ATTACHMENT D – PROCEDURES TO PREVENT HAZARDS

PROCEDURES TO PREVENT HAZARDS

Heritage Environmental Services, LLC
284 East Storey Road
Coolidge, AZ 85128

AZD081705402

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APPENDICES

1 SECURITY

A chain link fence with three strands of barbed wire surrounds the facility with the main gate located on Storey Road. The main gate is controlled by restricted electronic key access and can be opened/closed from controls inside the office. A gate for railcar ingress/egress located at the northeast corner of the property is kept locked at all times with a padlock. If the railcar gate is unlocked, Heritage personnel will be present in the vicinity at all times. There is a pedestrian ingress/egress gate located at the southeast corner of the property. It is always kept locked. Keys for the locks are maintained by key employees, and spare keys are stored in the office. An additional access gate on Storey Road, which is normally locked, can be accessed by the Coolidge Fire Department. This gate is locked with keys maintained by Heritage employees and the City of Coolidge Fire Department.

The typical operating hours of the facility are 6:00 A.M. to 5:00 P.M., seven days per week. In the event of an evacuation, facility personnel control access to the facility (see Evacuation Plan in Section 7 of the Contingency Plan).

An automatic gate at the main entrance on Storey Road controls entrance to the facility. Access to the office building is permitted by the front door, into a reception area. Visitors must sign in the logbook and wait for authorized personnel in the reception area. Any on-site visitors are accompanied at all times by Heritage employees. Visitors are required to sign out upon leaving the facility. Contractors must follow Heritage's written program titled "Contractors Safety Guide." Signs are posted at the main entrance, the northeast entrance, and other approachable sides of the facility fence. The signs read "Danger - Unauthorized Personnel Keep Out." The signs are legible from a distance of at least 25 feet. The legend is printed in English and Spanish at the Coolidge facility.

In addition to the security requirements required by 40 CFR Part 264.14(b)(2)(i) and (ii), Heritage provides additional security measures that consist of surveillance cameras that record images at strategic locations within active areas of the facility and other electronic security measures. Additional information concerning the security devices at the facility is provided in Appendix D-B. In lieu of security cameras or similar devices, Heritage may provide 24-hour onsite security personnel.

2 INSPECTION SCHEDULE

The following inspection schedule will be implemented:

Reference 40 CFR 264.	*Unit*	*Types of Problems*	*Minimum Frequency*[1]
15(b)(1)	Safety and emergency equipment[2]	Inventory depletion and functionality	Weekly
15(b)(1)	Monitoring equipment[2]	Malfunctions and calibration drift	Annual
15(b)(1)	Security devices[2]	Malfunctions	Monthly
174	Containment (including trenches and sumps) for container storage areas and bulk loading area (liquids) and concrete base and rail base (for solids storage and bulking)	- cracks and gaps in the containment system, - wear, cracks, and gaps on berms and walls, - wear on sealant, - liquids in containment, - waste dropped on containment base, - proper placement of grating on containment trenches - Lighting properly functioning (for indoor storage)	Weekly
174	Containers	- Leaking - Bulging - Deterioration - Labeling properly affixed - Containers are closed (except if adding or removing waste),	Daily
1052	Subpart BB – Pumps	- Leaking	Visual – weekly; Monitor - monthly
1061	Subpart BB – Valves	- Leaking	Initial, then annual
1086 (c), (d), & (e)	Subpart CC – Containers	Cracks, holes, gaps, or other spaces into the interior of the container	Initially, then annual

Notes: [1] Changes to inspection frequencies may be made up to the frequency specified in the applicable rules by submitting a class 1 permit modification to the ADEQ, in accordance with 40 CFR 270.42.
[2] See Table D-A in Appendix D-A for additional details.

The schedule of inspections and the Inspection Reports are maintained by the Environmental Compliance Manager. Specific items that will be inspected are detailed in Appendix D-A. An example Inspection Findings Form that can be used to document inspection dates, corrective actions, and completion dates is also provided in Appendix D-A. Corrective action that is needed, as noted at any inspection, must be initiated within 24 hours and completed as early as possible.

3 EQUIPMENT REQUIREMENTS

3.1 Communication Equipment

Internal communications and alarm systems used to provide immediate emergency instruction to the facility are discussed in the Evacuation Plan located in Section 7 of the Contingency Plan. Telephones capable of making external calls are located in the office, the laboratory building, and the maintenance building. Emergency telephone numbers are outlined in Section 8 of the Contingency Plan. Employees are equipped with two-way radios or have access to air horns to alert key personnel of an emergency.

3.2 Emergency Equipment

An emergency equipment list is located in Appendix E-D of the Contingency Plan.

3.3 Aisle Space Requirements

The facility maintains sufficient aisle space, a minimum of two feet, to allow the unobstructed movement of personnel, fire protection equipment, or spill control equipment to any area of facility in the event of an emergency. For containers that are stored on containment pallets in adjacent rows, the distance between the containers is at least two feet.

3.4 Sprinkler Suppression System

The Central Container Storage Area and the 800 Container Storage Area are equipped with an automatic fire suppression system that is water-AR-AFFF foam based. The system was designed in accordance with NFPA 30 incorporated into the 2003 International Fire Code which was the standard adopted by the Arizona State Fire Marshal at the time of installation. The fire suppression system installed in the Central Storage Area and the 800 Area Container Storage are suitable for storage of hazardous materials including flammable liquids. In addition to the sprinkler system, the Central Storage Area and the 800 Container Storage Area are equipped with a beam smoke detection system and photoionization smoke detection system as a means to detect fire/smoke in advance of sprinkler system activation and provide early warning to emergency responders. Attachment D-C provides drawings of the fire suppression and alarm system.

There are also several water outlets within the facility that may be utilized in an emergency. There are eight water storage tanks at the facility that are filled by groundwater from an on-site water production well that is designed to pump ground water in excess of 600 gallons per minute. The tanks are equipped with low-level alarms. Heritage controls water rights for the aquifer beneath the facility, and water usage is well below the volume of water rights. In addition to the sprinkler suppression system, the Heritage facility is protected by conventional ABC fire extinguishers. There are also 55-gallon containers of AFFF fire suppression foam available for response to a fire. Heritage personnel have been trained in fire response by the local fire department.

3.4.1 Fire Protection Measures

Heritage maintains the following measures for fire protection:

1. Heritage has a fire suppression system serving the Central Container Storage Area and the 800 Area Container Storage Area at the facility. This system is maintained in operational status.
2. Heritage has an existing system of water storage tanks at the facility that are filled by a groundwater production well. The current volume of water in storage exceeds 126,900 gallons. The pumps and water tank systems are maintained in operational status. The water well is designed to pump ground water at a rate in excess of 600 gallons per minute to replenish water storage tanks in the event of an emergency.
3. Heritage maintains its water rights, sufficient to provide adequate volume of water to the water storage tank system. Heritage has not sold or traded any of its water rights for the facility.
4. The Heritage facility is also served by the City of Coolidge Fire Department' The City of Coolidge has informed Heritage of additional equipment purchases that enable even more sophisticated response to emergencies at the Heritage facility. The advanced equipment ordered by the City of Coolidge reduced the quantity of water necessary for fire fighting, in comparison to existing equipment and technology.
5. The City of Coolidge has in place a written Mutual Aid Agreement with the following municipal fire departments within Pinal County:
    - Casa Grande Fire Department
    - Eloy Fire Department
    - Maricopa Fire Department
    - Arizona City Fire District
    - Avra Valley Fire District
    - Florence Fire Department
    - Golder Ranch Fire District
    - Kearny Fire Department
    - Stanfield Fire Department
    - Regional Fire & Rescue Department
    - Gila River Indian Community Fire Department
6. Heritage has four 55-gallon canisters of AFFF fire suppression foam in inventory. The canisters are stored outside the southwest corner of the Central Container Storage Area. As part of the Agreement with the City of Coolidge, the Coolidge Fire Department owns and will provide the foam eductors necessary for application of the AFFF foam on-site at Heritage, should it be required in an emergency.
7. In addition to hand-held A/B/C fire extinguishers, Heritage has two 125-pound fire extinguishers rated B/C for flammable liquid and electrical fires (both located at the Central Container Storage Area) and two Class D fire extinguishers (one located in the Lab Depack Area and one located in Area

800 by the north door).

8. Heritage employees have been trained in the use of Fire Extinguishers.
9. Heritage employees have been trained in the Contingency Plan and Procedures to Prevent Hazards documents established for emergencies at the facility.
10. Heritage has established "No Smoking" areas and appropriate signage. Heritage also has a "Safe Work Permit" program that would prevent performance of any "hot work," such as welding in the areas where hazardous wastes are stored, without the proper precautions (e.g., relocation of combustible materials).

4 PREVENTIVE PROCEDURES, STRUCTURES, AND EQUIPMENT

4.1 Unloading and Consolidation Operations

Unloading procedures for containerized wastes are discussed in the Container Storage and Consolidation Plan (Permit Attachment C). Container loading and unloading is conducted with specialized equipment designed to move containers in accordance with written Standard Operating Procedures (SOPs). Consolidation operations, including solids (filter cake) blending, is conducted with specialized equipment in accordance with written SOPs. Consolidation equipment, including housekeeping tools, is tested and maintained and inspected prior to use.

The following SOP's related to bulking, blending and consolidation will be maintained at the facility:

- F006 Blending and Consolidation
- Organic Waste Consolidation
- Bulking for Shipment Offsite

4.2 Run-on / Run-off

All hazardous waste activities are conducted indoors, under roof with curbing, or in otherwise contained areas. The facility has the following controls to prevent run-on/runoff of storm water.

General Facility Controls: The facility has a soil berm constructed on the north, east and west side of the perimeter fence with the exception of areas where access is required (e.g., the rail spur). These berms mitigate potential run-on and run-off from the facility. Based on visual observation, drainage conveyances are constructed along the railroad and along East Storey Road to prevent run-on to the facility from potential offsite sources.

Central Storage Area – The Central Storage Area is constructed of poured concrete walls up to approximately 4 feet above the surrounding grade. Above the concrete wall, the Central Storage Area is a metal sided building with a roof to prevent precipitation from entering the Central Storage Area. These structures serve to mitigate any potential run-on into the unit and prevent precipitation from accumulating. Although located in an indoor structure under roof, the sloped floors coupled with blind sumps of the Central Storage Area would serve to prevent run-off from the unit.

Roll Off Container Storage Area – The Roll-Off Container Storage Area is a contained area that consists of block walls on the east and north sides of the unit that are approximately eight feet in height. On the south side of the unit a six inch concrete curb is present at the Roll-Off Container Storage Area. On the west side of the unit a 3-inch curb is present at the Roll-Off Container Storage Area. The structures are constructed in a manner that they are sufficiently above the surrounding grade to prevent run-on/run off at the unit. Additional detail concerning the construction of the curbs is provided in Permit Attachment C of the permit application.

Dock and Van Container Storage Area (DVSA) – The DVSA secondary containment volume is sufficient to contain precipitation from a 25-year/24-hour storm event including any run-on into the unit which was based on land surveying conducted to determine the drainage area in the vicinity of the DVSA. Permit Attachment C of the permit application provides additional information.

East Container Storage Area – Run-on Run-off is prevented in the East Container Storage Area by curbing that is a minimum of 5.5 inches above the surrounding grade to prevent runon/runoff from the unit.

Lab Depack Area – The Lab Depack Area is located inside a building with a roof and doors to prevent precipitation and runoff from the unit. The finished floor of the unit is above natural grade and the unit is accessed by a concrete ramp which mitigates the potential for runon at the unit. Storage of hazardous waste in the Lab Depack area is conducted in Portable Secondary Containment Pallets. These manufactured devices are typically constructed with sides of sufficient height to prevent contact from runon/runoff at the unit. Permit Attachment C, Appendix C-H provides technical information for typical secondary containment pallets.

Bulk Loading Area (Tanker and Rail) – The Bulk Loading Area (Tanker and Rail) secondary containment volume is sufficient to contain precipitation from a 25-year/24-hour storm event, including any run-on into the unit, based on land surveying conducted to determine the drainage area in the vicinity of the adjacent DVSA. Accumulated precipitation or other liquids found in the containment are removed within one operating day of discovery. Permit Attachment C, Appendix C-E provides additional information.

Metal grates over the sump minimize run-on into the sump. To the west of the rail spur, there is an 18-inch high wall to minimize run-on into the unit. Where there is a gap in the wall and grating over additional containment for the rail area, that grating is raised, preventing run-on into the unit from the dock area. To the south of the rail spur, there is an end-loading dock for railcars. This dock is raised and sloped away from the rail area, preventing run-on or run-off. The tanker truck bay is sloped from the south and from the north toward the sump to minimize run-off from the area. To the east of the tanker truck bay, the unit is bordered by walls. Therefore, there is no run-on or run-off at the east side of the unit.

800 Area Container Storage – The 800 Container Storage Area is located inside a building with roof and doors to prevent precipitation and significantly limit the potential for run-off or accumulated precipitation. Storage of hazardous waste in the 800 Area Container Storage is conducted in Portable Secondary Containment devices. These manufactured devices are typically constructed with sides of sufficient height to prevent contact with hazardous waste from potential runon/run-

off. Permit Attachment C, Appendix C-H provides technical information for typical secondary containment pallets.

4.3 Power Failure

In the case of a power failure, the facility may have to cease operations, but there would be no threat of a release or endangerment to human health or the environment. Ingress/egress to the facility would be via the manually controlled gates or the main gate, which can also be manually opened. A list of emergency lighting units is included with the emergency equipment list in Appendix E-D of the Contingency Plan.

4.3.1 Fire Suppression Capability

The fire suppression system in the Central Storage Area and the 800 Area Container Storage Area is equipped with a rated fire pump powered by a diesel engine. The diesel fire pump is designed to operate with or without power either automatically or in manual mode.

In the event of a power outage during a fire, the fire hydrant feed pump system will not operate because there is no backup power source. The fire department has access to the fire water supply through the hydrants (the City of Coolidge pumper trucks have the capability to suck water from hydrants) as well as from a central draw-point. The pumper trucks will then boost the pressure for direct fire-fighting purposes.

The well pump will also not operate when the power is out and will not be able to refill the water tanks. In this case, the facility will be limited to the stored volume of water (126,900 gallons) at the facility before water from offsite is required. The Coolidge Fire Department is in the process of acquiring new equipment that will significantly reduce the water requirements of their pumper trucks.

The loss of power will have no effect on the use of the four foam canisters, as these are educted by the fire trucks. Also, the loss of power will have no effect on using hand-held extinguishers.

4.4 Personnel Protective Equipment

The facility prevents undue exposure of personnel to hazardous waste by installing engineering controls, implementing administrative measures, or providing employees with the appropriate personal protective equipment. Heritage provides eye protection (e.g., safety glasses), foot protection (steel toed boots), dermal protection (coverall, gloves, aprons, uniform, etc.), and breathing protection (e.g., air purifying respirator) which is selected based on the task or activity being performed and the conditions associated with the task being performed. In addition, Heritage provides thorough medical monitoring for employees. The medical monitoring program is managed by an industrial hygienist and Heritage occupational health physicians.

4.5 Minimize Release to the Atmosphere

Waste management activities are conducted in a manner to minimize the exposure to the atmosphere by engineering controls and by conducting activities under roof, when possible. Solids (filter cake) blending operations do not take place in windy conditions. If deterioration or leaks are detected during container inspections, the container is immediately overpacked.

4.6 Management of Temperature Sensitive Materials

Heritage prohibits certain wastestreams that are considered temperature sensitive from being accepted at the facility during the months of June through September when average daily high temperatures in the Phoenix area exceed 100 °F. Wastestreams that generators identify as temperature sensitive, shock sensitive, spontaneously combustible, or requiring temperature controls undergo an additional technical review prior to approval to consider whether or not the materials can be accepted at the facility during the months of June through September.

Wastes that will normally be prohibited from acceptance to the facility during months of June through September will consist of the following:

- Wastestreams that generators identify on the Heritage wastestream profile as being temperature sensitive, requiring temperature controls, or are shock sensitive with self-accelerating decomposition temperatures that are less than 122 °F (50 °C). Typically, these materials are azo-compounds, azide-compounds, and organic peroxides.
- Technical/commercial grade formulations of the following compounds or formulations:

dibenzyl peroxydicarbonate	gelatinized nitrocellulose	nitrogen trichloride
2,5 dimethyl-2,5-dihydroperoxy hexane	guanyl nitrosamino guanyl nitrosamino guanylidene	nitrogen triiodide nitroglycide nitroglycol
dinitrotoluene	guanyltetrazene	nitronium perchlorate
dry guanyl compounds	heavy metal azide	nitrourea
dry lead azide	hexanite	organic amine
Unwetted nitrocellulose	hexanitrodiphenylamine	nitrates
films and similar materials	hexanitrostilbene	organic nitramines
Unwetted picric acids	hexogen	picramide
Unwetted explosives	hydrazoic acid	picratol
aluminum ophorite	hyrazinium nitrate	picryl fluoride
explosive	lead azide	polynitro aliphatic
amatol	lead mannite	compounds
ammonal	lead	potassium
butyl tetryl	mononitroresorcinate	nitroaminotetrazole
copper acetylide	lead picrate	robenzoic acid
cyanuric triazide	lead styphnate	silver acetylide
cyclotrimethylenetrinitramine	magnesium ophorite	silver azide
	mannitol hexanitrate	silver fulminate
dinitroethyleneurea	mercury fulminate	silver styphnate
dinitroglycerine	mercury oxalate	silver tetrazene
dipicryl sulfone	mercury oxalate	sodatol
dipicrylamine	mercury tartrate	sodium amatol
erythritol tetranitrate	mononitrotoluene	syphnic acid
fulminating gold	nitrated carbohydrate	tetranitrocarbazole
fulminating mercury	nitrated glucoside	tetraze
fulminating platinum	nitrated polyhydric	tetrytol
fulminating silver	alcohol	trimethylolethane

trimonite	trinitronaphthalene	vinylidene chloride
trinit	trinitrophenetol	acetylides
trinitroanisole	trinitrophloroglucinol	
trinitrobenzoic acid	trinitroresorcinol	
trinitrocresol	urea ammonium nitrate	
trinitro-meta-cresol	vinyl chloride	

5 IGNITABLE, REACTIVE AND INCOMPATIBLE WASTE

5.1 Prevention of Ignition or Reaction

Smoking is allowed in designated areas only. "NO SMOKING" signs are posted throughout the facility. Any work that involves open flames or other sources of heat (*e.g.,* welding, cutting, etc.) must be accompanied by a Heritage-issued Safe Work Permit. Water reactive wastes will only be stored in the Lab Depack Area. When water reactive wastes are in transit on a trailer, the trailer will be placarded accordingly.

5.2 General Handling Precautions

The procedures to be followed prior to consolidating different wastestreams are specified in the facility's Waste Analysis Plan (Permit Attachment B) and in facility SOPs.

5.3 Screening Solids (Filter Cake) Prior to Blending

Wastestreams designated for the Solids (Filter Cake) Blending program are initially screened for cyanide, volatile organic compounds, and free liquids. Additional details are provided in the Waste Analysis Plan (Permit Attachment B).

5.4 Management in Containers

Containers of ignitable or reactive waste are located at least 50 feet (15 meters) from the facility's property line. See the Container Storage and Consolidation Plan (Permit Attachment C) for applicable drawings. Incompatible wastes and materials are not placed in the same container or in unwashed containers that previously held incompatible wastes. Incompatible materials will not be stored in a railcar and a tanker truck simultaneously in the Bulk Loading Area. Storage of incompatible containers is addressed in the Container Storage and Consolidation Plan (Permit Attachment C).

5.5 Fire Detection Devices

The facility is equipped with automated fire detection devices in the Central Container Storage Area, the 800 Area Container Storage Area, the Dock and Van Container Storage Area, and the Rail and Tanker Loading Area, as well as other areas of the facility. Depending on their location, these automated devices are designed to detect a pressure loss indicating that automated fire suppression equipment was engaged, detect heat in excess of 190 ^{0}F, detect smoke using beam detection systems or detect smoke by photoionization devices. Manual pull-down fire alarms are also present at the facility. When engaged, these devices activate internal horns/strobe lights and automatically notify a third party security firm. Additional information is provided in Appendix D-B.

APPENDIX D-A
FACILITY INSPECTION INFORMATION

CONTAINER AND CONTAINMENT INSPECTION

Containers will be inspected for leaks, deterioration, and presence of labeling on a daily basis. The frequency of inspection for the structure and ancillary items in the container storage areas, [e.g., containment system, trenches, and sumps (for liquids), and concrete base, berms and walls (for Hazardous roll-off storage)], will be inspected on a weekly basis. Additional information is available in Section 2 – Inspection Schedule and in the Container Storage and Consolidation Plan (Permit Attachment C).

SAFETY AND EMERGENCY EQUIPMENT INSPECTION

At a minimum frequency of once per week, emergency equipment identified in the Contingency Plan will be inspected to identify that the items are present and in working order. In addition, safety equipment identified in Table D-A will be inspected at the frequency noted in Table D-A.

MONTHLY SECURITY INSPECTION

At a minimum frequency of once per month, the following security items will be checked:

- Fencing in good condition
- Danger signs posted
- Automatic gates operational

ANNUAL SAFETY MONITORING EQUIPMENT/ COATING/ SPRINKLER INSPECTION

At a minimum frequency of once per year, Heritage will inspect monitoring equipment for malfunction or calibration drift.

At a minimum frequency of once per year, the coatings will be inspected for cracks, spalling, blistering, chips, or staining (only an indicator).

At a minimum frequency of once per year, the fire suppression systems at the Central Container Storage Area and the 800 Storage Area will be inspected to confirm that they are in working order. The components that will be inspected include the automatic sprinkler systems, the pumping systems that feeds the sprinkler system, and the fire hydrants. The pressure gauges will be inspected for malfunction or calibration drift.

SUBPART BB INSPECTION AND REPAIRS

Refer to Subpart BB Air Emissions Standards for Equipment Leaks (Permit Attachment L) for more information. At a minimum frequency of once per week, the following equipment will be inspected:

- Pumps in light liquid service will be inspected in accordance with 40 CFR 264.1052
- Flanges and other connectors will be inspected in accordance with 40 CFR 264.1058
- Heritage has opted to monitor valves in light liquid services per 40 CFR 264.1061
- Monitoring shall comply with 40 CFR 264.1063(b)
- All repairs will be in compliance with 40 CFR 264 Subpart BB

SUBPART CC INSPECTION

At a minimum, containers will be visually inspected for cracks, holes, gaps, or other spaces into the interior of the container as required in 40 CFR Part 264, Subpart CC. Refer to the Subpart CC Inspection and Monitoring Plan (Permit Attachment H) for more information.

- If waste is added to a container at the facility, the initial inspection must be performed promptly upon adding waste to the container.

- If waste is already in the container, the initial inspection must be performed at the time the container is being accepted at the facility.
- If a container remains at the facility for a period of one year or more, the visual inspection must be repeated once every 12 months.

CHECKLISTS

Heritage maintains checklists documenting inspections of each area subject to daily, weekly, monthly, and annual inspections. Samples of these checklists are provided in the following pages. An entry will be made on the relevant checklist for each item subject to inspection and will include the printed name and signature of the inspector and the date of the inspection.

