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 City of Coolidge Fire Department. This gate is locked with keys maintained by Heritage employees and the 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 request 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 G-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. Appendix 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 (Section D). 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 Section D 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. Section D 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 run-on/run-off 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 run-on 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 run-on/run-off at the unit. Section D, Appendix D-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. Section D, Appendix D-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 run-on/run-off. Section D, Appendix D-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 G-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
2,5 dimethyl-2,5-dihydroperoxy hexane
dinitrotoluene
dry guanyl compounds
dry lead azide
Unwetted nitrocellulose films and similar materials
Unwetted picric acids
Unwetted explosives
aluminum ophorite explosive
amatol
ammonal
butyl tetryl
copper acetylide
cyanuric triazide
cyclotrimethylenetrinitramine
dinitroethyleneurea
dinitroglycerine
dipicryl sulfone
dipicrylamine
erythritol tetranitrate
fulminating gold
fulminating mercury
fulminating platinum
fulminating silver
gelatinized nitrocellulose
guanyl nitrosamino
guanyl nitrosamino
guanylidene
guanyltetrazene
heavy metal azide
hexanite
hexanitrodiphenylamine
hexanitrostilbene
hexogen
hydrazoic acid
hyrazinium nitrate
lead azide
lead mannite
lead
mononitroresorcinate
lead picrate
lead styphnate
magnesium ophorite
mannitol hexanitrate
mercury fulminate
mercury oxalate
mercury oxalate
mercury tartrate
mononitrotoluene
nitrated carbohydrate
nitrated glucoside
nitrated polyhydric alcohol
nitrogen trichloride
nitrogen triiodide
nitroglycide
nitroglycol
nitronium perchlorate
nitrourea
organic amine nitrates
organic nitramines
picramide
picratol
picryl fluoride
polynitro aliphatic compounds
potassium nitroaminotetrazole
robenzoic acid
silver acetylide
silver azide
silver fulminate
silver styphnate
silver tetrazene
sodatol
sodium amatol
syphnic acid
tetranitrocarbazole
tetraze
tetrytol
trimethylolethane
trimonite
trinit
trinitroanisole
trinitrobenzoic acid
trinitrocresol
trinitro-meta-cresol
trinitronaphthalene
trinitrophenetol
trinitrophloroglucinol
trinitroresorcinol
urea ammonium nitrate
vinyl chloride
vinylidene chloride
acetylides

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 (Section C) 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 (Section C).

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 Section D) for applicable drawings. Incompatible wastes and materials are not placed in the same container or in unrinsed 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 (Section D).

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^{o} 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 alarm-monitoring company. 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 weekly. Additional information is available in Section 2 – Inspection Schedule and in the Container Storage and Consolidation Plan (Section D).

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 G-A will be inspected at the frequency noted in Table G-A.

MONTHLY SECURITY INSPECTION

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

- Fencing in good condition
- Fence-line berms in good condition (i.e., sufficient sandy clay loam content for structural integrity to prevent stormwater run-on/run-off) with minimum height of 1.5 feet
  * (in addition to monthly, check integrity after any storm event greater than 1 inch)
- 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 (Section N) 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 (Section O) 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:

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:

EXAMPLE FORM

M = Maintenance H = Housekeeping

Heritage Environmental Services, LLC

Annual Inspection Findings Form

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

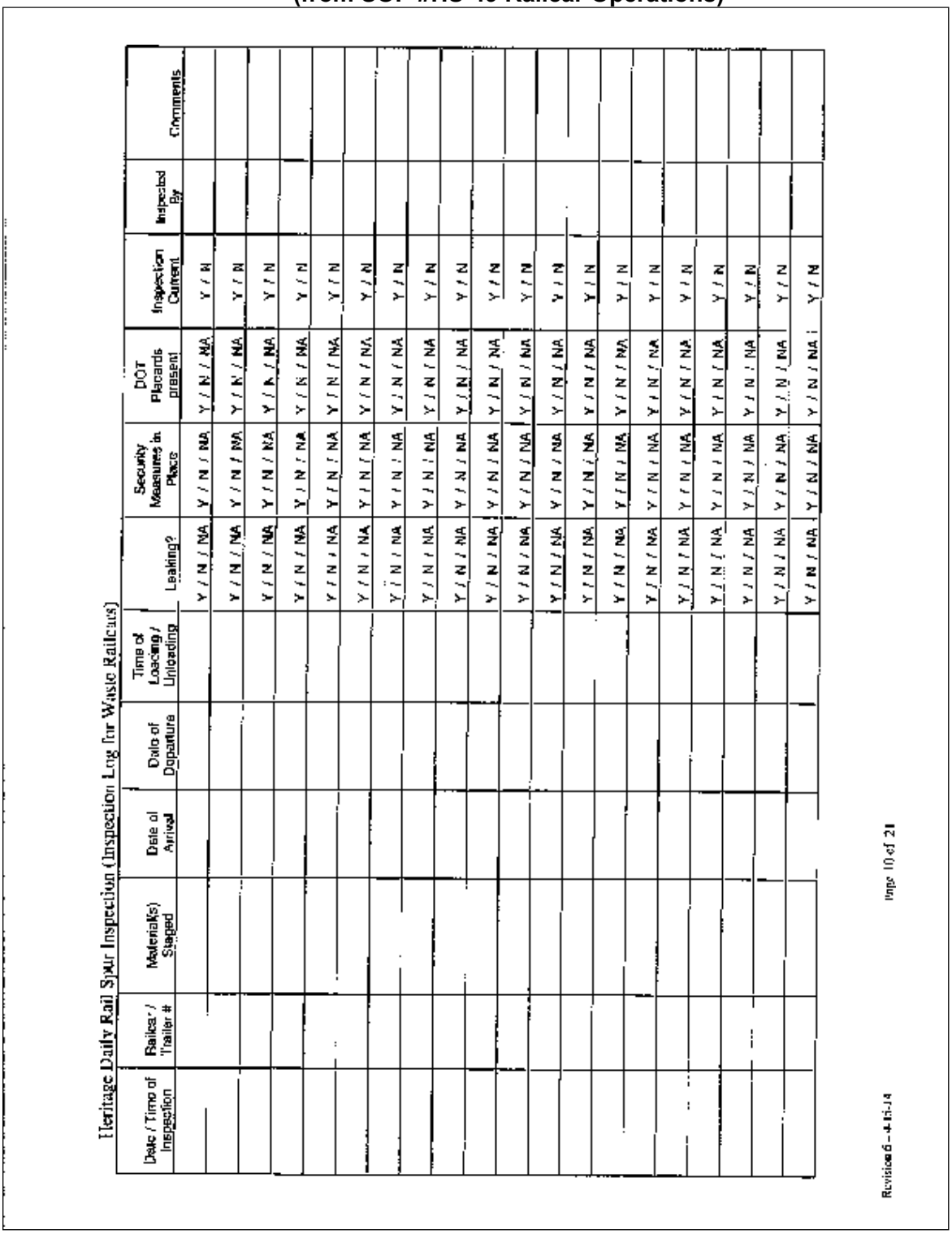
Finding		**Corrective Action or Scheduled Date for Correction**	**Completed (Signature, Printed Name, Date)**
	M		**By:**
	H		**Date:**
	M		**By:**
	H		**Date:**
	M		**By:**
	H		**Date:**
	M		**By:**
	H		**Date:**
	M		**By:**
	H		**Date:**
	M		**By:**
	H		**Date:**
	M		**By:**
	H		**Date:**
	M		**By:**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

Heritage Environmental Services, LLC

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

EXAMPLE FORM

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 _____

Revision 6 4 15 14 Page 11 of 21

Heritage Environmental Services, LLC

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

EXAMPLE FORM

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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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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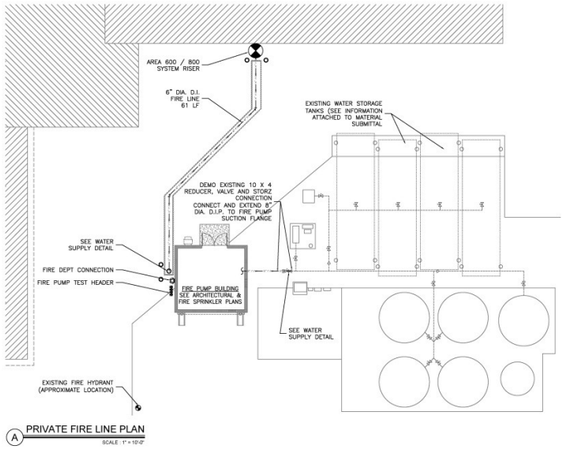
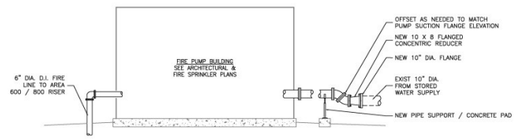
APPENDIX D-C

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 DSPM 6-1. 4041 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 30" (FROM TOP OF PIPE)
8) PIPING SHALL BE FLUSHED AND TESTED PER NFPA 24

SCOPE / INSTALLATION NOTES

OWNER:	HERITAGE ENVIRONMENTAL SERVICES, LLC 7901 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

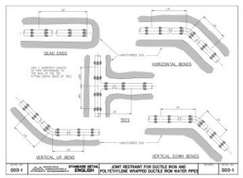
SCOPE / INSTALLATION NOTES

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 6" D.I.P. PRIVATE UNDERGROUND FIRE LINE FROM FIRE PUMP DISCHARGE TO AREA 600 / 800 RISER.
4) AVFP WILL COORDINATE NEW FIRE ROUTING WITH EXISTING FIELD CONDITIONS.

SYMBOLS

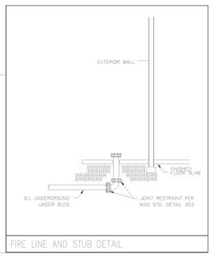
	UNDERGROUND PIPE
	EXISTING FIRE HYDRANT
	FIRE DEPARTMENT CONNECTION
	AUTOMATIC FIRE SPRINKLER SYSTEM RISER
	EXISTING VALVE
FDC	FIRE DEPARTMENT CONNECTION
(E) / EXIST	EXISTING

VICINITY MAP

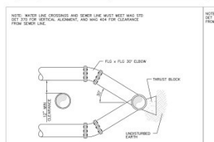


303-1 STANDARD DETAIL ENGLISH JOINT RESTRAINT FOR DUCTILE IRON AND POLYETHYLENE WRAPPED DUCTILE IRON WATER PIPES 303-1

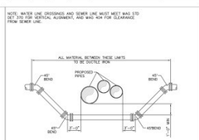
303-2 STANDARD DETAIL ENGLISH JOINT RESTRAINT FOR DUCTILE IRON AND POLYETHYLENE WRAPPED DUCTILE IRON WATER PIPES 303-2



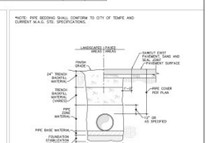
FIRE LINE AND STUB DETAIL



1 WATERLINE CROSSING DETAIL
N.T.S.



5 UTILITY CROSSING DETAIL
N.T.S.



6 TYPICAL TRENCH DETAIL
N.T.S.

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 #: 96896
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

STEVEN A. SHELDON — 28886 — Phoenix, Arizona — Exp. 03/31/2015

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

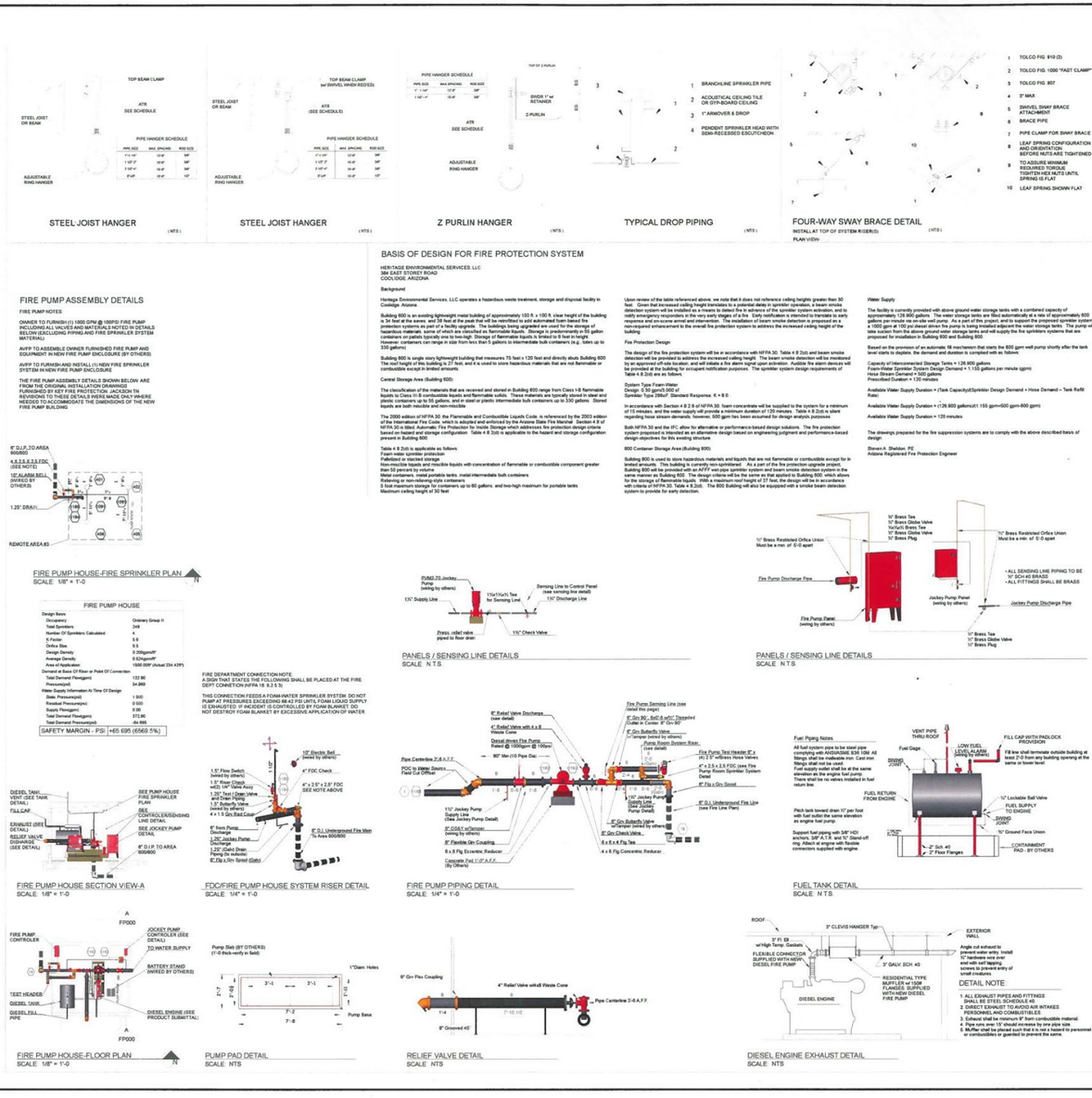
HERITAGE ENVIRONMENTAL SERVICES, LLC
NEW FIRE LINE
5122 E. STOREY ROAD
COOLIDGE, ARIZONA

REVISIONS:
AS BUILT 8/27/2014

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

Sheet Title:
PRIVATE FIRE LINE PLAN

SHEET #
FL001


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 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_____
FIRE PUMP ASSEMBLY DETAILS
FIRE PUMP NOTES
FIRE PUMP HOUSE-FIRE SPRINKLER PLAN
SCALE: 1/8" = 1'-0
FIRE PUMP HOUSE
SAFETY MARGIN - PSI: +65 695 (6569.5%)
FIRE PUMP HOUSE SECTION VIEW-A
SCALE: 1/8" = 1'-0
FDC/FIRE PUMP HOUSE SYSTEM RISER DETAIL
SCALE: 1/4" = 1'-0
FIRE PUMP HOUSE-FLOOR PLAN
SCALE: 1/8" = 1'-0
PUMP PAD DETAIL
SCALE: NTS
BASIS OF DESIGN FOR FIRE PROTECTION SYSTEM
HERITAGE ENVIRONMENTAL SERVICES LLC
38K EAST STOREY ROAD
COOLIDGE, ARIZONA
Background
Water Supply
PANELS / SENSING LINE DETAILS
SCALE: N.T.S.
FIRE PUMP PIPING DETAIL
SCALE: 1/4" = 1'-0
RELIEF VALVE DETAIL
SCALE: NTS
PANELS / SENSING LINE DETAILS
SCALE: N.T.S.
FUEL TANK DETAIL
SCALE: N.T.S.
DIESEL ENGINE EXHAUST DETAIL
SCALE: NTS
AVFP - SCOPE OF WORK
1. DEMO EXISTING AREA 600 WET SYSTEM PIPING, RISER AND CAP/WINDOW IN PLACE EXISTING 3" DIA. U.G. FIRE LINE
2. REASSEMBLE (1) 100 PSI/1000 GPM DIESEL FIRE PUMP (FOUNDATION/ENCLOSURE AND WIRING BY OTHERS) & PIPE FROM EXISTING STORED WATER SUPPLY TO PUMP SUCTION FLANGE
3. INSTALL (1) NEW WET PIPE FIRE SPRINKLER SYSTEM IN NEW FIRE PUMP ENCLOSURE
4. INSTALL NEW 8" DIA. D.I. FIRE LINE FROM PUMP DISCHARGE TO NEW AREA 600/800 RISER
5. INSTALL NEW CLOSED HEAD FOAM-WATER SYSTEM IN AREA 600/800
PROJECT AREA
OWNER
PROJECT ADDRESS
FIRE SPRINKLER CONTRACTOR
APPLICABLE CODES
AUTHORITY HAVING JURISDICTION STATE OF ARIZONA FIRE MARSHAL
SHOP DRAWING
JAMES H. SAWYER, CET
NICET CERTIFICATION # 99386
WATER-BASED SYSTEMS LAYOUT
LEVEL 3
Arizona Verde Fire
3115 N. 29th Avenue
Phoenix, AZ 85017
Phone (602)278-1111 FAX (602)278-1114
Arizona State Contractors License: ROC 177239
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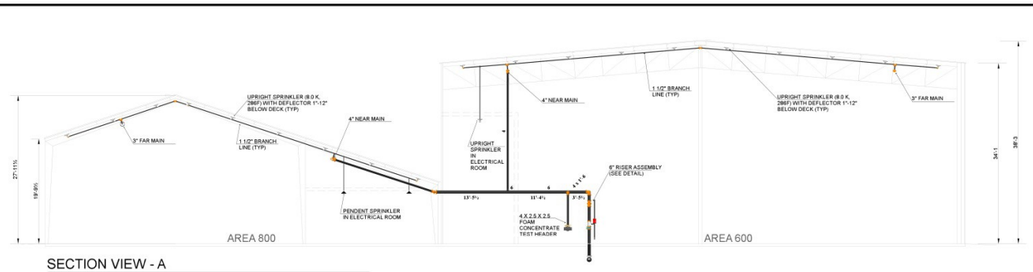
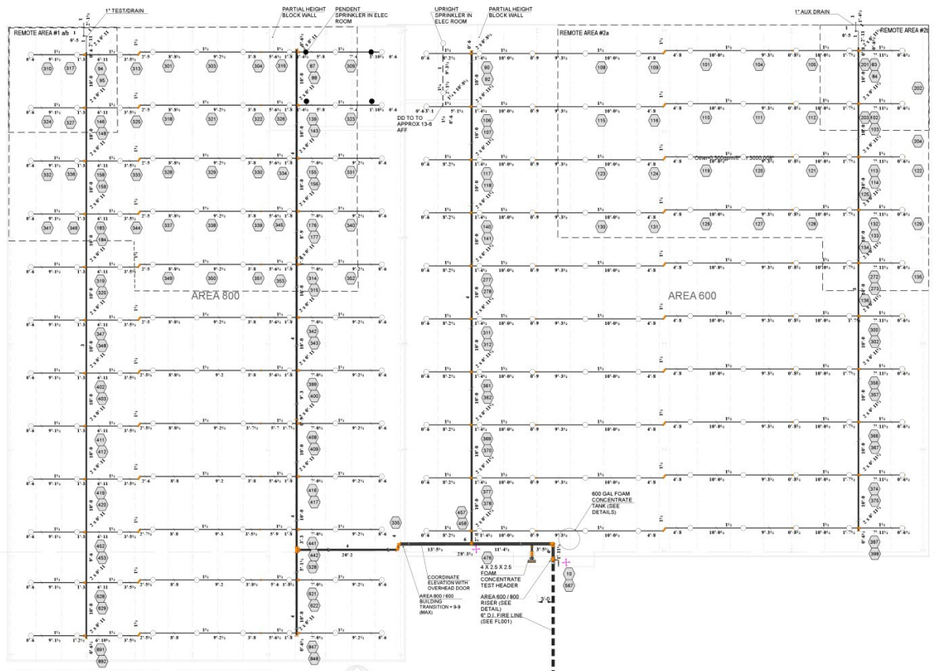
HERITAGE ENVIRONMENTAL SERVICES, LLC
5122 E. STOREY ROAD
COOLIDGE, ARIZONA
REVISIONS
AS BUILT 8/27/2014
DATE: 3/27/2014
SCALE: AS NOTED
DRAWN BY: JG
PROJECT NO: 114004
CHECKED BY: BAS
Sheet Title
FIRE SPRINKLER DETAILS, NOTES & SYMBOLS
SHEET #
FP000



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



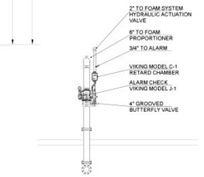
FIRE SPRINKLER PLAN - AREA 600 & 800
SCALE: 1/8" = 1'-0"
NORTH

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:	0.337gpm/ft²
Area of Application:	3000.00ft² (Actual 3042.06ft²)
Demand at Base Of Riser or Point Of Connection	
Total Demand Flow(gpm):	1026.06
Pressure(psi):	60.820
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):	-32.881
SAFETY MARGIN - PSI	+15.849 (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:	406.78ft² (Actual 406.78ft²)
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%)

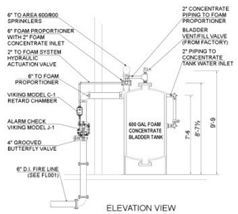
REMOTE AREA #2a - MAX FOAM DEMAND	
Design Basis:	
Occupancy:	Other
Total Sprinklers:	249
Number Of Sprinklers Calculated:	30
K-Factor:	8
Orifice Size:	0.531
Design Density:	0.300gpm/ft²
Average Density:	0.317gpm/ft²
Area of Application:	3000.00ft²
Demand at Base Of Riser or Point Of Connection	
Total Demand Flow(gpm):	951.18
Pressure(psi):	68.837
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):	-28.864
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:	0.296gpm/ft²
Area of Application:	406.78ft² (Actual 406.78ft²)
Demand at Base Of Riser or Point Of Connection	
Total Demand Flow(gpm):	120.41
Pressure(psi):	29.937
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):	-86.647
SAFETY MARGIN - PSI	+86.646 (8664.6%)

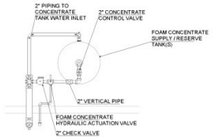


RISER DETAIL
SCALE: 1/4" = 1'-0

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 SYSTEM DEMAND: 1655.12 GPM SYSTEM DEMAND - 600 GPM REFILL RATE X 120 MIN = 126,615 GAL

FOAM CONCENTRATE SUPPLY CALC:
PER NFPA 30 (2000) 4.8.2.6
ACTUAL SYSTEM DISCHARGE (REMOTE AREA 1a) = 1155.12 GPM
1155.12 GPM X 3% = 34.6536 X 15 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

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_____.

