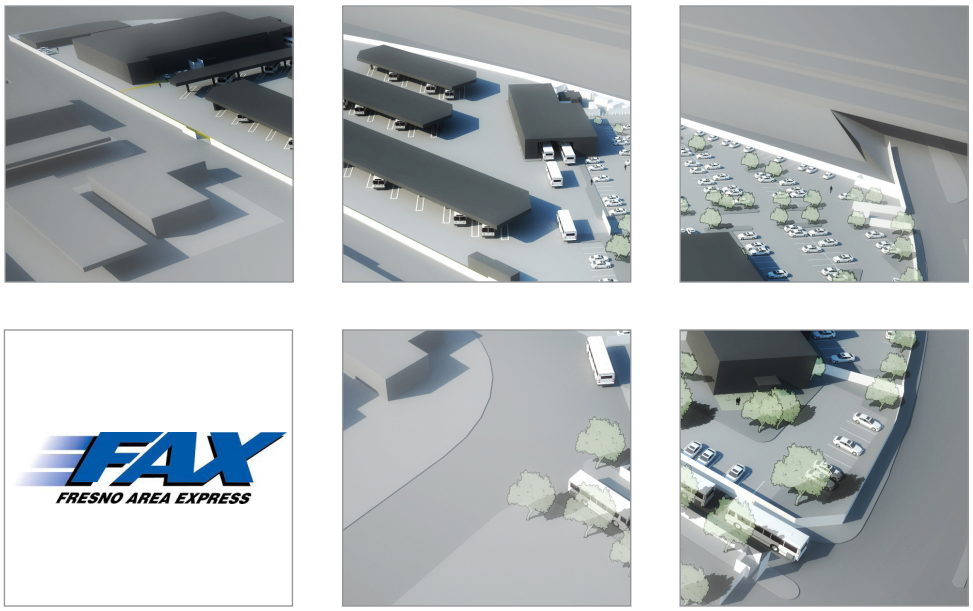


MASTER PLAN REPORT

FAX Transit Operations & Maintenance Facility
Fresno FAX
Fresno, California

November 21, 2014

Maintenance Design Group

Section One - Project Overview

Section Two - Needs Assessment

Section Three - Space Needs Program

Section Four - Master Plan Concepts

Section Five - Facility Master Plan

Section Six - Probable Construction Costs

Section Seven - Implementation Plan

Appendices

Section One
Project Overview

Introduction

Fresno Area Express (FAX) Transit Operations and Maintenance Facility provides bus transit services to the citizens of Fresno County and the surrounding areas and communities. Fresno FAX is organized into single bus operation and maintenance facility with a single transfer facility (Manchester) to provide necessary bus services within the Fresno Metropolitan area. Fresno FAX Transit Operations and Maintenance Facility (OMF) is located at 2223 G Street, Fresno, California, on the northwest side of downtown Fresno. The Manchester transfer center is located at 1901 E Shields Avenue, Fresno, CA. Refer to Figure 1.A below for the Fresno FAX Vicinity Map.

Figure 1.A - Fresno FAX Vicinity Map

Purpose of this Report

The purpose of this report is to document the programmatic requirements and assess the facility conditions in order to develop recommended action to deferred improvements of the current and future Fresno FAX operations, and propose a facility and building master plans for Fresno FAX. The information shall also be used as a general basis for design for the new and renovated buildings and the surrounding support areas. This document is generally intended for internal Fresno FAX use, coordination, and budget development efforts to evaluate and confirm ultimate facility size and operational capacity. This document may also be used by

future design teams that will produce the final design and engineering of the remodeled facility and site.

Ultimately, Fresno FAX will acquire Architectural and Engineering services to update the administration/operations building, maintenance facility, fuel and wash and add a public amenities building to accommodate at least 111 standard buses and future articulating buses for a 115 bus operations plan.

The Fresno FAX OMF will include components to accommodate the following functions:

- Reconfigure employee parking areas to one centralized area per new site plan layout (Section 5, Figure 5.A)
- Admin/Operations Building (Existing to be renovated, Note: Alternate for new building)
  - ✓ Administrative office and support areas for Admin. staff
  - ✓ Administrative office areas for Operations staff
  - ✓ Bus Operator support areas (Day Room, Lockers, Restrooms, Dispatch, Training Room, etc.)
- Maintenance Building (Existing to be renovated)
  - ✓ New Chassis Wash Bay Addition
  - ✓ Existing Service Bay Addition
  - ✓ Bus Maintenance offices and Mechanic support areas
  - ✓ Bus Maintenance shops and support areas
  - ✓ New Paint Booth
  - ✓ New high density parts storage area
  - ✓ New Elevator
- Fuel and Clean building(s) (Existing to be renovated)
  - ✓ New Bus Washers (2)
  - ✓ New office and support areas
  - ✓ New Vaulting Area Addition
  - ✓ New Vacuum Room Addition
  - ✓ Renovated Restroom, Lockers, Shower
  - ✓ CNG Bus Fueling Facility Upgrades (by Fresno FAX)
  - ✓ Fuel & Vacuum (2)
- Bus parking areas for 115 standard buses.

The goal of the Renovation Master Plan is to determine the best possible layout and location for the necessary functional elements to support the Fresno FAX operation. Additionally, a goal of the Planning Team is to develop a comprehensive facility that takes advantage of the available property, resources, and existing components, while including all necessary elements of efficient bus operations and maintenance functions, utilizing creative design solutions. By achieving these goals, the resulting Probable Construction Cost will provide a phased cost implementation plan that will be a realistic basis for future funding of the proposed Master Plan improvements.

The Master Plan and Conceptual Layouts will provide accommodation for the existing maintenance, administration/operations and fuel wash buildings. The plan will update the existing facility to a fully functional facility on the existing site that will function for many years after construction.

No exterior modifications have been made to the existing structures. Any adjacent structures proposed in this report will be consistent and sympathetic to the nature of existing structures.

Planning Team

Fresno FAX has selected and contracted with a Planning Team led by Maintenance Design Group (MDG) (*Denver, Colorado, Pasadena, California, Baltimore, Maryland,* and *Houston, Texas*) to provide comprehensive master planning design services for this facility. The Team also includes RNL Design (*Los Angeles, California* and *Denver, Colorado*), Arup (*Los Angeles, California and San Francisco, California*), Provost & Pritchard (*Fresno, California*), Fuel Solutions (*Los Angeles, California*) and Jacobus & Yuang, Inc. (*Camarillo, California*) The planning team consists of Facility Planners and Designers, Architects, Structural, Civil, Mechanical and Electrical Engineers, Landscape Architects and Cost Estimators.

As a part of the planning process, this Master Plan Report is developed to document assumptions, the planning theory, planning ratios, space needs, and other technical data pertaining specifically to the unique functions required at the Fresno FAX facility.

The most successful Master Plan projects begin with gaining the understanding of the functions or operations to be performed within the facility.

Methodology

The most successful Master Plan projects begin with gaining an understanding of the functions or operations to be performed within the facility. Therefore, the Planning Team began this project with data collection, observations, and interviews with staff related to the transit operations and bus maintenance. This approach provided the Planning Team with valuable insight and direction that otherwise may not have been collected using less interactive programming methods.

The Planning Team's involvement in several other bus operations and maintenance facilities efforts, the Planning Team utilized this background to draw upon this experience in an effort to benefit and streamline the programming and planning processes. MDG used both extrapolated data from the Fresno FAX baseline program and data from other facility Master Plans, previously completed, to compare and establish the Fresno FAX Space Needs Program.

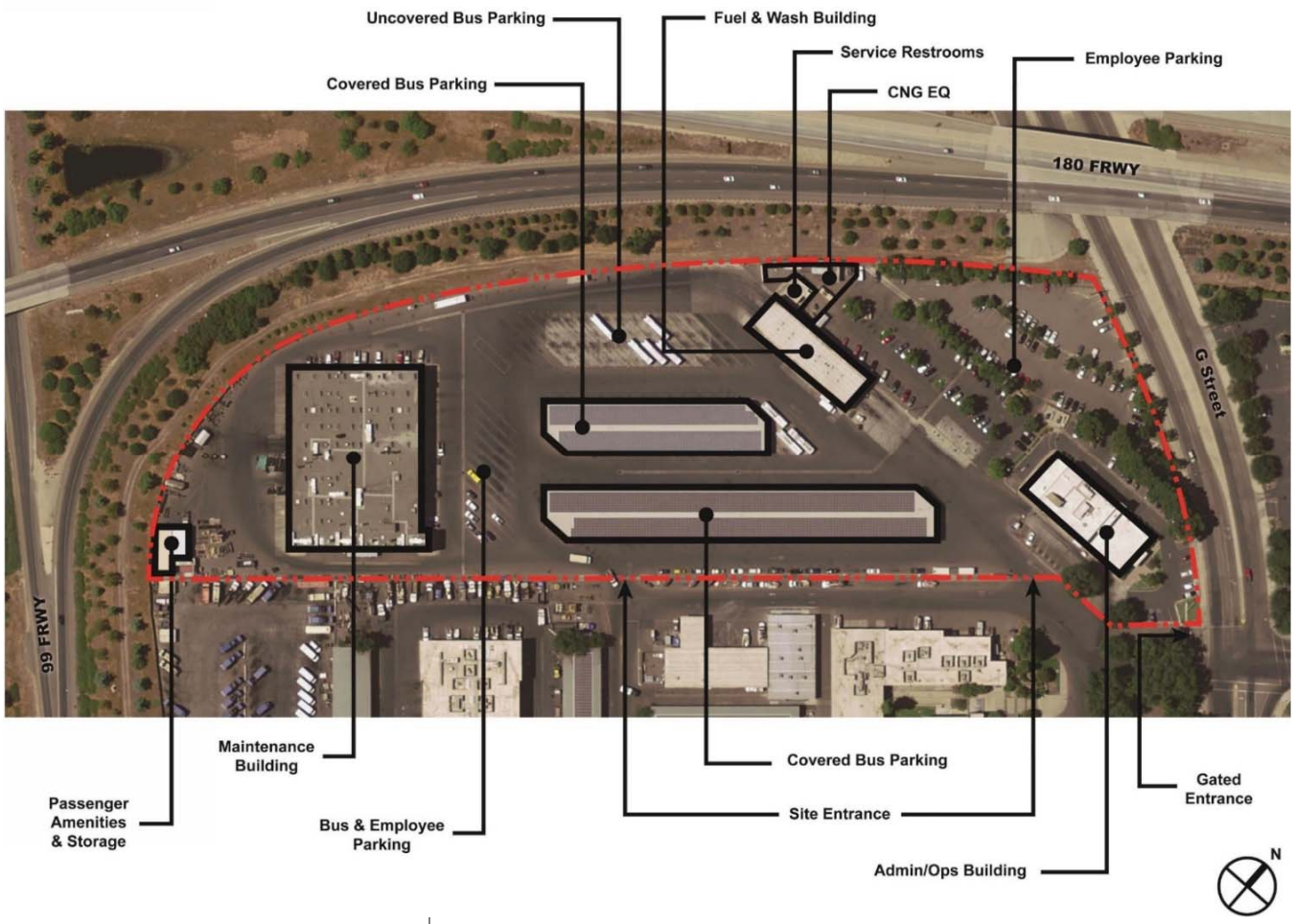
Existing Facility

The renovations of the facility are to take place on the existing site, and will utilize the existing buildings. From a planning standpoint, the current layout of the site has some inefficiencies, and a renovated facility will help with current deficiencies of every day operations. The most impactful deficiency is the fare vaulting operation which creates a "bottle neck" at the current vaulting location at the administration building that restricts bus ingress into the site and limits the fare vaulting to a single lane.

Fresno FAX currently provides public fueling within the interior of the current site which presents a major safety concern for both Fresno FAX personnel and public users of the existing fueling dispensers.

The following Aerial Image Figure 1.B illustrates the existing Fresno FAX Fresno FAX property.

Figure 1.B - Aerial Image of Current Fresno FAX Site



Report Overview

This Renovation Master Plan Report prepared by the Planning Team consists of seven sections. The following is a brief description of the contents of each section.

Section One - Project Overview

Describes the background of the project and gives an overview of the complete report.

Section Two - Needs Assessment

Provides detailed assessment and documentation on existing conditions throughout the facility for the viewpoint of Civil,

Architectural, Structural, Mechanical, Electrical, Plumbing, and functional engineering disciplines.

Section Three - Space Needs Program

Presents a detailed listing of space requirements for functional and supportive spaces. The intent of the program is to catalog spaces required to fulfill future needs. Programmed spaces are furthered defined in their quantity, area special requirements and any remarks significant to design.

Section Four - Master Plan Concepts

Presents the Conceptual Plans developed for Fresno FAX during the on-site planning Charrette session held July 23-24, 2014 and sequential plan refinement exercise.

Section Five - Facility Master Plan

Presents the final facility master plan and building layouts developed through the Charrette and sequential plan refinement exercise.

Section Six - Probable Construction Costs

Presents the estimated costs of the proposed modifications and construction outlined in the Master Plan Conceptual Layout Plans and Design Criteria presented in Chapters Four.

Section Seven - Implementation Plan

Presents the phased construction and sequencing of renovation activities for the Master Plan including a task duration schedule and floor plans of the existing buildings.

Appendices

Appendix A - Existing Maintenance Service Equipment Photo Inventory & Assessment

Appendix B - Space Needs Program

Appendix C - Participants Involved in Review Sessions

Appendix D - Conceptual Design Opinion of Cost

Appendix E - Master Plan Electrical Report

Appendix F - Master Plan Lighting Report

Section Two
Needs Assessment

Introduction

During the months of June and July of 2014, the planning team visited the FAX facility numerous times. During these visits, the team investigated the site for their respective design disciplines, to assess existing conditions and note observations and deficiencies. Part of that assessment involved questioning key FAX Administration, Operation, and Maintenance and Service staff and FAX users of specific equipment. Further, the assessment involved a detailed study of the existing facility Record Drawings that were provided by FAX. The needs assessment is based on the professional opinion and current code knowledge held by the planning team's engineers, architects and facility planners.

The Needs Assessment is valuable documentation in that it provides evidence and background information towards many of the recommendations of the Master Plan and Opinion of Probable Costs.

The Needs Assessment is valuable documentation in that it provides evidence and background information towards many of the recommendations of the Master Plan and Opinion of Probable Costs. In addition, the Needs Assessment provides a starting point for information gathering for the future design phase of the project.

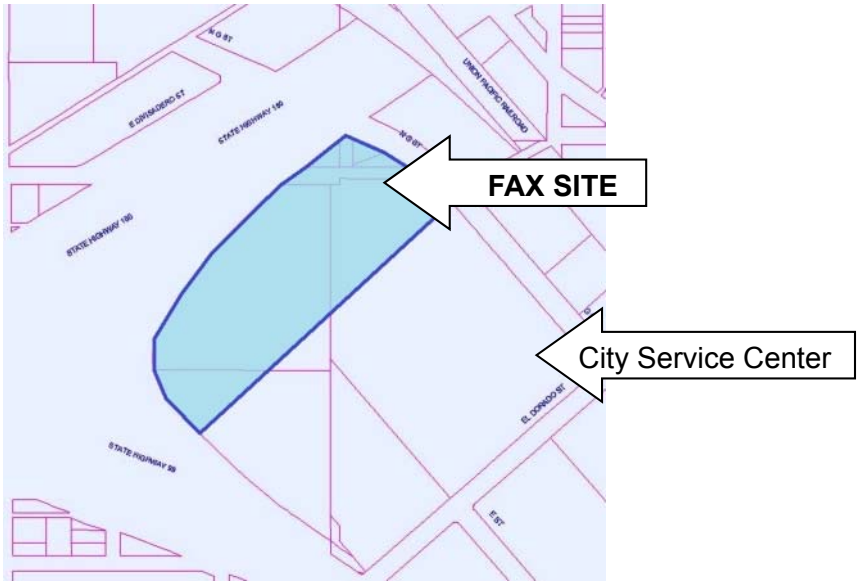
The following will document Civil/Site, Architectural, Structural, building systems, and vehicle maintenance and service equipment. The following are the planning team's findings.

Civil Assessment

Facility Location

The FAX Operations and Maintenance Yard lies on several parcels of land including abandoned streets, see Figure 2.A. The facility occupies the northerly portion of an area of land bounded on the northeast by G Street, the southeast by El Dorado Street, the southwest by Highway 99 and the northwest by Highway 180.

Figure 2.A - FAX Site



To the south of the FAX Operations and Maintenance Facility is the City of Fresno's Municipal Service Center. Both facilities are gated and outside of the public right of way.

G Street is the only street adjacent to the FAX facility.

Off-site Streets - G Street

Sidewalk at G Street

- Good condition, even surface free of cracks or abrupt changes in level
- Black wrought iron fencing recently installed along the entirety of the FAX Operations and Maintenance Facility frontage at the back of walk

New Left Turn Pocket in G Street Median

- Left turn pocket recently constructed within the median of G Street to allow for left turn off northbound G Street for future entrance into FAX employee parking lot
- Visual Observations and City records indicate that G Street is in good to very good condition

On-Site Pavement Condition

Asphalt concrete and Portland Cement Concrete (PCC) are the two primary paving surfaces on-site at the FAX Operations and Maintenance Yard. Asphalt concrete throughout the site is in fair to poor condition. Pavement adjacent to drainage facilities showed moderate to severe levels of distress. The majority of PCC pavement is located in the bus parking areas, to the rear of the Maintenance Building, adjacent to the Bus Wash Facility, and on the south side of the Administration Building. With the exception of minor wear at the surface, the condition of the PCC pavement is fair to good and is minimally distressed.

Pavement Markings

Pavement striping and markings are faded but still visible on the majority of the site. We recommend refreshing these markings at the time of routine pavement maintenance.

Pavement Around Bus Parking

The Southerly Drive Aisle

- Asphalt pavement displays evidence of thermal cracking, and early stages of fatigue cracking

- Some small localized areas of pavement spalling

Drive aisle between covered middle and southerly parking bays

- Asphalt severely distressed with fatigue cracking extending the length of the concrete ribbon gutter
- Cracking is most severe near the gutter and reduces with distance. Width of cracking is approximately 13 feet to north and 10 feet to south of gutter

Drive aisle between northerly (uncovered) and middle (covered) parking bays

- Asphalt displaying signs of fatigue cracking and structural failure of pavement

Drive aisle between northerly fence and uncovered bus parking

- Asphalt severely distressed with fatigue cracking extending the length of the concrete ribbon gutter
- Cracking is most severe near the gutter and reduces with distance. Width of cracking is approximately 6 feet to north and 10 feet to south of gutter
- Areas of pavement spalling observed

Drive aisle south of parking bays and around Maintenance Building parking

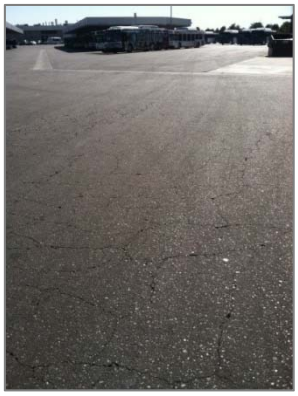
- Asphalt in generally good condition

Drive aisle to northwest of Maintenance Building

- Asphalt is weathered with minor cracking
- Concrete ribbon gutter is severely cracked which may lead to water intrusion in the asphalt pavement, thus reducing the lifespan of the asphalt pavement

Drive aisle between parking bays and bus wash facility

- Asphalt surface displays moderate levels of fatigue cracking



Drive aisle at primary bus exit

- Asphalt in generally good condition

Exit Lane at Divisadero Street

- Use of the fire hydrant to fill City vehicles has led to water consistently running over the asphalt pavement which has damaged the integrity of the pavement

- Evidence of several attempts at crack sealing in the area

Main Employee Parking (southerly)

- Asphalt in generally good condition becoming progressively more distressed with increased proximity to drainage devices (ribbon gutters or inlets)

Main Employee Parking (northerly)

- Asphalt is weathered and raveling with exposed aggregate

Portland Cement Concrete (PCC) Pavement

- Most of the PCC pavement on the facility is in good condition, including the bus parking bays

- The photo to right is of the concrete pavement to the west of the bus wash facility

Concrete Curbs

- Most of the concrete curbs and/or gutters are in good condition
- One location near the exit of the bus wash has been significantly scarred, but this is a purely aesthetic issue

Pavement Behind Maintenance Building

Asphalt Pavement

- Weathered and poorly maintained
- Pavement distress ranges from thermal cracking to areas of fatigue cracking

- Aggregate becoming exposed in some areas

Portland Cement Concrete (PCC) Pavement adjacent to building

- Severe transverse cracking at areas of high stress

- Severe longitudinal cracking across length of roll-up doors
- Some pavement beginning to spall along the crack(s)

Pavement Around Administration Building

Asphalt Pavement

- Pavement in parking bays and straight drive aisles is generally in good condition, with more cracking at the northwest and northeast corners of the building
- Very long, deep, and wide cracks around northeast corner of building. This will lead to moisture intrusion and rapid decline of pavement strength

Portland Cement Concrete (PCC) Pavement

- Along the southerly side of the building.
- Pavement is worn with cracking and spalling occurring at joints

Concrete Curbs

- Most of the curbs are in good condition
- On the south side of the building, the curb is chipped in several locations; but this is a purely aesthetic issue

- One location adjacent to a tree at the northeast corner of the parking bay on the north side of the building is uplifting due to the tree roots
- Asphalt paving is lifted, but not yet cracking

- One location adjacent to a tree at the southeast corner of the parking bay on the south side of the building is uplifting due to the tree roots

Concrete Picnic Area

- Good condition, surface is free of cracks or abrupt changes in level
- Ramp leading to picnic area is convenient, but it does not comply with current accessible codes for curb ramp as it lacks detectable warning surface and the slope of the wings exceeds 10 percent; additionally, there is no connection to a pedestrian path of travel

Accessible "ADA" Parking

East Side of Administration Building

- Four stalls are marked with signage and the international symbol of accessibility on the pavement
- Stalls are non-compliant due to:
  - ✓ Lack of access aisle for two stalls at far left;
  - ✓ Lack of connection to accessible path of travel
  - ✓ Second space from right should be designated "van accessible"

West Side of Administration Building

- Three stalls are marked with signage and the international symbol of accessibility on the pavement
- Stalls are non-compliant due to:
  - ✓ Lack of access aisle
  - ✓ Lack of connection to accessible path of travel
  - ✓ Less than required 18 foot length
  - ✓ Must have at least one van accessible space

Facility Fencing

Perimeter Fence along G Street

- Black wrought iron fencing
- New and in great condition

Perimeter Fence along Highway 99 and 180

- Chain link fencing and barbed wire, with and without mesh screening
- Generally good condition
- One bent post observed near bus wash facility

Fencing between FAX and City's Yard

- Chain link fencing without barbed wire
- Generally good condition
- One bent post observed, assumed to be the result of a City vehicle overhang

Site Drainage

On-site drainage generally sheet flows to concrete ribbon gutters and standard curb and gutters. These convey the runoff to grated drop inlets or side opening catch basins. Collected stormwater from the site is conveyed through several underground pipe systems that discharge into the public storm drain located in G Street or discharged into the storm drain system located within the City yard to the southeast. The City yard on-site storm drain system flows to the public drain systems in G Street and El Dorado Street.

Catch basins and grated drain inlets were observed to be in working order. Minor maintenance to clear out debris is recommended. A few manholes that are believed to be storm drain

manholes have lids marked sewer. To avoid confusion, these lids should be replaced with ones that are properly marked.

Ponding near exit to Divisadero Street

- Regular, possibly daily, use of the fire hydrant to fill City vehicles was observed. Water spilling from this activity drains across the asphalt, damaging the pavement and creating a regular pond of standing water within a depression in the concrete gutter

Drain Inlet near Main Employee Parking

- Acceptable condition of gutter and inlet; adjacent asphalt shows signs of distress possibly due to water overwhelming drainage facilities

Concrete Ribbon Gutters and Grated Inlets

- Concrete gutters are in acceptable condition and inlets are free of debris; signs of failure of adjacent asphalt pavement is indication that drainage facilities are undersized or not functioning as desired; asphalt pavement failure near gutters was observed in bus and employee parking areas

Site Utilities

Potable Water/Backflow Preventer

- Acceptable Condition

Natural Gas

- Acceptable condition

Fire Hydrants

- One hydrant is in the rear of the site behind the Maintenance Building; another is near the northwest corner of the Maintenance Building; both are older models, but appear to be in acceptable condition (hydrants untested)
- The hydrant used to fill the City vehicles near the Divisadero Street exit is not located on the FAX site

Architectural Assessment

Administration and Operations Building

Exterior

General


South Elevation

- Building exterior is generally in good condition and does not show any significant signs of deterioration.
- Exterior north/south walls are single-wythe; fluted concrete masonry block (CMU) and east/west walls are embossed porcelain enamel panels with cement plaster clad fascia at the upper roof.
  - ✓ Existing drawings indicate exterior walls have R-11 batt insulation within metal stud framing.
  - ✓ E.P.E. panels may have cement asbestos board substrate. Further investigation into panel composition will be required to determine if panels pose an environmental hazard.


North Elevation

- Windows and storefronts consist of dual-pane glazing in aluminum frames. Openings are generally in good condition.
  - ✓ Operable windows appear to be in good condition, but functionality and hardware of each window was not assessed.
- Exterior envelope of the building may likely not meet current CAL-Green code required insulation values for exterior insulation.
- Exterior doors have push button door operators. Door operators were functioning at time of assessment, but do not meet current code requirements. New door operators are required to be at both high and low positions.

Main Entry (from South/East)

Roof

- White membrane roofing does not appear to be original to the building. Roofing is generally in good condition with no apparent leaks.
  - ✓ Existing drawings indicate built-up roofing over lightweight insulating concrete. R-value of concrete is unknown.
  - ✓ Membrane roofing, textured walking pads are in fair condition and are causing debris accumulation in some areas.
- Roof drains have minor but typical debris accumulation around most drains.
- Mechanical equipment does not have screening around it.
- Roof is accessible from west stair.
- See Mechanical and Plumbing assessments for comments on rooftop equipment.

Roof Membrane & Walking Pads

HVAC Equipment

Exterior Spaces

- Entry space on east end of building is in fair condition. Significant weathering from landscape irrigation is visible on the face of the building adjacent to the entry way

Main Entry (from northeast)

- Barbeque grill and patio space north of the building is in fair condition but does not have direct access from Admin/Ops Building and therefore appears to not be in regular use.

Admin Building Patio

- Bus shelter and miscellaneous furniture located on the curb southwest of the building is used as a smoking area. Location of on traffic island does not appear to meet, or be appropriate for, the need for a designated smoking area for bus operators.

Smoking Patio

- Ice machine located adjacent to southwest entry door is located under bus shelter. Ice machine is not rated for exterior location and should be relocated inside or under more adequate cover.

Exterior Ice Machine

- Fare vaults are located under a canopy that is not original to the building. Date of canopy addition is unknown. Canopy does not appear to be providing sufficient cover for vaulting function and tarp has been hung on west side.

Fare Vaults

- Utility yard to the northwest only has chain-link fence around mechanical equipment. Screening should be provided around visible exterior equipment.

Chiller Plant for Admin

Interior

Stairs

- Interior stairs consist of concrete filled metal pan treads with bent metal risers. Rise of all interior stairs is approximately 7-1/4 inches. Current code maximum is seven inches for interior stairs.
- Handrails do not have code required handrail extensions at top and bottom of stairs. Top of stair should have 12-inch handrail extension past top riser and bottom of stair should have extension of 11 inches plus tread depth.
- Stairs also do not have code required contrasting stripes at top and bottom treads of each stair run.

Typical Bottom of Stair & Handrail

Elevator

- Elevator is not original to the building; date of elevator addition is unknown.

- Elevator appears to meet current Code requirements for elevator access and usage.
- Location of elevator is not obvious and accessible path through second floor corridor/storage room is awkward.
- Elevator equipment room is accessed from the exterior and was not assessed.

Elevator Cab

Interior Finishes and Furniture

- Interior finishes are generally in good condition unless noted otherwise.
- Floor finishes are in fair condition and are generally worn and past typical lifespan. Rubber wall base is missing or damaged in various locations.
- Hollow metal, painted door jambs are worn and in need of repainting.
- Furniture is generally mismatched and inconsistent between spaces. Furniture systems also appear to provide insufficient storage in most areas.

Typical Floor & Door Jambs

Main Building Entrance

Reception - 111, Lobby Entry - 152, Offices - 147 & 154

- Transaction counter is 42 inches tall. Current code requires minimum of 36 inches of counter length to be maximum of 34 inches high. Millwork is otherwise in fair condition.
- Only one of the two offices appeared to be in use.

Reception Counter

Administration and Planning Offices

134, 135, 146, 148, 149, 151, & 153

- Offices are generally in good condition. See general comments elsewhere for additional information.

Admin Manager Office - 135

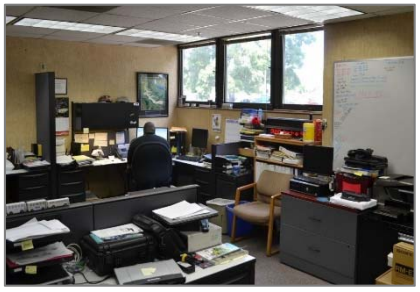
Conference Room - 140

- Room has conference table and chairs for 12 persons.
- Room is generally in good condition, but has exposed data cable covers and miscellaneous furniture that appears unnecessary. Furniture is mismatched and not typical commercial grade.
- Room also does not have projector or projection screen, but has large screen monitor on west wall.

Conference Room

IT Office - 123 & IT Room - 129

- Rooms are in good condition. Floor finishes are in poor condition and IT Room is missing a threshold.



IT Office - 123

- IT office has four workstations and other miscellaneous furniture. IT function appears to lack sufficient storage for IT equipment. Portion of storage issue could be solved with more efficient furniture, but additional storage room appears to be necessary for IT.
- Tele/Data equipment appears to be relatively new, but functionality of equipment was not assessed.
- IT Room has card reader access control.
- Electrical Room - 210 also contains some IT equipment that may be in conflict with electrical equipment clearances.

IT Room

Operations Office - 122 & Operations Manager - 126

- Shared operations office has five workstations of various sizes. Furniture is mismatched and appears to be an inefficient use of space.
- Carpet is in poor condition and walls show numerous holes from prior furniture anchorage.
- Operations Manager Office is oversized compared to other administrative offices.
- Room contains excessive file storage and insufficient storage furniture.
- Room also has window in Fare Counting Room - 131.

Operations Office -122

Operations Manager Office

Supervisor's and Scheduling Offices - 127

- Shared office space is insufficient for current number of workstations and lacks space for file storage. Room is divided by partial height furniture partition separating the two

Scheduling workstations from the five Supervisors workstations.

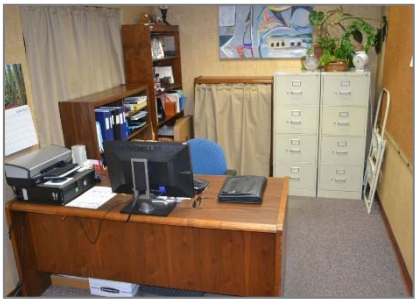
- Furniture is in fair condition but is mismatched.
- Carpet is in poor condition. Other finishes are in good condition.

Supervisor Workstation

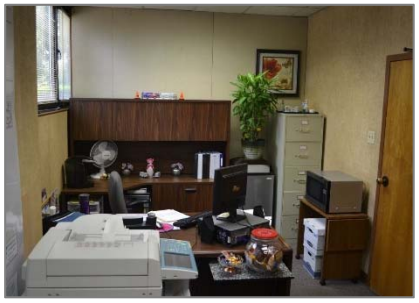
Scheduling Workstation

Community Coordinator - 114 & Transit Supervisor - 117

- Room was originally built as two separate offices (Instructor Office - 114 and Handi-Ride Office - 117), but demising wall was removed. Date unknown.
- Window from Operators Room into Room 114 has been covered by bulletin board in Operators Room and curtain in 114.
- In various location, the wall covering was removed and patched with cork material.



Community Coordinator Workstation



Transit Supervisor Workstation

Fare Counting - 131 & Vault - 130

- Room is too small for fare counting functions. Sorting equipment must be moved into place during use.
- Rooms are in poor condition, finishes are very worn and past typical lifespan.
- Doors in room do not have proper code clearances.
- Lighting is inadequate for detailed work done in this room.
- Hollow metal framed window into Operations Manager office may not provide proper acoustic separation between rooms.

Workstation & Sorting Equipment

Dispatch

Radio Dispatch - 118, Copy/File - 119, Dispatch Counter - 120, & Chief Dispatcher - 121

- Dispatch has poor visibility of main entry/exit for Operators.
- Dispatch counter and under-counter cabinets are original to building and are in poor condition.
- Transaction counter is 42 inches tall. Current Code requires minimum of 36 inches of counter length to be maximum of 34 inches high.
- Portion of dispatch counter and window has been replaced with mail slots (date unknown).
- Furniture, storage shelving, etc. is mismatched and inefficient use of space. Miscellaneous storage and cabinetry in space does not appear to be providing adequate functionality for dispatch operations.

Counter (from Dispatch Side)

Counter (from Operators Side)

- Radio Dispatch room appears to be too small for radio dispatch function. Workstations are too small for the size of monitors and hardware required for function.

Radio Dispatch

- Radio Dispatch space is not original to the building and was originally a file storage room. Room was extended into Dispatch room, reducing the functional area of the room.
- Adjacent Copy and File area appears adequately sized, but furniture is outdated and mismatched.

Copy & File Area

- Chief Dispatcher office is sufficiently sized but appeared to be currently unused.

Chief Dispatcher Office

Operators Room -115 & TV Alcove -116

- Room is small for the number of Operators observed at the facility during peak times. Room was very loud which would pose a difficult space to do required paperwork.
- The orientation of the TV Alcove adds to noise in the Operators Room and at the Dispatch counter. Sound source

should generally be located such that the noise is directed away from Dispatch.

- Counter and cabinets are in fair condition. Counter is used sufficiently, but half of the doors on lower cabinet storage have been removed which adds to visual clutter within the room.
- Operators do not have access to sink or kitchenette, but have coffee makers and microwaves in the room.
- Bulletin boards are inconsistent and only two are lockable.
- Space is also used for distribution and storage of route schedules, pamphlets, etc. further reducing usable space.
- Furniture is in fair condition.

Operators Room with Report Counter

TV Alcove

Operators Locker Room - 101

- Locker room shared between men and women. Room has a total of 190 full size lockers (60 inches tall by 15 inches deep by 12 inches wide) . Lockers have sloped tops with the exception of the row of lockers under the north windows.

Operator's Lockers

- Lockers are larger than typically used for Operators. Half-size lockers are generally sufficient.
- Lockers are generally in good condition with some minor damage to a few lockers.

Operators Lounge - Second Floor

- Space is adequate for Operators lounge, but disconnect from Dispatch and ground floor functions may create supervision issues.

- Room contains vending machines, pool table, ping-pong table, and two computer workstations for Operator use.
- Large cabinets along west wall are in good condition but are generally empty.
- Miscellaneous furniture in space is mismatched and in fair condition.

Operator's Lounge

Operators Toilet and Shower Rooms

Men's - 104, Women's - 109, and Women's Restroom - 112

- Men's and Women's rooms have not been updated to current accessibility standards.
- Accessible toilet stalls do not have sufficient clearances within stall. Per current Code, a minimum of one accessible stall should be provided in each toilet room.
- Toilet paper and paper towel dispensers are not mounted within Code required height ranges.
- Sink drains do not have code required pipe covers.

Women's Toilet

- Bottom of mirror height should be 40 inches maximum at all locations.
- Fixtures and showers appear to be in working condition, but in need of cleaning.

- Finishes are generally in good condition, but the ceramic tile is damaged in several locations and ceilings are showing excessive dust accumulation around ceiling diffusers.

Women's Sinks

Men's Sinks

- Showers in both Toilet Rooms are too small to meet current accessibility standards. Where showers are located, minimum of one shower is to be accessible. Hand-held shower, folding bench, and grab bars are also required in accessible shower.

Men's Showers

Toilet Rooms

Women's - 136, Men's - 141, Women's - 201, & Men's - 202

- Toilet rooms meet current accessibility standards. All toilet rooms were originally configured for multiple occupancy and have since been reconfigured with the exception of 141. First floor restrooms still have two fixtures, but second floor toilet rooms only have one fixture. Date of restroom modifications is unknown.

Women's Accessible Toilet 136

- Finishes are generally in good condition with the exception of the tile floor in Women's - 201 has lost its bond with the sub-floor in one observed location.

- Sink drains in rooms 201 and 202 do not have proper pipe guards and should be replaced.
- Fixtures appear to be in working condition.
- Drinking fountain outside second floor restrooms does not have proper accessibility clearances, should be minimum of 18 inches from adjacent wall.

Women's - 201

Men's - 141

Training Office - 204

- Room is appropriate size for three workstations and small conference table, but furniture is mismatched and inefficient.
- Room was previously the 'Lunch Room' and contained a small kitchenette unit and vending space. Date of conversion and addition of door into room is unknown.
- Access to File Storage - 206 is through room which may cause access issues to files.

Training Office

Training Room - 203

- Room is adequate size for training and as secondary conference room.
- Room has a projection screen that appears to be in good condition, but room does not have a built-in projector. Projection screen is small for the size of the room.
- Furniture appears to be adequate for training and conference functions.

Training Room

File Storage - 206

- Room is not adequate size for the amount of file box storage.
- Shelving should be anchored to the walls per current seismic code requirements for tall shelving.
- Stacking of file boxes as observed may pose safety issues.

File Storage

Administrative Office - 207

- Room is adequate size for the six workstations in the room. Only four workstations were in use at time of assessment.
- Room was originally designated as a conference room.
- Room and furniture are in good condition. Furniture is cohesive and efficient use of the space. Partitions are appropriate height to provide privacy, but allow daylight across the room.
- Space also contains a full size refrigerator, microwave, coffee maker, and toaster oven.

Workstations in Open Office

Appliances

Janitor Rooms: 106 & 145

- Rooms are generally in good condition, but floor finishes are in poor condition. Janitor rooms should have tile finish on floor.
- Sinks appear to be in working condition.

Janitors Room - 145

Electrical & Utility Rooms: 208 & 210

- See Mechanical and Electrical assessments.

Additional Life-Safety and Code Issues

- If expansion of second floor is to proceed the addition of a new stair will be required. Code required separation distance would not be sufficient, i.e. the current stair locations would be too close in the event of expansion.

General Comments

- Administration and Operations functions lack a proper break room and/or kitchenette for staff use. Many offices have their own coffee makers, microwaves, or mini-refrigerators. Consolidating appliances into a common break room would reduce energy usage and would help reduce clutter throughout the building.
- Building generally lacks sufficient storage. Most rooms and furniture could be made more efficient with modernized, commercial grade furniture systems.
- Administration and Operations are lacking conference room space. Small conference room on first floor may not be adequate for large meetings and the use of the training room on the second floor may also not be sufficient for larger meetings or presentations.
- Computer, servers, and general IT equipment has not been assessed, unless noted otherwise.

Maintenance Building

Exterior

General

- The Maintenance Building consists of single-wythe CMU walls with cement plaster fascia along north and south elevations. Exterior walls have no added insulation.

- ✓ Exterior envelope of the building may likely not meet current CAL-Green code required insulation values for exterior insulation.
- ✓ Exterior is generally in good condition and does not show any significant signs of deterioration.

