-	**Sequential Number**
PFD	-	xx	-	xxx

Example: PFD-02-012

Coversheet and typical detail page numbers will be designated as PFD-00-xxx.

2.4.2. P&ID Drawing Numbering

PROCESS will assign sequential numerical P&ID Sheet numbers, beginning with 001, by Unit Number. P&ID Sheets will be numbered as shown below:

P&ID Designation	-	**Unit Number**	-	**Sequential Number**
P&ID	-	xx	-	xxx

Example: P&ID-02-012

Coversheet and typical detail page numbers will be designated as P&ID-00-xxx.

2.5. Equipment Identification

2.5.1. Equipment Classification

PROCESS will use the Equipment Classifications shown below. Classification designations for equipment not shown to be assigned by PROCESS as required.

Vessels		
C	Towers/Columns	Distillation Columns, Scrubber Columns
R	Reactors	Dedicated Reaction Vessels
T	Tanks	API Atmospheric and Low Pressure, Portable Tanks
VT	Pressure Vessels	General Process Service ASME Pressure Vessels
Rotating Equipment		
A	Mixing Equipment	Agitators, Aerators, Mechanical Mixers
BLR	Blowers	Centrifugal Blowers, Positive Displacement Blowers, Fans
K	Compressors	Centrifugal, Reciprocating, Screw
M	Mechanical Drivers	Electric and Pneumatic Motors, Diesel Engines
P	Pumps	
VP	Vacuum Pump	
Heat Exchange Equipment		
E	Heat Exchangers	Unfired Heat Exchangers
EH	Electric Heater	
FF	Fin-Fan Heat Exchanger	Air Cooled Direct and Indirect
H	Fired Heaters	Process heaters
Pressure Relief		
PSV	Pressure Safety Valve	Pressure Safety Valve, Conservation Vent
RD	Rupture Disc	
Utility Systems		
B	Boilers	Fired, Electric
CT	Cooling Tower	
FL	Flare	
Other		
AD	Adsorption	Specialized Adsorption System
CL	Coalescer	Liquid Coalescing Pads, Mist Eliminator
DR	Dryers	Desiccant, Rotary, Spray, etc.
F	Filters	
IX	Ion Exchange	
J	Jets, Eductor, Ejectors	
S	Scrubber	Venturi, etc.

2.5.2. Equipment Numbering

PROCESS will assign sequential numerical Equipment numbers, beginning with 01, by Equipment Classification and Unit Number. Multiple, similar equipment items may be identified with sequential alphabetic designators, beginning with A. Equipment will be numbered as shown below:

	Equipment Classification	-	**Unit Number**	**Sequential Number**	**Multiple Designator**
	xx	-	xx	xx	x
Example:	P-0401B				
	Pump	-	**Unit 04**	**Pump # 1**	**Multiple B**
	P	-	04	01	B

2.5.3. Equipment P&ID Description

P&ID equipment description and tagging shall follow the general example formats below.

Blowers/Fans

BLR-XXX
Equipment Name
Flow:
D/P:
Power:
MOC:

Heat Exchangers

E-XXX
Equipment Name
Nominal Size: ID x Surface Area
Type:
Length:
Design Shell:
Design Tube:
MAWP Shell: psig @ ^{o}F
MAWP Tube:
MOC:
Insulation:

Reactors

R-XXX
Equipment Name
Size: ID x T/Unit
Design: psig @ ^{o}F
MOC:
Insulation:

Pumps

P-XXX
Equipment Name
Manufacturer/Model:
Design: psig at $^{\circ}$F
Capacity: gpm at ft. TDH
MOC:
Power: hp at RPM

Tanks/Pressure Vessels/Filters

T-XXX
Tank Name
Size: ID x Ht
Design: psig @ ^{o}F
MAWP: psig @ ^{o}F
Capacity:
Type:
MOC:
Insulation:

2.6. P&ID Instrumentation Symbols and Identification

P&ID Instrumentation symbols and identification to follow ISA 5.1.

2.7. Design Codes and Standards

To Be Determined

3. PLANT DEFINITION

3.1. Depack/ Consolidation/Repack

PROCESS will be responsible for the following:

- Estimation of the contamination levels in the local atmosphere in each depack/consolidation/repack bay
- Specifying conceptual process design information for the ventilation system in each bay
- Preparing a conceptual process design for a scrubber system or carbon canister system for each bay
- Estimating emissions from each scrubber system

3.1.1. Process Description

Mixed wastes arrive at the facility in boxes, drums or other small containers. Incoming material is analyzed and sent to one of five bays for processing. Bays 1 and 2 receive acids and bases; Bays 3, 4, and 5 receive organics and toxics. Once the material arrives in the designated bay, it is depacked, consolidated, and repacked to be sent for further processing or disposal.

Each bay needs to have constant ventilation that meets minimum guidelines for walk-in fume hoods. The client may ultimately decide to make one or more bays enclosable, thereby allowing negative pressure operation. The air to each bay is drawn in from inside the building by an extraction fan and is discharged to a scrubber and/or carbon canister outside the building. After passing through these pollution control devices the air is discharged to the atmosphere. Scrubber solution is periodically sent to the wastewater treatment system as necessary to purge collected contaminants. Carbon will be routinely replaced and recycled when it becomes spent.

3.1.2. Mixed Waste Feed Stream

Miscellaneous mixed waste materials (both solids and liquids) arrive at the facility in drums, boxes or other shipping containers. Once they arrive, they are unpacked and segregated by material type. When applicable, similar materials are consolidated into a common container for offsite treatment. The depack/consolidate/repack area contains five (5) bays for different material types. As the area is presently expected to be configured, each bay resembles a walk-in fume hood approximately 10’ wide and 10’ tall. Each bay ceiling contains a vented hood leading to a scrubber and/or carbon canister and a fan for final control of contaminants before the treated air stream is discharged to the atmosphere. These bays may be designed to be closed, thus allowing the fan to pull a negative pressure and prevent unwanted vapor and odor to egress into the rest of the building.

The different types of waste materials expected to be received into each depack/consolidate/repack bay are as follows:

Bay 1: Acids/Bases

Bay 2: Acids/Bases

Bay 3: Organics/Toxics

Bay 4: Organics/Toxics

Bay 5: Organics/Toxics

PROCESS estimates that the following worst-case scenarios of air contaminants may be present in each bay:

Table 2: Pack/Repack/Consolidation Area air constituent composition as estimated by PROCESS

Constituent	Bay 1	Bay 2	Bay 3	Bay 4	Bay 5
To be determined/suggested					
Oxygenated solvents (alcohols/ketones/ethers)			X		
Aliphatic hydrocarbons (butane, pentane)				X	X
Aromatic hydrocarbons (benzene, etc.)				X	X
Halogenated solvents (Trichloroethane, e.g.)				X	X
Ammonia, urea, other volatile nitrogen compounds, as well as acidic and basic materials	X	X			

The table below summarizes the most common VOCs that could be expected in wastes.