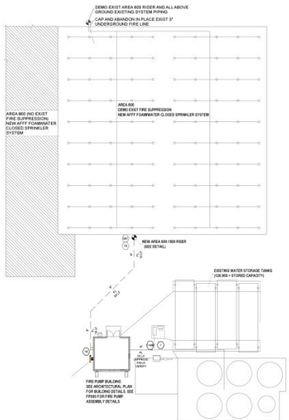
SYMBOLS

- 6" 1'-0" — UNDERGROUND PIPE SIZE / LENGTH (FOR HYDRAULIC REFERNCE ONLY)
- 1" 1'-0" — NEW OVERHEAD PIPE SIZE / LENGTH
- 6" 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



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

SHOP DRAWING

JAMES H. SAWYER, CET
NICET CERTIFICATION #: 96996
WATER-BASED SYSTEMS LAYOUT
LEVEL 3

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

Exp. 03/31/2015

Arizona / erde 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

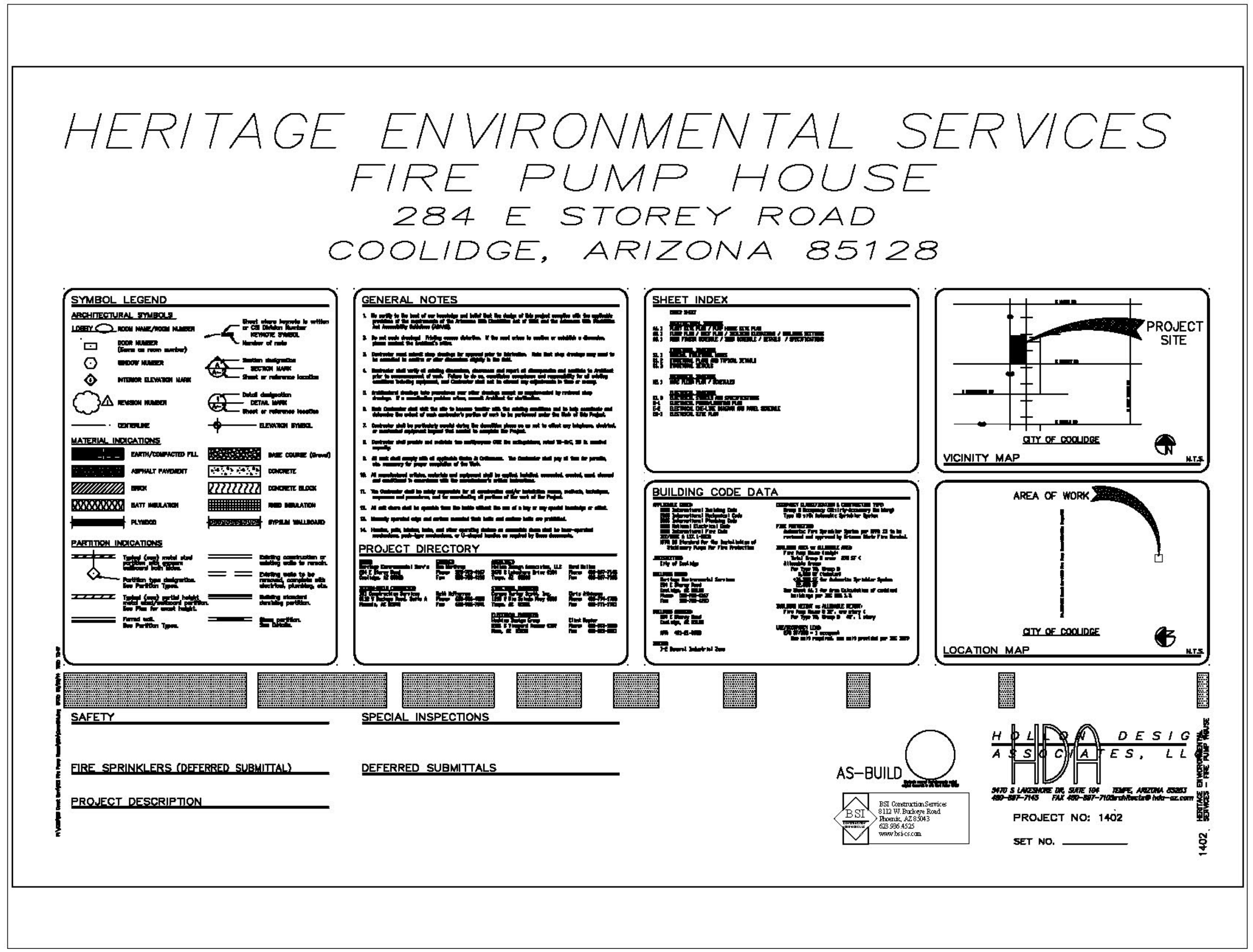
REVISIONS:
AS BUILT 8/27/2014

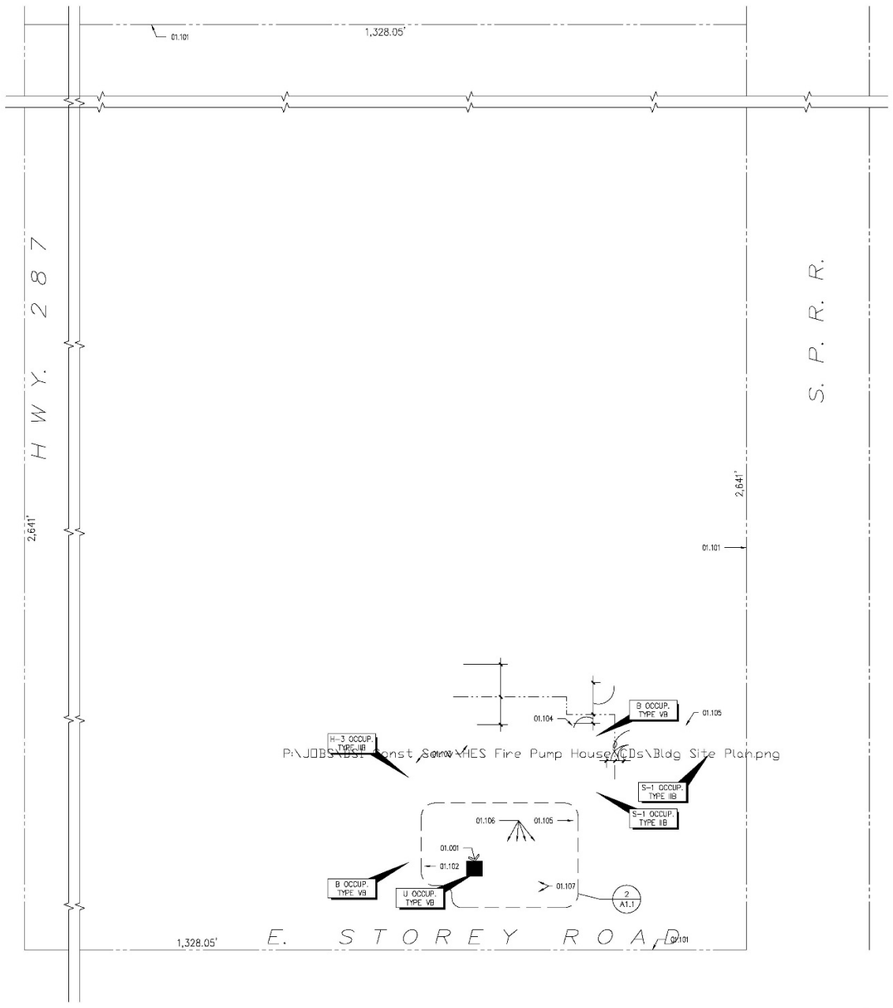
DATE: 3/28/2014	SCALE: AS NOTED
DRAWN BY: JS	PROJECT NO 113004
CHECKED BY: SAS	

Sheet Title:
FIRE SPRINKLER PLAN
AREA 600 & 800

SHEET #
FP001

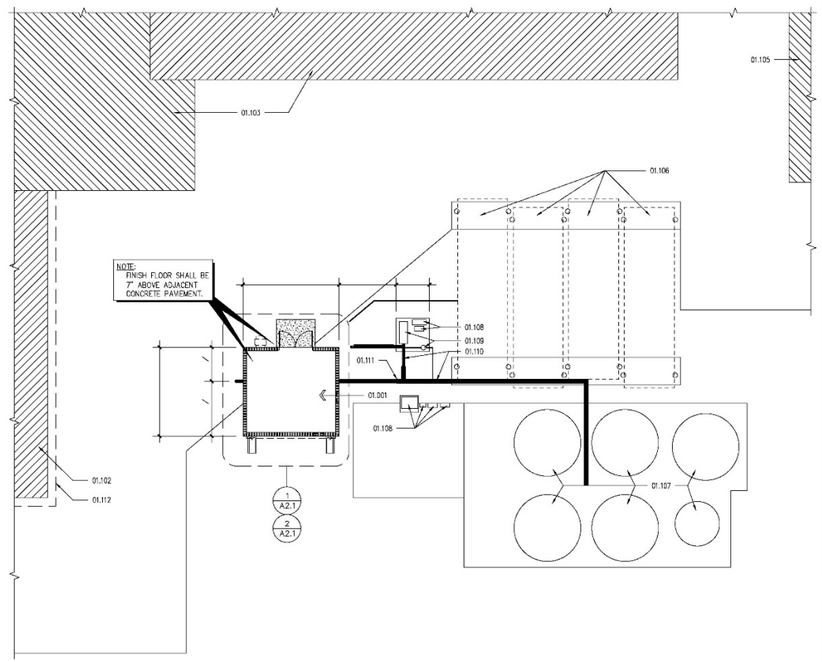
AS BUILT PUMPHOUSE


HERITAGE ENVIRONMENTAL SERVICES
FIRE PUMP HOUSE
284 E STOREY ROAD
COOLIDGE, ARIZONA 85128
SYMBOL LEGEND
GENERAL NOTES
PROJECT DIRECTORY
SHEET INDEX
BUILDING CODE DATA
PROJECT SITE
CITY OF COOLIDGE
VICINITY MAP
AREA OF WORK
LOCATION MAP
SAFETY
SPECIAL INSPECTIONS
FIRE SPRINKLERS (DEFERRED SUBMITTAL)
DEFERRED SUBMITTALS
PROJECT DESCRIPTION
AS-BUILD
PROJECT NO: 1402
SET NO.



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:	17,390 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:
14,000 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:

$\frac{2,612}{9,000} + \frac{17,390}{56,000} + \frac{1,168}{9,000} + \frac{3,852}{17,500} + \frac{278}{22,000} = 0.96 < 1.0$

KEYNOTES

DIVISION 1 – GENERAL REQUIREMENTS

01.001 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 potentials, 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.

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PLAN SITE PLAN
PUMP HOUSE SITE PLAN

HERITAGE ENVIRONMENTAL SERVICES – FIRE PUMP HOUSE
284 1 STOREY ROAD
COOLIDGE, ARIZONA 85128

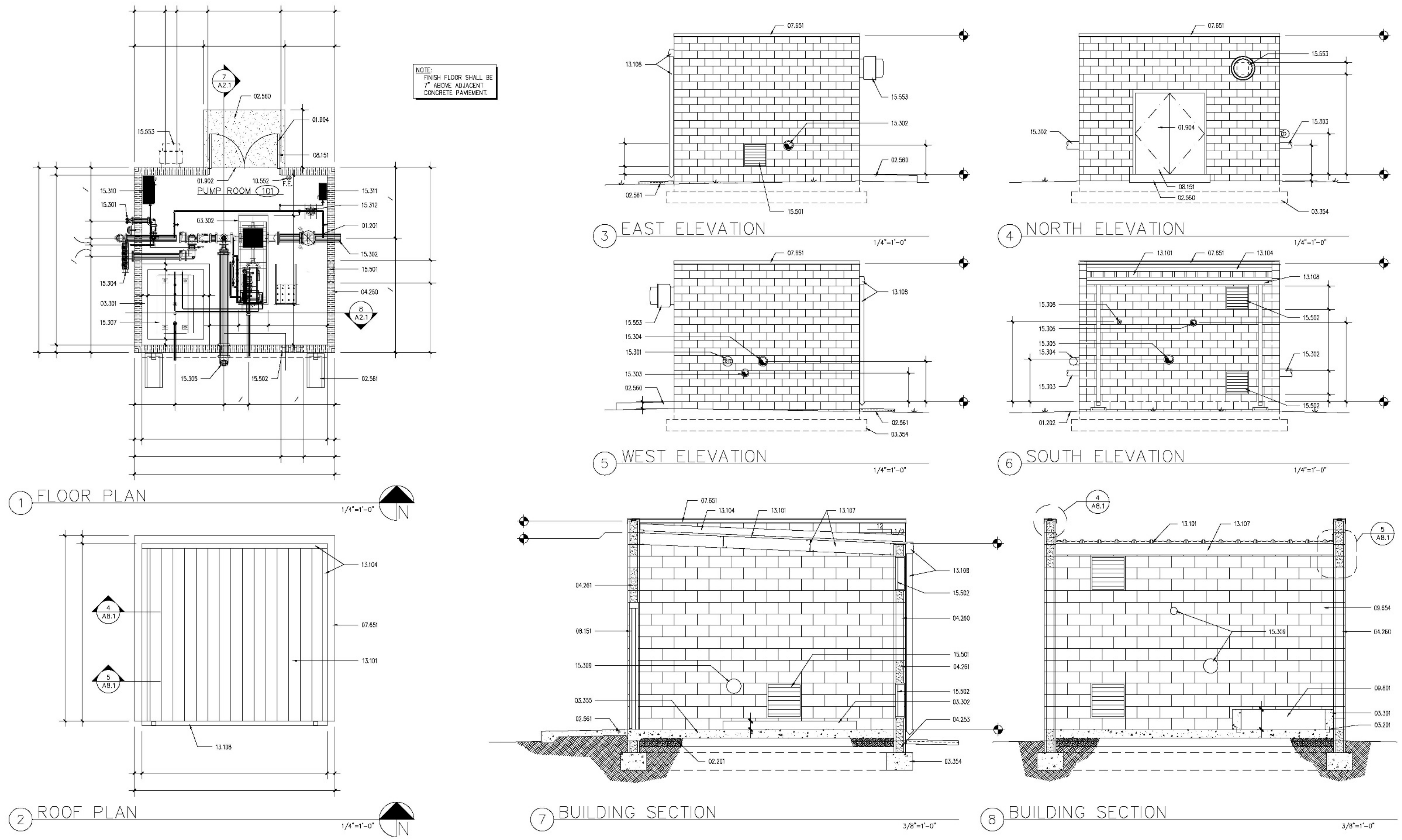
AS-BUILD

Electronic copy of final document; sealed original document is with Word Folder #2158

JOB: 1402
DATE: 3/12

SHEET A1.1

P:\JOBS\1351 Const Serv\HES Fire Pump House\CDs\A1.1.dwg DATE: 01/30/14 TIME: 18:08



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

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

DIVISION 8 – DOORS AND WINDOWS

08.151 Hollow metal door and frame.

DIVISION 9 – FINISHES

09.654 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-A:10-B:C fire extinguisher.

DIVISION 13 – SPECIAL CONSTRUCTION

13.101 Metal building galvalume roofing panels.

13.104 Parapet rake flashing.

13.107 8" metal "Z"-Girt and track ledger. 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 15.5 – MECHANICAL

15.501 Ventilation louver. See Mechanical Drawings.

15.502 Combustion air louver. See Mechanical Drawings.

15.553 Exhaust fan. See Mechanical Drawings.

P:\JOBS\BSI Const Serv\HES Fire Pump House\CDs\A2.1.dwg DATE: 03/30/14 TIME: 22:09

AS-BUILD

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FLOOR PLAN
ROOF PLAN
BUILDING ELEVATIONS
BUILDING SECTIONS

HERITAGE ENVIRONMENTAL SERVICES – FIRE PUMP HOUSE
2841 E STOREY ROAD
COOLIDGE, ARIZONA 85128

JOB: 1402
DATE: 3/12

SHEET A2.1

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ROOM FINISH SCHEDULE

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

ROOM FINISH SCHEDULE CODES

FLOOR	BASE	WALLS				CEILING	
FINISH	MATERIAL	MATERIAL		FINISH		MATERIAL	FINISH

GENERAL NOTES

NOTES

DOOR SCHEDULE

DOOR NO.	DOOR			FRAME			DETAILS			HARDWARE ITEMS										NOTES
	ELEV.	SIZE	MATL.	ELEV.	DEPTH	MATL.	FIRE LABEL	HEAD	JAMB	SILL	HINGE	LATCH SET	CLOSER	ASSY. PUSH PLATE	K-PLATE	ASTRG.	SHELS	SSCWS	DRSTOP	SGNS	DOOR VIEWER	GLAZING	

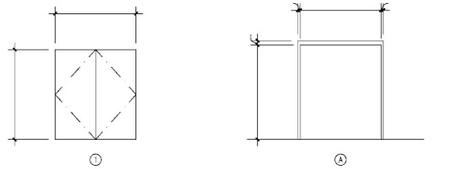
DOOR SIZES

FRAME DEPTH

NOTES

DOOR MATERIAL

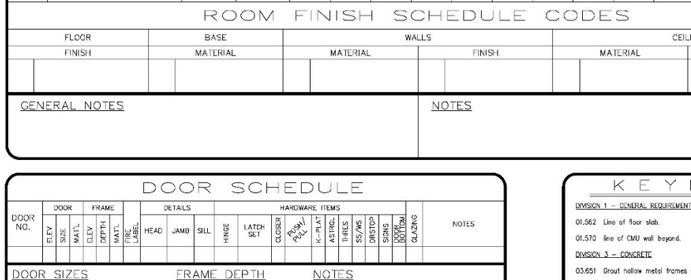
FRAME MATERIAL



1 DOOR ELEV. 1/4"=1'-0"

2 FRAME ELEV. 1/4"=1'-0"

3 DOOR DETAILS



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 2x8 continuous wood nailer, anchor @ 32" O.C. to bond beam with 1/2" x 8" long anchor bolts.

06.171 Continuous beveled cedar siding tapered shim 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 rake flashing.

13.105 Fasteners @ 12" o.c.

13.106 Mastic.

13.107 8" metal "Z"-Girt and track 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, stub 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, grassed 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 02523 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 02668 FIRE WATER SYSTEMS:
1. See Fire Protection Drawings.

Division 3 – CONCRETE

Section 03253 WATERSTOPS:
1. Provide thermoplastic elastomeric rubber waterstops as manufactured by Westec, St. Louis, MO, (800-759-7852), including:
   A. Waterstops embedded in concrete and spanning contraction, control, expansion, or construction joints to create a continuous diaphragm to prevent fluid migration.
2. Provide the following types where indicated on the Drawings:
   A. "Westec" Environstop 600 Series TPE-R, Style 619, 6" ribbed center bulb waterstop for liquid-tight joints between new concrete structures.
   B. Field weld straight butt joint splices per requirements for shop fabricated fittings.
4. Installation of ribbed tear web and ribbed centerbulb waterstop:
   A. Use split formwork where required.
   B. Center waterstop on joint. Coat each half directly into fresh concrete.
   C. Allow clearance between waterstop and reinforcing steel to prevent rock pockets and air voids caused by aggregate bridging.
   D. At expansion joints, keep centerbulb positioned within the limits of the expansion joint opening to prevent centerbulb being confined in concrete.
   E. Secure waterstop in proper 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.
   Maximum slump 4+1/2".
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 coated with a chemical release agent that is non-staining and that will not inhibit the natural bonding characteristics of secondary toppings 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 in 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 is required. Record and report.
   E. Compressive Strength Tests: ASTM C39; one set for each day's pour exceeding 5 cu.yds. plus additional sets for each 50 cu.yds. over and above the first 25 cu.yds. of each concrete class placed in 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 results fall below 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 "Dress & Seal WB" as manufactured by L & 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 system consisting of Ammo-Plast resin and a foaming agent surfactant.
      1) Core-Fill 500 as manufactured by Tailored Chemical Products, Hickory, NC 28603, (800-627-1687) or approved equal.
         a. Surface Burning Characteristics: Maximum flame spread, smoked 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 4.93/inch @ 50 degrees F mean, ASTM C177.
         d. Sound Abatements: Minimum STC rating of 53 and a minimum OITC rating of 44 for 8" tall assembly SITY ESD-90.
      2) Engage an experience dealer/applicator who are properly trained and certified in the use of Ammo-Plast Foam Insulation material and equipment.
      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 needed) 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, weld plates, inserts, bolts, anchor bolts, brackets and anything else of a miscellaneous nature necessary to complete the construction of this Project.
2. Form metal fabrications form 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 07900 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 JOINT 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) For exterior joints in vertical surfaces and non-traffic horizontal surfaces provide single-component or multi-component, low-modulus, non-sag sealant; comply with ASTM C920, Type S or M, Grade NS, Class 25.
      2) Acceptable urethane sealants from Tremco include:
         Vulkem 921, Dymonic, Tremflex 25, Vulkem 116, Vulkem 931, Vulkem 931, or approved equal.
   B. Sealant Type B:
      1) For interior joints in vertical surfaces and non-traffic horizontal surfaces.
      2) Acceptable single component sealants from Tremco include:
         Dymonic, Vulkem 245, Vulkem 921, Tremflex 25, Vulkem 911, Vulkem 932, or approved equal:
   C. Sealant Type C:
      1) For exterior and interior joints in horizontal and sloped traffic surfaces, provide single-component or multi-component polyurethane sealant having a Shore "A" Hardness of not less than 25 nor more than 50 and capable of plus-or-minus 25 percent joint movement capability; complying with ASTM C920, Type M or I, Grade P or NS, Class 25.
      2) Acceptable sealants from Tremco include:
         THC-900/901, Vulkem 245, Tremflex SL, 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-oozing non-extruding, non-staining resilient material in dimension 25 percent to 50 percent wider than joint widths as recommended by sealant manufacturer for conditions and exposures indicated.
   E. Masking 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, Trussdale Inc., Republic Builders Products, Curries or as approved.
   A. Exterior doors -16 gage, galvannealed with closed tops
   B. Exterior frames -16 gage, galvannealed
   C. Interior doors -18 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. Push/pull units Quality (per ADA)
   F. Closers LCN or Norton (per ADA)
   G. Kickplates Quality (per ADA)
   H. Thresholds Pemko (per ADA)
   I. Coat hooks/arms Clyne Johnson
   J. Provide silencers on all doors.
   K. Hardware finish shall be US26D, u.n.o.
3. Locks and latches shall be A161 A156.2 Series 4000 Grade 1 Extra Heavy Duty Commercial.