Table D-A
Safety and Security Equipment[1]
Heritage Environmental Services, LLC
Coolidge, AZ

Equipment	Location	Manufacturer	Model Number	Inspection Frequency[2]	Comment
Phones	Offices	AT&T	2-line speaker phones model 993	Daily	
Paging System	Front Office and Warehouse Breakroom	ADT/Cortelco	C-123LW LEM	Daily	Speakers in 600,Dock, 300, Scalehouse and Warehouse
Radios	With Each Staff Member	Nextel	Varies	Daily	
Air Horn	Emergency Equipment Cabinet	Falcon Signal Horns	Varies	Weekly	
Surveillance Cameras	Recording Unit in Scalehouse	ADT \ GE	DIVAR Digital Versatile Recorder	Daily	Locations throughout the facility
Auto Dialer	Scalehouse	ADT	control panel - model Vista 50P	Annual	
Fire Suppression System					
Tanks	South side of property near Central Storage Area at Pumphouse	N/A	N/A	Daily	
Diesel Fire Pump	South side of property near Central Storage Area at Pumphouse	Aurora Pump/Cummins Diesel	Model 4-491-14C/CFP39-F15	Annual	System inspection
Pump Controller	Pumphouse on south side of property near Central Storage Area	Metron	FD4	Annual	System inspection
Sprinkler System	Central Storage Area and 800 Storage Area	Varies	Varies	Annual	System inspection
Foam System	South side of 600 Building adjacent to main feed riser	Ansul AR-AFFF System	Varies	Annual	System inspection
Alarms/Monitors	Throughout Central Storage Area and 800 Storage Area	Varies	Varies	Annual	System inspection
Heat detection cable	Dock and Van Container Storage Area & Bulk Loading / Unloading Area	Safe Fire Detection, Inc.	Thermo Cable	NA	Does not require inspection, in the event that the signal becomes disconnected the fire alarm will sound
Horn / strobe lights	Dock and Van Container Storage Area, Central Storage Area, 800 Area Storage	System Sensor	SpectrAlert Advance	Annual	System inspection
Pull alarms	Outside 800, Central Storage Area, 800 Area Storage. and inside main office	Varies	Varies	Annual	System inspection
Smoke alarms	Main office and Scaleroom	Varies	Varies	Annual	System inspection
Photoionization Smoke alarms	Central Storage Area and 800 Storage Area	Fenwall		Annual	System inspection
Beam smoke detection system	Central Storage Area and 800 Storage Area	Xtralis	OSID	Annual	System inspection
Fire hydrants	South of 600 at fence and East of 300 at fence			Annual	
Fire extinguishers - hand held	Throughout the facility	Badger Fire Protection	Varies	Weekly	
Fire extinguishers - wheeled	Noth side of Central Storage Area, Outside SE corner of Central Storage Area	Badger Fire Protection	Badger 150	Weekly	
Foam canisters	4 55-gal drums, stored on N side of 800 Building			Monthly	
Automatic gate	South Fence on Property	Controls from ADT	Brivo System	Monthly	

Notes:

(1) New or updated equipment may be purchased and installed as it becomes available. Equipment may be replaced with functionally equivalent equipment
(2) Heritage established inspection frequency. Changes to inspection frequencies may be made up to the frequency specified in the applicable rules by submittting a Class 1 Permit Modification to ADEQ, in accordance with 40 CFR Part 270.42.

Heritage Environmental Services, LLC

Daily Inspection Findings Form

Item: **Paging System** **Date:** **Name:** **Page:**

Finding		Corrective Action or Scheduled Date for Correction	Completed (Signature, Printed Name, Date)
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:

EXAMPLE FORM

M = Maintenance H = Housekeeping

Heritage Environmental Services, LLC

Weekly Inspection Findings Form

Item:
Fire Extinguishers - Hand Held

Week of:

Name:

Page:

Finding		Corrective Action or Scheduled Date for Correction	Completed (Signature, Printed Name, Date)
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:

M = Maintenance H = Housekeeping

Heritage Environmental Services, LLC

Annual Inspection Findings Form

Item: **Fire Hydrants** **Year:** **Name:** **Page:**

Finding		Corrective Action or Scheduled Date for Correction	Completed (Signature, Printed Name, Date)
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:
	M		By:
	H		Date:

EXAMPLE FORM

M = Maintenance H = Housekeeping

Heritage Environmental Services, LLC

Daily Rail Spur Inspection (Inspection Log for Waste Railcars)
(from SOP #HS-49 Railcar Operations)

Heritage Daily Rail Spur Inspection (Inspection Log for Waste Railcars)

Date / Time of Inspection	Railcar / Trailer #	Material(s) Staged	Date of Arrival	Date of Departure	Time of Loading / Unloading	Leaking?	Security Measures in Place	DOT Placards present	Inspection Current	Inspected By	Comments
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		
						Y / N / NA	Y / N / NA	Y / N / NA	Y / N		

Revision 6 – 4-15-14

Page 10 of 21

EXAMPLE FORM

Heritage Environmental Services, LLC

Tank Car Inspection Checklist – Upon Arrival - Full
(from SOP #HS-49 Railcar Operations)

Heritage Railcar Inspection - Prior to unloading inspection
Tank Car Inspection Checklist - Upon Arrival - Full

Date: _____ Tank Car No. _____

Contents: _____

Inspector: _____ Unloader: _____ Doc #: _____

	Inspector's initials
1. Blue "Caution Men At Work" Sign on Track	
2. Hand brake set, wheels chocked, derail set	
3. Tank car bonded an/or grounded (if applicable)	
4. Placards on all four sides	
5. All valve closed with no leaks prior to opening	
6. Examine all fittings, seals, and gaskets	
7. Exterior condition of tank	
8. Mechanical integrity of car (visual inspection)	
9. Railcar exhibits no sign or leaking	
10. Belly valve is securely closed	
11. All handrails are good condition	

Comments/Problems Noted:
If Railcar has a problem or defect requiring corrective action please explain below.
(Include actions taken to correct issue, corrected by, supervisor initial, and date corrected)

Signature _____ Inspection date _____

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EXAMPLE FORM

Heritage Environmental Services, LLC

Tank Car Inspection Checklist – Upon Arrival - Empty
(from SOP #HS-49 Railcar Operations)

Heritage Railcar Inspection – Receipt of Empty Car
Tank Car Inspection Checklist - Upon Arrival – Empty

***Verify proper chocking and signage is in place prior to inspection**

Car #	Man Way	Valve Box / Valves	Bottom Caps	Date & Time	Comments	Signature

*If Railcar has a problem or defect requiring corrective action please explain in comments above and do not begin loading until actions have been taken to correct issue

Heritage Railcar Inspection - Prior to Shipping Outbound

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EXAMPLE FORM

Heritage Environmental Services, LLC

Tank Car Inspection Checklist – Outboard Railcar
(from SOP #HS-49 Railcar Operations)

EXAMPLE FORM

Tank Car Inspection Checklist – Outbound Railcar

Date:_____ Tank Car No._____ Prior Contents: _____

Seal #(s):_____

		Initial Below Inspector 1	Inspector 2
1	Within maximum load limit		
2	Correct outage observed		
3	Valves with lock pins are closed and secure		
4	All unloading connections/hose/fittings are removed		
5	Bottom outlet cap tightened and secured with a 36" wrench		
6	Steam coil inlet and outlet caps are hanging (if applicable)		
7	Manway gasket is in good condition, replace if necessary		
8	Manway cover is closed on seated gasket, and security seal is in place		
9	Manway bolts tightened with wrench using star pattern (torque tight)		
10	*Under protective housing*, valves are closed and plugs/caps/nuts wrench tight		
11	Safety relief vent / valve checked (replace frangible disk if needed)		
12	Protective housing is secured in place with lock pin and security seal		
13	All four sides are properly placarded and stenciling legible		
14	All non-DOT placards / markings (i.e. used oil) removed		
15	All tank car safety / inspection test dates are current		
16	Grounding / Bonding devices removed		
17	Under frame checked for wear plates, springs, loose equipment, railings, etc		
18	Exterior is clean and free of spills or residue		

The chocks and blue "Caution" sign should not be removed until the railcar is ready for pick-up.

Inspector 1 from above: Printed Name: _____ Signature: _____

Inspector 2 from above. Printed Name: _____ Signature: _____

*If Railcar has a problem or defect requiring corrective action please explain below:
(Include actions taken to correct issue, corrected by, supervisor initial, and date corrected)

Supervisor's Signature _____ Date _____

Appendix B – Tank Car – General Information

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APPENDIX D-B

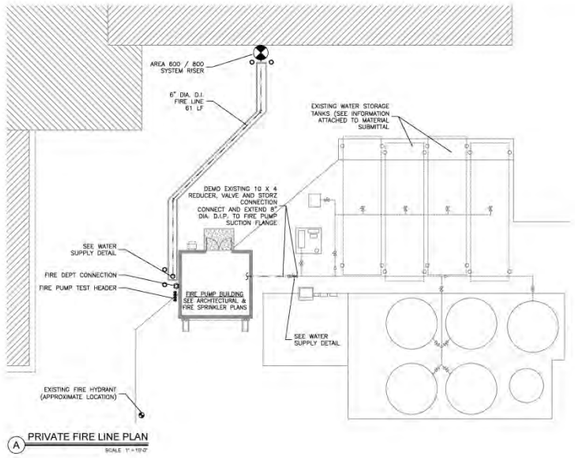
ELECTRONIC SECURITY SYSTEMS

CONTENTS OF THIS APPENDIX HAVE BEEN PLACED IN THE HERITAGE CONFIDENTIAL FILE

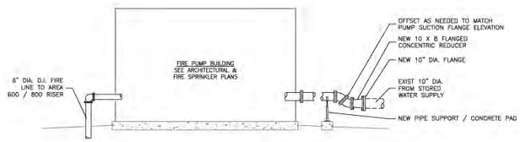
APPENDIX D-C

FIRE SUPPRESSION SYSTEM DIAGRAMS

AS-BUILT PUMP, AR-AFFF FOAM, AND PIPING SYSTEM



A PRIVATE FIRE LINE PLAN
SCALE: 1" = 10'-0"



B WATER SUPPLY DETAIL
SCALE: 1/4" = 1'-0"

GENERAL NOTES

1) ALL CONSTRUCTION SHALL CONFORM TO LOCAL AND NATIONAL STANDARDS
2) ALL MATERIALS AND INSTALLATION SHALL COMPLY WITH NFPA 24, 13 AND ALL LOCAL REQUIREMENTS.
3) ALL TRENCHING, BACKFILL AND PAVEMENT REPLACEMENT SHALL CONFORM TO MAG STANDARD DETAILS.
4) ALL PIPING SHALL BE CLASS 350 DUCTILE IRON, POLY-WRAPPED PER DDPM 61-1 8041 WITH MECHANICALLY RESTRAINED JOINTS
5) AN APPROVED SET OF DRAWINGS SHALL BE AVAILABLE ON THE JOB SITE AT ALL TIMES
6) ALL PIPE AND MATERIALS SHALL BE PER NFPA 24
7) ALL PIPE SHALL HAVE A MINIMUM BURY DEPTH OF 36" (FROM TOP OF PIPE)
8) PIPING SHALL BE FLUSHED AND TESTED PER NFPA 24

SCOPE / INSTALLATION NOTES

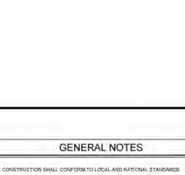
OWNER:	HERITAGE ENVIRONMENTAL SERVICES LLC 7501 W MORRIS ST INDIANAPOLIS, INDIANA 46231
PROJECT ADDRESS:	HERITAGE ENVIRONMENTAL SERVICES 5122 E. STOREY ROAD COOLIDGE, ARIZONA
PROJECT ARCHITECT:	HOLLON DESIGN ASSOCIATES, LLC 5470 S. LAKESHORE DRIVE, SUITE 104 TEMPE, ARIZONA 85283
FIRE SPRINKLER CONTRACTOR:	ARIZONA VERDE FIRE PROTECTION 3115 N. 29TH DR PHOENIX, ARIZONA 602-278-1111
APPLICABLE CODES:	INTERNATIONAL FIRE CODE (2003) / NFPA 13 & 24 (2002)
AUTHORITY HAVING JURISDICTION:	ARIZONA STATE FIRE MARSHAL

SCOPE / INSTALLATION NOTES

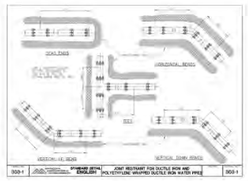
1) CONNECTION TO EXISTING STORED WATER SUPPLY
2) PIPING FROM STORED WATER SUPPLY TO FIRE PUMP SUCTION FLANGE.
3) INSTALLATION OF APPROXIMATELY 61 LF OF NEW 8" D.I.P. PRIVATE UNDERGROUND FIRE LINE FROM FIRE PUMP DISCHARGE TO AREA 600 / 800 RISER.
4) AVFP WILL COORDINATE NEW PIPE ROUTING WITH EXISTING FIELD CONDITIONS

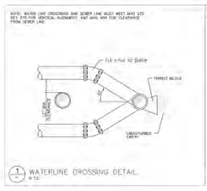
SYMBOLS

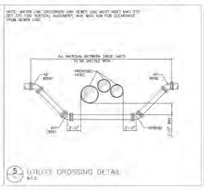
	UNDERGROUND PIPE
	EXISTING FIRE HYDRANT
	FIRE DEPARTMENT CONNECTION
	AUTOMATIC FIRE SPRINKLER SYSTEM RISER
	EXISTING VALVE
FDC	FIRE DEPARTMENT CONNECTION
(E) / EXIST	EXISTING

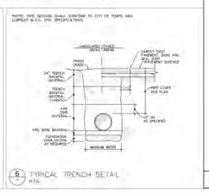


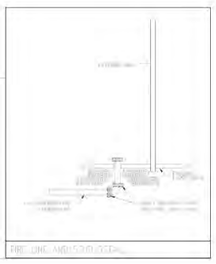
VICINITY MAP











1) WATERLINE CROSSING DETAIL
N.T.S.

2) SEWER CROSSING DETAIL
N.T.S.

3) TYPICAL TRENCH DETAIL
N.T.S.

FIRE LINE AND LOOP DETAIL

602-263-1100
1-800-STAKE-IT

1"=10'-0"
40 0 40 80

1/4"=1'-0"
0 4 8

FIRE PROTECTION SHOP DRAWING

JAMES H. SAWYER, CET
WATER-BASED SYSTEMS LAYOUT
LEVEL 3
NICET # 96895

Arizona Verde Fire Protection
3115 N. 29th Avenue
Phoenix, AZ 85017
Phone: (602)278-1111 FAX: (602)278-1114
Arizona State Contractors License: ROC 177239

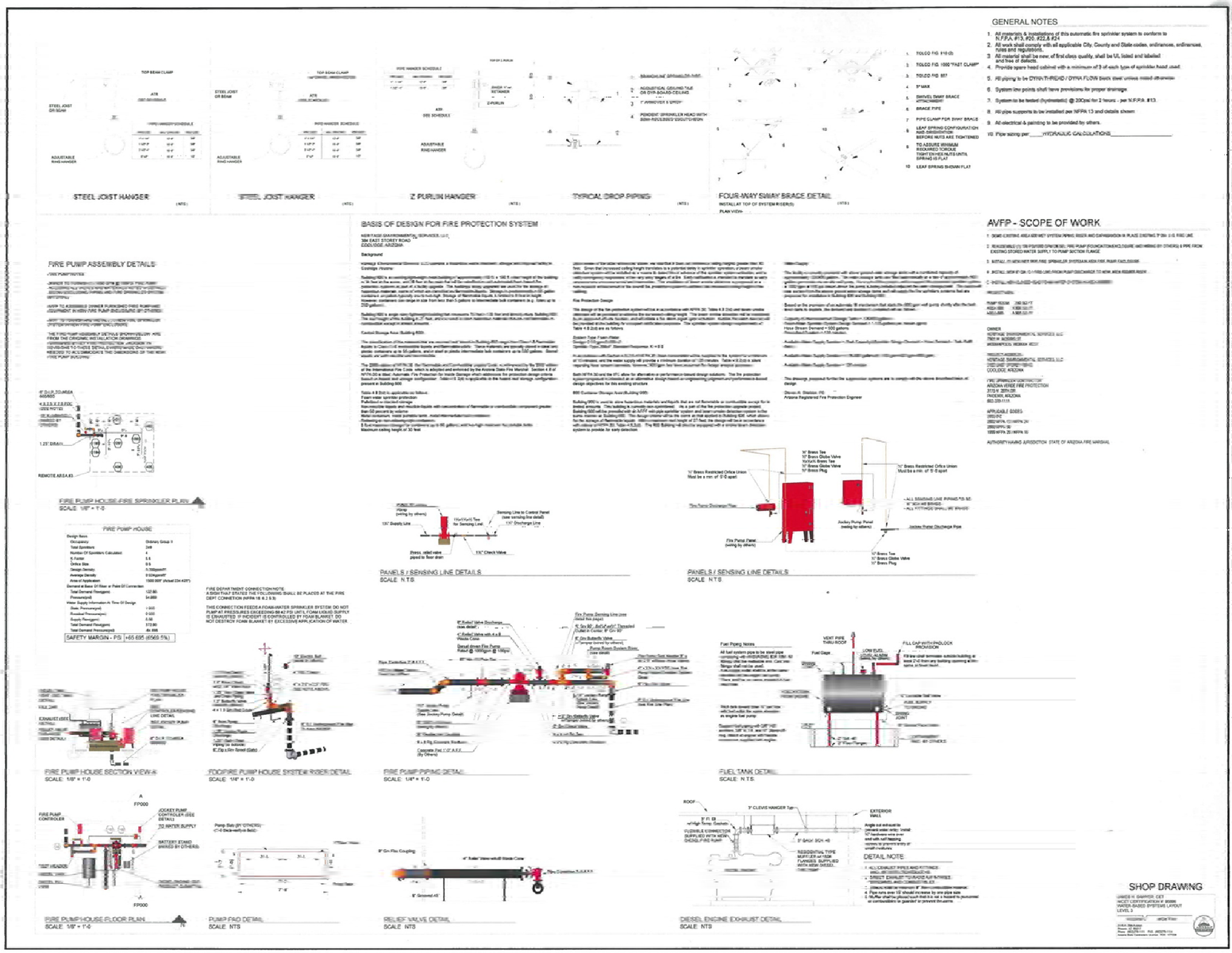
REVISIONS:
AS BUILT 8/27/2014

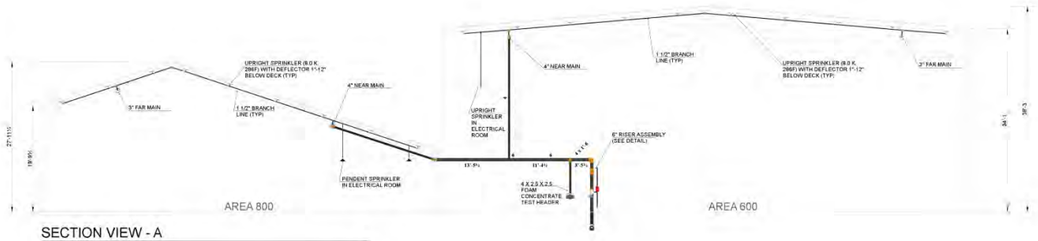
DATE: 3/19/2014
SCALE: AS NOTED
DRAWN BY: SAS
PROJECT NO: 114004
CHECKED BY: SAS

Sheet Title:
PRIVATE FIRE LINE PLAN

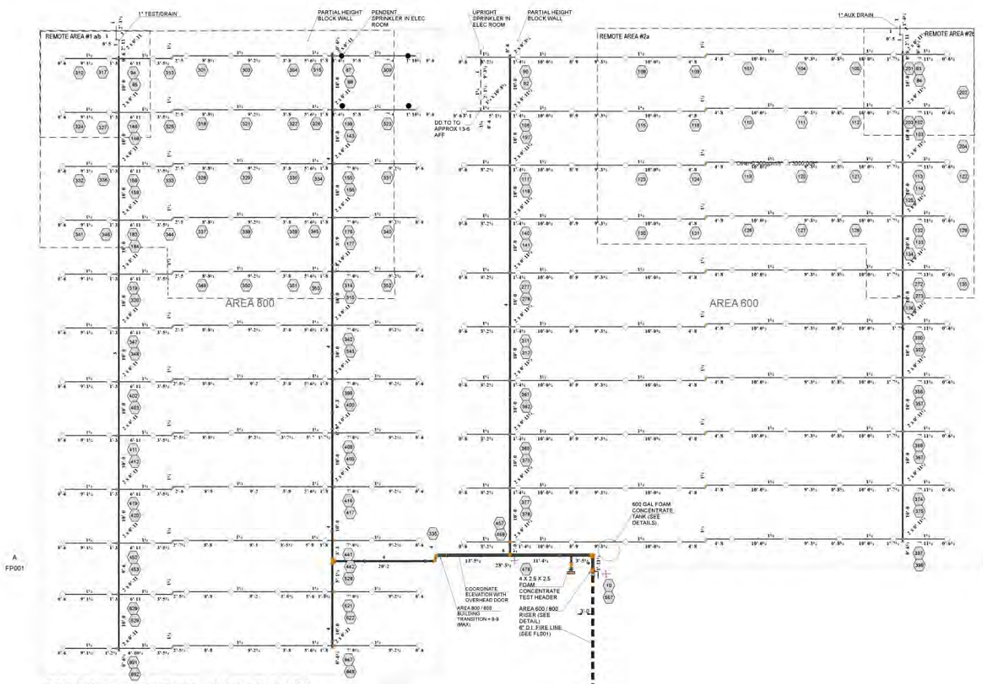
SHEET #
FL001

HERITAGE ENVIRONMENTAL SERVICES, LLC
NEW FIRE LINE
5122 E. STOREY ROAD
COOLIDGE, ARIZONA


STEEL JOIST HANGER
STEEL JOIST HANGER
Z PURLIN HANGER
TYPICAL DROP PIPING
FOUR-WAY SWAY BRACE DETAIL
GENERAL NOTES
1. All materials & installations of this automatic fire sprinkler system to conform to N.F.P.A. #13, #20, #22,& #24
2. All work shall comply with all applicable City, County and State codes, ordinances, ordinances, rules and regulations.
3. All material shall be new, of first class quality, shall be UL listed and labelled and free of defects.
4. Provide spare head cabinet with a minimum of 3 of each type of sprinkler head used.
5. All piping to be CPVC/H-THREAD / CPVC FLOW Swich steel unless noted otherwise
6. System line points shall have provisions for proper drainage
7. System to be tested (hydrostatic) @ 200psi for 2 hours - per N.F.P.A. #13.
8. All pipe supports to be installed per NFPA 13 and details shown
9. All electrical & painting to be provided by others.
10. Pipe sizing per ____HYDRAULIC CALCULATIONS_____
FIRE PUMP ASSEMBLY DETAILS
BASIS OF DESIGN FOR FIRE PROTECTION SYSTEM
AVFP - SCOPE OF WORK
FIRE PUMP HOUSE-FIRE SPRINKLER PLAN
SCALE: 1/8" = 1'-0
FIRE PUMP HOUSE
SAFETY MARGIN - PS: +65 695 (6565.5%)
PANELS / SENSING LINE DETAILS
SCALE: N.T.S
PANELS / SENSING LINE DETAILS
SCALE: N.T.S
FIRE PUMP HOUSE SECTION VIEW-A
SCALE: 1/8" = 1'-0
FOOTPRE PUMP HOUSE SYSTEM RISER DETAIL
SCALE: 1/4" = 1'-0
FIRE PUMP PIPING DETAIL
SCALE: 1/4" = 1'-0
FUEL TANK DETAIL
SCALE: N.T.S.
FIRE PUMPHOUSE FLOOR PLAN
SCALE: 1/8" = 1'-0
PUMP PAD DETAIL
SCALE: NTS
RELIEF VALVE DETAIL
SCALE: NTS
DIESEL ENGINE EXHAUST DETAIL
SCALE: NTS
DETAIL NOTE
SHOP DRAWING
Arizona Verde Fire Protection
3115 N. 29th Avenue
Phoenix, AZ 85017
Phone (602)278-1111 FAX (602)278-1114
Arizona State Contractor's License: ROC 177239
HERITAGE ENVIRONMENTAL SERVICES, LLC
5122 E. STOREY ROAD
COOLIDGE, ARIZONA
REVISIONS
SCALE: AS NOTED
PROJECT NO: 114004
FIRE SPRINKLER DETAILS, NOTES & SYMBOLS
SHEET #
FP000