Table 3: Common Metal Cleaning Solvents

Table 2-1

COMMON METAL CLEANING SOLVENTS****

Type of Solvent/ Solvent	Solvency for Metal Working Soils	Toxicity (ppm)	Flash Point	Evaporation Rate**	Water Solubility (% wt.)	Boiling Point (Range)	Pounds Per Gal.
Alcohols							
Ethanol (95%)	poor	1000*	60°F	24.7	∞	165-176°F	6.76
Isopropanol	poor	400*	55°F	19	∞	179-181°F	6.55
Methanol	poor	200*	58°F	45	∞	147-149°F	6.60
Aliphatic Hydrocarbons							
Heptane	good	500*	<20°F	26	<0.1	201-207°F	5.79
Kerosene	good	500	149°F	0.63	<0.1	354-525°F	6.74
Stoddard	good	200	105°F	2.2	<0.1	313-380°F	6.38
Mineral Spirits 66	good	200	107°F	1.5	<0.1	318-382°F	6.40
Aromatic Hydrocarbons							
Benzene***	good	10*	10°F	132	<0.1	176-177°F	7.36
SC 150	good	200	151°F	0.48	<0.1	370-410°F	7.42
Toluene	good	200*	45°F	17	<0.1	230-232°F	7.26
Turpentine	good	100*	91°F	2.9	<0.1	314-327°F	7.17
Xylene	good	100*	81°F	4.7	<0.1	281-284°F	7.23
Chlorinated Solvents							
Carbon Tetrachloride***	excellent	10*	none	111	<0.1	170-172°F	13.22
Methylene Chloride	excellent	500*	none	363	0.2	104-105.5°F	10.98
Perchloroethylene	excellent	100*	none	16	<0.1	250-254°F	13.47
1,1,1-Trichloroethane	excellent	350*	none	103	<0.1	165-194°F	10.97
Trichloroethylene	excellent	100*	none	62.4	<0.1	188-190°F	12.14
Fluorinated Solvents							
Trichlorotrifluoro-ethane (FC-113)	good	1000*	none	439	<0.1	117°F	13.16
Ketones							
Acetone	good	1000*	<0°F	122	∞	132-134°F	6.59
Methyl ethyl ketone	good	200*	28°F	45	27	174-176°F	6.71

3.1.3. Air Quality Control

Air exiting the scrubbers or carbon canisters will ultimately be discharged to the atmosphere. The specification of the exhaust airstream will meet or exceed the expected permit requirements for particulates, VOC, and specific listed compounds.

EPA publishes a list of 188 specific hazardous air pollutants. Some of the compounds on this list may not be adequately handled by the air pollution control equipment foreseen for the various bays. Incoming wastes containing any of these compounds will have to be evaluated on a case-by-case basis.

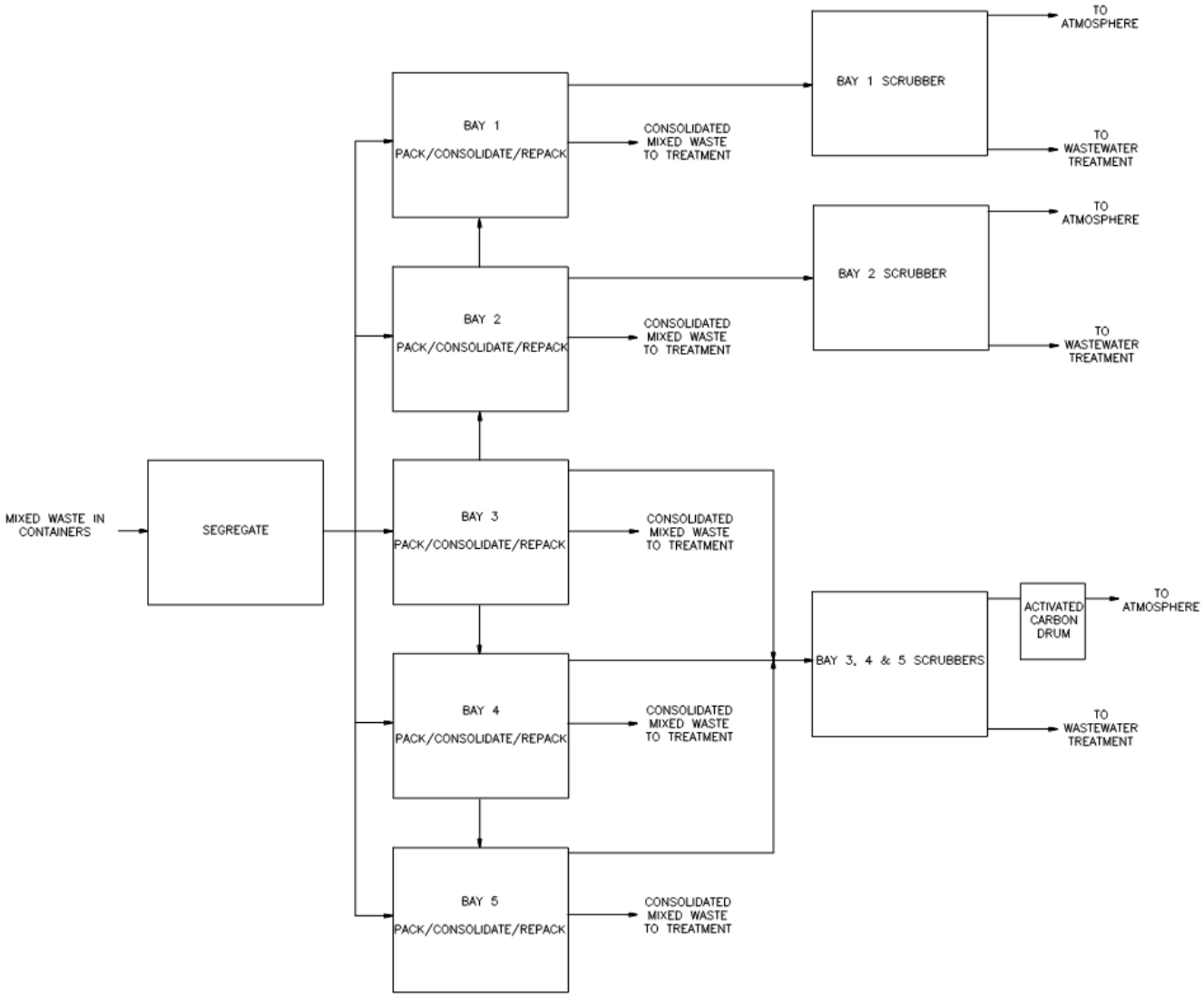
Air emissions within the bay will also be estimated on a case-by-case basis, and strongly depend on the volatility of the chemical, the surface area it is exposed to while depacking, and the bay temperature. EPA guideline AP-42 is used to estimate the VOC emission rate for depack/repack. The closest approximation to the depack/repack process is solvent degreasing from an open tank, which generates an emission of 0.15 lb/hr-ft2 based on tricholorethane. It is assumed a continuous open area corresponding to one 55-gallon drum. To estimate the release of volatile acid, 37% HCl is used, and the release rate is ratioed by the vapor pressure ratio of 37% HCl to tricholorethane. For volatile base, 20% NH3 is used at its vapor pressure ratio to tricholorethane. 24 hour/day, 365 day/yr operation is assumed.