Division 9 – FINISHES

Section 09800 SPECIAL COATINGS:
1. Polycarbon/Polycarbonate Film Sealer:
   A. Seal all exposed concrete surfaces of fuel containment basin.
   B. Apply polycarbon/polycarbonate film sealer, Ultra Shield II-A as manufactured by Pre-Seal (Redwood, NM 800-348-7325) or approved equal, per manufacturer's instructions.
      1) Color: Clear
      2) Surface must by 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 H.M. 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 painted surfaces.
   D. Uneven coats, runs, or holidays will not be permitted.
   E. Treat questionable concrete surfaces w/acid detergent and muriatic acid.
   F. Spray paints 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 to Architect for approval. He also shall request manufacturer for the following applications:
   Pittsburgh Paints specification used as a guide.
   A. Masonry Block Filler:
      1) Speedhide Interior/Exterior Masonry Block Filler Latex (6-7)
   B. Primers:
      1) Perma-Crete Interior/Exterior Alkali Resistant Primer (4-603)
      2) Pittsburgh Paints Interior/Exterior Rust Inhibitive Steel Primer (7-852)
   C. Exterior finish paint materials:
      1) Speedhide Exterior Flat Acrylic Latex (6-510 & 600 Series)
      2) Pitt-Tech Interior/Exterior Satin DTV Industrial Enamels (90-474 Series)
   D. Interior finish paint materials:
      1) Speedhide Interior High-Lustre Semi-Gloss Latex (6-8510 Series)
      2) Pitt-Tech Interior/Exterior Satin DTV Industrial Enamels (90-474 Series)
6. Exterior Paint Systems (EPS):
   A. EPS-1: Concrete Masonry Units (CMU)
      1) Primer: 1 coat - Speedhide Int/Ext Masonry Block Filler (6-7). 4.0 to 14.0 Mils DFT.
      2) Primer: 1 coat Perma-Crete Int/Ext Alkali Resistant Primer (4-600). 1.2 to 3.1 Mils DFT.
      3) Finish: 2 coats - Speedhide Exterior Flat Acrylic (6-800 Series). 2.0 to 3.2 Mils DFT.
   B. EPS-2: Ferrous Metals (doors, frames, handrails, etc.)
      1) Primer: 1 coat - Pittsburgh Paints Rust Inhibitive Primer (7-852). 1.5 to 2.0 Mils DFT.
      2) Finish: 2 coats - Pitt-Tech DTV Industrial Enamels (90-474 Series). 2.0 to 3.0 Mils DFT.
7. Interior Paint Systems (IPS): Refer to Room Finish Schedule for system above.
   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 (4-600). 1.2 to 3.1 Mils DFT.
      3) Finish: 2 coats as identified in Room Finish Schedule for system above.
   B. IPS-2: Ferrous metals
      1) Primer: 1 coat - Pittsburgh Paints Rust Inhibitive Primer (7-852). 1.5 to 2.0 Mils DFT.
      2) Finish: 2 coats - Pitt-Tech DTV Industrial Enamels (90-474 Series). 2.0 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 location 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 is 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 rough-in for Owner furnished equipment.

AS-BUILD

Electronic copy of land document(s) sealed original document is with West Valley Engineering

6 SPECIFICATIONS

HOLLON DESIGN ASSOCIATES, LLC
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480-897-7745 FAX 480-897-7102 architect@hda-az.com

SPECIFICATIONS & DETAILS

284 L STORY ROAD
CASA GRANDE, ARIZONA 85228

JOB: 1402
DATE: 3/12

SHEET A8.1

P:\JOBS\05 Const Serv\05 Fire Pump House\DGN\A8.1.dwg DATE: 03/26/14 TIME: 13:05

ABBREVIATIONS

ABBREV1

NOTE: ABBREVIATIONS MAY OR MAY NOT HAVE PERIODS, BUT SHALL BE READ AS SAME.

A.B.	ANCHOR BOLT
A.B.C.	AGGREGATE BASE COURSE
ACI	AMERICAN CONCRETE INSTITUTE
A/C	AIR CONDITIONER
A.F.F.	ABOVE FINISHED FLOOR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AISI	AMERICAN IRON AND STEEL INSTITUTE
AITC	AMERICAN INSTITUTE OF TIMBER CONSTRUCTION
ALT.	ALTERNATE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
APA	AMERICAN PLYWOOD ASSOCIATION
ARCH'L	ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AWS	AMERICAN WELDING SOCIETY
A.W.T.S.	AUTOMATIC WELDED THREADED STUDS
BM	BEAM
B.F.F	BELOW FINISHED FLOOR
BLK	BLOCK
B.O.B.	BOTTOM OF BEAM
B.O.D.	BOTTOM OF DECK
B.O.F.	BOTTOM OF FOOTING
BRG	BEARING
C	CAMBER
C.C.	CENTERLINE TO CENTERLINE
CFS	COLD FORMED STEEL
C.G.	CENTER OF GRAVITY
C.I.P.	CAST IN PLACE
C.L.	CENTERLINE
C.L.B.	CENTERLINE OF BEAM
C.L.C.	CENTERLINE OF COLUMN
C.L.F.	CENTERLINE OF FOOTING
C.L.W.	CENTERLINE OF WALL
CLR	CLEAR
CONC	CONCRETE
CONC C.J.	CONCRETE CONTROL JOINT
CONC S.J.	CONCRETE SAWCUT JOINT
C.M.U.	CONCRETE MASONRY UNIT
CONN	CONNECTION
CONT	CONTINUOUS
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
D.F. (D.F.L.)	DOUGLAS FIR LARCH
DL	DEAD LOAD
DIA	DIAMETER
DN	DOWN
DWG(S)	DRAWING(S)
E.C.	END TO CENTERLINE
E.E.	END TO END
E.O.S.	EDGE OF SLAB
EQ	EQUAL
EQUIP	EQUIPMENT
EXP. BOLT (E.B.)	EXPANSION BOLT
EXP. JT (E.J.)	EXPANSION JOINT
E.W.	EACH WAY
F.F.	FINISHED FLOOR
F.O.M.	FACE OF MEMBER
F.O.S.	FACE OF STEEL
F.O.W.	FACE OF WALL
GA	GAGE (UNIT OF MEASUREMENT)
GALV	GALVANIZED
G.S.N.	GENERAL STRUCTURAL NOTES
GLB (GLULAM)	GLUED-LAMINATED BEAM
H.F.	HEM FIR
HORIZ	HORIZONTAL REINFORCING
H.S.	HEADED STUDS
IBC	INTERNATIONAL BUILDING CODE
ICBO	INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS
ICC	INTERNATIONAL CODE COUNCIL
ICF	INSULATED CONCRETE FORMS
I.F.W.	INSIDE FACE OF WALL
I.O.D.	INTERPRETATION OF DRAWINGS
JST	JOIST
K(KIP)	1000 POUNDS
KLF	KIPS PER LINEAR FOOT
LBS (#)	POUNDS
LGR	LEDGER
LGS	LIGHT GAGE STEEL
LGSEA	LIGHT GAGE STEEL ENGINEERS ASSOCIATION
L.O.D.	LOCATION OF DETAILS
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
MAS	MASONRY
MAS C.J.	MASONRY CONTROL JOINT
MAX	MAXIMUM
MBMA	METAL BUILDING MANUFACTURERS ASSOCIATION
MECH'L	MECHANICAL
MFR'D	MANUFACTURERED
MFR('S)	MANUFACTURER('S)
MIN	MINIMUM
N/A	NOT APPLICABLE
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
O.F.W.	OUTSIDE FACE OF WALL
OPP	OPPOSITE
OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
PCI	PRECAST/PRESTRESSED CONCRETE INSTITUTE
P.C.	PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PLF	POUNDS PER LINEAR FOOT
±	PLUS OR MINUS
PREFAB	PREFABRICATED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POST-TENSIONED
PTI	POST-TENSIONING INSTITUTE
REINF	REINFORCING
SDI	STEEL DECK INSTITUTE
SLH	SHORT LEG HORIZONTAL
SLV	SHORT LEG VERTICAL
SJI	STEEL JOIST INSTITUTE
SIM	SIMILAR
SQ.	SQUARE
SSMA	STEEL STUD MANUFACTURERS ASSOCIATION
STD	STANDARD
STL	STEEL
TL	TOTAL LOAD
T.O.B.	TOP OF BEAM
T.O.C.T.	TOP OF CONCRETE TOPPING
T.O.D.	TOP OF DECK
T.O.F.	TOP OF FOOTING
T.O.L.	TOP OF LEDGER
T.O.M.	TOP OF MASONRY
T.O.P.	TOP OF PLATE
T.O.P.C.	TOP OF PRECAST CONCRETE
T.O.S.	TOP OF STEEL
T.O.W.	TOP OF WALL
TPI	TRUSS PLATE INSTITUTE
TYP	TYPICAL
T&G	TONGUE AND GROOVE
UBC	UNIFORM BUILDING CODE
U.N.O.	UNLESS NOTED OTHERWISE
VERT	VERTICAL REINFORCING
WCLA	WEST COAST LUMBER ASSOCIATION
WCLIB	WEST COAST LUMBER INSPECTION BUREAU
W.W.F.	WELDED WIRE FABRIC
WWPA	WESTERN WOOD PRODUCTS ASSOCIATION
W/	WITH
W/C	WATER TO CEMENT RATIO
W/O	WITHOUT

GENERAL STRUCTURAL NOTES

Applies unless noted otherwise on drawings

BUILDING CODE:

2006 EDITION OF THE INTERNATIONAL BUILDING CODE.

LOADS:

ROOFS:

ROOF LIVE LOAD = 20 PSF.
ROOF DEAD LOAD = 5 PSF.

LATERAL:

WIND:

BASIC DESIGN WIND SPEED (3-SECOND GUST), V = 90 MPH.
OCCUPANCY CATEGORY, IV.
IMPORTANCE FACTOR, I = 1.15
EXPOSURE C.

SEISMIC, EQUIPMENT STORAGE BUILDING:

SEISMIC IMPORTANCE FACTOR, I = 1.5.
OCCUPANCY CATEGORY, IV.
MAPPED SHORT PERIOD SPECTRAL ACCELERATION, Ss = 0.222g.
MAPPED ONE SECOND SPECTRAL ACCELERATION, S1 = 0.069g.
SOIL SITE CLASS, D.
DESIGN SHORT PERIOD SPECTRAL ACCELERATION, Sds = 0.237g.
DESIGN ONE SECOND SPECTRAL ACCELERATION, Sd1 = 0.111g.
SEISMIC DESIGN CATEGORY, D.
BASIC SEISMIC-FORCE-RESISTING SYSTEM = ORDINARY REINFORCED MASONRY SHEAR WALLS.
RESPONSE MODIFICATION FACTOR (R)= 2.0.
ANALYSIS PROCEDURE USED = EQUIVALENT LATERAL FORCE PROCEDURE.
SEISMIC RESPONSE COEFFICIENT, Cs = 0.136

FOUNDATIONS:

SPREAD FOOTING DESIGNS ARE BASED ON IBC SECTION 1804 CLASS 5 SOILS. SPREAD FOOTINGS SHALL BEAR ON FIRM, UNDISTURBED SOIL 1'-6" MINIMUM BELOW ADJACENT EXISTING GRADE. DESIGN SOIL BEARING VALUE = 1,500 PSF. FINISHED GRADE (PAD GRADE) IS DEFINED AS TOP OF SLAB FOR INTERIOR FOOTINGS AND LOWEST ADJACENT GRADE WITHIN 5 FEET FOR PERIMETER FOOTINGS. SOILS ENGINEER SHALL INSPECT FOUNDATION EXCAVATIONS PRIOR TO PLACEMENT OF CONCRETE.

CONCRETE:

SPECIFIED 28 DAY COMPRESSIVE STRENGTH F'c:

SLAB ON GRADE -------------------------------------- 3,000 PSI
FOUNDATIONS -------------------------------------- 3,000 PSI

GENERAL:

ALL CAST-IN-PLACE CONCRETE CONSTRUCTION SHALL CONFORM TO THE LATEST EDITION OF THE ACI. MECHANICALLY VIBRATE ALL CONCRETE WHEN PLACED UNLESS NOTED OTHERWISE. ADMIXTURES CONTAINING CHLORIDES SHALL NOT BE USED. NO OTHER ADMIXTURES PERMITTED WITHOUT APPROVAL. FOR CONCRETE WITHOUT PLASTICIZER, MAXIMUM SLUMP 4 1/2" AT POINT OF PLACEMENT U.N.O. IF PLASTICIZER IS USED, A HIGHER FINAL SLUMP MAY BE ALLOWED UPON STRUCTURAL ENGINEER'S APPROVAL.

FOR REINFORCING INFORMATION, SEE REINFORCING SECTION OF G.S.N., PLANS, SCHEDULES AND DETAILS.

UNLESS NOTED OTHERWISE ON THE DRAWINGS, THE EMBEDMENT OF CONDUITS, PIPES, SLEEVES, ETC. OF ANY MATERIAL SHALL NOT BE PERMITTED WITHIN ANY CONCRETE STRUCTURAL ELEMENT (IE: COLUMNS, BEAMS, ELEVATED SLABS, ETC.) OR STRUCTURAL CONCRETE TOPPINGS WITHOUT THE EXPRESSED APPROVAL OF THE STRUCTURAL ENGINEER.

TEST DATA FOR EACH CONCRETE MIX SHALL BE SUBMITTED FOR REVIEW PER CHAPTER 5 OF ACI 318. REFERENCE FIGURE R5.3 FOR SUBMITTAL REQUIREMENTS AND OPTIONS. CONCRETE MIX DESIGNS THAT ARE SUBMITTED WITHOUT THE APPROPRIATE TEST DATA CANNOT BE REVIEWED.

SLABS ON GRADE:

MAXIMUM SLUMP WITHOUT PLASTICIZER AT POINT OF PLACEMENT SHALL BE 5 INCHES. FOR WAREHOUSE, INDUSTRIAL OR HIGH TRAFFIC SLAB USES, MIX DESIGN SHALL HAVE A MINIMUM AMOUNT OF CEMENTITIOUS MATERIALS (CEMENT PLUS FLY ASH), 540 POUNDS PER CUBIC YARD (FOR 3/4 INCH NOMINAL MAXIMUM AGGREGATE SIZE) PER ACI 302.1R-04 TABLE 6.2. MIX DESIGNS SHALL TAKE CARE TO PROVIDE THE LARGEST POSSIBLE SIZE OF COURSE AGGREGATE WHILE MAINTAINING CONCRETE WORKABILITY. NOMINAL MAXIMUM AGGREGATE SIZE SHALL NOT BE LESS THAN 3/4 INCH NOR MORE THAN 1/3 THE DEPTH OF THE SLAB. MIX DESIGNERS SHALL SUBMIT SLAB ON GRADE DESIGNS WITH SHRINKAGE CHARACTERISTICS NOT EXCEEDING 0.00078 IN/IN TO MEET THE REQUIREMENTS OF ACI 360R-06, FIG5.6 FOR TYPICAL CONCRETE. SLABS SHALL BE PLACED ON A FLAT, SMOOTH, FIRM, COMPACTED SUBGRADE.

CONCRETE SHALL BE MIXED, PLACED, FINISHED AND CURED PER LATEST EDITION OF ACI 302.1 FOR THE APPROPRIATE FLOOR CLASS TYPE PER TABLE 1.1 AND SECTION 7. CONCRETE SHALL BE BROOM FINISHED.

SLABS ON GRADE SHALL BE VIBRATED ONLY AT TRENCHES, FLOOR DUCTS, TURNDOWNS, ETC. CAST CLOSURE POUR AROUND COLUMNS AFTER COLUMN DEAD LOAD IS APPLIED. UNLESS APPROVED OTHERWISE IN WRITING BY THE ARCHITECT, ALL CONCRETE SLABS ON GRADE SHALL BE BOUND BY CONTROL JOINTS (CONSTRUCTION OR SAW CUT) PER TYPICAL DETAILS, AS SHOWN ON THE FOUNDATION PLAN, SUCH THAT THE ENCLOSED AREA DOES NOT EXCEED 150 SQUARE FEET. CONSTRUCTION CONTROL JOINTS NEED ONLY OCCUR AT EXPOSED EDGES DURING POURING, ALL OTHER JOINTS MAY BE SAW CUT. SLAB REINFORCING, WHERE SHOWN, SHALL NOT EXTEND MORE THAN 125 FEET WITHOUT STOPPING THE REINFORCEMENT AT A CONTROL JOINT.

AT A MINIMUM, JOINTS IN SLABS SUBJECT TO SOLID RUBBER, HARD URETHANE, OR NYLON CASTERS OR STEEL WHEEL TRAFFIC SHALL BE FILLED WITH A SEMI-RIGID EPOXY OR POLYUREA CONSISTING OF 100 PERCENT SOLIDS AND A MINIMUM SHORE HARDNESS OF A-80 PER ASTM D 2240. FILLER MATERIAL SHOULD BE INSTALLED THE FULL JOINT DEPTH, WITHOUT A BACKER ROD, AND FLUSH WITH THE FLOOR SURFACE VIA OVERFILLING THEN SHAVED FLAT. JOINT FILLING SHOULD BE DELAYED AS LONG AS POSSIBLE TO ACCOMMODATE THE MAXIMUM POSSIBLE SLAB SHRINKAGE.

MASONRY:

GENERAL:

HOLLOW CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C90, MEDIUM WEIGHT, GRADE N, F'm = 1,500 PSI, RUNNING BOND, MORTAR TYPE S, 1,800 PSI. GROUT 2,000 PSI. MECHANICALLY VIBRATE GROUT IMMEDIATELY AFTER POURING AND AGAIN 5 TO 10 MINUTES LATER. PROVIDE CLEANOUTS IF GROUT LIFT EXCEEDS 5'-0" IN BLOCK WALLS. MAXIMUM GROUT LIFT SHALL BE 6'-0". WHEN APPROVED BY THE STRUCTURAL ENGINEER AND BUILDING OFFICIAL, GROUT LIFTS MAY BE GREATER THAN 8'-0" IF IT CAN BE DEMONSTRATED BY CONTRACTOR THAT THE GROUT SPACES CAN BE PROPERLY FILLED. FILL CELLS SOLIDLY WITH GROUT IN LIFTS AND STOP POURS 1 1/2" BELOW THE TOP OF A COURSE TO FORM A KEY AT POUR POINTS. UNLESS NOTED OTHERWISE ON THE PLANS, PLACE CONTROL JOINTS IN MASONRY WALLS SUCH THAT NO STRAIGHT RUNS OF WALL EXCEEDS 24'-0". CONTROL JOINTS SHALL NOT OCCUR AT WALL CORNERS, INTERSECTIONS, ENDS, WITHIN 24" OF CONCENTRATED POINTS OF BEARING OR JAMBS, OR OVER OPENINGS UNLESS SPECIFICALLY SHOWN ON THE STRUCTURAL DRAWINGS. ALL MASONRY BELOW FINISHED FLOOR OR GRADE SHALL BE GROUTED SOLID.

VERTICAL REINFORCING:

1 #5 IN CENTER OF GROUT AT CENTER OF WALL, CONTINUOUS FULL HEIGHT OF WALL AT ALL CORNERS, INTERSECTIONS, WALL ENDS, BEAM BEARINGS, JAMBS, EACH SIDE OF CONTROL JOINTS AND AT INTERVALS NOT TO EXCEED 48" O.C. UNLESS NOTED OTHERWISE. TIE AT 8'-0" VERTICALLY, WITH SINGLE WIRE LOOP TIE BY A.A. WIRE PRODUCTS COMPANY. DOWEL VERTICAL REINFORCING TO FOUNDATION WITH DOWELS TO MATCH VERTICAL REINFORCING.

HORIZONTAL REINFORCING:

2 #5 TOP AND BOTTOM IN MINIMUM 16" DEEP GROUTED CONTINUOUS BOND BEAM AT ELEVATED FRAMING ASSEMBLIES. 1 #5 IN MINIMUM 8" DEEP GROUTED CONTINUOUS BOND BEAM AT TOP OF PARAPETS AND FREESTANDING WALLS. PLACE THESE BARS CONTINUOUS THRU CONTROL JOINTS PER TYPICAL DETAIL. TO MAINTAIN BOND BEAM CONTINUITY, INSTALL BENT BARS PER TYPICAL DETAILS TO MATCH HORIZONTAL BOND BEAM REINFORCING AT CORNERS AND INTERSECTIONS. STANDARD WEIGHT (NO. 9 GAGE WIRE) DUR-O-WAL OR DUR-O-WIRE (OR EQUIVALENT) LADDER TYPE JOINT REINFORCEMENT AT 16" O.C. ALL JOINT REINFORCING SHALL BE EITHER HOT-DIPPED GALVANIZED OR STAINLESS STEEL. FOR INTERIOR WALLS ONLY - JOINT REINFORCING MAY BE MILL GALVANIZED AT CONTRACTORS OPTION.

LAP SPLICES:

LAP SPLICES FOR VERTICAL AND HORIZONTAL REINFORCING SHALL BE PER TYPICAL DETAIL. DO NOT SPLICE WITHIN 8'-0" OF CONTROL JOINTS. LAP HORIZONTAL LADDER TYPE JOINT REINFORCING 12" MINIMUM.

FOR ADDITIONAL REINFORCING INFORMATION, SEE REINFORCING SECTION OF G.S.N., PLANS, SCHEDULES AND DETAILS.

REINFORCING:

ALL REINFORCING PER CRSI SPECIFICATIONS AND HANDBOOK. ASTM A615 (Fy = 60 KSI / GRADE 60) DEFORMED BARS FOR ALL BARS #5 AND LARGER (AND FOR ALL CONCRETE WALLS, BEAMS, SLABS AND COLUMN REINFORCING). ASTM A615 (Fy = 40 KSI / GRADE 40) DEFORMED BARS FOR ALL BARS #4 AND SMALLER. WHERE SHOWN ON DRAWINGS ALL GRADE 60 REINFORCING TO BE WELDED SHALL BE ASTM A706. WELDED WIRE FABRIC PER ASTM A185, WIRE PER ASTM A82. NO TACK WELDING OF REINFORCING BARS ALLOWED WITHOUT PRIOR REVIEW OF PROCEDURE WITH THE STRUCTURAL ENGINEER. LATEST ACI CODE AND DETAILING MANUAL APPLY. CLEAR CONCRETE COVERAGES AS FOLLOWS:

CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH -------------------- 3"
EXPOSED TO EARTH OR WEATHER
#6 OR LARGER -- 2"
#5 AND SMALLER -- 1 1/2"
ALL OTHER PER LATEST EDITION OF ACI 318

ALL REINFORCING SHALL BE CHAIRED TO ENSURE PROPER CLEARANCES. SUPPORT OF FOUNDATION REINFORCING MUST PROVIDE ISOLATION FROM MOISTURE/CORROSION BY USE OF A PLASTIC OR CONCRETE CHAIR. DUCT-TAPE COVERED REINFORCING IS NOT AN ACCEPTABLE CHAIR.

ALL DIMENSIONS REFERENCED IN DRAWINGS AS "CLEAR" SHALL BE FROM FACE OF STRUCTURE TO EDGE OF REINFORCING, AND SHALL NOT BE LESS THAN STATED, NOR GREATER THAN "CLEAR" DIMENSION PLUS 3/8". ALL OTHERS SHALL BE PLUS OR MINUS 1/4" TYPICAL UNLESS NOTED OTHERWISE.

FIELD BENDING OR STRAIGHTENING OF DEFORMED BARS SHALL BE LIMITED TO #5 BARS AND SMALLER AND SHALL BE FIELD BENT OR STRAIGHTENED ONLY ONCE. ANY BEND SHALL BE LIMITED TO 90 DEGREES. IF FIELD BENDING OR STRAIGHTENING OF #6 BARS OR LARGER IS REQUIRED, OR IF A SECOND BEND IS REQUIRED FOR #5 BARS AND SMALLER, HEAT SHALL BE APPLIED FOR BENDING OR STRAIGHTENING. CONTRACTOR SHALL SUBMIT PROCEDURE FOR APPLYING HEAT TO ENGINEER FOR REVIEW AND APPROVAL PRIOR TO BENDING OR STRAIGHTENING BARS.

LAP SPLICES IN CONCRETE:

ALL SPLICE LOCATIONS SUBJECT TO APPROVAL BY THE STRUCTURAL ENGINEER. PROVIDE BENT CORNER BARS TO MATCH AND LAP WITH HORIZONTAL BARS AT ALL CORNERS AND INTERSECTIONS PER TYPICAL DETAILS. REINFORCING BAR SPACING GIVEN ARE MAXIMUM ON CENTERS. DOWEL VERTICAL REINFORCING TO FOUNDATION WITH STANDARD 90-DEGREE HOOKS UNLESS NOTED OTHERWISE. SECURELY TIE ALL BARS IN LOCATION BEFORE PLACING CONCRETE.