SECTION VIEW - A
SCALE: 1/8" = 1'-0"



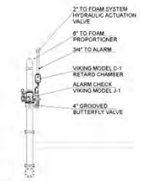
FIRE SPRINKLER PLAN - AREA 600 & 800
SCALE: 1/8" = 1'-0"

REMOTE AREA #1a - MAX FOAM DEMAND	
Design Basis:	
Occupancy:	Other
Total Sprinklers:	249
Number Of Sprinklers Calculated:	33
K-Factor:	8
Orifice Size:	0.531
Design Density:	0.300gpm/ft²
Average Density:	0.332gpm/ft²
Area of Application:	3000.00ft² (Actual 3043.06ft²)
Demand at Base Of Riser or Point Of Connection	
Total Demand Flow(gpm):	1026.06
Pressure(psi):	80.820
Water Supply Information At Time Of Design	
Static Pressure(psi):	1.000
Residual Pressure(psi):	0.500
Supply Flow(gpm):	0.00
Total Demand Flow(gpm):	1526.06
Total Demand Pressure(psi):	-32.681
SAFETY MARGIN - PSI	+15.649 (1584.9%)

REMOTE AREA #1b - MIN FOAM DEMAND	
Design Basis:	
Occupancy:	Other
Total Sprinklers:	249
Number Of Sprinklers Calculated:	4
K-Factor:	8
Orifice Size:	0.531
Design Density:	0.300gpm/ft²
Average Density:	0.278gpm/ft²
Area of Application:	406.79ft² (Actual 406.79ft²)
Demand at Base Of Riser or Point Of Connection	
Total Demand Flow(gpm):	112.93
Pressure(psi):	28.041
Water Supply Information At Time Of Design	
Static Pressure(psi):	1.000
Residual Pressure(psi):	0.500
Supply Flow(gpm):	0.00
Total Demand Flow(gpm):	612.93
Total Demand Pressure(psi):	-92.877
SAFETY MARGIN - PSI	+93.876 (9387.6%)

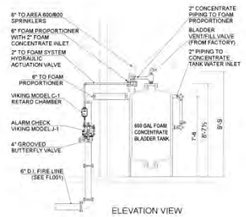
REMOTE AREA #2a - MAX FOAM DEMAND	
Design Basis:	
Occupancy:	Other
Total Sprinklers:	249
Number Of Sprinklers Calculated:	30
K-Factor:	8
Orifice Size:	0.531
Design Density:	0.300gpm/ft²
Average Density:	0.331gpm/ft²
Area of Application:	3000.00ft²
Demand at Base Of Riser or Point Of Connection	
Total Demand Flow(gpm):	951.18
Pressure(psi):	68.937
Water Supply Information At Time Of Design	
Static Pressure(psi):	1.000
Residual Pressure(psi):	0.500
Supply Flow(gpm):	0.00
Total Demand Flow(gpm):	1451.18
Total Demand Pressure(psi):	-29.864
SAFETY MARGIN - PSI	+29.842 (2984.2%)

REMOTE AREA #2b - MIN FOAM DEMAND	
Design Basis:	
Occupancy:	Other
Total Sprinklers:	249
Number Of Sprinklers Calculated:	4
K-Factor:	8
Orifice Size:	0.531
Design Density:	0.300gpm/ft²
Average Density:	0.298gpm/ft²
Area of Application:	406.79ft² (Actual 406.79ft²)
Demand at Base Of Riser or Point Of Connection	
Total Demand Flow(gpm):	120.41
Pressure(psi):	25.937
Water Supply Information At Time Of Design	
Static Pressure(psi):	1.000
Residual Pressure(psi):	0.500
Supply Flow(gpm):	0.00
Total Demand Flow(gpm):	620.41
Total Demand Pressure(psi):	-85.647
SAFETY MARGIN - PSI	+86.648 (8664.6%)

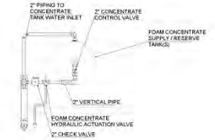


RISER DETAIL
SCALE: 1/4" = 1'-0

THIS RISER SERVES 115 SPRINKLERS AND 18,700 SQ. FT.



ELEVATION VIEW



PLAN VIEW

FOAM SUPPLY DETAILS
SCALE: 1/8" = 1'-0"

FOAM / WATER DESIGN DATA

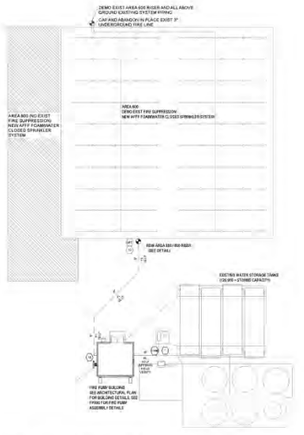
TYPE OF SYSTEM:
AUTOMATIC FOAM / WATER
CLOSED SPRINKLER WITH 3 X 3 LOW-VISCOSITY AR-AFFF 3% FOAM CONCENTRATE

SUPPLY SIDE CALCULATED FLOW:

OVERHEAD FOAM / WATER SPRINKLERS: 1155.12 GPM (REMOTE AREA 1a)
HOSE STREAM ALLOWANCE: 500 GPM
TOTAL FLOW: 1655.12 GPM
TOTAL WATER CAPACITY: 1655.12 GPM SYSTEM DEMAND - 600 GPM REFILL RATE X 120 MIN = 126,615 GAL

FOAM CONCENTRATE SUPPLY CALC:
PER NFPA 30 (2020) A.8.2.6
ACTUAL SYSTEM DISCHARGE (REMOTE AREA 1a) = 1155.12 GPM
1155.12 GPM X 3% = 34.6536 X 10 MIN = 519.804 GAL FOAM CONCENTRATE REQUIRED
(600 GAL FOAM CONCENTRATE WILL BE FURNISHED FOR ACCEPTANCE TESTING AND ANY VARIANCE THAT MAY OCCUR IN FIELD PROPORTIONING)

FOAM SYSTEM ACCEPTANCE TESTING TO BE IN ACCORDANCE WITH NFPA 16 CHAPTER 8



KEY / HYDRAULIC REFERENCE PLAN
SCALE: 1" = 20'-0"

GENERAL NOTES

1. All materials & installations of this automatic fire sprinkler system to conform to N.F.P.A. #13, #20, #22 & #24
2. All work shall comply with all applicable City, County and State codes, ordinances, rules and regulations.
3. All material shall be new, of first class quality, shall be UL listed and labeled and free of defects.
4. Provide spare head cabinet with a minimum of 3 of each type of sprinkler head used.
5. All piping to be DYNA THREAD / DYNA FLOW black steel unless noted otherwise
6. System low points shall have provisions for proper drainage.
7. System to be tested (hydrostatic) @ 200psi for 2 hours - per N.F.P.A. #13.
8. All pipe supports to be installed per NFPA 13 and details shown
9. All electrical & painting to be provided by others.
10. Pipe sizing per:____HYDRAULIC CALCULATIONS_____

SYMBOLS

- 8" / 1'-0" — UNDERGROUND PIPE SIZE / LENGTH (FOR HYDRAULIC REFERNCE ONLY)
- 1" / 1'-0" — NEW OVERHEAD PIPE SIZE / LENGTH
- 4" X 1'-0" — VERTICAL PIPE
- XX — HYDRAULIC REFERENCE NODE
- TYPICAL PIPE HANGER
- 4-WAY SWAY BRACE

SPRINKLER HEAD LEGEND - SHEET TOTAL

SYMBOL	MAKE / DESCRIPTION	SIN	RESPONSE TYPE	TYPE	THREAD	ORIFICE	K-FACTOR	TEMP.	FINISH	REMARKS	QTY.
○	TYCO UPRIGHT	TY4151	SR	SSU	3/4"	3/4"	8.0	286°	BRASS	--	214
●	TYCO PENDENT	TY4251	SR	SSP	3/4"	3/4"	8.0	286°	BRASS	--	4

QR = QUICK RESPONSE
SR = STANDARD RESPONSE
SSU = STANDARD SPRAY UPRIGHT
SSP = STANDARD SPRAY PENDANT
HSW = HORIZONTAL SIDEWALL
TOTAL 218

SHOP DRAWING

JAMES H. SAWYER, CET
NICET CERTIFICATION #: 96891
WATER-BASED SYSTEMS LAYOUT LEVEL 3

Arizona Verde Fire
3115 N. 29th Avenue
Phone: (602)278-1111 FAX: (602)278-1114
Arizona State Contractors License: ROC 177239

STEVEN A. SHELDON
Exp. 03/31/2015

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Arizona Verde Fire Protection
3115 N. 29th Avenue
Phoenix, AZ. 85017
Phone: (602)278-1111 FAX: (602)278-1114
Arizona State Contractors License: ROC 177239

HERITAGE ENVIRONMENTAL SERVICES, LLC
5122 E. STOREY ROAD
COOLIDGE, ARIZONA

REVISIONS:
AS BUILT 8/27/2014

DATE: 3/28/2014
SCALE: AS NOTED
DRAWN BY: JS
PROJECT NO. 113004
CHECKED BY: DAS

Sheet Title:
FIRE SPRINKLER PLAN AREA 600 & 800

SHEET #
FP001

AS BUILT PUMPHOUSE

HERITAGE ENVIRONMENTAL SERVICES
FIRE PUMP HOUSE
284 E STOREY ROAD
COOLIDGE, ARIZONA 85128

SYMBOL LEGEND

ARCHITECTURAL SYMBOLS

MATERIAL INDICATIONS

PARTITION INDICATIONS

GENERAL NOTES

PROJECT DIRECTORY

SHEET INDEX

PROJECT SITE

CITY OF COOLIDGE

VICINITY MAP N.T.S.

BUILDING CODE DATA

AREA OF WORK

CITY OF COOLIDGE

LOCATION MAP N.T.S.

SAFETY

SPECIAL INSPECTIONS

FIRE SPRINKLERS (DEFERRED SUBMITTAL)

DEFERRED SUBMITTALS

PROJECT DESCRIPTION

AS-BUILD

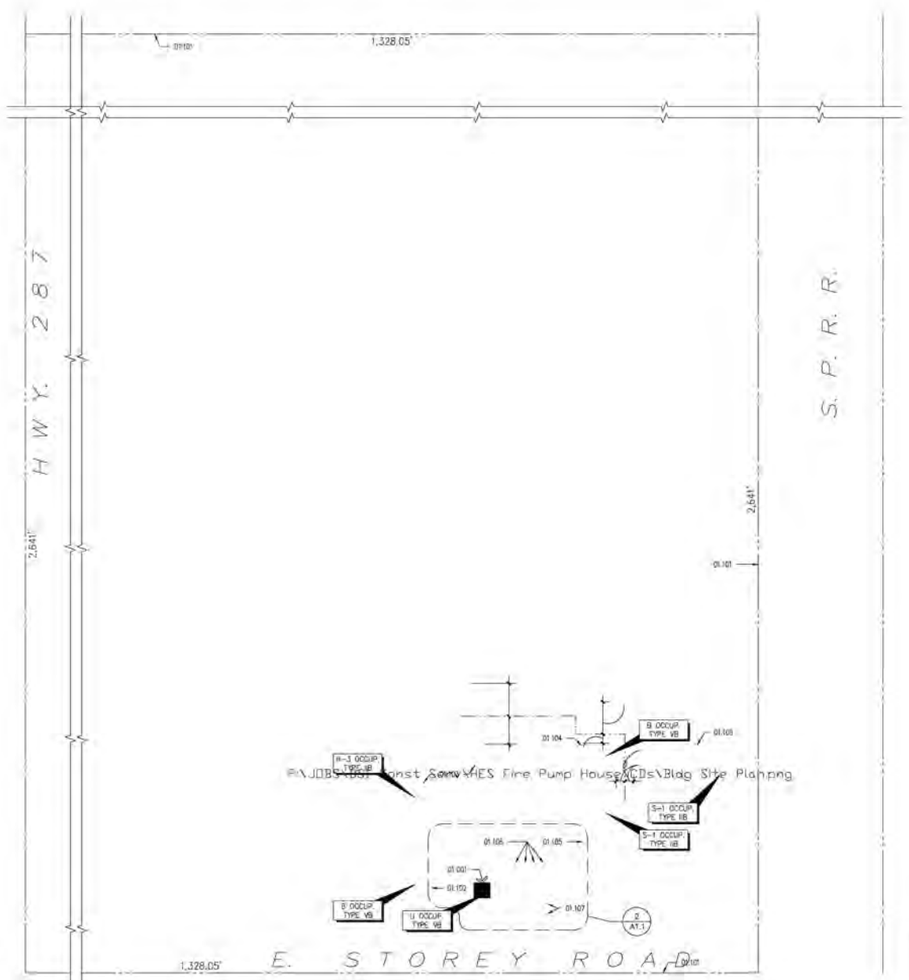
BSI Construction Services
8112 W. Buckeye Road
Phoenix, AZ 85043
602 936 6525
www.bsi-co.com

HOLDEN DESIGN ASSOCIATES, LLC

PROJECT NO: 1402

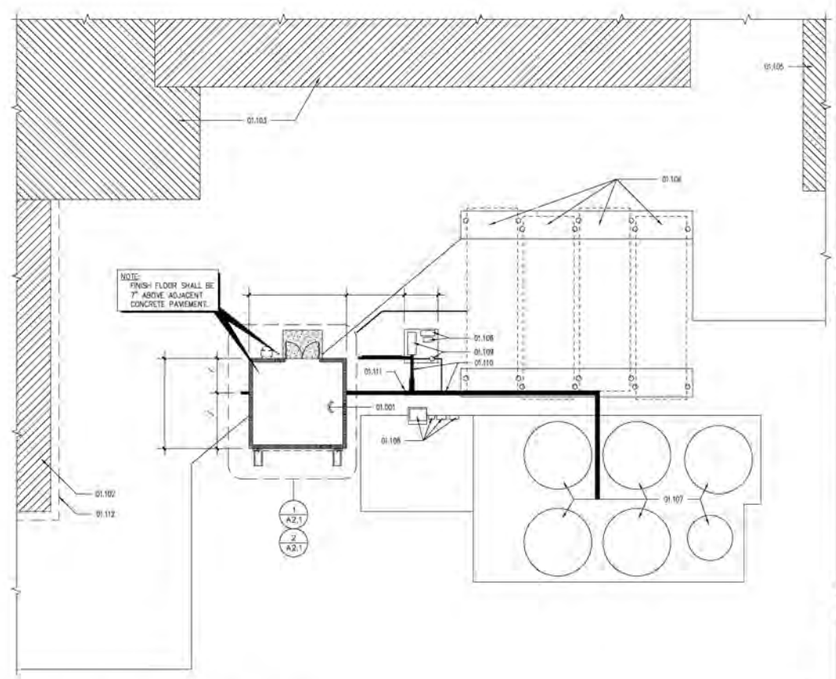
SET NO. _____

1402 HERITAGE ENVIRONMENTAL SERVICES FIRE PUMP HOUSE



1 PLANT SITE PLAN

1"=60'-0"



2 PUMP HOUSE SITE PLAN

1"=10'-0"

AREA CALCULATION

BUILDING AREA vs. ALLOWABLE AREA for COMBINED BUILDING:

Building Areas:

Office Building:	2,612 SF
Areas 600 & 800:	17,350 SF
Laboratory Building:	1,168 SF/per Floor
Area 500:	3,852 SF
Fire Pump House:	278 SF
Total Building Area:	25,300 SF

Allowable Areas:

For Group B, Type VB, non-sprinklered:
9,000 SF (tabular)
For Group S-1, Type IIB, non-sprinklered:
17,500 SF (tabular)
For Group H-3, Type IIB, sprinklered:
34,000 SF
+42,000 SF for fire sprinklers
56,000 SF
For Group U, Type IIB, sprinklered:
5,500 SF (tabular)
+16,500 SF for fire sprinklers
22,000 SF

Mixed Area Calculation:

$\frac{2,612}{9,000} + \frac{17,350}{56,000} + \frac{1,168}{9,000} + \frac{3,852}{17,500} + \frac{278}{22,000} = 0.96 \leq 1.0$

KEYNOTES

DIVISION 1 – GENERAL REQUIREMENTS

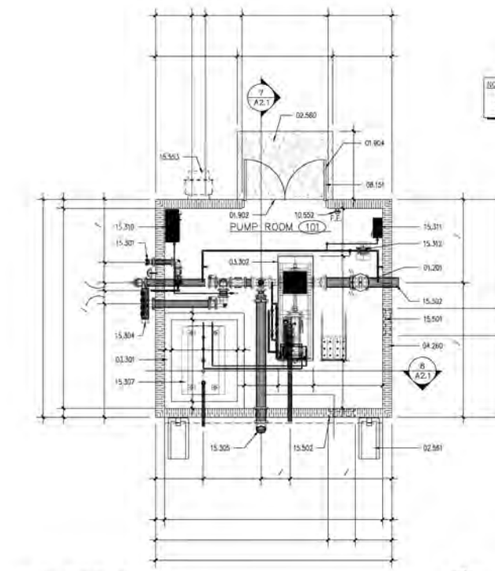
01.000 SCOPE OF WORK – FIRE PUMP HOUSE:
Provide new masonry building for the installation of a new fire pump for a portion of the plant. Work to include excavation for concrete footing, concrete footing, load-bearing masonry walls, concrete floor slab, concrete equipment pedestals, hollow metal door, steel roof structure with metal roofing panels, mechanical, and electrical. The installation of the fire pump is to be done under a separate submittal and permit from the State Fire Marshal.

01.101 Property line.
01.102 Existing office building.
01.103 Existing storage buildings for flammable liquids. Installation of new automatic fire sprinkler system in Areas 600 and 800 to be done under a separate submittal and permit from the State Fire Marshal.
01.104 Existing laboratory building to remain as is.
01.105 Existing storage building with open sides to remain as is.
01.106 Existing elevated horizontal storage tanks for non-potable water to remain as is.
01.107 Existing water tanks. Water is supplied from an on-site well. Water from this system will be used for the new fire sprinkler system.
01.108 Existing electrical switchgear. See Electrical Drawings.
01.109 Existing electric motor driven water pump to remain.
01.110 Existing water piping to remain.
01.111 Connection point for new fire water piping per Fire Protection Drawings.
01.112 Dashed line indicates overhang of existing roof.

AS-BUILD

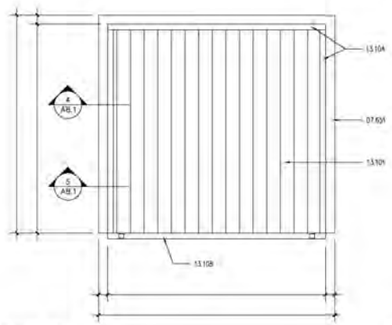
JOB: 1402
DATE: 3/12

SHEET A1.1 OF 5

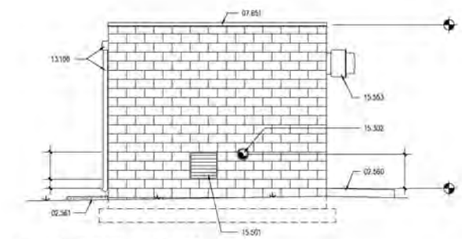


NOTE:
FINISH FLOOR SHALL BE 7" ABOVE ADJACENT CONCRETE PAVEMENT

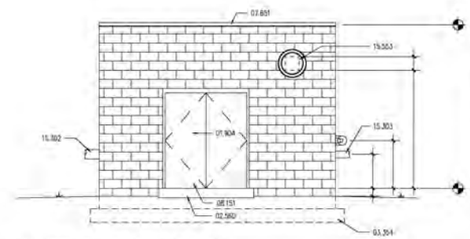
1 FLOOR PLAN 1/4"=1'-0"



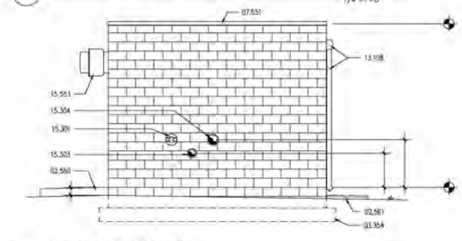
2 ROOF PLAN 1/4"=1'-0"



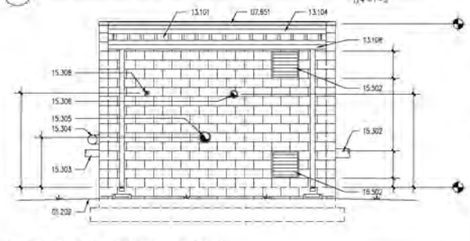
3 EAST ELEVATION 1/4"=1'-0"



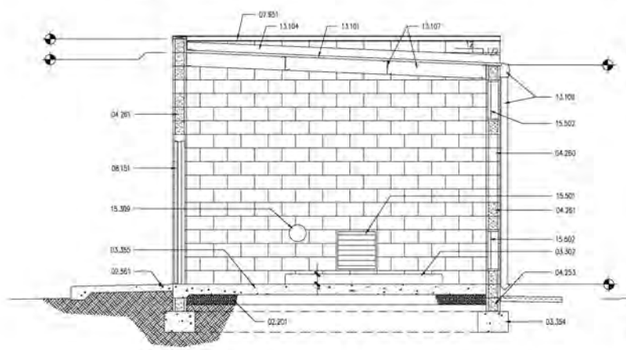
4 NORTH ELEVATION 1/4"=1'-0"



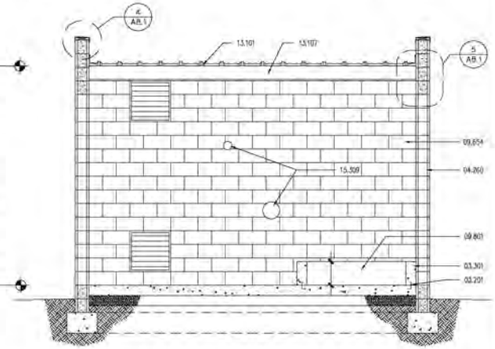
5 WEST ELEVATION 1/4"=1'-0"



6 SOUTH ELEVATION 1/4"=1'-0"



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



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

KEYNOTES

DIVISION 1 – GENERAL REQUIREMENTS

01.201 Fire protection piping, fire pump, diesel engine, fuel tank, etc. to be provided by Fire Protection contractor under a separate permit.