Walk-in hoods are typically designed to have a face velocity of 80-120 scfm/ft2. Taking the upper end of that range and assuming an open face area of 100 ft^2, each bay will need a fan capable of handling at least 12,000 scfm. The canisters and/or scrubbers will be designed on this basis as well.

The air flow drawn into each bay of the depack/consolidate/repack areas must be sufficient to meet the minimum walk-in hood face velocity at all times when waste is present.

It is assumed that the acid and base bays each have their own independent scrubber system. The three organic bays will preferably be fed to a single scrubber assuming it is capable of operating at a 67% turndown ratio should only one of the three bays be in operation. All three scrubber systems will employ appropriate chemical treatment packages to maximize contaminant removal (e.g., base neutralization of acids, acid neutralization of bases, and VOC encapsulation of organics). It is expected the organic scrubber will require carbon canisters for final removal of organic contaminants to very low levels.

Figure 1: Preliminary BFD for the Depack/Repack/Consolidation Process, Rev A



3.1.4. Capacity Factors and Minimum Performance Assumptions

The ventilation and scrubbing will have the following characteristics:

- Normal operation: 100% of design rate (nominally 12,000 scfm if bay is hooded and has a vertical face opening of 10’x10'
- Maximum feed rate: 120% of design.
- Design onstream operation: 24 hours per day, 7 days/week
- Minimum bay face velocity: 120 scfm/ft^2
- If bay can be closed, it will hold a pressure of –20 to –30 Pa (-0.15 to –0.22 mm Hg)

3.2. Wastewater Neutralization Tanks

As a part of this project, PROCESS will be responsible for the following:

- Specifying conceptual process design information for two (2) 20,000-gallon neutralization tank systems
- Estimating emissions from the neutralization system

3.2.1. Neutralization Feed Stream Flow

Both acidic and basic aqueous liquids arrive at the facility and will be neutralized prior to further treatment. Once aqueous material is received into the facility, it will be characterized and added to either an acidic water tank or a basic water tank. Incoming material will be added in a manner to neutralize pH as much as practical by mixing in the appropriate tank (i.e., low pH material may be added to the basic water tank to lower the pH and vice versa). Material is assumed to arrive at a pH ranging from 0 to 14, atmospheric pressure, and 85ºF. On occasion, the pH of the received material may lie outside this range. In addition, no aqueous waste stream with a VOC level greater than 500 ppm(wt) will be accepted.

3.2.2. Reported Analysis

Triumvirate receives all types of materials with various properties. It is expected that the targets below will be used as the worst case/design to expectations. The expected analysis is presented in Table 4 below.

Table 4: Neutralization Material Analysis expected by Triumvirate

Incoming Material	Value	Notes
Acidic Material Low pH	0	pH may be lower than 0 on occasion
Acidic Material Volume	20,000 gal/day	Volume is expected to fluctuate daily
Basic Material High pH	14	pH may be higher than 14 on occasion
Basic Material Volume	20,000 gal/day	Volume is expected to fluctuate daily

3.2.3. Product Specifications

The scope of the pH neutralization area includes adjusting the pH of the incoming material stream to produce a neutralized intermediate product. The pH of the neutralized material will meet the criteria required to send it downstream to the evaporator system. The materials of construction of the evaporator system as well as any special pH requirements of the evaporator will be considered when targeting neutralized wastewater pH. Assuming the evaporator vendor does not have alternate requirements, the neutralized material pH target[1] will range between 6 and 7.

3.2.4. Design Basis Assumptions:

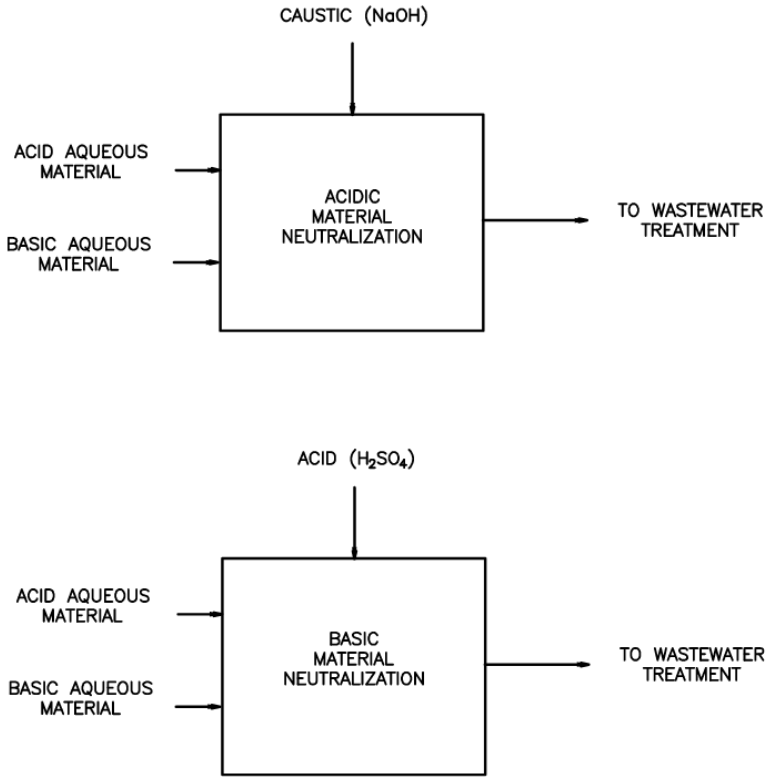
- Material will be delivered via tank trucks, totes or drums and will be segregated by incoming pH and combined in an acid tank (low pH) or base tank (high pH) as appropriate
- Raw water adjustment will occur by mixing the incoming streams to obtain a final pH within the ranges specified in this document and permit requirements will not change this range of values.
- "Fine tuning" of pH will occur by adding an acid or caustic to the material accompanied by mixing
- The process will operate 24 hours per day
- Once the pH has been brought into a neutral range that is expected to be between 6 and 7, the neutralized wastewater will be sent to the evaporation system where the bulk of the water will be evaporated and discharged to the atmosphere and the remaining sludge will continue to be pumpable and will be sent to the neutralization vats that are located elsewhere in the facility for treatment.