- Windows on second floor consist of dual-pane glazing in aluminum frames. Openings are generally in good condition.
  - ✓ Operable windows in break room appear to be in good condition, but functionality and hardware of each window was not assessed.
  - ✓ Additional windows located in office area are not shown in the original drawings but windows are also in good condition.
- Main entry storefront consists of non-insulated glazing in hollow metal frame. All other doors are typical hollow style doors and frames and are in good condition.
- Exposed conduit for lighting, gas detection, etc. is visible in numerous locations on exterior walls, but exterior is generally free of extraneous utilities.


Main Entry Storefront Glazing


North Elevation


South Elevation

Roof

- Roof is the original ballasted, built-up roofing and appears to be in fair condition with the exceptions noted.

- ✓ At time of assessment roof was leaking under roof-top unit HV-2. Leak was located in the center of the second level parts storeroom.
- ✓ Roof is ponding in several locations around overflowing evaporative coolers.

Roof Leak at HV-2

- ✓ Existing drawings indicate built-up roofing over lightweight reinforced insulating concrete with three inches of insulation board. Total R-value of roof is unknown.

- At one location, roof has had fluid-applied, white membrane added over original built-up roofing around HVAC unit that is likely serving the Facilities Supervisor and Transit Police offices. Date of spray-applied white roofing is unknown.

New White Membrane Roofing

- Roof drains have significant debris, dirt accumulation around most drains, with some drains having plant life growing within build-up around drains. Insufficient cricketing of roof edges appears to be causing ponding around drains and other locations.
- Various locations: Paint on parapet coping and various flashings is deteriorating. Parapet cap around entire perimeter is showing signification weathering and rust.
- Electrical conduit routed through overflow drain in one location. Integrity of conduit and overflow drain is unknown.
- Skylights throughout building appear to be in fair condition. Acrylic domes show significant weathering and are not transmitting as much light as possible.
  - ✓ About half of skylights are also operable smoke vents. The functionality of smoke vents was not assessed, but several were visibly leaking fluid from hydraulic mechanisms.

- Building does not have mechanical screens around any equipment.

Overflow from Evap Cooler

Conduit through Overflow Drain

Interior

Stairs

- Stairs are generally in good condition, but painted stairs are in need of repainting.
- Interior stairs consist of concrete filled metal pan treads with bent metal risers. Rise of all interior stairs is approximately 7.09 inches. Current Code maximum is seven inches for interior stairs.
- Handrails do not have Code required handrail extensions at top and bottom of stairs. Top of stair should have 12-inch handrail extension past top riser and bottom of stair should have extension of 11 inches plus tread depth.
- Stairs also do not have Code required contrasting stripes at top and bottom treads of each stair run.

Typical Bottom of Stairs

Typical Guardrail

Maintenance Bays and Shops

- Concrete floors are currently in poor condition. Light colored floor finish is worn and peeling in numerous locations. Multiple

locations have new concrete slabs that were not refinished to match the remainder of the building.

- Accent painting and painted HVAC ductwork is in good condition unless noted otherwise.
- Fireproofing on underside of roof deck and steel roof structure appears to be in good condition.
- Lighting is generally in good condition, but typical recommendation of 100 foot-candles where work is performed is unlikely being met with current lighting.
- Overhead coiling doors appear to be in good, working condition. Vision slots in doors are very small and are not sufficient to provide exterior lighting. Weather-striping seals around overhead coiling bay doors are damaged or missing from multiple observed doors.
  - ✓ Additional daylight and insulation could be provided by replacing overhead doors with translucent, insulated door types. Motors could be reused with new doors.
- See functional and equipment assessment for more information.

Typical Floor Finish

Common Work Area

Vision Slots in Overhead Door

Inspection Bay and Shop

- Removable pipe and chain guards as shown on original drawings were removed from interior inspection position, but guards are still partially in place for position closest to north door.
- Rails were added to guide buses along inspection pits.
- Inspection pit has cardboard on floor to absorb fluid spills and leaks. Floor should have permanent solution to collect fluid spills.

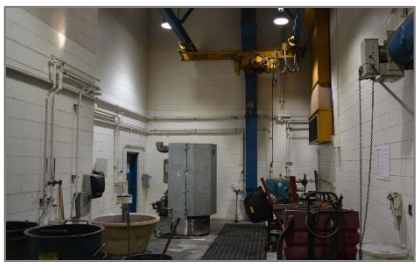
- Toilet Room - 102 in Inspection Bay is not accessible and is likely not required to be brought up to current code if main toilet rooms are updated.

Pipe and Rail Guards at Pit

Inspection Pit

Chassis Wash & Component Clean - 111 & 112

- Floor in component clean area is worn and in need of refinishing.
- Lighting in component clean is very good, but much higher foot candles than elsewhere in the Maintenance facility.



Component Clean Area

- The Chassis Wash bay has significant residue accumulation from chassis wash operations and wall paint is flaking off. Room is in need of significant cleaning and refinishing.
- Pipe insulation on wall mounted plumbing is deteriorating and should be replaced.
- Light levels within chassis wash bay are low compared to other bays and shops. Lighting levels should be consistent between spaces.

Chassis Wash Bay

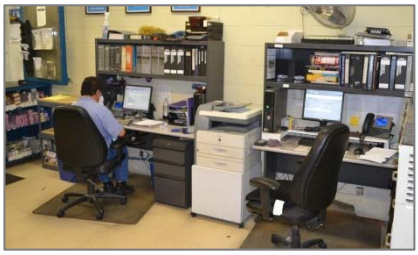
Storeroom

Parts Storage - 126, Secure Storage - 131, Office - 132, & Parts Storage Mezzanine - 208 & 209

- Painted parts counter is heavily worn. Re-painting of transaction counter is generally not recommended. Stainless steel surface is typically specified for a parts counter.
- Exit sign above door to Stair 6 corridor is missing and should be replaced.
- Four workstations adjacent to parts counter are in good condition and appear to be sufficiently sized.
- Parts Room Office - 132
  - ✓ Room is sufficiently sized but has inefficient furniture.
  - ✓ Finishes are in good condition except the floor which has damaged composite tiles.
- Storage Mezzanine - 208 & 209
  - ✓ Rooms are in good condition with the exception of the leaking roof as noted above. Fireproofing may be damaged by significant leaks and further investigation may be required.
  - ✓ Rooms are separated by rated coiling doors with fusible links. Doors appear to be in good condition.

Parts Counter

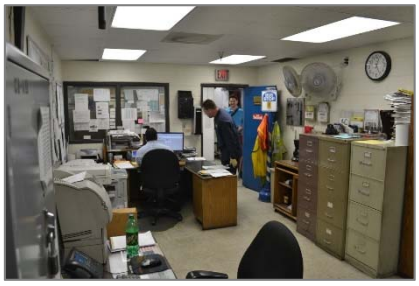
Missing Exit Sign



Storeroom Workstations

Roof Leak

Supervisors Office - 134


Supervisors Office

- Shared Supervisor office has two shared workstations in addition to other various furniture. Furniture is mismatched and inefficient use of the space.
- Space is adequate but more efficient furniture layout would provide space adequate for at least three workstations.
- Windows into maintenance shop is in good condition but it covered with paperwork.
- Room is in good condition with the exception of the composite tile flooring which is in poor condition.

Electronics Shop - 138

- Room was originally designated as the Battery Room.
- Room has insufficient storage and appears to be lacking proper work bench for amount of working being performed.
- Room has freestanding portable air conditioning unit that is vented through existing wall vent.


Workstation


AC Unit

Room - 128


File Storage & Toilet Room Beyond

- Room was originally designated at the First Aid Room but is currently used for storage.
- Small toilet room at the rear of the room is not up to current accessibility standards, but would likely

not be required to be updated if adjacent toilet rooms are made compliant.

- Finishes are in good condition.

Women's & Men's Toilet Rooms - 129 & 130

- Both toilet rooms can be made accessible by removing the toilet partitions and converting to single occupancy toilet rooms.
- Toilet room stalls do not meet current accessibility clearance requirements. Stalls must be minimum five feet clear.
- Toilet paper dispensers and grab bars are not mounted at the correct heights.

Men's Room Fixtures

- Finishes in the Women's room are in good condition. Finishes in the Men's room are in poor condition.
- The sink in the Men's room does not meet accessibility clearances for sinks. The sink in the Women's room is compliant.
- Both sink drains are missing required pipe covers.

Men's Room Toilet

Second Floor Office Suite

Assistant Director, Conference Room, Fleet Manager, and Clerk Workstations

- Office suite is not original to the building. Space was taken out of original square footage of Lunch Room - 203 and Parts Storage - 208 (S occupancy). Date of office addition is unknown.
- Space is currently B and A (office and assembly) occupancies, but does not have code required fire alarm or CNG gas detection systems.
- Finishes are generally in good condition. Lay-in tile ceilings are damaged or dirty in several locations. Carpet is in fair condition.

- Furniture is all in very good condition. Open office space is lacking in sufficient storage furniture.
- Exterior CMU walls have added 1/2-inch fabric wrapped acoustic panels applied to interior face of walls.
- Room access is controlled by card reader.

Assistant Director's Office

Maintenance Clerk

Conference Room

Lunch Room - 203

- Room and finishes are in good condition. Kitchen cabinetry is in fair condition. Appliances have not been assessed.
- Kitchen sink is not accessible and does not provide knee clearance under the sink.
- Evacuation sign is located on side of refrigerator. Signs should be located in conspicuous location adjacent to door.
- Furniture is in good condition.
- Maximum occupancy sign above door does not state occupancy and signage text is too small per current code.
- Room is also used for occasional training but does not have projector or projection screen typical of most training rooms.

Kitchen Cabinets & Appliances

Break Room

Men's Toilet Room & Locker Room - 204

- Toilet and Locker Rooms do not meet accessibility standards. Rooms would be required to be updated or provide reasonable accommodations elsewhere on the same floor in order to meet current Building Codes.

Toilet Room

- Room has five showers, three urinals, three toilets, and two semi-circular hand wash basins. Minimum of one sink, toilet stall, urinal, etc. should be provided to make restrooms accessible.
- Hand wash basins do not quality as accessible sinks.
- Room was originally planned for 48, 12-inch wide by 15-inch deep lockers. Original lockers have been replaced with 46, 18-inch wide by 20-inch deep. Minimum of 5 percent of lockers and one bench should be made accessible.
- Bench has been added to shower room.

Non-Accessible Toilet Stalls

- Lockers are generally in fair condition with some minor damage and wear to multiple lockers.
- Lockers do not have sloped tops, allowing for storage of miscellaneous items on top of lockers.
- Showers are not accessible size or configuration. Shower does not have seat, proper hardware, and has large threshold.
- Fixtures all appear to be in working condition.
- Ceramic tile is generally in good condition with some minor damage and wear in various locations.

Large Lockers

- Ceilings in shower room are in poor condition and exhaust grilles have significant dust accumulation.

Shower Room w/ Large Lockers

Shower exhaust

Women's Toilet Room & Locker Room - 205

- Toilet and Locker Rooms do not meet accessibility standards. Rooms would be required to be updated or provide reasonable accommodations elsewhere on the same floor in order to meet current building codes.

Sinks without Pipe Guards

- Room has two showers, two toilets, and three sinks. Minimum of one sink, toilet stall, urinal, etc. should be provided to make restrooms accessible.
- Room was originally planned for 45, 12-inch wide by 15-inch deep lockers. Portion of original lockers have been removed; only 24 remain and two, 18-inch wide by 20-inch deep lockers have been added. Minimum of 5 percent of lockers and one bench should be made accessible.
- Sinks are accessible, but drains do not have Code required pipe guards.
- Fixtures appear to be in working condition.
- Finishes are all in very good condition.

Showers

Lockers

Print Shop - 210

Print Shop Equipment

- Room was originally designated as the Upholstery Shop, but is currently used for the printing and laminating of large scale printed materials.
- Room is adequate size for printing operations. Miscellaneous storage furniture appeared to not be utilized and could be relocated to provide more space for printing function.
- Smoke vent/skylight located within room appeared to be dripping grease.
- Room access is controlled by card reader.

Storage - 211

Fare Box Components

- Room was originally designated as the Glazing Shop, but is currently used for storage of fare boxes, sewing machine, and other miscellaneous items. Room could be repurposed for more efficient use.

Mechanical Room - 213

Mechanical Equipment & File Storage

- Room contains various utilities (hot water heaters, air compressor, and electrical panels).
- Room is also used for file storage and other miscellaneous storage. Paper storage should be separated from utilities to ensure files are not damaged and are secure.

Additional Life-Safety & Code Issues

- Storage of lockers and uniforms in egress corridor as observed in first floor corridor from Stair 6, is prohibited by code. Lockers and uniforms should be relocated to appropriate areas.

Lockers Located in Corridor

- Doors at the ends of the Paint Bay and Inspection Bay do not have sufficient push clearance on latch side of doors. Doors could be re-hung to opposite hand within current door frames to meet current code clearances.
- Occupancy of mezzanine where Facilities Supervisor and Transit Police are located is currently acceptable, but if major renovation of the facility is to proceed this space will no longer be considered accessible and will not be allowed as a B (Office) occupancy.

Door with No Push Clearance

- Building does not have a passenger elevator. If major renovation is to proceed with the Maintenance Building the current code will require the addition of an elevator to meet current accessibility standards.
- Pending detailed design process, the use of Stair 5 for exiting from second floor may not be permitted since stair exits through an intermediate space (maintenance bays). Exiting will be determined by occupancy and existing analysis typically done during the schematic design phase of the architectural process.

Stair-5 Open to Corridor

- Fire shutters on storage rooms 135 and 137 create egress issues for occupants. In the event of a fire the fire shutter will close, trapping those inside without an exit. Necessity of fire shutters on these rooms is likely not required by the current code and could be removed. Electronics Shop-138 has a similar issue with the fire shutter but has separate man door that would allow for egress.

Fire Shutter on Room 135

General Comments

- Card readers have been added to various doors throughout the facility. Cabling to card readers has been installed is plastic cable covers. Low-voltage equipment should be concealed within appropriate conduit.
- Maintenance Management and Supervisors functions do not have a separate break room or kitchenette. Numerous microwaves, refrigerators, and other appliances are located throughout the facility. Appliances and break spaces should be consolidated into specific areas.
- Finishes are generally in good condition, unless noted otherwise. Most areas have significant wear typical of maintenance facilities.

Typical Card Reader Wiring

- Computer, servers, and general IT equipment has not been assessed, unless noted otherwise.

Fuel and Wash Building

Exterior

- The exterior of the Fuel and Service Building is generally in fair condition with exceptions as listed below. Building is in need of significant cleaning and/or re-painting.
- The building consists of single-wythe CMU walls around rooms along southern edge, open cell CMU along north elevation, with precast concrete panel fascia around the entire building.

- Large portions of the north wall have been removed to make room for equipment (fuel dispenser and vacuum equipment). Tarps have also been hung on north face of the building along fuel lanes apparently to shade the interior.
- Exposed conduit for lighting, gas detection, security cameras, etc. is visible in numerous locations on all exterior walls.
- Canopy added over CNG fuel dispenser on south side of building. Date of canopy addition is unknown.

Public CNG Dispenser

Building Exterior

Removed CMU on N. Elevation

Roof

- The roof of the building was not accessible during assessment. No apparent leaks were visible from below.
- Existing drawings indicate roof is built-up roofing over two inches of insulation.

Interior

- Drainage from bus wash cycle was observed overflowing beyond floor drainage between bus washer and vacuum position. Standing water in service lane is likely leaking into unused lower level. Drainage and floor slopes should be analyzed in more detail.

Service Lane

- Pipe insulation on various piping is significantly deteriorated and should be replaced.
- Refrigerator, vending machine, drinking fountain, and water cooler are located within service aisle. Equipment should be located within proper break room.


Pipe Insulation

- Removable pipe rails along service aisles have been removed. Rails are not required if lower level area is closed.

Lower Level Inspection Area

- Lower level has been abandoned and is no longer used for bus inspection, but stair access is still open.
- Floor openings have steel plates added to cover openings but plates are not sufficiently secured to prevent movement.
- Lower level space was not thoroughly assessed due to significant odor, but space was observed with standing water and trash. Environmental hazards of space have not been assessed but it is likely that local jurisdictions may require special precautions or remediation to be addressed if space is to be repurposed or completely abandoned.


Stair to Lower Level

- Guardrail and handrail on stair to lower level do not meet current code requirements.

Toilet and Locker Room Building

- The Toilet and Locker building is located at the northwest corner of the Fuel and Wash Building and is meant to serve as the locker and toilet rooms for the service attendants but the building is currently under-utilized due to small size of lockers and lack of showers.

Building Exterior

- Building consists of fluted, single-wythe CMU walls and metal deck roof. Building has no added insulation
- Mens room has 22 lockers and Womens room has 11 lockers. Lockers are all 60 inches tall by 15 inches deep by 12 inches wide. Lockers are small relative to the lockers available in the Maintenance Building locker rooms. Lockers are not being used.

Mens Room Lockers

- Building has no HVAC systems.
- Rooms have ceiling speakers for PA system, but functionality of system has not been assessed.
- Building has fire alarm pulls on exterior adjacent to doors but building does not have strobes and alarm on interior. Building does have fire sprinkler system.
- Both entry doors have access control card readers.
- Operable hopper windows are in good condition and are the only source of ventilation for the building.
- Sink vanities in both rooms are in very poor condition and sink drains do not have pipe guards.
- Toilet stalls do not meet current accessibility clearances.
- Men’s room has two urinals. Minimum of one urinal should be at accessible height.
- Men’s room toilet stall door has been partially painted black.
- Women’s room paper towel dispenser and waste bin is missing waste bin and paper towel dispenser is not being used.
- Finishes are in fair condition with the exception of the ceilings which are in poor condition.

- Janitor closet and water heater closet were not accessible and therefore not assessed.

Womens Room Interior

Womens Toilet Stall

Equipment and Utility Rooms

- See other discipline's assessments.

Passenger Amenities Building

- Building is a simple steel framed shed structure without HVAC systems, but does have fire sprinkler system.
- Building is clad in simple corrugated sheet metal paneling. Building envelope is un-insulated. Occupied shop spaces, not storage, would be required to meet current energy and Building Codes.
- Lighting in building appears insufficient if detailed shop work is being performed.
- Building is also used as a break room. Space near door has table and chairs, refrigerator, etc.

Building Interior

Covered Palette Storage

- Building does not have restroom or any other plumbing that was visible during assessment.
- Canopy structure off of building to the north is used for palletized storage. Canopy has fluorescent lighting but does not have fire sprinkler system.


Exterior Uncovered Storage

- Function appears to be lacking sufficient exterior covered storage. Several portable containers are being utilized for storage needs and a large percentage of materials are stored in the yard.

Bus Parking Canopies

- Canopies are generally in good condition, but there is significant paint flaking and chipping on the underside of the canopies.
- Fire sprinkler system appears to have adequate coverage. Multiple pipes, particularly at ends of canopies have significant weathering and should be repainted to protect piping.
- Lighting systems appear to be adequate for canopies.
- Roofs were not accessible for assessment but no apparent leaks were observed.
- Photovoltaic system on roof of canopies has not been assessed. System was added in 2004 according to as-built drawings.


Bus Canopy


Typical Underside of Canopy


Fire Protection System


Roof Mounted PV System

Overall Facility Comments

Door Hardware

- Cross-bar exit devices, where located, do not meet current codes for exiting devices. Non-compliant exit devices should be replaced with new push bar style.
- Door knob hardware does not meet current accessibility requirements and should be replaced with current level type door hardware.
- At various entry doors, IT rooms, card readers have been added for access control.

Typical 'Cross-Bar' Exit Device

Signage

- All buildings lack proper room identification signs and accessible way-finding signs with braille and raised text that is required by code. Room ID signage is sporadic and not consistent between all of the building. Room ID signage should be adjadcent to doors and have minimum of raised room numbers and braille lettering.
- Restroom signage does not meet current Code for room identification.
- Evacuation maps also do not meet current Code requirements. For example, signs should indicate location of horns and strobes for fire alarm systems.
- Stairwells and exit paths lack tactile exiting and egress signage required by Code.

Typical Room ID Signage

Restroom Signage

Typical Evacuation Signage

- Facility identification signage is located on the Admin-Ops Building main entry facing and visible from G Street. Signage contains building address and is in good condition.
- Additional FAX signage is included on semi-circular monument signage at campus entries on G Street and East El Dorado Street. Signage is difficult to see from the street due to shape of signage.

Facility Address on Admin-Ops

- Way-finding 'City of Fresno' signage within campus that provides directions to FAX buildings is difficult to see due to small text size. Text size may not be sufficient per City Fire Department standards.

FAX Signage on G Street

FAX Signage on El Dorado Street

Perimeter Fencing and Gates

- Picket style, black security fence added to G Street frontage is in excellent condition. Fencing was in the process of being erected during assessment.


Security Fence During Install

- Chain-link fencing with barbed wire around remainder of external perimeter is generally in fair condition, but several locations have apparently been damaged by bus collisions.


Damaged Perimeter Fencing

- Double rolling chain-link gates on G Street are motorized and were observed in working condition. Gates do not match adjacent black security fencing.
- Chain-link fencing and gates separating FAX campus from the remainder of the Municipal Service Center is generally in good condition. However, gates were only observed in the open position.

Trash Enclosures

- Buildings do not have trash or recycling dumpster enclosures. The CEQA (California Environmental Quality Act) or other local jurisdiction may require refuse containers to be located within a covered enclosure to prevent storm water from collecting in bins. Further analysis will be required to determine if necessary for FAX facility.

Recycling Dumpster in Admin/Ops Parking Lot

- Recycling dumpster at the Admin Building was observed propped up on curb in the employee parking lot.

Landscaping

- The landscaping at the facility exists only around the Admin/Ops Building and employee parking lot. No landscaping exists around the maintenance building or Fuel and Wash Buildings. Landscaping within in the MSC campus was not assessed.


Landscaping in Parking Lot

- Plantings are generally in good condition, except as noted.
- Grass and vine ground cover is inconsistent and mulch is non-existent. Exposed soil and exposed sprinklers are typical of most areas.


Landscaping Around Patio

- Plantings that were originally between back of sidewalk and fencing are generally in fair condition.
- Trees around Admin Building are substantial and appear generally healthy. Trees within parking lot are smaller but generally healthy. However, several trees show considerable dead branches that should be trimmed and are showing stress potential.

Note: See Administration/Operations Exterior Assessment for Additional Photos of Landscaping

Code Summary

Building Code

Codes in Effect

California Administrative Code, 2013 Edition

California Building Code, 2013 Edition

California Electrical Code, 2013 Edition

California Mechanical Code, 2013 Edition

California Plumbing Code, 2013 Edition

California Energy Code, 2013 Edition

California Fire Code, 2013 Edition

California Green Building Standards Code, 2013 Edition

Fresno Municipal Code, 2014 Edition

Authority Having Jurisdiction

City of Fresno Building and Safety Services

Fresno Fire Department

Description

Fresno Transit Bus Maintenance and Operation Facility

Existing Building Occupancy Types

Administration and Operations Building

- B: Business

Maintenance Building(s)

- S-1: Moderate Hazardous Storage

Fuel and Wash (Service) Building

- S-1: Moderate Hazardous Storage

California Building Code

Chapter 10 Means of Egress

Means of Egress Sizing (CBC 1005)

1. Stairways - The capacity, in inches of means of egress stairways shall be calculated by multiplying the occupant load served by such stairway by a means of egress capacity factor of 0.3 inches per occupant (CBC 1005.3.1)
2. In buildings where a required accessible floor is four or more stories above or below a level of exit discharge, at least one required accessible means of egress shall be an elevator complying with Section 1007.4. (CBC 1007.2.1)
3. In order to be considered part of an accessible means of egress, an elevator shall comply with the emergency operation and signaling device requirements of *California Code or Regulations, Title 8, Division 1, Chapter 4, Subchapter 6, Elevator Safety Orders*. (CBC1007.4)
4. Each area of refuge shall be sized to accommodate two wheelchair spaces that are not less than 30-inches by 48-inches. The total number of such 30-inch by 48-inch space per story shall be not less than one for every 200 persons of calculated occupant load served by the area of refuge. (CBC 1007.6.1)
5. Doors serving a Group H occupancy and doors serving rooms or spaces with an occupant load of 50 or more in a Group A occupancy, E, I-2 or I-2.1 occupancies shall not be provided with a latch or lock unless it is panic hardware or fire exit hardware. (CBC 1008.1.10)
6. Interior exit stairways shall lead directly to the exterior of the building or shall be extended to the exterior of the building with an exit passageway conforming to the requirements of Section 1023, except as permitted in Section 1027.1 (CBC 1009.2)
7. Floor openings between stories created by exit access stairways shall be enclosed. (CBC 1009.3)
    a. Exception 4 - In other than Group B, I-2, I-2.1, I-3 and M occupancies, exit access stairway openings are not required to be enclosed provided that the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1, the floor opening does not connect more than four stories, the area of the floor opening between stories does not exceed twice the horizontal projected area of the exit access stairway, and

the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13.

8. Width - The width of stairways shall be determined as specified in Section 1005.1, but such width shall not be less than 44 inches. (CBC 1009.4)
9. Headroom - Stairways shall have a minimum headroom clearance of 80 inches measured vertically from a line connecting the edge of the nosings. (CBC 1009.5)
10. Riser height and tread depth - Stair riser heights shall be 7 inches maximum and 4 inches minimum. The riser height shall be measured vertically between the nosings of adjacent treads. Rectangular tread depths shall be 11 inches minimum measured horizontally between the vertical place of the foremost projection of adjacent treads and at a right angle to the tread's nosing.(CBC 1009.7.2)
11. Exits and exit access doors shall be marked by an approved exit sign readily visible from any direction of egress travel. (CBC 1011.1)
    a. Exceptions:
        i. Exit signs are not required in rooms or areas that require only one exit or exit access.
12. Handrail height, measured above stair tread nosings, or finish surface of ramp slope, shall be uniform, not less than 34 inches and not more than 38 inches. (CBC 1012.2)
13. Handrails shall return to a wall, guard or the walking surface or shall be continuous to the handrail of an adjacent stair flight or ramp run. Where handrails are not continuous between flights, the handrails shall extend horizontally at least 12 inches beyond the top riser and continue to slope for the depth of one tread beyond the bottom riser. The extension of handrails shall be in the same direction of the stair flights at stairways and the ramp runs at ramps. (CBC1012.6)
14. Where two exits or exit access doorways are required from any portion of the exit access, the exit access doorways shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between exit doors or exit access doorways.
    a. Exception 2. Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the exit doors or exit access doorways shall not be less than one-third of the length of the maximum overall diagonal dimension of the area served.

15. A contrasting marking strip shall be provided on each tread at the nosing or leading edge such that the location of each tread is readily apparent when viewed in descent. Such stripe shall be a minimum of 1 inch, and a maximum of 2 inches, wide. (CBC 1028.11.3)

Chapter 11B

1. Interior and exterior signs identifying permanent rooms and spaces shall comply with Sections 11B-703.1, 11B-703.2, 11B-703.3 and 11B-703.5. (CBC 11B-216.2)
2. Signs that provide direction to or information about interior and exterior spaces and facilities of the site shall comply with Section 11B-703.5 (CBC 11B-216.3)
3. In existing buildings and facilities where not all entrances comply with Section 11B-404, entrances complying with Section 11B-404 shall be identified by the International Symbol of Accessibility complying with Section 11B-703.7.2.1. (CBC 11B-216.6)
4. Doorways leading to toilet rooms and bathing rooms complying with Section 11B-603 shall be identified by a geometric symbol complying with Section 11B-703.7.2.6. (CBC 11B-216.8)
5. Where lockers are provided, at least 5 percent, but no fewer than one of each type, shall comply with Section 11B-811. (CBC 11B-225.2.1)
6. Operable parts shall be operable with one hand and shall not require tight grasping, pinching, or twisting of the wrist. The force to activate operable parts shall be 5 pounds maximum. (CBC 11B-309.4)
7. Handles, pulls, latches, locks, and other operable parts on doors and gates shall comply with Section 11B-309.4. Operable parts of such hardware shall be 34 inches minimum and 44 inches maximum above the finish floor or ground. (CBC 11B-404.2.7)

CALGreen Mandatory Measures:

Chapter 3

301.3 Nonresidential additions and alterations. [BSC] (CGC Chapter 3)

- The provisions of individual sections of Chapter 5 apply to newly constructed buildings, building additions of 1,000 square feet or greater, and/or building alterations with a permit valuation of $200,000 or above (for occupancies within the authority of California Building Standards Commission). Code

sections relevant to additions and alterations shall only apply to the portions of the building being added or altered within the scope of the permitted work.

- A code section will be designated by a banner to indicate where the code section only applies to newly constructed buildings [N] or to additions and alterations [AA]. When the code section applies to both, no banner will be used.

303.1 Phased projects

- For shell buildings and others constructed for future tenant improvements, only those code measures relevant to the building components and systems considered to be new construction (or newly constructed) shall apply.

303.1.1 Tenant improvements

- The provisions of this code shall apply only to the initial tenant or occupant improvements to a project.

Chapter 5

Division 5.1: Planning & Design

1. Bicycle Parking
    a. Short-Term - provide anchored bicycle racks for 5% of new visitor motorized vehicle parking with any new or additions.
    b. Long-Term - If adding 10 occupants provide bicycle parking for 5% for tenant vehicular parking being added.
2. Designated Parking
    a. If adding 10 or more vehicle parking spaces provide designated parking for any combination of low-emitting, fuel-efficient & carpool vans.
    b. Parking stalls shall be marked with “CLEAN AIR/VANPOOL/EV”
3. Light pollution reduction
    a. Outdoor lighting systems shall be designed and installed per: California Energy Code or BUG ratings.

Division 5.2: Energy Efficiency (California Energy Code)

1. Roof/Ceiling Insulation
    a. Climate Zone 13
        i. Nonresidential Continuous Insulation - R14
        ii. Nonresidential Continuous Insulation - U-Factor .055
    b. Existing roofs with R-7 insulation or U-factor lower than 0.089 are not required to meet the R-value requirement

i. Nonresidential Continuous Insulation - R14

ii. Nonresidential Continuous Insulation - U-Factor .055

2. Wall Insulation

   a. Wood Framed & Other - Minimum R-11 or the weighted average U-factor of the wall assembly shall not exceed U0.110

3. Floor Insulation

   a. Altered portions that separate condition space from unconditioned space:

      i. Raised Framed Floors - Minimum R-11insulation between framing members or the weighted average U-factor of the wall assembly shall not exceed U0.071

      ii. Raised Mass Floors - No minimum U-factor requirement

Division 5.3 Water Efficiency and Conservation

1. Indoor Water Use

   a. Submeter to be installed on new buildings or additions in excess of 50,000 square feet

2. Water Reduction

   a. Plumbing fixtures shall meet the maximum flow rate of Table 5.303.2.3

3. Water conserving plumbing fixtures & fittings

   a. Water closets shall not exceed 1.28 gallons per flush.

   b. Urinals shall not exceed 0.5 gallons per flush.

   c. Showerheads

      i. Single showerheads shall not exceed 2.0 gallons per minute at 80 psi

      ii. Multiple showerheads serving one shower shall not exceed a combined rate of 2.0 gallons per minute at 80 psi.

   d. Wastewater reduction

      i. Wastewater shall be reduced by 20%

         1) Install water-conserving fixtures.

         2) Utilize nonpotable water systems.

4. Outdoor water use

   a. Water budget.

i. A water budget shall be developed for landscape irrigation use that conforms to the local water efficient landscape ordinance or to the California Department of Water Resources

b. Outdoor potable water use

i. For new or upgraded water service for landscaped areas of at least 1,000 square feet but not more than 5,000 square feet a separate Submeter or metering devices shall be installed.

c. Irrigation design

i. Install irrigation controllers and sensors in new nonresidential construction or building addition or alteration with at least 1,000 but not more than 2,500 square feet of cumulative landscaped area.

d. Irrigation controllers

i. Automatic irrigation system controllers installed

Division 5.4 Material Conservation and Resource Efficiency

1. Water resistance and moisture management
   a. Design and maintain irrigation systems to prevent spray on structures
   b. Exterior entries and/or openings shall be covered to prevent water intrusion
2. Construction waste reduction, disposal and recycling
   a. Recycle and/or salvage for reuse a minimum of 50% of the nonhazardous construction and demolition waste
3. Building maintenance and operation
   a. Provide readily accessible areas for recycling
4. All additions resulting in an increase of 30% or more in floor area

Division 5.5 Environmental Quality

1. Pollution control
   a. If existing ventilation used during construction for additions or alterations, use return air filters with MERV 8. Replace all filters immediately prior to occupancy
   b. During rough installation all ducts and other related air distribution component openings shall be covered
   c. MERV 8 filters shall be installed prior to occupancy, and recommendations for maintenance with filters of the same value shall be included in the operation and maintenance manual

d. Smoking areas shall be prohibited with 25 feet of building entries, outdoor air intakes and operable windows and within the building as already prohibited by other laws or regulations

2. Indoor air quality
   a. Carbon dioxide (C02) monitoring.
      i. For buildings or additions equipped with demand control ventilation, CO2 sensors and ventilation controls shall be specified and installed in accordance with the requirements of the 2013 California Energy Code, Section 120(c)(4)
3. Environmental comfort
   a. Acoustical control. Employ building assemblies and components with Sound Transmission Class (STC) values determined in accordance with ASTM E 90 and ASTM E 413 or Outdoor-Indoor Sound Transmission Class (OITC) determined in accordance with ASTM E 1332
4. Outdoor air quality
   a. Ozone depletion and greenhouse gas reduction
      i. Install HVAC, refrigeration and fire suppression equipment that do not have contain CFCs
      ii. Install HVAC, refrigeration and fire suppression equipment that do not have contain Halons

Accessibility Summary

The following are thresholds within the applicable codes that will trigger certain work and scope of renovations and modifications to the existing buildings at the FAX facility. Each building will be required to be evaluated under each of the following code criteria. Upon review by the local building jurisdiction, the entire campus of buildings may be required to be reviewed holistically in lieu of each building separately.

Americans with Disabilities Act (ADA) requirements

Anytime renovations are made to a facility where barriers still exist, a minimum of 20 percent of the construction costs must be spent on barrier removal on the path of travel. For ADA purposes, the path of travel also includes water fountains and rest rooms. Any renovation to a “primary function area” triggers the requirement.

Uniform Federal Accessibility Standards

Where substantial alteration occurs to a building or facility, then each element or space that is altered or added shall comply with the applicable provisions of 4.1.1 to 4.1.4 of 4.1, Minimum Requirements, except to the extent where it is structurally impracticable. The altered building or facility shall contain:

(d) In making the determination as to what constitutes "substantial alteration," the agency issuing standards for the facility shall consider the total cost of all alterations (including but not limited to electrical, mechanical, plumbing, and structural changes) for a building or facility within any twelve (12) month period. For guidance in implementing this provision, an alteration to any building or facility is to be considered substantial if the total cost for this twelve month period amounts to 50 percent or more of the full and fair cash value of the building as defined in 3.5.

EXCEPTION: If the cost of the elements and spaces required by 4.1.6(3)(a), (b), or (c) exceeds 15 percent of the total cost of all other alterations, then a schedule may be established by the standard setting and/or funding agency to provide the required improvements within a 5-year period.

Structural Assessment

Introduction

Arup North America Ltd. was commissioned by Maintenance Design Group, LLC to provide engineering support to a master plan effort for the Fresno Area Express site in Fresno, California. Arup's scope consists of two components: to conduct a structural, mechanical, electrical and plumbing due diligence survey of the existing site conditions, and to evaluate proposed master plan changes from the vantage point of those disciplines.

According to Arup's understanding, the goal of the technical due diligence is to obtain an overview and a deeper understanding of the building's structural and technical conditions. The aim is to discover and point out deficiencies and evaluate them in respect to costs for maintenance and future improvements.

The building's on-site inspection was carried out on June 18, 2014 between 10:00 AM and 5:30 PM. The following participants from Arup took part in the site inspection:

- Michelle Dionello - Mechanical

- Bryce Tanner - Structural
- Lingyan Gorsuch - Plumbing
- Jonathan Gervais - Electrical

The inspection comprised an interview with the Equipment Supervisor, Arnold Napoles, followed by an on-site inspection of the property.

This document contains only the structural component of this scope, and presents both the existing condition observations and the master plan review. Four existing structures are evaluated on the site, in the following order: the maintenance building, the administration building, the CNG fueling/bus wash building, and the bus canopies. A fifth structure, a passenger amenities building, is proposed as a new structure in the master plan. Structural recommendations for this building are provided at the end of this report.

Maintenance Building

Existing Condition Assessment

The maintenance building is a tall single-story industrial building with partial mezzanine. The interior volume is broken into full-height workshop areas and two-story administrative areas. The building is approximately rectangular in plan, with dimensions of approximately 236 feet by 170 feet. The sloped roof structure is approximately 24 feet above grade at low point and 25 feet at high point. There is no basement, though below-grade access spaces exist under bus maintenance garages.

Masonry walls consisting of concrete masonry units (CMU) divide the space. These walls serve both as bearing walls to support roof and mezzanine levels, and as shear walls to resist lateral forces such as earthquake and wind. These walls are primarily aligned with the short building dimension, the east-west direction. These walls are shown by the structural drawings to be fully grouted and reinforced. Wall thicknesses vary; perimeter walls and walls spanning the full building height without lateral support from the mezzanine are 12 inches thick, whereas walls in the mezzanine area are eight inches thick.

The mezzanine floor is of reinforced concrete flat slab construction with thickened regions around columns. This floor is supported by concrete columns and bearing CMU walls. The mezzanine occupies approximately half of the building footprint. Most of the

mezzanine is contiguous, but a small isolated mezzanine exists at the north end of the building. The mezzanine is accessed by steel-framed stairs, with steel elements bolted to the concrete.

The roof structure consists of steel beams supporting bare metal deck. A typical structural bay is 25 feet in north-south direction and 60 feet in east-west direction. The 60-foot span is carried by tapered plate girders, with maximum depths of 28 inches to 36 inches, which support W12 or W14 wide flange beams spanning the short direction. Roof framing is supported by 8 inch by 8 inch tube steel columns where no mezzanine exists, and by bearing CMU walls or concrete pilasters in the mezzanine areas. The roof deck is penetrated by numerous large and small holes for services and skylights. The roof supports many exhaust stacks and mechanical equipment.

The building is supported on shallow reinforced concrete foundations. Individual square pads exist under columns, and strip footings exist under bearing walls. A 6-inch reinforced concrete slab on grade covers the building footprint and is tied to footings through reinforcement dowels.

In general, the building structure is in good physical condition. No evidence of significant degradation of steel, concrete or masonry materials could be observed. No evidence of excessive foundation settlement could be observed. Some fine vertical cracks were observed in some CMU walls; these are expected to be related to shrinkage or thermal effects and are not considered detrimental to the structure.

A significant item of note is a discrepancy that was observed between the structural drawings and the actual structure. The structural and architectural drawings provided to Arup both show a 12-inch concrete wall around the building perimeter, but these walls were found to be CMU upon inspection. This substitution may be sufficient to resist the required loading, however it raises questions about the construction quality control program. Such a change should never be made during construction without clear documentation and approval of the structural engineer of record. If this was done without the engineer's knowledge or without proper verification of the substitution, it is also possible that other deviations exist that could not be observed during this site visit.