01.202 Line of existing grade.

01.902 Landing shall be flush with finish floor, typical.

01.904 Inactive door leaf.

DIVISION 2 – SITE WORK/DEMOLITION

02.201 6" compacted base course. See Structural Drawings.

02.560 4" concrete pad. Thicken edges to 8" at exposed edges.

02.561 Precast concrete splashblock.

DIVISION 3 – CONCRETE

03.201 Rubber waterstop. See Specifications and Structural Drawings.

03.301 Concrete containment curb. See Structural Drawings.

03.302 Concrete equipment pad. See Structural Drawings.

03.354 Concrete footing. See Structural Drawings.

03.355 Concrete floor slab. See Structural Drawings.

DIVISION 4 – MASONRY

04.253 Grout solid below grade.

04.260 Reinforced CMU wall. See Structural Drawings.

04.261 Reinforced bond beam. See Structural Drawings.

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07.851 Metal galvanized cap flashing. Prime and paint as scheduled.

DIVISION 8 – DOORS AND WINDOWS

08.151 Hollow metal door and frame.

DIVISION 9 – FINISHES

09.624 See Room Finish Schedule for wall finish.

09.801 Paint all exposed surfaces of concrete containment curbs and floors with polycarbonate film sealer. See Specifications.

DIVISION 10 – SPECIALTIES

10.552 ADA compliant wall mounted 2-A10-B.C fire extinguisher.

DIVISION 13 – SPECIAL CONSTRUCTION

13.101 Metal building galvalume roofing panels.

13.104 Parapet roof flashing.

13.107 8" metal "Z"-Girt and track edger. See Structural Drawings.

13.108 Continuous gutter and 4" x 4" down spout.

DIVISION 15 – PLUMBING

15.301 FDC by Fire Protection Contractor.

15.302 Fire water line to fire pump by Fire Protection Contractor.

15.303 Fire water line from fire pump to new fire sprinkler system by Fire Protection Contractor.

15.304 Fire water line to fire pump test header by Fire Protection Contractor.

15.305 Fire water relief pipe by Fire Protection Contractor.

15.306 Diesel exhaust pipe by Fire Protection Contractor.

15.307 Diesel fuel tank by Fire Protection Contractor. Set in concrete containment basin.

15.308 Diesel fuel fill pipe by Fire Protection Contractor.

15.309 Fire Protection Contractor to bore all openings in masonry wall for fire pump system.

15.310 Fire pump control panel to be installed by Fire Protection Contractor. See Electrical Drawings for power connection.

15.311 Jockey pump control panel to be installed by Fire Protection Contractor. See Electrical Drawings for power connection.

15.312 Electric jockey pump to be installed by Fire Protection Contractor. See Electrical Drawings for power connection.

DIVISION 15/6 – MECHANICAL

15.501 Ventilation louver. See Mechanical Drawings.

15.503 Combustion air louver. See Mechanical Drawings.

15.553 Exhaust fan. See Mechanical Drawings.

AS-BUILD

HOLDEN DESIGN ASSOCIATES, LLC
5470 S. LAKESHORE DR. SUITE 104
480-897-7145 FAX 480-897-7103
TEMPE, ARIZONA, 85283
architects@hda-az.com

HERITAGE ENVIRONMENTAL SERVICES, LLC
7284 E. STARR ROAD
FLORENCE, ARIZONA 85232

FLOOR PLAN
ROOF PLAN
BUILDING ELEVATIONS
BUILDING SECTIONS

JOB: 1402
DATE: 3/12

SHEET A2.1

ROOM FINISH SCHEDULE

ROOM NO.	ROOM NAME	FLOOR FINISH	BASE MATERIAL	WALLS NORTH MATERIAL	WALLS NORTH FINISH	WALLS EAST MATERIAL	WALLS EAST FINISH	WALLS SOUTH MATERIAL	WALLS SOUTH FINISH	WALLS WEST MATERIAL	WALLS WEST FINISH	CEILING MATERIAL	CEILING FINISH	CEILING HEIGHT	NOTES

ROOM FINISH SCHEDULE CODES

FLOOR	BASE	WALLS		CEILING	
FINISH	MATERIAL	MATERIAL	FINISH	MATERIAL	FINISH

GENERAL NOTES

NOTES

DOOR SCHEDULE

DOOR NO.	DOOR QTY	DOOR SIZE	DOOR MATL	FRAME MATL	FRAME DEPTH	FRAME MATCH	FRAME FIRE LABEL	DETAILS HEAD	DETAILS JAMB	DETAILS SILL	HARDWARE ITEMS HINGE	LATCH SET	FINISH/ FINISH PLT	K-PLAT	ASTRG.	THRES	SIL/ANS	DROPSTOP	SIGNS	DOOR BOTTOM	GLAZING	NOTES

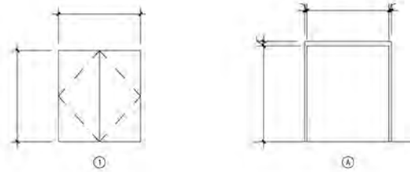
DOOR SIZES

FRAME DEPTH

NOTES

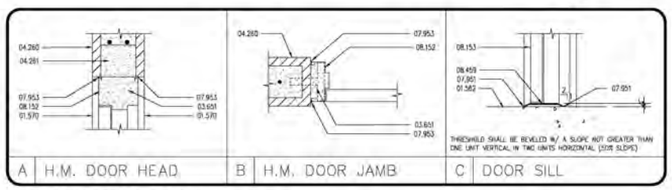
DOOR MATERIAL

FRAME MATERIAL

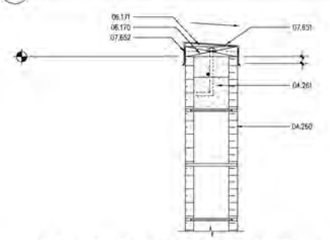


① DOOR ELEV. 1/4"=1'-0"

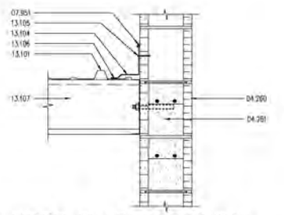
② FRAME ELEV. 1/4"=1'-0"



③ DOOR DETAILS 1-1/2"=1'-0"



④ CMU CAP FLASHING DETAIL 1-1/2"=1'-0"



⑤ ROOF FLASHING DETAIL 1-1/2"=1'-0"

KEYNOTES

DIVISION 1 – GENERAL REQUIREMENTS

01.562 Line of floor slab.

01.570 line of CMU wall beyond.

DIVISION 3 – CONCRETE

03.651 Grout hollow metal frames solid.

DIVISION 4 – MASONRY

04.260 Reinforced CMU wall. See Structural Drawings.

04.261 Reinforced bond beam. See Structural Drawings

DIVISION 6 – WOOD AND PLASTICS

06.170 Treated 2x6 continuous wood nailer, anchor @ 32" O.C. to bond Beam with 1/2" x 8" long anchor bolts.

06.171 Continuous nevamar color wing superex 4mm anchored to wood nailer.

DIVISION 7 – THERMAL AND MOISTURE PROTECTION

07.651 Metal galvanized cap flashing. Prime and paint as scheduled.

07.652 Continuous cleat each side, 24 gage min., fastened @ 8" o.c.

07.951 Sealant.

07.953 Sealant around all doors, windows, and other openings where two different materials meet. Typical for entire building.

08.152 Hollow metal frame. See Schedules and Elevations

08.459 Aluminum threshold, ADA compliant.

DIVISION 13 – SPECIAL CONSTRUCTION

13.101 Metal building galvalume roofing panels.

13.104 Parapet roof flashing.

13.105 Fasteners @ 12" o.c.

13.106 Mastic

13.107 6" metal "Z"-Girt and brick ledger. See Structural Drawings.

TECHNICAL SPECIFICATIONS

Division 2: SITE WORK/DEMOLITION

Section 02070 SELECTIVE DEMOLITION:
1. Extent of selective demolition work is indicated on Drawings.
2. Owner assumes no responsibility for actual condition of items or structures to be demolished.
3. Provide temporary barricades and other forms of protection as required to protect Owner's personnel and general public from injury due to selective demolition work.
4. Promptly repair damages caused to adjacent facilities by demolition work at no cost to the Owner.
5. Locate, identify, shut off and disconnect utility services that are not indicated to remain.
6. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both nature and extent of the conflict. Submit report to Owner's Representative in written, accurate detail. Pending receipt of directive from Owner's Representative rearrange selective demolition schedule as necessary to continue overall job progress without delay.
7. Remove debris, rubbish and other materials resulting from demolition operations from building site. Transport and legally dispose of materials off site.
8. Repair demolition performed in excess of that required. Return structures and surfaces to remain to condition existing prior to commencement of selective demolition work. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

Section 02200 EARTHWORK:
1. Locate existing underground utilities in areas of work. If utilities are to remain in place, support and protect during earthwork operations.
2. Barricade open excavations and post warning lights as required.
3. Excavation shall conform to elevations shown within 0.10'±.
4. Scarify/compact top 12" of subgrade and each layer of backfill or fill material to at least 95% standard proctor density. Moisture content should be at optimum to 3% above the optimum moisture content.
5. Uniformly grade areas to smooth finished surface within specified tolerances, compact with uniform levels or slopes between points where elevations are indicated or between such points and existing grades.
   A. Lawn, unpaved areas, walks 0.10"±
   B. Pavements 1/2"±
   C. Under building slabs 1/2" with 10' straightedge
6. Place subbase course material in layers of uniform thickness.

Section 02525 EXTERIOR CONCRETE PAVING:
1. Concrete sidewalk: (2500 psi strength.) Finish to match adjacent walks.
2. Concrete pavements: (3500 psi strength.) Finish to match existing pavements.
3. Apply light broom finish to all exterior concrete, unless noted otherwise.

Section 02658 FIRE WATER SYSTEMS:
1. See Fire Protection Drawings.

Division 3 – CONCRETE

Section 03215 WATERSTOPS:
1. Provide thermoplastic elastomeric rubber waterstops as manufactured by Greshec, St. Louis, Mo. (800-(138-7853), including:
   A. Waterstops embedded in concrete and spanning construction, control, expansion, or construction joints to create a continuous diaphram to prevent fluid migration.
2. Provide the following types where indicated on the Drawings:
   A. "Greshec" Envirostop 700 Series TPE-R, Style 735, 6" ribbed center bulb waterstop for liquid-tight joints between non concrete structures.
3. Splices:
   A. Provide factory fabricated waterstop intersections, leaving only straight butt joints for the field. Use Teflon covered thermoelectrically controlled waterstop splicing iron at 350 ± to 410 ± for 1'0-in
   B. Field make straight butt joint spliced per requirements for shop fabricated fittings.
4. Installation of ribbed (bar web and ribbed centerbulb waterstop:
   A. Use split formwork where required.
   B. Center waterstop on joint. Cast each half directly into fresh concrete.
   C. Allow clearance between waterstop and reinforcing steel to prevent rock pockets and are voids caused by aggregate bridging.
   D. At expansion joints, keep centerbulb positioned within the limits of the expansion joint material, to prevent centerbulb from being confined in concrete.
   E. Secure waterstop in correct position using wires tied through waterstop eyelets to adjacent reinforcing steel.
5. Concrete placement at waterstop:
   A. Carefully place concrete without displacing waterstop from proper position.
   B. Thoroughly and systematically vibrate concrete around waterstop to obtain impervious, void-free concrete in vicinity of joint and to maximize intimate contact between concrete and waterstop.
   C. After first pour, clean unembedded waterstop leg to ensure full contact of second pour concrete.

Section 03300 CAST-IN-PLACE CONCRETE:
1. All concrete shall meet or exceed strengths in the General Structural Notes, Drawings.
2. Concrete work shall conform to the requirements of ACI 301.
3. Provide proposed mix design.
4. Formwork: Earthwork may be used for forms for concrete below grade. New plywood or engineered forms shall be used elsewhere.
   A. Form Release Agent: All cleaned concrete forms shall be treated with a chemical release agent that is non-staining and that will not inhibit the natural bonding characteristics of secondary coverings or coatings, caulks or sealants:
      1) Approved product: Burke Form Oil V.O.C. or approved equivalent.
5. Reinforcing: See General Structural Notes and Structural Drawings.
6. Sampling Fresh Concrete: ASTM C172, except modified for slump to comply with ASTM C94.
   A. Slump: ASTM C143: measure and record the slump of each batch of concrete from which test specimens are taken.
   B. Air Content: ASTM C173, volumetric method for lightweight, or normal weight concrete; ASTM C231 pressure method for normal weight concrete; one for each day's pour of each type of air-entrained concrete. The concrete used to performing the air content shall not be used in fabricating test specimens.
   C. Temperature: Determine and record the temperature in accordance with test method C 1064.
   D. Compression Test Specimen: ASTM C31; one set of 4 standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when Field-cure test specimens are required.
   E. Compressive Strength Tests: ASTM C39; one set for each day's pour exceeding 5 cu.yds. plus additional sets for each 10 cu.yds. over and above the first 25 cu.yds. of each concrete class placed on any one day; one specimen tested at 7 days, two specimens tested at 28 days, and one specimen retained in reserve for later testing if required.
      1) Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls more than specified compressive strength by more than 500 psi.
   F. Test results will be reported in writing to Architect, Structural Engineer, Contractor and Owner within 24 hours after tests. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in structure, design compressive strength at 28 days, concrete mix proportions and materials; compressive breaking strength and type of break for both 7-day tests and 28-day tests.
7. Seal concrete floors where noted on Finish Schedule with VOC compliant water based acrylic cure/sealer "Omega & Seal WB" as manufactured by L.A.M Construction Chemicals, Inc.
8. Refer to Structural Drawings.

Division 4 – MASONRY

Section 04200 CONCRETE MASONRY:
1. The National Concrete Masonry Association (NCMA) "Guide Specifications for Concrete Masonry" is by reference made a part of this Specification.
2. Submit Type "A" Certificates for compliance for masonry units.
3. Insulation. Provide the following in all masonry walls.
   A. Masonry Foam Insulation: Two component systems consisting of Astro-Plast resin and a foaming agent surfactants.
      1) (Core-Fill 100 as manufactured by Tailored Chemical Products, Hickory, NC 28601 (800-457-4687) or approved equal
         a. Surface Burning Characteristics: Optional Flame spread, smoke developed and fuel contributed of 0, 5 and 0 respectively;
         b. Combustion Characteristics: Must be noncombustible. Class A building material.
         c. Thermal Values: R-value of 4.0/inch @ 62 degrees F mean, ASTM C177.
         d. Sound Abatement: Minimum STC rating of 53 and a minimum OITC rating of 44 for 8" wall assembly SRTH END-50;
      2) Engage an experienced applicator who are properly trained and certified in the use of Astro-Plast Foam Insulation material and equipments.
      3) Fill all open cells and voids in hollow concrete masonry walls where shown on Drawings. The foam insulation shall be pressure injected through a series of 5/8" to 7/8" holes drilled into every vertical column of block cells (every 8" on center) beginning at an approximate height of four (4) feet from finished floor level. Repeat this procedure at an approximate height of ten (10) feet above the first horizontal row of holes (or as required) until the void is completely filled. Patch holes with mortar and score to resemble existing surface.
4. Refer to Structural Drawings.

Section 05500 METAL FABRICATIONS:
1. Contractor shall provide all miscellaneous steel such as supports, clip angles, cant plates, reverse, bolts, anchor bolts, brackets and anything else of a miscellaneous nature necessary to complete the construction of this Project.
2. Form metal fabrications from materials of size, thickness, and shapes indicated but not less than that needed to comply with performance requirements indicated.

Division 7 – THERMAL AND MOISTURE PROTECTION

Section 07600 FLASHING AND SHEET METAL:
1. All flashing shall be 26 gage galvanized sheet steel, unless noted otherwise.
2. Comply with manufacturer's installation instructions and recommendations, and with SMACNA "Architectural Sheet Metal Manual".
3. Anchor units of work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated.
4. Install work with laps, joints and seams which will be permanently watertight and weatherproof

Section 07920 ELASTOMERIC TOOUT SEALANTS:
1. Provide joint sealants, joint fillers and accessory joint materials that are compatible with one another and with joint substrates under project conditions.
2. Elastomeric sealants:
   A. Sealant Type A:
      1) As for exterior joints in vertical surfaces and non-traffic horizontal surfaces, provide single-component or multi-component polyurethane sealant having a Shore "A" Hardness of not less than 25 or more than 50 and plus-or-minus 25 percent joint movement capability; comply with ASTM C920, Type S or M, Grade P or NS, Class 25.
      2) Acceptable sealants from Tremco include:
         THC-900/901, Vulkem 245, TremFlex 54, Vulkem 45, Vulkem 227, or approved equal:
3. Accessories:
   A. Joint cleaner: Cleaner as recommended by sealant manufacturer for substrates indicated.
   B. Joint primer: As recommended by sealant manufacturer for substrates, conditions and exposures indicated.
   C. Bond breaker: Polyethylene tape or other adhesive faced tape as recommended by sealant manufacturer to prevent sealant contact where it would be detrimental to sealant performance.
   D. Joint backer: Polyethylene foam rod or other compatible non-wasting non-extruding, nonstaining resilient material in dimensions 25 percent to 50 percent wider than joint width as recommended by sealant manufacturer for conditions and exposures indicated.
   E. Cleaning tape: Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces that is suitable for masking.
4. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor and approved by the sealant manufacturer as compatible, subject to review of the Architect.

Division 8 – DOORS AND WINDOWS

Section 08110 STEEL DOORS AND FRAMES:
1. Standard steel door and frame specifications of the Steel Door Institute SDI-100 is hereby by reference made a part of this Specification.
   A. Whenever practicable, provide set-up and welded door frames as a pre-welded unit.
2. Submit shop drawings.
3. Approved suppliers: Steelcraft, Truseastic Inc., Republic Builders Products, Curried or as approved.
   A. Exterior doors -14 gage, galvannealed with Chassd 1989
   B. Exterior Frames -16 gage, galvannealed
   C. Interior doors -16 gage
   D. Interior Frames -16 gage
   E. Where fire door assemblies are required, comply with ASTM E152 and NFPA 80 "Standard for Fire Doors and Windows".

Section 08710 FINISH HARDWARE:
1. Finish hardware includes items known commercially as finish hardware which are required for swing, sliding and folding doors or gates.
2. Types of finish hardware include, but are not limited to the following.
   A. Hinges, pivots Stanley, Ives, Bommer, Hager
   B. Lock cylinders & keys Schlage (per ADA)
   C. Lock and latch sets Schlage (per ADA)
   D. Exit devices Von Duprin (per ADA)
   E. Panic/exit units Quality (per ADA)
   F. Closers LCN or Norton (per ADA)
   G. Flushplates Quality (per ADA)
   H. Thresholds Pemko (per ADA)
   I. Stops, holders Glynn Johnson
   J. Provide silencers on all doors.
   K. Hardware Finish shall be US26D, u.n.o.
3. Locks and latches shall be ANSI A156.2 Series 4000 Grade 1 Extra Heavy Duty Commercial.

Division 9 – FINISHES

Section 09900 SPECIAL COATINGS:
1. Polycarbon/Polycarbonate Tile Sealer:
   A. Seal all exposed concrete surfaces of fuel containment basin.
   B. Apply polycarbon/polycarbonate tile sealer, ultra Shield 33-A as manufactured by Pro-Seal (Redmond, WA 800-349-7325) or approved equal, per manufacturer's instructions.
      1) Color: Clear
      2) Surface must be dry, clean and free of all loose particulate and bond-breaking matter.
      3) Wear PPE when applying.

Section 09900 PAINTING:
1. Work includes painting and finishing of interior and exterior exposed items and surfaces throughout Project, except as otherwise noted. This shall include but not limited to, M.T. doors and frames, all gypsum board surfaces, metal flashing, counter flashing, stucco, concrete masonry, composite wood siding, etc.
2. Related work specified in other sections.
   A. Shop applied prime coats and factory applied finishes.
3. Quality assurance:
   A. Provide primers and other undercoat paint produced by same manufacturer.
   B. Coordinate with other specifications to ensure compatibility.
   C. Protect materials and job painted surfaces.
   D. Uneven joints, runs, or holidays will not be permitted
   E. Treat questionable concrete surfaces w/dilute muriatic detergent and muriatic acid.
   F. Spray paint all surfaces unless noted otherwise.
   G. Omit primer on metal surfaces that have been shop-primed and touch up painted.
4. Acceptable manufacturers:
   Sherwin-Williams, Pittsburgh Paints, Dunn-Edwards, Frazee, Benjamin Moore & Co.
5. Materials:
   Contractor shall furnish recommended painting specs and procedures and submit as Archives for approval for his preferred manufacturer for the following applications:
   Pittsburgh Paints specification used as a guide.
   A. Masonry Block Fillers:
      1) Speedhide Interior/Exterior Masonry Block Filler Satins (6-7)
   B. Primers:
      2) Perma-Crete Interior/Exterior Alkali Resistant Primer (4-603)
      3) Pittsburgh Paints Interior/Exterior Rust Inhibitive Steel Primer (3-853)
   C. Exterior finish paints materials:
      1) Speedhide Exterior Flat Acrylic Latex (6-610 & 650 Series)
      2) Pitt-Tech Interior/Exterior Satin DTF Industrial Enamels (90-474 Series)
   D. Interior finish paint materials:
      1) Speedhide Interior Wash-Lustre Semi-Gloss Latex (6-610 Series)
      2) Pitt-Tech Interior/Exterior Satin DTF Industrial Enamels (90-474 Series)
6. Exterior Paint Systems (EPS):
   A. EPS-1: Concrete Masonry Units (CMU)
      1) Filler: 1 coat – Speedhide Int/Ext Masonry Block Filler (6-7). 4.8 to 14.0 mils DFT.
      2) Primer: 1 coat Perma-Crete Int/Ext Alkali Resistant Primer (4-603). 1.2 to 1.5 mils DFT.
      3) Finish: 2 coats – Pitt-Tech Exterior Flat Acrylic (6-650 Series). 1.0 to 1.2 mils DFT.
   B. EPS-2: Ferrous Metals (doors, frames, handrails, etc.)
      1) Primer: 1 coat – Pittsburgh Paints Rust Inhibitive Primer (7-853). 1.5 to 2.5 mils DFT.
      2) Finish: 2 coats – Pitt-Tech DTM Industrial Enamels (90-474 Series) 1.0 to 3.0 mils DFT.
   C. Interior Paint Systems (IPS):
      A. IPS-1: Concrete Masonry Units
         1) Filler: 1 coat Speedhide Masonry Block Filler (6-7). 4.8 to 14.0 mils DFT.
         2) Primer: 1 coat Perma-Crete Int/Ext Alkali Resistant Primer (4-603). 1.2 to 1.5 mils DFT.
         3) Finish: Coats as identified on Room Finish Schedule for system above.
      B. IPS-2: Ferrous metals
         1) Primer: 1 coat – Pittsburgh Paints Rust Inhibitive Primer (7-853). 1.5 to 2.5 mils DFT.
         2) Finish: 2 coats – Pitt-Tech DTM Industrial Enamels (90-474 Series) 1.0 to 3.0 mils DFT.

Division 10 – SPECIALTIES

Section 10522 FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES:
1. Furnish and install Larsen bracket-mounted-fire extinguishers as located on the Drawings.
   Extinguisher to handle A, B & C type fires.