3.2.5. Minimum Performance Specifications

The pH neutralization for incoming material will target a neutralized pH that is suitable for the evaporator in the product stream. Ultimately the evaporator vendor will set the pH range requirement for the evaporator feedstock. It is assumed that this range will be between pH 6 and 7.

[1] From website: Treating Acidic Wastewater (pH Adjustment) for Evaporation | ENCON Evaporators

Figure 2: Preliminary BFD for the Neutralization Process, Rev A



3.2.6. Process Description

Raw wastewater will be delivered via tank trucks, totes or drums, segregated by incoming pH, and combined in an acid tank (low pH) or base tank (high pH) as appropriate. The incoming material will be pumped into the acid tank or base tank strategically to neutralize the mixed water's pH as much as practical.

Once the material is ready to be fed to the wastewater treatment system, the pH will be fine-tuned by addition of acid (H_2SO_4) or caustic (NaOH) as appropriate. Neutralized material will be fed to the wastewater treatment system for evaporation and concentration.

3.2.7. Capacity Factors and Minimum Performance Assumptions

The wastewater neutralization system will be designed for the following:

- Design feed rate: 100% capacity, or 40,000 gal/day feed;
- Maximum feed rate: 120% capacity, or 33.3 gpm.
- Maximum throughput per annum: 14.6 MM gal/year.

3.3. Wastewater Concentration System

PROCESS will be responsible for the following:

- Specifying conceptual process design information for the wastewater concentration system
- Estimating system emissions

Raw wastewater is neutralized and sent to the concentration system. Process alternatives for concentration include:

1. Mechanical evaporation: waste water is sprayed into the air from a pond, which results in a portion of the water evaporating. The contents of the pond continue to be evaporated until a viscosity limit is reached, at which time the remaining sludge is sent to waste water off site. This process has very low capital and operating costs, but high land requirement. VOCs in the incoming water are released to atmosphere.

2. Thermal evaporation: waste water is evaporated using a heat source (steam or direct firing) up to a viscosity limit, and the resulting sludge is disposed of. This process has high capital and very high operating cost but is compact. VOCs in the incoming water are released to atmosphere

3. Mechanical vapor recompression: waste water is initially heated using steam for startup, but once up to temperature uses mechanical recompression of the vapor to generate the heat required to vaporize water. The vaporized water is condensed by incoming feed, which is very energy efficient but results in a liquid distillate product that must either be reused (as cooling tower or boiler feed water, for example), or disposed of. A final sludge is also produced. This process has very high capital cost but relatively low operating cost. There is very little release of VOCs, as most will stay in the distillate.

Neutralized wastewater will be fed to the concentrator feed pumps at atmospheric pressure and 85°F and an average rate of 40,000 gallons per day. There may be some redundancy built into the system depending on the process chosen. The process will be designed for a maximum feed rate of 2,000 gallons per hour (33.3 gpm).

3.3.1. Feed Analysis

The incoming water stream is expected to have the following characteristics:

- pH between 6 – 7
- VOC < 500 ppm(wt)
- Total dissolved solids: TBD by evaporator vendor spec and Triumvirate experience

3.3.2. Product Specifications

It is expected that that the bulk of the water will removed either as vapor or distillate along with any remaining VOC content, and that the resulting sludge will be pumpable. The evaporated water stream must meet regulations for air emissions. At a feed rate of 40,000 gal/day and a maximum VOC concentration of 500 ppm, the potential daily emission rate of VOCs is 166.6 lbs. At the stated 365 day/yr operating rate, this translates to a potential worst-case emission of 60,809 lb/yr VOC. The maximum daily emission at 2000 gph feed and 500 ppm VOC is 200 lb/day. These VOCs will be a combination of neutral organics, ketones, aldehydes, alcohols, ethers, and low molecular weight sulfur compounds.

3.3.3. Design Basis Assumptions:

- All raw wastewater will be treated to meet the concentrator feed specs
- Any upsets in the wastewater treatment process will be corrected so that no untreated water will be fed
- The process will operate 24 hours per day, 365 days/year
- Triumvirate will determine path for concentrated brine slurry disposal and distillate, if applicable

3.3.4. Minimum Performance Specifications

The vendor of the concentrator technology will specify the maximum concentration that can be achieved for any incoming neutralized feed, and the concentrator will be operated to maximize that concentration.

3.3.5. Capacity Factors and Minimum Performance Assumptions

The wastewater concentrator system will meet the following performance criteria:

- Nominal feed rate of 40,000 gal/day neutralized feed;
- Maximum feed rate (each unit): 120% capacity factor, or 33.3 gpm.
- Maximum throughput per annum: 14.6 MM gal/year (365 days/yr @ 40,000 gpd)
- Ability to reduce incoming feed to 10% of initial volume or less (Depending on incoming non-volatile content)

3.4. Neutralization/Stabilization Vats

As a part of this project, PROCESS will be responsible for the following:

- Estimation of the contamination levels in the local atmosphere around the neutralization/stabilization vats
- Specifying conceptual process design information for a negative ventilation system in the stabilization room
- Preparing a conceptual process design for room ventilation with dust collection and vent abatement (if required)
- Estimating emissions from the dust collection and vent abatement system

3.4.1. Neutralization/Stabilization Feed Stream Flow

Typical materials to be stabilized are inorganic wastewater treatment sludges (WWT), media with metals, contaminated soils, sand blast grit, incinerator ash, incinerator slag, emissions control dust, and debris. These waste streams are chemically compatible and have no reactive properties. The waste material to be stabilized arrives at the facility in dump trailers, roll-off boxes, drums, pneumatic trailers, and other types of containers. The waste can be wet, sticky, cohesive, dusty, and could contain rock, concrete, rags, wire, and other debris. The material will be segregated based on the stabilization recipe (type and quantity of reagents) required before being transferred to one of the two vats.