The seismic system appears to be robust. Reinforced masonry walls of substantial length are provided in both directions, and they are distributed throughout the building. Walls appear to be

positively anchored to roof, mezzanine and foundation. Walls appear to be thick enough relative to their vertical spans to limit the risk of out-of-plane collapse. However, the bare metal deck roof with many penetrations may not be stiff enough to provide adequate out-of-plane restraint to the taller masonry walls. A seismic analysis has not been performed as part of this evaluation, however it is possible that the primary seismic system could meet current code requirements. It should be noted that non-seismic concrete column tie reinforcement does not appear to meet current code requirements for compatibility with seismic displacements.

Another seismic consideration is the anchorage of non-structural components to minimize the risk of injury due to falling objects during a seismic event. In general, it appears that consideration has been given to this in this building, though some concerns exist. Tall storage shelves were observed to be bolted to the floor, though objects on these shelves could still slide off. A large water tank is bolted to the floor, but supported upon slender legs which may not be robust enough to prevent toppling. Rooftop equipment appears to be anchored, though in one instance it was observed that an exhaust stay cable was anchored to a duct.

Photographic Documentation

Exterior Photos

Many penetrations exist in East and West facades, whereas North and South facades have few penetrations. Substantial equipment and penetrations exist on roof. Note perimeter walls are given as concrete in the structural drawings but were built as CMU.

East Façade (West façade similar)

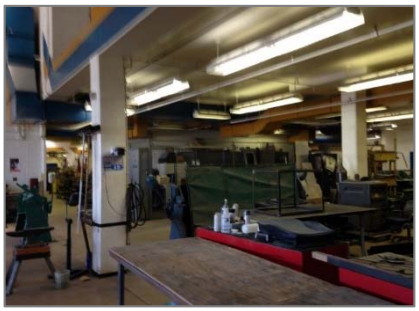
South Façade (North façade similar)

Roof

Interior Photos

Wide column spacing and high ceilings in full-height spaces. Robust concrete structure supporting mezzanine. Limited structure below grade. Structure generally in good physical condition.

Full-height workshop



Workshop under mezzanine area

Bus maintenance bay with below grade access

Potential Seismic Falling Hazards

Large objects appear to be generally anchored, but falling hazards may still exist. Objects may slide off of shelving, a large water tank may not be sufficiently anchored, and an exhaust stack is anchored to a duct.

Tall shelving

Tall water tank anchored to floor only

Exhaust stack anchored to duct

Master Plan Recommendations

If the maintenance building is to be incorporated into the long-term functioning of this facility, it is recommended that a more rigorous structural evaluation be performed. A seismic analysis of the structure is recommended to confirm conformance with current code practice, as seismic codes have changed substantially since this building's construction; this will be required if the building's use, occupancy or geometry are changed as part of the master plan. Such an analysis should incorporate as-built information such as the substitution of masonry for concrete walls described above.

Also, given this significant deviation from the Structural drawings, some testing should be performed to confirm construction in other areas was performed according to the structural design. Such testing may include material testing and non-destructive reinforcement scanning.

The proposed master plan contemplates two significant structural modifications to this building: the addition of a new chassis bay, and the expansion of the southeast workshop area to accommodate longer buses, known as the "specialty bays." The potential impacts are described below.

The specialty bays could have the most significant effect on the structure. To achieve the longer bays, a portion of the existing exterior wall would need to be removed, and this alone would likely trigger a review of the complete structure seismic system. In general, there appears to be enough shear wall length in the building to resist current Code-mandated seismic loading, though this should be confirmed by a detailed analysis. An area of particular concern is the capacity of the highly-perforated metal deck roof to distribute loads to the walls.

Along the south wall, the proposed modifications may require additional reinforcement in the remaining walls. Such reinforcement could consist of shotcrete applied against the existing CMU, or fiber-reinforced polymer wrapping of the existing CMU. Alternatively, the new offset walls created by the expansion may serve as shear walls if a robust roof is provided connecting the top of these walls to the existing south wall line.

If a full-building seismic review is required, all CMU walls not clearly isolated from the seismic system would become part of the system. Many CMU partition walls in the building do not appear to

be isolated, and were probably not designed to carry seismic loads. Some of these walls may need strengthening, or else gaps introduced to allow the structure to move without carrying seismic loads into them.

The new chassis bay addition would probably have minor impacts on the structure. This addition, on its own, probably would not trigger a whole-building seismic upgrade. The addition should be designed to carry its own seismic inertia, but may be attached to the existing structure. Penetrations through the existing wall along this addition should be minimized.

Administration and Operations Building

Existing Condition Assessment

The Administration Building is a two-story structure of modest size. It is rectangular in plan, with dimensions of approximately 163 feet by 66 feet. Roof elevation above grade is approximately 25 feet, and the roof structure is slightly sloped for drainage. No basement exists. A portion of the building at each end is only a single story.

This is primarily a conventional steel structure. Second floor and roof consist of concrete-filled metal deck supported by steel beams on a regular column grid 20 feet square. Columns and beams are wide flange steel shapes. The lateral force-resisting system consists of steel concentrically braced frames in the East-West direction and reinforced CMU shear walls in the North-South direction. The structure is supported by shallow foundations: square pads under columns and strip footings under masonry walls. A 4-inch reinforced concrete slab on grade covers the ground floor and is tied into footings with reinforcement dowels. Much of the building is clad in architectural masonry.

The structure is generally covered by architectural finishes, limiting the ability to observe its condition. Indirect observations, such as lack of water damage to finishes and lack of cracking due to excessive foundation settlement, suggest that the structure is generally in good condition. One exception is an exterior steel column at the South building face, which has suffered significant corrosion damage. The column does not appear to have been protected from the elements except for a thin plaster cladding, and soil is built up around this cladding. In this location the cladding was damaged and water could penetrate. The column could not be viewed closely enough to determine how much damage has

occurred to its base plate or how much capacity has been lost. The same detail appears to exist at other exterior columns, but it was not evident that other columns have similar damage.

The seismic system is regular and may be considered typical for the time of its construction, but may not meet current seismic design standards, which have changed substantially since then. The steel brace frames are relatively slender by modern standards, and brace end detailing does not permit a very ductile response. It is not clear whether the non-structural masonry around and parallel to the braces has been detailed to ensure it is not damaged by building movements that would occur after brace buckling. Masonry shear walls in the North-South direction may be long enough to meet current Code demands. A detailed seismic analysis would be required to determine if the existing structure is sufficient.

Photographic Documentation

Exterior Photos

Masonry walls in North-South direction, windows and metal panel cladding as well as some masonry cladding over brace frames in

South façade

East façade

West façade

Roof

East-West direction. Steel structure is not exposed. Roof is mostly free of equipment and penetrations.

Damaged exterior structural column located at grid D/9

Damaged column (behind cladding)

Master Plan Recommendations

The following more detailed structural evaluations are recommended. The observed corroded column should be investigated by removing existing cladding and evaluating the extent of corrosion damage to the column and its base plate. Other similar columns should be closely observed and perhaps some finishes removed to confirm whether similar damage exists. Also, if this building is to be included in the long-range planning for this facility, a detailed seismic analysis should be conducted to determine if it meets current seismic design standards. Such an analysis will be required if significant changes in use, occupancy or geometry are anticipated.

Structurally, the most significant proposed change to the Administration Building is the addition of a second floor in the areas that are currently a single story. Structural considerations related to this modification exist in three areas: the floor framing system, the seismic force-resisting system and the foundation system. The main considerations are as follows.

This change will certainly trigger a Code-mandated review and upgrade of the seismic force-resisting system. In addition, the proposed program will remove some existing brace frames and masonry shear walls. Therefore, a new seismic system will be required. Three significant aspects must be considered for the seismic system superstructure.

The first consideration is the vertical framing system. The east-west steel brace frames, if they were to remain, would likely not be sufficient to resist current Code forces. A more robust system of concrete or reinforced masonry shear walls or steel brace frames is recommended. Figure 2.B shows some possible locations for such components. In the north-south direction, the proposed program may permit existing exterior CMU walls to remain intact. These walls can likely be incorporated into the new seismic

system and extended to the new second floor level, though detailed structural evaluation is required to confirm this. Additional interior shear walls should be provided.

Secondly, the floor slabs at both roof and second floor must be evaluated for the additional seismic load. It could not be determined from the drawings or the site investigation whether the concrete-filled deck has steel reinforcement bars or mesh. Preliminary calculations indicate that an unreinforced slab may be sufficient for loads that are sufficiently well distributed. This means enough vertical frames must be provided. Certain areas of the slab may require local reinforcing. For example, the proposed programming permits an east-west frame at only one end of the south building face due to window openings, and a stair well partially cuts this area off from the rest of the floor slab. Slab seismic loads thus become concentrated in this area. Possible reinforcement options include a layer of fiber-reinforced polymer or additional steel horizontal bracing elements.

Thirdly, to distribute seismic loads uniformly from the floor slabs to the vertical framing elements, a system of collector elements should be provided. These elements are shown as dashed lines in Figure 2.C. A typical collector line can consist of a line of steel beams with end connections specially designed for seismic loads - generally welded or having a few more bolts than required for typical floor framing beams. Existing steel beams may serve as collector beams where their alignment matches the alignment of frames or walls. Existing beams and their connections may need to be strengthened to carry the additional seismic collector forces.

An additional seismic consideration is the treatment of CMU partition walls, both new and existing. Current Code provisions, not rigorously followed in earlier construction practices, require that all stiff vertical elements either be considered part of the seismic system and detailed as such, or they shall be isolated from the seismic system with appropriate gaps or sliding connections. Typically, CMU walls not considered part of the seismic system are provided with a horizontal gap along their top and a vertical gap along each end to separate them from the structure. These gaps must be specially detailed to ensure the walls are allowed to move in a direction parallel to their plane, but be braced against collapse in a direction perpendicular to their plane. Existing CMU walls may need to be retrofitted to meet this requirement.

The existing floor framing appears to have been intended to accommodate this additional floor. The roof slab as well as the beams, girders and columns in the single-story areas match the design used for the floor of the two-story area. However, it is not clear whether these elements are sufficient to carry current code-mandated loading. Though the design office live load stated in the structural drawings is the same as that required by the current code, that load does not include provision for higher loading in corridor and exit areas, for special storage spaces, or for vertical seismic loading. Preliminary calculations indicate that the capacity of floor beams and girders may be close to their original design demands, so any additional loads due to the programming changes may necessitate strengthening. A detailed review should be conducted to evaluate the structural capacity of the existing floor structure to resist new loads.

An additional consideration for the floor slab is its fire rating. It is not clear whether the concrete-filled metal deck is reinforced or adequately fireproofed to achieve the required fire performance. This must be evaluated, and possibly spray fireproofing applied to the underside of deck.

The foundation system likewise appears to be likely acceptable for the new loading on typical floor support columns, but not for current seismic loading. Footings under typical columns appear to be sized for the dead and live loads given in the structural drawings, but should be checked for additional live loads and for vertical seismic loads as required by current Code. Higher seismic loading required by current code places much larger overturning forces at the ends of shear walls or brace frames, which likely will result in the need for deep foundations to resist uplift and bearing. The addition of micropiles is one possible solution; Figure 2.B shows recommended locations and approximate quantities. Micropiles can be placed in areas of tight overhead clearance, enabling them to be installed within an existing building. To tie the piles into the seismic system, new concrete pile caps and grade beams would be required.

Figure 2.B - Seismic Upgrade Concept - Level 1

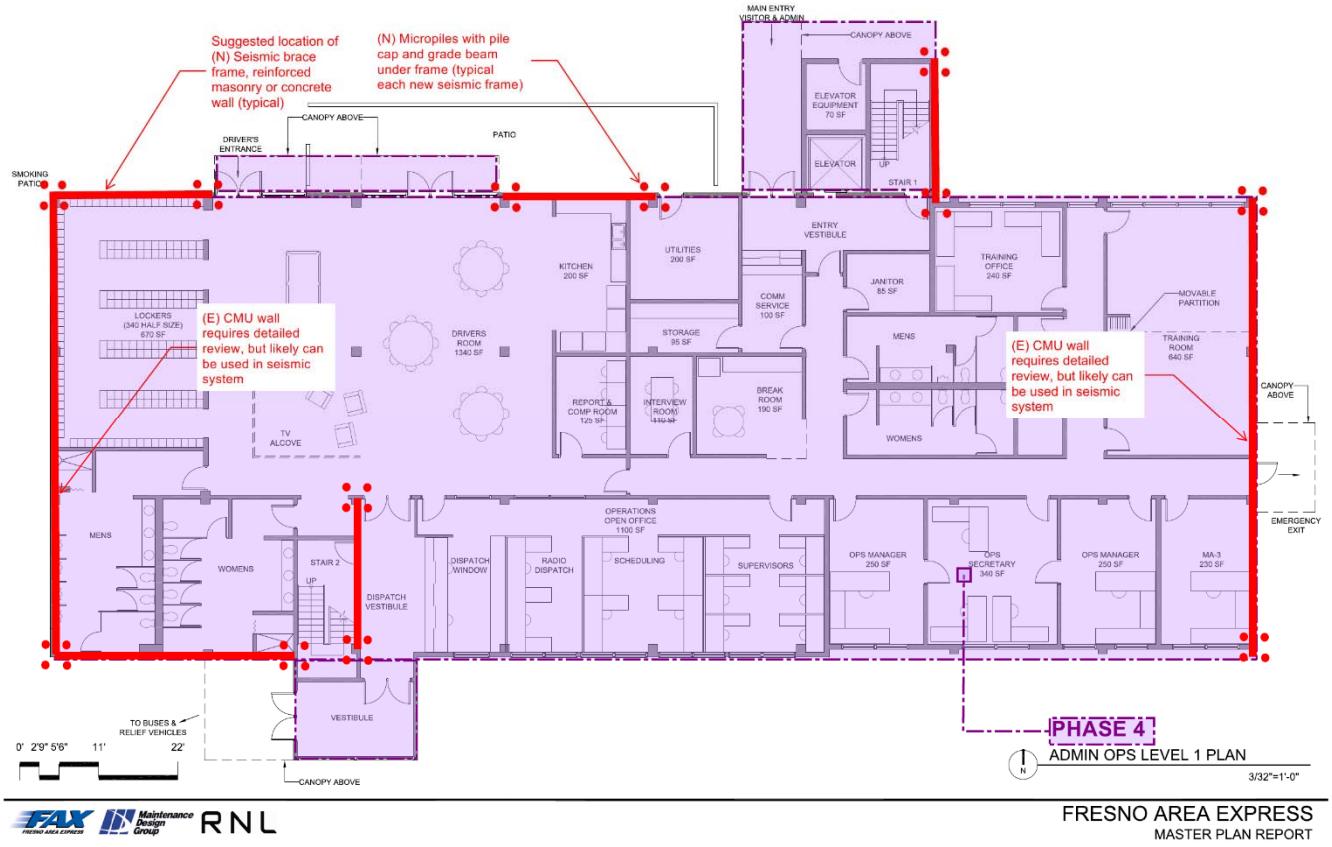
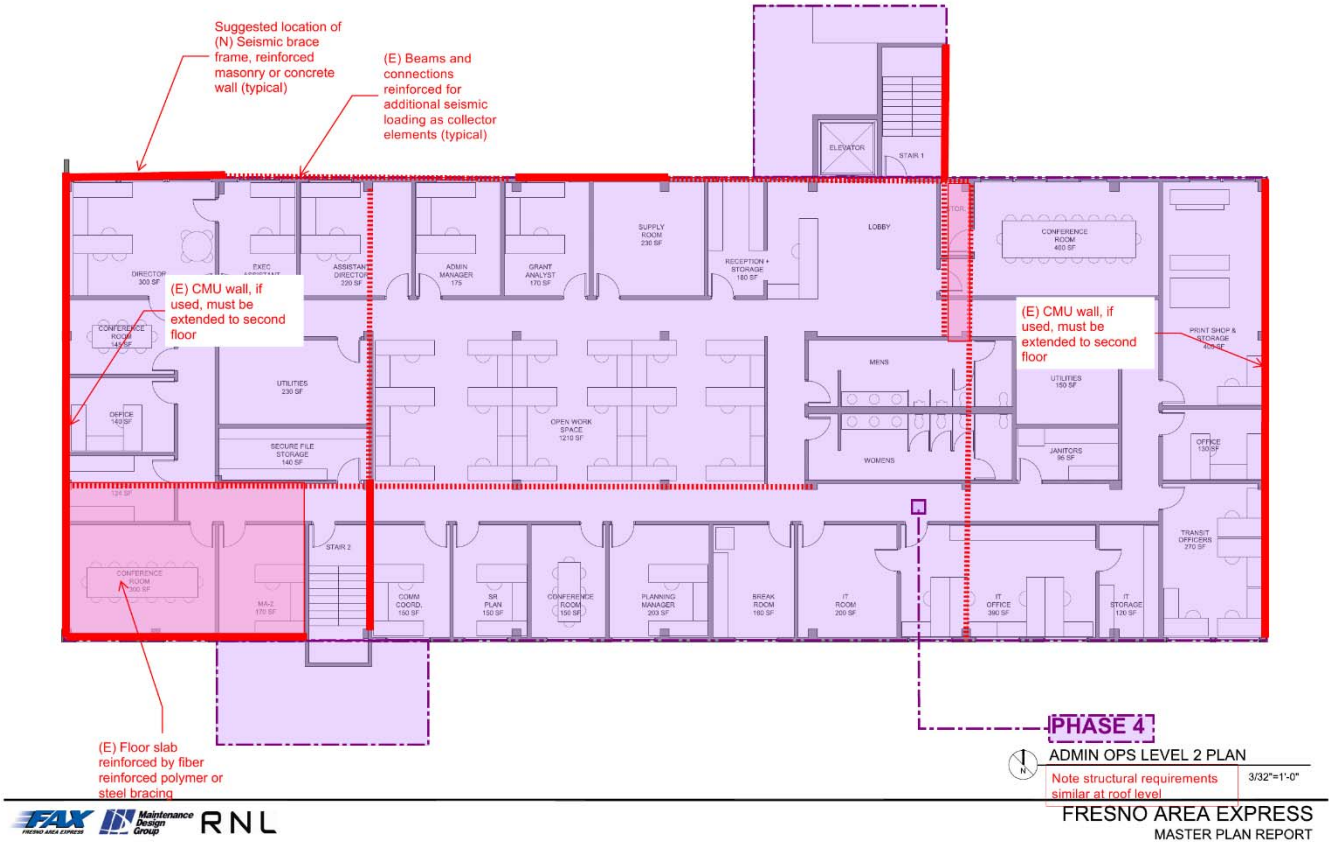


Figure 2.C - Seismic Upgrade Concept - Level 2 and Roof



Fuel and Wash Building

Existing Condition Assessment

The CNG Fueling/Bus Wash facility is a single-story, light-framed steel structure. The structure is rectangular in plan and approximately 53 feet by 162 feet in dimension, and 20 feet tall. A small basement area exists below grade.

The structure is comprised of bare metal deck roof supported on steel framing. A tapered steel plate beam and column portal frame spans the building's short dimension at 20-foot intervals, and conventional wide-flange steel beams span between these frames. The metal deck is reinforced by steel horizontal bracing. The portal frames provide lateral force resistance in the short direction, while diagonal channel braces resist lateral force in the long direction.

The foundation is a shallow system. Columns are supported by concrete spread footings. A concrete slab on grade ties the foundations together.

Perforated masonry cladding partially covers the building's long facades. It appears that this cladding has been detailed to protect it from seismic movement, however it is not certain whether sufficient displacement has been allowed for to prevent falling hazards in large earthquake events. Around the building perimeter, a band of precast concrete cladding is anchored to the frames. It is similarly uncertain whether jointing and anchorage of this system allows for enough building movement, especially in the corner regions.

The structure appears to be generally in good physical condition. No significant material deterioration or foundation settlement was evident, though some paint flaking may lead to future corrosion. However, one of the steel braces appears to have been removed to allow for service equipment. The braces in this structure are proportioned to act in tension only; therefore, at least two braces are required along each frame line for a complete seismic system. One of the two braces does not exist along one of the brace lines. Seismic behavior may be erratic and not achieve the performance intended by design. The facility manager stated that this brace has never existed in his memory, which dates to a few years after construction. There is evidence that the brace was initially installed but cut free later.

It is not clear whether the seismic system could meet current design standards even if all designed braces were in place. The structure is light, however cladding elements add significant mass. The regular layout and distributed portal frames are good. The tension-only brace system, though permitted by Code for small structures, allows limited ductile response, and its use is penalized. A detailed seismic analysis would be required to confirm.

Photographic Documentation

Exterior Photos

Light steel frame with precast concrete cladding around perimeter near top, masonry cladding along long sides

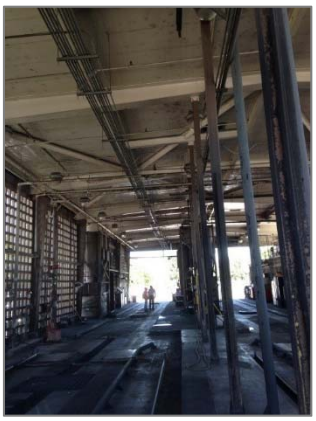
Typical short direction

Typical long direction

Interior Photos

Exposed steel structure. Light weight framing. Note missing seismic brace.

Missing seismic brace



Typical interior

Seismic Detailing

Ordinary concentric brace frame system used, with double channel braces. Braces are too slender to carry compression forces, so will behave as a tension-only system.

Masonry cladding is detailed for out of plane bracing to steel structure, but a gap is provided to allow steel structure to move in-plane a limited amount without damaging cladding. Out-of-plane movements may be a concern, including buckling of braces.

Top of brace connection

Masonry cladding bracing

Master Plan Recommendations

The proposed master plan recommends the expansion of this building in two ways. A new bay would be added to the longitudinal axis of the canopy, and a side structure would be added known as the “vaulting and vacuum equipment room.” It is presumed that the new longitudinal bay would mirror the structure already in place at the canopy roof level, as well as the portal structure supporting it. The side building may be a shorter structure, whose roof does not align with the main building roof. These two modifications, taken together or separately, would probably trigger a mandatory seismic review of the complete structure. The main structural considerations should be as follows.

The nature of the vaulting and vacuum equipment room structure may dictate the treatment of the canopy structure. For architectural reasons it may be desirable for the walls of this structure to be constructed of CMU block. The program appears to permit enough wall length for CMU shear walls to serve as the seismic stability system as well. However, such a system would not be very compatible with the existing seismic system of the main canopy. The detailed design should consider providing a seismic joint between this addition and the canopy in order to minimize the scope of change to the canopy seismic system.

The main canopy seismic system, even without the addition of the vaulting and vacuum equipment room, requires a detailed seismic evaluation to confirm that sizing of the bracing and portal frames is sufficient for the current code. It is likely that larger braces are required in the longitudinal direction in addition to the replacement of the removed brace described in the existing building assessment. Also, a few micropiles or soil anchors may be advisable at brace frame columns to address seismic uplift. Changes required through this evaluation are likely to be relatively limited in scope.

Bus Canopies

Existing Condition Assessment

The bus canopies are comprised of two large open canopy structures. The larger structure is 500 feet long by 68 feet wide, and the smaller is 284 feet by 68 feet. The roof high point is approximately 17 feet, six inches above grade.

The structure consists of bare metal deck supported by steel beams, which are in turn supported by concrete columns. Two rows of columns are along diagonal alignments parallel to the bus parking, whereas roof framing is rectilinear, parallel and perpendicular to the long dimension of the canopy footprint. Hence beams in the short direction do not span from column to column, but from column to girder. In addition, a 25-foot cantilever exists to both sides of the column rows. Short-direction beams are tapered built-up plate girders, whereas longitudinal beams are conventional wide-flange steel shapes.

Lateral forces such as wind and earthquake are resisted by the columns as cantilevered from the ground. Each column is supported by a concrete pier that penetrates approximately 8 feet into the soil. The steel framing is connected to the tops of columns by cast-in-place anchor bolts.

Columns are of robust dimension, but the reinforcement detailing shown in the drawings does not meet current seismic standards. In addition, the depth of foundation embedment may not be sufficient for current seismic loading. It may be desirable to perform a detailed seismic evaluation to establish the level of seismic risk if these canopies are to be included in the long-term plan for this facility.

The structure appears to be in good physical condition, though flaking of paint may lead to corrosion in the future. No evidence of damage to steel or concrete was evident that could compromise the structure.

Photographic Documentation

Geometric Configuration

Light steel frame with concrete columns. Column alignment is skew relative to roof framing alignment.

View from maintenance building roof

Typical framing


Column alignment

Typical Interior

Note paint flaking on metal deck.


Typical top of column

Master Plan Recommendations

The most probable structural concerns with the existing canopy design are the lack of tie reinforcement in the concrete columns and the relatively short foundation embedment depth. Code requirements are not as restrictive for a structure of this nature, and a detailed seismic evaluation could establish the extent to which the existing design would need to be altered. These concerns should be evaluated if the canopies are to be modified, such as suggested in the following components of the master plan.

It is understood that solar panels are intended to be added to these structures. Though the structure is probably robust enough to carry the weight of such panels under service conditions, the added weight may trigger a mandatory seismic evaluation of the structure, which may result in some retrofitting requirements. Such retrofitting may include wrapping of columns with fiber-reinforced polymer to compensate for the lack of existing tie reinforcement. If analysis indicates that the existing foundations are deficient, possible solutions could be to alter the connections between steel beams and concrete columns to reduce the flexural demands on footings, or to add micropiles.

The master plan includes the addition of a bus canopy over a currently uncovered area of the parking lot similar to the existing canopies. Architecturally, it may be desirable for this canopy to match the others in style. Structurally, this should be achievable; the structural modifications to the design suggested above need not greatly affect the appearance of the structure. Concrete columns could be constructed with more tie reinforcement, and foundations could be constructed deeper if necessary.

Proposed Passenger Amenities Building

The passenger amenities building would be a single-story structure approximately 70 feet by 140 feet in plan, with approximately half of its footprint occupied by an open canopy. Structurally, the building is simple and permits a range of possible systems.

To maintain consistency with other buildings on the site, a combination of steel and CMU systems may be appropriate for this building. The enclosed portion of the structure may consist of CMU bearing and shear walls. The walls should be at least 8 inches thick and solid-grouted with reinforcement similar to that in the maintenance building. Given the spans of 40 feet or more for the roof, a steel wide-flange framing system with light-gauge metal deck and no concrete fill may be most appropriate. Masonry pilasters or steel columns should be provided at major girder support points.

The canopy will be supported by columns on a grid of approximately 30 feet, which is most suited to a steel roof framing system. A steel X-brace frame should be considered for the northern-most column bay in the East-West direction; otherwise, the canopy may be laterally supported by the enclosed portion of the structure.

Shallow foundations would probably be appropriate for this structure. Strip footings should be located under CMU walls and an isolated spread footing under each column of the canopy.

To lower the embodied carbon of this structure, timber may be considered as an alternate design scheme. Glulam beams of sufficient depth can readily achieve the required spans. Light-framed timber panels for walls and roof can be pre-fabricated and craned in place to minimize waste and site time.

Mechanical, Electrical, Plumbing Assessment

Introduction

Arup North America Ltd was commissioned by Maintenance Design Group, LLC to provide a structural, mechanical, electrical and plumbing due diligence survey and provide input for the Master Plan of the Fresno Area Express site in Fresno, CA. This report provides the assessment and recommendations for mechanical, electrical, and plumbing.

Proposed Master Plan

The Fresno FAX site has five primary structures on site: Maintenance Building, Administration Building, CNG Fueling/Bus Wash, and two Bus Canopies (A&B).

The proposed Master Plan program proposes the following:

1. Maintenance Building: Mostly leave as-is with the exception of providing one new elevator, some space reconfiguration on level 1 and 2, new specialty bay addition, and new chassis bay.
2. Administration Building: Adaptive reuse; renovate existing 2nd floor and demolish existing low roof and build new second level addition.
3. CNG Fueling/Bus Wash: Adaptive reuse; building out new spaces for vacuum equipment, bathrooms/locker rooms; canopy extension, and admin spaces.
4. Bus Canopies: Currently have two existing canopies will be adding two more in the main area.
5. Build new public building: New structure, adjacent to the maintenance building.
6. Reconfigure and build new island layout for employee parking

General Comments

Plumbing

The following plumbing issues/recommendations are typical for all buildings:

Drinking water quality concerns. The existing galvanized steel piping for domestic water piping system may contribute to the bad taste. In addition, the incomplete Solar pre-heating systems if confirmed to be connected into current hot water system may be source of contamination. Further studies are required. To address

the drinking water quality issue, we suggest starting with obtaining current water quality report, and consulting a water treatment specialist to decide what treatment is required, and conduct a cost analysis to decide best approach among overall treatment, point of use treatment or use bottled water for drinking stations.

Regular roof cleaning/maintenance are required.

It seems some pipes have asbestos insulations - we suggest replacing with non-hazardous insulation materials.

Current plumbing fixtures are not supper low flow fixtures as required per current Cal Green Code - there is room to improve water efficiency.

If solar pre-heat system is restored, it can improve energy efficiency.

Some existing systems (such as solar pre-heating, reclaim water system) are incomplete; and some as-built drawings are not accurate/updated. We recommend commissioning service for future projects to ensure proper construction quality control, equipment operation, stuff training and maximize construction value.

For details, see specific comments for individual buildings.

Maintenance Building

Mechanical

There are eight evaporative cooling units, each with a gas fired burner, a two speed fan motor and filters on the make-up air and recirculation air. Filters were not accessible to inspect. All units were installed in 1982. Evaporative coils were retrofitted but in general require maintenance or complete replacement. Comments on individual units are included below.

- HV-1: Rated for 5,400 CFM/8,100CFM; 5 horsepower (HP);460 Volt/3 Phase/60 Hz; Gas burner: 500 MBH; serving Inspection shop
  - ✓ Observation: Not running during site visit.

Typical Heat & Vent (H&V): HV-1 Shown

- HV-2: Rated for 13,000 CFM/26,000CFM; 15HP; 460 Volt/3 Phase/60 Hz; Gas burner: 750 MBH; serving chassis, brake, weld, and dynamometer
  - ✓ Observation: Evaporative coil leaking onto roof and has build-up. Fans were running at the time of site visit.


HV-2 Unit Leaking to Roof

- HV-3: Rated for 4,900CFM /9,800CFM; 5HP; 460 Volt /3 Phase /60 Hz; Gas burner: 500 MBH; serving cleaning and tire shops and drum/pump room.
- HV-4: Rated for 7,000CFM/10,500CFM; 7.5HP; 460 Volt/3 Phase/60 Hz; Gas burner: 500 MBH; serving shops and storage under mezzanine
  - ✓ Observation: Running at the time of the site visit. Water is not being distributed well among the evaporative coil.


HV-4 Evaporative Coil Damage

- HV-5: Rated for 6,500CFM/19,500CFM; 10hp; 460 Volt/3 Phase/60 Hz; Gas burner: 250 MBH; serving body shop and storage on mezzanine
  - ✓ Observation: Leaking to floor below. Evaporative section requires maintenance, currently has water only running across top section of coil.
- HV-6: Rated for 1,300CFM/3,900CFM; 2HP; 460 Volt/3 Phase/60 Hz; Gas burner: 250MBH;serving paint preparation
  - ✓ Observation: Running at the time of the site visit. Distribution of water along evaporative cooling coil section is adequate.


Leak from HV-5 to Floor below

- HV-7: Rated for 2,400CFM/3,600CFM; 2HP; 460 Volt/3 Phase/60 Hz; Gas burner: 250 MBH; serving paint shop-center bay
  - ✓ Observation: Running at the time of the site visit. Distribution of water along evaporative cooling coil section is adequate.
- HV-8: Rated for 1,400CFM/4,200 CFM; 3HP; 460 Volt/3 Phase/60 Hz; Gas burner: 250 MBH; serving paint shop-east bay.
  - ✓ Observation: Running at the time of the site visit. Distribution of water along evaporative cooling coil section is adequate.

There are six make-up air units on the roof (100 percent outside air). Fans are designed to run at constant volume with an evaporative coil and gas-fired burner. All units were installed with the original building in 1982. Comments on individual units are included below.

Typical Make-Up (MU) Unit

- MU-1: 9,700 CFM; 5HP;460/3/60; Gas burner: 500 MBH, serving steam cleaning make-up air
  - ✓ Observation: Intake shown on opposite side of design documents. Please see photo. FAX expressed concern about areas where re-entrainment was potentially happening; especially when painting booth exhaust is on, other areas in building smell the fumes.

MU-1 Intake near EF-15 & EF-11 (serving parts cleaning rooms)

- MU-2: 8,000 CFM; 5 HP; 460/3/60; Gas burner: 500 MBH; serving parts cleaning rinse booth make-up air

- ✓ Observation: Not running on the day of the site visit.

- MU-3: 7,600 CFM; 5HP;460/3/60; Gas burner: 500 MBH; serving parts paint booth make-up air
- MU-4: 18,400 CFM; 15HP;460/3/60; Gas burner: 1250 MBH; serving paint preparation paint/cure operating make-up air
  - ✓ Observation: Not running on the day of the site visit. Panel open. Damaged evaporative coil seen.

MU-4 Unit Control Panel

- MU-5: 18,400 CFM; 15HP;460/3/60; Gas burner: 1250 MBH; serving paint shop (center bay) paint/cure operating make-up air
  - ✓ Observation: Fan observed to be running but the coiling coil was not engaged.
- MU-6: 18,400 CFM; 15HP;460/3/60; Gas burner: 1250 MBH; serving paint shop (east bay) paint/cure operating make-up air.
  - ✓ Observation: Unit was not running on the day of the site visit. Unit designed to be interlocked with EF-34.

Master Plan Recommendations

Based on the reconfiguration of the paint booth and prep area, it is recommended that the equipment serving this area be removed and redesigned. The following equipment is to be demolished and replaced with a central system or a packaged paint booth unit including equipment with mechanical system:

- MU-3,4,5, and 6
- HV-3 and HV-4
- EF-10, 16, 17, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, and 34

An evaporative cooler is located in lieu of EF-2 shown on original design documents. EF-2 was supposed to serve the inspection pit and hoist pits. This unit appears to be in poor condition and evidence of algae was seen on the evaporative coil.

Evaporative Cooler (not on original drawings)

Master Plan Recommendations

Recommend replacing this system and modifying to serve the needs of the current space - PM Inspection. Currently only EF-1 serves the PM Inspection

There are (2) standalone units

- AC-1
  - ✓ Carrier Weathermaker I DX Unit 3,000 CFM; 3HP;460/3/60; Gas burner: 150 MBH; serving offices, toilet/locker rooms, lunch room and first aid room
  - ✓ Observation: Rust on top of condenser section and damaged fins.

AC-1 DX Carrier Unit

- AC-2
  - ✓ Two to three year old new DX (R-410A) heatpump. Model: BBUZ-F030AA; serving two offices.
  - ✓ Observation: Unit in good working condition and minor maintenance is required.

AC-2 New Heatpump Unit

There are 34 exhaust fans (EF) on the roof from the original building. EF-35 is no longer on the roof, which originally served toilet, locker, and janitor rooms. EF-2 is no longer on roof as well, as described previously. The fans are all single speed and differ in size from each other (range from 84 CFM to 18,000 CFM). The electrical service for all fans with motors of 1/2 HP and larger is 460 Volt/3 Phase/60 Hz and all fans with motor less than 1/2 HP is 115 Volt/1 Phase/60 Hz.

From Right to Left: EF-14(CNG Detection System), EF-34, EF-30

EF-9- Noisy Fan

Control of the fans varies between interlocking with HVs, activated by a temperature setpoint, or manual on/off. Control of equipment is an on-going issue on site, since different controls contractors are called on to site. The system is modified by a certain contractor and currently not documented or the contractor might not return to site; therefore the knowledge of modifications on site is lost.

EF-22 is no longer in use. Fan served battery room, which is now used as an electronics work room. The sidewall exhaust fan is located near the main entrance of the building and staff no longer operates.

There are 17 new centrifugal upblast fans located on the roof. These fans serve the compressed natural gas (CNG) detection system. Age of fans is unknown but at least 10 years old based on the equipment brand which has been rebranded to PennBary. While on site, the alarm went off and the fire department came. FAX discussed with the Arup team that there are issues with this alarm system; it is currently very sensitive and sets off alarms during non-emergency situations. The fire department comes and since there is no real emergency FAX is charged with the call. Detection sensors are on a five-year schedule to be replaced. System and controls should be thoroughly reviewed in order to reduce alarms.

Master Plan Recommendations

Recommend that all EF's control be checked and documented. Depending on use and functionality, exhaust fan shall be evaluated to either be replaced with new high efficiency exhaust fans or motors replaced with high efficiency motors with variable frequency drives (VFDs).

Provide new evaporative cooling make-up air unit and exhaust fan for new chassis bay addition. (~3,000 cfm)

Mechanical assumes that bathroom remodel on 2nd floor does not have new fixtures and therefore existing capacity is adequate. Team did not inspect shower ductwork to verify that replacement is not necessary due to damage caused by humidity in space. Contractor to verify.

There is one supply fan in the building serving the mechanical room - 600/1800CFM; 1/3HP; 115/1/60.

SF-2- Inline Centrifugal Fan in Mechanical Room

HVAC ductwork for supply, return, and exhaust are punched thru the roof. HVAC supply and return ductwork are not insulated. Ductwork has been painted depending on the system it is serving. Paint on ductwork has helped with sealing.

We did not inspect the filters in HVs and MUs because they were not accessible but recommend to change based on dirt build-up on grille. See photo.

Typical ductwork in building

Grille in wall

The paint booth has a specialty exhaust system was designed to exhaust air at the bus when painting was occurring. This system is planned to be decommissioned since most of the painting is

occurring on the table and whole bus paintjobs are not being performed in this space any more.

Specialty Paint Booth Exhaust System

Master Plan Recommendations

During installation of new mechanical system, it should be confirmed that there is no entrainment from new exhaust system into outside air intake for the rest of the Maintenance Building.

There is one air compressor (CA) serving the pneumatic controls for the building HVAC equipment. ; 460 Volt/3 phase/ 60 Hz.

CA-3 located in Mechanical Room

CA-3 is rated for 2.0 SCFM; 1/2 HP Unit appears to be in good condition. Overall control and system line pressure should be tested and sealed.

There are a total of nine Gravity Roof Ventilators (GV) serving the building. GV-9 is rated at 750 CFM and serves the elevator shaft. All other GVs are used for relief throughout the building. GV-3 is scheduled as an intake point in an unnamed room between the Dismantling Room and Drum Storage Room.

Typical Gavity Roof Ventilator

Master Plan Recommendations

Based on addition of new elevator, gravity ventilator may be required or coordination of mechanical elevator requirements must be discussed with elevator manufacturer.

Electrical

Electrical service to the Maintenance Building comes from four sets of four #500 MCM cable in four-inch PVC conduits. These cables terminate in the General Electric AV-Line main distribution panel (MDP) which contains the PGE meter and service disconnect. The gear is comprised of three sections with the right most being dedicated for distribution. It is rated for 277/480V, 3Ph, and 1600A; it has two spaces and one spare breaker available. The spare breaker is in the ON position; to prevent shock it is recommended to be switched OFF if not in use. The equipment is good working condition and has capacity for additional loads.