LAP SPLICES, UNLESS NOTED OTHERWISE, SHALL BE CLASS "B" TENSION LAP SPLICES PER LATEST EDITION OF ACI 318.

LAPS IN WELDED WIRE FABRIC SHALL BE MADE SO THAT THE OVERLAP, MEASURED BETWEEN OUTERMOST CROSS WIRES OF EACH FABRIC SHEET, IS NOT LESS THAN THE SPACING OF CROSS WIRES PLUS 2 INCHES.

DRYPACK:

DRYPACK SHALL BE 5,000 PSI NON-SHRINK GROUT, FIVE STAR OR EQUIVALENTS. INSTALL DRYPACK UNDER BEARING PLATES BEFORE FRAMING MEMBER IS INSTALLED. AT COLUMNS, INSTALL DRYPACK UNDER BASE PLATES AFTER THE STRUCTURAL STEEL FRAME HAS BEEN PLUMBED BUT PRIOR TO SUPPORTED DECKING BEING INSTALLED.

STRUCTURAL STEEL:

ANCHOR RODS:

ANCHOR RODS INCLUDE HOOKED, HEADED, AND THREADED AND NUTTED ANCHORS. THE TERMS ANCHOR BOLT AND ANCHOR ROD ARE USED SYNONYMOUSLY THROUGHOUT THESE DOCUMENTS. ALL ANCHOR ROD MATERIAL SHALL BE PER ASTM F1554 GRADE 36. A307 ANCHOR RODS MAY BE SUBSTITUTED FOR ASTM F1554 GRADE 36 AT CONTRACTOR'S OPTION. ALL ANCHOR RODS SHALL BE INSTALLED WITH STEEL WASHERS AT OVERSIZED ROUND HOLES USING SNUG TIGHT INSTALLATION, UNLESS NOTED OTHERWISE.

THE ANCHORING MECHANISM FOR NUTTED ANCHOR RODS SHALL CONSIST OF DOUBLE NUTS WITH A WASHER BETWEEN. THE NUTS AND WASHER ARE TO BE EMBEDDED INTO THE CONCRETE PER THE DETAILS AND PLANS. THE WASHER SHALL BE 1/4"X4"X4" U.N.O. THE CONTRACTOR SHALL PREVENT THE NUTS FROM SPINNING OFF DURING THE VIBRATION OF THE CONCRETE. THIS COULD BE ACCOMPLISHED BY TIGHTENING THE NUTS AGAINST EACH OTHER THEREBY LOCKING THEM IN PLACE OR BY TACK WELDING EACH NUT TO THE ANCHOR ROD.

WHERE THE ANCHORS ARE TO BE GALVANIZED, THE ANCHOR ROD AND THE NUTS SHALL BE GALVANIZED WITH THE SAME PROCESS TO ENSURE THE THREADS MATCH.

AT CONTRACTOR'S OPTION HEADED ANCHORS PER ABOVE MAY BE SUBSTITUTED FOR CONVENTIONAL ANCHORS AND MACHINE BOLTS (REVERSE SUBSTITUTION NOT ALLOWABLE).

EXPANSION AND EPOXY ANCHORS:

ALL EXPANSIVE ANCHORAGE FOR CONCRETE INSTALLATION ONLY SHALL BE PER SIMPSON 'STRONG-BOLT' 2 WEDGE ANCHOR (ICC ESR-3037) OR APPROVED EQUIVALENT. ALL EXPANSIVE ANCHORAGE FOR MASONRY INSTALLATION ONLY SHALL BE PER SIMPSON 'WEDGE-ALL' ANCHOR (ICC ESR-1396) OR APPROVED EQUIVALENT. ALL ADHESIVE (EPOXY) ANCHORAGE FOR CONCRETE SHALL BE PER SIMPSON 'SET-XP' SYSTEM WITH DUAL SIDE BY SIDE CARTRIDGES (ICC ESR-2508) OR APPROVED EQUIVALENT. ALL ADHESIVE (EPOXY) ANCHORAGE FOR MASONRY SHALL BE PER SIMPSON 'SET' SYSTEM WITH DUAL SIDE BY SIDE CARTRIDGES (ICC ESR-1772) OR APPROVED EQUIVALENT. ALL ANCHORS SHALL BE INSTALLED WITH STEEL WASHERS AT SHORT SLOTTED HOLES AND TIGHTENED/TORQUED PER MANUFACTURERS RECOMMENDATIONS.

COLD FORMED STRUCTURAL STEEL FRAMING:

GENERAL:

ALL COLD FORMED STRUCTURAL STEEL FRAMING AND COMPONENTS INDICATED ON THE STRUCTURAL DRAWINGS SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND IN ACCORDANCE WITH THE LATEST EDITION OF AISC'S "SPECIFICATIONS FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS".

FRAMING:

ALL WELDING TO BE PERFORMED BY WELDERS HOLDING A VALID CERTIFICATE AND HAVING CURRENT EXPERIENCE IN LIGHT GAUGE STEEL. CERTIFICATES SHALL BE ISSUED BY AN ACCEPTED TESTING AGENCY. DO NOT NOTCH FLANGES OF MEMBERS WITHOUT EXPRESSED APPROVAL OF THE ENGINEER OF RECORD. ALL WELDING TO BE PERFORMED IN AN APPROVED FABRICATORS SHOP.

COLD FORMED STRUCTURAL STEEL MEMBERS SHALL HAVE A MINIMUM YEILD STRENGTH OF Fy = 55,000 PSI. COLD FORM STRUCTURAL STEEL SHALL BE GALVANIZED PER ASTM A653 WITH A MINIMUM COATING DESIGNATION OF G90. THE GRADE AND THE ASTM SPECIFICATION NUMBER OR OTHER SPECIFICATION DESIGNATION SHALL BE INDICATED BY PAINTING, DECAL, TAGGING OR OTHER SUITABLE MEANS ON EACH BUNDLE OF FABRICATED ELEMENTS. IT IS ACCEPTABLE TO USE THE Fy SHOWN ON THE MILL CERTIFICATION IN LIEU OF THE "ORDERED" Fy.

THE STEEL PURLINS DO NOT HAVE TO BEAR DIRECTLY ON THE MASONRY WALL. IT IS ACCEPTABLE AND COMMON FOR THE PURLINS TO NEED TO BE RAISED A LITTLE (1/2" MAXIMUM) TO ASSIST IN LEVELING AND 'TUNING' THE STRUCTURE. THE LOAD BETWEEN THE PURLIN AND THE WALL IS TRANSFERRED ENTIRELY THROUGH THE SCREWS CONNECTING THE PURLIN TO THE PURLIN CLIP. THE PURLIN DOES NOT NEED TO BEAR ON THE WALL.

MILS	GAGE NO.	MIN DELIVERED THICKNESS	DESIGN THICKNESS
12	30	0.0120"	0.0126"
14	29	0.0132"	0.0139"
16	26	0.0174"	0.0183"
33	20	0.0336"	0.0354"
43	18	0.0447"	0.0470"
54	16	0.0561"	0.0590"
68	14	0.0713"	0.0750"
97	12	0.0998"	0.1050"
118	10	0.1283"	0.1350"
150	9	0.143"	0.1500"

SHOP DRAWINGS:

SHOP DRAWINGS SHALL BE SUBMITTED FOR ALL STRUCTURAL ITEMS IN ADDITION TO ITEMS REQUIRED BY ARCHITECTURAL SPECIFICATIONS. CONTRACTOR SHALL PROVIDE A MINIMUM OF 2 HARD COPY SUBMITTAL SETS OF EACH ITEM TO CTS FOR REVIEW, UNLESS NOTED OTHERWISE IN ARCHITECTURAL SPECIFICATIONS. ELECTRONIC SUBMITTALS ARE ALSO ACCEPTABLE.

THE CONTRACTOR SHALL REVIEW ALL SHOP DRAWINGS PRIOR TO SUBMITTAL. ITEMS NOT IN ACCORDANCE WITH CONTRACT DOCUMENTS SHALL BE FLAGGED UPON CONTRACTOR'S REVIEW.

VERIFY ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS AND FIELD CONDITIONS.

MANUFACTURER OR FABRICATOR SHALL CLOUD ANY CHANGES, SUBSTITUTIONS, OR DEVIATIONS FROM CONTRACT DOCUMENTS. ANY OF THE AFOREMENTIONED WHICH ARE NOT CLOUDED OR FLAGGED BY SUBMITTING PARTIES, SHALL NOT BE CONSIDERED APPROVED AFTER ENGINEER'S REVIEW, UNLESS NOTED ACCORDINGLY.

THE ENGINEER HAS THE RIGHT TO APPROVE OR DISAPPROVE ANY CHANGES TO CONTRACT DOCUMENTS AT ANYTIME BEFORE OR AFTER SHOP DRAWING REVIEW.

THE SHOP DRAWINGS DO NOT REPLACE THE CONTRACT DOCUMENTS. ITEMS OMITTED OR SHOWN INCORRECTLY AND ARE NOT FLAGGED BY THE STRUCTURAL ENGINEER OR ARCHITECT SHALL NOT BE CONSIDERED CHANGES TO CONTRACT DOCUMENTS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE ITEMS ARE CONSTRUCTED TO CONTRACT DOCUMENTS.

THE ADEQUACY OF ENGINEERING DESIGNS AND LAYOUT PERFORMED BY OTHERS RESTS WITH THE DESIGNING OR SUBMITTING AUTHORITY.

REVIEWING IS INTENDED ONLY AS AN AID TO THE CONTRACTOR IN OBTAINING CORRECT SHOP DRAWINGS. RESPONSIBILITY FOR CORRECTNESS SHALL REST WITH THE CONTRACTOR.

GENERAL NOTES:

THE STRUCTURAL CONSTRUCTION DOCUMENTS REPRESENT THE FINISHED STRUCTURE. EXCEPT WHERE NOTED, THEY DO NOT INDICATE THE METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE ALL MEASURES NECESSARY TO PROTECT THE STRUCTURE DURING CONSTRUCTION. SUCH MEASURES SHALL INCLUDE, BUT NOT BE LIMITED TO, BRACING, SHORING FOR LOADS DUE TO CONSTRUCTION EQUIPMENT, ETC. THE STRUCTURAL ENGINEER OF RECORD SHALL NOT BE RESPONSIBLE FOR THE CONTRACTOR'S MEANS, METHODS, TECHNIQUES, SEQUENCES FOR PROCEDURE OF CONSTRUCTION, OR THE SAFETY PRECAUTIONS AND THE PROGRAMS INCIDENT THERETO (NOR SHALL OBSERVATION VISITS TO THE SITE INCLUDE INSPECTION OF THESE ITEMS).

WHERE REFERENCE IS MADE TO VARIOUS TEST STANDARDS FOR MATERIALS, SUCH STANDARDS SHALL BE THE LATEST EDITION AND/OR ADDENDA. ANY ENGINEERING DESIGN, PROVIDED BY OTHERS AND SUBMITTED FOR REVIEW, SHALL BEAR THE SEAL OF A REGISTERED ENGINEER RECOGNIZED BY THE BUILDING CODE JURISDICTION OF THIS PROJECT.

NOTES AND DETAILS ON DRAWINGS SHALL TAKE PRECEDENCE OVER GENERAL STRUCTURAL NOTES AND TYPICAL DETAILS. WHERE NO DETAILS ARE SHOWN, CONSTRUCTION SHALL CONFORM TO SIMILAR WORK ON THE PROJECT, AND/OR AS PROVIDED FOR IN THE CONTRACT DOCUMENTS. WHERE DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, GENERAL STRUCTURAL NOTES AND SPECIFICATIONS, THE GREATER REQUIREMENTS SHALL GOVERN.

CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL DIMENSIONS WITH ARCHITECTURAL DRAWINGS PRIOR TO START OF CONSTRUCTION. RESOLVE ANY DISCREPANCY WITH THE ARCHITECT. ESTABLISH AND VERIFY ALL OPENINGS AND INSERTS FOR ARCHITECTURAL, CIVIL, MECHANICAL, PLUMBING AND ELECTRICAL ITEMS WITH THE APPROPRIATE TRADE DRAWINGS AND SUBCONTRACTORS PRIOR TO CONSTRUCTION.

TYPICAL DETAILS MAY NOT NECESSARILY BE CUT ON PLANS, BUT APPLY UNLESS NOTED OTHERWISE.

CONSTRUCTION MATERIALS SHALL BE SPREAD OUT IF PLACED ON FRAMED CONSTRUCTION. LOAD SHALL NOT EXCEED THE DESIGN LIVE LOAD PER SQUARE FOOT.

OPTIONS ARE FOR CONTRACTOR'S CONVENIENCE. IF AN OPTION IS CHOSEN, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY CHANGES, APPROVALS AND THE COORDINATION OF THE WORK WITH ALL RELATED TRADES AND SUPPLIERS.

SPECIAL INSPECTION - STRUCTURAL ONLY:

SPECIAL STRUCTURAL INSPECTIONS:
CONTACT CARUSO TURLEY SCOTT, INC. AT 480-774-1700 PRIOR TO CONSTRUCTION:

SPECIAL INSPECTION IS TO BE PROVIDED FOR THE ITEMS LISTED BELOW IN ADDITION TO THE INSPECTIONS CONDUCTED BY THE BUILDING JURISDICTION. "SPECIAL STRUCTURAL INSPECTION" SHALL NOT RELIEVE THE OWNER OR THEIR AGENT FROM REQUESTING THE BUILDING JURISDICTION INSPECTIONS REQUIRED BY SECTION 109 OF THE INTERNATIONAL BUILDING CODE. SPECIAL INSPECTION IS REQUIRED PER CHAPTER 17 FOR THE FOLLOWING:

CONCRETE CONSTRUCTION:

1. CONCRETE:
A. DURING THE TAKING OF TEST SPECIMENS.
B. CONTINUOUS INSPECTION DURING THE PLACEMENT OF ALL REINFORCED CONCRETE, UNLESS NOTED OTHERWISE.
C. CONTINUOUS INSPECTION OF BOLTS TO BE INSTALLED IN CONCRETE PRIOR TO AND DURING THE PLACEMENT OF CONCRETE AROUND BOLTS.

2. REINFORCING STEEL: INSPECTION OF IN-PLACE REINFORCING FOR CONFORMANCE PRIOR TO THE CLOSING OF FORMS OR THE DELIVERY OF CONCRETE TO THE JOBSITE FOR THE FOLLOWING:
A. REINFORCING FOR ALL CONCRETE REQUIRED TO HAVE INSPECTION NOTED ABOVE.
B. REINFORCING FOR CONCRETE FOUNDATIONS.
C. REINFORCING FOR SLABS ON GRADE.
D. REINFORCING FOR ALL MASONRY REQUIRED TO HAVE INSPECTION NOTED BELOW.

MASONRY CONSTRUCTION:

1. STRUCTURAL MASONRY:
A. DURING PREPARATION OF PRISMS.
B. INSPECTION OF IN-PLACE REINFORCING FOR CONFORMANCE PRIOR TO THE DELIVERY OF GROUT TO THE JOBSITE.
C. CONTINUOUS INSPECTION DURING PLACEMENT OF GROUT.
D. CLEANOUTS PRIOR TO CLOSING.

SPECIAL CASES:

1. EXPANSION, EPOXY, ADHESIVE, AND SCREW ANCHORS: DURING THE PLACEMENT OF ALL ANCHORS SHOWN ON STRUCTURAL DRAWINGS. ADDITIONAL INSPECTIONS REQUIRED FOR REPAIR DETAILS SHALL BE PERFORMED AT THE CONTRACTOR'S EXPENSE.
A. INSPECTION OF HOLE DIAMETER, HOLE DEPTH AND DRILL BIT CONFORMANCE.
B. INSPECTION OF HOLE CLEANING WITH WIRE BRUSH AND COMPRESSED AIR.
C. INSPECTION OF ANCHOR INSTALLATION USING SPECIFIED PRODUCT AND MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURES.
D. INSPECTION OF EXPANSION ANCHORS SHALL INCLUDE THE VERIFICATION OF THE TIGHTENING TORQUE THAT IS SPECIFIED BY THE ANCHOR MANUFACTURER.

DUTIES AND RESPONSIBILITIES OF THE SPECIAL INSPECTOR:

A. THE SPECIAL INSPECTOR SHALL OBSERVE THE WORK ASSIGNED TO BE CERTAIN IT CONFORMS TO THE APPROVED DESIGN DRAWINGS AND SPECIFICATION.
B. THE SPECIAL INSPECTOR IS NOT AUTHORIZED TO APPROVE DEVIATIONS FROM THE DESIGN DRAWINGS OR SPECIFICATIONS, AND ALL DEVIATIONS MUST BE APPROVED BY THE STRUCTURAL ENGINEER OF RECORD PRIOR TO PROCEEDING WITH THE WORK. ALL REQUESTS FOR DEVIATIONS SHALL BE INITIATED BY THE CONTRACTOR VIA WRITTEN REQUEST FOR INFORMATION (RFI).
C. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE ENGINEER OR ARCHITECT OF RECORD. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION, THEN, IF UNCORRECTED, TO THE DESIGN AUTHORITY AND THE BUILDING OFFICIAL.
D. CONTRACTOR SHALL PROVIDE THE SPECIAL INSPECTOR ACCESS TO ALL ITEMS REQUIRING SPECIAL INSPECTION. ACCESS SHALL BE PROVIDED BY IN-PLACE LADDERS, SCAFFOLDS, LIFTS AND/OR OTHER EQUIPMENT OPERATED BY THE CONTRACTOR'S PERSONNEL AS REQUIRED FOR SAFE OBSERVATION. INSPECTOR IS NOT RESPONSIBLE OR AUTHORIZED TO OPERATE CONTRACTOR'S EQUIPMENT.
E. UPON COMPLETION OF THE ASSIGNED WORK THE ENGINEER OR ARCHITECT SHALL COMPLETE AND SIGN THE APPROPRIATE FORMS CERTIFYING THAT TO THE BEST OF THEIR KNOWLEDGE THE WORK IS IN CONFORMANCE WITH THE APPROVED PLANS AND SPECIFICATIONS, AND THE APPLICABLE WORKMANSHIP PROVISIONS OF THE CODE.

AS-BUILD

FOR ADDITIONAL INFORMATION SHOWN BUT NOT NOTED, SEE GENERAL STRUCTURAL NOTES ON SHEET S1.1 AND TYPICAL DETAIL SHEETS.

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

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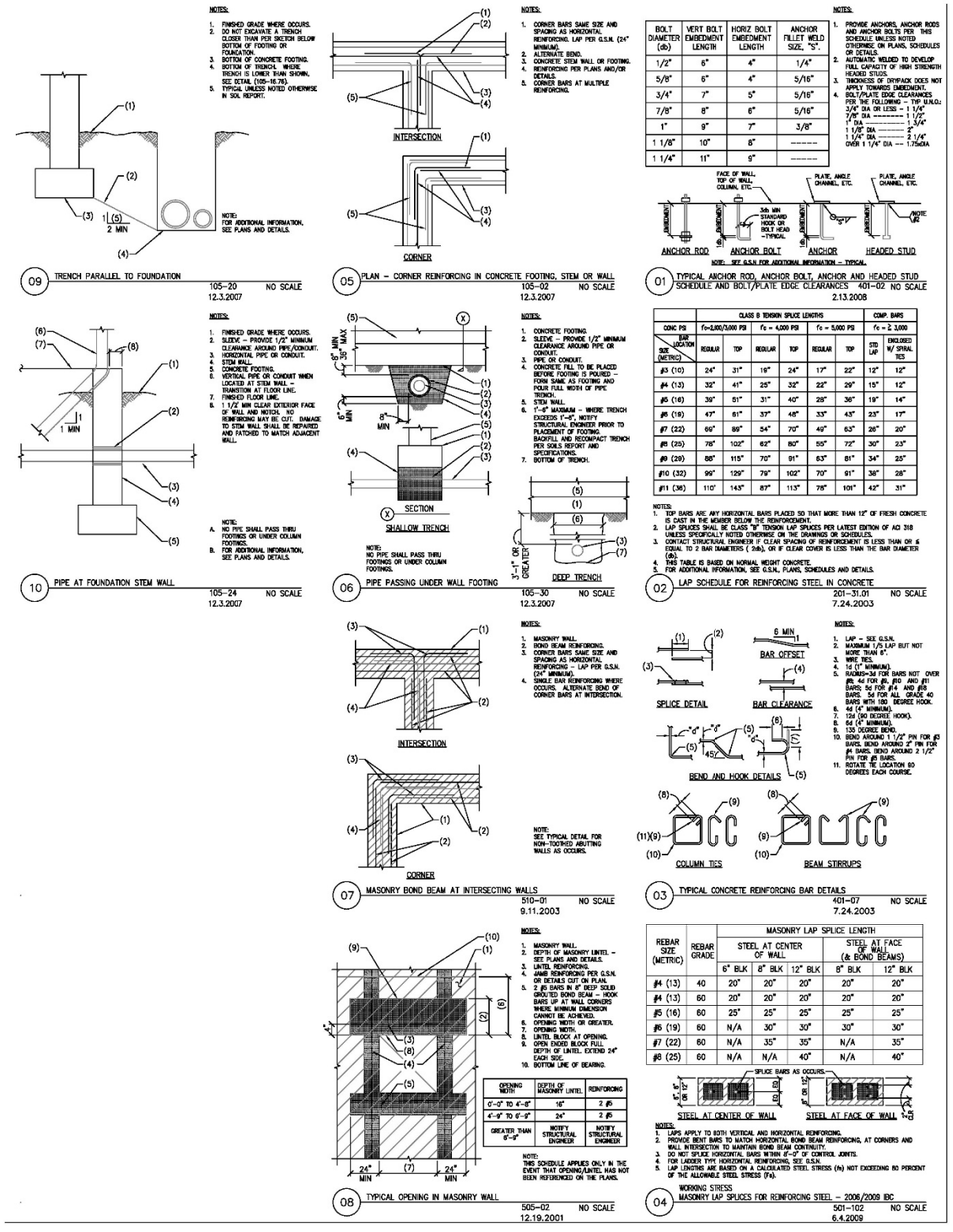
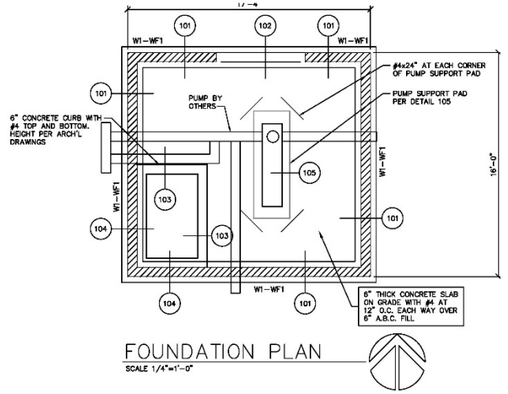
GENERAL STRUCTURAL NOTES

HERITAGE ENVIRONMENTAL SERVICES - FIRE PUMP HOUSE
284[illegible] STOREY ROAD
COOLIDGE, ARIZONA 85128

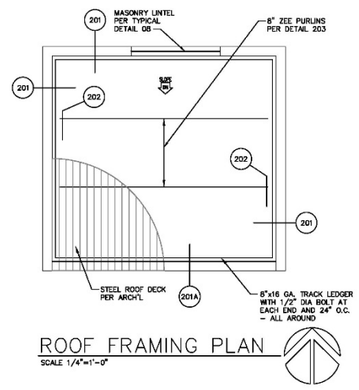
JOB: 1402
DATE: 3/12

SHEET S1.1



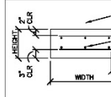


FOUNDATION PLAN
SCALE 1/4"=1'-0"



ROOF FRAMING PLAN
SCALE 1/4"=1'-0"

CONTINUOUS FOOTING (WF) SCHEDULE
901-03



MARK	DIMENSIONS: HEIGHT	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. ▨ - 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. W1, 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 DETAILS/A 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, NUMBER AND LOCATION OF OPENINGS, SEE ARCHITECTURAL, MECHANICAL, PLUMBING, ELECTRICAL, SPRINKLER 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

FOR ADDITIONAL INFORMATION SHOWN BUT NOT NOTED, SEE GENERAL STRUCTURAL NOTES ON SHEET S0.1 AND TYPICAL DETAIL SHEETS.