Division 13 – SPECIAL CONSTRUCTION

Section 13120 PREENGINEERED METAL BUILDINGS:
1. Provide preengineered building components as shown in Drawings.
   A. Roofing to be manufacturer's standard roof panel. Color to be selected from manufacturer's standard colors.
2. Deliver and store prefabricated components, sheets, panels, and other manufactured items so they will not be damaged or deformed.
   A. Stack materials on platforms or pallets, covered with tarpaulins or other suitable weathertight ventilated covering. Store metal sheets or panels so that water accumulations will drain freely. Do not store sheets or panels in contact with other materials which might cause staining.

Division 15 – MECHANICAL SYSTEMS

Section 15500 HEATING, VENTILATION AND AIR CONDITIONING:
1. See Mechanical Drawings.

Division 16 – ELECTRICAL

Section 16000 ELECTRICAL:
1. See Electrical Drawings.
2. Contractor shall provide roughing for Owner furnished equipment.

AS-BUILD

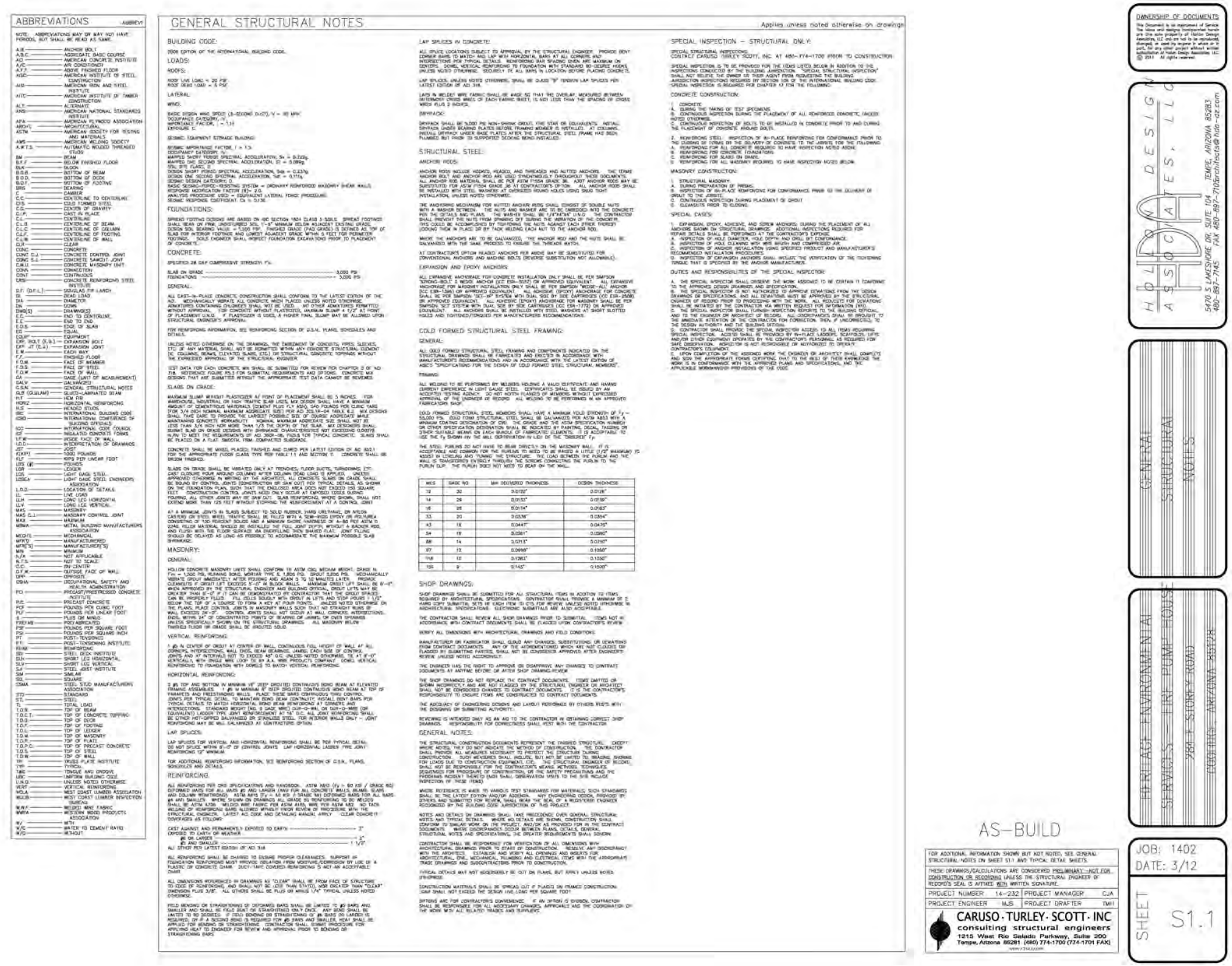
(Redlined copy of this document, annual engine document is with Mark Holden 4/2015)

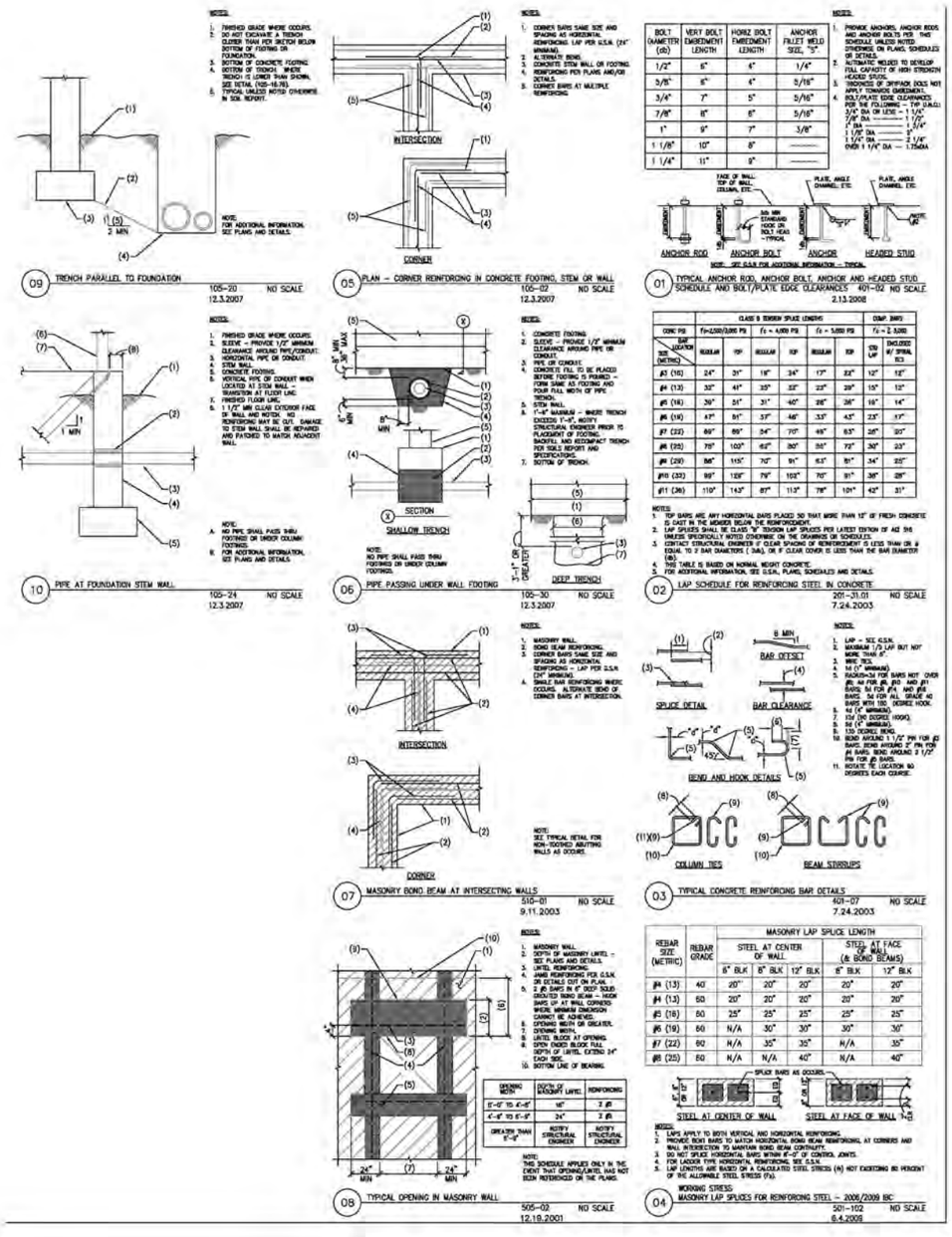
6 SPECIFICATIONS

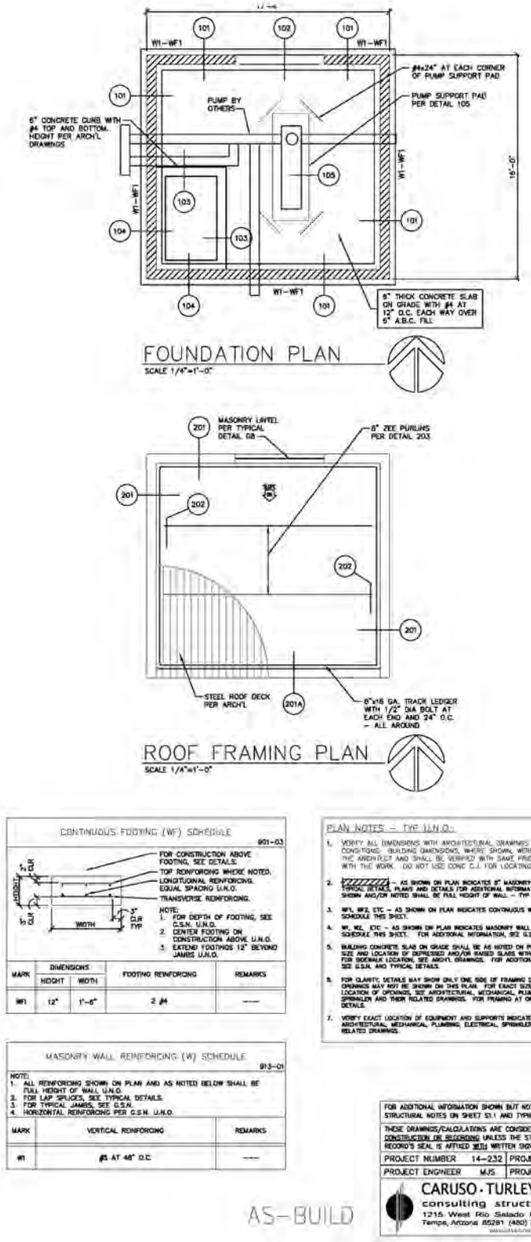
HOLDEN DESIGN ASSOCIATES, LLC
5470 S LAKESHORE DR, SUITE 104, TEMPE, ARIZONA 85283
480-897-7145 FAX 480-897-7106mchitect@hda-azc.com

JOB: 1402
DATE: 3/12

SHEET A8.1


ABBREVIATIONS
GENERAL STRUCTURAL NOTES
Applies unless noted otherwise on drawings
BUILDING CODE:
LOADS:
FOUNDATIONS:
CONCRETE:
SLABS ON GRADE:
MASONRY:
VERTICAL REINFORCING:
HORIZONTAL REINFORCING:
LAP SPLICES:
REINFORCING:
LAP SPLICES IN CONCRETE:
DRYPACK:
STRUCTURAL STEEL:
ANCHOR RODS:
EXPANSION AND EPOXY ANCHORS:
COLD FORMED STRUCTURAL STEEL FRAMING:
SHOP DRAWINGS:
GENERAL NOTES:
SPECIAL INSPECTION – STRUCTURAL ONLY:
CONCRETE CONSTRUCTION:
MASONRY CONSTRUCTION:
SPECIAL CASES:
DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR:
OWNERSHIP OF DOCUMENTS
HOLDA DESIGN ASSOCIATES, LLC
5470 S LAKESHORE DR, SUITE 104 TEMPE, ARIZONA 85283
480-897-7145 FAX 480-897-7105 architects@hda-az.com
GENERAL STRUCTURAL NOTES
HERITAGE ENVIRONMENTAL SERVICES – FIRE PUMP HOUSE
2XX E STOREY ROAD
COOLIDGE, ARIZONA 85128
AS–BUILD
PROJECT NUMBER 14–232
PROJECT MANAGER CJA
PROJECT ENGINEER MJS
PROJECT DRAFTER TMH
CARUSO · TURLEY · SCOTT · INC
consulting structural engineers
1215 West Rio Salado Parkway, Suite 200
Tempe, Arizona 85281 (480) 774-1700 (774-1701 FAX)
JOB: 1402
DATE: 3/12
SHEET S1.1





CONTINUOUS FOOTING (WF) SCHEDULE 901-03

MARK	DIMENSIONS HEIGHT	DIMENSIONS WIDTH	FOOTING REINFORCING	REMARKS
WF1	12"	1'-6"	2 #4	----

MASONRY WALL REINFORCING (W) SCHEDULE 913-01

NOTE:
1. ALL REINFORCING SHOWN ON PLAN AND AS NOTED BELOW SHALL BE FULL HEIGHT OF WALL U.N.O.
2. FOR LAP SPLICES, SEE TYPICAL DETAILS.
3. FOR TYPICAL JAMBS, SEE G.S.N.
4. HORIZONTAL REINFORCING PER G.S.N. U.N.O.

MARK	VERTICAL REINFORCING	REMARKS
W1	#5 AT 48" O.C.	----

PLAN NOTES – TYP U.N.O.

1. VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS AND FIELD CONDITIONS. BUILDING DIMENSIONS, WHERE SHOWN, WERE PROVIDED BY THE ARCHITECT AND SHALL BE VERIFIED WITH SAME PRIOR TO PROCEEDING WITH THE WORK. DO NOT USE CONC C.J. FOR LOCATING BUILDING ELEMENTS.
2. [illegible] – AS SHOWN ON PLAN INDICATES 8" MASONRY WALL. SEE G.S.N., TYPICAL DETAILS, PLANS AND DETAILS FOR ADDITIONAL INFORMATION. ALL REINFORCING SHOWN AND/OR NOTED SHALL BE FULL HEIGHT OF WALL – TYP U.N.O.
3. WF1, WF2, ETC – AS SHOWN ON PLAN INDICATES CONTINUOUS WALL FOOTING, SEE SCHEDULE THIS SHEET.
4. W, W2, ETC – AS SHOWN ON PLAN INDICATES MASONRY WALL REINFORCING, SEE SCHEDULE THIS SHEET. FOR ADDITIONAL INFORMATION, SEE G.S.N.
5. BUILDING CONCRETE SLAB ON GRADE SHALL BE AS NOTED ON PLAN. VERIFY EXACT SIZE AND LOCATION OF DEPRESSED AND/OR RAISED SLABS WITH ARCH'L DRAWINGS. FOR SIDEWALK LOCATION, SEE ARCH'L DRAWINGS. FOR ADDITIONAL INFORMATION, SEE G.S.N. AND TYPICAL DETAILS.
6. FOR CLARITY, DETAILS MAY SHOW ONLY ONE SIDE OF FRAMING CONDITIONS. ALL OPENINGS MAY NOT BE SHOWN ON THIS PLAN. FOR EXACT SIZE, LOCATION AND LOCATION OF OPENINGS, SEE ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL DRAWINGS AND THEIR RELATED DRAWINGS. FOR FRAMING AT OPENINGS, SEE TYPICAL DETAILS.
7. VERIFY EXACT LOCATION OF EQUIPMENT AND SUPPORTS INDICATED ON PLAN WITH ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, SPRINKLER AND THEIR RELATED DRAWINGS.

AS-BUILD

HOLDEN DESIGN ASSOCIATES, LLC
5470 S LAKESHORE DR, SUITE 104 TEMPE, ARIZONA 85283
480-897-7145 FAX 480-897-7108 architects@hda-az.com

STRUCTURAL PLANS AND TYPICAL DETAILS

HERITAGE ENVIRONMENTAL SERVICES – FIRE PUMP HOUSE
284 E. STOREY ROAD
COOLIDGE, ARIZONA 85128

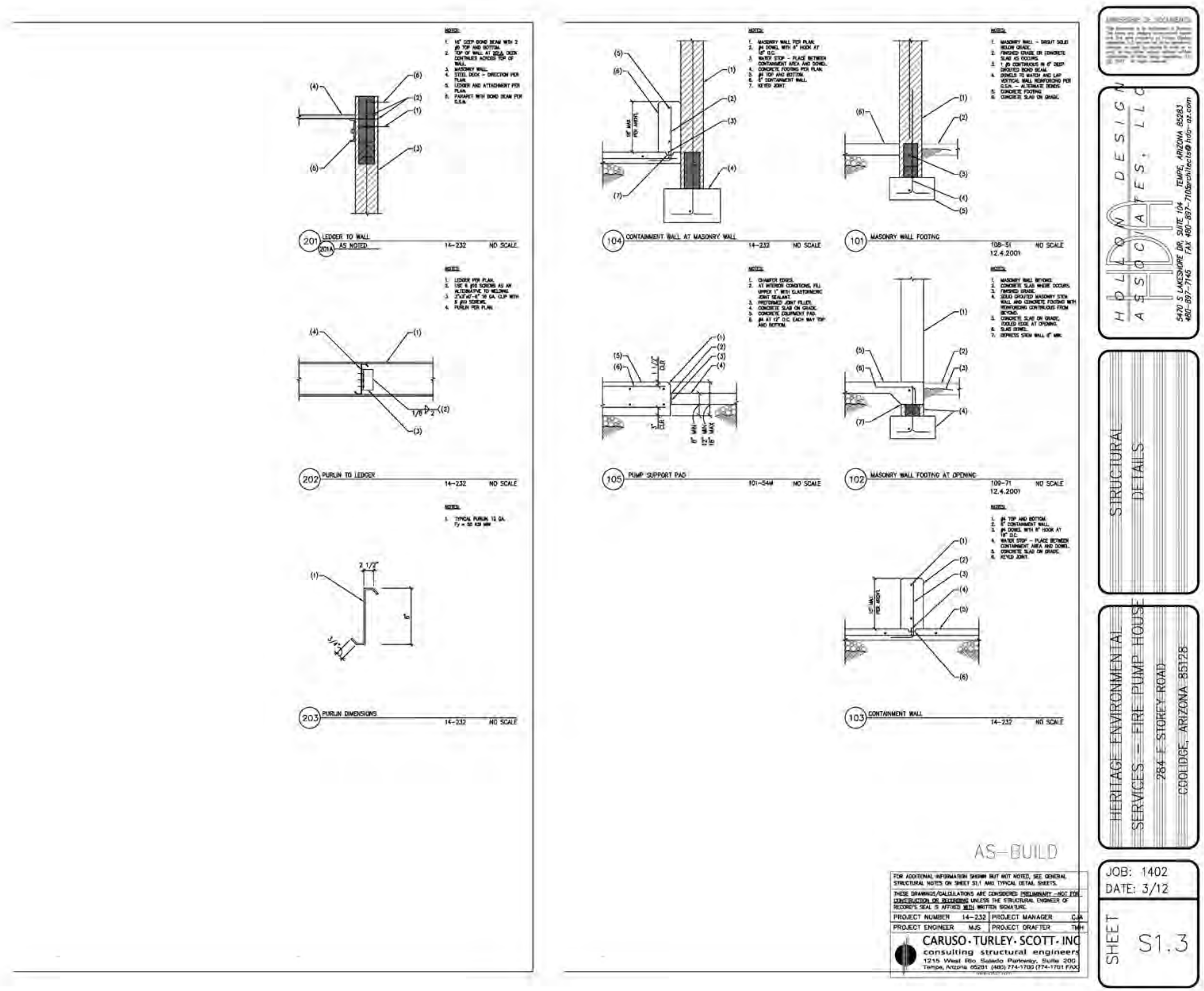
JOB: 1402
DATE: 3/12

SHEET S1.2

THESE DRAWINGS/CALCULATIONS ARE CONSIDERED PRELIMINARY / NOT FOR CONSTRUCTION OR RECORDING UNLESS THE STRUCTURAL ENGINEER OF RECORD'S SEAL IS AFFIXED WITH WRITTEN SIGNATURE.

PROJECT NUMBER 14-232 | PROJECT MANAGER CJA
PROJECT ENGINEER MJS | PROJECT DRAFTER TMH

CARUSO · TURLEY · SCOTT · INC
consulting structural engineers
1215 West Rio Salado Parkway, Suite 200
Tempe, Arizona 85281 (480) 774-1700 (774-1701 FAX)


201 LEDGER TO WALL
201A AS NOTED
14-232 NO SCALE
202 PURLIN TO LEDGER
14-232 NO SCALE
203 PURLIN DIMENSIONS
14-232 NO SCALE
104 CONTAINMENT WALL AT MASONRY WALL
14-232 NO SCALE
105 PUMP SUPPORT PAD
101-54M NO SCALE
101 MASONRY WALL FOOTING
108-51 NO SCALE
12.4.2001
102 MASONRY WALL FOOTING AT OPENING
109-71 NO SCALE
12.4.2001
103 CONTAINMENT WALL
14-232 NO SCALE
AS-BUILD
PROJECT NUMBER 14-232
PROJECT MANAGER CJA
PROJECT ENGINEER MJS
PROJECT DRAFTER TMH
CARUSO · TURLEY · SCOTT · INC
consulting structural engineers
STRUCTURAL
DETAILS
HERITAGE ENVIRONMENTAL
SERVICES — FIRE PUMP HOUSE
284 E STOREY ROAD
COOLIDGE, ARIZONA 85128
JOB: 1402
DATE: 3/12
SHEET
S1.3

LOUVER SCHEDULE

MARK	LOCATION	SERVICE	TYPE	MAT'L	MANUFACTURER	MODEL NO.	W X H X D	FINISH	REMARKS
L-1	FIRE PUMP ROOM	VENTILATION	MOTORIZED ADJUSTABLE DRAINABLE	STEEL	RUSKIN	LOE375D	24" X 24" X 6"	GALVANIZED	① ② ③ ④
L-2, L-3	FIRE PUMP ROOM	COMBUSTION AIR	MOTORIZED ADJUSTABLE DRAINABLE	STEEL	RUSKIN	LOE375D	24" X 24" X 6"	GALVANIZED	① ② ③ ④

① STORM PROOF DRAINABLE
② INSECT SCREEN, MATCH MAT'L
③ PROVIDE SHEETMETAL SLEEVE FOR LOUVER, BLADES AND MOTOR MOUNTING
④ PROVIDE MOTORIZED DAMPER

FAN SCHEDULE

ACCESSORIES: DAMPER, BIRDSCREEN, DISCONNECT SWITCH, ROOFCURB

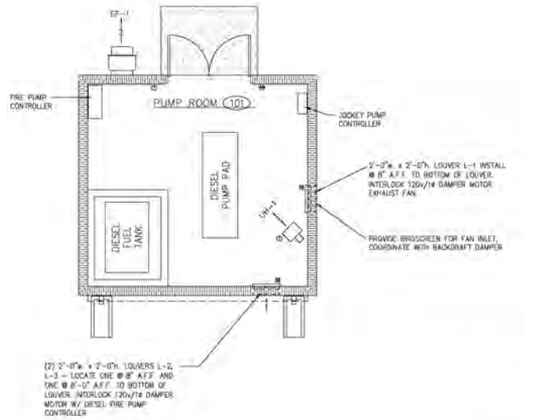
MARK	TYPE	DRIVE	CFM	S.P. ("WC)	MAX RPM	MAX SONES	ELECTRICAL	DAMPER SIZE (IN.)	ROOF/WALL OPENING (IN)	WEIGHT (#)	MODEL AND REMARKS
EF-1	CENT EXHAUST	BELTED	875	.25	1549	12.4	1/4 HP 115v/1ø	12x12	12.5x125.5	100	GREENHECK CSW-095-4 PUMP HOUSE EXHAUST

1. PROVIDE T-STAT AND CONTROLS FOR SUMMER VENTILATION WITH LOUVER MOTORIZED DAMPER AND EXHAUST FAN INTERLOCK.

ELECTRIC HEATING UNIT SCHEDULE

MARK	TYPE	HEAT INPUT (KW)	CFM	ELECTRICAL	MODEL AND REMARKS
UH-1	HORIZ. PROP	7.5	520	1/20 HP ~~480V/3ø~~	~~REZNOR EBE-7~~

1. MOUNTING HEIGHT 8'-0" AFF
2. PROVIDE MOUNTING HARDWARE
3. SINGLE STAGE UNIT MOUNTED T-STAT: SET POINT AT 45° (ADJUSTABLE)
4. PROVIDE INTEGRAL POWER DISCONNECT W/OVERLOAD PROTECTION FOR BOTH FAN AND ELECTRIC HEATING COIL.