The Main Distribution Panel (MDP)

Nameplate for Main Distribution Panel

The switchboard contains a PG&E meter, a set of analog meters, and a GE ‘MicroVersaTrip Plus’ meter/breaker. The load during the site visit on June 18, 2014 was approximately 180A per phase as measured by the MicroVersaTrip unit. Pulling the electrical usage history from the PG&E statements will show the load on system throughout the year. This will give a more accurate understanding of the building’s peak electrical demand. There is a set of analog gauges measure voltage, current, energy, and power factor. At the time of the observation the power factor gauge read 0.76, lagging. This could be improved by replacing existing motor controls with more modern VFDs or adding power factor correction equipment.

A Set of Analog Gauges

Master Plan Recommendations

Battery cabinet in main electric room

An inquiry to General Electric about the "AV-Line" main distribution panel (MDP) verifies that the panel can accommodate additional loads and the circuit breakers (THED) are still in production. We suggest installing breakers as needed to feed (a) the new 'Public Building' (b) the new elevator and (c) bush chassis wash equipment.

The recently adopted 2013 version of California Energy Code, Title 24, requires the separation of electrical loads. For this size service (>1000 kVa) separation of the following loads will be required: lighting, HVAC, plug loads, appliance over 25kVa, and load centers (panels) over 25 kVa.

Current Transformers Installed In a Panel

This could be achieved physically separating the loads in to different panels or by grouping similar circuits in to current transformers as seen in the image to the right and connecting them to meters.

For a simple final solution and more free space, existing panelboards can be replaced and loads sorted and organized in new smaller, higher capacity panels.

The biggest issue in this building is the mix of plug loads with equipment loads in panels located outside the electric room.

New products are being developed released to offer solutions to these metering requirements and a solution should be researched more thoroughly when the design is being created.

A generator is located outside the main electric room and supply emergency power to equipment connected to Panel 'EMA'. Its transfer switch is rated for 277/480V, 3Ph, and 225A. It seems to be in good working condition and properly maintained.

The maintenance building generator

The generator log shows that the generator is getting regular testing and maintenance.

Generator Log

Master Plan Recommendations

Replacement of the maintenance buildings generator was suggested. Based on the site plan we think the current location is the best option. The generator pad size can be increased in size if required. Screening may be installed to hide the generator if proper clearances are maintained.

Panel 'PB' needs a proper cover plate instead of tape.

Panel 'PB'

Proper schedules should be created

Panel schedules have handwritten corrections and some are falling apart. Updated printed schedules should be installed.

Panel 'PC' has exposed live conductors. A cover plate should be installed.

Panel 'PC'

The 'Gas Evacuation Control Panel' produces regular alarms signals that force evacuations and a fire department visit. The system should be inspected and serviced as needed.

Gas Evacuation Control Panel

An extension cord on the roof provides temporary power to a small pump in a rooftop HVAC unit labeled '11V8'. The California Electric Code prevents this usage in Section 400.8.


Extension Cord on Roof


Extension cord power a small pump

The receptacle inside the HVAC unit '11V8' should be inspected and repaired so it can power the pump.

The rooftop receptacles covers are weathered and may allow water to enter. The receptacle face shows signs of water damage. This particular receptacle shared conduit with the exterior lighting mounted on the roof. New waterproof covers should be installed.

Controls should be labeled as to which equipment it serves. Some controls equipment might be abandoned and should be removed.

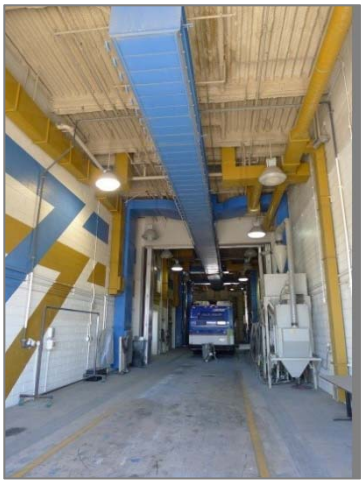

Controls equipment


Rooftop Weatherproof Receptacle

Some breakers are fitted with trip locks to prevent an overcurrent event from tripping the breaker. These are to be used be used for fire alarm circuits only and should not be used to prevent nuisance trips. The circuit shown in this image is label as “New 2nd Floor Office Plugs” and should be investigated. Newer breakers can trip even if in held in the “ON” position per CEC 240.80. It is unknown if these breakers are up to that standard.

Panel ‘P4’

Lighting fixtures and controls throughout the building are outdated. We recommend replacing fixtures that need repair with modern equivalents. Many of the spaces are supplemented by day light though open garage doors or skylights. We believe that the existing lighting levels may cause issues at night or days when the weather prevents leaving garage doors open. Some area like the shop or paint booth should have higher levels of illumination because of the detailed tasks being carried out. The area labeled “Dismantling Parts and Cleaning” is prone to getting dirty and should be cleaned regularly to maintain proper illumination levels.



Paint Room With Garage Doors Open

Light Fixture Dirty in Area ‘111’

Master Plan Recommendations

Changes to the interior spaces may trigger a requirement for the entire space to be compliant with the 2013 California Energy Code. Refer to Table 141.0-E and Table 141.0-F. Potential lighting requirements include occupancy sensing, dimming, and demand response.

Plumbing

The maintenance building was constructed in 1982. There are solar heating tank / piping partially installed. There are sprinkler systems throughout the building and in working condition. No internal standpipe system.

Leaky roof (under a roof Air handling unit which is leaking)

There is standing water on the roof from leaky Mech. system - indicating insufficient roof slope or roof has not been installed properly.

Overflow roof drain was used as conduit for cables. We recommend rerouting the cable and return the overflow roof drain to its intended usage.

Domestic water does not have backflow preventer for each individual building.

For industrial water they do have Reduced Zone Backflow preventers installed.

Master Plan Recommendations

Restrooms seem to be not ADA compliant. Reconfiguration to address this issue.

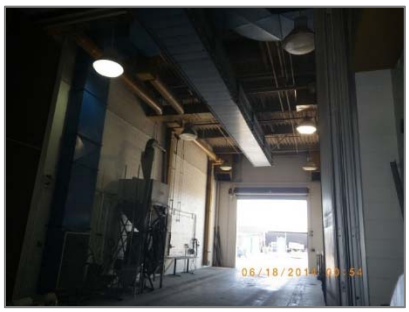
Newly installed compressors are located in exterior shed, are in working condition.

If the new Chassis bay addition is going to happen in this location, these air compressors will need to be relocated.

Two storage type gas fired water heaters are in working condition. Heaters to be A.O. Smith BT 80 112; 80-gallon, 75 MBH each.

Master Plan Recommendations

The Paint shop/booth will be re-configured. We recommend that the sprinkler layout to be re-evaluated and revised per the new layout. All MEP services penetrating new fire separations will need fire rated sleeves.

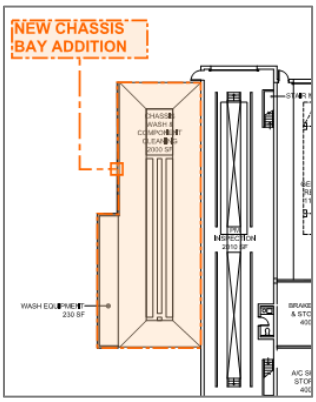


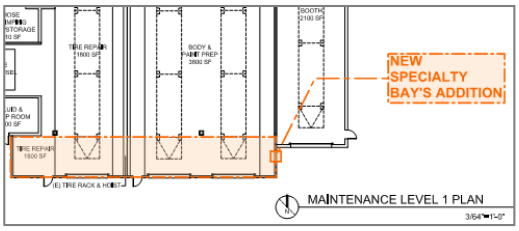
Steam/hot water cleaning system is in working condition

There is a wet filter system for a small fixed paint booth to the exhaust; it is currently not working and not in use. We recommend replacing the wet filter system with dry filters if the filter system will be required in the future.

The New Specialty Bay Addition and New Chassis Bay Addition may need addition/new roof drain/overflow roof drain and sprinkler systems.

New industrial water may be required at the new equipment wash.





If new hydraulic elevator is added, we suggest to check with local plumbing inspector to see if elevator pit pump and oil interceptor for the discharge are required per AHJ; although they are not required by current California Plumbing Code.

Administration and Operations Building

Mechanical

There are two AC units on the roof with prefilters, supply and return fans, with a heating and cooling coil. The coils are served by a boiler and two chillers. The zone level system is a dual duct system, which means that there are two sets of mains (hot and cold ducts) which serve control boxes located in the ceiling. The box dampers vary the flow of hot and cold into the box in order to meet the room temperature setpoint.

While on site, we were told that the fans had been rebuilt two years ago because of severe damage.

- AC-1 (Equipment No. 12): 6955 CFM; Supply fan-7-1/2hp; Return fan 2 HP; 480 Volt/3 phase/60 Hz; Heating Coil: 263MBH; Cooling Coil: 189MBH
- AC-2 (Equipment No. 13): 8960 CFM; Supply fan-7-1/2 HP; Return fan 2 HP; 480 Volt/3 phase/60 Hz; Heating Coil: 335MBH; Cooling Coil: 261.3MBH

AC-1 and AC-2 located on the roof

Filters do not appear to fit within the filter bank. Recommend upgrading the filter type used in the units.

Prefilters in the Units

Before the filters: dirt in the units

There is dirt within the units and recommend to clean, if units are to remain.

Post Filters in Fan Section of Units

Currently there is a significant amount of air leaking from the access doors at the fan section of the unit. Recommend using a gasketed door to seal.

Leaky Access Doors

There is one York packaged heating and cooling unit on the roof. Rated at two tons of cooling; Heating: input gas (45,000 BTU/hour)

This unit is at least 10 years old based on equipment tag. Uses R-22, which is a refrigerant that has been phased out. We recommend replacing this equipment and disposing of properly.

York Model D1NH024N03606C

There are four exhaust fans located on the roof and two exhaust points - an exhaust hood and exhaust 12-inch round riser.

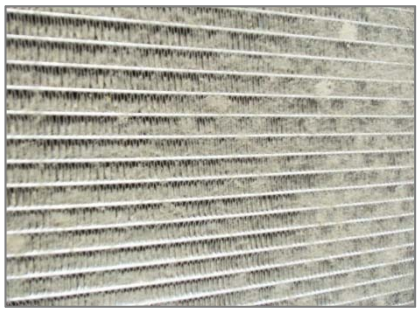
Exhaust Hood

Each exhaust fan is between 415-1200 CFM; 1/4 HP; 120 Volt/1 Phase/60Hz.

Chiller Yard is located adjacent to the building. There are two air cooled chiller. Both chillers have been having issues with tripping. Contractors have not been able to resolve issues with chillers. Potential issues: (a) communication between newer direct digital controls (DDC) and outdated pneumatic controls or (b) issues with part-load conditions causing tripping.

Chiller Yard

- CH-1- three years old
  - ✓ Carrier Model 30RAP0256DA01100
  - ✓ 25 tons



CH-1 Condenser Section blocked. Could lead to tripping if air path is blocked.

- ✓ 460Volt/3 Phase/ 60Hz; MCA-57.8

- CH-2- five years old
  - ✓ Carrier Model
  - ✓ 30RAN025---611KA
  - ✓ 25 tons
  - ✓ 460Volt/3 Phase/ 60Hz; MCA-50.3
- Two chilled water pumps Each 2 HP;460 Volts/3 Phase/60 Hz

Exterior Chilled Water Pump Damage- CH-2

One pump motor recently replaced, other one has not been.

Master Plan Recommendations

Exterior Piping

Based on the master plan schedule, the air-cooled chillers will be between seven to nine years old when this phase begins to go into design; typical equipment lifespan is 20-25 years therefore it is recommend that chiller system be commissioned properly to diagnose issue of failure. Recommend to fix any damaged piping insulation in the immediate future and clean the condenser section of CH-1.

Recommend that the existing air-handlers be properly sealed and cleaned immediately. These units shall be replaced with two new units for the remodeled and retrofitted space.

Based on addition of new elevator, gravity ventilator may be required or coordination of mechanical elevator requirements must be discussed with elevator manufacturer.

Heating hot water system is located in mechanical room of building. System consists of:

- One output 620 MBH gas-fired hot water boiler
- Two hot water pumps 3/4hp and 1 HP; 460Volt/3 Phase/ 60Hz;

Heating Hotwater System

The 3/4 horsepower motor has been recently replaced a few months ago.

There is one air compressor in the building serving the HVAC equipment.

Unit appears to be in good condition. The compressor was recently rebuilt on this unit.

Master Plan Recommendations

Overall control and system line pressure should be tested and sealed.

Recommend when the building upgrade occurs that a new direct digital control (DDC) system is installed and all pneumatic piping is removed.

Pneumatic Thermostat

Air Compressor

Electrical

Electrical service to the Administration building is fed from the Bus Wash Island. A 277/480V, 3-phase, 400A circuit from the 'Bus Wash Main Switchboard' supplies 'Distribution Panel D' located in room 210 of the Administration building. The electrical equipment appeared to be in good condition and layout matches the constructions drawings from March 1981. It is recommended to install a meter to measure the building's electrical demand. This could be a temporary meter for a minimum of 24hrs to get a snapshot, or a permanently installed meter. It is likely that a new 277/480V-120/208V transformer will need to be installed to support a new addition's 120V loads.

Utilities - Room 210

The existing panels have space for additional breakers and some spares already installed. Moderately sized new loads can be added without replacing equipment. An SCCR study should be performed to verify overcurrent devices are capable interrupting available fault current.

Utilities - Room 210- Panel F

The room is a shared space and an effort should be made to mark off the required working clearances of the electrical equipment. User should remove combustible materials and prevent obstructions like the cable reel in the photo. The open wall shows that some minor electrical work has been done since the construction. Fire block may be required here and the hole in the wall should be patched.

Utilities - Room 210

Master Plan Recommendations

We recommend reusing Panel “D” and replacing panels “H”, “F”, “L”, “EB”, and “E1”. A single 480/277V panel can be used to supply all lighting loads in the building while a 120/208V panel for each floor will power plug loads. The elevator and HVAC system can be fed directly from Panel D by installing new breakers and utilizing the spaces feeding the existing HVAC system. The panels mentioned above could be reused if cost is an issue but an additional panel may need to be added. Permanent metering provisions should be installed and should be compliant with 2013 Title 24 requirements.

This Gould ITE Motor Control Center (MCC) powers the buildings HVAC equipment. If the HVAC system is replaced this MCC may be used to power the new equipment or removed. The MCC is rated at 277/480V and 225A. The 1981 drawings show that the chillers are powered from this MCC; our

Utilities - Room 208

observations were that the chillers have been connected to 'Panel D' in the utility room.

Panel Schedules should be verified and then typed and printed. Old schedules and markings on the panels should be documented and removed.

Typical Panel Schedule

Master Plan Recommendations

Changes to the interior spaces will trigger a need for compliance with the 2013 California Energy Code. Refer to Table 141.0-E and Table 141.0-F. Potential lighting requirements include occupancy sensing, dimming, and demand response.

Plumbing

Most plumbing fixtures are in working condition and are from original installation - not low flow accessible type.

One of the water closets in one of the restrooms is leaking.

The faucet and drain are leaking in Women's restroom.

One gas fired water heater is in working condition.

The Temperature and Pressure relief valve discharge pipe is piped up for steam vent and only a very small 1/4 inch) pipe extended to drain. This is a safety issue. We recommend replacing this small pipe to the same size of the relief valve discharge and piped to drain for safe Temperature and Pressure relief.

'Solar pre-heating' system for domestic hot water system is incomplete. There is a tank, with piping from ceiling and circulation pump, but there is no solar panel on the roof. The incomplete system is piped to pre-heat the domestic water to the heaters. It seems that the

valves are open - this ‘solar’ system is currently connected to the hot water system. Further investigation is required to decide either to disconnect the ‘solar’ system from domestic water system to prevent contamination or if they are in good condition, they can be completed and put into use.

Additional filters and tanks are installed replacing drinking fountains, and these took additional space in the corridors. Further studies are required to decide if actions are required to improve water quality/replacing existing domestic water system or just demo all filters, tanks and drinking fountains and replaced with bottled system.

Existing Roof drain/overflow systems are in working condition.

Overflow drain of the new addition are missing strainers. We recommend adding strainers.

Overflow scuppers seem undersized (should be the same size as the primary).

Master Plan Recommendations

The current intent for the new revision/addition to the building is not to change the existing restrooms.

New roof drain/overflow roof drain system revisions are likely to be required per the new roof layout.

Sprinkler coverage shall be re-evaluated and revised per the new layout.

Building is fully sprinklered with no standpipe. Floor control valve is located at exterior - it shows signs of corrosion.

Fuel and Wash Building

Mechanical

There is one DX split system serving the office in this building. Unit running at the time of visit. Requires confirmation that unit is on time clock but appears to be in good working condition and there are no known complaints in this office.

Master Plan Recommendations

Recommend relocating this existing unit into the new office built out with the canopy extension.

New break room and vaulting rooms shall be provided with split systems in these spaces to provide cooling.

Bathroom remodel at the west side of the building shall be provided with two new exhaust fans (75 CFM/fixture) and shower ductwork shall be provided with stainless steel ductwork and new exhaust fan.

New toilet and locker room on the eastside shall be provided with exhaust system.

Electrical

Electrical service to the Maintenance Building comes from three sets of four #500 MCM cable in 4-inch conduit. These cables terminate at the Main Switchboard

Master Plan Recommendations

We recommend replacing this Main switchboard. A newer switchboard rated between 1000A and 1200A with 1000A main breaker is recommended. A GE switchboard is used at the Maintenance building and we would recommend a GE Spectra Integrated Switchboard which would combine many of the existing transformers and panels in to one unit. This switchboard serves the bus wash island, the admin/ops buildings, and the future vaulting additions.

The Main Switchboard

A generator installed in the electrical room in the bus wash island building. The last date of service was May, 20, 2014 when a voltage regulator was replaced. The service log suggests annual visits with load bank tests have been performed. No monthly testing logbook was found.

Bus Wash Generator

A generator was discovered that was not shown on any of drawings provided. Its connection points were not discovered during the site visit. It was noted that the generator is 277/480, 3 phase, and is rated at 600kW/ 750kVA. It was manufactured in July 2005 and is installed near the CNG compressors, adjacent to the bus wash island.

Generac Generator

The vacuum system seemed to be in good working order electrically. It was mentioned that the system may be replaced in the future. We see no issue in routing power to a new system in the future. Modern systems may have a better power factor and higher efficiency.


Bus Vacuum System

Bus canopy's solar components at the bus wash island are in good condition. The two solar panel installations are independent and connect separately to the Main Switchboard in the bus wash island.


Solar Panel Equipment

Panel 'A' contains an unlisted part which is being used as a cover plate. Source and install proper cover plate.


Makeshift cover plate

Master Plan Recommendations

Changes to the interior spaces will trigger a need for compliance with the 2013 California Energy Code. Refer to Table 141.0-E and Table 141.0-F. Potential lighting requirements include occupancy sensing, dimming, and demand response.

Plumbing

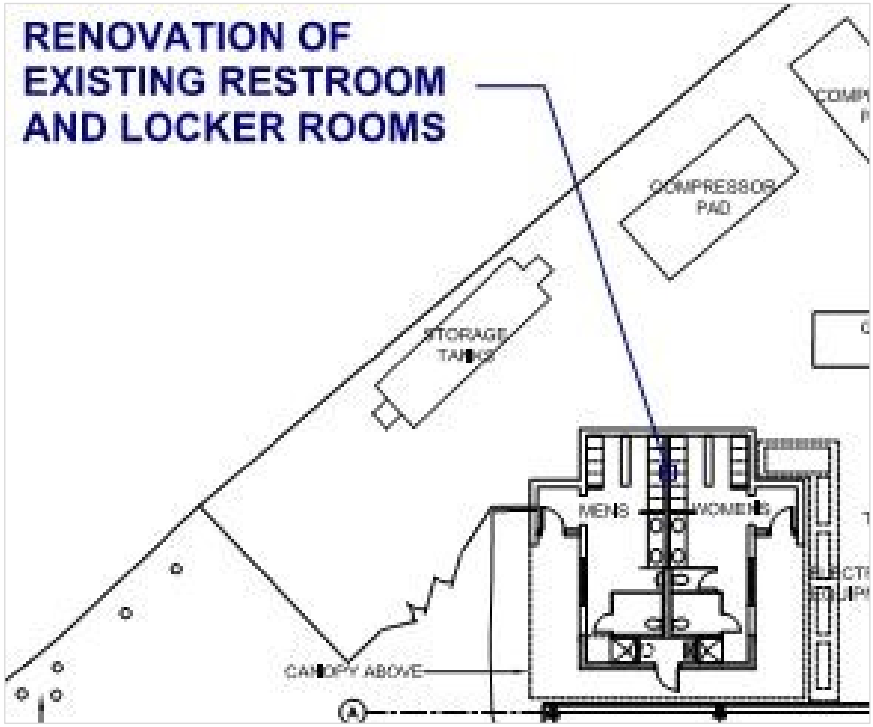
Reclaimed water system for bus pre-rinse is incomplete, requires further investigation. If restored, it can improve water efficiency.

Plumbing fixtures in the restrooms are in working condition, are mostly from original installation.

Restroom roofs show signs of leakage, seems have been fixed.

Master Plan Recommendations

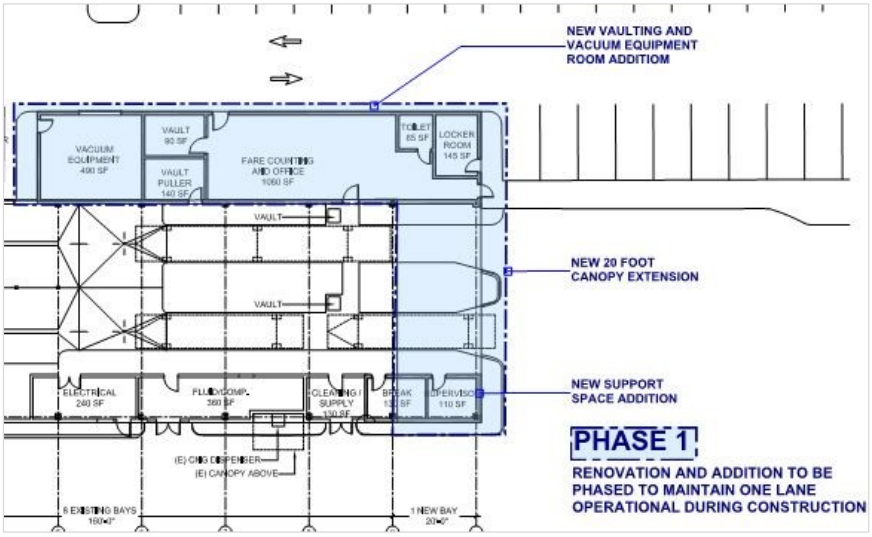
The new layout will add two showers in the bathroom. New water heater may be needed (maybe in the Janitor's closet) to meet the new shower demand.



The extension of the canopy, New Support space addition and new vaulting and vacuum equipment room addition will require

revision/addition of existing roof drains/overflow roof drains and sprinkler systems.

There is a new restroom to be added that requires new domestic water connection, 4-inch sanitary drainage and 2-inch vent (3-inch vent through roof). Electrical water heater may be added to supply Lavatories.



Bus vacuum systems are in working condition and about to be decommissioned.

The building is fully sprinklered with no standpipe.

Storm water piping is not properly supported. We recommend fixing the supports.

Compressed air system is in working condition.

There is no floor drain/floor sink near the compressor for condensate. We suggest provide proper drainage for this area.

There is intent of adding new CNG compressor beyond the current CNG storage area.

The current two CNG compressor and dryers for the incoming NG are in working condition.

Sump pumps and clarifier are in working condition.

Recycled water system seems to be incomplete and not in use currently, requires further investigation to bring it back to working condition for pre-rinse for bus wash.

Bus wash/final rinse RO water system are in working condition.

Bus Canopies

Electrical

The solar panel installation was not directly accessible at the time of the visit. The panels were observed from the roof of adjacent buildings and appeared to be dirty. Cleaning panels would produce more energy, which should be monitored before and after cleaning.

Canopy Solar Panels

Bus canopy's solar components under the canopy are in good condition. Each canopy has a separate solar panel installation and both are independently connected to the Main Switchboard in the bus wash island.

Master Plan Recommendations

The new 20 stall bus canopy shall have a new panel installed and can be sub fed from the panel in the existing 28 stall canopy. If new air compressors are to be located in the new canopies their loads should be reviewed to verify capacity exists. We feel that the 11 bus canopy loads can be fed directly from a panel in the maintenance building's electric room.

Solar Panel Equipment

Changes to the lighting will likely trigger a need for compliance with the 2013 California Energy Code. Potential lighting requirements include occupancy sensing, dimming, and demand response.

Plumbing

Canopies are fully sprinklered with no standpipe. The sprinkler system is regularly inspected and maintained. There was a recent fire in one of the canopies, the sprinkler system worked properly.

It seems that the Canopies have roof drain and overflow roof drain systems installed properly.

Master Plan Recommendations

Sprinkler coverage for the new bus canopy shall be added.

Proposed Passenger Amenities Building

Mechanical

This new building shall be provided with new exhaust fans.

- Passenger Amenity Storage: 1.5 CFM/square foot
- Materials Storeroom Overflow: 1.5 CFM/square foot
- Toilet: 75 CFM/fixture
- Electrical room: 1.5 CFM/square foot or DX split system may be required.

No cooling has been assumed for this building under the Master Plan.

Electrical

Please see discussion under maintenance building.

Plumbing

There is a new restroom to be added that requires new domestic water connection, 4-inch sanitary drainage and 2-inch vent (3-inch vent through roof). Electrical water heater may be added to

supply Lavatories. The storm drainage/overflow systems for new canopy and the new building roof will be required.

The Fire Protection requirement such as the sprinkler coverage etc. shall be re-designed and revised accordingly.

Currently, gas and industrial water and compressed air are not required in the new Public Building.

Maintenance and Service Equipment Assessment

The Maintenance and Service Equipment Assessment section addresses the equipment used in the maintenance and servicing functions; generally those found within and around the Maintenance Building and Fuel and Wash Buildings. Equipment was assessed based on visual and functional observation, estimated age of equipment, user interview, obsoleteness, and conformance to the master plan. The section generalizes observations by building, equipment category, and Maintenance Area. For more specific equipment observations, refer to *Appendix A - Existing Maintenance & Service Equipment Photo Inventory & Assessment*.

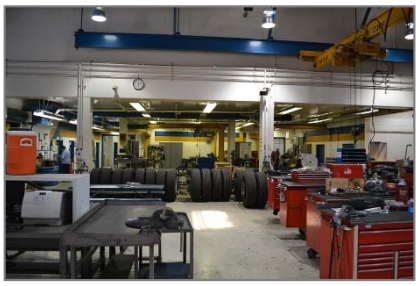
It should be noted that given the age of the facility (30+ years) and the amount of original equipment still in operation, FAX has done an exceptional job of maintaining their facility. Many pieces of original equipment observed in operation were in decent working order. Even so, the equipment lifespan has reached or is nearing. FAX has created this opportunity to replace and update equipment with modern, safer and more efficient equipment that will once again give them a state-of-art bus maintenance facility.

Maintenance Building

The Maintenance Building was built in the 1980s. From general observations, many of the existing equipment was installed during initial building construction and therefore is in need of modernization. FAX maintenance operations have changed in some fashion over the course of the past 30 years. Centralized functions originally designed into the building involved major engine and component rebuilding including heavy equipment workbenches, overhead cranes, and welding and cleaning functions. Currently, these needs are performed off-site through contract. Some of the original equipment in the centralized repair areas were removed or decommissioned, others are still in-place

although no longer, or infrequently used. These central repair and cleaning areas are currently underutilized as storage, break and common working areas.

Centralized Repair Area

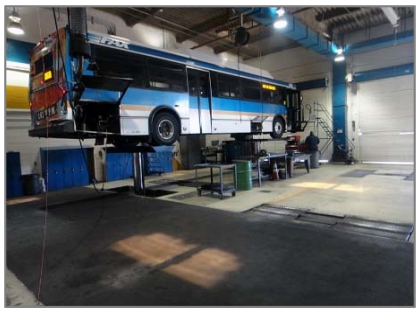


Centralized Repair Area

General equipment categories are discussed below and not further discussed within each Maintenance Area sub-section.

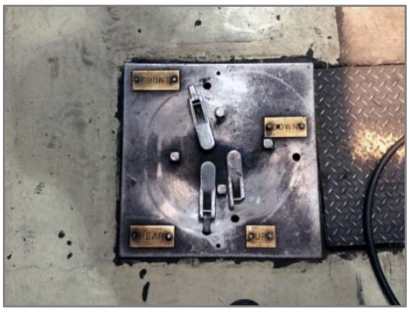
Vehicle In-Ground Lifts

1980s buses were generally shorter and lighter than modern buses. 1980s buses ran on diesel fuel and had higher passenger decks than modern buses. Existing major maintenance equipment, such as vehicle in-ground drive-on and axle engaging lifts are currently operating at or near maximum weight capacity. Operating the equipment in this fashion leads to quicker deterioration and carries a potential safety risk. It is inefficient and not feasible to replace 30-year old in-ground lift components to raise lift capacity to meet modern bus capacity and safety requirements. Existing lift controls offer independent although imprecise front and rear piston control. Those controls are either floor or wall mounted. Further, the existing lifts require a lift pump station that takes up considerable



Repair Bay - West

Non-Operating Lift - Repair Bay - 3



Floor Lift Controls - Operational

amount of floor space. Modern equipment houses hydraulic lift motors and consoles in one console capable of providing better control and pre-programmed settings for multiple bus models.

Wall Lift Controls - Operational

Lift Pump Station

- In-ground bus lifts are drive-on or axle-engaging.
- Lifts are original to building construction but work was done to them.
- Over time, lifts had had multiple repairs.
- Some lifts have broken and their controls removed; see *Appendix A - Existing Maintenance & Service Equipment Photo Inventory & Assessment*.
- Broken in-ground repair bays use portable lifts.
- Replace in-ground lifts with modern axle-engaging lifts. Remove old lift pump stations to free up floor space.

Lubrication Fluid Dispensing and Waste System

Distribution System

The Lubrication Fluid Dispensing System consists of dispensers, fluid management system, hose reels, distribution tubing/ hoses, pumps, above ground storage tanks, and below ground storage tanks. The system originates in the Drum Storage and Pump Room, centrally located on the west side of building. Within the room, wall and tank mounted fluid


Drum Storage & Pump Room


Drum Storage & Pump Room

pumps supply Engine Oil, Gear Oil, Automatic Transmission Fluid, and Chassis Grease into the fluid distribution tubing. Above

Drum Storage & Pump Room

Drum Storage & Pump Room

ground storage tanks and drums within the room contain Gear Oil and Chassis Grease. Engine Oil and Automatic Transmission Fluid are fed from 6,000-gallon underground storage tanks that are located outside of, and adjacent to, the building in this area.

The tubing then distributes the fluids to the repair and inspection bays located north of the Drum Storage and Pump Room. There were no complaints heard and no deficiencies observed with the fluid supply pumps and distribution piping, therefore it is assumed that the pumps, piping and tanks are in fair working order.

Lubrication hose reels observed throughout the repair and inspection bays had visible wear on the reels, flexible hoses and connections between the hard tubing and reels. Fluid buildup observed on the majority of reel banks was consistent with the age of the system. Lubrication reels, hoses and dispensers within the Inspection Pits were either not working or in a considerable wear state.

Hose Reels

Inspection Shop Reels

Inspection Shop Reels

Fleet Watch Fuel Force Fluid Management System was observed operating in the Inspection Shop and West Repair Bays presumably monitoring use of Engine Oil, Gear Oil and Automatic Transmission Fluid.

Fluid Management

Inspection Shop also has additional above ground storage tanks with for SAE 15w-40 Engine Oil (currently not hooked up) and Diesel Engine Oil with tank mounted pump and reel dispenser.

Inspection Shop Tanks

As a summary:

- Fluid supply pumps in fair operating order however given the opportunity, replace with new and keep old as backups.
- Hose reels, dispensers and connections are worn or not working. Replace with new.
- Inspect the fluid management system for correct operation. Update software as necessary.

Waste Fluid

Within the Inspection Shop, Waste Engine Oil is collected through a rolling drain pan in the Inspection Pit that is connected to a waste oil pump located in the lower level. The waste engine oil is pump from the Inspection Pit underground to an exterior 2,000-gallon underground storage tank located adjacent to and west of the building. There is also a connection from the oil filter press located on ground level, to the underground waste oil tank.

Waste Oil Pump

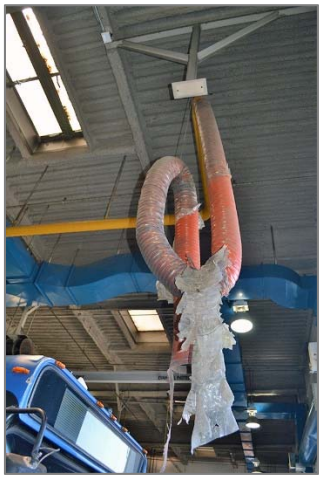
Within the repair bays, waste oil collected through portable oil collection equipment is then emptied into a centrally located a collection sump and then pumped underground to the underground waste oil tank.

Rolling Drain Pan

- Rolling drain pain damaged. Replace with new.
- Replace waste oil pumps and collection sump with new.
- Repair leaks or clean area near oil filter press.

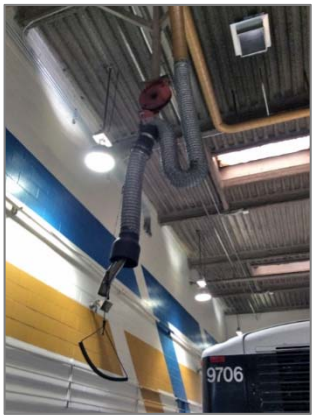
Vehicle Exhaust Extraction System

Having an operating vehicle exhaust system allows bus engines to run while inside the facility with simultaneous inspection or testing to be performed. The facility was designed with two separate vehicle exhaust extraction systems consisting of exhaust hose drops intended to be connected to bus tail pipes, overhead mechanical ductwork and rooftop mounted exhaust fans. Refer to the mechanical assessment for discussion on exhaust fans. The exhaust extraction systems are divided between the East Repair Bays and Inspection Shop and the



Non-Operational Hose Drop

West Repair Bays and Inspection Shop. The vehicle exhaust system was designed for manual start and stop through column mounted push button controls. The majority of tail pipe exhaust hose drops were in disrepair and not used. Some tail pipe hose drops were observed intact. These were observed to have been replaced with CNG capable hoses.



Operational Hose Drop

Modern exhaust hose equipment can handle higher CNG temperatures, has motor operated reels, multiple adapters for different manufacturer's tail pipe configurations, and can be individually operated allowing energy conservation.

- Replace all tail pipe hose drops with individually operated modern hose reels capable of handling both CNG exhaust temperatures.
- Provide exhaust hose reels for all repair and inspection bays.

Compressed Air System

All maintenance and service facilities require compressed air to operate permanent equipment that utilizes hydraulic or pneumatic motors, such as lifts and presses, portable equipment and tools. Compressed air is also used to pressurize vehicle tires. The compressed air system in the facility is supplied compressed air from two air compressors located exterior of the building along the south wall outside of the paint shop. Air dryers were not observed on the system. Air


Air Compressor


Radiator Repair

Air Compressor

compressors supply compressed air throughout the facility through piping distribution system. Equipment is either connected to the compressed air system through hard connection or hose connection to a filter/ regulator assembly. Compressed air convenience connections are located throughout the facility mainly consisting of a filter/ regulator assembly. Compressed air supply to

Compressed Air Outlets

Compressed Air Outlets

Compressed Air Outlets

Compressed Air Outlets

the repair and inspection bays are through wall mounted convenience outlets mentioned or through wall, column, or overhead mounted hose reels. A large number of wall/ column mounted convenience outlets were observed turned off or disconnected because they were either inaccessible (located behind portable equipment or shelving). Many were however observed in sufficient operating order. Many outlets contain components by different manufacturers. Further, compressed air hose reels were generally in good condition. There was no complaints heard and no deficiencies observed in the compressed air distribution piping, or air compressor equipment. Although, the east air compressor that is water-cooled, contained repaired damage to its radiator.

- Determine which compressed air outlets are being used.
- Replace wall and column mounted compressed air outlets with equipment from the same manufacturer throughout the facility.

- Replacement equipment should consist of a filter/regulator and lubricator (where appropriate), blow-down “drip” leg, and quick coupler.
- Evaluate system air dryers. Potentially replace or add air dryers.
- Repair air compressor radiator.

Workbenches and Furniture

Different types of workbenches, working surfaces, desks, storage cabinets, storage lockers and files cabinets were observed throughout the facility. The Materials Storage areas are discussed in a separate section below. Workbenches generally consist of fabricated steel of varying lengths and may contain a small shelf below. Some workbenches are bolted to the floor, some are sitting in the floor, others contain heavy-duty castors. Throughout the facility, there are other smaller workbenches that are essentially base cabinets with working surface tops, some contain drawers. All workbenches look to be original to the building’s construction; most are operational although some are damaged.


Storage shelving


Workbench


Workbench


Workbench


Workbench

Given the opportunity, replace the workbenches with new and reduce the amount of furniture to only those necessary, located where they will facilitate efficient use.

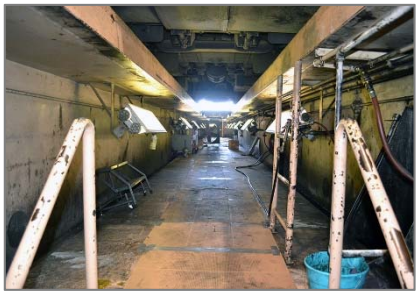

Desk and Locker

- Reduce quantity of workbenches and working surfaces cabinets
- Replace with new equipment.

Inspection Shop

The Inspection Shop consists of the entire north end of the building, is one long bay containing a drive-on lift to the west and a long inspection pit to the east. The drive-on lift is broken and not being used. We were told that this bay was used for A/C repair in the past. A overhead fall-protection cable was observed in the bay. Consequentially, the west end of the inspection shop is currently underutilized. The inspection pit is heavily used. Its layout provides proper ingress and egress to and from the lower level. Opening protection is through guard post and chain and tire guides. The guard post and chain system was observed being used however, this type of system may pose an obstruction to mechanic's movement and is often removed, resulting in an unprotected opening. Further, the tire guides may be a tripping hazard to mechanics working above. The lower level passages are ventilated and lit and large enough for stand up desks for the mechanic's use. The pit area itself contains oil drip debris. A rolling waste oil drain pan and a rolling bridge jack were located within the inspection pit opening. The drain pan contains minor grating damage. Additionally, there is a stainless steel moveable pit bridge. The bridge contains visible welded repairs. Most vehicle lubrication fluid and compressed air hoses, outlets and dispensers within the Inspection Shop are damages, leaking or not in service.


Inspection Shop


Inspection Pit

- Clean and refinish the interior of the inspection pit.
- Provide updated lighting in the pit
- Fluid Reels need replacing.
- Rolling drain pan is damaged
- Consider replacing the pit opening post and chain protection and wheel guides with modern pit protection devices.
- Remove unused equipment.