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

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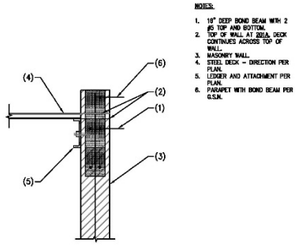
STRUCTURAL PLANS AND TYPICAL DETAILS

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

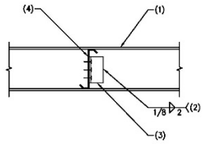
JOB: 1402
DATE: 3/12

SHEET S1.2



201 LEDGER TO WALL (201A AS NOTED) 14–232 NO SCALE

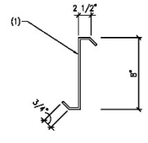
NOTES:
1. 18" DEEP BOND BEAM WITH 2 #5 TOP AND BOTTOM.
2. TOP OF WALL AT 20'-0". DECK CONTINUES ACROSS TOP OF WALL.
3. MASONRY WALL.
4. STEEL DECK – DIRECTION PER PLAN.
5. LEDGER AND ATTACHMENT PER PLAN.
6. PARAPET WITH BOND BEAM PER S.S.A.



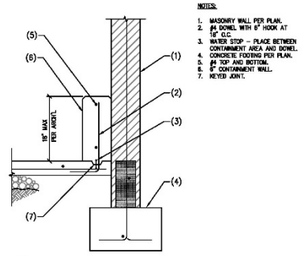
202 PURLIN TO LEDGER 14–232 NO SCALE

NOTES:
1. LEDGER PER PLAN.
2. USE 5 #10 SCREWS AS AN ALTERNATIVE TO WELDING.
3. 3"x3"x5"-6" 16 GA. CLIP WITH 5 #10 SCREWS.
4. PURLIN PER PLAN.

NOTES:
1. TYPICAL PURLIN, 12 GA. Fy = 55 KSI MIN

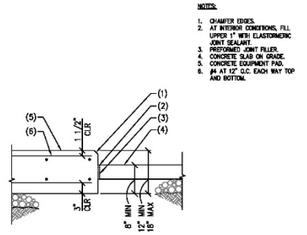


203 PURLIN DIMENSIONS 14–232 NO SCALE



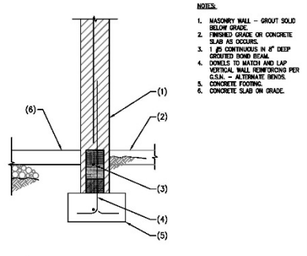
104 CONTAINMENT WALL AT MASONRY WALL 14–232 NO SCALE

NOTES:
1. MASONRY WALL PER PLAN.
2. #4 DOWEL WITH 6" HOOK AT 18" O.C.
3. WATER STOP – PLACE BETWEEN CONTAINMENT AREA AND DOWEL.
4. CONCRETE FOOTING PER PLAN.
5. #4 TOP AND BOTTOM.
6. 8" CONTAINMENT WALL.
7. KEYED JOINT.



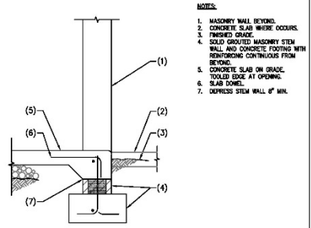
105 PUMP SUPPORT PAD 101–54M NO SCALE

NOTES:
1. CHAMFER EDGES.
2. AT INTERIOR CONDITIONS, FILL UPPER 1" WITH ELASTOMERIC JOINT SEALANT.
3. PREFORMED JOINT FILLER.
4. CONCRETE SLAB ON GRADE.
5. CONCRETE EQUIPMENT PAD.
6. #4 AT 12" O.C. EACH WAY TOP AND BOTTOM.



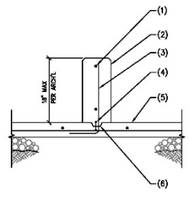
101 MASONRY WALL FOOTING 108–51 12.4.2001 NO SCALE

NOTES:
1. MASONRY WALL – GROUT SOLID BELOW GRADE.
2. FINISHED GRADE OR CONCRETE SLAB AS OCCURS.
3. 1 #5 CONTINUOUS IN 8" DEEP GROUTED BOND BEAM.
4. DOWELS TO MATCH AND LAP VERTICAL WALL REINFORCING PER S.S.A. – ALTERNATE BENDS.
5. CONCRETE FOOTING.
6. CONCRETE SLAB ON GRADE.



102 MASONRY WALL FOOTING AT OPENING 109–71 12.4.2001 NO SCALE

NOTES:
1. MASONRY WALL BEYOND.
2. CONCRETE SLAB WHERE OCCURS.
3. FINISHED GRADE.
4. SOLID GROUTED MASONRY STEM WALL AND CONCRETE FOOTING WITH REINFORCING CONTINUOUS FROM BEYOND.
5. CONCRETE SLAB ON GRADE. TOOLED EDGE AT OPENING.
6. SLAB DOWEL.
7. DEPRESS STEM WALL 8" MIN.



103 CONTAINMENT WALL 14–232 NO SCALE

NOTES:
1. #4 TOP AND BOTTOM.
2. 8" CONTAINMENT WALL.
3. #4 DOWEL WITH 6" HOOK AT 18" O.C.
4. WATER STOP – PLACE BETWEEN CONTAINMENT AREA AND DOWEL.
5. CONCRETE SLAB ON GRADE.
6. KEYED JOINT.

AS–BUILD

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PROJECT ENGINEER	MJS	PROJECT DRAFTER	TMH

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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	LC6375D	24" X 24" X 6"	GALVANIZED	(1) (2) (3) (4)
L-2, L-3	FIRE PUMP ROOM	COMBUSTION AIR	MOTORIZED ADJUSTABLE DRAINABLE	STEEL	RUSKIN	LC6375D	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 CBW-098-4 PUMP HOUSE EXHAUST~~

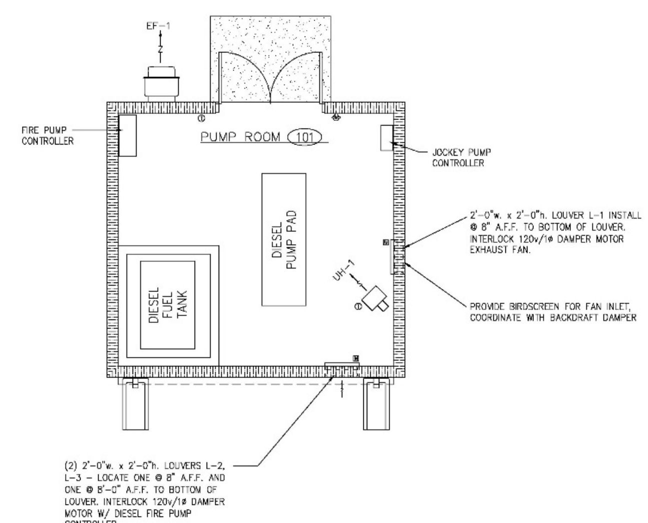
Model: 100 ACW OO ACW35
Serial: 1009P30227-00/ 0000701
Loren Cook Company, Phone: 417-869-6474 or www.lorencook.com

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	590	1/20 HP ~~480V/3ø~~	~~REZNOR EGE-7~~ Model: HER 75B 55O1, Mar.: Modine
					Serial: 5001C919 4-2586 Power: 480V not available. Switched to #10 wire, 230V / Single Phase / 20 amp

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"

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

HVAC FLOOR PLAN
SCHEDULES

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

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

- JUNCTION BOX (4" SQUARE MINIMUM)
- INDICATES HOMERUN.
- CIRCUIT CONDUCTORS. LONG DASH INDICATES NEUTRAL CONDUCTOR, SHORT DASH INDICATES PHASE CONDUCTORS. CODE SIZED EQUIPMENT GROUND NOT INDICATED BUT REQUIRED.
- ISOLATED GROUNDING CONDUCTOR. GREEN, INSULATED WITH YELLOW STRIPE.
- GROUNDING CONDUCTOR. GREEN, INSULATED, SIZE PER PLAN.
- SURFACE PANELBOARD
- FLUSH PANELBOARD
- TRANSFORMER. (KVA SIZE AS NOTED). GROUNDING SYSTEM TO BUILDING STEEL (IF APPLICABLE).
- CONDUIT STUB-UP ABOVE CEILING
- CONDUIT STUB-DOWN TO FLOOR BELOW
- CONDUIT IN UNDERGROUND/SLAB
- CONDUIT STUB-UP WITH CAP
- CONDUIT SEAL-OFF
- FLEXIBLE CONDUIT. PROVIDE LIQUID TIGHT FLEX IN WET OR EXTERIOR LOCATIONS AND AT CONNECTIONS TO VIBRATING EQUIPMENT AND/OR TRANSFORMERS.
- CONDUIT CONCEALED IN WALLS OR ABOVE CEILING.

B. POWER

- 20A SPEC GRADE SINGLE RECEPTACLE MOUNTED AT +15" TO BOTTOM OR AS NOTED
- 20A SPEC GRADE DUPLEX RECEPTACLE MOUNTED AT +15" TO BOTTOM OR AS NOTED
- 20A SPEC GRADE FOURPLEX RECEPTACLE MOUNTED AT +15" TO BOTTOM OR AS NOTED
- 20A SPEC GRADE DUPLEX CONVENIENCE OUTLET MOUNTED ABOVE COUNTER. VERIFY EXACT HEIGHT WITH ARCHITECTURAL ELEVATIONS.
- 20A SPEC GRADE FOURPLEX CONVENIENCE OUTLET MOUNTED ABOVE COUNTER. VERIFY EXACT HEIGHT WITH ARCHITECTURAL ELEVATIONS.
- SPECIAL OUTLET AS NOTED ON DRAWINGS – VERIFY NEMA RATING BEFORE INSTALLATION
- SPECIAL OUTLET AS NOTED ON DRAWINGS

  X =
  C – MOUNTED IN CEILING
  DW – DISHWASHER
  MW – MICROWAVE
  P – PEDISTAL MOUNTED
  PD – PEDIATRIC SAFE
  RF – REFRIGERATOR
  SD – SINK DISPOSAL. PROVIDE SWITCH ABOVE COUNTER.
  UCR – UNDERCOUNTER REFRIGERATOR
  VM – VENDING MACHINE
- ISOLATED GROUNDING OUTLET AT +15" TO BOTTOM OR AS NOTED. "LEVITON" #5362-IG (ORANGE) RECEPTACLE WITH ISOLATED GROUND.
- 20A SPEC GRADE HALF SWITCHED DUPLEX RECEPTACLE AT +15" TO BOTTOM OR AS NOTED.
- DUAL COMPARTMENT POWER/TELE DATA POLE
- FLUSH FLOOR POWER OUTLET – WITH 20A SPEC GRADE RECEPTACLES DUPLEX OR FOURPLEX. HUBBLE, THOMAS & BETTS, CARLON OR EQUAL.
- 20A SPEC GRADE GFCI DUPLEX RECEPTACLE AT +15" TO BOTTOM OR AS NOTED.
- 20A SPEC GRADE GFCI DUPLEX RECEPTACLE AT +6" ABOVE COUNTER TO BOTTOM OR AS NOTED.
- DROP CORD POWER OUTLET – WITH 20A SPEC GRADE RECEPTACLES DUPLEX OR FOURPLEX. HUBBLE, THOMAS & BETTS, CARLON OR EQUAL.
- "J" BOX FLUSH MOUNTED IN WALL FOR SYSTEMS FURNITURE POWER. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH SUPPLIER PRIOR TO ROUGH-IN. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR FINAL CONNECTION TO SYSTEM FURNITURE.
- WIRE MOLD. LENGTH AND TYPE AS NOTED ON DRAWINGS. MOUNT AS NOTED ON THE DRAWINGS.

C. COMMUNICATIONS

- FLUSH FLOOR COMBINATION TELEPHONE/DATA OUTLET – PROVIDE 1" MIN CONDUIT TO ABOVE ACCESSIBLE CEILING. HUBBELL, THOMAS & BETTS, CARLON OR EQUAL.
- DATA OUTLET AT +15" A.F.F. TO BOTTOM OF WALL FIXTURE OR AS NOTED. PROVIDE 3/4" CONDUIT STUBBED TO +4" ABOVE FINISHED CEILING.
- TELEPHONE OUTLET AT +15" A.F.F. TO BOTTOM OF WALL FIXTURES OR AS NOTED. PROVIDE 3/4" CONDUIT STUBBED TO +4" ABOVE FINISHED CEILING OR AS NOTED:

  X=
  P – PAY PHONE
  W – WALL PHONE OUTLET MOUNTED AT +44" A.F.F.
- COMBINATION TELEPHONE/DATA OUTLET AT +15" A.F.F. TO BOTTOM OF WALL FIXTURES OR AS NOTED. PROVIDE 3/4"C. STUBBED TO +4" ABOVE FINISHED CEILING.
- DIGITAL CABLE TELEVISION OUTLET
- TELEVISION OUTLET WITH DEVICES
- "J" BOX FLUSH MOUNTED IN WALL FOR SYSTEMS FURNITURE TELE/DATA WITH 1-1/4" EMPTY CONDUIT STUBBED ABOVE CEILING. COORDINATE EXACT LOCATION AND REQUIREMENTS WITH SUPPLIER PRIOR TO ROUGH-IN. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR FINAL CONNECTION TO SYSTEM FURNITURE.
- TELEPHONE TERMINAL BOARD "TMB". 3/4" PLYWOOD TELEPHONE MOUNTING BOARD WITH #6 COPPER GROUND & DEDICATED FOURPLEX CONVENIENCE OUTLET. FURNISH IN ACCORDANCE WITH TELEPHONE COMPANY'S REQUIREMENTS. SIZE AS NOTED ON DRAWINGS. PLYWOOD SHALL BE TYPE "CDX".

D. LIGHTING

- STANDARD SWITCH AND COVER PLATE WITH LOCKING DEVICE (BRADY NO. 2AF98 OR EQUAL)
- SINGLE POLE SWITCH MOUNTED AT +44" TO CENTER OF DEVICE OR AS NOTED.
- TWO POLE SWITCH MOUNTED AT +44" TO CENTER OF DEVICE OR AS NOTED.
- THREE WAY SWITCH MOUNTED AT +44" TO CENTER OF DEVICE OR AS NOTED.
- FOUR WAY SWITCH MOUNTED AT +44" TO CENTER OF DEVICE OR AS NOTED.
- SINGLE POLE SWITCH WITH PILOT LIGHT AT +44" TO CENTER OF DEVICE OR AS NOTED.
- 2000W INCANDESCENT SLIDE CONTROL DIMMER AT AT +44" TO CENTER OF DEVICE OR AS NOTED. LUTRON #N2003P-WH.
- SWITCH KEY OPERATED MTD AT +44" TO CENTER OF DEVICE OR AS NOTED.
- 1500W LOW VOLTAGE SLIDE CONTROL DIMMER WITH PRESET AT +44". CONTRACTOR SHALL SUPPLY SPECIFIC (ELECTRONIC AND/OR MAGNETIC) TO SUIT LOADS.
- WALL MOUNTED OCCUPANCY SENSOR. WATTSTOPPER-DUAL TECHNOLOGY OR EQUAL. IN RESTROOMS: WATTSTOPPER-ULTRASONIC.
- SINGLE POLE UP-OFF-DOWN SWITCH FOR CONTROL OF PROJECTION SCREEN. MOUNTED AT +44" TO CENTER OF DEVICE OR AS NOTED.
- PUSH BUTTON CONTROL STATION AS NOTED. VERIFY MOUNTING HEIGHT.
- ROOF MOUNTED PHOTOCELL (AIM NORTH) INTERMATIC #K1121.
- ASTRONOMIC ELECTRONIC 4 POLE LIGHTING TIMESWITCH, INTERMATIC #ET70415CR.
- CEILING MOUNTED OCCUPANCY SENSOR 360°. WATTSTOPPER-DUAL TECHNOLOGY OR EQUAL. IN RESTROOMS: WATTSTOPPER-ULTRASONIC. IN WAREHOUSE: WATTSTOPPER-HIGHBAY. (WR) WIDE ANGLE (LR) LONG RANGE.
- OCCUPANCY SENSOR – POWER PACK OR SLAVE PACK.
- FLUORESCENT STRIP LIGHTING FIXTURE – AS NOTED ON DRAWINGS.
- FLUORESCENT LIGHTING FIXTURE – AS NOTED ON DRAWINGS SURFACE MOUNTED.
- RECESSED GRID W/FLEXIBLE CONNECTION.
- INDICATES NIGHTLIGHT (NL) AND/OR EMERGENCY FIXTURE WITH INVERTER 1400 LUMEN MINIMUM (UNSWITCHED) – AS NOTED ON DRAWING.
- WALL MOUNTED LIGHTING FIXTURE – AS NOTED ON DRAWINGS.
- CEILING MOUNTED LIGHTING FIXTURE – AS NOTE ON DRAWINGS.
- H.I.D. HIGH/LOW BAY FIXTURE
- WALL WASH LIGHTING FIXTURE. AIM AS DIRECTED BY ARCHITECT.
- TRACK LIGHTING SYSTEM WITH TRACK FIXTURE HEADS AS INDICATED ON PLANS. VERIFY TYPE LINE OR LOW VOLTAGE.
- POLE MOUNTED AREA LIGHT (ARM MOUNTED) VERIFY HEIGHT SEE POLE DETAIL.
- POLE MOUNTED AREA LIGHT (POST TOP) VERIFY HEIGHT SEE POLE DETAIL.
- WALL PACK.
- SINGLE FACE EXIT SIGN, SEE LIGHTING FIXTURE SCHEDULE FOR SPECIFICATION. DIRECTIONAL ARROW AS INDICATED ON PLANS (CEILING OR WALL.)
- COMBINATION EMERGENCY EXIT SIGN WITH DUAL HEAD LIGHTS WITH EMERGENCY BATTERY BACK-UP.
- DOUBLE FACE EXIT SIGN, SEE LIGHTING FIXTURE SCHEDULE FOR SPECIFICATION. DIRECTIONAL ARROW AS INDICATED ON PLANS (CEILING OR WALL)
- DUAL HEAD EMERGENCY BATTERY PACK, SEE LIGHTING FIXTURE SCHEDULE FOR SPECIFICATIONS.

E. MECHANICAL

- CONTACTOR – FURNISHED AND INSTALL BY OTHERS
- CONTACTOR – FURNISHED/INSTALLED BY ELECTRICAL CONTRACTOR SIZE AS NOTED
- MOTOR STARTER/CONTROLLER– FURNISHED WITH MOTOR.
- MOTOR STARTER/CONTROLLER – FURNISHED/INSTALLED BY ELECTRICAL CONTRACTOR.
- MOTOR – SIZE AS INDICATED ON DRAWINGS.
- DISCONNECT SWITCH – SIZE AND FUSES AS PER MANUFACTURER'S RECOMMENDATIONS (WEATHERPROOF WHERE OUTSIDE). N.F. INDICATES NON-FUSED.
- COMBINATION FUSIBLE DISCONNECT/MOTOR CONTROLLER – 30/3P WITH MIN. SIZE 1 MAGNETIC STARTER (UNLESS NOTED OTHERWISE). PROVIDE FUSES PER MANUFACTURER'S REQUIREMENTS. N.F. INDICATES NON-FUSED.
- HORSEPOWER RATED MANUAL MOTOR STARTER WITH THERMAL OVERLOAD(S). OVERLOAD HEATERS TO BE SIZED PER HORSEPOWER AND MANUFACTURER'S REQUIREMENTS.

F. FIRE ALARM

- FIRE ALARM PULL STATION AT +48".
- FIRE ALARM STROBE: +80" AFF OR 6" BELOW CEILING, WHICHEVER IS LOWER.
- FIRE ALARM HORN/STROBE: +80" AFF OR 6" BELOW CEILING, WHICHEVER IS LOWER.
- FIRE ALARM MAGNETIC DOOR HOLDER
- FIRE ALARM BELL
- FAAP – FIRE ALARM ANNUNCIATOR PANEL
- FACP – FIRE ALARM CONTROL PANEL
- FIRE ALARM HEAT DETECTOR.
- FIRE ALARM SMOKE DETECTOR.
- FIRE ALARM DUCT SMOKE DETECTOR.
- FIRE ALARM TAMPER SWITCH.
- FIRE ALARM FLOW SWITCH.
- SPEAKER.

G. ONE LINE DIAGRAM

- (M) METER, (S) SOCKET, (B) BLANK
- (M) METER, (S) SOCKET, (B) BLANK, WITH CURRENT TRANSFORMERS.
- BREAKER AS INDICATED.
- FUSED SWITCH.
- BREAKER WITH SHUNT TRIP (SIZE AS INDICATED)
- PULLOUT FUSE

H. ABBREVIATIONS

A	AMPERE
AIC	AVAILABLE INTERRUPTING CURRENT
Al	ALUMINUM
AFC	AVAILABLE FAULT CURRENT
AFCI	ARC FAULT CIRCUIT INTERRUPTER
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AH	AIR HANDLER UNIT
APS	ARIZONA PUBLIC SERVICE – (UTILITY CO.)
C	CONDUIT
CU	CONDENSING UNIT
Cu	COPPER
D	DEDICATED
DP	DUST – IGNITION PROOF
E	EXISTING
EC	EMPTY CONDUIT
EDF	ELECTRIC DRINKING FOUNTAIN
EF	EXHAUST FAN – 150 WATT, 120V.
EG	EQUIPMENT GROUND
EM	EMERGENCY LIGHT. BYPASS LOCAL SWITCHING AND PROVIDED BATTERY PACK.
FC	FAN COIL UNIT
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GFP	GROUND FAULT PROTECTION
GND	GROUND/BOND CONDUCTOR
GWH	GAS WATER HEATER
IAW	IN ACCORDANCE WITH
IG	ISOLATED GROUND
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MLO	MAIN LUG ONLY
N	NEW ITEM
NR	NEW LOCATION OF RELOCATED EXISTING ITEM
NL	NIGHT LIGHT. BYPASS LOCAL SWITCHING.
PNL	PANELBOARD
R	EXISTING TO BE RELOCATED
SES	SERVICE ENTRANCE SECTION
SRP	SALT RIVER PROJECT – (UTILITY CO.)
SWBD	SWITCHBOARD
TMB	3/4" PLYWOOD TELEPHONE MOUNTING BOARD WITH #6 CU. SOLID GROUND.
TTC	TELEPHONE TERMINAL CABINET (SIZE INDICATED ON DRAWINGS)
UFER	CONCRETE ENCASED ELECTRODE
UC	UNDERGROUND
UNO	UNLESS NOTED OTHERWISE
VA	VOLT AMPERES
W	WATT
WG	WIRE GUARD
WH	WATER HEATER
WP	WEATHERPROOF (RAIN TIGHT) WEATHER RESISTANT NEMA 3R OR NEMA 4 IN-USE
WR	WEATHER RESISTANT
X	EXISTING TO BE REMOVED
XP	EXPLOSION PROOF

ELECTRICAL SPECIFICATIONS

UPDATED: 01-02-2014

SOME SPECIFICATIONS MAY NOT BE USED FOR THIS PROJECT.