① HVAC PUMP HOUSE FLOOR PLAN 1/4"=1'-0"

HOLDEN DESIGN ASSOCIATES, LLC
5420 S. LAKESHORE DR. SUITE 104
TEMPE, ARIZONA 85283
480-897-7145 FAX 480-897-7109 mail@holden-az.com

HVAC FLOOR PLAN
SCHEDULES

HERITAGE ENVIRONMENTAL SERVICES — FIRE PUMP HOUSE
PART 1 STONEY ROAD
COCHISE, ARIZONA 85276

AS-BUILD

JOB: 1402
DATE: 3/12

SHEET M2.1

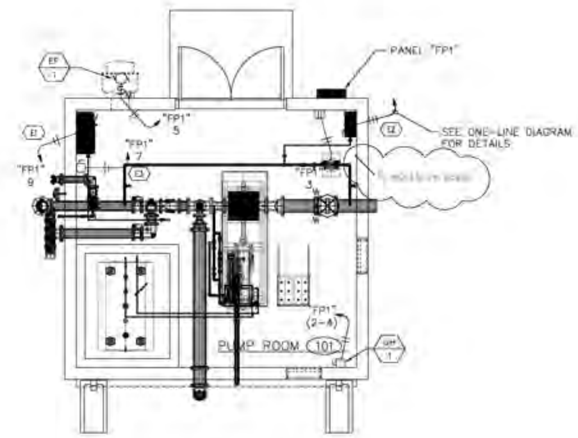

ELECTRICAL SYMBOL LEGEND
SOME SYMBOLS AND ABBREVIATIONS MAY NOT BE USED FOR THIS PROJECT.
A. GENERAL
B. POWER
C. COMMUNICATIONS
D. LIGHTING
E. MECHANICAL
F. FIRE ALARM
G. ONE LINE DIAGRAM
H. ABBREVIATIONS
ELECTRICAL SPECIFICATIONS
SOME SPECIFICATIONS MAY NOT BE USED FOR THIS PROJECT.
1.0 INTENT
2.0 GENERAL
2.11 RECONSTRUCTION (TO INCLUDE TENANT IMPROVEMENTS)
3.0 MATERIALS AND METHODS
4.0 SUBMITTALS
4.6 TESTS
5.0 WARRANTY
6.0 SERVICE
7.0 DISTRIBUTION
8.0 LIGHT FIXTURES
OWNERSHIP OF DOCUMENTS
5470 S LAKESHORE DR, SUITE 104 TEMPE, ARIZONA 85283
ELECTRICAL SYMBOLS AND SPECIFICATIONS
AS-BUILD
PRELIMINARY NOT FOR CONSTRUCTION
Expires: 08/30/11
Project Contact/Designer: KERRY LEONARD
Project #14104
HAWKINS DESIGN GROUP INC.
ELECTRICAL CONSULTING ENGINEERS
2152 SOUTH VINEYARD AVE, SUITE 107
MESA, ARIZONA 85210
PH. 480.813.9000 FAX 480.813.9001
EMAIL: email@hawkinsdg.com
JOB: 1402
DATE: 3/14
SHEET E-01

GENERAL NOTES – POWER

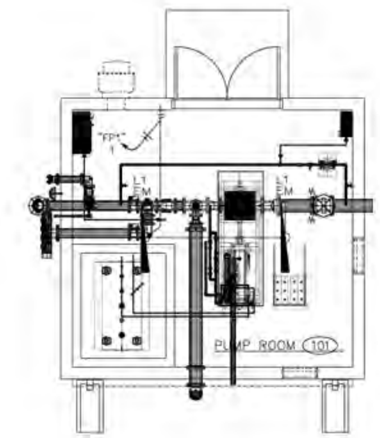
1. REFER TO ELECTRICAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND COMPLETE CONTRACTUAL OBLIGATIONS.
2. THE ELECTRICAL CONTRACTOR SHALL (PRIOR TO HIS BID) a) VISIT THE SITE AND FIELD VERIFY ALL EXISTING CONDITIONS AND b) TAKE ALL CONSIDERATIONS INTO ACCOUNT AT THE TIME OF BID. NO ADDITIONAL CONSIDERATIONS WILL BE GRANTED THE CONTRACTOR AFTER THE BID IS ACCEPTED.
3. ALL ELECTRICAL METALLIC TUBING (EMT), RIGID NON-METALLIC CONDUIT, FLEXIBLE METALLIC CONDUIT, FLEXIBLE NON-METALLIC CONDUITS, "SEALTIGHT" TYPE CONDUITS AND ALL OTHER CONDUITS THAT DO NOT CONTAIN A CODE SIZED GROUND WIRE SHALL HAVE A CODE SIZED BOND WIRE INSTALLED WITH THE CIRCUIT CONDUCTORS.
4. RECEPTACLES LOCATED WITHIN 6'-0" OF SINKS OR WATER SHALL BE CONNECTED EITHER TO A GROUND FAULT CIRCUIT INTERRUPTER TYPE CIRCUIT BREAKER OR TO A GROUND FAULT CIRCUIT INTERRUPTER TYPE RECEPT.
5. PRIOR TO ROUGH-IN, THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE EXACT LOCATION OF ALL WIRING DEVICES TO INCLUDE MOUNTING HEIGHTS AND LOCATIONS. ALL CONFLICTS SHALL BE REPORTED TO THE ENGINEER/ARCHITECT.

GENERAL NOTES – LIGHTING

1. REFER TO ELECTRICAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND COMPLETE CONTRACTUAL OBLIGATIONS.
2. THE ELECTRICAL CONTRACTOR SHALL (PRIOR TO HIS BID) a) VISIT THE SITE AND FIELD VERIFY ALL EXISTING CONDITIONS AND b) TAKE ALL CONSIDERATIONS INTO ACCOUNT AT THE TIME OF BID. NO CONSIDERATIONS WILL BE GRANTED THE CONTRACTOR AFTER THE BID IS ACCEPTED.
3. ALL ELECTRICAL METALLIC TUBING (EMT), RIGID NON-METALLIC CONDUIT, FLEXIBLE METALLIC CONDUIT, FLEXIBLE NON-METALLIC CONDUITS, "SEALTIGHT" TYPE CONDUITS AND ALL OTHER CONDUITS THAT DO NOT CONTAIN A CODE SIZED GROUND WIRE SHALL HAVE A CODE SIZED BOND WIRE INSTALLED WITH THE CIRCUIT CONDUCTORS.
4. ALL NIGHTLIGHT/EMERGENCY LIGHT (NL/EM) FIXTURES SHALL BE CONNECTED UNSWITCHED. IF NO EMERGENCY LIFE SAFETY SYSTEM IS INSTALLED (ie. GENERATOR, etc.), THE OUTER LAMPS SHALL BE CONNECTED UNSWITCHED TO LOCAL LIGHTING CIRCUIT AND CONNECTED VIA AN EMERGENCY BALLAST – 1400 LUMEN OR FULL LUMEN OUTPUT MINIMUM. PROVIDE NEW IF NOT ALREADY EXISTING.
5. ALL FIXTURES INSTALLED OUTDOORS SHALL BE RATED FOR DAMP/WET LOCATIONS AS REQUIRED. THE CONTRACTOR SHALL COORDINATE DAMP/WET LOCATION RATING AND INSTALLATION PER NEC ARTICLE "FIXTURE LOCATIONS".
6. ALL RECESSED LIGHT FIXTURES SHALL BE I.C. RATED OR A MINIMUM OF 3" FROM COMBUSTIBLE MATERIAL PER NEC ARTICLE "LUMINAIRES, LAMPHOLDERS AND LAMPS – CLEARANCE AND INSTALLATION".
7. ELECTRICAL CONTRACTOR TO VERIFY A MINIMUM OF 1 FOOT-CANDLE AT 1 FOOT ABOVE FLOOR ALONG EXIT PATH PER IBC ARTICLE "MEANS OF EGRESS ILLUMINATION".
8. LIGHT SWITCHES SHALL BE INSTALLED TO CONFORM TO NEC ARTICLE "SWITCHES – ACCESSIBILITY AND GROUPING".
9. ALL INDOOR FLUORESCENT FIXTURES WITH DOUBLE ENDED LAMPS SHALL HAVE INTEGRAL DISCONNECTS.



1 POWER PLAN 1/4"=1'-0" N



2 LIGHTING PLAN 1/4"=1'-0" N

ELECT. EQUIP. REQUIREMENTS

● ELECTRICAL CONTRACTOR SHALL PROVIDE CORRECT SIZE/TYPE/VOLTAGE/QUANTITY OF DUAL-ELEMENT, TIME-DELAY FUSE(S) SIZED PER EQUIPMENT MANUF. UNLESS OTHERWISE SPECIFIED BY UNIT NAMEPLATE/MANUFACTURER DATA.

◆ ALL FEEDERS SHALL BE IN ACCORDANCE WITH THE ELECTRICAL SYSTEM SPEC'S (3.2)

■ COORDINATE EXACT LOCAITONS OF ALL EQUIPMENT PRIOR TO ROUGH-IN.

LABEL ■	VOLTS/Ø	FLA	BRANCH CIRCUIT		CONNECTION TYPE ●	CONDUCTORS/ CONDUIT ◆
			PANEL	CIRCUIT		
E1 FIRE PUMP CONTROLLER	120/1	10	"FP1"	9	PROVIDE MEANS OF DISCONNECT IF NOT INTEGRAL WITH PUMP CONTROLLER	(2)#12's Cu., (1)#12 Cu. E.G. – 3/4"C
E2 JOCKEY PUMP CONTROLLER	480/3	4.8	FUTURE		PROVIDE MEANS OF DISCONNECT IF NOT INTEGRAL WITH PUMP CONTROLLER	(3)#10's Cu., (1)#10 Cu. E.G. – 3/4"C
E3 FIRE PUMP BLOCK HEATER	120/1	8.3	"FP1"	7	HEAVY DUTY 30AMP 250V 1P/1F NEMA 3R DISC. SWITCH	(2)#12's Cu., (1)#12 Cu. E.G. – 3/4"C

HVAC ELECT. REQUIREMENTS

● ELECTRICAL CONTRACTOR SHALL PROVIDE CORRECT SIZE/TYPE/VOLTAGE/QUANTITY OF DUAL-ELEMENT, TIME-DELAY FUSE(S) SIZED PER HVAC EQUIPMENT MANUFACTURER UNLESS OTHERWISE SPECIFIED BY UNIT NAMEPLATE/MANUFACTURER DATA.

◆ ALL CONDUCTORS SHALL BE IN ACCORDANCE WITH THE ELECTRICAL SYSTEM SPEC'S (3.2). ALL TAP CONDUCTORS SHALL MEET THE REQUIREMENTS OF NEC ARTICLE 240.21(B)(2).

■ PROVIDE MAGNETIC MOTOR STARTER WITH THERMAL OVERLOAD PROTECTION, (2) AUXILIARY CONTACT SWITCHES, INTERNAL LINE VOLTAGE TO 24 VOLT TRANSFORMER (250VA MIN) WITH PROPER PRIMARY/SECONDARY PROTECTION, AMBIENT COMPENSATED, RED RUNNING LIGHT, HAND-OFF-AUTO. ACROSS THE LINE STARTERS TO 25HP. WILL BE PROVIDED WITH EACH MOTOR ON THE DRAWINGS (ONE HORSEPOWER TO 25 H.P.).

EQUIPMENT INDICATED HERE WHICH IS OWNER PROVIDED SHALL BE LISTED TO THE APPROPRIATE U.L. LISTING FOR THE USE AND BEAR A NAMEPLATE WITH THIS INFORMATION. WHEN REQUIRED, ANY NON-COMPLIANT EQUIPMENT MUST BE MADE COMPLIANT AT THE OWNERS EXPENSE AND IS NOT A PART OF THIS WORK EFFORT.

UNIT	VOLTS/Ø	FULL LOAD AMPS		DISCONNECTING MEANS ●■	CONDUCTORS/ CONDUIT ◆
EF 1	120/1	HP		HEAVY DUTY 15AMP, 120V NEMA 3R ~~MOTOR RATED SWITCH~~	(2)#12's Cu., (1)#12 Cu. E.C. – 3/4"C
		3/4			
UH 1	240/1	kW		HEAVY DUTY 60AMP 250V 2P/2F NEMA 3R DISCONNECT SWITCH	~~(2)#12's Cu., (1)#12 Cu. E.C. – 3/4"C~~
		5			

LUMINAIRE SCHEDULE

1. PROVIDE 90 MINUTE EMERGENCY BATTERY BALLAST FOR ALL EMERGENCY FIXTURES. SEE SCHEDULE BELOW FOR SPECIFICATIONS AND LUMEN REQUIREMENTS.
2. MODULAR WIRING SYSTEM FOR LIGHT FIXTURES IS AN ACCEPTABLE ALTERNATE.
3. BASE BID FOR LUMINAIRES SHALL BE BASED ON MANUFACTURERS LISTED IN CONTRACT DOCUMENTS UPON AWARD OF PROJECT. ALTERNATES PROPOSED BY CONTRACTOR SHALL BE SUBMITTED WITH WRITTEN OWNER APPROVAL & AN ITEMIZED DEDUCT TO BASE BID.
4. ALTERNATE FIXTURE SELECTIONS MAY REQUIRE ADDITIONAL TIME FOR SUBMITTAL REVIEW & POSSIBLE ENGINEERING DESIGN CHANGES, TO BE BILLED TO THE CONTRACTOR.
5. PROVIDE MINIMUM 10 MINUTE TIME DELAY ON EMERGENCY FIXTURES WHEN HID AREA LIGHTING IS USED.

EMERGENCY BALLAST SCHEDULE

LAMP TYPE	MANUFACTURER MODEL NUMBER	MINIMUM LUMENS	# OF LAMPS	LAMP TYPE	MANUFACTURER MODEL NUMBER	MINIMUM LUMENS	# OF LAMPS
13W CFL	BODINE B94CG OR EQUAL	550	1	17W T8	BODINE B50 OR EQUAL	1050	1
18W CFL	BODINE B94CG OR EQUAL	650	1	32W T8	BODINE B50 OR EQUAL	1360	1
26W CFL	BODINE B94CG OR EQUAL	700	1	14W T5	BODINE LP600 OR EQUAL	750	1
32W CFL	BODINE B94CG OR EQUAL	900	1	28W T5	BODINE LP600 OR EQUAL	1250	1
42W CFL	BODINE B94CG OR EQUAL	1000	1	54W T5HO	(2)BODINE LP600 OR EQUAL	2500	2

MARK	MANUFACTURER MODEL NUMBER	VOLTS	LAMPS OR/CCT INPUT WATTS	REMARKS/MOUNTING
L1	LITHONIA DMW-228-120-GEB10PS EL14DW-IP67	120	2-28W T5 4100K 56W	WET LOCATION SURFACE MOUNT STRIP WITH 2 LAMPS

AS-BUILD

PRELIMINARY NOT FOR CONSTRUCTION
Expires: 09/30/11

Project Contact/Designer: KERRY LEONARD
Project #14104
HAWKINS DESIGN GROUP INC.
ELECTRICAL CONSULTING ENGINEERS
2152 SOUTH VINEYARD AVE. SUITE 107
MESA ARIZONA 85210
PH. 480.813.9000 FAX 480.813.9001
EMAIL email@hawkinsdg.com

HOLDON DESIGN ASSOCIATES, LLC
5470 S LAKESHORE DR, SUITE 104 TEMPE, ARIZONA 85283
480-897-7145 FAX 480-897-7105 architects@hda-az.com

ELECTRICAL POWER/LIGHTING PLAN

JOB: 1402
DATE: 3/14

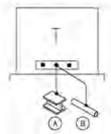
SHEET E-1

TRANSFORMER GROUND DETAIL

GROUND SIZE CHART

	TRANSFORMER SIZE (VA#)	GROUND SIZE (Cu.)
#	7.5kVA	#8
	9kVA	#8
	15kVA	#8
	30kVA	#8
	45kVA	#4
	75kVA	#2
	112.5kVA	#1/0
	150kVA	#2/0
	300kVA	#3/0

GROUNDING DIAGRAM



KEY NOTES – GROUNDING DIAGRAM

(A) BUILDING STEEL BOND WIRE. REFER TO CHART FOR MINIMUM SIZE. IF NOT BUILDING STEEL IS PRESENT, INSTALL PER NOTE "B".

(B) WATER PIPING BOND WIRE. REFER TO CHART FOR MINIMUM SIZE. THIS IS ONLY REQUIRED WHEN "A" CANNOT BE MET DUE TO CONSTRUCTION TYPE.

GENERAL NOTES – GROUNDING DIAGRAM

1. THIS DETAIL IS PROVIDED IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE, ARTICLES 250 AND 800 PERTAINING TO THE "GROUNDING ELECTRODE SYSTEM".
2. ANY VARIANCE FROM THIS DRAWING AND/OR SPECIFICATION MUST BE REQUESTED AND APPROVED IN WRITING PRIOR TO INSTALLATION.
3. ALL INSTALLATIONS SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF ARTICLE 250 AND 800 (ALL SUBPARAGRAPHS) OF THE NATIONAL ELECTRICAL CODE AND ALL STATE AND LOCAL CODE REQUIREMENTS.

BONDING & GROUND DETAIL

KEY NOTES – GROUNDING DIAGRAM

(A) CONCRETE ENCASED ELECTRODE (UFER) (GROUNDING ELECTRODE #1). REFER TO CHART FOR SIZE. MINIMUM 20'.

(B) MINIMUM 10 MIL ANNEALED COPPER CLAD STEEL GROUND ROD (GROUNDING ELECTRODE #2). REFER TO CHART FOR SIZE.

(C) GROUNDING ELECTRODE CONDUCTOR. REFER TO CHART FOR SIZE.

(D) INTEGRATED (FACTORY BONDED) BUS BAR MAIN BONDING JUMPER. REFER TO CHART FOR MINIMUM CONDUCTOR SIZE. (AMPACITY SHALL BE 150% MINIMUM).

(E) METALLIC PIPING BOND WIRE. REFER TO CHART FOR MINIMUM SIZE. BOND TO ALL METALLIC PIPING (WATER, SPRINKLER, GAS, PNEUMATIC LINES, ETC.) WITHIN 5'0" OF PIPES ENTRY INTO BUILDING.

(F) BUILDING STEEL BOND WIRE (IF REQUIRED PER BUILDING CONSTRUCTION TYPES). REFER TO CHART FOR MINIMUM SIZE.

(G) BOND WIRE FOR USE WITH MULTIPLE SERVICE'S (WHEN PRESENT). REFER TO CHART FOR MINIMUM SIZE.

(H) INTEGRATED (FACTORY BONDED) BUS BAR CASE BOND. REFER TO CHART FOR MINIMUM CONDUCTOR SIZE.

(J) INTEGRATED (FACTORY INSTALLED) GROUND BUS BAR. SHALL BE SIZED TO ACCOMMODATE GROUND WIRE LOADS AS INDICATED ON THE ONE-LINE DIAGRAM.

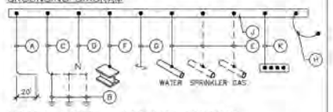
(K) INTERSYSTEM BONDING TERMINATION BAR, w/ MIN. 3 POINTS OF CONNECTION FOR OTHER SYSTEMS. CONDUCTOR SHALL BE MIN #6 CU. UNLESS SPECIFIED ELSEWHERE.

CONDUCTOR SIZE CHART

SES AMPACITY	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
.00 AMP	#4	5/8" x 10' (c)	#4	#6	#8	#8	#8	#6

ALL SIZES SHOWN ARE FOR COPPER CONDUCTORS. ALUMINUM IS NOT PERMITTED.

GROUNDING DIAGRAM



GENERAL NOTES – GROUNDING DIAGRAM

1. THIS DETAIL IS PROVIDED IN ACCORDANCE WITH NATIONAL ELECTRICAL CODE, ARTICLE 250-50 PERTAINING TO THE "GROUNDING ELECTRODE SYSTEM".
2. BONDING OF CONDUCTORS SHALL BE ACCOMPLISHED VIA EXOTHERMIC WELD (CAD WELD) ONLY.
3. ALL CONNECTIONS TO GROUND RODS BELOW GRADE OR IN CONCRETE SHALL BE MADE VIA EXOTHERMIC WELD (CAD WELD) ONLY. CONNECTIONS MADE ABOVE GROUND LEVEL CAN BE ACCOMPLISHED UTILIZING A U.L. LISTED MECHANICAL CLAMP SUITABLE FOR THE PURPOSE.
4. ANY VARIANCE FROM THIS DRAWING AND/OR SPECIFICATION MUST BE REQUESTED AND APPROVED IN WRITING PRIOR TO INSTALLATION.
5. ALL INSTALLATIONS SHALL COMPLY WITH THE LATEST ADOPTED EDITION OF ARTICLE 250 (ALL SUBPARAGRAPHS) OF THE NATIONAL ELECTRICAL CODE AND ALL STATE AND LOCAL CODE REQUIREMENTS.
6. THE GROUNDING SYSTEM SHALL PROVIDE NO GREATER THAN (5) FIVE OHMS RESISTANCE TO GROUND AT THE SERVICE CONNECTION. THE RESULTS SHALL BE VERIFIED BY AN INDEPENDENT TESTING AGENCY VIA GROUND TEST (FALL-OF-POTENTIAL) AND SUBMITTED IN ACCORDANCE WITH THE ELECTRICAL SPECIFICATIONS CONTAINED HEREIN.
7. THE GROUNDING ELECTRODE SYSTEM SHALL CONSIST OF ITEMS A, B, C AND K. ITEMS C (METALLIC PIPING BOND), F (BUILDING STEEL BOND), AND G (2nd SERVED BONDING) MUST BE BONDED TOGETHER AND TO THE GROUNDING ELECTRODE SYSTEM WHEN THEY ARE PRESENT.
8. TYPES: A, C, F, G, AND J (WHEN PRESENT), SHALL CAN) BE MADE IN SEPARATE CONDUITS(S) AND SUITABLY PROTECTED BY CONDUIT WHERE EXPOSED TO DAMAGE OR THEFT.