Stabilization of the hazardous waste is accomplished by inducing a chemical reaction between the hazardous components and one or more reagents, such as cement, cement kiln dust, lime, fly ash, or other pozzolanic materials. Reagents will be added to the stabilization vats primarily from a super sack held over the vat with an excavator or the like.

3.4.2. Reported Analysis

PROCESS is focused on the design of the ventilation system. Therefore, the primary “feed” materials to the ventilation system will be any particulate matter or volatile organic compounds that become airborne during the stabilization process.

The Triumvirate RCRA permit documentation stated that the reagents listed in Table 5 will be used in the stabilization pits. PROCESS estimated the physical properties based on SDS’s and data found online and emissions factors from the EPA AP-42 Emissions Factor website.

Table 5: Reagents to be Used in the Stabilization Pits

	Portland Cement	Cement Kiln Dust	Hydrated Lime	Lime Kiln Dust	Fly Ash
Manufacturer	Lehigh Hanson	Lehigh Hanson	Chemical Lime Co	Mississippi Lime	Mineral Resource Tech
CAS	65997-15-1	68475-76-3	1305-62-0 (CaOH2)	1305-78-8 / 1317-65-3	
Combustible	No	No	No	No	No
ACGIH TLV TWA Respirable (mg/m^3)		3	5	2	2
ACGIH TLV TWA Inhalable Particles (mg/m^3)		10			
ACGIH TLV TWA Respirable Dust (mg/m^3)	1				
OSHA PEL Respirable Fraction (mg/m^3)	5	5	5	2	5
OSHA PEL Total Dust (mg/m^3)	15	15	15	5	15
Relative Density	2.3 - 3.1	2.3 - 3.1	2.2-2.4	3.2-3.4	2.5-3.0
pH	>11.5	>11.5	12.4	12.45	8-12
Particle Size Range (um)	1-50	30-300	70	30-2000	7-12

3.4.3. Product Specifications

- Allowable emissions from the dust collector and abatement device are to be determined from air regulations and permitting discussions.

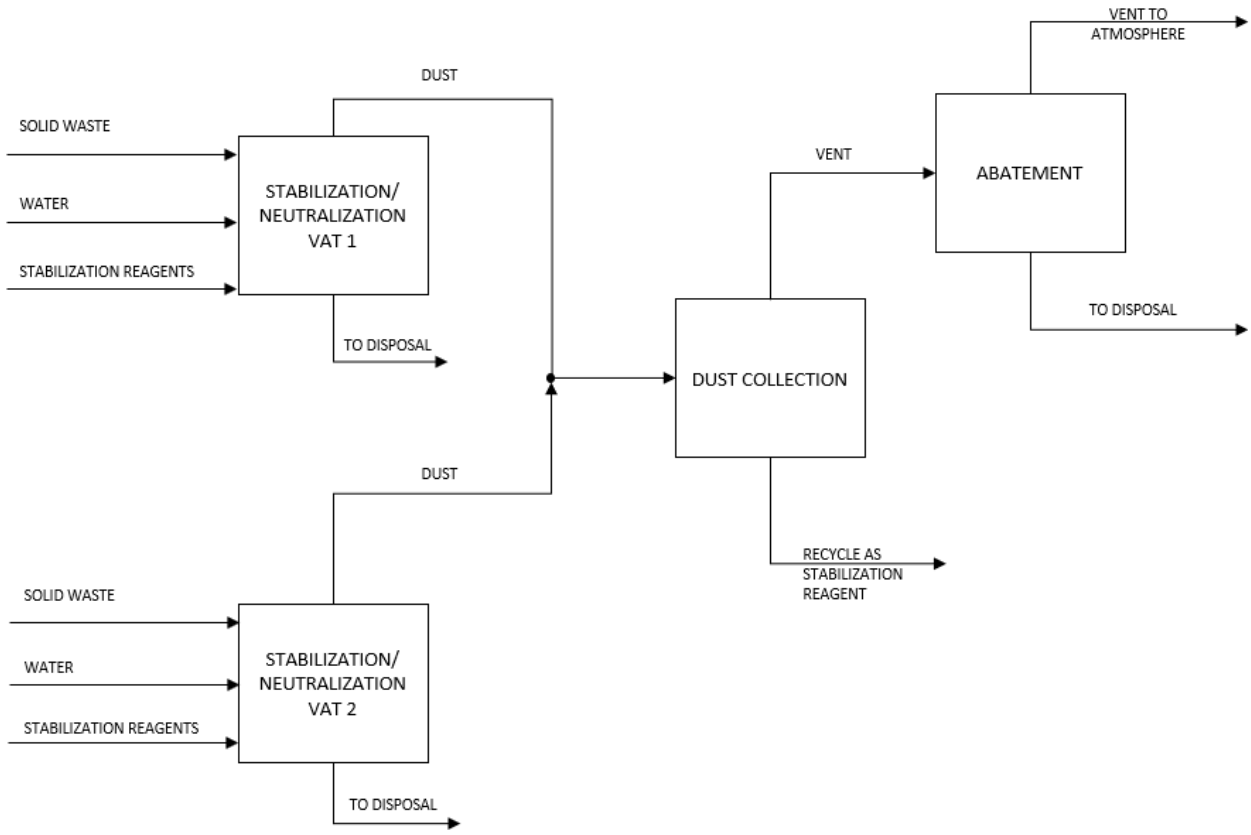
3.4.4. Design Basis Assumptions:

- The dust to be collected by the air handling system is assumed to be from both the reagents used in the stabilization recipes and the hazardous waste itself. Because the composition of the waste is unknown, the baghouse selection is based on the reagents only.
- The dust from the reagents is assumed to provide the worst case for design of the air handling system.
- Reagents will primarily be dumped in from super sacks held over the vats by an excavator or the like.
- All dusts can be removed from the air stream using the same dust collector without compatibility issues.
- Static pressure will be estimated based on a rough layout of the ductwork and location of the baghouse.
- Stabilization pits are located in Bulk Loading Area Room 107 of the facility which measures approximately 103’4” x 57’4” x 31’ or ~184,000 cubic feet.
- The process will operate 24 hours per day, 365 days per year.

3.4.5. Minimum Performance Specifications

- Emissions from the baghouse and abatement device to be below required emission limitations. Initial assumptions for efficiency are 99% for a baghouse and 95% for a carbon adsorber.
- Ventilation hoods are designed for a 100 fpm capture velocity which is sufficient to capture the dust.
- Ducts will be sized for a 4,000 fpm transport velocity which is sufficient to prevent accumulation of dust within the ductwork.
- A preliminary target for the room pressure is 0.04 +/- 0.02” wg. Makeup air flow from louvers in the building should be 5% less than the exhaust flow from the air handling system.