1.0 INTENT

1.1 FURNISH AND INSTALL A COMPLETE AND OPERATIONAL ELECTRICAL SYSTEM IN ACCORDANCE WITH PLANS AND SPECIFICATIONS.

1.2 ALL DRAWINGS ARE SCHEMATIC IN NATURE AND THE REQUIRED INSTALLATION IS NOT LIMITED TO WHAT IS SHOWN. ALL APPURTENANCES NECESSARY TO PROVIDE A COMPLETE AND OPERATIONAL SYSTEM MUST BE INCLUDED IN THE CONTRACTORS BID AND WORK.

2.0 GENERAL

2.1 THE CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ALL EXISTING CONDITIONS WHICH MAY AFFECT HIS BID OR WORK. NO ALLOWANCES WILL BE MADE FOR EXISTING CONDITIONS OR THE CONTRACTORS FAILURE TO ACCOMMODATE EXISTING CONDITIONS ON HIS BID.

2.2 IT IS THE CONTRACTORS RESPONSIBILITY TO OBTAIN CLARIFICATION OF ANY APPARENT CONFLICT OR INCONSISTENCY IN THE DRAWINGS, SPECIFICATION, OR DESIGN, PRIOR TO HIS BID AND IN WRITING WITH THE ENGINEER. OTHERWISE THE CONTRACTOR ACCEPTS RESPONSIBILITY TO CORRECT (AT HIS COST) ANY SUCH ITEMS TO MEET THE INTENT AS INTERPRETED BY THE ENGINEER.

2.3 ALL MATERIAL AND WORKMANSHIP SHALL CONFORM TO THE MOST RECENT EDITIONS OF THE NFPA, NATIONAL ELECTRIC CODE, IBC, APPLICABLE CITY AND STATE CODES AND ORDINANCES, THE AMERICANS WITH DISABILITIES ACT, E.P.A. REGULATIONS (INCLUDING EPACT 1992), AND UTILITY COMPANY REQUIREMENTS. THE FOREGOING CODES AND REGULATIONS ARE REQUIREMENTS AND ARE INCORPORATED IN THIS SPECIFICATION FOR THIS WORK BY REFERENCE.

2.4 THE CONTRACTOR SHALL COORDINATE AND PROVIDE INFORMATION AS REQUIRED TO ALL SERVING UTILITIES IN A TIMELY MANNER AS NECESSARY TO PROVIDE THE SERVICE REQUIRED AND MEET UTILITY REQUIREMENTS. IMMEDIATE COORDINATION WILL BE REQUIRED FOR MOST PROJECTS. FIELD COORDINATE ALL REQUIREMENTS WITH UTILITY Co. PRIOR TO TRENCHING.

2.5 REFER TO ARCHITECTURAL, MECHANICAL, CIVIL, STRUCTURAL, AND/OR EQUIPMENT SUPPLIERS DRAWINGS AND SPECIFICATIONS FOR EXACT EQUIPMENT LOCATIONS, LOADS AND ADDITIONAL REQUIREMENTS. REPRESENTATIONS OF THE WORK SPECIFIC TO THE OTHER DISCIPLINES IS SHOWN ON THE ELECTRICAL DRAWINGS FOR CLARITY ONLY.

2.6 THE CONTRACTOR ASSUMES RESPONSIBILITY FOR ALL EQUIPMENT HE SUPPLIES. ALL EQUIPMENT SHALL BE INSTALLED STRICTLY PER MANUFACTURERS RECOMMENDATIONS. OTHERWISE THE CONTRACTOR ASSUMES RESPONSIBILITY (AT HIS COST) TO CORRECT AND REMEDY ANY INSTALLATION NOT IN COMPLIANCE WITH THE MANUFACTURES RECOMMENDATIONS AND INTENTIONS AS INTERPRETED BY THE ENGINEER.

2.7 ANY VARIANCE OR EXCEPTIONS TO THE DRAWINGS AND SPECIFICATIONS MUST BE REQUESTED AND APPROVED IN WRITING. INTERIM VERBAL APPROVALS WILL ONLY BE PROVIDED WHEN THE ENGINEER DETERMINES THIS TO BE JUSTIFIED AND MUST BE CONFIRMED IN WRITING TO BE FINAL.

2.8 THE CONTRACTOR IS RESPONSIBLE TO OBTAIN ALL NECESSARY PERMITS, VARIANCES, AND APPROVALS, ETC. (AT HIS COST) WHICH MAY BE REQUIRED FOR COMPLETION OF THIS WORK.

2.9 PRIOR TO ROUGH-IN, THE ELECTRICAL CONTRACTOR SHALL COORDINATE THE EXACT LOCATION OF ALL LIGHT FIXTURES AND WIRING DEVICES: TO INCLUDE MOUNTING HEIGHT AND LOCATIONS WITH ARCHITECT/OWNER. ALL CONFLICTS SHALL BE REPORTED TO THE ENGINEER/ARCHITECT.

2.10 THE ELECTRICAL CONTRACTOR SHALL PROVIDE EQUIPMENT AND SUPPORT FOR PROGRESS AND FINAL INSPECTIONS. THIS INCLUDES COMPLETE ACCESS TO ALL EQUIPMENT. ADDITIONALLY A COMPLETE SET OF SPARE FUSES FOR ALL FUSES USED AND A 5% SUPPLY OF ALL LIGHT BULBS PROVIDED IN FIXTURES (TO A MAXIMUM OF 15 FOR EACH STYLE) SHALL BE PROVIDED TO THE OWNER AT FINAL INSPECTION.

2.11 RECONSTRUCTION (TO INCLUDE TENANT IMPROVEMENTS).
ALL RECONSTRUCTION OF EXISTING FACILITIES AND EQUIPMENT SHALL REQUIRE COMPLETE RENOVATION (MAKE GOOD AS NEW) FOR ALL EXISTING EQUIPMENT UPON WHICH WORK IS PERFORMED OR EQUIPMENT WHICH IS AFFECTED BY THE WORK PERFORMED. THIS WILL INCLUDE THESE FOLLOWING REQUIREMENTS:

2.11.1 VERIFICATION OF EXISTING SES COMPLIANCE WITH NEC "GROUNDING" ARTICLES.

2.11.2 VERIFICATION OF CABLE SIZE AND AMPACITY OF EXISTING FEEDERS AND BRANCH CIRCUITS WITH NEC TABLES.

2.11.3 EXISTING LIGHT FIXTURES TO BE REUSED MUST BE CLEANED, RE-LAMPED, AND RESTORED TO "LIKE NEW" CONDITION.

2.11.4 EXISTING PANEL BOARDS, SWITCH BOARDS, AND TRANSFORMERS WHICH ARE INCLUDED IN THE PROJECT WORK SHALL HAVE PREVENTATIVE MAINTENANCE PERFORMED TO INCLUDE RE-TORQUING OF ALL LUGS, CLEANING AND INSPECTION.

2.11.5 VERIFY PROPER WORKING CONDITION OF ALL EXISTING EMERGENCY FIXTURES AND EXIT SIGNS. REPAIR OR REPLACE AS REQUIRED.

IN THE EVENT THAT INSPECTION REVEALS DISCREPANCIES AND/OR NONCOMPLIANCE THE OWNER AND THE ENGINEER SHALL BE NOTIFIED IN WRITING, AND EQUIPMENT BROUGHT INTO COMPLIANCE.

3.0 MATERIALS AND METHODS

3.1 THE USE OF **EMT** IS ACCEPTABLE IN ACCORDANCE WITH NEC ARTICLE "ELECTRICAL METALLIC TUBING". EMT SHALL NOT BE USED WHERE IT IS SUBJECT TO SEVERE PHYSICAL DAMAGE. EMT FITTINGS SHALL BE COMPRESSION TYPE. MINIMUM TRADE CONDUIT SIZE IS 1/2" AND 3/4" FOR HOME RUNS.

3.2 **CONDUCTORS** SHALL BE 600V COPPER (98 % CONDUCTIVITY). MINIMUM LINE VOLTAGE WIRE SIZE IS #12 A.W.G. #6 AND SMALLER SHALL HAVE THHN/THWN INSULATION. #4 AND LARGER SHALL HAVE XHHW/XHHW-2 INSULATION. ALL CONDUCTORS SHALL HAVE 90° RATED INSULATION. ALL 120V, 20A BRANCH CIRCUIT CONDUCTORS (#12) OVER 100' IN LENGTH TO BE #10'S MINIMUM. ALL 277V, 20A BRANCH CIRCUIT CONDUCTORS (#12) OVER 200' IN LENGTH TO BE #10'S MINIMUM.

3.3 WHEN SEPARATE BRANCH CIRCUIT NEUTRAL CONDUCTORS ARE USED WITH EACH PHASE CONDUCTOR OR SYSTEMS FURNITURE IS INDICATED, THE MINIMUM NEUTRAL CONDUCTOR SIZE SHALL BE #10 A.W.G. STRANDED COPPER.

3.4 ALL WIRING DEVICES SHALL BE SPECIFICATION GRADE. (MINIMUM 20 AMPS RATED FOR RECEPTACLES AND SWITCHES). HUBBELL, PASS & SEYMOUR, BRYANT, OR LEVITON ARE ACCEPTABLE. ALL SPECIAL RECEPTACLES AND GROUND FAULT PROTECTION DEVICES MUST BE PERMANENTLY MARKED WITH ENGRAVED COVER PLATES. INDICATE USE AND CIRCUIT NUMBER.

3.5 COVER PLATES AND DEVICES SHALL BE PHENOLIC PLASTIC (WHITE OR COLOR SELECTED BY ARCHITECT) IN OFFICE/COMMERCIAL/OR LIVING AREAS, AND GALVANIZED STEEL IN WAREHOUSE/INDUSTRIAL/MANUFACTURING AREAS OR AREAS SUBJECT TO PHYSICAL ABUSE.

3.6 ALL CONDUCTORS TO BE CONCEALED EXCEPT TO SURFACE MOUNTED PANELS AND AT THE CEILING OF EXPOSED STRUCTURE AREAS. CONDUITS WILL BE RUN PARALLEL OR PERPENDICULAR TO BUILDING LINES.

3.7 FLEXIBLE METAL CONDUIT (SEAL TITE FOR EXTERIOR APPLICATIONS) SHALL BE USED FOR CONNECTIONS TO EQUIPMENT SUBJECT TO VIBRATION (E.G. MOTORS) WITH A MAX. OF 6ft.

3.8 THE USE OF **MC CABLE** IS ACCEPTABLE (UPON OWNER NOTIFICATION AND APPROVAL) AND MAY BE USED IN ACCORDANCE WITH NEC ARTICLE "METAL-CLAD CABLE: TYPE MC", BUT LIMITED TO USE FOR CONCEALED BRANCH CIRCUITS ONLY. ADDITIONALLY MC CABLE MAY NOT BE USED FOR HOME RUNS, OUTDOORS, AND MEDICAL/DENTAL ENVIRONMENTS.

3.9 NON-METALLIC CONDUIT (MIN. SCHEDULE 40) MAY BE USED ONLY IN OR UNDER SLABS & IN CONCRETE OR MASONRY WALLS. MIN. 24" COVER REQUIRED FOR UNDERGROUND USE.

3.10 **FUSES** SHALL BE BUSSMAN, LITTLEFUSE, OR GOULD SHAWMUT.

3.11 CONDUCTORS WILL BE SOLID AND/OR STRANDED WITH INSULATION CONTINUOUSLY COLOR COATED UP TO AND INCLUDING SIZE #8 A.W.G. GROUNDING/BONDING CONDUCTORS SHALL BE U.L. LABELED ROPE STRAND.

3.12 CONNECTIONS OR SPLICES SHALL BE EXOTHERMIC WELD (CAD WELD OR THOMAS AND BETTS FURSEWELD) FOR GROUNDING/BONDING CONDUCTORS.

3.13 NEW CONDUCTORS SHALL BE CONTINUOUS. HYDRAULIC CRIMP SPLICES OR CONNECTIONS ARE EXCEPTIONS AND REQUIRE SPECIFIC APPROVAL IN WRITING BY HAWKINS DESIGN GROUP.

3.14 ALL CONDUIT SUPPORT SYSTEMS SHALL BE INSTALLED ON THE BUILDING STRUCTURE. UNISTRUT, BEEUNE, SUPERSTRUT STEEL CITY SPRING STEEL FASTENERS OR CADDY MOUNTING SYSTEMS ARE ACCEPTABLE. NO CONDUIT WILL BE SUPPORTED BY THE CEILING WIRES, TIE WIRE OR GRID SYSTEM. PERFORATED STRAPS OR OTHER PIPING AND CONDUIT STRAPS ARE NOT ACCEPTABLE SUPPORTS.

3.15 ACCEPTABLE MANUFACTURES FOR **SWITCH GEAR, DISTRIBUTION GEAR** AND RELATED COMPONENTS ARE: SQUARE D, ACME TRANSFORMERS, GENERAL ELECTRIC, SIEMENS, HPS, AND CUTLER-HAMMER.

3.16 CONDUCTORS SHALL BE COLOR CODED FOR BRANCH CIRCUITS AND PHASE LEGS OF FEEDERS TO PANEL BOARDS, SWITCHBOARDS, ETC. IN ACCORDANCE WITH NEC AND LOCAL MUNICIPAL REQUIREMENTS. SPECIFIC REQUIREMENTS INCLUDE THE FOLLOWING.
- 120-V, 2-WIRE CIRCUIT: GROUNDED NEUTRAL-WHITE; UNGROUNDED LEG-BLACK.
- 208Y/120-V, 3-PHASE, 4-WIRE: GROUNDED NEUTRAL-WHITE; PHASE A-BLACK; PHASE B-RED; PHASE C-BLUE.
- 240/120-V, 3 WIRE, SINGLE PHASE CIRCUIT: GROUNDED NEUTRAL-WHITE; PHASE A-BLACK; PHASE B-RED.
- 240-V, DELTA, 3-PHASE, 3-WIRE: PHASE A-BLACK; PHASE B-RED; PHASE C-BLUE.
- 240/120-V, 3-PHASE, 4-WIRE, HIGH-LEG DELTA: GROUNDED NEUTRAL-WHITE; HIGH LEG (208-V TO NEUTRAL)-ORANGE; PHASE A-BLACK; PHASE C-BLUE.
- 480Y/277-V, 3-PHASE, 4-WIRE: GROUNDED NEUTRAL-GRAY; PHASE A-BROWN; PHASE B-ORANGE; PHASE C-YELLOW.
- 480-V, DELTA, 3-PHASE, 3-WIRE: PHASE A-BROWN; PHASE B-ORANGE; PHASE C-YELLOW.
- EQUIPMENT GROUNDING CONDUCTORS-GREEN; ISOLATED GROUNDS-GREEN WITH A YELLOW STRIPE.

3.17 ALL INSTALLATIONS WITHIN PLENUM RATED CEILING SPACE SHALL BE IN ACCORDANCE WITH NEC ARTICLE "WIRING METHODS" WITH REGARDS TO SMOKE DEVELOPMENT AND FLAME SPREAD.

3.18 ALL UNDERGROUND CABLE, PIPE AND CONDUITS SHALL BE DETECTABLE (METALLIC) OR HAVE A DETECTABLE UNDERGROUND LOCATION DEVICE INSTALLED WITH IT. THE RECOMMENDED DETECTABLE UNDERGROUND LOCATION DEVICE IS A #18 OR LARGER COPPER TRACER WIRE SECURELY ATTACHED TO THE TOP OF ANY NON-METALLIC CABLE, PIPE OR CONDUIT AT 8'-0" O/C AND SHALL HAVE A MINIMUM OF 12" OF TRACER WIRE ACCESSIBLE AT ALL ABOVE GRADE TERMINATIONS.

3.19 ALL HORIZONTAL UNDERGROUND CONDUIT RUNS (INCLUDING UNDER CONCRETE SLABS) SHALL BE A MINIMUM OF 24" BELOW GRADE.

3.20 ALL MATERIAL & DEVICES USED EXTERIOR OF THE BUILDING SHALL BE LISTED U.L. FOR WATERPROOF APPLICATIONS.

4.0 SUBMITTALS

4.1 SUBMIT 6 SETS OF SHOP DRAWINGS AND SAMPLES FOR ALL EQUIPMENT PRIOR TO ORDERING IN A TIMELY MANNER. SUBMITTALS SHALL INCLUDE LIGHT FIXTURES (INCLUDING LIGHT POLES), SWITCHBOARDS, PANELBOARDS, BREAKERS, STARTERS, HVAC ELECTRICAL EQUIPMENT AND TRANSFORMERS.

4.1.1 SHOP DRAWINGS SHALL INCLUDE LAYOUT DIMENSIONS AND IDENTIFICATION OF SPECIFIC EQUIPMENT FOR INSTALLATION. MINIMUM NEC CLEARANCES SHALL BE INDICATED.

4.1.2 THE CONTRACTOR SHALL INCLUDE COMPARISON DATA AND SAMPLES FOR BOTH THE SUBSTITUTE AND SPECIFIED ITEMS WHEN SUBSTITUTIONS ARE PROPOSED. THE CONTRACTOR REMAINS RESPONSIBLE TO PROVIDE THE ORIGINALLY SPECIFIED INSTALLATION IN ACCORDANCE WITH THE ORIGINAL DELIVERY DATE (AT HIS COST) WHEN SUBSTITUTIONS ARE NOT APPROVED.

4.2 THE CONTRACTOR SHALL PROVIDE PROOF OF PERFORMANCE BOND WITH HIS INITIAL SUBMITTALS (E.G. SHOP DRAWINGS) TO INCLUDE WARRANTY FOR THE WARRANTY PERIOD (2 YEARS).

4.3 THE CONTRACTOR SHALL SUBMIT COMPLETE AND ACCURATE "AS BUILT" DRAWING TO THE OWNER AND ENGINEER WITHIN 2 WEEKS OF OWNER ACCEPTANCE. PROVIDE 4 SETS OF BLUELINES OR REPRODUCIBLES. FAILURE TO COMPLY WILL RESULT IN WITHHOLDING OF PAYMENTS DUE, AND ASSESSMENT OF CHARGES (AGAINST THE CONTRACTOR) FOR AS-BUILT DEVELOPMENT BY THE ENGINEER AT THE CURRENT HOURLY RATE.

4.4 PROVIDE A LETTER TO THE OWNER AND ENGINEER CERTIFYING ALL EQUIPMENT AND TERMINATION'S ARE PROPERLY TORQUED. THIS CERTIFICATION SHALL BE EXECUTED BY A LICENSED CONTRACTOR, AND WRITTEN CERTIFICATION PROVIDED ON COMPANY LETTERHEAD.

4.5 PROVIDE 2 COPIES OF ALL MANUFACTURER/SUPPLIER WARRANTIES AND GUARANTEES TO THE OWNER WITHIN 2 WEEKS OF FINAL ACCEPTANCE BY THE OWNER.

4.6 TESTS

4.6.1 SUBMIT 2 COPIES OF ALL INDEPENDENT TEST RESULTS FOR THE ELECTRICAL POWER DISTRIBUTION SYSTEM AS A COMPLETE PACKAGE TO THE OWNER AND ENGINEER. PACKAGE MUST PROVIDE SPECIFIC VALUES OF TEST DATA OBTAINED AGAINST ACCEPTANCE CRITERIA (SIMPLE PASS/FAIL ALONE IS INADEQUATE).

4.6.2 TESTING PERSONAL SHALL BE CERTIFIED BY THE NATIONAL ELECTRIC TESTING ASSOCIATION (NETA) OR NATIOANL INSTITUTE FOR CERTIFICATION IN ENGINEERING TECHNOLOGIES (NICET).

4.6.3 ALL TESTING SHALL BE DONE IN ACCORDANCE WITH MANUFACTURER RECOMMENDATIONS OR NATIONALLY RECOGNIZED STANDARDS AND PRACTICES.

4.6.4 GROUNDING SYSTEM FALL OF POTENTIAL (RESISTANCE TO GROUND) TESTING.

4.6.4.1 GROUND SHALL PROVIDE 5 OHMS OR LESS RESISTANCE TO GROUND AND LESS THAN 0.5 OHMS POINT-TO-POINT BETWEEN THE MAIN GROUNDING ELECTRODE SYSTEM AND ELECTRICAL EQUIPMENT FRAMES, SYSTEM NEUTRAL AND/OR DERIVED NEUTRAL POINTS (REFERENCE IEEE STANDARDS 81-1983 AND 81-1991) AND SHALL NOT BE PERFORMED WITHIN 24 HOURS AFTER RAINFALL.

4.6.5 OVER-POTENTIAL (HI-POT) TESTING

4.6.5.1 SHALL BE PERFORMED ON ALL BUSSES 1000A OR GREATER OR ON MODIFICATIONS OF SERVICES GREATER THAN 400 AMPS.

4.6.5.2 TEST BOTH PHASE-TO-PHASE AND PHASE-TO-GROUND FOR AT LEAST ONE MINUTE.

4.6.6 GROUND FAULT PROTECTION TESTING

4.6.6.1 PROVIDE GROUND-FAULT PROTECTION TESTING BY CURRENT INJECTION AT SENSOR.

4.6.6.2 TEST PRIMARY CONTROL VOLTAGE TO NOT EXCEED 57% OF THE RATED VOLTAGE.

4.6.6.3 VERIFY PICK-UP TIME AND TIME-DELAY SETTINGS PROVIDED BY ENGINEER.

4.6.6.4 TEST GFP RELAY TIMING.

4.6.6.5 TEST INTEGRITY OF GROUNDED CONDUCTOR AND ITS INSULATION RESISTANCE TO GROUND.

4.6.7 INSULATION RESISTANCE (MEGGER) TESTING

4.6.7.1 TESTING SHALL BE 1000 VOLTS FOR ONE MINUTE AND SHALL PROVIDE 50 MEGAOHMS RESISTANCE OR GREATER.

4.6.7.2 TEST BOTH PHASE-TO-PHASE AND PHASE-TO-GROUND.

5.0 WARRANTY

5.1 THE CONTRACTOR SHALL GUARANTEE ALL MATERIAL AND/OR WORKMANSHIP FURNISHED BY HIM UNDER THIS CONTRACT FOR A PERIOD OF **TWO YEARS** FROM THE DATE OF FINAL ACCEPTANCE OF THE WORK BY THE OWNER. ANY DEFECTS DEVELOPING DURING THE WARRANTY PERIOD TRACEABLE TO MATERIALS OR WORKMANSHIP SHALL BE CORRECTED AT THE CONTRACTORS EXPENSE.

5.2 THE OWNER RETAINS THE RIGHT TO REQUIRE REMOVAL AND INSTALLATION (AT ANY TIME) OF ANY MATERIAL OR EQUIPMENT NOT IN COMPLIANCE WITH THE PROVISIONS AND STANDARDS OF THESE DRAWINGS AND SPECIFICATIONS. NO CLAIM FOR ADDITIONAL COMPENSATION WILL BE ALLOWED FOR WORK PERFORMED IN THIS REGARD.

5.3 THE CONTRACTOR AGREES TO TRANSFER ALL MANUFACTURER'S/SUPPLIER'S WARRANTIES AND GUARANTEES TO THE OWNER. THIS INCLUDES COMPLETION OF ALL DOCUMENTATION FOR THE MANUFACTURER/SUPPLIER.

6.0 SERVICE

6.1 EXISTING

7.0 DISTRIBUTION

7.1 **PANELBOARDS** (EXISTING): ADD CIRCUIT BREAKERS (FULL SIZED BREAKERS) AS REQUIRED FOR CIRCUITING. MATCH PRECISELY BRAND AND PROVIDE A.I.C. RATING AS INDICATED ON DRAWINGS. TANDEM AND PIGGY-BACK BREAKERS ARE NOT PERMITTED. ALL LUGS OR CONNECTORS TO BE 60°C FOR PANEL LESS THAN OR EQUAL 100 AMPS AND 75°C RATED OF GREATER THAN 100AMPS MINIMUM.