NEW PANELBOARD SCHEDULE "FP1"

TYPE: PANELBOARD — MTG: SURFACE — BUS AMPS: 40
VOLTAGE: 240/120V 1Ø 3W — MAINTING: SURFACE
NEMA TYPE: NEMA 3R — A.I.C. RATING: FULLY RATED 10,000
MAIN TYPE: M.C.B. — FEED THRU: NO — GD. GROUND: NO — SERVICE RATED: YES

LOAD TAKEN AT 120S — PROVIDE 3R BAR — EXIST. TO REMAIN UNCHANGED
HANDLE "LOCK-ON" DEVICE — CIRCUIT WA LTG CONTROLS — EXIST. WITH CHANGED LOAD
HANDLE "LOCK-OFF" DEVICE — EXIST. W/ ALL LOAD REMOVED — NEW BREAKER WITH NEW LOAD

N = NEUTRALS H = H.A.C. K = KITCHEN W = WBC (= CONT. LIGHTING E = CONT EQUIP.

T/	AREA SERVED	C/B	#	VA		#	C/B	T/	AREA SERVED
L	LIGHTS	20	1	720			20	H	HEATER
R	RECEPTACLE	20	3	1500		180	20		
H	EXHAUST FAN	20	1	300		1500	20	3	
C	CRANKCASE HEATER	20	1			1935		5	- BUSSED SPACE
E	FIRE PUMP CONTROLLER	20	3	1200				6	- BUSSED SPACE
-	SPARE	20	1	-		-		7	- BUSSED SPACE
-	SPARE	20	1	-		-		8	- BUSSED SPACE
NON-CONTINUOUS LOAD				2900		2850		2900	VA / 120 V = 24.2 AMPS
CONTINUOUS LOAD				112		0		112	VA / 120 V = 0.9 AMPS
CONTINUOUS LOAD @ 25Ø				38		0		38	VA / 120 V = 0.3 AMPS
TOTAL LOAD PER PHASE				3050		2850		3050	VA / 120 V = 25.3 AMPS

GENERAL NOTES – ONE-LINE

1. THE ELECTRICAL CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS TO FULLY FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS PRIOR TO BID. NO ADDITIONAL CONSIDERATIONS WILL BE ALLOWED AFTER THE BID.
2. THE ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL INDICATED EQUIPMENT TO CODE COMPLIANT CLEARANCES. PROVIDE SUBMITTALS AS INDICATED IN SPECIFICATIONS TO PROPERLY COORDINATE PHYSICAL LOCATIONS OF NEW AND/OR EXISTING EQUIPMENT.
3. REFER TO ELECTRICAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND COMPLETE CONTRACTUAL OBLIGATIONS.
4. ALL DASHED LINES ARE INDICATING EXISTING EQUIPMENT.
5. THE ELECTRICAL CONTRACTOR SHALL PROVIDE FOR AND COORDINATE ALL TESTING AND INSPECTIONS REQUIRED BY THE AUTHORITY HAVING JURISDICTION, AND SHALL PROVIDE WRITTEN REPORTS TO THE ENGINEER OF ALL TEST RESULTS AND INSPECTION REPORTS FOR THIS DISCIPLINE.
6. UPON SUBSTANTIAL COMPLETION, THE ELECTRICAL CONTRACTOR SHALL NOTIFY THE ENGINEER AND SHALL ALLOW, AT THE ENGINEERS DISCRETION, FOR THE INSPECTION OF NEW WORK PRIOR TO ENERGIZING.

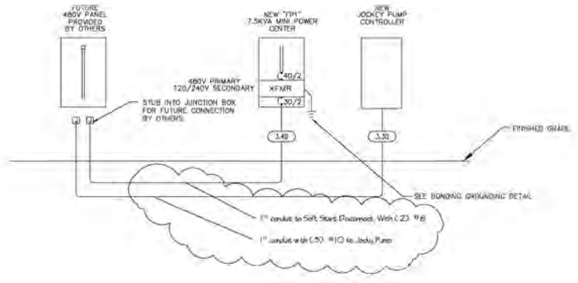
LOAD SUMMARY

CONNECTED LOAD ON PANEL "FP1"	=	5720 VA
CONNECTED LOAD ON JOCKEY PUMP CONTROLLER	=	1825 VA
TOTAL REVISED LOAD ON FUTURE PANEL	=	7545 VA

COPPER CONDUCTOR/CONDUIT SCHEDULE

NOTE: NOT ALL CONDUCTOR SIZES MAY BE USED.

TAG	
3.40	(3) #1's Cu., (1) #10 Cu. E.G. – 3/4" C.
3.30	(3) #1's Cu., (1) #10 Cu. E.G. – 3/4" C.



HAWKINS DESIGN ASSOCIATES, LLC
5420 S. LAKESHORE DR. SUITE 104 TEMPE, ARIZONA 85283
480-897-7145 FAX 480-897-7156archite1@hda-az.com

ELECTRICAL
ONE-LINE DIAGRAM
AND PANEL SCHEDULE

RELEASED FOR PERMIT
SERVICE'S FIRE PUMP HOUSE
2864 E. STORY ROAD
GILBERT, ARIZONA 85298

AS-BUILD

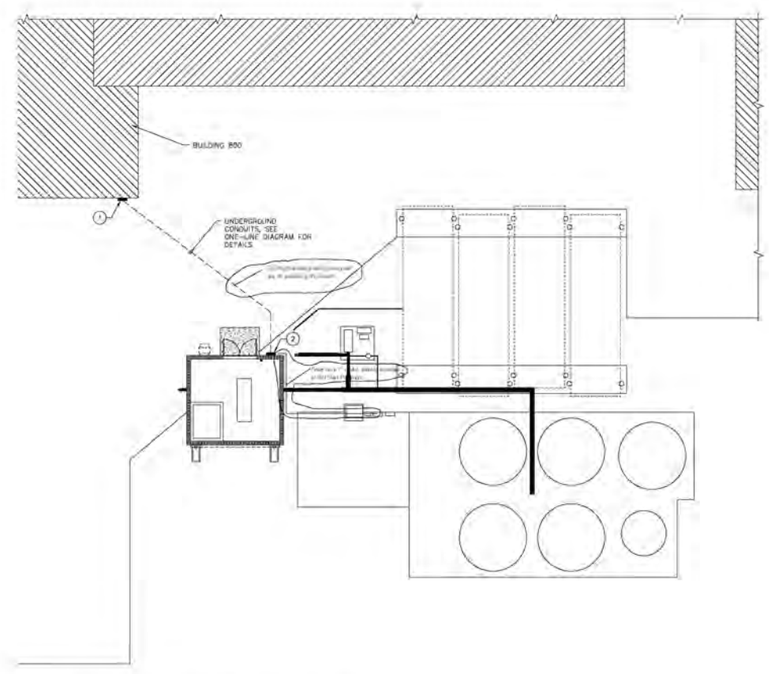
JOB: 1402
DATE: 3/14

SHEET E-2

PRELIMINARY NOT FOR CONSTRUCTION
Expires: 09/30/15

Project Contact/Designer: KERRY LEONARD
Project #14104:
HAWKINS DESIGN GROUP INC.
ELECTRICAL CONSULTING ENGINEERS
2152 SOUTH VINEYARD AVE. SUITE 107
MESA, ARIZONA 85210
PH. 480.813.9000 FAX. 480.813.9001
EMAIL: kerryl@hawkinsdg.com

P:\JOBS\JOB Const Services\Fire Pump House\ELEC\A1.1.dwg DATE: 03/09/14 TAC: TD:15



1 PUMP HOUSE SITE PLAN 1"=10'-0"

GENERAL NOTES – SITE

1. REFER TO ELECTRICAL SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND COMPLETE CONTRACTUAL OBLIGATIONS.
2. ELECTRICAL CONTRACTOR SHALL CONTACT TELEPHONE COMPANY REGARDING EXACT LOCATION OF ALL PRIMARY SERVICE EQUIPMENT, TRENCH LOCATION, ETC.
3. ELECTRICAL CONTRACTOR SHALL PROVIDE ALL NECESSARY TELEPHONE TRENCHING, BACKFILL, AND CONDUIT STUBS INTO TRENCH AS REQUIRED BY TELEPHONE COMPANY AND TO THEIR SPECIFICATIONS.
4. ALL WIRING FOR OUTSIDE LIGHTING SHALL BE A MINIMUM OF #10 COPPER WITH TYPE THWN INSULATION. RUN UNDERGROUND CIRCUITS IN P.V.C. AND PROVIDE A #10 COPPER BOND IN ADDITION TO CIRCUIT CONDUCTORS. UNDERGROUND WIRING SHALL COMPLY WITH APPLICABLE CODES OF THE NEC.
5. ELECTRICAL CONTRACTOR SHALL PROVIDE NECESSARY SECONDARY CONDUCTORS, POWER TRENCHING, BACKFILL AND CONCRETE PADS FOR TRANSFORMERS AND SERVICE EQUIPMENT. ADDITIONALLY PROVIDE CONDUIT STUBS INTO TRENCH PER POWER COMPANY SPECIFICATIONS AND REQUIREMENTS.
6. ALL WIRING SHALL BE COPPER. WIRING #4 AWG AND LARGER SHALL BE XHHW TYPE INSULATION.

KEYED NOTES

1. FUTURE ABOV PANEL TO BE INSTALLED BY OTHERS.
2. MINI POWER CENTER, "PPH" SEE ONE-LINE DIAGRAM FOR DETAILS.

HAWKINS DESIGN ASSOCIATES, LLC
5470 S. LAKESHORE DR. SUITE 134 TEMPE, ARIZONA 85283
480-897-7145 FAX 480-897-7159 EMAIL info@hawkinsdg.com

HERITAGE ENVIRONMENTAL SERVICES – FIRE PUMP HOUSE
ELECTRICAL SITE PLAN
2824 E. STORY ROAD GOODYEAR, ARIZONA 85338

AS-BUILD

PRIOR TO ANY GROUND EXCAVATION CALL BLUE STAKE (602) 263-1100 (800) 782-5348

PRELIMINARY NOT FOR CONSTRUCTION
Expires: 09/30/11

Project Contact/Designer: KERRY LEONARD
Project #141104
HAWKINS DESIGN GROUP INC.
ELECTRICAL CONSULTING ENGINEERS
2152 SOUTH VINEYARD AVE. SUITE 117
MESA, ARIZONA 85210
PH. 480.813.9000 FAX. 480.813.9001
EMAIL: email@hawkinsdg.com

JOB: 1402
DATE: 3/14
SHEET ES-1

AS-BUILT ALARM AND DETECTORS

ELECTRICAL NOTES:

1) INSTALLATION SHALL COMPLY WITH NFPA 70, PARTICULARLY ARTICLE 760, AND SHALL ALSO COMPLY WITH NFPA 72, AND ALL LOCAL ELECTRICAL CODES AND LOCAL JURISDICTION REQUIREMENTS.

2) WIRING RUNS INDICATED ON PRINTS ARE DIAGRAMMATIC AND ARE NOT INTENDED TO BE EXACT CONDUIT RUNS. WIRING SHOULD BE REVISED TO MEET FIELD REQUIREMENTS BY INSTALLING ELECTRICIAN.

3) AC POWER SHALL NOT OCCUPY THE SAME CONDUIT AS FIRE ALARM/DETECTION CIRCUITS (MOST FIRE ALARM UNITS ARE NFE CLASS X)

4) CONVENTIONAL FIRE DETECTION INITIATING (ZONED) CIRCUITS OR NOTIFICATION APPLIANCE CIRCUITS SHALL NOT BE HARNESSED, BRANCHED (TEE TAPPED) OR CAUSE SUPERVISION OF WIRING. ADDRESSABLE CLASS "B" FIRE DETECTION SIGNALING LINE CIRCUITS (SLC) MAY BE PARALLEL BRANCHED (TEE TAPPED) IF SO INDICATED ON THE SYSTEM RISER.

5) OBSERVE POLARITY OF ALL FIRE DETECTION WIRING. POLARITY SHALL BE MAINTAINED THROUGHOUT ENTIRE SYSTEM. WIRE SHALL BE MARKED (AND IDENTIFIED WHERE SPLICED, AND AT ANY JUNCTION POINTS.

6) THE FIRE ALARM PANEL GROUND SHALL BE A SEPARATE CONTINUOUS GROUND WIRE BACK TO THE SOURCE GROUND. CONDUIT GROUND IS NOT ACCEPTABLE PER MANUFACTURER'S SPECIFICATIONS.

7) ALL FIELD WIRING SHALL BE CHECKED FOR SHORTS, GROUNDS, & PROPER END OF LINE RESISTOR (EOL) VALUES BEFORE SCHEDULING WESTFIRE FOR SYSTEM CHECK OUT. DOCUMENT CIRCUIT READINGS AND PRESENT TO WESTFIRE TECHNICIAN UPON INITIAL ARRIVAL ON SITE. PROVIDE WESTFIRE A MIN. OF 1 WEEK NOTICE PRIOR TO CHECK OUT.

8) FIRE ALARM PANEL, AND ANY OTHER FIRE DETECTION EQUIPMENT REQUIRING 120VAC, SHALL BE SUPPLIED BY A DEDICATED CIRCUIT BREAKER. OTHER (NON-FIRE DETECTION) EQUIPMENT SHALL NOT SHARE THE FIRE ALARM CIRCUIT(S). THIS BREAKER SHALL BE LOCKED AND CLEARLY MARKED "FIRE ALARM CIRCUIT CONTROL". 120VAC POWER BY OTHERS.

10) POWER SHALL NOT BE APPLIED TO THE FIRE ALARM PANEL UNLESS A REPRESENTATIVE FROM WESTFIRE IS PRESENT.

GENERAL NOTES:

1) NOTIFY WESTFIRE OF ANY DESIGN QUESTIONS OR CHANGES PRIOR TO INSTALLATION OR FABRICATION. COMPARE DRAWINGS WITH CURRENT CONTRACT DRAWINGS PRIOR TO INSTALLATION.

2) ANY ALTERATIONS OR VARIATIONS FROM DRAWINGS SHALL BE APPROVED PRIOR TO WORK PROCEEDING AND DOCUMENTED ON THE AS-BUILT DRAWINGS. VERIFY DEVICE LOCATIONS PRIOR TO INSTALLATION.

3) REFERENCE FACTORY INSTRUCTION MANUALS DURING INSTALLATION OF FIRE CONTROL EQUIPMENT.

4) DETECTORS SHALL NOT BE MOUNTED IN A DIRECT AIR STREAM. DO NOT INSTALL DETECTORS WITHIN 3'-0" OF AIR SUPPLY DIFFUSERS.

5) USE ONLY U.L. LISTED DEVICES.

6) DO NOT INSTALL DETECTOR HEADS UNTIL FINAL CLEANING HAS BEEN PERFORMED.

7) FIELD DETERMINE INTERFACE REQUIREMENTS AND LOCATIONS OF EQUIPMENT SUPPLIED BY OTHER TRADES. (i.e., SPRINKLER DEVICES, HVAC UNITS, FIRE DAMPERS, ELEVATOR CONTROLS, & FAN CONTROLS.)

PROJECT INFORMATION:

NAME: *HERITAGE ENVIRONMENTAL SERVICES, LLC.*

SITE: *AREA 600 & 800*
284 E. STOREY ROAD
COOLIDGE, ARIZONA 85128

AREA: *APPROX. 18,500 SF*

PARCEL NUMBER: *401-21-033B*

DESIGN STANDARDS:

NFPA (CURRENT): 70,72 — *MANUFACTURES GUIDELINES*
UFC (1997) — *STATE OF ARIZONA*
CITY OF COOLIDGE, PINAL COUNTY (AUTHORITY HAVING JURISDICTION)

BILL OF MATERIALS (BOM)

ITEM	SYM	QTY	PART NUMBER	MODEL NUMBER	DESCRIPTION	MANUFACTURER	MOUNTING
1	FCP	1	74-600000-001	FN6000	SUPPRESSION CONTROL PANEL	FENWAL	72" AFF
2		4		12V-12AH	BATTERIES		IN FCP & SNAC
3		1	71-402001-102	HSD-7152	SMARTONE PHOTOELECTRIC DETECTOR	FENWAL	ON BASE
4		1	70-400001-108	BSB	6" UNIVERSAL DETECTOR BASE	FENWAL	TO 4" OCT. BOX
5		20	70-407008-001	AI	ADDRESSABLE CONTACT INPUT DEVICE N.O.	FENWAL	IN DEVICE 4-BOX
6		4	DS-10	DSD	BEAM DETECTOR IMAGER, 10'	XTRALIS	SURFACE
7		4	OSE-SP	DSD	BEAM DETECTOR EMITTER, STANDARD POWER	XTRALIS	SURFACE
8		1	OSD-INST	DSD	BEAM DETECTOR INSTALLATION KIT	XTRALIS	--
9		6	30-330002-001	--	ADDRESSABLE MANUAL PULL STATION	FENWAL	BACK BOX
10		3	30-195001-001	SDB-325	BACK BOX FOR MANUAL PULL STATION	FENWAL	SURFACE
11		10	P2R	--	HORN / STROBE 24VDC, RED, WALL	SYSTEM SENSOR	4" SQ., 2-GANG
12		1	P2R	--	W.P. HORN / STROBE 24VDC, RED, WALL	SYSTEM SENSOR	W.P. BACK BOX
13		3	NPTTB	--	BA SNAC PANEL/POWER SUPPLY	FEI	TOP @ 8'-0"
14							
15							
16							
17							
18							
19							
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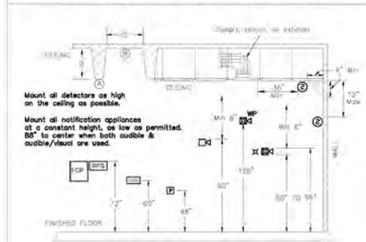
STANDARD MOUNTING OF APPLIANCES SCALE: N.T.S



Typical ceiling mounting of smoke detectors, other than flat ceiling:
- If ceiling height is 4'0" and 8'0" – Mount smoke detector at location A or B. Use B36 spacing.
- If ceiling height is 9'0" or 10'0" – Mount smoke detector at location B, in each "pocket".
- For sloped ceilings, mount one detector within 3' horizontally of the peak.
- If D is equal to or less than 4", mount detector using flat ceiling rules.

Typical ceiling mounting of heat detectors, other than flat ceiling:
- If D=4" and 8'0", or if D=4" to 12" and 9'0" to 8' – Mount heat detector in location A. Use B30 spacing.
- If D=8" and 12'0" – Mount heat detector in location B, in each "pocket".
- All other beam or peak configuration – Mount heat detector in location B. Use 2/3 spacing.
- For sloped ceilings, mount one detector within 3' horizontally of the peak.
- If D is equal to or less than 4", mount detector using flat ceiling rules.

WIRE SCHEDULE

CODE	DESCRIPTION / FUNCTION	PART #
A	2C#16 TW UNSHIELDED PWR, SLC LOOP, AND CONTACTS	BELDEN – 82704
B	2C#14, HORN/STROBE, OR NAC TRUNK CKTS.	BELDEN – 82704
C	2C#18, POWER OR AUX. CONNECTION	BELDEN – 82205
D	2C#18, MODULE INITIATION CKT.	BELDEN – 82205
E	2C#16 TW. SH. PR., SYSTEM BUS	BELDEN – 82841
AA	WEST LOCATION, 2C#16 TW. JACKETED PWR, SLC LOOP	WEST PENN – A2201
CC	WEST LOCATION, 2C#16, POWER OR AUX. CONNECTION	WEST PENN – A2201
DD	WEST LOCATION, 2C#18, MODULE INITIATION CKT.	WEST PENN – A2201
EE	WEST LOCATION, 2C#16 TW. SH. PR., SYSTEM BUS	WEST PENN – A0294
	WIRING TO MEET NEC 760 STANDARDS	

USE UNSHIELDED WIRE UNLESS OTHERWISE NOTED. ALL SHIELDS MUST BE TIED THROUGH, ISOLATED, AND TERMINATED, IF USED.

PART NUMBERS SHOWN ARE FOR PLENUM RATED CABLES. IF IN CONDUIT OR IF NEC® CAN BE VERIFIED, FPL CABLE MAY BE USED IN PLACE OF FPLP.

NOTE: NAC CIRCUIT WIRING HAS BEEN CALCULATED FOR VOLTAGE DROP AND CURRENT LOAD. CHANGING THE WIRING OR NUMBER OF DEVICES ON A CIRCUIT SHOULT RESULT IN OVERLOAD OR FAILURE OF CIRCUIT.