Repair Bays

Bus Repair - East Bays

There are six repair bays not including specialty repair spaces. Three of the repair bays are accessed from the west and three from the east. Bays are capable of handling standards size 40-foot long buses. All bays contain in-ground 2-post lifts. East bays are axle-engaging type, west bays are drive-on type. All lifts are Rotary Lift Company brand and look to be original to the building construction. Currently, Repair Bay-3 (southeast bay) is not working. Its control handles were removed and portable tire-engaging lifts are being used in this bay. Refer to prior discussions of vehicle lifts, lubrication fluid, compressed air, and workbenches. The north-west bay is being used primarily for A/C Repair. An overhead fall-protection cable was observed in the bay. A/C equipment storage is located in an adjacent small room east of the bay.

Bus Repair - West Bays

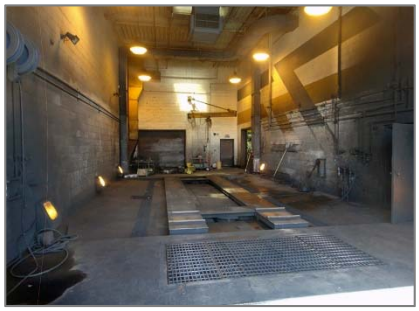
Other repair bay support equipment is located within the central structural bay, easily accessible from all repair bays, and also located around the perimeter of the bays. Support equipment consists of parts washers, buffer/grinders, and other shop equipment.


Toolbox Storage

Personal toolboxes are standardized in size throughout the facility at 6-foot length that benefits the facility in unitizing floor space allocation, among other reasons. Toolboxes are located in the central structural bay and wheeled to their daily positions. Workbenches and other working surfaces are distributed between repair bays and along building walls. As previously mentioned, workbenches and other furniture should be reduced in quantity, replaced and relocated to facilitate efficient utilization.

Views into and through the repair bays are limited to the centralized structural bay and when no buses are blocking views, from within the repair bays themselves. Mechanic leader standup desks are located within the centralized structural bay near to Repair Bay-3 and the Secure Tool Room. While these stations offer views to the Repair Bays, it is preferable that the Supervisors also have direct view of the repair bays. This arrangement is addressed in the Master Plan.

Chassis Wash and Component Cleaning


Chassis Wash Bay

Current facility layout locates the Chassis Wash and Component Cleaning area central to the Repair Bays and Unit Rebuild and Machine Shop. Vehicles access this bay from the west. Personnel may also access the bay internally from the Dismantling and Parts Cleaning Room or the access aisle near the Unit Rebuild Shop. The cleaning bay consists of a drive-on platform lift central in the bay. Component cleaning is performed at the front of the bay, where a fold-up cleaning rack is positioned over a large grate drain. In this area, a 3-ton jib crane allows mechanics to move heavy components into the


Component Cleaning Area

cleaning area. Both component cleaning and chassis washing areas drain to an exterior oil interceptor. An adjacent cleaning equipment room houses a high pressure hot water washer, water filters and detergents.


High Pressure Hot Water Washer - Not Performing

The cleaning bay condition was dirty as expected. In a bay where grease and other debris are cleaned away, a residue is typically left on the surrounding surfaces and equipment. Compressed air outlets and hose reels located on the walls in the bay contained heavy build-up. Periodic pressure washing is desired to keep the bay tidy. Further, the door to the cleaning equipment room was observed open allowing the interior of the room to collect greasy film.

The current vehicle lift looks original to the building's construction. Lift equipment badges and control labels were not found. As previously discussed, the lift may be at load capacity. In addition to loading capacity, the use of the lift is also limited by its physical dimensions. Complaints were heard that the high-pressure hot water washer does not supply hot enough water and does not clean well. It is recommended to replace equipment in the future build-out of the proposed chassis wash and component cleaning bay.


Platform Lift


Lift Controls

Tire Shop

The Tire Shop is centrally located the building. Buses access the shop from the west. Personnel may also access the bay internally from the access aisle located west of the Machine Shop or from the Dismantling and Parts Cleaning area. The Tire Shop is

operated by a Contractor. Some of the equipment within the shop is owned and supplied by the Contractor. Contractor's equipment is included in the existing equipment analysis.


Tire Shop Lift

Buses are serviced with in-ground single-post axle-engaging lifts. Of the two lifts within the Tire Shop, only one is accessible. Because of this, buses being services only pull into the bay part-way. The other half of the bus sticks out of the bay onto the apron. Repairing tires this way is inefficient as to service both axles, either the technician has to pull the bus out of the bay, turn the bus around, then pull back in; or the technician has to use a portable jack to lift one of the axles. With both axles lifted at once within the bay, the technician can simply walk around the bus.

New and used and both mounted and un-mounted tires are generally stored within the tire shop. FAX stated that the Contractor is storing more tires on-site than allowed. Tires were also observed stacked outside adjacent to the Tire Shop on the bus apron. Tires are stacked at the interior of the bay blocking one of the single-post in-ground lifts. In addition to blocking one of the single-post lifts, stacked tires are prone to topple over when struck or during an earthquake. Along the south wall of the shop, a permanently fixed two-tiered tire rack is capable of holding up to 98 tires. The rack is custom built and anchored to the floor and block wall. Tires are accessed from the rack by overhead 500-lbs. hoist that runs the length of the rack on a monorail track. The tire rack, overhead track and hoist are fairly new additions and are in good condition.


Tires stored on apron


Tire Rack & Hoist

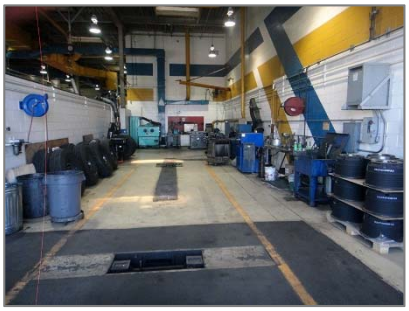
Compressed air is supplied throughout the Tire Shop. Multiple outlets are regulated overhead and distributed. Office functions have been confined to a stand-up desk currently located in the middle of the bay.


Tire Shop Desk

- Reduce the quantity of tires being stored on-site.
- More tire storage is necessary to provide efficient working space.
- Single-post lift is being blocked leading to inefficiencies.
- Proper administrative area is needed.

Brake Shop

The Brake Shop is comprised of one eastern bay service area and included additional space for a shop. Buses access the bay from the east. The bay is separated from adjacent East Repair Bays by a partial height concrete block wall. The wall allows for a back wall for equipment and utility connections. However, the separating wall also provides a restrictive barrier. Complaints were heard that the bay is not wide enough to allow for comfortable repair on the side of the bus. FAX cuts and machines their own brake parts as wells as stocks brake kits that arrive on pallets. These kits should be securely stored near to the shop. Since FAX cuts their own brakes, maintaining full Brake Shop capabilities is required.


Brake Repair Bay & Shop

Brakes are services as the bus is lifted on an in-ground 2-post axle-engaging lift. The Brake Shop equipment is located in the shop area west end and along both sides of the bay. Consensus reached during the Master Plan charrette is that the bay should be opened up to adjacent bays,


Brake Lathe

equipment modernized where possible and contained within a shop.

- Bay configuration narrow for current functionality
- Maintain full capabilities

Body Repair, Metal Shop, and Painting

The Body Repair, Metal Shop, and Painting functions are interrelated. They are located at the south end of the building and consist of two adjacent body repair bays that are fully open to the adjacent Metal Shop. One body repair bay contain an in-ground 2-post drive-on lift. The other body repair bay contains frame-pulling equipment consisting of floor frame jacks and anchor pots. Body repair shop equipment is located along the south side of the frame-pulling bay and overflows into the adjacent Metal Shop.

Paint Prep Bay

Frame-Pulling Equipment

The Metal Shop functions primarily support body repair. Most Metal Shop equipment is utilized and looks to be original to the building's construction. A secure cage within the Metal Shop acts as an office and tool crib for the shop. Painting functions are located within the

Body Repair & Metal Shop

Rolling Paint Booth

Parts Painting Booth

long continuous bay along the south side of the building. Personnel have access through multiple coiling and personnel doors that connect the painting areas to the Metal Shop and Body Repair areas. The painting bay was designed to function in a continuous bus painting operation. Starting on the west end, buses would be prepped in a curtained-off area, then moved into the central bay which contains a 42-foot long bus drop table and a rolling paint booth. Following painting, the bus would move into the east part of the bay for drying. Paint mixing equipment is also located in the east part of the bay. FAX has stated that the rolling paint booth never worked properly. In addition, the paint booth did not fit through the separation curtain. Within the prep area, the paint booth's floor tracks also caused an issue with media blasting cleanup. Overtime, the floor tracks within the paint prep area were filled-in. Moreover, because the separation curtain did not properly function, the painting prep functions were separated into media blasting within the original paint prep area, and the frame-pulling bay in the Body Repair bays.

Complaints were heard as a result of the lack of separation between the frame-pulling bay being used as paint prep, and Metal Shop and both levels of the Materials Storage, dust and residue settles throughout these areas. Additional, some personnel complain of fume migration.

Bus Drop Table

While not being used, the rolling paint booth is currently permitted requiring a yearly renewal. FAX plans to decommission this booth. The bus drop table within this area is in use. While FAX desires to keep the drop table function, similar equipment is no longer manufactured. Therefore, in the interim before FAX acquires 60-foot buses, the drop table will be used for standard length buses.

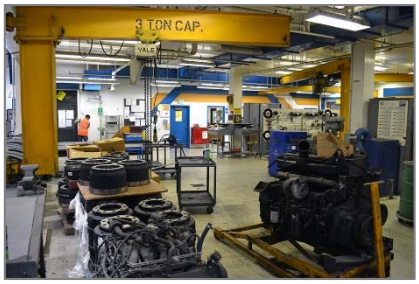
Painting functions require proper ventilation, lighting, lifting and equipment. Modern paint booths can be built within existing spaces that have self-contained lighting and ventilation.

The existing parts paint booth is being used however, certain components are non-functional. Refer to the mechanical assessment section for this discussion.

- Rolling paint booth not functional and inhibiting use of long painting bay.
- Paint prep being performed in frame-pulling bay is causing dust and fume migration into adjacent areas.
- Majority of Metal Shop equipment being utilized.
- Drop table lift being utilized but aging and not replaceable.
- Some parts painting booth components not operating.

Unit Rebuild Shop, Machine Shop, and Dismantling and Parts Cleaning Areas

The Unit Rebuild Shop, Machine Shop, and Dismantling and Parts Cleaning Areas were integral functions that are no longer being efficiently utilized by FAX. The Unit Rebuild and Machine Shops are located within the central structural bay accessible to repair bays and the Dismantling and Parts Cleaning room. The Unit Rebuild and Machine Shops contain three operational overhead jib cranes and adjacent Bridge Crane. Jib crane use was observed assisting mechanics lift heavy components onto repair benches.



Unit Rebuild & Machine Shops


Unit Rebuild & Machine Shops

Large portion of these areas are being used for storage in the sense that the equipment, workbenches and miscellaneous components are not being used and essentially stored. Some of the larger equipment is rarely occasionally used. As expressed in the master plan, remove underutilized equipment and workbenches and repurpose the area. The Dismantling and Parts Cleaning area is currently being used for hand washing and parts washing with a large part of the room for storage.

Parts Washer - Not Operational

- Areas are underutilized
- Cranes are operational. Leave operational and in-place if possible.
- Repurpose areas as expressed in the master plan.


Dismantling & Parts Cleaning Area

Material Handling

The Material Handling function includes the material storeroom, secure storage, parts window, office and bolt bins on the first floor. Material Handling also includes the Parts Storage Loft and Parts Storeroom on the second floor. Both levels of the parts and material storerooms are secured from outside of the rooms. There is additional security with secure rooms and cages.

The first floor storeroom is accessible from the east side of the building through personnel and coiling doors, and internally from multiple locations: exit corridor, parts window or through the parts office. Deliveries are made from the east or at the Parts Counter.


Inside of Parts Counter

The second floor consists of two rooms. Both rooms contain parts and material storage housed on traditional storage equipment. The division of rooms adds to the confusing nature of way finding. The second floor is accessible from the storeroom elevator, back-of-house stair, or


Parts Storeroom - First Floor


Parts Storeroom - Second Floor


Parts Storeroom - Second Floor


Parts Storeroom - Second Floor

corridor near the locker rooms and through the administrative offices. The Parts Storage Loft opens to the Body Repair Bays below through a gate. There is a disconnected jib crane and hoist once used to lift parts into the loft from below. This wall opening and hoist is no longer used and has issues allowing dust and fume migration from the below Body Repair and Metal Shop.

Parts storeroom and second level storerooms consist of traditional storage shelving, pallet racks, storage lockers and storage drawers. Parts office space is short. The office itself feels cramped and disconnected from the parts window, where interaction with “customers” occurs.

While being traditional in nature, the storage equipment was generally in good condition. As the master plan expresses, improvements should be focused on gaining more efficient storage.

- Existing storage equipment in good condition.
- Quantity of storage lacking.
- Parts office cramped and disconnected from customer interaction.
- Second floor area lacks efficiency.
- Second floor mezzanine opening problematic.

Miscellaneous Shops and Storage

Tool and Manual Storage

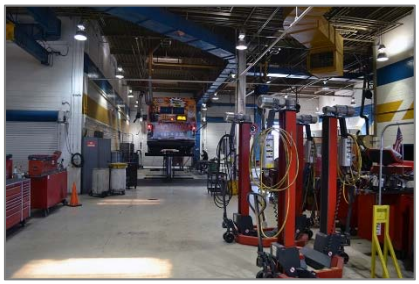
FAX supplied tools are securely stored within the Tool Room (originally the Radiator Shop) and within the Tool and Manual Storage room. Both rooms are adjacent to the repair bays. Storage equipment within these rooms is in poor condition. Physical repair manual storage is no longer required as repair manuals are electronic and accessible through centrally located computer workstations and printers.

Manual & Tool Storage

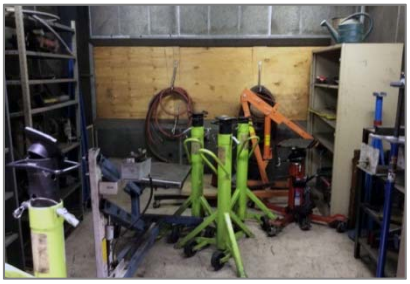
Manual & Tool Storage

Portable Equipment and Hose Storage

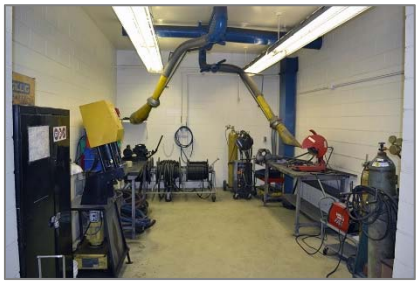
Portable equipment is currently stored throughout the facility. Portable equipment accessible to the repair bays is stored within the small room that was previously the dynamometer room. While this room is centrally located, the master



Portable Equipment Storage



Portable Equipment Storage Room



Hose Shop

plan relocates this room to another centrally located position. Hose storage and crimping is located adjacent to the stairwell to access the small offices on the north with of the central structural bay. The hose storage and crimping room contains rolls of hoses and crimping equipment that is in good working order. The room

was previously the Weld Shop and still contains welding exhaust arms and welding tables.

Electronics and Farebox Repair Shops

The Electronics Shop is that room used to repair and store electrical and technology components used on the bus. The shop is secure and located at the southwest end of Repair Bay-3. Furniture and storage equipment within this shop is in poor condition.

Electronics Repair Shop

The Farebox Repair Shop is a secure room located between the Maintenance Supervisor's office and the parts window. The room is used to repair and store farebox mechanical and electronic components.

Farebox Repair Shop

As the Master Plan presents, it is desirable to have both of these shops located adjacent to a repair bays that could be used for the repair of the specific components. Both shops and storage would also be housed in a shared but secure room.

Fuel and Wash Building

The Fuel and Wash Building was originally built around the same time as the Maintenance Building, in the 1980s. The building was designed for the fueling, inspection, fare collection and washing of diesel buses. A locker and restroom building was built for Fuel and Wash personnel. Overtime, CNG fueling was added to the facility. The CNG equipment yard now

Fuel & Wash Building

Fare Collection at Admin/Ops Building

occupies the site between the Fuel and Wash Building and north property line and surrounds the small locker and restroom building. Both buildings currently exist in close to original configuration. The inspection function was removed from the Fuel and Wash Building and is performed within the Inspection Shop in the Maintenance Building. The fare collection function may never have been performed in its designed location. A small break room occupies the farebox storage room. Fare collection is performed out of the southwest side of the Administration and Operations Building. Staff spaces within this building are lacking.

Fueling Lanes

There are two fueling lanes accesses from the east. Both lanes contain CNG and diesel fuel dispensers, Engine Oil, Engine Coolant, Automatic Transmission Fluid, and Compressed Air Dispensers. There is an above ground storage tank with tank mounted pump and dispenser for Diesel Engine Oil accessible to both lanes. Current hose reels show wear and leakage similar to

Fueling Lane Showing Plated Pit Opening & Cyclone Vacuum

Hose Reels

Diesel Engine Oil Dispenser

Air Compressors

those in the Maintenance Building. Originally, underground storage tanks were located south of the building storing the lubrication fluids, diesel, and leaded and unleaded gasoline. Lubrication fluids and petrol is now stored in newer underground storage tanks located east of the building. Compressed air is supplied from air compressors located within the Compressor

Room. These compressors are aging and given the opportunity, should be replaced.

Part of the original design involved lower level inspection pits. The pit openings were in each fueling lane. Personnel access to the pits was through stairway located on the southwest corner of the building. Since then, the pit openings have been plated over and the pit cavities house underground piping, exposed within the cavity. The stairway is still accessible and open. Standing rancid water was observed within the bottom of the pits.

Parts of the original construction also included a central vacuum system with overhead distribution hoses and hose drops and the lanes. Over time, the central vacuum system was removed and replaced with two standalone cyclone type door blower systems. These systems require a person to walk through the bus with a broom or compressed air wand moving debris to the front door, that is then sucked up into the door blower system and deposited into dumpsters located at the base of the machine. The cyclone systems are severely worn and aged. Using compressed air wands to move debris to the front of the bus commonly results in sand getting into the electronics and dash board of the bus. Those problems were mentioned as occurring here.

Door Blower

- Underground inspection pits holding water.
- Hose reels worn.
- Cyclone vacuum systems worn and at end of life cycle.
- Personnel spaces lacking
- See Fueling Assessment section below for further fueling discussion

Wash Bays


RO Console

There are two wash bays with rolling gantry bus washers. Original design shows these systems with a reclaimed water system located in the current wash equipment location. Approximately 15 years ago, the gantry washers were replaced with similar Whiting Supra Smart Wash Truck Washer systems. A Reverse Osmosis (RO) system was added. The (RO) console looks to be in good condition. Neither washer contains blowers for drying the buses. Minor shroud and rubber cracks were observed on the washers. FAX personnel stated that not all buses are washed every day for water conservation. Additionally, less use of the equipment will prolong its calendar life. Buses were observed being washed in both lanes. The bus washer in Lane #1 was activated without a vehicle in it and continued to run until power was manually shut-off and reset to the equipment. During this time, spraying water was observed migrating towards the inspection pit openings although none was observed actually going down into the pit.


Bus Washers


Waste Detergent Tanks

Rolling gantry washers have many moving parts requiring much maintenance. While the existing equipment are of good quality, based on its projected age at master plan implementation, and given the opportunity, a drive through bus washer with blowers and water reclamation is recommended.

- Washers do not contain blowers.
- Washers get stuck in program requiring manual power down.
- Wash water may be migrating down into the adjacent inspection pits.

Fueling Assessment

Background

- Fuel Solutions has assessed the condition of the compressed natural gas (CNG) fueling facility at the Fresno Area Express. The assessment is based on the following:
- Meeting with FAX staff and MDG design team on June 3, 2014.
- Inspection of existing CNG facility on June 3, 2014.
- Conduct performance test on July 9, 2014.
- Review record documents (specifications and construction documents) from original design and construction of CNG facility from 2004-2005.

FAX also has a diesel fueling system, but it is understood to be operating well and is not anticipated to be included in any modifications to the configuration, function or layout of the FAX bus fueling and maintenance facility.

Captioned photographs of the CNG fueling system as well as a performance-test data sheet are included at the end of this memorandum.

General Comments and Findings

1. CNG dispensing
    a. There are two high-capacity CNG dispensers in the fueling building that appear to be in good condition and are serviceable.
    b. There is a third two-hose CNG dispenser located on the south outside wall of the fueling building. This dispenser fuels non-bus FAX and City of Fresno natural gas vehicles (NGVs), which includes public/non-City users.
2. The CNG system is supplied by two Greenfield model ‘CT’ compressor skids that were installed in 2005, and have a rating of 1020 standard cubic feet per minute (SCFM) each (system rating of 2040 SCFM). Staff indicated that one or the other of the skids is often offline due to maintenance or failure on a semi-frequent basis, but that the station performs ‘OK’ when both compressors are online. Both skids were on line during both site visits by Fuel Solutions.
3. The minimum required throughput per the 2004 RFP specification for the CNG facility is 1843 SCFM.

4. When the CNG facility was built, it was intended to accommodate a CNG-bus fleet of 40-50 buses. However, as the CNG fleet is expected to grow to a maximum of about 81 buses, FAX has contracted with CNG contractor Clean Energy to provide and install a new third compressor skid. The original CNG-facility design included space planning for this third skid at the west end of the existing CNG-equipment compound, which is where the third skid will be installed.
5. The CNG system also includes a light/medium-duty dispenser for fueling non-revenue and outside/public CNG vehicles and customers. The dispenser includes 3000 PSI and 3600 PSI hoses, and is located along the south exterior wall of the transit-fueling building. This configuration requires outside customer vehicles to enter the FAX facility and circulate in and around the FAX buses, which is not desirable.
6. Although FAX buses are currently fueled using a 'fast fill' scheme, which is common for transit fleets, FAX indicated being open to augmenting their bus fueling with a time-fill scheme, where multiple buses would be fueled simultaneously via individual CNG-dispenser hoses located at their respective parking spaces. If TF-fueling is implemented and assuming that fast-fill fueling will continue to be used, time-fill fueling should not commence (nightly) until FF fueling has been completed. However, since the compressor capacity is relatively large, a reasonable amount of TF fueling could still be implemented. For example, assuming FF fueling is completed by 2:00 AM and rollout is 6:00 AM, about 40 buses could be filled.[1] The process of timing the start of TF fueling can be automated.
7. If implemented, this would likely cost on the order of $9,000 per TF hose, and FAX should note that metering of individual bus-fuel consumption is not practical for TF dispensing, though the aggregate flow dispensed to the time-fill buses can be metered.
8. The City of Fresno's refuse-truck fleet is transitioning to CNG from LNG it currently uses. The existing LNG system could be augmented to generate CNG (by adding one to two high-pressure reciprocating pumps, heat exchanger(s), and a conventional CNG storage/ valve panel/dispensing system).

[1] 4 hours x ~ 1600 SCFM capacity observed during recent test = 384,000 SCF CNG / 137 SCF per DGE = 2802 DGE's of CNG / 60 DGE's / bus fill = 46 buses able to be time filled in 4-hr. window.

This approach has not been studied closely and requires further discussion and evaluation, if the solid-waste department is interested in pursuing this strategy.

9. Note that LNG commodity is significantly more expensive that gas supplied via utility pipeline on an energy-equivalency basis. Accordingly, compressor-based CNG systems almost always enjoy a significant overall fuel-cost advantage vs. LCNG systems.
10. Alternately, the refuse fleet could be fueled by leveraging the FAX CNG system. This could be done by fueling the refuse trucks at the existing transit CNG-fueling lanes during daytime hours when FAX buses are not using it. However, co-mingling disparate fleets is not ideal.
11. A second option for fueling the refuse trucks with the FAX CNG system would be to pipe CNG to a new time-fill subsystem located at the existing refuse truck-parking area. Assuming 40 DGE's per fill, up to 70 trucks could be fueled nightly, after FAX FF-bus fueling is completed. Further to comment item #6 above, time-fill fueling of refuse trucks would have to commence after completion of nightly FAX fast-fill fueling.[2]

Performance Test

Fuel Solutions conducted a performance test of the FAX CNG system during the evening of July 9, 2014. The test parameters and results are described below.

- Based on record data from the original contractor's technical proposal in 2004, the compressor system was rated at 2040 SCFM from both compressors, based on a suction-supply pressure of 260 PSIG.
- The test data observed by FS indicated a throughput of about 1550 SCFM. However, the suction-supply pressure observed at the time of the test was only 170 PSIG, which is well below the original design-supply pressure of 260 PSIG. Since compressor flow is a function of supply pressure, the reduction in throughput is expected and reasonable.

[2] 4 hours x ~ 1600 SCFM capacity observed during recent test = 384,000 SCF CNG / 137 SCF per DGE = 2802 DGE's of CNG / 40 DGE's / refuse-truck fill = 70 trucks able to be time filled in 4-hr. window.

- Fuel Solutions has extrapolated that the expected throughput at a supply pressure of 170 PSIG could be as low as 1450 SCFM. Accordingly, the observed performance of 1550 SCFM is very good, considering the reduced supply pressure.

Calculations for the test is included as attachments to this memo.

Conclusions and Recommendations

1. When both compressors are online, the CNG system appears to be working well and at good capacity, given the relatively low supply pressure.
2. FAX should review the gas-supply pressure issue with PGE and determine if it can be increased closer to its originally intended pressure of 250-260 PSIG. Note that an increase to 200 PSIG supply would deliver a system flow of about 1675 SCFM (8 percent increase), and an increase to 250 PSIG would provide about 1950 SCFM (26 percent increase). Electrical power costs would be reduced as well, since the (given) nightly fuel volume would be produced over a shorter compressor-run duration, thus reducing electric-power usage.
3. Installation of the third compressor skid will improve system performance and will reduce the impact of one of the original compressors failing.
4. FAX should be sure to coordinate the range of design supply pressures for the new compressor, including accounting for possible increases or decreases, as indicated by PGE.
5. FAX should verify with Clean Energy that the gas dryer has adequate capacity to handle the increased flow of the third compressor skid.
6. The development of the expansion of the FAX CNG system should be supervised and monitored. This should include verifying system compatibility and integration with the existing system (flow ratings, supply utilities, equipment clearances), and review of both product and design submittals from Clean Energy. Also, a follow-up performance test of the CNG system should be conducted once the new compressor is installed, in order to verify that its actual performance meets its design performance (in comparison to the baseline test referenced herein).
7. Public-access dispensing should be discontinued, due to the undesirable comingling of transit buses and ‘public’ drivers that may not be aware of close-quarters bus traffic in the FAX bus yard.
8. Adding a time-fill subsystem is a feasibly option that would reduce time pressure for fast-fill fueling. However, the

improved FF performance that will be provided by the addition of the third compressor will likely significantly improve fast-fill fueling performance. Further consideration of the need to add a time-fill subsystem should be done after the compressor upgrade has been completed and the resulting benefits to FF fueling are evaluated.

9. The approach to meeting the future CNG-fueling needs of the City of Fresno's refuse fleet - i.e. either via adding an LCNG subsystem to the existing refuse-fleet LNG system or utilizing the existing FAX CNG system - should be further explored with the City.

Section Three
Space Needs Program

Facility staffing levels are crucial to the Planning Team when determining the number of parking spaces, size of support facilities, and developing occupancy levels.

Introduction

This section presents the Master Plan level Space Needs Program for the Fresno FAX Facility. This program is based on MDG's standard program with a review of current operations and projections by Fresno FAX. The data was reviewed and revised for this report through interviews with Fresno FAX staff and a tour of the Fresno FAX site and facilities

The Space Needs Program presents the space requirements necessary for a facility required to support a 115-bus operation including all building spaces, covered areas, and parking areas necessary to meet the current and future operational needs for the Administration, Operations, and Maintenance Departments to be located and efficiently operate at the facility.

The Program information is summarized in a summary table in *Appendix B - Space Needs Program*. This summary table details includes projected square footage needs for building areas, covered areas, exterior areas, and parking areas. These projected space needs are subtotaled into net square footage requirements and converted to the total site acreage requirements for the new facility.

Staff Summary

Facility staffing levels are crucial to the Planning Team when determining the number of parking spaces, size of support facilities, and developing occupancy levels. The following Table 4.A is a summary of the projected staffing levels for each department on the Fresno FAX site. These staffing levels were taken directly from interview sessions and questionnaires. Refer to *Appendix B - Space Needs Program* for a more detailed breakdown of each department's employees.

Table 3.A - Staff Summary

Staffing	
Department	**FAX 115-Bus Program**
Transportation	234
Maintenance	54
Service	24
Total	**312**

Vehicle Summary

The number of buses, non-revenue vehicles, and employee vehicle quantities are essential to the Planning Team when determining the size of the required parking facilities. Bus, non-revenue vehicles, and employee vehicle quantities were taken directly from interview sessions.

Table 3.B - Vehicle Summary summarizes Program Vehicle and Parking requirements for the Fresno FAX 115-Bus Facility.

The buses and non-revenue vehicles will be stored and maintained at the Facility, whereas the employee vehicles will only be stored at this site during the time the employee is on duty.

Table 3.B - Vehicle Summary

Vehicle Summary	
Vehicle	**Fresno FAX 115-Bus Program**
FAX Transit Bus Parking	
Standard Transit Buses (40’ Bus)	115
Articulated (60’ Bus)	TBD
Total Bus Parking	***115***
Automobile and Light Truck Parking	
Non-Revenue Support Vehicles (Transportation, Facility Maintenance, and Maintenance)	22
Service Truck	1
Shop Pick Up	1
Employee On-Site Vehicles	202
Visitor Vehicles	9
Disability Vehicles	6
Golf Carts	1
Total Automobile Parking	***242***
Total Parking	**357**

Rule of Thumb Planning Ratios

Methods of applying planning ratios to vehicle quantities has always been an effective way to calculate the number of repair bays required to maintain those vehicles. These ratios are derived

from data and space utilization information gathered from numerous other successful bus maintenance facilities analyzed throughout the country by Maintenance Design Group (MDG) and its staff over a 20-year period. The repair bay ratio are as follows:

Table 3.C - Rule of Thumb Planning Ratios

Space	Ratio or Space Standard	Fresno FAX 115 Bus Program
Bus Repair Bays - Standard Bus (20' x 60')	1 bay for every 15 buses to be maintained	115 buses/ 15 buses per bay = 8 bays
PM/ Inspection Bays - Standard Bus (20' x 60')	1 bay for every 50 buses to be maintained	115 buses/ 50 vehicles per bay = 2.3 or 3 bays
Tire Bay (20' x 60')	1 bay for every 150 buses to be maintained	115 buses / 150 vehicles per bay = 0.76 or 1 bay
Tire Shop/ Repair	400 to 800 SF (subject to adjustment depending on level and type of operation)	600 SF based on the level and type of operation (i.e. separate contracted operation)
Tire Storage	1.5 SF per tire stored vertically in carousels (85%), 4 SF per tire in ground mounted racks (15%)	675 SF
Materials Handling (Parts Storage)	20 SF per bus (based on fleet mix and use of some high density storage systems and mezzanine area)	115 buses x 20 SF = 2,300 SF *
Materials Handling (Parts Storage) (Mezzanine or slow moving parts)	7.5 SF per bus (based on fleet mix and final parts room configuration)	865 SF

Space Standards

Space standards were applied to the Space Needs Program and generally apply to the office and vehicle parking areas. Area requirements in shops and storage areas were derived from functional requirements and equipment space needs. The space standards listed below were utilized to develop the facility program and overall area requirements. The space standards are based on functional needs and requirements established through the design of other facilities, rules of thumb, and specific requirements of each functional group.

Table 3.D - Space Standards

Space Standards	
Area	**Space Requirement**
Office:	
Transportation Manager	260 SF office
Assistant Manager	180 SF office
Steno/Secretary	100 SF workstation
Training Instructor	150 SF office
Maintenance Manager	260 SF office
Clerical/Records Specialist	180 SF office
General Workstation - large	100 SF workstation
General Workstation - medium	84 SF workstation
General Workstation - small	64 SF workstation
Standard Spare Office	150 SF
Conference Room	25 SF per person
Training Room/Classroom	15 SF per person
Lockers 1/2 height, 18 inch	4 SF per locker
Lockers full height, 18 inch	8 SF per locker
Shop:	
Space for Running Repair Bay - 40' Standard Buses	1,200 SF (20' x 60')
Space for Running Repair Bay - 60' Articulated Buses	1,600 SF (20' x 80')
PM/Inspection Bay - standard	1,200 SF (20' x 60')
Chassis Wash Bay - standard	1,500 SF (20' x 75')
Body Shop Bay	1,500 SF (20' x 75')
Parking:	
40-foot Transit Bus	600 SF (12' x 50')
60-foot Articulated Bus	840 SF (12' x 70')
Support Vehicles	200 SF (10' x 20')
Employee Vehicles	162 SF (9' x 18')
Visitor Vehicles	162 SF (9' x 18')
Accessible Parking	234 SF (13' x 18')
***Square Feet (SF)**	

Circulation Factors

The space requirements shown for each function are net usable area. There are three Circulation Factors utilized in the Space Needs Program. These factors are:

Interior or Building Circulation

This factor is applied to the program as a percentage of the total building square footage. It accounts for miscellaneous building spaces such as hallways; stairwells; janitor closets; mechanical, plumbing, and electrical rooms; wall thickness; structure (Circulation/Mechanical/Electrical/Structural - Net: Gross); and access requirements. The following is a list of the factors (in general) that have been applied to the program:

- Administrative Office areas 40%
- Operations areas 20%
- Maintenance Office areas 40%
- Maintenance Support areas 20%
- Shop and Bay areas 15%
- Tire Shop 15%
- Covered Service areas 10%

Parking Circulation

This factor is included to account for the drive aisles, walkways, islands, and other areas created by site and access. This factor can vary depending on the space occupied by a vehicle. For this project the following factors were applied:

- Bus Parking areas 15%
- Automobile Parking areas 100%

Site Circulation Factor

This factor is also applied to the program as a percentage of the total program square footage. It accounts for areas around buildings, site drive-aisles, building access, and site access. For new construction, a 100 percent factor is normally applied to account for all site inefficiencies. As such, the better the site conditions, access, easement, etc., the more efficient the site layout can become, reducing this factor to as low as 50 percent.

Space Needs Program

A summary of the Master Plan Space Needs Program for the Fresno FAX Facility is included in *Appendix B - Space Needs Program*, and includes all building and site areas including Transportation Administration, Operations, Maintenance, and

Parking Areas. Site circulation, setbacks, landscaping requirements, and total acres required are also shown.

The Space Needs Program, located in Appendix B, begins with the identification of each space by name and a **Space Standard** (if applicable). The Fresno FAX Bus Program heading represents spaces required to accommodate a 115-bus operation. The Remarks heading represents listed notes about each space.

The Space Needs Program shall be used by the Planning Team to develop the Facility Master Plan and Renovation Layouts.

Section Four
Master Plan Concepts

The goal was to develop a master plan based on Fresno FAX decisions for operations and space needs data to accommodate a fully functional facility.

Introduction

The Planning Team returned to Fresno FAX, during the week of July 23-24, 2014, to present "Hot Start" design concepts and to conduct a Master Plan Charrette to further develop new concepts for a Master plan for the renovation of Fresno FAX. The goal for this session was to develop a master plan based on Fresno FAX decisions for operations and space needs data to accommodate a fully functional facility. This renovated facility will efficiently accommodate 115 standard 40-foot buses with accommodation for future articulated bus fleet maintenance. Future facility bus parking capacity will be reduced based on new articulated bus fleet acquisition.

The design concepts developed during the Charrette process were presented at daily review meetings to all interested stakeholders. The purpose of these daily review meetings was to interactively discuss the merits and deficiencies of each concept, with the end product being a concept that meets the programmatic needs and that most completely fulfills the goals of all stakeholders. All Option Alternatives and sketches developed during the Charrette can be found throughout this section.

Participants

Participants for the "Hot Start Presentation" and Charrette review sessions included but were not limited to the following:

- Maintenance Design Group
  - ✓ Stephen Ward, Facility Design Manager
  - ✓ Kai Fishman, Senior Facility Designer
- RNL
  - ✓ Will Todd, Associate Architect
  - ✓ Colin Winchell, Associate Architect
- Fresno FAX
  - ✓ Brian Marshall, Director
  - ✓ Jim Schaad, Assistant Director
  - ✓ Arnold Napoles, Facilities Supervisor
  - ✓ Dean Huss, Operations Manager
  - ✓ John Downs, Planning Manager
  - ✓ Jeff Long, Planner
  - ✓ Kathleen Healy, Administrative Manager

- ✓ Joe Vargas, Management Analyst
- ✓ Darlene Christiansen, Grants Analyst
- ✓ Bruce Robinson, Information Systems Manager
- ✓ Duane Meyers, Equipment Maintenance
- ✓ Miguel Sanchez, Equipment Maintenance
- ✓ Harold Schade, Equipment Maintenance
- ✓ Larry Thompson, Parts Supervisor
- ✓ Joseph Ayerza, Municipal Fleet Manager
- ✓ Tim Olday, Management Analyst – Municipal Fleet Acquisitions

A documented list of daily participants for each review session can be found in *Appendix C - Participants Involved in Review Sessions.*

Planning Issues

The following is a brief description of issues identified by the Planning Team that must be taken into consideration when creating conceptual designs for a renovation of the Fresno FAX Facility.

- Entry and exit opportunities must be examined very carefully to give bus operators a safe and efficient means to circulate to and from the buses on-site
- Public fueling options must be carefully examined to address safety concerns and issues associated with cross traffic with fleet vehicles and public vehicles.
- Consideration is given to adjust bus circulation on-site to utilize the G Street gate entrance*.*
- A Fresno FAX priority is to have all employees parking on-site in one centralized parking area.
- Existing and New Bus Canopies accommodate existing 40-foot buses. Future 60-foot articulated buses will reduce the covered parking capacity and shall require further study to determine fleet capacity based on articulated fleet acquisition.
- The Master Plan assumes that the existing Maintenance Building will be renovated and expanded to meet program requirements to include accommodation of 60-foot articulated buses.

- The Master Plan assumes that the existing Administration/Operations Building will be renovated and expanded to meet program requirements.
- The Master Plan assumes that the existing Fuel & Wash Building will be renovated to meet program requirements to include accommodation of 60-foot articulated buses.
- The Master Plan assumes that the existing Service Restroom Building will be renovated to meet program requirements.

Master Planning Charrette

The following is a detailed description of each day's events at the On-Site Master Plan "Hot Start" Presentation and Concept Design Charrette.

Day One - July 23, 2014

Overview

The first review meeting began with a review of the agenda and a project introduction to define the expectations and project priorities and to discuss the safety concerns associated with the current operation. Fresno FAX provides public fueling within the confines of the bus yard creating hazardous traffic patterns mixing public vehicles with Fresno FAX bus fleet vehicles. In addition, the current bus roll-in sequence is inefficient requiring buses to be fare vaulted at the administration/operations building then parked before beginning the service cycle. The renovated facility shall provide bus parking capacity for 115 standard buses. This includes space for 4 buses parked along the security fence adjacent to Bus Pad C. Note: The capacity does not include buses that are parked in service bays.