7.2 **PANELBOARDS** (NEW): SHALL BE RATED AS SHOWN ON DRAWINGS WITH PLATED COPPER BUSSING. PROVIDE NEMA ENCLOSURES AS REQUIRED BY CODE FOR REGULATION. BACK BOXES ENLARGED FOR DOUBLE NEUTRALS AND LUGS CAPABLE OF OVERSIZING ISOLATED GROUND AND NORMAL GROUND BUS. ALL LUGS OR CONNECTORS TO BE 60°C FOR PANEL LESS THAN OR EQUAL 100 AMPS AND 75°C RATED OF GREATER THAN 100AMPS MINIMUM. PANELBOARD CABINET SHALL BE EQUIPPED WITH PIANO HINGES WITH DOOR IN DOOR CONSTRUCTION.

7.3 **CIRCUIT BREAKERS** WILL BE SWITCH RATED AND AMBIENT COMPENSATED FOR ALL CIRCUITS. PROVIDE SWITCHED NEUTRALS ON ALL CIRCUIT BREAKERS FEEDING CLASS 1 AND CLASS 2 AREAS WITH NEUTRALS. GFCI ON CIRCUITS WITH NEUTRALS TO DEVICES ABOVE CLASSIFIED AREAS. ALL LIGHTING PANELS/CIRCUIT BREAKERS SHALL BE RATED FOR CONTINUOUS DUTY. HACR RATED BREAKERS SHALL BE INSTALLED FOR ALL HVAC CIRCUITS CONTAINING MULTIPLE MOTOR LOADS.

7.4 ALL EQUIPMENT (PANELS, DISCONNECT SWITCHES, STARTERS, ETC.) WILL BE MARKED WITH BLACK OR RED ENGRAVERS STOCK TAGS EMBOSSED WITH 1/4" HIGH LETTERS DESCRIBING EACH ITEM. CONDUCTORS WILL BE MARKED AT ALL TERMINATION AND JUNCTION POINTS (PANELS, JUNCTION BOXES, SPLICES, ETC.) WITH LABELS BEARING THE PANEL AND CIRCUIT NUMBER WHICH FEEDS EACH CONDUCTOR (PER NEC 210.4, 300.3).

7.5 ALL **PANELBOARDS** WILL HAVE TYPED DIRECTORY CARDS IDENTIFYING ALL CIRCUITS AND SPACES.

7.6 ACCEPTABLE MANUFACTURERS FOR **PANELBOARDS, SWITCHBOARDS, AND TRANSFORMERS** SHALL BE PER SECTION 3.15 OF THIS SPECIFICATION. TRANSFORMERS 15 KVA AND ABOVE SHALL BE 150°C TEMPERATURE RISE ABOVE 40°C AMBIENT. ALL INSULATING MATERIALS TO BE IN ACCORDANCE WITH NEMA ST20-1972 STANDARDS FOR A 220°C UL COMPONENT RECOGNIZED INSULATION SYSTEM. SINGLE PHASE TRANSFORMERS 15 KVA THROUGH 50 KVA, AND THREE PHASE TRANSFORMERS THROUGH 45 KVA SHALL BE DESIGNED SO THEY CAN BE EITHER FLOOR OR WALL MOUNTED. THE TRANSFORMER SHALL BE LISTED BY UNDERWRITERS LABORATORY FOR SPECIFIED TEMPERATURE RISE. TRANSFORMERS 75 KVA AND ABOVE SHALL BE DESIGNED FOR FLOOR INSTALLATION ONLY UNLESS NOTED OTHERWISE.

7.7 LABEL ALL PANELS/TRANSFORMERS/DISCONNECTS WITH "WARNING" – ELECTRICAL EQUIPMENT – DANGER – QUALIFIED PERSONNEL ONLY TO OPERATE ON OPEN EQUIPMENT.

7.8 **DISCONNECT SWITCHES** WILL BE COMMERCIAL-DUTY, QUICK-MAKE, QUICK-BREAK, HORSEPOWER RATED, NEMA 1 INDOOR, NEMA 3R GASKETED, (4X) NEMA 12, OR NEMA 7 AS APPLICABLE WITH FUSES PER DRAWING.

7.9 **MANUAL MOTOR** STARTERS WITH THERMAL OVERLOADS WILL BE PROVIDED FOR FRACTIONAL HORSEPOWER MOTORS 1/2 HP OR GREATER. SQUARE 'D' CLASS 2510, 2511, 2512. AMBIENT COMPENSATED AS REQUIRED.

7.10 **MAGNETIC MOTOR STARTERS** WITH THERMAL OVERLOADS, (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 AS SHOWN ON THE DRAWING (ONE HORSEPOWER TO 25 H.P.).

8.0 LIGHT FIXTURES

8.1 FURNISH AND INSTALL ALL LIGHTING FIXTURES COMPLETE WITH LAMPS, WHIPS AND ACCESSORIES. ALL RECESSED FIXTURES WILL BE RATED FOR USE IN ANY CEILING APPLICATIONS AND BE THERMALLY PROTECTED.

8.2 MOUNTING TYPE AND VOLTAGE OF FIXTURES IS THE RESPONSIBILITY OF THE CONTRACTOR. (4) EARTHQUAKE CLIPS WILL BE INSTALLED ON EACH FIXTURE MOUNTED IN GRID OR FLANGE TYPE CEILINGS. FLUORESCENT FIXTURE LENSES WILL BE 100% ACRYLIC, .125" THICK MINIMUM.

8.3 ALL FIXTURES TO BE INSTALLED IN SYMMETRICAL MANNER FREE FROM LIGHT LEAKS AND DIRTY LENSES OR REFLECTORS.

8.4 ALL LAY-IN FIXTURES IN ACOUSTICAL CEILING SYSTEMS WILL BE INSTALLED PER IBC STANDARD. VERIFY WITH LOCAL BUILDING AUTHORITY.

8.4.1 SUPPORT FIXTURES PER IBC WITH TWO LOOSE SIZE #9 WIRES TO STRUCTURES ON OPPOSITE CORNERS AND 2 TAUGHT SIZE #9 WIRE TO STRUCTURE AT CORNERS AND/OR FIXTURE SHALL BE FASTENED BY SCREWS INTO T-BAR RUNNERS IN ACCORDANCE WITH LOCAL AUTHORITY HAVING JURISDICTION.

8.5 LAMPS LAMPS SHALL BE:

8.5.1 T8-3500 KELVIN TEMPERATURE UNLESS NOTED OTHERWISE.
8.5.2 70 CRI (COLOR RENDERING INDEX) MINIMUM.

H.I.D. LAMPS:

8.5.3 AS NOTED ON PLANS.

INCANDESCENT LAMPS:

8.5.4 130V. FOR ALL "A" TYPE BASES.

8.6 BALLASTS

8.6.1 BALLASTS SHALL BE:

8.6.1.1 HIGH POWER FACTOR, UL LISTED, CBM CERTIFIED AND ETL TESTED.
8.6.1.2 HAVE A SOUND RATING OF "A"
8.6.1.3 HAVE THD < 10%
8.6.1.4 HAVE GREATER THAN .9 POWER FACTOR.

8.6.2 FLUORESCENT BALLASTS SHALL:

8.6.2.1 START RELIABLY DOWN TO AT LEAST 60°F (0°F WHEN INDICATED AS LOW TEMPERATURE ON THE DRAWINGS OR IN AN OPEN WAREHOUSE OR OUTDOORS)
8.6.2.2 BE RATED FOR AN AMBIENT OF AT LEAST 140°F.
8.6.2.3 ELECTRONIC TYPE

8.6.3 HID BALLASTS SHALL:

8.6.3.1 START RELIABLY DOWN TO AT LEAST – 20°F.
8.6.3.2 BE RATED FOR AN AMBIENT OF AT LEAST 131°F.
8.6.3.3 BE POTTED AND ENCASED IN AN OFFICE ENVIRONMENT.
8.6.3.4 HAVE PULSE START TECHNOLOGY.

8.6.4 ELECTRONIC DIMMING BALLAST SHALL:

8.6.4.1 WITHSTAND SURGES AS SPECIFIED IN ANSI C62.41.
8.6.4.2 PREHEAT LAMP CATHODES BEFORE APPLYING ARC VOLTAGE.
8.6.4.3 INTERNALLY LIMIT INRUSH CURRENT TO NOT EXCEED THREE AMPS AT 277 VOLTS OR SEVEN AMPS AT 120 VOLTS.
8.6.4.4 BE UL LISTED AND CLASS P THERMALLY PROTECTED.
8.6.4.5 BE INAUDIBLE IN A 27dB AMBIENT THROUGHOUT THE DIMMING RANGE.
8.6.4.6 ELECTRONIC DIMMING BALLASTS SHALL HAVE A DIMMING RANGE FROM 100% TO 10% ILLUMINANCE LEVEL.
8.6.4.7 ACCEPTABLE BALLAST MANUFACTURES ARE: ADVANCE, MOTOROLA, LUTRON, HONEYWELL AND MAGNETEK.

AS-BUILD

PRELIMINARY NOT FOR CONSTRUCTION
Expires: 09/30/11

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ELECTRICAL SYMBOLS AND SPECIFICATIONS

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

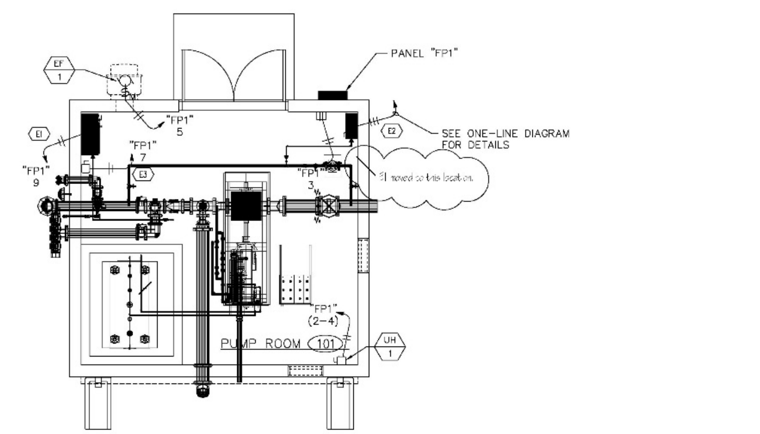
JOB: 1402
DATE: 3/14

SHEET E-01

P:\JOBS\BSI Const Serv\HES Fire Pump House\CDs\A2.1.dwg DATE: 03/06/14 TIME: 10:15

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.



1 POWER 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 INTIGRAL 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 INTIGRAL 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.).

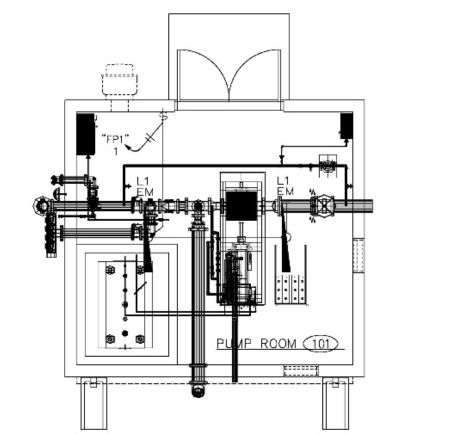
EQUIPMENT INDICATED HERE WHICH IS OWNER PROVIDED SHALL BE LISTED TO THE APPROPRIATE U.L. LISTING FOR THE USE AND BEAR A NAMEPLATE WITH THIS INFORMATION. WHEN REQUIRED, ANY NON-COMPLIANT EQUIPMENT MUST BE MADE COMPLIANT AT THE OWNERS EXPENSE AND IS NOT A PART OF THIS WORK EFFORT.

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

Sheet M2.1 called for 480V / 3 phase. This power was not available. Switched to 220V and (2) #10 Cu., (1) #10 Cu. E.G.

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.



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

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 INTEMIZED 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 B84CG OR EQUAL	550	1	17W T8	BODINE B50 OR EQUAL	1050	1
18W CFL	BODINE B84CG OR EQUAL	650	1	32W T8	BODINE B50 OR EQUAL	1350	1
26W CFL	BODINE B84CG OR EQUAL	700	1	14W T5	BODINE LP600 OR EQUAL	750	1
32W CFL	BODINE B84CG OR EQUAL	900	1	28W T5	BODINE LP600 OR EQUAL	1250	1
42W CFL	BODINE B84CG OR EQUAL	1000	1	54W T5HO	(2)BODINE LP600 OR EQUAL	2500	2

MARK	MANUFACTURER MODEL NUMBER	VOLTS	LAMPS CRI/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

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ELECTRICAL POWER/LIGHTING PLAN

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

JOB: 1402
DATE: 3/14

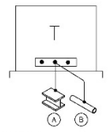
SHEET E-1

TRANSFORMER GROUND DETAIL

GROUND SIZE CHART

	TRANSFORMER SIZE (kVA)	GROUND SIZE (Cu.)
*	7.5kVA	#8
	9kVA	#8
	10kVA	#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 450 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 450 (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% RATED)

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

(F) BUILDING STEEL BOND WIRE (IF REQUIRED PER BUILDING CONSTRUCTION TYPE). 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 LUGS AS INDICATED ON THE ONE-LINE DIAGRAM.

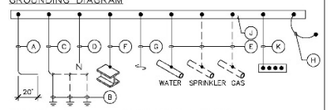
(K) INTERSYSTEM BONDING TERMINATION BAR, W/ MIN. 3 POINTS OF CONNECTION FOR OTHER SYSTEMS. CONDUCTOR SHALL BE MIN. #6 CU., UNLESS SPECIFIED ELSEWHERE.

CONDUCTOR SIZE CHART

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

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. SPLICING 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 E (METALLIC PIPING BOND), F (BUILDING STEEL BOND), AND G (2nd SERVICE BONDING) MUST BE BONDED TOGETHER AND TO THE GROUNDING ELECTRODE SYSTEM WHEN THEY ARE PRESENT.
8. ITEMS, A,C,D AND E (WHEN PRESENT), SHALL EACH BE MADE IN SEPARATE CONDUCTORS AND SUITABLY PROTECTED BY CONDUIT WHERE EXPOSED TO DAMAGE OR THEFT.

NEW PANELBOARD SCHEDULE "FP1"

TYPE:	PANELBOARD	NEMA TYPE:	NEMA 3R
VOLTAGE:	240/120V 1Ø 3W	AFC:	<18k
MOUNTING:	SURFACE	C/B RATING:	FULLY RATED
BUS AMPS:	40	C/B A.I.C.:	10,000
MAIN TYPE:	M.C.B.
FEED THRU:	NO
ISO. GROUND:	NO
SERVICE RATED:	YES

LOAD TAKEN AT 125% ✱ : PROVIDE TIE BAR ⊕ : EXIST. TO REMAIN UNCHANGED □

HANDLE "LOCK-ON" DEVICE ⊖ : CIRCUIT VIA LTE CONTROLS ◇ : EXIST. WITH CHANGED LOAD ○

HANDLE "LOCK-OFF" DEVICE ◑ : EXIST. W/ ALL LOAD REMOVED ◇ : NEW BREAKER WITH NEW LOAD △

R = RECEPTS H = H.V.A.C. E = EQUIP. K = KITCHEN W = MISC. L = CONT. LIGHTING C = CONT. EQUIP.

T	AREA SERVED	C/B	#	A/B	B/#	C/B	T	AREA SERVED
L LIGHTS		20 / 1	11	112		20 / 2	H	HEATER
			13	1500				
R RECEPTACLE		20 / 1	15		180	4 / 2		
			17		1500			
H EXHAUST FAN		20 / 1	19	200	–	8 / 1	–	BUSSED SPACE
E CRANKCASE HEATER		20 / 1	21	–	1000	8 / 1	–	BUSSED SPACE
E FIRE PUMP CONTROLLER		30 / 3	23	1200	–	10 / 1	–	BUSSED SPACE
– SPARE		20 / 1	25	–	–	12 / 1	–	BUSSED SPACE
NON-CONTINUOUS LOAD				2900	2580		2900 VA / 120 V = 24.2 AMPS	
CONTINUOUS LOAD				112	0		112 VA / 120 V = 0.9 AMPS	
CONTINUOUS LOAD @ 25%				28	0		28 VA / 120 V = 0.2 AMPS	
TOTAL LOAD PER PHASE				3040	2580		3040 VA / 120 V = 25.3 AMPS	

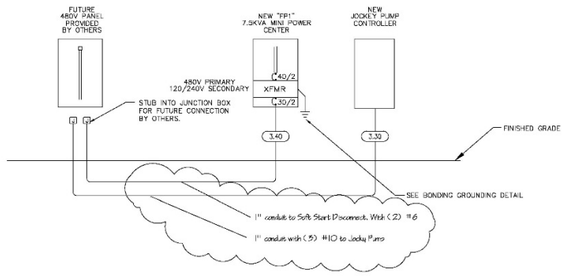
GENERAL NOTES – ONE-LINE

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

TAG	COPPER CONDUCTOR/CONDUIT SCHEDULE NOTE: NOT ALL CONDUCTOR SIZES MAY BE USED.
3.40	(3) #8's Cu., (1) #10 Cu. E.G. – 3/4" C.
3.30	(3) #10's Cu., (1) #10 Cu. E.G. – 3/4" C.



PHILLIPS DESIGN ASSOCIATES, LLC
5420 S. LAKESHORE DR. SUITE 104
TEMPE, ARIZONA 85283
480-897-7145 FAX 480-897-7105architects@pda-az.com

ELECTRICAL
ONE-LINE DIAGRAM
AND PANEL SCHEDULE

HERITAGE ENVIRONMENTAL SERVICES, LLC
7841 S. STORY ROAD
GOODYEAR, ARIZONA 85338

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. emric@hawkinsdg.com

JOB: 1402
DATE: 3/14
SHEET E-2

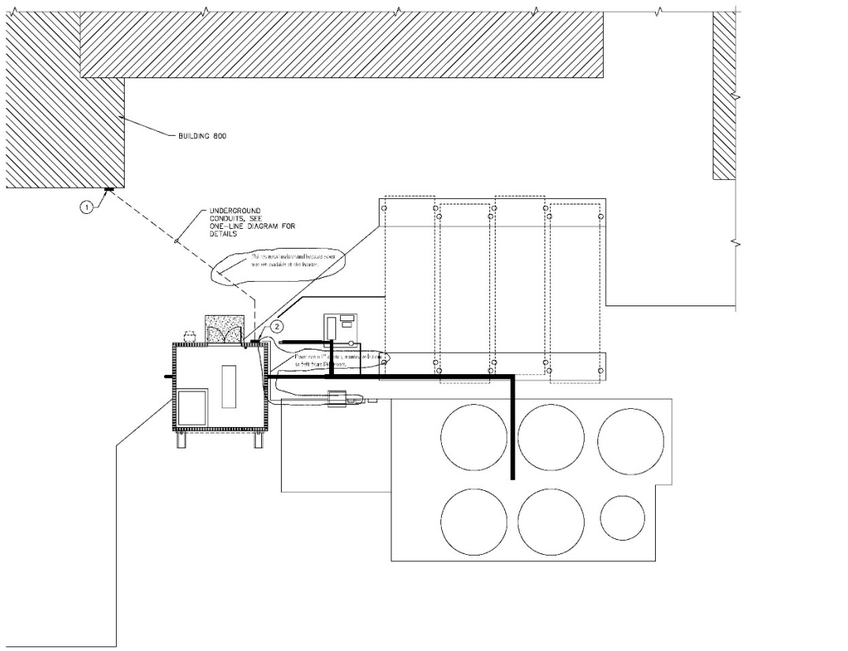
P:\JOBS\JBS Const Serv\HES Fire Pump House\CDs\A21.dwg DATE: 03/06/14 TIME: 13:15

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 480V PANEL TO BE INSTALLED BY OTHERS.
(2) MINI POWER CENTER, "FP1" SEE ONE-LINE DIAGRAM FOR DETAILS.



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

AS-BUILD

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

PRELIMINARY, NOT FOR CONSTRUCTION
Expires: 08/30/11

Project Contact/Designer: KERRY LEONARD
Project #14104
HAWKINS DESIGN GROUP INC.
ELECTRICAL CONSULTING ENGINEERS
7150 South Vineyard Ave, Suite 107
Mesa, Arizona 85212
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5470 S LAKESHORE DR, SUITE 104
480-897-7145 FAX 480-897-7105
TEMPE, ARIZONA 85283
architects@hda-az.com

HERITAGE ENVIRONMENTAL SERVICES, LLC
ELECTRICAL SITE PLAN
281 E STANLEY ROAD
GOODYEAR, ARIZONA 85338

JOB: 1402
DATE: 3/14

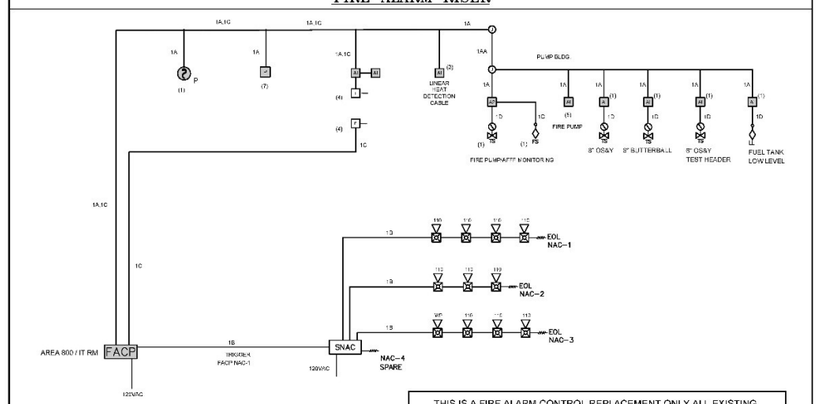
SHEET ES-1

P:\JOBS\08 Const Serv\145 Fire Pump House\CDs\A21.dwg DATE: 03/28/14 TIME: 10:15

AS-BUILT ALARM AND DETECTORS

SHEET SIZE 36X24

FIRE ALARM RISER



THIS IS A FIRE ALARM CONTROL REPLACEMENT ONLY ALL EXISTING NOTIFICATION DEVICES TO REMAIN AS-IS. REPLACE ALL EXISTING INITIATING DEVICES NOT COMPATIBLE WITH NEW FIRE ALARM CONTROL PANEL

FIRE ALARM RISER DIAGRAM (1 FA1)
SCALE: NTS

BATTERY BACK UP CALCULATIONS

FIRELITE MS-9200UDLS Battery Calculation

Regulated Load in Standby

Device Type	Number of Devices		Current (Amps)		Total Current (Amps)
Main Circuit Board	1	x	0.255000	=	0.255000
IPDACT	1	x	0.100000	=	0.100000
LCD-80F	0	x	0.025000	=	
Addressable Devices					
SD355	1	x	0.000300	=	0.000300
I355	0	x	0.000300	=	
MMF-300	22	x	0.000400	=	0.008800
MDF-300	1	x	0.000750	=	0.000750
MMF-301	0	x	0.000375	=	
BG-12LX	7	x	0.000230	=	0.001610
CMF-300	0	x	0.000390	=	
CRF-300	0	x	0.000270	=	
Current Draw from TB3 (nonalarm)			0.000000		
			Total Standby Load		0.371460

Regulated Load in ALARM

Device Type	Number of Devices		Current (Amps)		Total Current (Amps)
Main Circuit Board	1	x	0.325000	=	0.325000
IPDACT	1	x	0.300000	=	0.300000
LCD-80F	0	x	0.064000	=	
ALL Addressable Devices - Maximum draw	1	x	0.400000	=	0.400000
NAC #1	0	x	0.000000	=	
NAC #2	0	x	0.000000	=	
NAC #3	0	x	0.000000	=	
NAC #4	0	x	0.000000	=	
Current Draw from TB3 (nonalarm)			0.000000	=	
			Total Alarm Load		1.036000
			Required Standby Time in Hours (24 or 60 Hrs.)		
Standby Load Current (Amps)	0.371460	x	24	=	8.915 AH
			Required Alarm Time in Hours (5 minutes = 0.084)		
Alarm Load Current (Amps)	1.036000	x	0.084	=	0.087 AH
			Total Current Load		9.002 AH
			Multiply by the Derating Factor	=	x 1.20
			Total Ampere Hours Required		10.802 AH

NOTE: TWO (2) 12V 12AH BATTERIES USED WITH THE FIRE ALARM CONTROL PANEL

THIS IS A FIRE ALARM CONTROL REPLACEMENT ONLY ALL EXISTING NOTIFICATION DEVICES TO REMAIN AS-IS THEREFOR NO VOLTAGE DROP CALCULATIONS HAVE BEEN PROVIDED

FIRE ALARM GENERAL NOTES

THE NEW FIRE ALARM CONTROL PANEL SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE SPECIFIC STANDARDS APPROVED BY THE AUTHORITY HAVING THE JURISDICTION.