DETAIL REFERENCE

TYPICAL ADDRESS DESCRIPTION

INPUTS	RESPONSES
CONTROL PANEL MATRIX OF EVENTS	POWER ON (LED) · ALARM (LED) · TROUBLE (LED) · SUPERVISORY (LED) · ALARM SIGNALS TO CENTRAL STATION · TROUBLE SIGNALS TO CENTRAL STATION · SUPERVISORY SIGNALS TO CENTRAL STATION · ALARM VERIFY STROBES
X = DEVICE RESPONSE U = UNSURE RESPONSE A = ABORT RESPONSE D = RESPONSE AFTER TIME DELAY	
SYSTEM NORMAL	X
TROUBLE CONDITION	X · X
MANUAL PULL STATION	X · X · X
SMOKE DETECTOR	X · X · X
BEAM DETECTOR	X · X · X
LOSS OF POWER/SYSTEM SYSTEM – CONTROL PANEL	X · X
LOSS OF POWER/SYSTEM SYSTEM – WATER FLOW	X · X · X

WESTFIRE
8360 S. KYRENE RD., STE. 108
TEMPE, AZ. 85284
PHONE: (480) 940-8811
CONTRACTORS LICENSE NO. - 16 #288334, L-2, B60078453

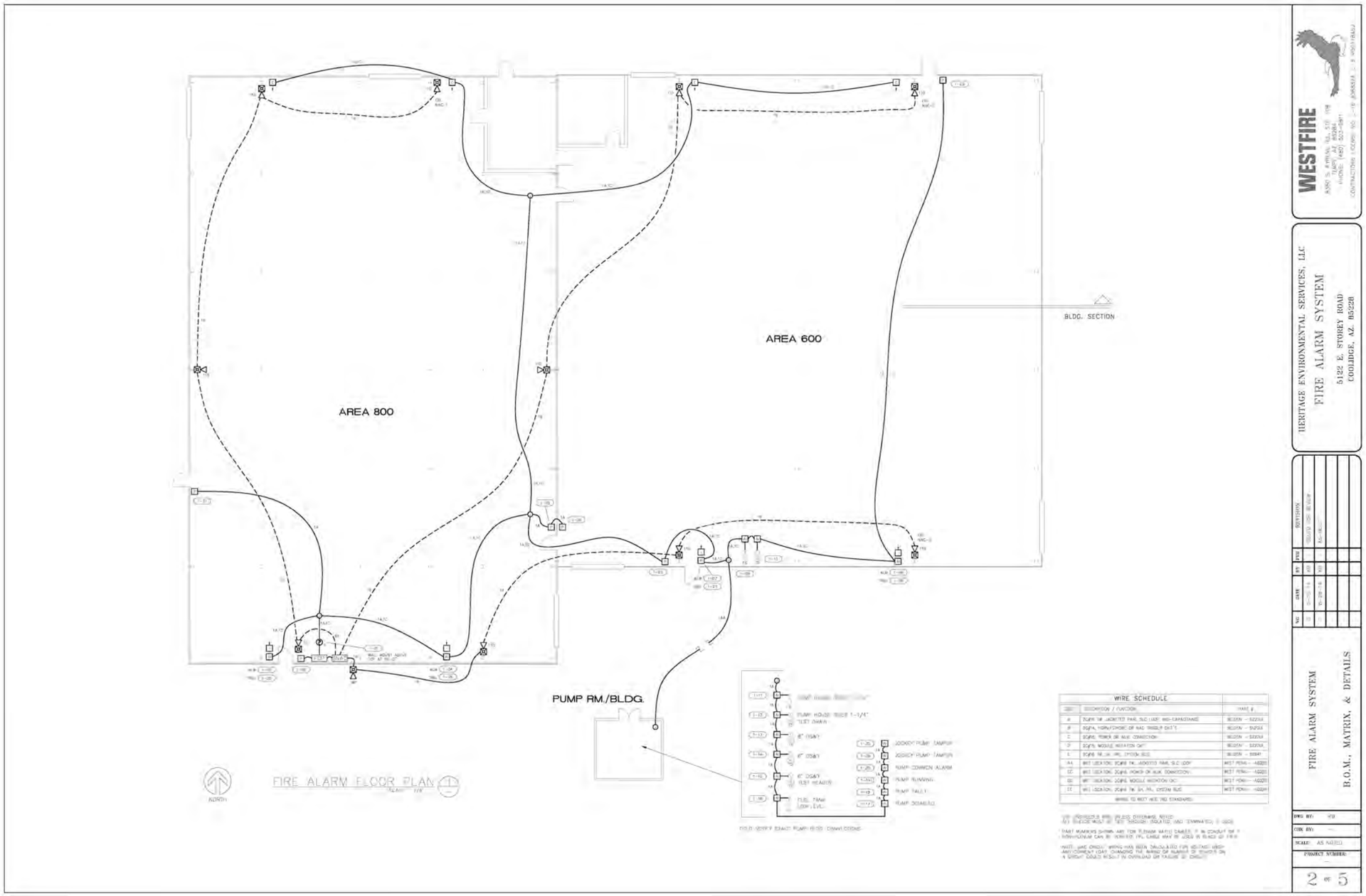
HERITAGE ENVIRONMENTAL SERVICES, LLC
FIRE ALARM SYSTEM
5122 E. STOREY ROAD
COOLIDGE, AZ. 85228

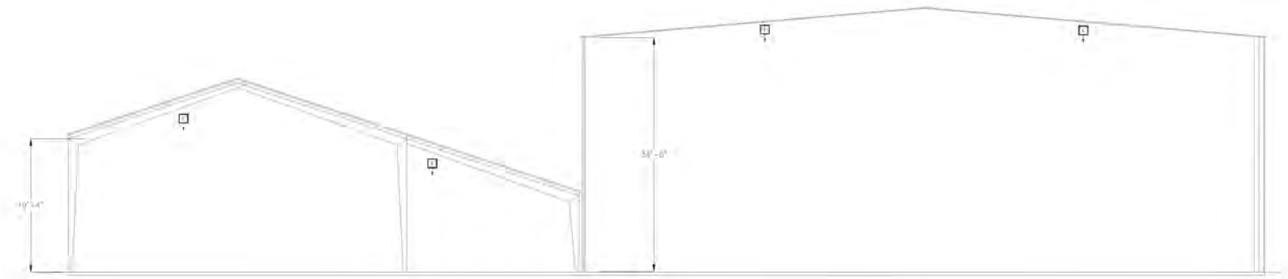
NO.	DATE	BY	REVISION
0	5-15-14	KB	ISSUED FOR REVIEW
1	8-28-14	KB	AS-BUILT

FIRE ALARM SYSTEM
B.O.M., MATRIX, & DETAILS

DRG. BY: KB
CHK. BY:
SCALE: AS NOTED
PROJECT NUMBER:

1 OF 5


AREA 800
AREA 600
BLDG. SECTION
PUMP RM./BLDG.
FIRE ALARM FLOOR PLAN
NORTH
WIRE SCHEDULE
WESTFIRE
HERITAGE ENVIRONMENTAL SERVICES, LLC
FIRE ALARM SYSTEM
5122 E. STOREY ROAD
COOLIDGE, AZ. 85228
FIRE ALARM SYSTEM
R.O.M., MATRIX, & DETAILS
DWG BY:
CHK BY:
SCALE: AS NOTED
PROJECT NUMBER:
2 OF 5



FIRE ALARM BLDG. SECTION 1

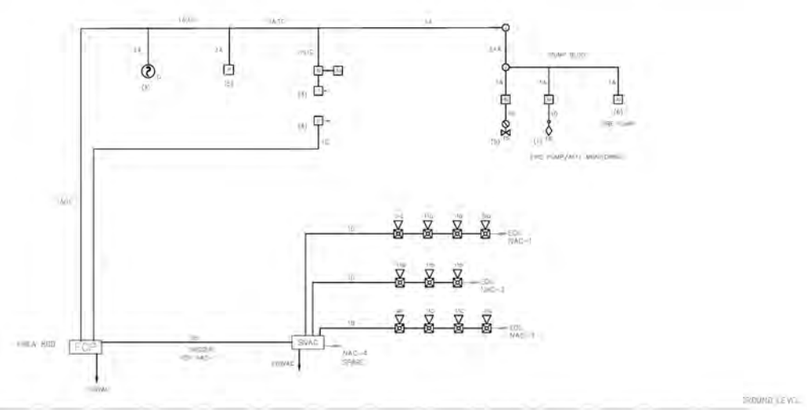
NOTES:
1. MOUNT BEAM DETECTOR IMAGERS AND EMITTERS WITHIN 3'-0" OF CEILING AND IN A CLEAR LINE OF SITE FROM EACH OTHER, WHERE EVER POSSIBLE.
2. MOUNT EACH PAIR OF IMAGERS AND EMITTERS DIRECTLY IN A LINE AND AT THE SAME MOUNTING HEIGHTS.

WIRE SCHEDULE		
CODE	DESCRIPTION / FUNCTION	PART #
A	2C#18 TW JACKETED PAIR SLC LOOP MID-GRADE FACP	BELDEN – 9320UL
B	2C#14, HORN/STROBE OR NAC POWER 24V, 3	BELDEN – 9120UL
C	2C#18, POWER OR AUX. CONNECTION	BELDEN – 9320UL
D	2C#18, MODULE INITIATION CKT.	BELDEN – 9320UL
E	2C#18 TW SH. PR., SYSTEM BUS	BELDEN – 9364
AA	WET LOCATION, 2C#18 TW JACKETED PAIR, SLC LOOP	WEST PENN – N2223
CC	WET LOCATION, 2C#14, POWER OR AUX. CONNECTION	WEST PENN – N2220
DD	WET LOCATION, 2C#18, MODULE INITIATION CKT.	WEST PENN – N2220
EE	WET LOCATION, 2C#18 TW SH. PR., SYSTEM BUS	WEST PENN – N2294
	WIRING TO MEET NEC 760 STANDARDS	

USE JACKETED WIRE UNLESS OTHERWISE NOTED.
ALL SHIELDS MUST BE TIED THROUGH, ISOLATED, AND TERMINATED, PER [illegible]

PART NUMBERS SHOWN ARE FOR PLENUM RATED CABLES. IF IN CONDUIT OR IF NON-PLENUM CAN BE VERIFIED, TFT CABLE MAY BE USED IN PLACE OF FPLP.

NOTE: NAC CIRCUIT WIRING HAS BEEN CALCULATED FOR VOLTAGE DROP AND CURRENT LOAD. CHANGING THE BRAND OR NUMBER OF DEVICES ON A CIRCUIT COULD RESULT IN OVERLOAD OR FAILURE OF CIRCUIT.



FIRE ALARM RISER DIAGRAM 2

WESTFIRE
4080 S. AVENIDA DEL SOL, STE 109
TEMPE, AZ 85284
PHONE: (480) 222-8811
CONTRACTORS LICENSE NO. – 16 606887A, L12 606887A

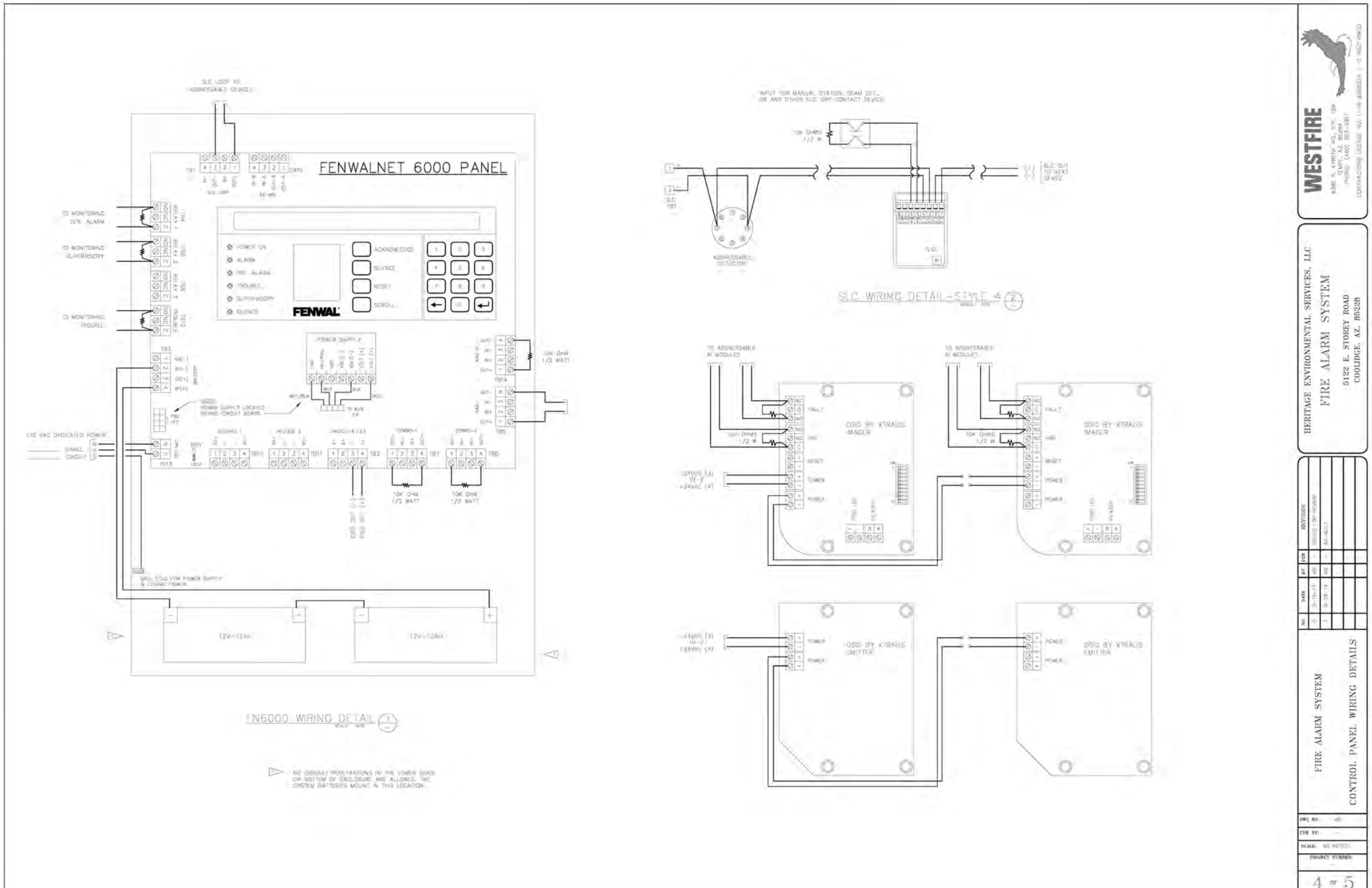
HERITAGE ENVIRONMENTAL SERVICES, LLC
FIRE ALARM SYSTEM
5122 E. STOREY ROAD
COOLIDGE, AZ. 85228

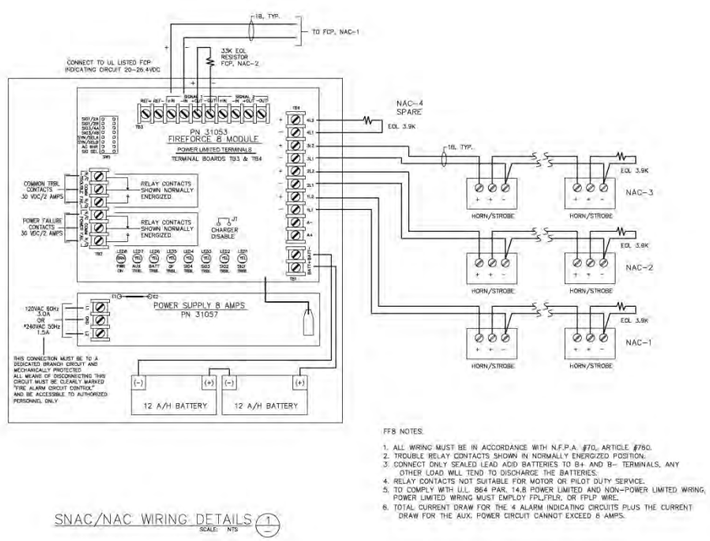
NO	DATE	BY	REVISION
1	2-15-16	KD	PERMIT SUBMITTAL
	8-25-16	KD	AS BUILT

FIRE ALARM SYSTEM
SECTION & RISER DIAGRAM

DWG BY: KD
CHK BY:
SCALE: AS NOTED
PROJECT NUMBER:

3 OF 5


FENWALNET 6000 PANEL
FENWAL
FN6000 WIRING DETAIL
SLC WIRING DETAIL - STYLE 4
OSID BY XTRALIS IMAGER
OSID BY XTRALIS EMITTER
12V-12AH
WESTFIRE
HERITAGE ENVIRONMENTAL SERVICES, LLC
FIRE ALARM SYSTEM
5122 E. STOREY ROAD
COOLIDGE, AZ. 85228
FIRE ALARM SYSTEM
CONTROL PANEL WIRING DETAILS
4 OF 5



SNAC/NAC WIRING DETAILS (1) SCALE: NTS

FFS NOTES.

1. ALL WIRING MUST BE IN ACCORDANCE WITH N.F.P.A. #70, ARTICLE #760.
2. TROUBLE RELAY CONTACTS SHOWN IN NORMALLY ENERGIZED POSITION.
3. CONNECT ONLY SEALED LEAD ACID BATTERIES TO B+ AND B- TERMINALS, ANY OTHER LOAD WILL TEND TO DISCHARGE THE BATTERIES.
4. RELAY CONTACTS NOT SUITABLE FOR MOTOR OR PILOT DUTY SERVICE.
5. TO COMPLY WITH U.L. 864 PAR. 14.8 POWER LIMITED AND NON-POWER LIMITED WIRING, POWER LIMITED WIRING MUST EMPLOY FPL/FPLR, OR FPLP WIRE.
6. TOTAL CURRENT DRAW FOR THE 4 ALARM INDICATING CIRCUITS PLUS THE CURRENT DRAW FOR THE AUX. POWER CIRCUIT CANNOT EXCEED 8 AMPS.

BATTERY CALCULATIONS

JOB NUMBER:
JOB NAME: Heritage Environmental
APPLICATION: Fenwal Net 6000 FCP
DATE: 05/15/14
REV: 1 REV DATE: 08/28/14

Device/Description	Qty	Supervision Amps/Device	Supervision Total Amperage	Qty	Alarm Amps/Device	Alarm Total Amperage
FN-800 main board	1	0.2	0.2	1	0.65	0.65
NAC ckt. -1 (Higgin)	1			1	0.015	0.015
PSD-7152 Smoke det.	1	0.000405	0.000405	1	0.000445	0.000445
Manual pull station	6	0.000405	0.00243	6	0.00045	0.0027
AI Input module	20	0.000405	0.0081	20	0.00045	0.009
Beam Det. Imager	4	0.008	0.032	4	0.008	0.032
Beam Det. Emitter	4	0.00035	0.0014	4	0.00035	0.0014

	Amperes	Hours	Total Amp-Hrs
Total Supervisory Current	0.244335	24	5.9

	Amperes	Minutes	Total Amp-Hrs
Total Alarm Current	0.710545	5	0.1

Battery Charging Rate (Amp-Hr/Hr)	Stand-By Battery Requirement	Total Amp-Hrs 6.0
	Battery De-Rating Plus: 20%	Total Amp-Hrs 7.2
Total Time to Recharge (Hrs) N/A	***Battery Supplied***	Total Amp-Hrs 12.0

Comments:

BATTERY CALCULATIONS

JOB NUMBER:
JOB NAME: Heritage Environmental
APPLICATION: SNAC Panel -1
DATE: 05/15/14
REV: REV DATE:

Device/Description	Qty	Supervision Amps/Device	Supervision Total Amperage	Qty	Alarm Amps/Device	Alarm Total Amperage
NAC ckt. -1	1			1	0.804	0.804
NAC ckt. -2	1			1	0.603	0.603
NAC ckt. -3	1			1	0.76	0.76
NAC ckt. -4						
Main Ckt. Board - HPFF8	1	0.207	0.207	1	0.075	0.075

	Amperes	Hours	Total Amp-Hrs
Total Supervisory Current	0.207	24	5.0

	Amperes	Minutes	Total Amp-Hrs
Total Alarm Current	2.242	5	0.2

Battery Charging Rate (Amp-Hr/Hr)	Stand-By Battery Requirement	Total Amp-Hrs 5.2
	Battery De-Rating Plus: 20%	Total Amp-Hrs 6.3
Total Time to Recharge (Hrs) N/A	***Battery Supplied***	Total Amp-Hrs 12.0

Comments:

BATTERY & NAC VOLTAGE DROP CALCULATIONS (2) SCALE: NTS

NAC Circuit Load/Voltage Drop Calculations

Date: 5/15/2014
Job Number:
Job Name: Heritage Environmental
NAC Circuit: SNAC Panel NAC-1

Device Type	Qty.	Amps	Total
P2 Series Horn/Strobe			
15cd Horn/Strobe - medium setting typ.		0.069	0.000
30cd Horn/Strobe		0.097	0.000
75cd Horn/Strobe (interior or W.P.)		0.157	0.000
110cd Horn/Strobe	4	0.201	0.804
			0.000
			0.000
S Series Strobes			
15cd Strobe		0.066	0.000
30cd Strobe		0.094	0.000
75cd Strobe (Interior or W.P.)		0.158	0.000
110cd Strobe		0.202	0.000
			0.000
			0.000
MH Mini Horn (temporal - low 76db)		0.014	0.000
			0.000
MB-G10-24-R W.P. 10" Alarm Bell		0.060	0.000
			0.000
			0.000
			0.000
			0.000
PC Series Horn/Strobe - Ceiling mount			
15cd Temporal medium setting typ.		0.069	0.000
30cd		0.097	0.000
75cd		0.157	0.000
110cd		0.201	0.000
185cd high output strobe		0.258	0.000
			0.000
			0.000
			0.000
			0.000
Combined Device Totals	**4**		**0.804**

Voltage Drop - Wire Size (One Way Distance)	Feet	Resistance	Drop
AWG 16 - 5.29 Ohms/1000 ft		0.000	0.000
AWG 14 - 3.26 Ohms/1000 ft	275	1.793	1.442
AWG 12 - 2.05 Ohms/1000 ft		0.000	0.000

NAC Circuit Load/Voltage Drop Calculations

Date: 5/15/2014
Job Number:
Job Name: Heritage Environmental
NAC Circuit: SNAC Panel NAC-2

Device Type	Qty.	Amps	Total
P2 Series Horn/Strobe			
15cd Horn/Strobe - medium setting typ.		0.069	0.000
30cd Horn/Strobe		0.097	0.000
75cd Horn/Strobe (interior or W.P.)		0.157	0.000
110cd Horn/Strobe	3	0.201	0.603
			0.000
			0.000
S Series Strobes			
15cd Strobe		0.066	0.000
30cd Strobe		0.094	0.000
75cd Strobe (Interior or W.P.)		0.158	0.000
110cd Strobe		0.202	0.000
			0.000
			0.000
MH Mini Horn (temporal - low 76db)		0.014	0.000
			0.000
MB-G10-24-R W.P. 10" Alarm Bell		0.060	0.000
			0.000
			0.000
			0.000
			0.000
PC Series Horn/Strobe - Ceiling mount			
15cd Temporal medium setting typ.		0.069	0.000
30cd		0.097	0.000
75cd		0.157	0.000
110cd		0.201	0.000
185cd high output strobe		0.258	0.000
			0.000
			0.000
			0.000
			0.000
Combined Device Totals	**3**		**0.603**

Voltage Drop - Wire Size (One Way Distance)	Feet	Resistance	Drop
AWG 16 - 5.29 Ohms/1000 ft		0.000	0.000
AWG 14 - 3.26 Ohms/1000 ft	350	2.282	1.376
AWG 12 - 2.05 Ohms/1000 ft		0.000	0.000

NAC Circuit Load/Voltage Drop Calculations

Date: 5/15/2014
Job Number:
Job Name: Heritage Environmental
NAC Circuit: SNAC Panel NAC-3

Device Type	Qty.	Amps	Total
P2 Series Horn/Strobe			
15cd Horn/Strobe - medium setting typ.		0.069	0.000
30cd Horn/Strobe		0.097	0.000
75cd Horn/Strobe (interior or W.P.)	1	0.157	0.157
110cd Horn/Strobe	3	0.201	0.603
			0.000
			0.000
S Series Strobes			
15cd Strobe		0.066	0.000
30cd Strobe		0.094	0.000
75cd Strobe (Interior or W.P.)		0.158	0.000
110cd Strobe		0.202	0.000
			0.000
			0.000
MH Mini Horn (temporal - low 76db)		0.014	0.000
			0.000
MB-G10-24-R W.P. 10" Alarm Bell		0.060	0.000
			0.000
			0.000
			0.000
			0.000
PC Series Horn/Strobe - Ceiling mount			
15cd Temporal medium setting typ.		0.069	0.000
30cd		0.097	0.000
75cd		0.157	0.000
110cd		0.201	0.000
185cd high output strobe		0.258	0.000
			0.000
			0.000
			0.000
			0.000
Combined Device Totals	**4**		**0.760**

Voltage Drop - Wire Size (One Way Distance)	Feet	Resistance	Drop
AWG 16 - 5.29 Ohms/1000 ft		0.000	0.000
AWG 14 - 3.26 Ohms/1000 ft	210	1.369	1.041
AWG 12 - 2.05 Ohms/1000 ft		0.000	0.000

WESTFIRE
8360 S. KYRENE RD., STE. 108
TEMPE, AZ 85284
PHONE: (480) 503-9911
CONTRACTORS LICENSE NO. L-16 #086324, L-5 ROC178452

HERITAGE ENVIRONMENTAL SERVICES, LLC
FIRE ALARM SYSTEM
5122 E. STOREY ROAD
COOLIDGE, AZ. 85228

NO.	DATE	BY	PER
0	5-15-14	KB	-
1	8-28-14	KB	-

REVISION: ISSUED FOR REVIEW; AS-BUILT

FIRE ALARM SYSTEM
NAC WIRING DETAILS & CALC'S

DWG BY: KB
CHK BY: -
SCALE: AS NOTED
PROJECT NUMBER: -
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