- MDG presented PowerPoint slides identifying Major Facility Issues and priorities.
- MDG presented the "Hot Start" concepts developed prior to the charrette and led a discussion identifying the pros and cons of each concept.
- FAX discussed ongoing modifications that are planned for the facility. Improvements include new canopy lighting upgrades, additional CNG compressor and site security fencing.
- FAX stated they are not currently planning to add any BRT articulated buses but the renovated facility should be designed to accommodate them.

- FAX discussed concern with pedestrian traffic between admin/ops building and maintenance building. MDG is charged with delineating a marked pedestrian path along the west property line to minimize vehicle and pedestrian cross traffic.
- The Planning Team is charged with re-using as much of the existing site and facilities to create overall improved operations and site bus circulation. A total re-build concept will be considered under this Master Plan. Due to cost constraints. Fresno FAX shall remain operational and sequencing plans shall be developed to allow the facility to operate while improvements are being completed. This shall include placement of modular trailers, temporary office lease space and reduced bus parking to facilitate the phased/sequenced improvements.
- MDG identified the planning effort progress since the conclusion of the programming and interview sessions in June 2014, noting that the master plan Charrette will be focused on refinements to existing facilities. MDG noted an Alternate Administration/Operations Building Concept shall be considered for this Master Plan.

Items of discussion

- Accommodation for future articulated bus fleet
- Public Fueling operation
- Fare Vaulting operation
- Traffic Issues, potential alternative entrance, and exit location at G Street.
- Service opportunities
- Maintenance opportunities
- Reuse opportunities
- New Construction opportunities

Option Alternatives Presented

Option A - Site Plan

- **Site -** New public fueling island and canopy located off G Street adjacent to new employee parking entrance/exit. Reconfigured and more efficient employee and non-revenue parking areas.
- **Bus Entry/Exit** - New entry/exit point for buses off G Street gate at intersection.

- **Bus Parking** - Bus parking areas have a capacity of 106 standard buses. ***No articulated bus parking*** is being developed for this Master Plan.
- **Bus Canopy** - New shade canopy at Bus Pad C with solar panel array to match existing.
- **CNG Equipment** - Existing site location to remain. Fresno FAX plans to add an additional compressor to increase fueling capacity (*not part of this Master Plan*).
- **Fuel & Wash Building** - Utilize the current Bus Fuel & Wash Building with renovations and modifications to include new fare vaulting addition to accommodate future articulated buses.
- **Administration/Operations Building** - Utilize the current Administration/Operations Building with major renovations and modifications to improve functionality.
- **Maintenance Building** - Utilize the current Maintenance Building with renovations and modifications to improve functionality. New Chassis Wash Bay, Paint Booth and Service Bay addition to accommodate future articulated buses.
- **Public Amenities Building** - Demolish existing building and construct new 5,000 square foot+/- public amenities building for bus shelter operations and materials handling overflow.

Option B - Site Plan, Same as Option A except

- **Site -** New public fueling lane relocated along west property line located on the MSC property. Reconfigured employee and non-revenue parking areas. New employee parking entry/exit off G Street.

Option C - Same as Option B except

- **Administration/Operations Building** - Construct new Administration/Operations Building. Current Administration/Operations Building to remain operational while new building is constructed.
- **Site -** Reconfigured employee and non-revenue parking areas. New employee parking entry/exit off G Street.

Option A – Fuel & Wash Building Plan

- Canopy Structure - Add twenty-foot canopy extension to the west for overhead service equipment functions and support spaces below designed to accommodate articulated bus service functions.
- Support Spaces - Add new break and cleaning supply room

- Fare Vaulting - Construct new fare vaulting room addition and associated support spaces.
- Bus Washers - Phased replacement with new rolling bus washers and water reclamation system. New wash equipment to be located within bus wash bay.

Option A - Administration/Operations Building Plan

- Level 1
  - ✓ Major renovation and reorganization of spaces to consolidate operations on Level 1
  - ✓ New addition on south side for expanded dispatch area and bus yard visibility
  - ✓ IT relocated to northwest corner with door directly to data room
  - ✓ Fare vaulting to be relocated to Fuel and Wash Building
  - ✓ Restrooms to be expanded
  - ✓ Transit Police relocated to admin/ops building
  - ✓ Operator's toilet rooms to remain and shall be renovated
  - ✓ Operator's locker rooms to remain and shall be renovated
    - New half size lockers were approved by FAX
  - ✓ Expanded Driver's Day Room
  - ✓ New driver's outdoor patio located on north side of building
  - ✓ Training rooms relocated to Level 1
  - ✓ Training office relocated to Level 1
- Level 2
  - ✓ Major renovation and reorganization of spaces to consolidate administration on Level 2
  - ✓ New addition over east roof area for relocated director's office and associated support spaces
  - ✓ Restrooms relocated and expanded
  - ✓ New centralized open office area
  - ✓ New large conference rooms off lobby and at southeast corner of new addition

Option A - Maintenance Building

- Level 1
  - ✓ New chassis wash bay addition with 75,000 pound, 48-foot parallelogram lift and equipment room
  - ✓ New passenger elevator to meet ADA requirements to Level 2

- ✓ Expansion of parts department to include high-density storage system with rack mounted crane.
- ✓ New seven (existing) bay extension addition on south side for articulated bus service functions
- ✓ New paint booth and associated support spaces
- ✓ Renovations and compartmentalization of body shop functions to address environmental issues associated with paint fume migration to other work areas within the shop

- Level 2
  - ✓ New passenger elevator to meet ADA requirements to Level 1
  - ✓ New storage mezzanine above hose and brake shop
  - ✓ Expansion of parts department to the north
    - Eliminate miscellaneous temporary partitions throughout
  - ✓ Relocate Facilities Supervisor from mezzanine to office area
  - ✓ Relocate Transit Police from mezzanine to Admin/Ops Building
  - ✓ Break room to be reduced in this plan

Issues Discussed

The following is a list of major issues discussed during the first day of review meetings:

- **Options A, B, C - Site Plan**
  - ✓ FAX responds well to new employee entry/exit off G Street. City of Fresno has stated they have concern with vehicles inadvertently accessing the site after hours and shall require a turnaround and/or a gate/signage at the curb line to prevent entering afterhours. Control gate options were discussed to include overhead roll down for security for after hour operations. Final security gate option(s) to be addressed in final design phase. FAX reiterated that all employees shall be required to use the north employee parking lot with the exception of management staff.
  - ✓ Proposed public fueling island and canopy addresses internal traffic movement issues with safety by removing public vehicles from the internal site. The proposed relationship of the G Street employee entry/exit and public fueling entrance/exit creates access issues requiring vehicles to execute a 180-degree movement at the left turn

lane off G Street. Further discussion regarding alternative public fueling options resulted with a consensus that ***no public fueling should be performed at the Fresno FAX site*** due to safety concerns identified by the design team and Fresno FAX staff. The current MSC fueling facility was suggested as a candidate for the public fueling site location based on its current infrastructure already in place.

- ✓ New bus access off G Street would require the gate to be relocated to the south to allow bus stacking at the G Street entrance. The City of Fresno has the same concern with vehicles inadvertently accessing the site after hours and shall require a turnaround and/or a gate/signage at the curb line to prevent access after-hours.
- ✓ Fare vaulting operation to be relocated to Fuel and Wash Building from Admin/Ops
- ✓ FAX stated they would prefer all internal access gates be closed from the MSC site with the exception of the northwest gate.
- ✓ Additional perimeter security fencing shall be established segregating public access to the site from the north parking lot and new G Street entrance. New gates shall secure the site during off hours preventing public access of the facility. Service vehicles shall use the El Dorado Street controlled access for deliveries and afterhours access.

- **Option A - Fuel & Wash Building**
  - ✓ Option A plan was well received. The relocation of the fare vaulting operations would allow two lanes of fare vaulting to be performed and would increase the efficiency of the service cycle as a result. Additionally, the queuing cycle and stacking at roll in has been significantly improved increasing the roll in stacking from three buses to 14 buses.
  - ✓ Centralized vacuum system was proposed and shall be incorporated into the Master Plan.
- **Option A - Administration/Operations Building**
  - ✓ FAX expressed concern with the proposed Level 1 “bump out” addition for the dispatch area expansion. Design team stated they would design within the existing footprint of the building.
  - ✓ FAX stated consideration should be given to for future growth opportunities for Level 2.

- ✓ New public entry located at north side adjacent to elevator and new stairwell. New space should function similarly to existing but smaller in area,
- ✓ Expanded driver's room was well received. Half-size lockers were approved by FAX.
- ✓ Operations Manager and secretary need separate offices but can be directly connect to operations suite.
- ✓ Additional office spaces desired for future growth to include: Additional conference rooms and two to three additional offices on Level 1 and 2.
- ✓ Enlarge Level 2 conference rooms. Larger conference room to accommodate 20-25 people. Second conference to accommodate 18-20 people.

- **Option A - Maintenance Building**
  - ✓ South side addition of seven service bays maybe to cost prohibitive but provides the most flexibility for the incorporation of articulated buses into the fleet. Design team to look at alternative options to reduce costs.
  - ✓ Small conference room need adjacent to supervisors.
  - ✓ New chassis wash bay location was approved by FAX and shall be incorporated into the master plan. Existing chassis bay shall be converted into AC repair bay
  - ✓ Existing rolling paint booth shall be decommissioned and replaced with new stationary paint booth.
  - ✓ Level 1 parts area expanded to include high density parts storage system. Existing small storage rooms along north exterior wall shall be eliminated.
  - ✓ New carousel tire storage to be added to tire bay.
  - ✓ FAX expressed concern with break room size and suggested it be enlarged to be similar to the existing. It was noted by FAX that training sessions were conducted out of the break room and a smaller area would be problematic. No new training room is being considered as part of this master plan.
- **Option A - Public Amenities Building**
  - ✓ Develop new 5,000 square foot building with work stations for four and material storage area overflow. Develop canopy along east side for shelter operations.

Figure 4.A - Day One, Option A Site Plan

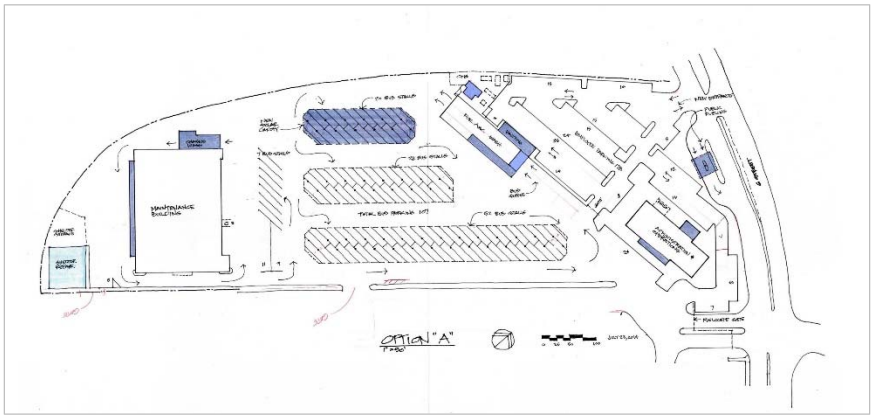


Figure 4.B - Day One, Option B Site Plan

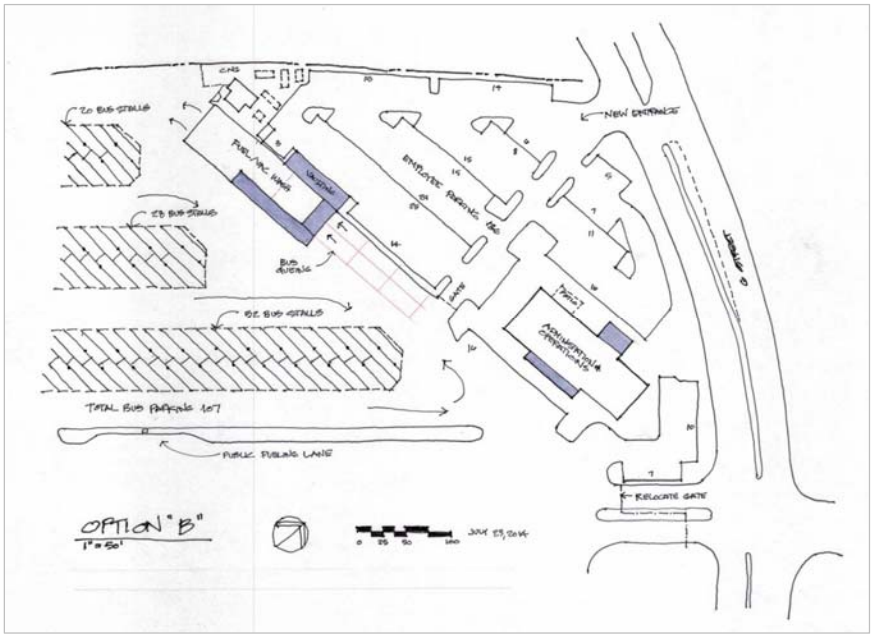


Figure 4.C - Day One, Option C Site Plan

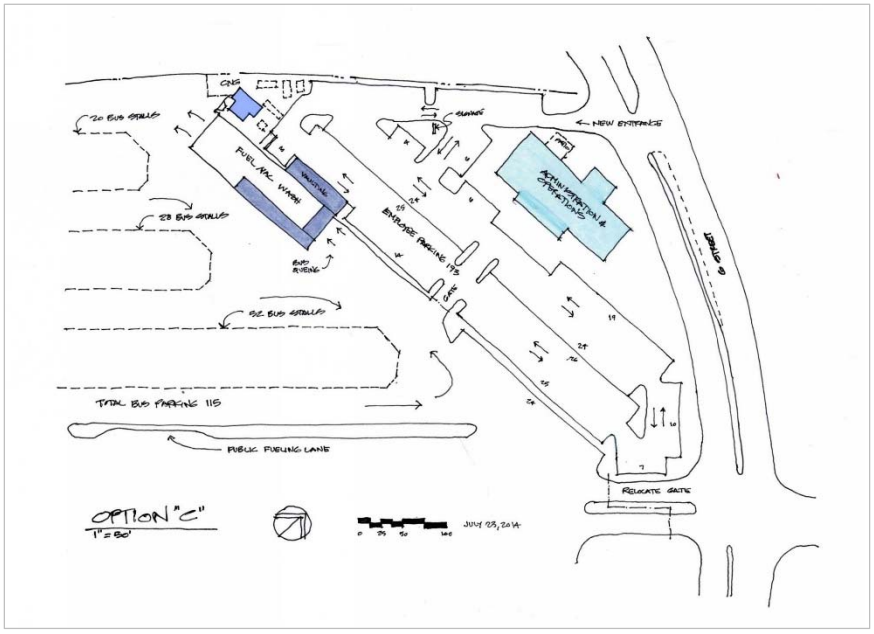


Figure 4.D - Day One, Option A Fuel & Wash

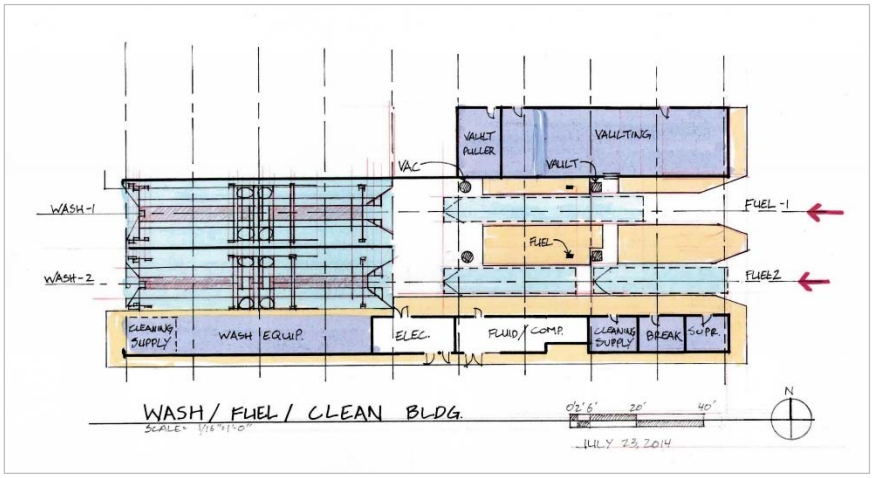


Figure 4.E - Day One, Option A Admin/Ops

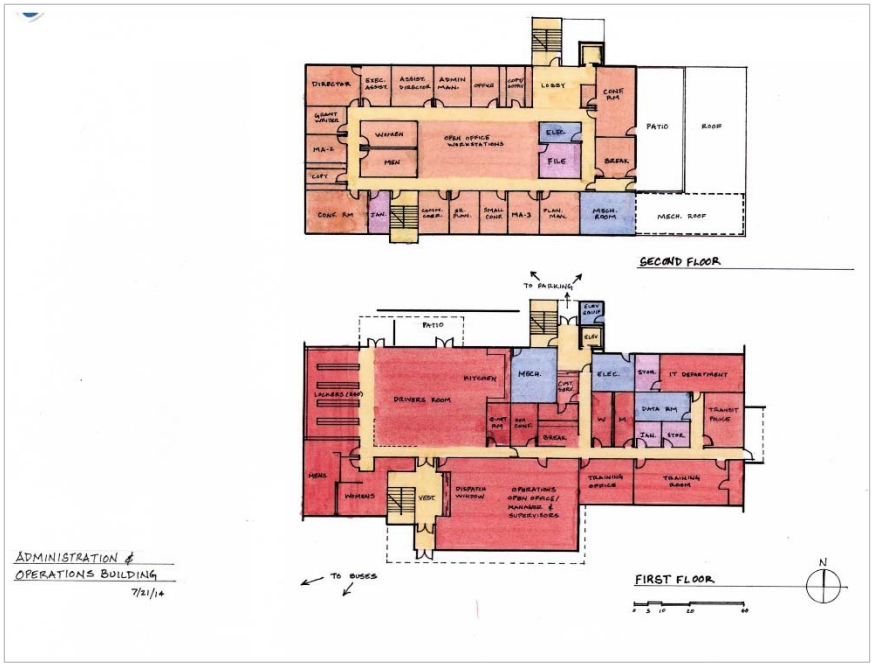


Figure 4.F - Day One, Option B Admin/Ops

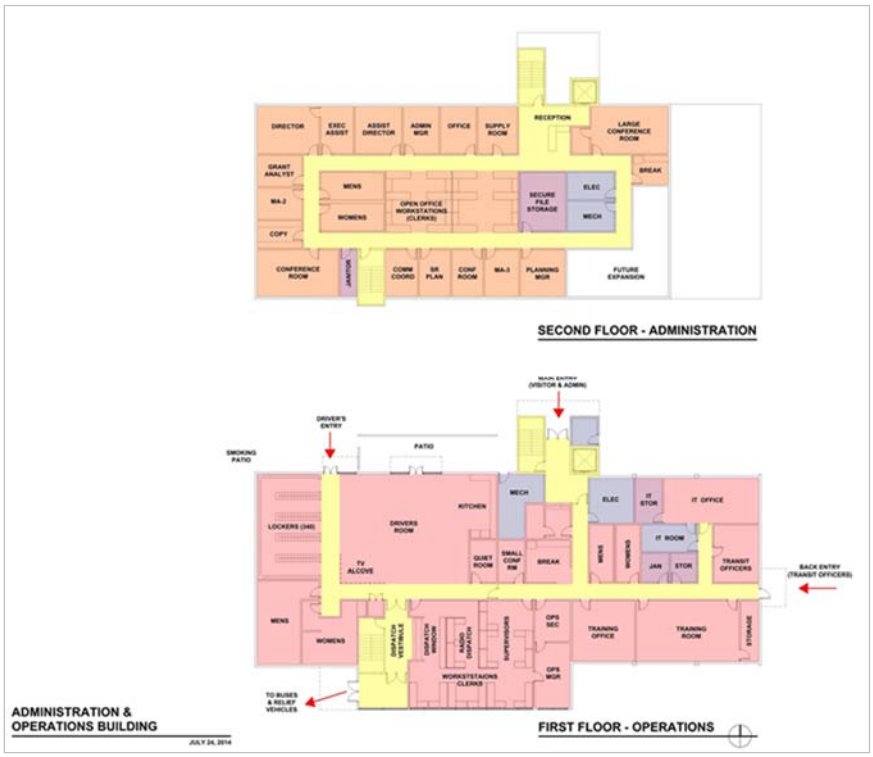


Figure 4.G - Day One, Option A Maintenance

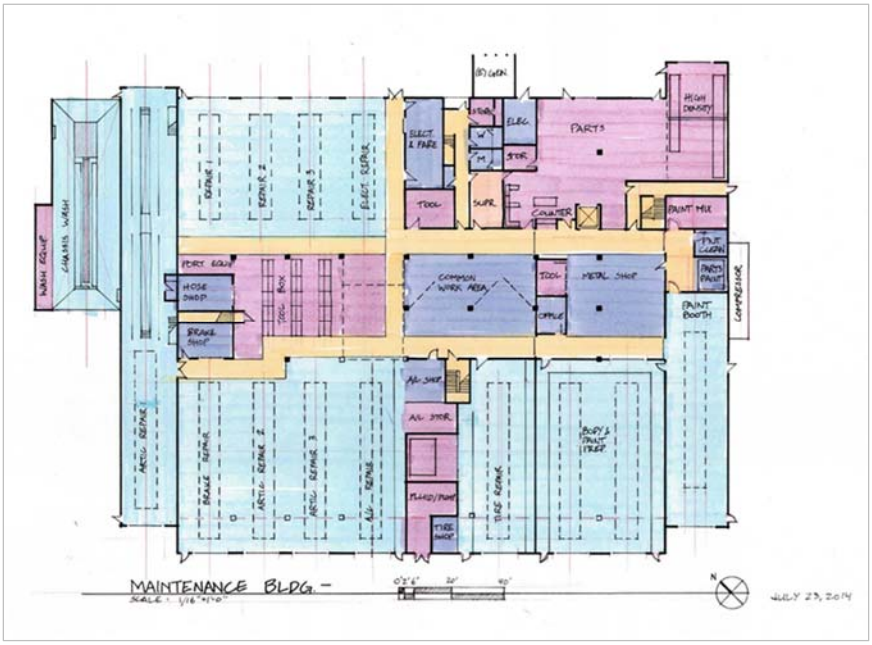


Figure 4.H - Day One, Option A Maintenance

Day Two - July 24, 2014

Issues Discussed

The following is a list of major issues discussed during the second day of review meetings:

Option Alternatives Presented

Option D - Site Plan

- **Site** - Public fueling option has been eliminated and is not part of this master plan. Fresno FAX shall phase out public fueling due to the major safety issues identified by the design team and as acknowledged by Fresno FAX. Public fueling dispensers shall remain operational and shall be utilized for bus fleet fueling during the phased implementation of improvements for the fuel wash building.
- **Bus Entry/ Exit** - New entry/exit point for buses off G Street gate at the Divisadero Street intersection shall have gates at curb line to prevent the public from accessing the bus entrance and employee parking lot entrance off G Street after hours. Final design of gate system shall be part of future detailed design and shall require approval of the City of Fresno prior to its implementation.
- **Bus Parking** - Final bus parking areas have a capacity of 115 standard buses. ***No articulated bus parking*** is being developed for this Master Plan.
- **Bus Canopies** - New shade canopies at Bus Pad C and at north side of maintenance building with solar panel array to match existing. Existing canopies shall be retrofitted to address structural seismic code updates.
- **CNG Equipment** - Existing site location to remain. Fresno FAX plans to add an additional compressor to increase fueling capacity (*not part of this Master Plan*). All fuel management equipment shall be relocated as required to meet phased renovations for the facility.
- **Fuel & Wash Building** - Utilize the current Bus Fuel and Wash Building with renovations and modifications to include new fare vaulting and vacuum equipment room addition to accommodate future articulated buses. Existing restroom and lockers to be renovated to meet ADA standards.
- **Administration/Operations Building** - Utilize the current Administration/Operations Building with major renovations and modifications to improve functionality. Plan provides for full build out of second level providing additional space for future growth.
- **Maintenance Building** - Utilize the current Maintenance Building with renovations and modifications to improve functionality. New Chassis Wash Bay, Paint Booth and south Service Bay addition to accommodate future articulated buses.

Plan reduces south side expansion to three bays from seven bays initially proposed.

- **Public Amenities Building** - Demolish existing building and construct new 5,000 square foot public amenities building for bus shelter operations and materials handling overflow. Add new 4,500 square foot canopy to the east of the building for shelter storage and operations.

Option B - Fuel & Wash Building

- Plan remains the same as Option A except add new room to the east side of vaulting room addition for new centralized vacuum system. Public fueling dispensers shall remain and be utilized for Fresno FAX vehicles and for temporary bus fleet fueling during Phase 1 fuel island modifications.

Option C - Administration/Operations Building

- Automated driver check in was discussed. Design Team stated that specific technology components would require further study and detailed design. Options would be to incorporate automated check in at dispatch window or a separate kiosk.
- Operational adjacencies as follows:
  - ✓ Dispatch
    - Direct visual, audible and window access to Dispatch vestibule
  - ✓ Radio Dispatch
    - Audible and visual (secondary) connection to dispatch window
  - ✓ Supervisors
    - Should have separate entry point, visual privacy from remainder of operations suite, but should have direct access to dispatch.
  - ✓ Schedulers
    - Direct access to dispatch and radio.
  - ✓ Operations Manager and associated clerical
    - Doesn’t require direct access, but should be adjacent to operations suite.
- Supervisors
  - ✓ Workstations might be too small and should be studied in more detail.
  - ✓ Private meeting room, i.e. ‘Interview Room’ needed for disciplinary reasons.

- Quiet Room to be re-programmed as workstation room.
  - ✓ Private area for drivers to work on reports, etc.
- Training office is too large, reduce size. Only need space for three workstations and a small conference table (four chairs).
  - ✓ Give excess space to supervisors and training room.
  - ✓ Put moveable partition in training room.
- Remove bump-out on south façade.
  - ✓ Move IT department and transit police to Level 2.
  - ✓ Stretch Operations suite from south side of building to fill east side.
    - Add two private offices: One same size as Operations Manager, the other slightly smaller.
    - Make room for MA-3 office.
- Increase square footage on second floor (Occupy same square footage as ground floor footprint).
  - ✓ Allow space for personnel expansion.
- Director's office should have direct access to secretary and adjacent small conference room.
- Administrative offices could generally be slightly smaller than what was shown on plans.
- FAX liked open-office concept for central office area and seemed open to the concept of handling their specific needs with furniture and wall systems in lieu of permanent construction.
  - ✓ Showed Haworth website during meeting.
- Print shop should be located in plan area designated as 'future use' on second level.

Option B1 – Maintenance Building

- Level 1
  - ✓ Fresno FAX prefers this option (B1). South addition revised to three service bays with modifications to common work areas and tool box storage area.
  - ✓ Brake area needs additional storage for brake kits,
  - ✓ Tool box storage located adjacent to engine repair area.
  - ✓ Design team shall explore expanded space for electrical/ bus IT service and repair spaces. FAX staff insist that the space is inadequate since it is not known what kind of technology could be included in future buses.

- ✓ Existing paint booth bay width does not provide sufficient space for operation of scissor lifts and shall require continued use of existing drop table per Fresno FAX. Reconditioning and/or replacement of drop table shall not be part of this Master Plan.

- Level 2
  - ✓ Stair to mezzanine office area has been removed. Mezzanine to be converted to storage. Spaces below to be brake and AC shop storage. Facilities Supervisor to be relocated to main Level 2 office suite. Transit police to be relocated to Admin/Ops building.

Option C1:C4 - Maintenance Building

- Level 1
  - ✓ Larry Thompson of FAX provides sketch of parts area. Design team incorporated the ideas and objectives depicted in the sketch into four options for the parts counter orientation and parts room staffing workstations as follows:
    - Space for four separate, non-shared workstations
    - One Supervisor, potentially in a separate office
  - ✓ Reorganize metal shop and parts storage area.
  - ✓ Relocate tool box storage to engine repair area.
- Level 2
  - ✓ Remove office spaces on the north mezzanine. Facilities Supervisor to be relocated to main Level 2 office suite. Transit police to be relocated to Admin/Ops Building.
  - ✓ Portion of the parts storage shall be programmed for future expansion. FAX desires additional office space to be developed for three to four additional open workstations.
    - Need file storage room in admin suite.
    - Need for kitchenette in admin suite for admin office use only
    - Conference room for 12 people
  - ✓ Use of the Break Room is acceptable for use as a Training Room and need for separate training space is not required, but it should be noted in the program that the space is used for both and should contain IT components for use in training.

- ✓ Print Shop to be relocated to passenger amenity building. Later discussion on September 25, 2014 to relocate print shop and associated storage to Admin/Ops Building.

Public Amenities Building

- Option A program approved. Final plan to be developed based on the following:
  - ✓ Open office area to accommodate four to six workstations with work benches and data.
  - ✓ Material handling over flow storage area of 2,500 square feet
  - ✓ 4,500-square foot exterior canopy located on east side of building.

Summary

The Team adjourned the Charrette on Day Two and the Design Team was charged to complete the final Master Plan design refinements and Exhibits for presentation to Fresno FAX management at a later date.

Figure 4.I - Day Two, Option D Site Plan

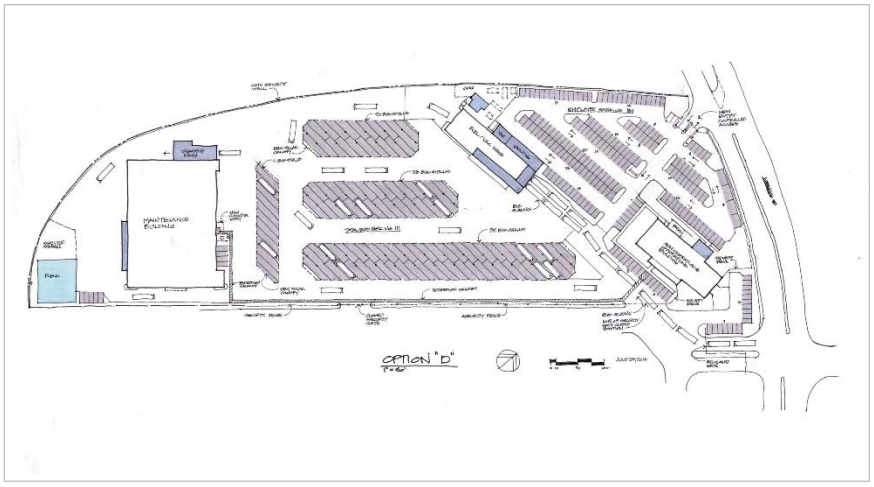


Figure 4.J - Day Two, Option D Fuel & Wash

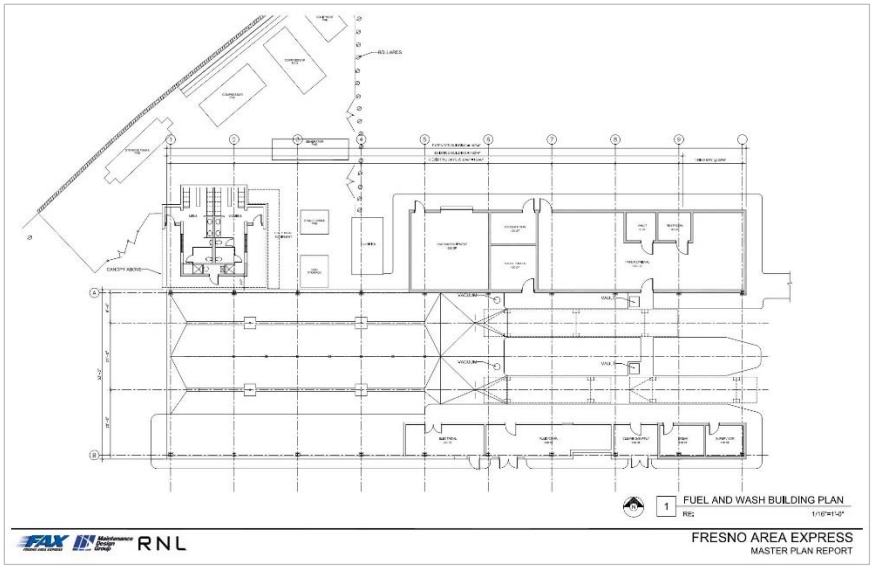


Figure 4.K - Day Two, Option C Admin Ops

Figure 4.L - Day Two, Option B1 Maintenance

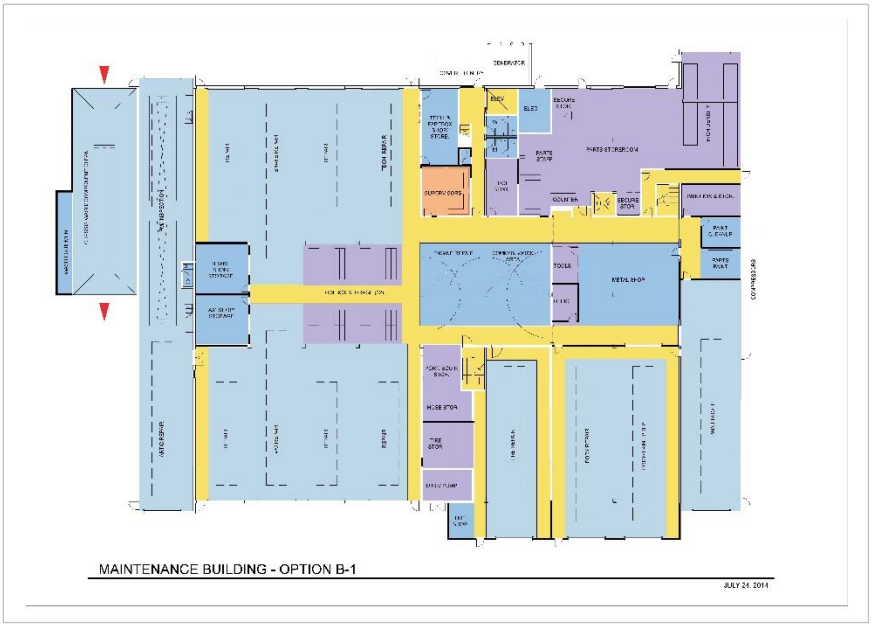


Figure 4.M - Day Two, Option B1 Maintenance

Figure 4.N - Day Two, Option C1 Maintenance

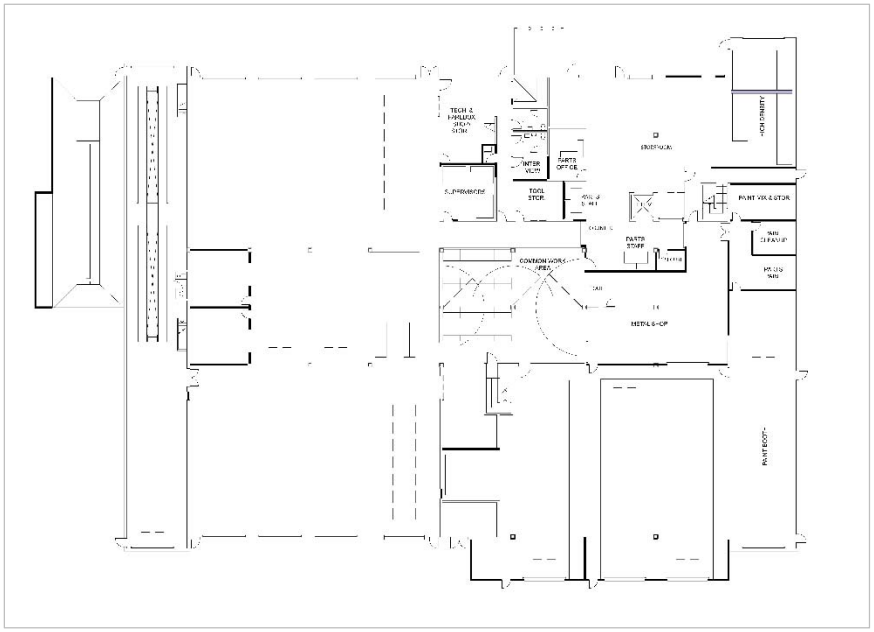


Figure 4.O - Day Two, Option C2 Maintenance

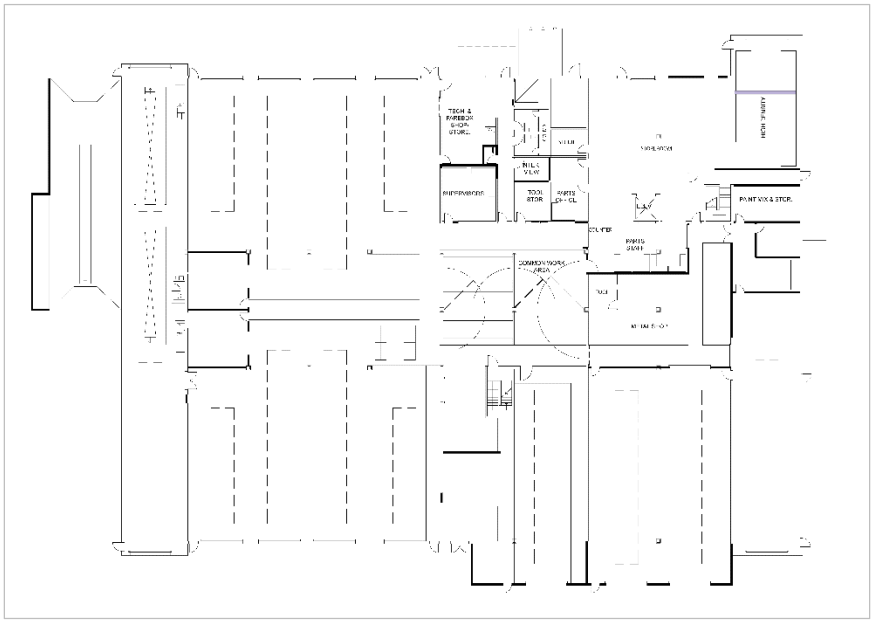


Figure 4.P - Day Two, Option C3 Maintenance

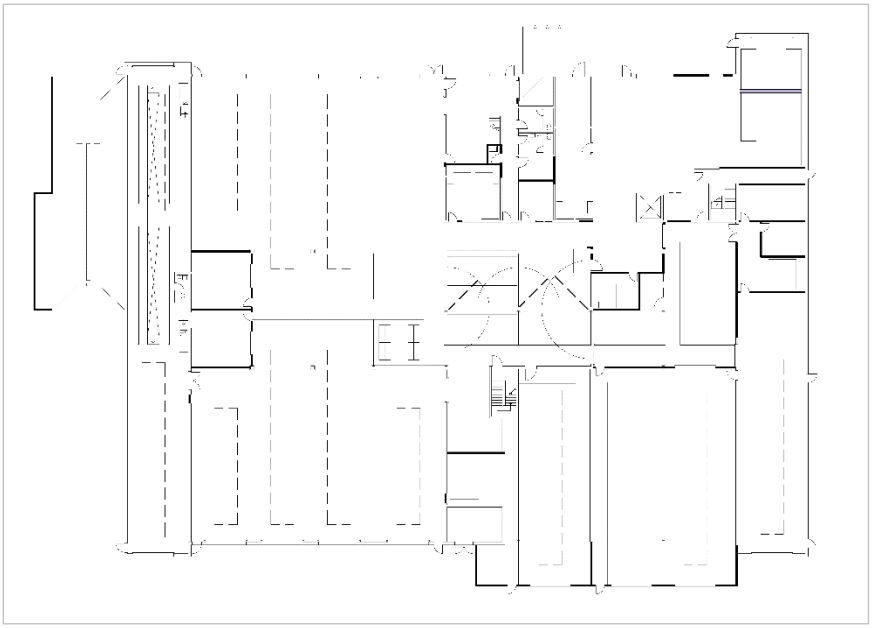


Figure 4.Q - Day Two, Option C4 Maintenance

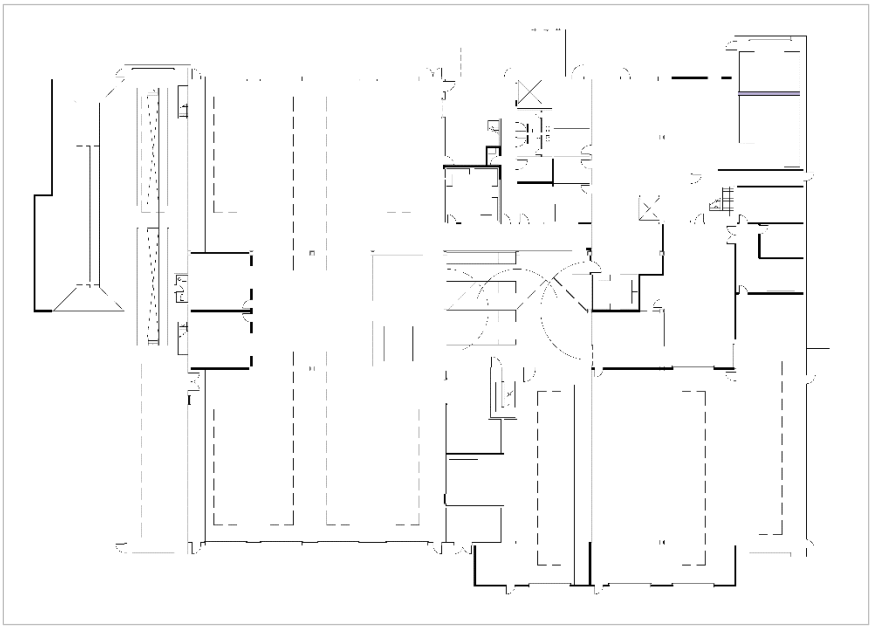
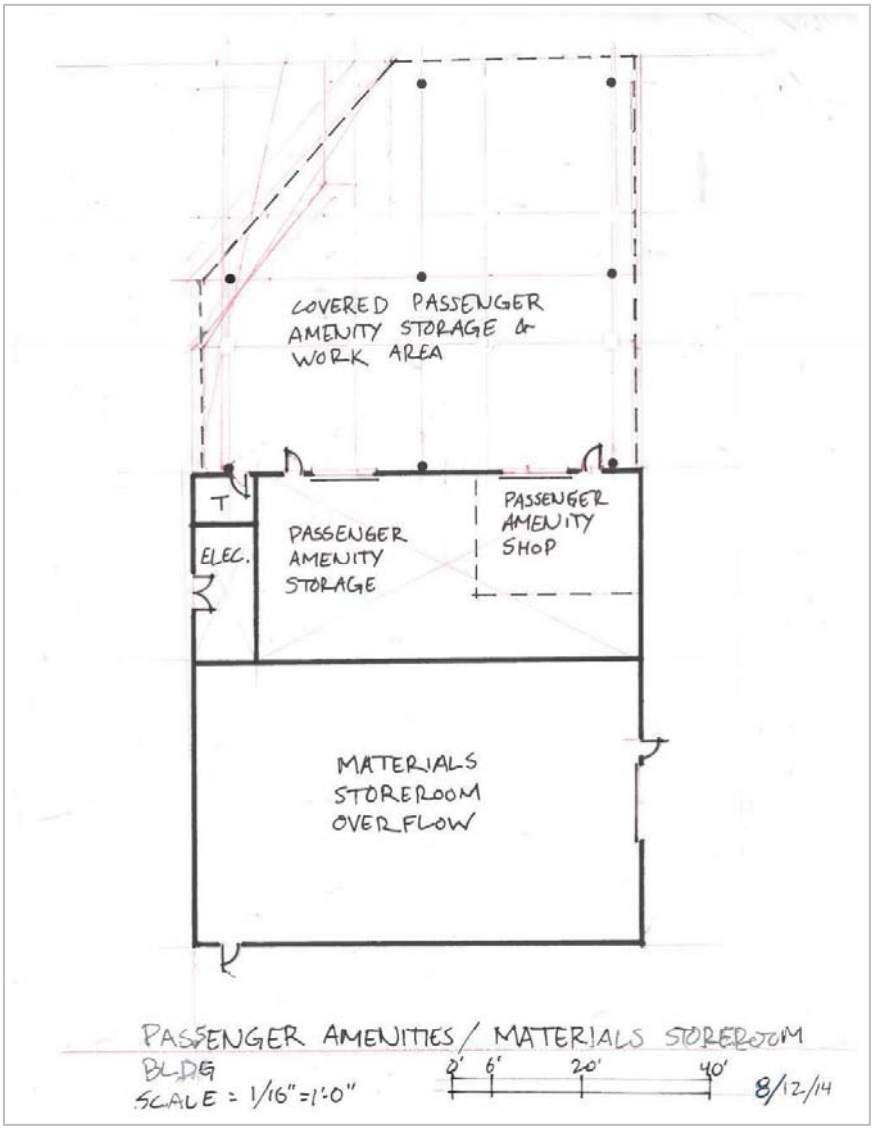


Figure 4.R - Day Two, Option A Public Amenities Building



Section Five
Facility Master Plan

Introduction

Immediately following the Master Plan and Concept Design Charrette, the site and building plans were further developed in detail to address issues discussed at the conclusion of Day Two of the Charrette. The purpose of the Post Charrette Concept Development exercise was to finalize the Master Plan and Conceptual Building Layouts and present them within this report. In addition, the plans were further developed in AutoCAD and Revit software programs.