ALL EXISTING WIRING SHALL BE UTILIZE TO TIE-IN ALL EXISTING NAC CIRCUITS AND INITIATING CIRCUITS TO THE NEW FIRE ALARM CONTROL PANELS.

ALL EXISTING FIRE ALARM NOTIFICATION DEVICES SHALL REMAIN AS-IS UNLESS NOTED OTHERWISE

REPLACE ANY INITIATING DEVICE NOT COMPATIBLE WITH NEW FIRE ALARM CONTROL PANEL WITH A NEW ADDRESSABLE INITIATING DEVICE (FIELD VERIFY)

PROVIDE/INSTALL MONITOR MODULES TO MONITOR EACH FIRE SPRINKLER WATER FLOW SWITCH ALARM AND TAMPER SWITCH SUPERVISORY.

THE NEW FIRE ALARM EQUIPMENT SHALL BE INSTALLED THAT ACCIDENTAL OPERATION OR FAILURE IS NOT CAUSED BY VIBRATION, JARRING OR TAMPERING.

ALL SPLICES OF WIRE SHALL BE MECHANICALLY CONNECTED TAPED OR INSULATED AND BE FREE OF ANY CONDUIT OR GROUND FAULTS.

A FULL FUNCTION TEST SHALL PERFORMED WITH THE NEW FIRE ALARM DEVICES AND THE EXISTING DEVICES TO ASSURE PROPER OPERATIONS PRIOR TO FINAL INSPECTION WITH THE LOCAL AUTHORITY HAVING JURISDICTION.

ALL EXISTING NAC CIRCUITS SHALL BE TESTED FOR INTEGRITY AND VOLTAGE DROP.

PRIOR TO ANY WORK BEEN STARTED A SET OF APPROVED PLANS SHALL BE KEPT AT THE JOB SITE AT ALL TIMES.

INSTALLING CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE ALL TESTING WITH LOCAL AUTHORITY HAVING JURISDICTION, GENERAL CONTRACTOR, AND ANY ASSOCIATED CONTRACTORS.

WIRE CHART

WIRE SCHEDULE

CODE	DESCRIPTION / FUNCTION	PART #
A	2C#16 TW, JACKETED PAIR, SLC LOOP, MID-CAPACITANCE	BELDEN – 82200L
B	2C#14, HORN/STROBE OR NAC TRIGGER CKT.'S	BELDEN – 82100L
C	2C#16, POWER OR AUX. CONNECTION	BELDEN – 82200L
D	2C#16, MODULE INITIATION CKT.	BELDEN – 82200L
E	2C#18 TW. SH. PR., SYSTEM BUS	BELDEN – 82841
AA	WET LOCATION, 2C#16 TW. JACKETED PAIR, SLC LOOP	WEST PENN – A0225
CC	WET LOCATION, 2C#16, POWER OR AUX. CONNECTION	WEST PENN – A0225
DD	WET LOCATION, 2C#16, MODULE INITIATION CKT.	WEST PENN – A0225
EE	WET LOCATION, 2C#18 TW. SH. PR., SYSTEM BUS	WEST PENN – A0294
	WIRING TO MEET NEC 760 STANDARDS	

FIRE ALARM SYMBOLS

QTY	SYMBOL	DESCRIPTION	MANUFACTURE	MODEL NUMBER
1	FACP	FIRE ALARM CONTROL PANEL	FIRELITE	MS9200UDLS
2		BATTERIES	-	12V 12AH
	FAAP	FIRE ALARM ANNUNCIATOR	FIRELITE	LCD-80F
	SNAC	AUXILIARY POWER BOOSTER	FIRELITE	PCPS-24M6
		BATTERIES	-	12V 12AH
1	S	PHOTOELECTRIC SMOKE DETECTOR	FIRELITE	SD355
7	PS	MANUAL PULL STATION	FIRELITE	BG-12LX
22	M	ADDRESSABLE MONITOR MODULE	FIRELITE	MMF-301
1	M	ADDRESSABLE DUAL MONITOR MODULE	FIRELITE	MDF-300
	WF	WATER FLOW SWITCH CONNECTION	-	-
	TS	TAMPER SWITCH CONNECTION	-	-
	H	WALL MOUNT HORN/STROBE	SYSTEM SENSOR	P2R
	S	BEAM SMOKE DETECTOR	FIRELITE	BEAM1360

QUANTITIES APPLY ONLY TO NEW DEVICES LOCATED IN THE SCOPE OF WORK, NOT ALL SYMBOLS MAY APPLY TO THIS PROJECT (SEE FIRE ALARM RISER)

DEVICE ANNOTATIONS

R - RELOCATE/RE-USE EXISTING FIRE ALARM DEVICE AT NEW LOCATION AS SHOWN
D - DEMO EXISTING FIRE ALARM DEVICE
X - EXISTING FIRE ALARM DEVICE SHALL REMAIN AS-IS UNLESS NOTED OTHERWISE
RP - REPLACE THE EXISTING FIRE ALARM DEVICE UTILIZING EXISTING WIRING LOCATION

SA-00 = NAC CIRCUIT – DEVICE NUMBER | WP = WEATHERPROOF | S-00 = SLC/DC CIRCUIT – DEVICE NUMBER

FACP REPLACEMENT

THIS IS A FIRE ALARM CONTROL PANEL REPLACEMENT ONLY ALL DEVICES ARE EXISTING TO REMAIN AS-IS NO CHANGE. THE FIRE ALARM LAYOUT IS BASED ON THE INFORMATION PROVIDED BY INSTALLING CONTRACTOR TO ARCS DESIGN GROUP

SCOPE OF WORK

THE NEW FIRE ALARM CONTROL REPLACEMENT SHALL CONSIST OF, BUT NOT LIMITED TO THE FOLLOWING:

- A: REPLACE EXISTING FIRE ALARM CONTROL PANEL WITH A FIRELITE MS-9200UDLS FIRE ALARM CONTROL PANEL W/BATTERY BACK UP AND BUILT IN DIGITAL COMMUNICATOR UTILIZING ALL EXISTING WIRING AND FIRE ALARM DEVICES. (MONITORED BY A CENTRALLY LOCATED MONITORING STATION)
- B: PROVIDE/INSTALL MONITOR MODULES TO MONITOR ALL EXISTING WATER FLOW AND TAMPER SWITCHES IN EACH BUILDING.
- C: ALL EXISTING FIRE ALARM STROBES ONLY AND HORN/STROBES TO REMAIN AS-IS
- D: PROVIDE/INSTALL MONITOR MODULES AS NEEDED TO MONITOR THE EXISTING INITIATING CIRCUITS IN THE BUILDING.
- E: PROVIDE/INSTALL DUAL MONITOR MODULE TO MONITOR THE FIRE SPRINKLER WATER FLOW ALARM AND TAMPER SWITCH SUPERVISORY
- F: REPLACE ANY INITIATING DEVICE NOT COMPATIBLE WITH NEW FIRE ALARM CONTROL PANEL WITH A NEW ADDRESSABLE INITIATING DEVICE (FIELD VERIFY)
- G: 120V DEDICATED CIRCUIT TO THE FIRE ALARM CONTROL PANEL, PROVIDED BY OTHERS
- H: TWO (2) PHONE LINES ONE (1) DEDICATED AND ONE (1) SECONDARY BACK LINE LEISURE, PROVIDED BY OTHERS, IF NOT EXISTING
- J: TEST ALL EXISTING NAC CIRCUITS FOR INTEGRITY WITH NEW FIRE ALARM CONTROL PANEL.
- K: A VOLTAGE DROP TEST SHALL BE CONDUCTED IN FIELD FOR ALL EXISTING NAC CIRCUITS.

SEQUENCE OF OPERATION

INPUTS & ACTIONS / OUTPUTS & CONTROLS	FACP TROUBLE CONDITION	BATTERY FAULT	GROUND FAULT	OPEN CIRCUIT	LOSS OF PRIMARY POWER	LOSS OF PRIMARY PHONELINE	SMOKE DETECTOR IN ALARM	REMOTE MANUAL PULL STATION	FIRE SPRINKLER WATER FLOW SWITCH	FIRE SPRINKLER TAMPER SWITCH	FIRE PUMP ALARM	FIRE PUMP RUNNING	FIRE PUMP TROUBLE	FIRE PUMP DISABLED
OPERATE AREA EVACUATION SIGNALS (TEMPORAL CODE 3)							●	●	●					
SOUND LOCAL PIEZO AT FACP	●	●	●	●	●	●	●	●	●	●	●	●	●	●
INDICATE ZONE/DEVICE AT FACP & FAAP							●	●	●	●	●	●	●	●
SEND ALARM SIGNAL TO CENTRAL MONITORING STATION							●	●			●			
SEND TROUBLE SIGNAL TO CENTRAL MONITORING STATION	●	●	●	●	●	●					●		●	●
SEND SUPERVISORY SIGNAL TO CENTRAL MONITORING STATION										●		●		
SEND WATERFLOW SIGNAL TO CENTRAL MONITORING STATION									●					
ILLUMINATE LED ON SMOKE DETECTOR							●							

NOTE: THE SEQUENCE OF OPERATION REFLECTS WHAT IS IN THE SCOPE OF WORK ONLY

APPROVAL STAMP

OFFICE OF THE STATE
FIRE MARSHAL

02/02/2017

Approval is not to be construed as an Approval of any violation of the Arizona Fire Code

Permit 17-549 FA
See Notes On Permit

INSTALLING COMPANY:
NAME: A & J FIRE PROTECTION
ADDRESS: P.O. BOX 82052
PHOENIX, AZ 85071
PHONE: 602-546-7796
AZ ROC: C-16 268804

TYPE OF SYSTEM:
FIRE ALARM SYSTEM
LOCAL PROTECTIVE
OFFSITE MONITORING
DIGITAL ADDRESSABLE
NOTIFICATION CL-A66 "B" WIRING
SLC STYLE "6" WIRING
TEMPORAL SOUNDERS/SYNC STROBES
POWER LIMITED SYSTEM
FREE AIR CABLE

CODES & STANDARDS:
I.B.C. 2012
I.F.C. 2012
I.M.C. 2012
N.E.C. 2011
N.F.P.A. 72 2013

BUILDING OCCUPANCY:
GROUP "B" - LAB TESTING
ORGANICS/RESEARCH
FULLY SPRINKLERED

SQUARE FOOTAGE:
TOTAL: ±18,500 SQ FT

APPROVING AGENCY (S)
NAME: STATE FIRE MARSHAL
ADDRESS: 1110 WEST WASHINGTON RD, SUITE 100
PHOENIX, AZ 85007
PHONE: 602-364-1003

ARCS DESIGN GROUP
ARCSdesigngroup.com
Phone: (623) 225-6005
email: cruz@ARCSdesigngroup.com
"FOR ALL OF YOUR FIRE ALARM DESIGN NEEDS"

No.	Date	Description

Reviews

Installing Contractor
A&J
FIRE PROTECTION
P.O. BOX 82052
PHOENIX, ARIZONA 85071
OFFICE PHONE: (602) 546-7796
ROC# C-16 268804

Reserved for Stamp
ENGINEERING TECHNICIAN
ARTEMIO CRUZ DIETZ
CERTIFICATION # 103885
N.I.C.E.T. III
VALID THRU 10/1/2019
ART CRUZ DIET
X

Project Name and Address
HERITAGE ENVIRONMENTAL SERVICES, LLC
-
284 EAST STOREY RD
COOLIDGE, AZ

Sheet Description
COVER SHEET

Drawn
AC
Job Number
17.004
Date
30, JANUARY 2017
Scale
AS NOTED
Sheet Number
FA1
OF: TWO

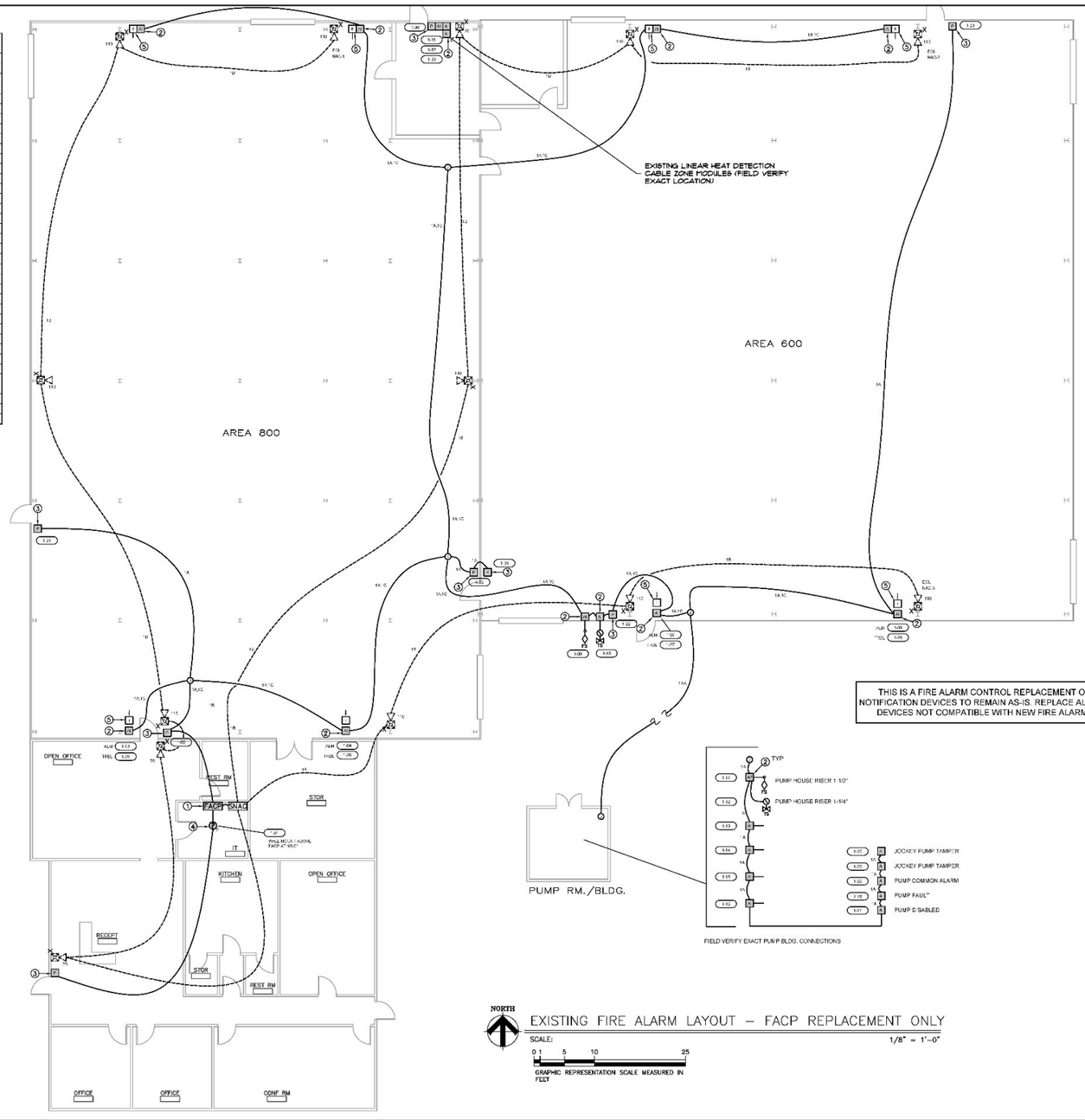
ENGINEER SHALL NOT BE RESPONSIBLE FOR CONTRACTOR'S MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OF CONSTRUCTION, OR THE SAFETY PRECAUTIONS AND PROGRAMS INCIDENT THERETO, AND ENGINEER SHALL NOT BE RESPONSIBLE FOR CONTRACTOR'S FAILURE TO PERFORM THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS

01-30-2017 HERITAGE ENVIRONMENTAL SERVICES, LLC, COOLIDGE AZ AC

SHEET SIZE 36X24

Zones

Zone	Description
1	SMOKE DETECTOR ABOVE FACP
1	600 NORTH Pull
2	600 SOUTH Pull
3	600 WEST Pull
4	800 SOUTH Pull
5	800 EAST Pull
6	800 WEST Pull
7	600 Beam Det Alarm
8	600 Beam Det Trouble
9	600 Beam Det Alarm
10	600 Beam Det Trouble
11	800 Beam Det Alarm
12	800 Beam Det Trouble
13	800 Beam Det alarm
14	800 Beam Det trouble
15	600 FOAM WATERFLOW
16	600 FOAM VALVE OUTSIDE
17	FIRE PUMP DISABLED
18	FIRE PUMP FAULT
19	FIRE PUMP RUNNING
20	FUEL TANK LOW
21	PUMP HOUSE FIRE SPRINKLER
22	PUMP HOUSE SPRINKLER VALVE
23	PUMP HOUSE 8" OS&Y
24	PUMP HOUSE BUTTERBALL VALVE
25	JOCKEY PUMP VALVE EAST
26	JOCKEY PUMP VALVE WEST
27	PUMP HOUSE TEST HEADER
28	FOAM SYSTEM HEADER
30	LOBBY Pull
31	LOADING DOCK - REAR OF BUILDING Pull
32	CANOPY THERMO CABLE
33	TRUCK THERMO CABLE
34	RAIL CAR THERMO CABLE



THIS IS A FIRE ALARM CONTROL REPLACEMENT ONLY ALL EXISTING NOTIFICATION DEVICES TO REMAIN AS-IS. REPLACE ALL EXISTING INITIATING DEVICES NOT COMPATIBLE WITH NEW FIRE ALARM CONTROL PANEL

NORTH

EXISTING FIRE ALARM LAYOUT – FACP REPLACEMENT ONLY

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

0 1 5 10 25

GRAPHIC REPRESENTATION SCALE MEASURED IN FEET

KEY NOTE

1. NEW FIRELITE MS-9200UDLS ADDRESSABLE FIRE ALARM CONTROL PANEL TO REPLACE THE EXISTING
2. REPLACE ALL EXISTING MONITOR MODULES COMPATIBLE WITH NEW FIRE ALARM CONTROL PANEL UTILIZING ALL EXISTING WIRING TYP. (FIELD VERIFY)
3. REPLACE ALL EXISTING FIRE ALARM REMOTE MANUAL PULL STATIONS TO BE COMPATIBLE WITH NEW FIRE ALARM CONTROL PANEL UTILIZING EXISTING WIRING TYP. (FIELD VERIFY EXACT LOCATION AND QTY)
4. REPLACE THE EXISTING FIRE ALARM SMOKE DETECTOR LOCATED ABOVE THE FIRE ALARM CONTROL PANEL TO BE COMPATIBLE WITH THE NEW FIRE ALARM CONTROL PANEL (FIELD VERIFY EXACT LOCATION)
5. EXISTING CONVENTIONAL BEAM SMOKE DETECTORS TO REMAIN AS-IS TIED-IN TO THE NEW FIRE ALARM CONTROL PANEL. PROVIDE A FIRE ALARM MONITOR MODULE IF REQUIRED FOR MONITORING (FIELD VERIFY)

FIELD INSTALL NOTE

TIE-IN NEW ADDRESSABLE MONITOR MODULES TO THE EXISTING SLC CIRCUIT ON FLOOR (FIELD VERIFY)

ALL EXISTING FIRE ALARM DEVICES SHOWN ON THE FIRE ALARM LAYOUT TO REMAIN AS-IS UNLESS NOTED OTHERWISE

WIRE SCHEDULE

CODE	DESCRIPTION / FUNCTION	PART #
A	2Cg16 TW, JACKETED PAIR, SLC LOOP, MID-CAPACITANCE	BELDEN – 6220UL
B	2Cg14, HORN/STROBE OR NAC TRIGGER CKT.'S	BELDEN – 6120UL
C	2Cg16, POWER OR AUX. CONNECTION	BELDEN – 6220UL
D	2Cg16, MODULE INITIATION CKT.	BELDEN – 6220UL
E	2Cg16 TW, SH. PR., SYSTEM BUS	BELDEN – 82841
AA	WET LOCATION, 2Cg16 TW, JACKETED PAIR, SLC LOOP	WEST PENN – AQ223
CC	WET LOCATION, 2Cg16, POWER OR AUX. CONNECTION	WEST PENN – AQ225
DD	WET LOCATION, 2Cg16, MODULE INITIATION CKT.	WEST PENN – AQ225
EE	WET LOCATION, 2Cg16 TW, SH. PR., SYSTEM BUS	WEST PENN – AQ294
WIRING TO MEET NEC 760 STANDARDS		

USE UNSHIELDED WIRE UNLESS OTHERWISE NOTED.
ALL SHIELDS MUST BE TOO "THROUGH, SOLATED, AND TERMINATED IF USED.

PART NUMBERS SHOWN ARE FOR PLENUM RATED CABLING. IF IN CONDUIT OR IF NON-PLENUM 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 COULD RESULT IN OVERLOAD OR FAILURE OF CIRCUIT.

ARCS DESIGN GROUP
ARCSdesigngroup.com
Phone: (623) 225-6005
email: cruza@ARCSdesigngroup.com
"FOR ALL OF YOUR FIRE ALARM DESIGN NEEDS"

No. | Date | Description — Revisions

Installing Contractor

A&J
FIRE PROTECTION
P.O. BOX 850082
YUKON, OK 73085-0071
OFFICE PHONE: (800) 548-7796
ROC# C-16 258854

Reserved for Stamp

ENGINEERING TECHNICIAN
FIRE ALARM SYSTEMS
CERTIFICATION # 103985
N.I.C.E.T. III
VALID THRU 10/1/2019
ART CRUZ CET

Project Name and Address

HERITAGE ENVIRONMENTAL SERVICES, LLC
-
284 EAST STOREY RD
COOLIDGE, AZ

Sheet Description: EXISTING FIRE ALARM LAYOUT - FACP REPLACEMENT ONLY

Drawn: AC
Job Number: 17-004
Date: 30, JANUARY 2017
Scale: AS NOTED
Sheet Number: FA-2
OF: TWO

ENGINEER SHALL NOT BE RESPONSIBLE FOR CONTRACTOR'S MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES OF CONSTRUCTION, OR THE SAFETY PRECAUTIONS AND PROGRAMS INCIDENT THERTO, AND ENGINEER SHALL NOT BE RESPONSIBLE FOR CONTRACTOR'S FAILURE TO PERFORM THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS

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