Figure 3: Preliminary BFD for the Neutralization/Stabilization Vat Process, Rev A



3.4.6. Process Description

Wastes will be added to either of two 80 yd^3 vats for neutralization and stabilization. These open top vats will be inside of a building. Stabilization is a process that results in the reduction of mobility (or leachability) of hazardous components within a hazardous waste matrix. Stabilization is accomplished by inducing a chemical reaction between the hazardous components and one or more reagents, such as cement, cement kiln dust, lime, fly ash, or other pozzolanic materials. Stabilized wastes must meet applicable land disposal restrictions in 40 CFR part 268. Stabilized waste will be shipped to a permitted hazardous waste landfill for final disposal.

Waste profiles are carefully reviewed for EPA codes, components, and types of metals present to determine the stabilization recipe. Generally, bulk loads are processed as individual batches. Drummed or other small quantities of waste and bulk loads that have similar characteristics, non-conflicting EPA waste codes, and the same stabilization recipe may be combined to increase the batch size for processing.

Wastewater from equipment wash down, corrosive wastewaters that have been neutralized onsite, or compatible hazardous and non-hazardous waste that have been received by the Facility may be used as the water source in the recipe. Alternatively, city water or non-hazardous site waters may be used to avoid code conflict.

The building housing the vats needs to have constant ventilation and must be kept at a negative pressure. An exhaust fan pulls the air from the room through a baghouse and then through VOC control (such as carbon) before being discharged into the atmosphere.

3.4.7. Capacity Factors and Minimum Performance Assumptions

The ventilation system should have the flexibility to operate up to 120% of the design flow.

- Annual throughput of waste to be processed: Twelve 80 yd^3 batches per day = 525,600 tons/yr
- Ratio of reagent used to waste processed: 0.2 lb reagent / 1 lb waste
- Design: 120% capacity
- Maximum feed rate: 100% capacity factor.

3.5. Fuels Blending

As a part of this project, PROCESS will be responsible for the following:

- Preparing a conceptual process design for eight identical fuels blending tank systems
- Estimating emissions from the fuels blending system

3.5.1. Fuels Blending Feed Stream Flow

The specified throughput for the fuels blending system shall be approximately 142,000 gallons per day based on one turnover of working volume for each tank per day. Feedstock material is assumed to be liquid material of various BTU values received at approximately 85°F (30°C).

3.5.2. Reported Feedstock BTU Values

Triumvirate indicated that all types of materials with heating values can be accepted. The incoming heating values are not as critical as the end values after blending. The target minimum of blended material is 10,000 BTU/lb although higher or lower BTU values are acceptable.

3.5.3. Product Specifications

The scope of the Fuels Blending area design by Triumvirate includes adjusting the BTU value of the incoming material stream via product mixing to produce a suitable product for burning as a fuel product in cement kilns. The BTU value of the blended material will be targeted as a minimum of 10,000 BTU/lb.

3.5.4. Design Basis Assumptions:

- Material will be delivered via rail cars, tank trucks, totes or drums and will be segregated by incoming BTU values and combined in one of the eight tanks as appropriate to achieve the desired minimum BTU value
- The process will operate 24 hours per day
- Vapor balancing will be used for loading/unloading activities to contain working loss emissions
- Standing loss emissions (tank breathing) will be emitting to the atmosphere through standard safety devices such as the tank's conservation vent.

3.5.5. Minimum Performance Specifications

The fuels blending tanks are designed for <75 m3 flooded volume for materials with a maximum vapor pressure of <76.6 kPa. The BTU value for blended material will target a minimum BTU value of 10,000 BTU/lb.

3.5.6. Process Description

Eight tanks will be used for fuels blending. Liquid materials of various BTU value will be received at the site. The reported BTU value of the incoming material will determine the blending tank that the material will be off-loaded into. Each fuels blending tank will be 17,764 gallons in working capacity (19,454 gallons flooded), will have the appropriate instrumentation, will be manifolded together/valved appropriately to keep each tank segregated from the others and to allow transfer from each individual blend tank to any of the others as needed, and each will be agitated.

Each blend tank will be classified as requiring Level 1 Controls per §264.1084(b)(1)(i) through (b)(1)(iii) so that no emissions control/capture device will be required. Standing losses that consist of tank emissions due to normal "breathing" of each tank will be vented to the atmosphere while working losing associated with filling/emptying of vessels will be done using tank balancing to capture vapors in the corresponding tank that is being unloaded.

3.5.7. Capacity Factors and Minimum Performance Assumptions

The fuels blending system emissions control system should have the flexibility to operate up to 120% of the design flow.

- Design: 120% calculated capacity
- Maximum feed rate: 120% capacity factor.

4. SITE INFORMATION[2]

4.1. Location and Elevation

Location and Elevation	
Location	Casa Grande, Arizona
Elevation	1,398 ft
Latitude	32.9501 °N
Atmospheric Pressure	13.97 psia

4.2. Ambient Design Temperature

4.2.1. High Ambient Design Temperatures

High Ambient Design Temperatures (Outdoor)[3]		
Dry Bulb	Maximum Design	108.5°F
	MCWB	69.6°F
	Relative Humidity	13.4%
Air Cooling		110°F
Wet Bulb	Maximum Design	73.9°F
	MCDB	92.8°F
	Relative Humidity	42.0%

4.2.2. Low Ambient Design Temperatures

Low Ambient Design Temperatures (Outdoor)[4]		
Dry Bulb	Minimum Design	31.8°F

[2] Climatic design conditions based on 2017 ASHRAE data for Casa Grande, Arizona, USA.
[3] Values from 2017 ASHRAE 'Annual Cooling, Dehumidification, and Enthalpy Design Conditions' 0.4% exceeding data.
[4] Values from 2017 ASHRAE 'Annual Heating and Humidification Design Conditions' 99.6% exceeding data.

5. EQUIPMENT AND DESIGN DATA

5.1. Pressure Vessels

5.1.1. Design Pressure

Vessel design pressure assumptions are summarized in the table below:

Table 6: Vessel Design Pressure Requirements by Specified Operating Pressure

Maximum Operating Pressure	Vessel Design Pressure
< 30 psig	60 psig
30 psig – 215 psig	Max Operating Pressure + 30 psi

Full vacuum specification is not required for equipment open to the atmosphere or fitted with vacuum relief. Full vacuum (FV) shall be specified for equipment under the following conditions:

- Equipment normally operating below atmospheric pressure
- Equipment subject to sub-atmospheric pressure due to pumping and draining
- Vessels having steam as a significant feed component.
- Equipment subject to steam out.
- Equipment containing a fluid with a vapor pressure less than atmospheric at minimum ambient temperature or minimum operating temperature unless vessel is open to the atmosphere or fitted with vacuum relief.