Post Charrette Concept Development

These final digital plans represent discussion agreements and consensus achieved during the final presentation on Day Two, and subsequent discussions including:

- Site Plan
  - ✓ Employee parking area was modified to include shade trees and refined perpendicular Entry/Exit from G Street.
  - ✓ Additional non-revenue parking was developed along south side of maintenance building adjacent to storeroom.
  - ✓ Public Fueling shall be eliminated from the Fresno FAX internal site due to safety concerns with cross traffic. Fresno FAX shall explore alternate public fueling options off site to mitigate this hazardous ongoing practice.
- Fuel & Wash Building
  - ✓ The existing restroom building was modified to add new CNG tool room storage. The restrooms and lockers have been renovated and expanded to meet ADA standards per space needs program.
  - ✓ New vacuum room addition was added to facilitate new centralized vacuum equipment.
- Administration/Operations Building (Level 1)
  - ✓ All operational functions have been consolidated to Level 1 per stakeholder input.
  - ✓ Dispatch area shall be modified to include vision panels (glazing) between driver's room and dispatch.
- Administration/Operations Building (Level 2)
  - ✓ All administrative functions have been consolidated to Level 2 per stakeholder input.

- ✓ Future use areas were modified to include relocated print shop and storage area from existing maintenance building per space needs program.
- ✓ Storage room location in Large Conference Room was relocated to east side of room.

- Maintenance Building (Level 1)
  - ✓ Paint booth location has been modified to allow continued use of existing drop table. Note: Drop table is at the end of its life cycle and needs to be replaced/reconditioned (no available replacement). Replacement cost is not part of this Master Plan.
  - ✓ Paint mixing room has been relocated to the west side of the building outside the existing footprint.
  - ✓ North addition to accommodate seven articulated bays has been consolidated to three articulated bays. Interior tool storage has been relocated to allow articulated service bay functions within the existing footprint of the building.
  - ✓ Service parts counter has been reoriented to the east and accessible from common work area. Four Parts staff work stations have been reconfigured along north and west walls.
  - ✓ A/C and Brake Shop area have been reconfigured along east wall adjacent to inspection bays. Office mezzanine above has been modified to storage mezzanine. Refer to Level 2 plan.
- Maintenance Building (Level 2)
  - ✓ New canopy has been added to south entry.
  - ✓ New windows have been added to second floor south elevation at offices/conference.
  - ✓ Additional open work stations for clerks have been added to lobby/reception area.
  - ✓ Existing break room has been reconfigured to include new sink and base cabinets.
  - ✓ Men's and Women's locker/toilet rooms have been reconfigured per the space needs program.
  - ✓ New storage mezzanine over A/C and Brake Shop area below. Refer to Level 1 plan.
- Public Amenities Building
  - ✓ New covered 4,500-square foot canopy was added to the east side on the building.

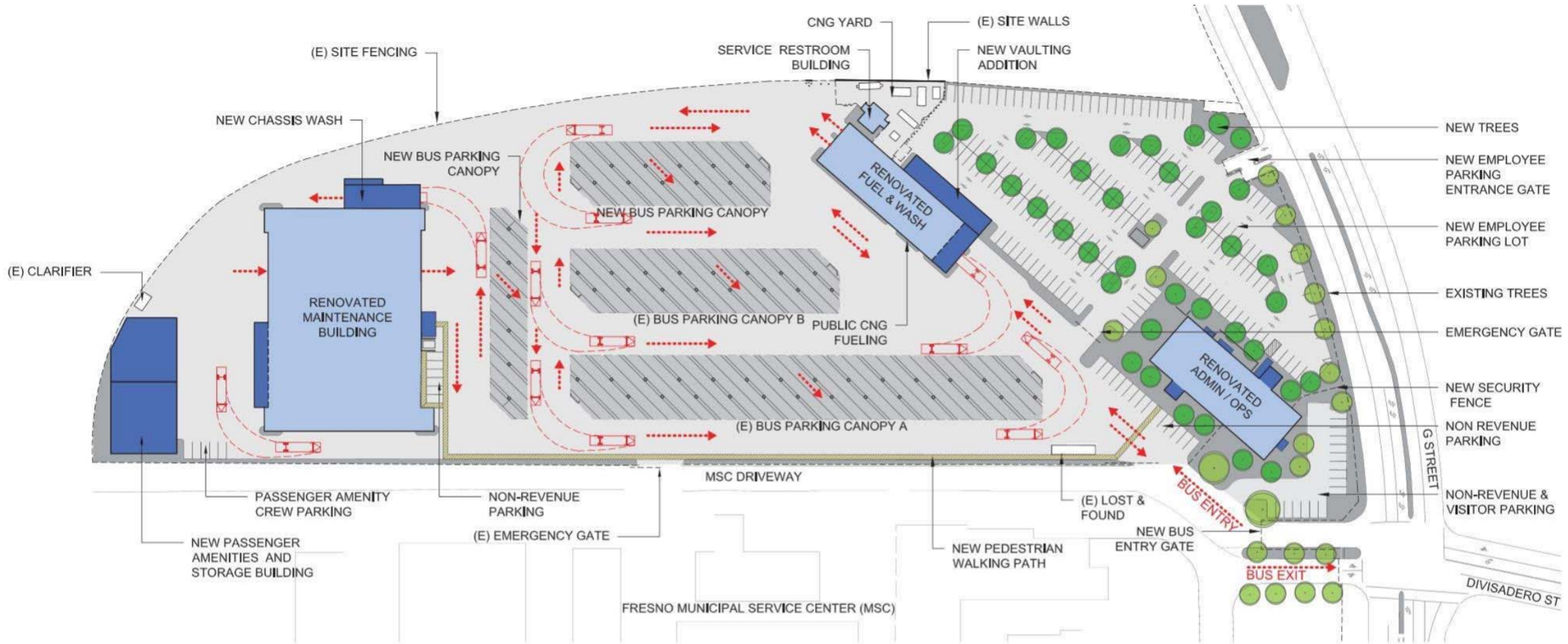
- ✓ New unisex toilet was added to east side of building.
- ✓ Materials storeroom overflow was developed per the space needs program.
- ✓ Passenger amenities crew parking was added along west property line.

Master Plan & Conceptual Layout Drawings

The Final Facility Master Plan and Conceptual Building Layout Drawings are as follows:

- Fresno FAX Master Plan - Site Plan
- Fresno FAX “Alternate” Master Plan - Site Plan
- Fuel & Wash Building, Restroom & Vaulting Building Plan
- Maintenance Building Plan - Level 1
- Maintenance Building Plan - Level 2
- Administration/Operations Building Plan - Level 1
- Administration/Operations Building Plan - Level 2
- Public Amenities Building Plan
- Site Perspective Proposed from East
- Site Perspective “Alternate” from East
- Site Perspective Proposed from North
- Site Perspective “Alternate” from North
- Site Perspective Proposed from South
- Site Perspective Proposed from West

Figure 5.A - Site Plan - Aerial



BUS PARKING: 115
EMPLOYEE / VISITOR PARKING: 243

0' 25' 50' 100' 200'
1:100

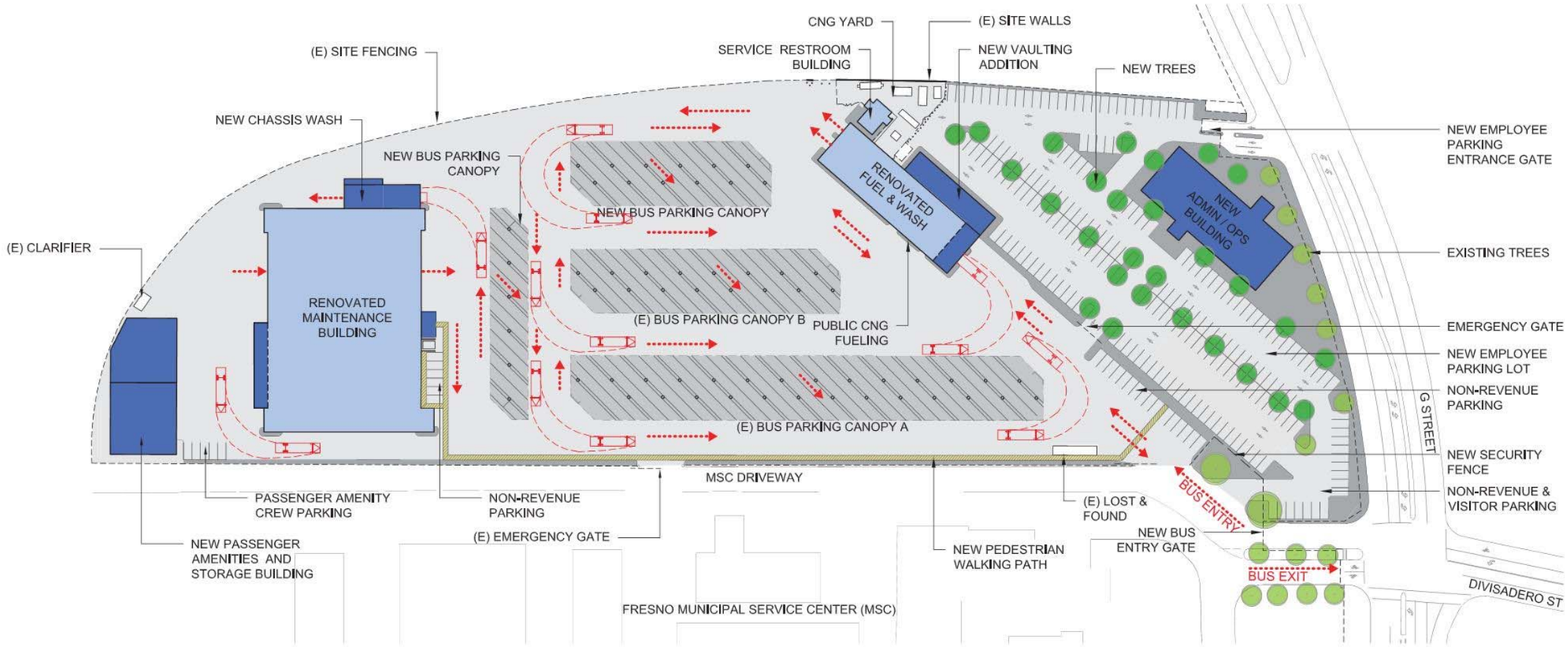
EXISTING - RENOVATED
NEW CONSTRUCTION
BUS CIRCULATION CYCLE
EXISTING STRUCTURES

PROPOSED SITE PLAN

FAX FRESNO AREA EXPRESS | Maintenance Design Group | RNL SEPTEMBER 4, 2014

FRESNO AREA EXPRESS
MASTER PLAN REPORT

Figure 5.B - Site Plan Alternate



BUS PARKING: 115
EMPLOYEE / VISITOR PARKING: 247

0' 25' 50' 100' 200'
1:100

EXISTING - RENOVATED
NEW CONSTRUCTION
BUS CIRCULATION CYCLE
EXISTING STRUCTURES

PROPOSED SITE PLAN - ALTERNATE

FAX FRESNO AREA EXPRESS | Maintenance Design Group | RNL SEPTEMBER 4, 2014

FRESNO AREA EXPRESS
MASTER PLAN REPORT

Figure 5.C - Maintenance Building - Fuel, Wash & Vaulting Plan

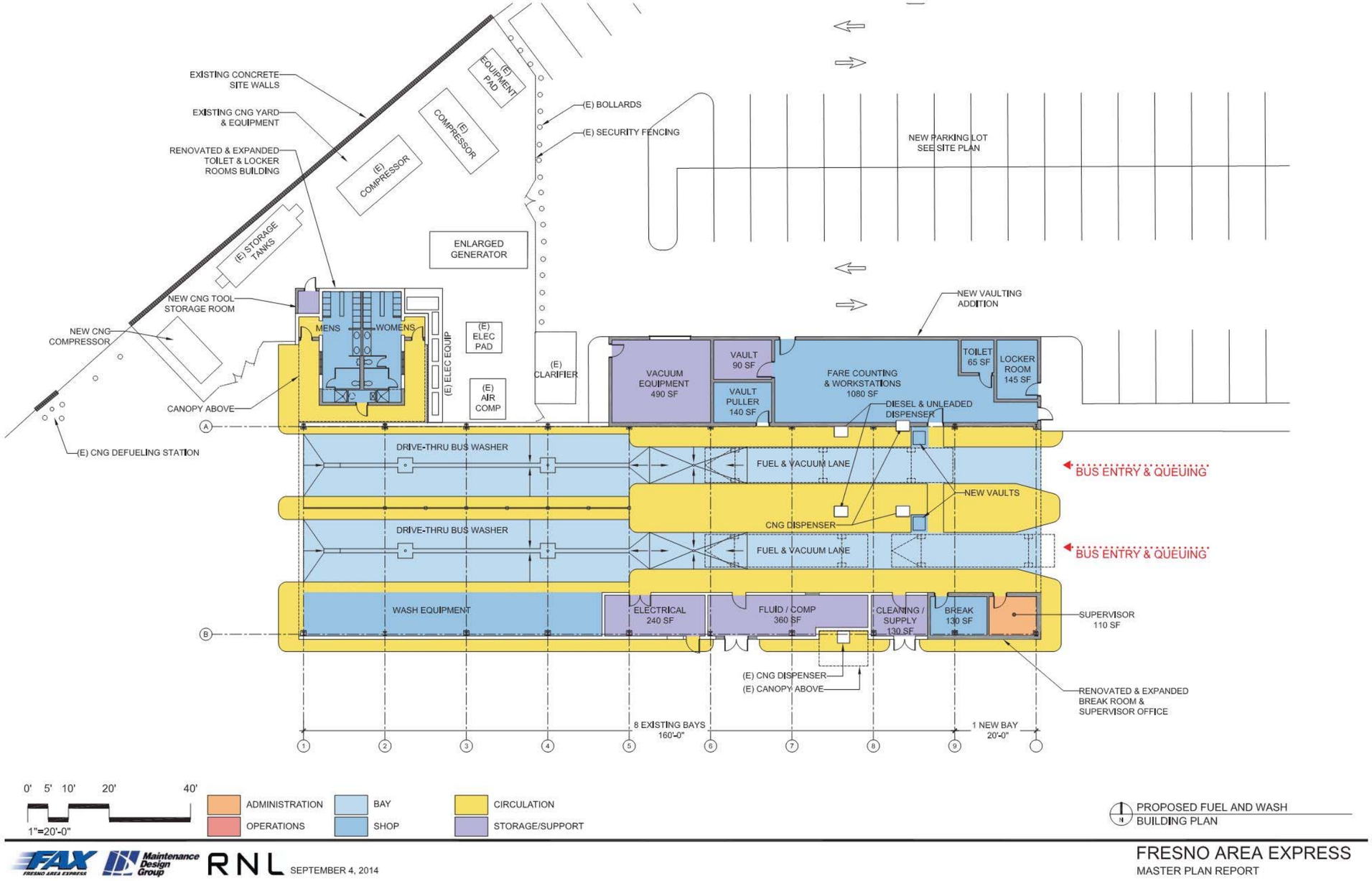


Figure 5.D - Maintenance Building - Level One

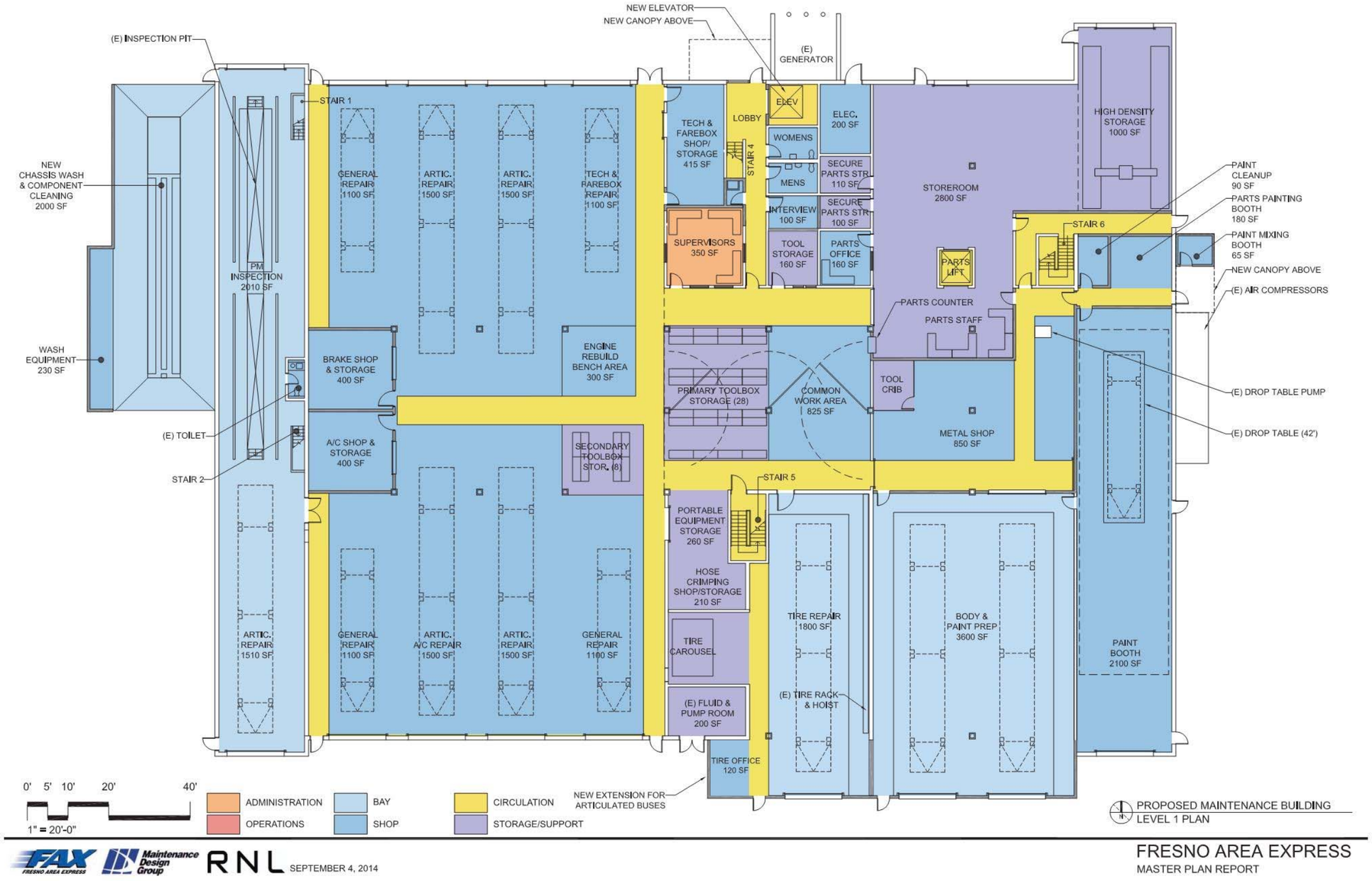


Figure 5.E - Maintenance Building Plan - Level Two

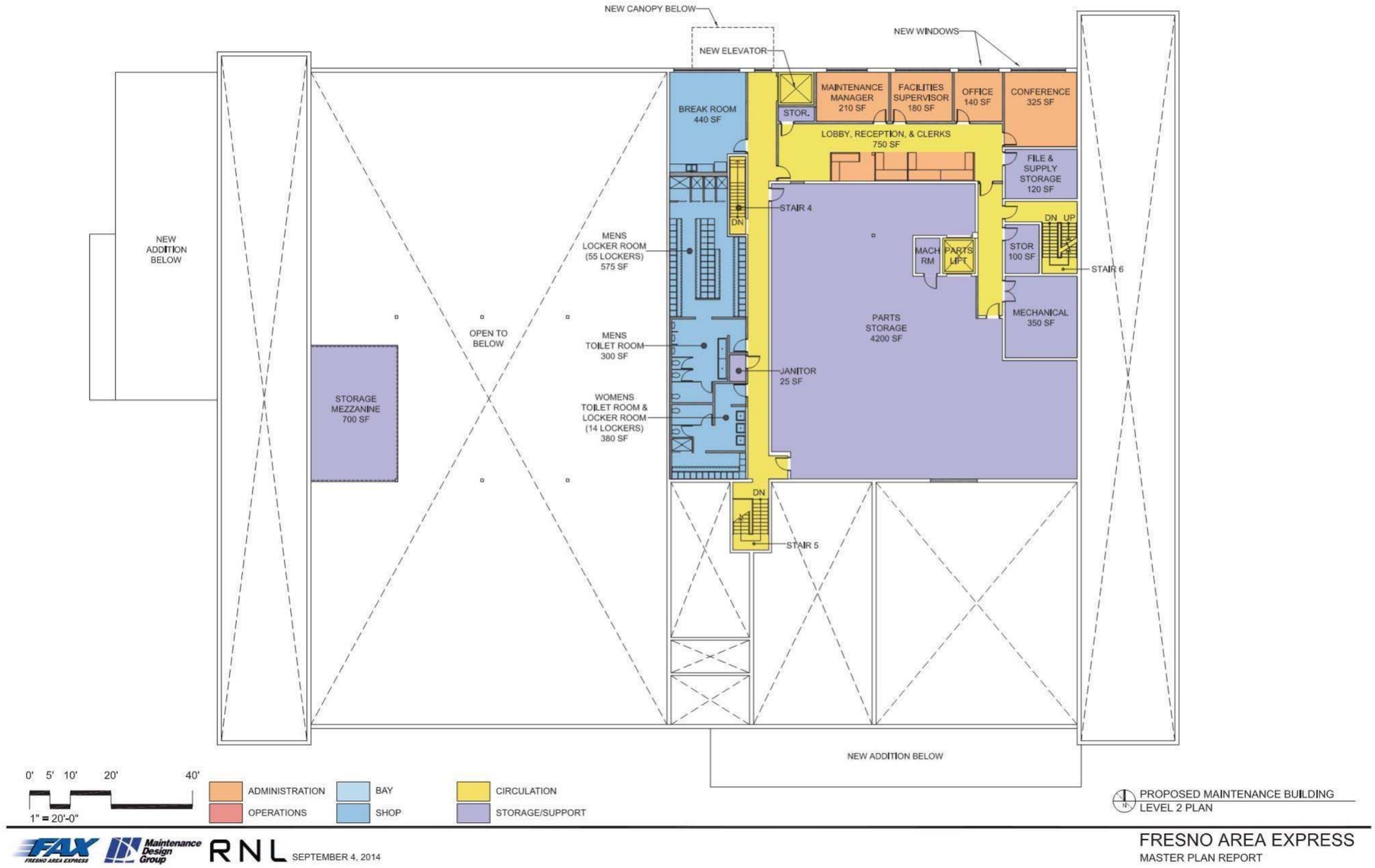


Figure 5.F - Administration/Operations Building Plan - Level One

Figure 5.G - Administration/Operations Building Plan - Level Two

Figure 5.H - Public Amenities Building Plan

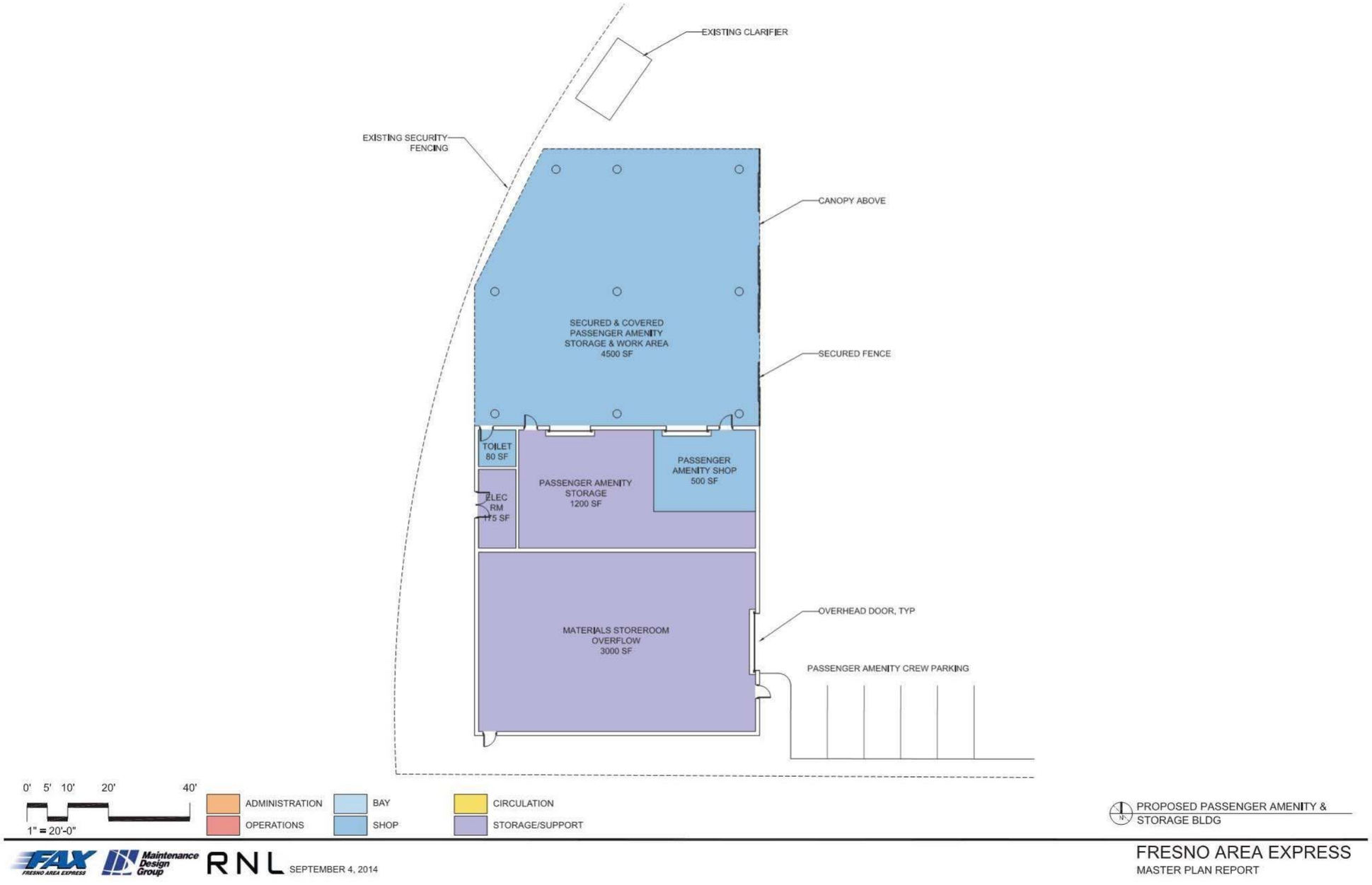


Figure 5.I - Proposed Scheme - View from East

Figure 5.J - Alternate Scheme - View from East

Figure 5.K - Proposed Scheme - View from North

Figure 5.L - Alternate Scheme - View from North

Figure 5.M - Site Perspective from South

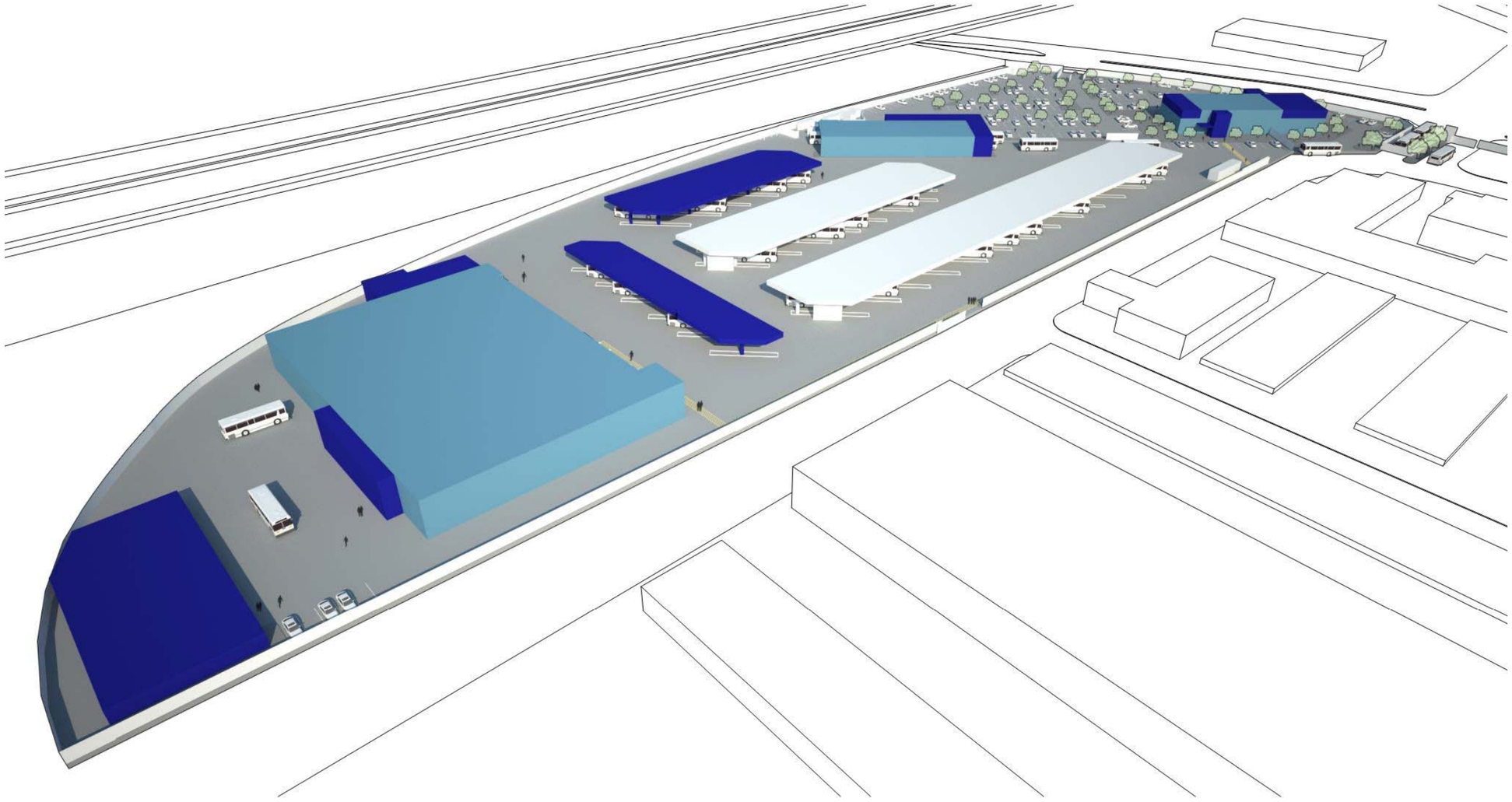


Figure 5.N - Site Perspective from West

Introduction

The following is the good faith estimate of the probable costs to renovate and complete the new construction identified in the Master Plan, for the reconstructed Fresno FAX Facility. The estimate presented in *Appendix D - Conceptual Design Opinion* of Cost was prepared by Jacobus & Yuang, Inc., an independent construction cost consultant based in Southern California. The values were initially derived from information in the program document, Fresno FAX record drawing information, the master plan site and building layout plans presented in Section Four - Master Plan Concepts, Section Five - Facility Master Plan and other supplemental information. This information was augmented by the narrative explanations presented in this report.

Opinion of Probable Cost

The Opinion of Probable Cost for the reconstructed Fresno FAX includes two elements: hard costs and soft costs.

- Hard costs are those related to construction.
- Soft costs are administrative costs supporting the design and management of the project.

Hard Costs

As with any conceptual estimate, an appropriate amount of contingency has been built into the estimate to cover issues that have not been addressed in the schematic design process. This contingency will diminish as the design documents become more refined and decisions are made about specific issues that affect cost, allowing the actual price for construction to be more accurately assessed.

Methods and values used in determining the construction costs of the facility were based on historical data. Information regarding projects that have been recently constructed in the surrounding region, that are similar in scope and construction methods as assumed in the schematic design, were analyzed in this process. Values in the estimate include the cost for everything affecting the project including, but not limited to, site work, selective building demolition, materials and labor for new construction, furniture, finishes, and equipment.

For detailed data of the costs estimate, please refer to *Appendix D - Conceptual Design Opinion of Cost*. It should be noted that the cost information has been based on the following assumptions:

- An annual 3.25 percent Escalation Factor was applied to the estimate. An averaged Escalation Factor of 9.0 percent (through mid-point of construction) has been included in prorates. This factor is based on a sequentially phased construction schedule. This factor is an average used in all options.
- An estimate contingency of 10.00 percent for all site and new building construction and 15.00 percent for all renovated building construction has been included in prorates due to the conceptual nature of the documentation.
- Other elements included in prorates include General Conditions of 7.00 percent. No market factor was applied.
- Additional Hard Costs include Bonds and Insurance Fee of 2.00 percent and Contractor's Fee of 6.50 percent.

As with any estimate, the possibility that market conditions will change exists. In recent years, due to environmental events, economic cycles, and material supply and demand trends, the cost of construction has increased significantly. Accordingly, the escalation factored for the duration of this project is based on schedule estimates.

Table 6.A - Estimated Cost with Alternate

Prepared by: Jacobus &Yuang, Inc.