5.1.2. Design Temperature

Vessel design temperatures shall be maximum operating temperature plus 80°F. Special conditions like steam out or dry out may govern design temperatures.

5.1.3. Corrosion Allowance

Vessel corrosion allowances are defined as per the table below.

Table 7: Corrosion Allowances for Vessel Design by Material

Alloy	Corrosion Allowance (in)
Carbon Steel	1/16
Stainless Steels	1/32

5.1.4. General Pressure Vessel Design Requirements

- Vessels shall be designed for a minimum specific gravity of 1.0 for hydro-testing.
- Vortex breakers shall be provided for all pump draw-off connections.
- All vessels shall be equipped with local site glass as well as level indicator-transmitter.
- Mechanical design and foundation design for all towers shall be suitable for hydro test in erected position.

Table 8: Vessel Connections

Vessel Volume (gal)	Vent (in)	Drain (in)	Steam-Out (in)
< 250	1.5	1.5	1.5
250 to 5,000	2	2	2
5,000 to 13,000	3	3	2
13,000 to 80,000	4	4	2
> 80,000	4	4	3

Table 9: Man-Entry Access and Ventilation Nozzle Sizing

Diameter (gal)	Side Nozzle for Access (in)	Top Nozzle for Ventilation (in)
< 250	8	None
250 to 500	18	None
>500	24	8

5.2. Column Design

5.2.1. Distillation Design:

- Diameters, heights, and types of internals to be determined based on final Mass and Energy Balance.
- Vapor outlet nozzle sizing: max velocity of 65 ft/s for atmospheric and pressure columns; sub-atmospheric columns less than 10.15 psia increase maximum velocity to 197 ft/s.
- Confirmation that that the pressure between the column overhead and condenser is acceptable.

5.3. Heat Exchangers

5.3.1. General Requirements

- All heat exchangers are to be designed for full vacuum.
- TEMA Standard: To be Determined
- Back flush connections: Required for cooling water service. Valves can be located in exchanger piping and be one size less than service line.
- Chemical cleaning connections: To be Determined

5.3.2. Typical Fouling Factors

Typical heat exchanger fouling factors are summarized in the table below:

Table 10: Fouling service factors by application

Service	Fouling Factor (hr-ft^2 °F/BTU)
Cooling Water	0.0015
Condensing	0.0005
Vaporizing	0.0010
Capture Solutions	0.0010

5.3.3. Heat Transfer Coefficients

Heat transfer coefficients shall be determined using appropriate thermo-physical properties and relevant flow conditions for each heat exchanger application.

5.3.4. Heat Exchanger Pressure Drop

Heat Exchanger pressure drops (preliminary for modeling purposes, finalize in detailed design.):

- Tube side of liquid-liquid exchangers: 4 psi.
- Shell side of liquid-liquid exchangers: 3 psi.
- Shell side (vapor side) of vapor-liquid exchanger: 4 psi.

5.3.5. Heat Exchanger Area Margin

Heat exchanger design shall include 20% margin on required surface area. This margin is for area alone and not applicable to flow-rate margins or range of duty requirements.

5.3.6. Heat Exchanger Connections

All condensers shall have liquid outlet nozzles sized for self-venting flow. Process condensers shall have non-condensable vapor vents on the outlet side unless the liquid outlet is specifically designed for two-phase flow.

5.4. Pumps

5.4.1. General Design Requirements

- All pumps shall include a 20 percent margin over nominal design flow condition.
- All pumps shall include a design factor of 15 percent applied to the frictional pressure drop portion of the calculated total displaced head.
- Full spares (2 x 100%) philosophy will be applied.
- Pump dead head pressure shall not exceed pipe system rating at normal temperature plus 28 °C using the maximum impeller trim and motor that the pump casing can accommodate.
- Prefer pumps to operate 80 percent above BEP with 1.5 m of NPSH margin at the end of the curve. A spill back line to suction vessel with an RO is acceptable to achieve greater flows.

5.4.2. Pump Seal Requirements

To Be Determined

5.4.3. Pump Driver Requirements

To be Determined

5.5. Blowers

5.5.1. General Design Requirements

- All blowers shall include a 20 percent margin over design flow.

- Rated discharge head or static pressure shall include all process equipment losses, static differences due to layout (if applicable) and dynamic losses at the rated design capacity.

5.5.2. Blower Driver Requirements

To Be Determined

5.6. Piping

5.6.1. General Specifications

- Design Pressure: Operating pressure plus 15 percent, or, maximum includes PSV, pump dead head or line-loss potential plus 15 percent.
- Design Temperature: Operating temperature plus 80°F
- The operating pressure and temperature used to establish these design conditions shall correspond to the most severe condition of coincidental pressure and temperature expected including startup and shutdown.
- Steam out pressure and temperature are considered minimum design conditions.
- Block and bleed applied to all pumps.
- Prevent vortexes in liquid drawn out vessel bottom by installing a vortex breaker and limiting maximum velocity to 9.84 ft/s.

5.6.2. Pipe Friction Losses and Recommended Velocities

Pumped Liquid friction losses and velocities are summarized in the table below:

Table 11: Maximum Velocities and Allowable Friction Pressure Drop Due for Pipe Sizing

Nominal Pipe Diameter (mm)	Maximum Velocity		Allowable Friction Pressure Drop		
	Suction Velocity (ft/s)	Discharge Velocity (ft/s)	Suction, Sub-cooled (psi/100ft)	Suction, Saturated (psi/100ft)	Discharge (psi/100ft)
1	3	14.75	0.75 to 3.0	0.20 to 0.62	1.0 to 2.0
2	3	14.75	0.75 to 3.0	0.20 to 0.62	1.0 to 2.0
3	3	14.75	0.75 to 3.0	0.20 to 0.62	1.0 to 2.0
4	4	14.75	0.75 to 3.0	0.20 to 0.62	1.0 to 2.0
6	4	14.75	0.75 to 3.0	0.20 to 0.62	1.0 to 2.0
8	4.25	14.75	0.75 to 3.0	0.50 to 1.0	1.0 to 2.0

Additional considerations include:

- For saturated vapor lines of columns operating below 25 psig the pressure drop shall not be greater than 0.5 psi/100 ft.
- For superheated vapor and gases, the maximum velocity should be restricted to 100 m/s.
- For cooling water (raw water, demineralized water, distilled water, boiler water), a velocity of 6.5 to 14.7 m/s shall be used with a pressure drop not greater than 1.0 to 2.0 psi/100 ft.
- For low pressure steam (<50 psig), piping shall be sized for a friction loss of 0.22 to 0.44 psi/100 ft; and for low pressure saturated steam the velocity should be 65-100 m/s.
- Two-phase flow friction losses: Address on a case-by-case basis using appropriate correlation. Generally, use a correlation that includes kinetic energy changes in the fluid mixture and has methods of checking for compressibility and sonic velocity of the vapors or gas fractions. Piping design nozzles to/from thermosyphon reboilers shall be hydraulically checked in an appropriate software package.
- Relief Systems: TBD
- Protective Coatings: TBD

5.6.3. Insulation and Freeze Protection

- Heat Conservation: Per Triumvirate, no Freeze protection is required for Casa Grande, Arizona
- Personnel Protection: 140°F.

5.7. Instruments and Control

5.7.1. Instrumentation and Control System Preferences

- Control system preference: TBD
- Instrument preferred technologies:
- Control Valves:
- Automated Block Valves: Type/ Actuator/preferred vendor?
- Fieldbus:
- Instrument Installation Preferences:
- Instrument connections:

5.7.2. Basic Process Control System

- New/Existing Building Control Room?
- Ethernet protocol; data server with data historian.
- Operator workstation interfaces with server and skid.
- WAN uplink with secure login for remote data monitoring.
- Shutdown Philosophy: To Be Determined
- Process Safety System: To Be Determined

5.8. Civil/Structural

All civil structural responsibility shall be by owner or site constructor.

6. UTILITY DESIGN DATA

6.1. Electrical

Voltage requirements are listed in the table below. Operating loads to be estimated during P&ID development.

Table 12: Electrical Supply for equipment, lighting, and instrumentation

Motor Size (hp)	Voltage (Volts)	Phase	Frequency (Hz)
0 to 0.5	240	1	60
0.75 to 200	480	3	60
> 200	480	3	60
Lighting	120	1	60
Instrumentation	120	1	60

6.2. Steam and Condensate

- To be defined if required

6.3. Cooling/Chilled Water

- To be defined if required

6.4. Process Water (Water Makeup)

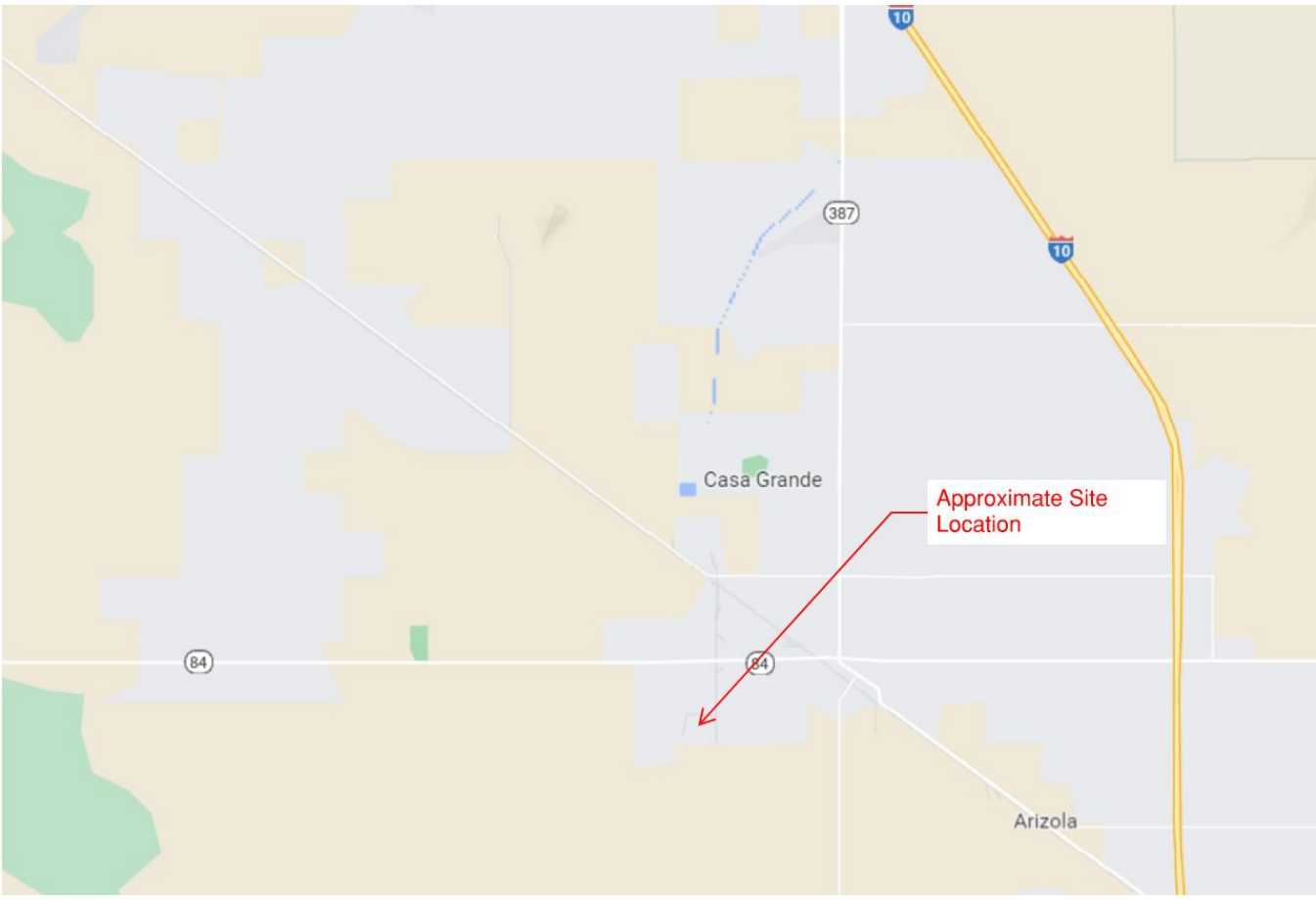
- City water from City of Casa Grande Public Works

6.5. Instrument Air

- 120 psig at - 40°C dew point.
- Plant air for pneumatic tools: TBD

7. Site Location

Preliminary Siting Information: 73 South Commerce Drive, Casa Grande, Arizona


10
387
10
Casa Grande
Approximate Site Location
84
84
Arizola