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT				JOB #:	C2008A-R2
LOCATION: FRESNO, CA				DATE:	29-Aug-14
CLIENT: MAINTENANCE DESIGN GROUP				REVISED:	30-Sep-14
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - GRAND SUMMARY					

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	SUMMARY OF ESTIMATE			$	$
	COST SUMMARY				
	PHASE 1				
	FUEL & WASH FACILITY ADDITION & RENOVATION	11,988	SF	166.65	1,997,786
	MAINTENANCE & SERVICE EQUIPMENT COSTS, INSTALLATION + TAXES	11,988	SF	101.64	1,218,476
	ADDITION & RENOVATION OF EXISTING RESTROOM/LOCKER ROOM BUILDING	690	SF	573.56	395,756
	RELATED SITEWORK	12,682	SF	21.08	267,398
	SUB TOTAL PHASE 1				**3,879,416**
	PHASE 2				
	MAINTENANCE BUILDING RENOVATION & ADDITION + RELATED SITEWORK	52,970	SF	150.01	7,946,259
	MAINTENANCE & SERVICE EQUIPMENT COSTS, INSTALLATION + TAXES	52,970	SF	82.75	4,383,456
	SUB TOTAL PHASE 2				**12,329,715**
	PHASE 3				
	NEW & EXISTING SOLAR CANOPY + RELATED SITEWORK	74,430	SF	62.77	4,672,183
	SUB TOTAL PHASE 3				**4,672,183**
	PHASE 4				
	ADMIN-OPS BUILDING RENOVATION & ADDITION	21,054	SF	317.76	6,690,161
	RELATED SITEWORK	104,160	SF	18.42	1,919,137
	SUB TOTAL PHASE 4				**8,609,298**
	PHASE 5				
	NEW PASSENGER AMENITIES BUILDING & CANOPY + RELATED SITEWORK	5,320	SF	355.88	1,893,304
	SUB TOTAL PHASE 5				**1,893,304**
	GENERAL SITEWORK (WORK NOT SPECIFICALLY INCLUDED IN PHASES INDICATED)				
	SITEWORK OUTSIDE PHASING WORK	289,670	SF	2.51	727,274
	SUB TOTAL GENERAL SITEWORK				**727,274**
	TOTAL ESTIMATED CONSTRUCTION COST WITH EQUIPMENT				**32,111,190**
	CNG FUELING SYSTEM -				N.I.C.
	TOTAL ESTIMATED CONSTRUCTION COST [W/ EQUIPMENT + W/O CNG EQUIPMENT]				**$ 32,111,190**

GRAND SUMMARY

Prepared by: Jacobus &Yuang, Inc.

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	JOB #:	C2008A-R2
LOCATION: FRESNO, CA	DATE:	29-Aug-14
CLIENT: MAINTENANCE DESIGN GROUP	REVISED:	30-Sep-14
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - GRAND SUMMARY		

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	ALTERNATES				
	SITEWORK ALTERNATE				
	SITEWORK PHASE 4				$ 4,050,095
	TOTAL ESTIMATED CONSTRUCTION COST [WITH EQUIPMENT + ALTERNATE]				**$ 36,161,285**

NOTES:

GENERAL NOTES

1 PRICES BASED ON MIN. 4-5 COMPETITIVE RESPONSIVE BIDS RECEIVED FROM GENERAL CONTRACTORS
2 ESTIMATE IS DERIVED FROM SCHEMATIC DESIGN DRAWINGS & REPORTS: ARCHITECTURAL DRAWINGS & REPORT PREPARED BY RNL, STRUCTURAL & MEP REPORT PREPARED BY ARUP, & CIVIL REPORT PREPARED BY MDG, ALL DATED JULY/AUGUST 2014, RECEIVED 8/13/2014.
3 COSTS IN THIS ESTIMATE INCLUDE LABOR BASED ON PREVAILING WAGE RATES + MATERIAL & EQUIPMENT COSTS
4 COST OF REMOVAL OF (E) VAULTING EQUIPMENT FROM (E) ADMINSTRATION BUILDING AND RELOCATING TO PHASE 1 FUEL-WASH BUILDING

SPECIFIC EXCLUSIONS

1 F, F & E ARE EXCLUDED EXCEPT FOR MAINTENANCE EQUIPMENT & CNG INSTALLATION PER SUMMARY ABOVE
2 THE FOLLOWING COSTS ARE EXCLUDED: PROJECT SOFT COSTS BEYOND ESTIMATED CONSTRUCTION COST, LAND COSTS, CONSTRUCTION CONTINGENCY, OCCUPANT RELOCATION COSTS & TEMPORARY SWING SPACE PREPARATION

SPECIFIC INCLUSIONS

1 SITE OR BUILDING PAD OVER EXCAVATION IS INCLUDED.
2 NEW 2-STOP PASSENGER ELEVATOR @ MAINTENANCE BUILDING
3 GENERATOR REPLACEMENT @ MAINTENANCE BUILDING
4 RELOCATION OF (E) FUEL/WASH EQUIPMENT (VACUUM/CNG DISPENSERS)
5 MODIFICATION TO LEFT TURN POCKET & MEDIAN @ "G" STREET TO MEET CITY STANDARDS
6 ESCALATION INCLUDED IN THE ABOVE IS BASED ON THE FOLLOWING:

ESCALATION CALCULATION

	PH 1	PH 2	PH 3	PH 4	PH 5
BASE MONTH	Aug-14	Aug-14	Aug-14	Aug-14	Aug-14
CONSTRUCTION START MONTH	Nov-15	Nov-16	Nov-17	Nov-18	Apr-20
CONSTRUCTION DURATION (MONTHS)	10	10	6	14	10
MID POINT OF CONSTRUCTION	Apr-16	Apr-17	Jan-18	Jun-19	Aug-20
% ANNUAL ESCALATION	3.75%	3.75%	3.75%	3.75%	3.75%
ALLOWANCE FOR ESCALATION (TO MIDPOINT OF CONSTRUCTION)	6.03%	10.02%	13.44%	19.14%	24.75%

GRAND SUMMARY

Soft Costs

Soft Costs are included in the Opinion of Probable Cost to ensure that there are adequate available funds to cover the costs of necessary contingencies, project construction management, permitting, insurance, materials testing, design services, surveying, and other miscellaneous items. These soft costs are figured as a percentage of the total construction cost and have likewise been based on historical data from other projects of similar characteristics.

Table 6.B - Estimated Soft Cost Summary

Soft Cost Summary		
Soft Cost Item (based on Hard Cost of $32,111,190)		**Selected Concept Plan**
Design Contingency	10%	$3,211,190
Architectural/Engineering Fees	10%	$3,211,190
Construction Management Fees	5%	$1,605,595
Survey/Tests/Reports	Lump Sum	$125,000
Permits/Fees	Lump Sum	$125,000
Environmental Reports	Lump Sum	$25,000
Communication and Security Systems	Lump Sum	$75,000
Furniture and Fixtures	$20 x 11,250 SF of Office Areas	$225,000
Total	**9**	**$8,602,975**

Cost Summary

The Total Project Cost represents a conceptual level estimate based on the Selected Concept Plan, and is a result of preliminary cost estimating methods using a site master plan and conceptual building floor plans. Specific issues that impacted the costs are presented below.

- **Site Work**
  - ✓ The site work costs are based on disturbed portions of the 10.8 acres site and Sitework included in the respective phases and for overall work defined in the exhibits developed by the design team.
- **Site Utilities**
  - ✓ New utility services were accounted for the new Passenger Amenities building. Utilities impacted by the renovations/additions have been accounted for relocation

or replacement as required to facilitate the implementation of the phased improvements.

- **Building Areas**
  - ✓ During the Charrette, the Planning Team maximized the efficiency and building reuse to accommodate the square footage of building areas designed.
- **Vehicle Service and Maintenance Equipment**
  - ✓ The cost for special equipment was based on an equipment estimate developed from a preliminary equipment list. All probable cost for Maintenance Equipment accounted for are for new equipment, and to relocate equipment as identified in the master plan.
- **Structural Seismic Retrofit**
  - ✓ The hard cost of the Administration/Operations Building and Bus Canopies contains costs for the potential of the requirement to seismically retrofit the entire building and canopies in the cost estimate. The requirement would be determined during the design phase if the cost of renovation exceeds 50 percent of the value of the existing structures. At this point, we believe the seismic retrofit shall be required, so we have included costs for retrofitting both the administration/operations building and existing bus canopies. The total amount to include Prorates but not including Bonds and Contractor's Fees.
- **Hard Cost Fees**
  - ✓ Necessary bonding and contractor fees were included in the estimate at 2 percent and 6.5 percent respectively.
- **Contingencies**
  - ✓ A 10 percent (of the Hard Costs) Design Contingency was applied in the Soft Costs estimate and a 10 percent Estimate Contingency was applied in the Hard Cost estimate. These contingencies are necessary at this conceptual level and are generally reduced as the design is refined.

Table 6.C is a summary of the Hard Costs presented in *Appendix D - Conceptual Design Opinion of Cost* (derived from the Master Plan Site Plan, Building Floor Plans, and the estimated project Soft Costs. The figures in the summary table have been rounded to the nearest thousand.

Table 6.C - Cost Summary

Cost Summary	
Cost Item	**Master Plan w/o Alternate**
Hard Costs	$32,111,190
Soft Costs	$8,602,975
Total Project Cost	**$40,714,165**

The total combined estimated costs (Hard Costs + Soft Costs) for the Fresno FAX Facility is **$40,714,165**

Conclusion

The Opinion of Probable Cost presented in this Section for the renovations of the Fresno FAX facility will assist FAX in the ability to move forward with the planning and design process, secure funding and select a Planning Team. This information also allows the selected Planning Team the ability to confidently determine the appropriate scope necessary to solve the numerous design challenges of this project. It is by no means a final cost, and is intended to be a flexible document with heavy contingency that will represent changing information to the team based on FAX's and the Planning Team's decisions throughout the planning process. It will also allow tracking of the accuracy of the design documentation to the final budget for the project.

Since the total Project Cost presented may be more than Fresno FAX desires to spend in one construction project/period, the following Section Seven, Implementation Plan, proposes phasing for priority and implementation of the Master Plan improvements.

Section Seven
Implementation Plan

A multi-phased sequencing plan was developed to achieve the Master Plan.

Introduction

Fresno FAX is a key element of the Fresno Metropolitan Area public transportation system. With the responsibility in keeping up with Fresno Area Express's obligation and work load it dedicates to the public, it is vital to keep the Facility working at the highest capacity possible during implementation of the Master Plan. Proper sequencing and planning must take place for the implementation plan to work properly. Taking the cause and effect of the sequencing, the Master Plan was carefully studied by the Planning Team. A multi-phased sequencing plan was developed to achieve the Master Plan. Keeping the facility as fully functional as possible is a major consideration of each phase. Each phase will have several interim steps that shall require further detailed analysis and coordination to reach its respective goal.

Multiple steps are shown in the Sequencial Phasing Plan allowing for design and construction to be done concurrently. It also allows for phases to overlap. Once design and bidding are complete, Phase 1 construction can begin. This process would repeat through the end of all Phases.

The drawing on the next page depicts the current conditions at the Fresno FAX site. This drawing will help illustrate the whole process from beginning to end. To Fresno FAX's discretion, **buses and employee parking will need to be reassigned/relocated during** phased construction activities. Refer to sequential phasing plan(s) for impacts of each phase. In addition, plans of the existing facility can be found at the end of this section for reference.

Figure 7.A - Existing Current Conditions Site Plan

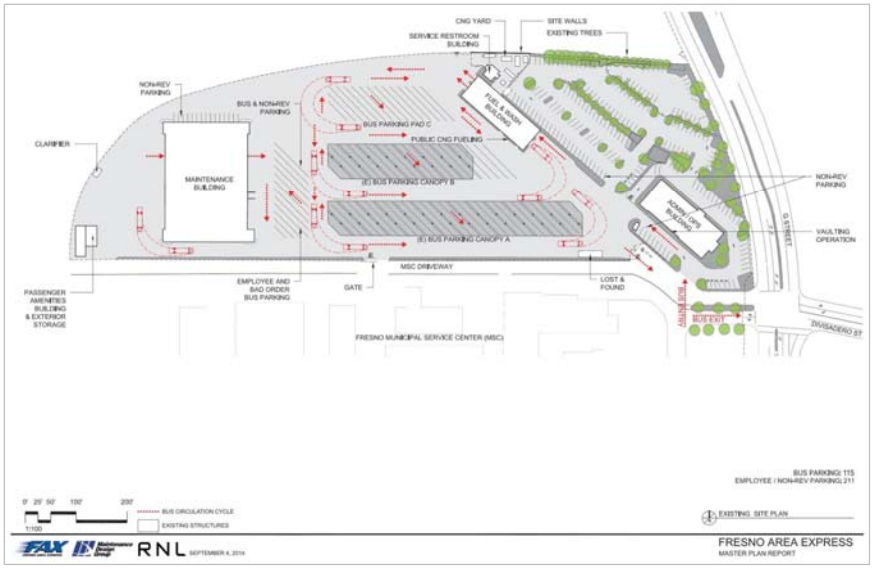
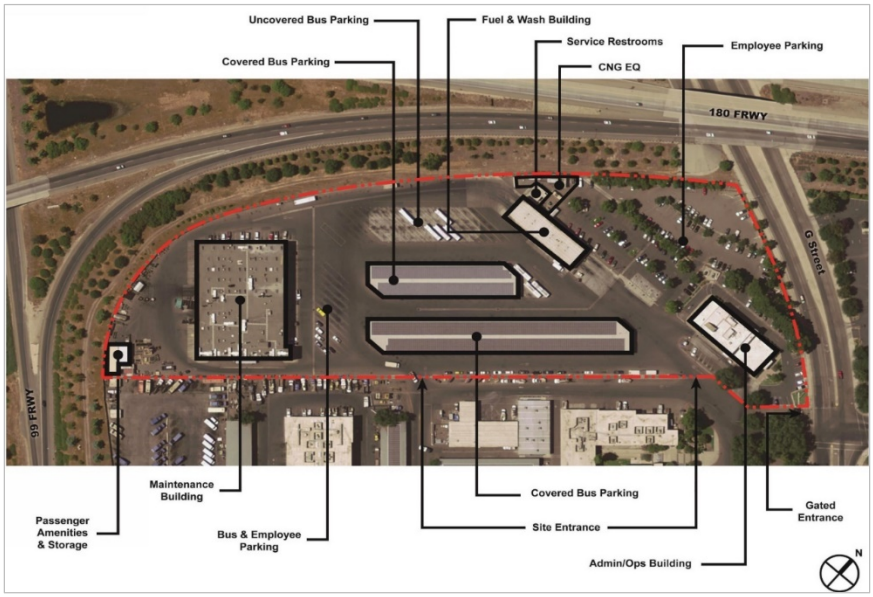


Figure 7.B - Aerial of Fresno FAX Site

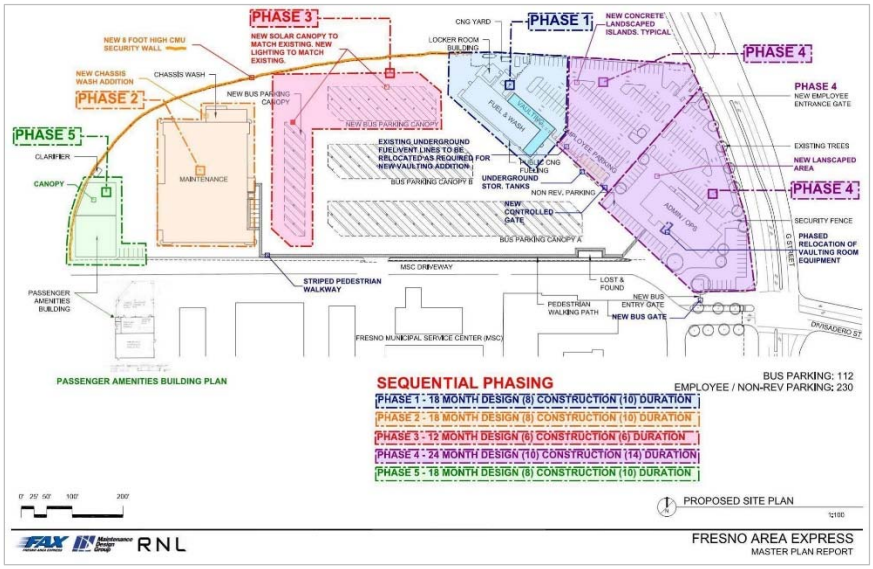


Master Site Plan

This following plan depicts the full implementation of the Master Plan reflecting all completed phases. As referenced in this report, current and future projects have been procured by Fresno FAX including new bus canopy lighting, additional (third) CNG fuel compressor and new emergency generator located at maintenance building.

Figure 7.C - Master Site Plan Fully Implemented

Figure 7.D - Overall Sequential Phasing Master Plan



Phase 1 Plan

This phase will be the first step in updating the Fresno FAX Bus Operating Facility. Existing vital operational elements shall remain intact until new replacement construction is completed. More comprehensive and detailed phasing plans shall be developed during the detailed design and construction phases to fully coordinate the intricacies of the Master Plan. **Employee parking to be displaced totals 25 for Phase 1 construction staging.**

Summary

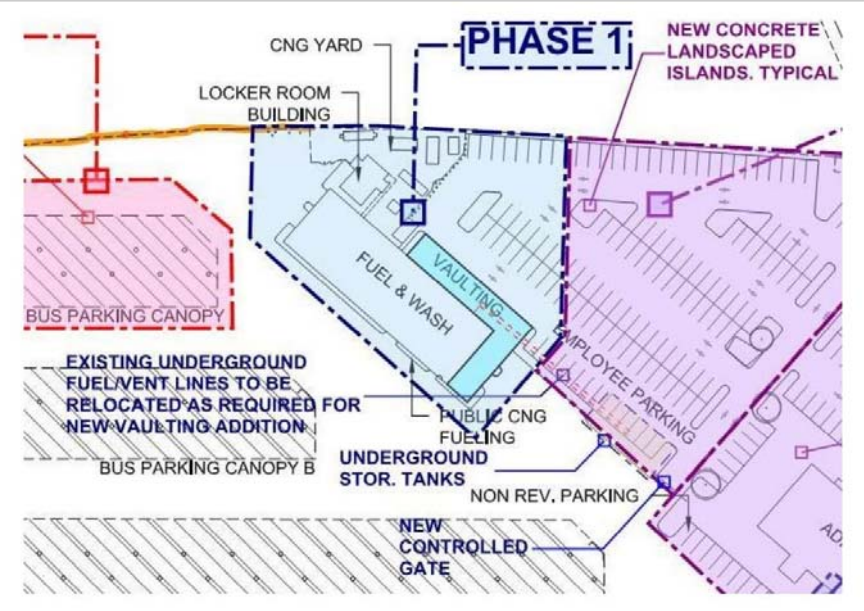
Fuel, Wash & Vacuum Building Renovation/Addition

The existing fuel islands shall be taken off line sequentially to allow renovations to take place while maintaining operations. The capacity of service shall be determined by Fresno FAX based on single lane service cycle with supplemental fueling at the current public fueling dispensers located along south side of building. Refer to Section 5, Figure 5.C for building plan. Renovations to include but not limited to:

- Canopy (20-foot) addition to west to accommodate future articulated buses service functions
- Fluid Room Conversion
- Interior Renovations
- New Roof, Fuel Bays and Fuels Building Renovations
- New Maintenance Equipment and Installation
- Replace Plumbing Fixtures and systems. Rework Fire Protection Systems
- Replace HVAC System, Exhaust Fans and miscellaneous system upgrades
- Refurbish and Replacement of Power and Lighting Systems
- Refurbish and Replacement of Communication Systems
- Refurbish and Replacement of Security Systems

Contractor staging area shall be limited to area depicted on the partial site plan below. **Renovation and demolition activities shall be performed without interruption of Fresno FAX daily operations.**

Figure 7.E - Phase 1 Partial Site Plan - Renovation/Addition



*** Employee parking to be displaced totals 20 for Phase 1**

Phase 2 Plan

This phase will be the next step in updating the Fresno FAX Bus Operating Facility. As stated previously, existing vital operational elements shall remain intact until new replacement/renovated construction is completed. More comprehensive and detailed phasing plans shall be developed during the detailed design and construction phases to fully coordinate the intricacies of the Master Plan. **Buses to be displaced totals 10 for Phase 2 staging areas.**

Summary

Chassis Wash Addition

Upon completion of Phase 1 and associated selective site demolition, construct new chassis wash bay and associated site work. This work shall be completed and operational prior to decommissioning existing chassis wash bay. Refer to Section 5, Figure 5.D for building plan.

Service Bay Addition

Upon completion of selective demolition, construct new three specialty bay functions at south side to accommodate servicing of future articulated buses. This work shall be done in concert with the paint booth improvements and interior renovations. Refer to Section 5, Figure 5.D for building plan.

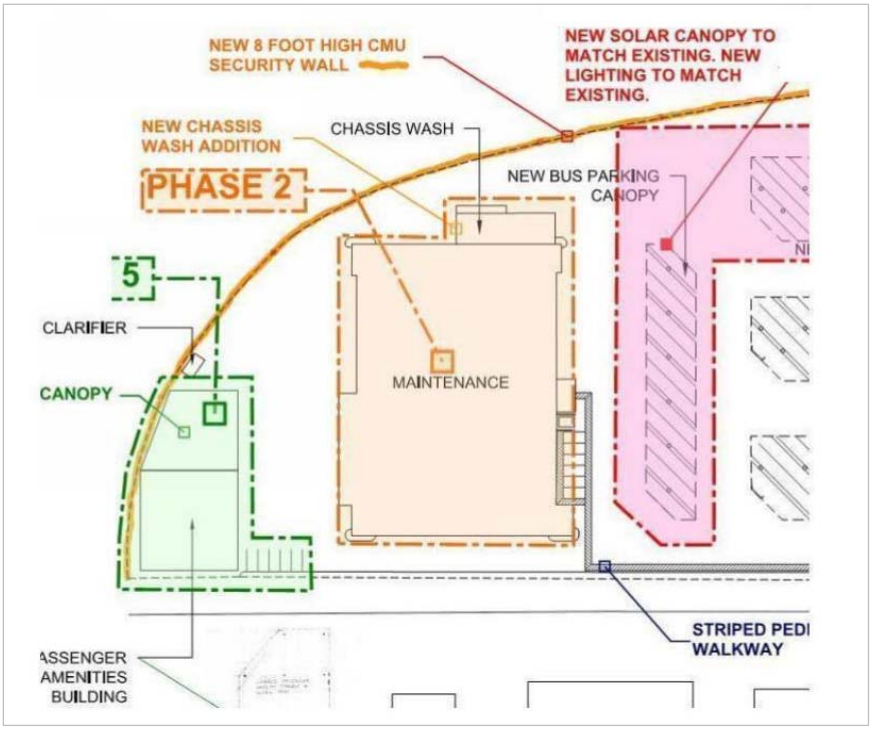
Contractor staging area shall be limited to area depicted on the partial site plan below with the exception of additional storage/staging areas to be defined by contractor based on detailed study of items to be implemented. Renovations, new construction and demolition activities shall be performed without interruption of Fresno FAX daily operations.

Maintenance Building Renovation

Upon completion of new Fuel, Wash & Vacuum Building Renovation/Addition, Chassis Wash Addition and Service Bay Addition shall be completed. Upon completion of new additions, renovation Improvements shall commence to Include but not limited to:

- Re-roof 100 percent of building
- New canopy at north entrance
- New window openings at upper level office suite
- Interior Support Area Remodel & Finish Upgrades
- Interior Shop Area Remodel & Finish Upgrades
- New Maintenance and Service Equipment
- New paint booth. Reuse existing drop table.
- Remove & Replace Plumbing Fixtures.
- Remove and Replace aging piping systems. Insulate HW piping.
- HVAC Upgrades - Refurbish & Replace Exhaust Fan Systems. Evaluate and Upgrade Existing Ductwork Systems
- Electrical - Hi-Efficiency Lighting and Controls. Branch Power upgrades to New Rooms.
- Note: Current work procured by FAX include new canopy lighting and Emergency Generator.

Figure 7.F - Phase 2 Partial Site Plan - Renovation/Addition



*** Employee parking to be displaced totals 5 for Phase 5**

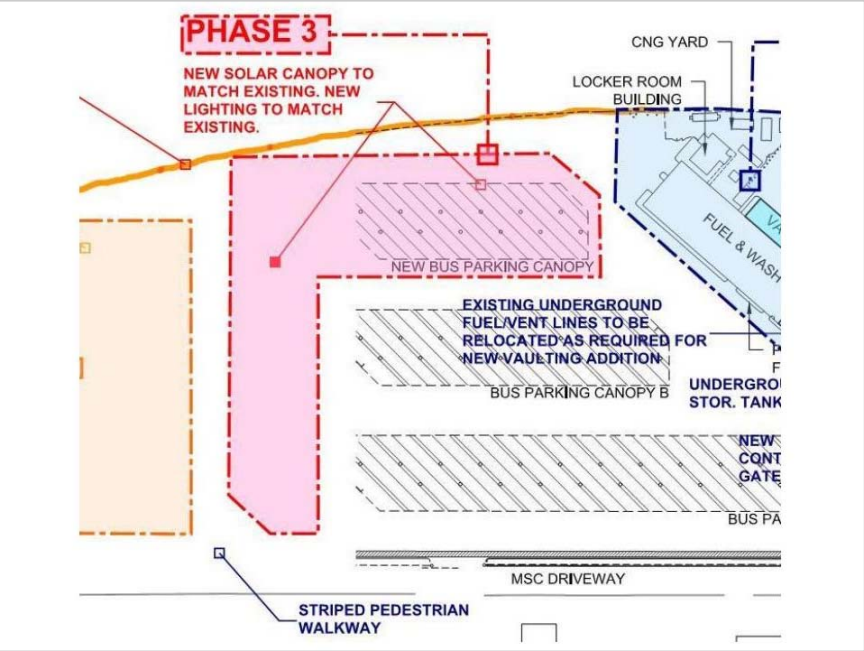
Phase 3 Plan

Staged construction of new bus canopies with solar arrays to match existing. Refer to Section 3, Needs Assessment for detailed description of work. Sequenced retrofit of existing canopies for seismic and refurbishment. Existing vital operational elements shall remain intact until new refurbishment or replacement construction is completed. More comprehensive and detailed phasing plans shall be developed during the design and construction phases to fully coordinate the intricacies of the Master Plan. **Buses to be displaced totals 25 for Phase 3.**

Retrofit, Refurbish & Construct New Bus Canopies

Upon completion of refurbishments and retrofit of existing canopies, construct new bus canopies in a sequential staged manner. Refer to Section 5, Figure 5.B for site plan.

Figure 7.G - Phase 3 Partial Site Plan - New Construction and Retrofit



*** Buses to be displaced totals 25 for Phase 3**

Phase 4 Plan

This phase will be the next step in updating the Fresno FAX OMF. Major renovations shall be performed while maintaining the day to day operations of the facility. Temporary Space Modules (or temporary short term lease) shall be utilized to provide operational support spaces during construction activities. **Note: If Phase 4 Alternate is implemented existing Administration/Operations Building shall remain operational while new building is constructed.** More comprehensive and detailed phasing plans shall be developed during the design and construction phases to fully coordinate the intricacies of the Master Plan. **Employee parking to be displaced totals 60 for Phase 4.**

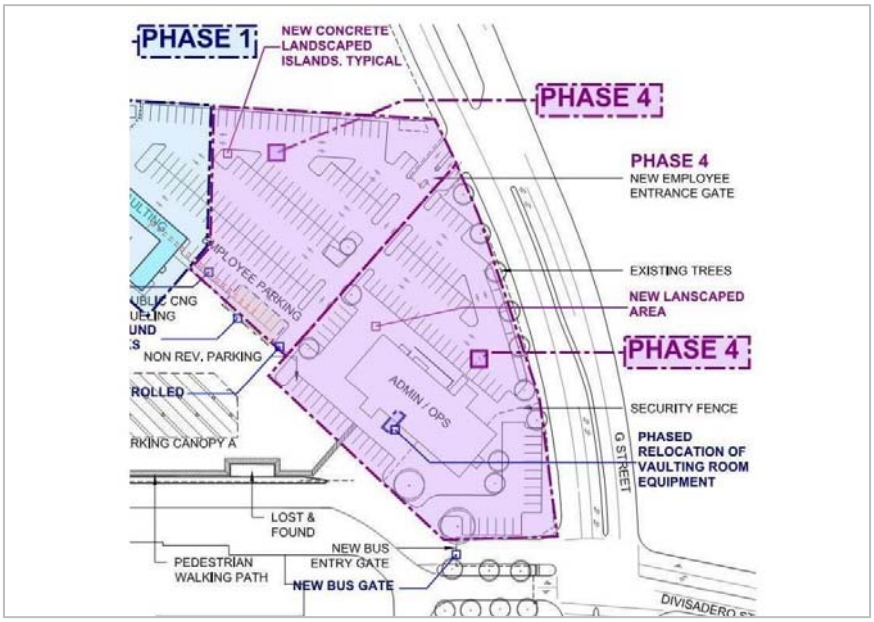
Administration/Operations Building Addition & Renovation

Upon completion of Maintenance Building Renovation, Temporary Space Modules shall be placed to on-site to allow addition and renovation activities to commence and to maintain Fresno FAX operations. Refer to Section 5, Figure 5.F for building plan. Addition and renovations to include, but not limited to:

- Vacation of existing building to temporary space modules or short term lease space shall be required (exception, Phase 4 alternate)

- Major Selective Building Demolition
- New Second Floor Infill Additions
- New stair additions
- New Fenestration
- Major Interior Remodel
- New Break Room Equipment
- New Employee Locker Room Equipment
- New Plumbing Systems
- New HVAC Systems
- New Electrical Systems

Figure 7. H - Phase 4 Partial Site Plan - Renovations



*** Employee parking to be displaced totals 60 for Phase 4**

Phase 5 Plan

This phase will be the final step in updating the Fresno FAX Bus Operating Facility. Major renovations shall be performed while maintaining the day to day operations of the facility. Temporary operations shall be relocated to the maintenance building, or offsite, during construction. More comprehensive and detailed phasing plans shall be developed during the design and construction phases to fully coordinate the intricacies of the Master Plan.

Passenger Amenities Building

Upon completion of Administration/Operations Building construction shall commence on the passenger amenities building to include new shade canopy and yard enclosure. Refer to Section 5, Figure 5.H for building plan.

Figure 7. I - Phase 5 Partial Site Plan - New Building

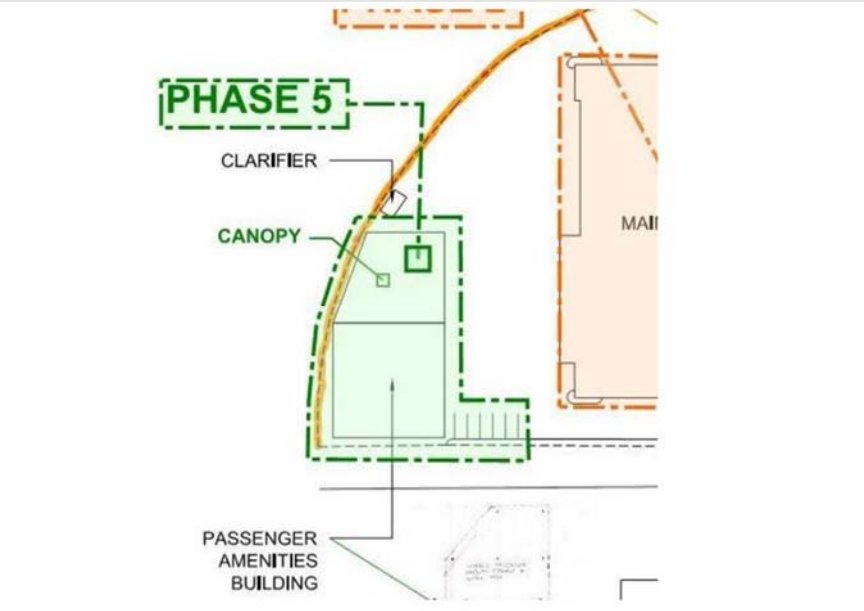


Figure 7.J – Existing Fuel, Wash & Vaulting Building

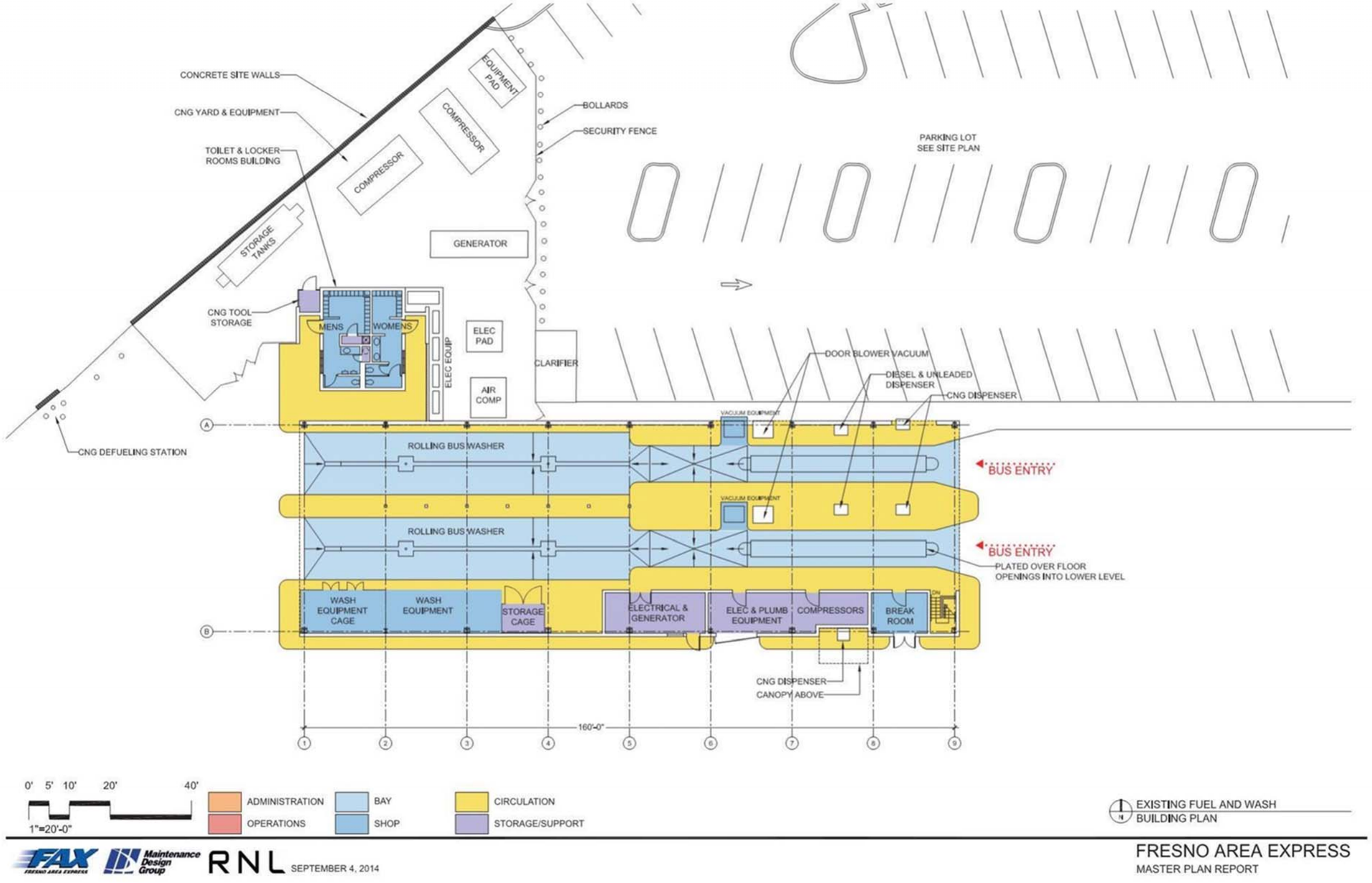


Figure 7. K – Existing Maintenance Building – Level 1

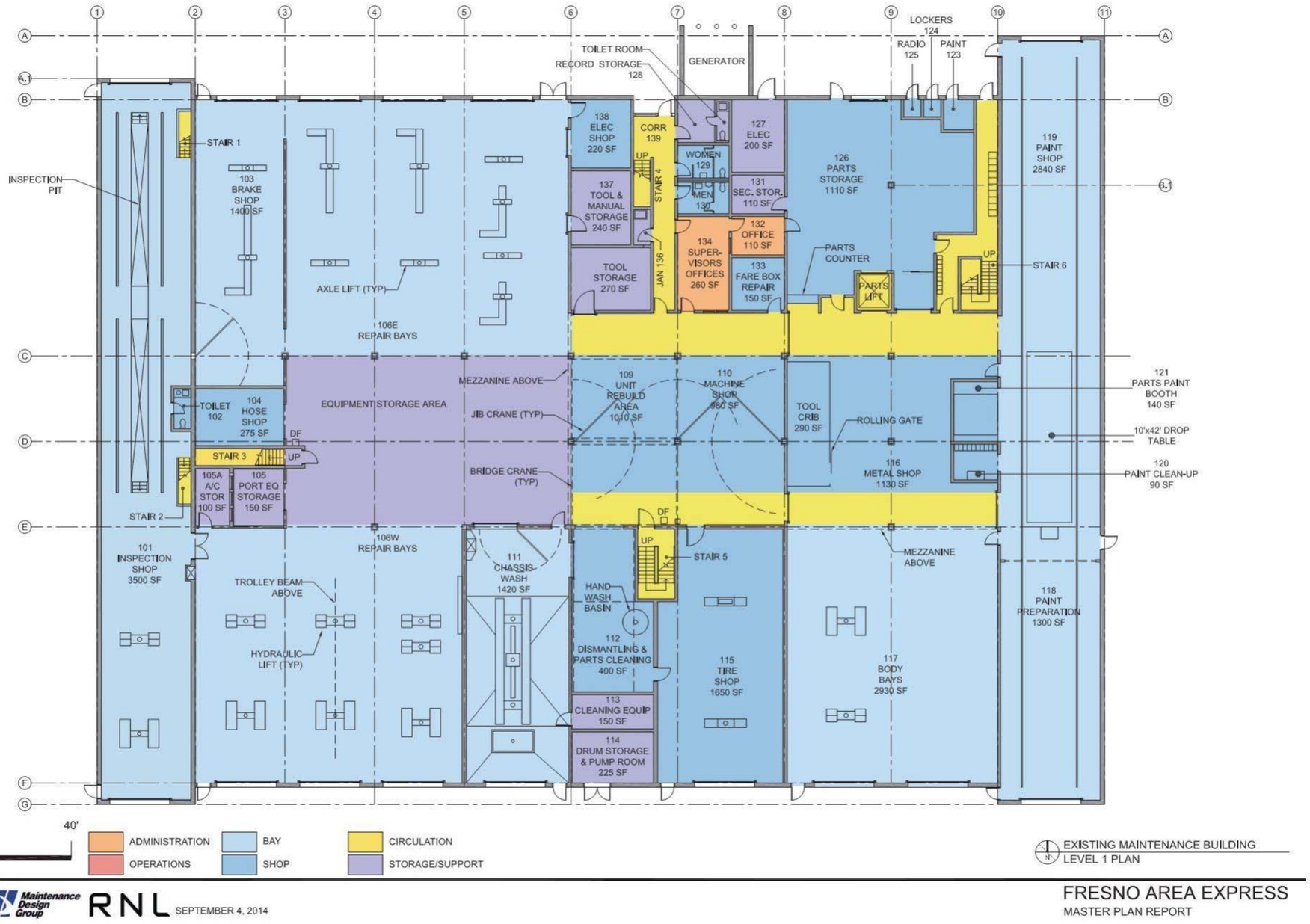


Figure 7. L – Existing Maintenance Building – Level 2

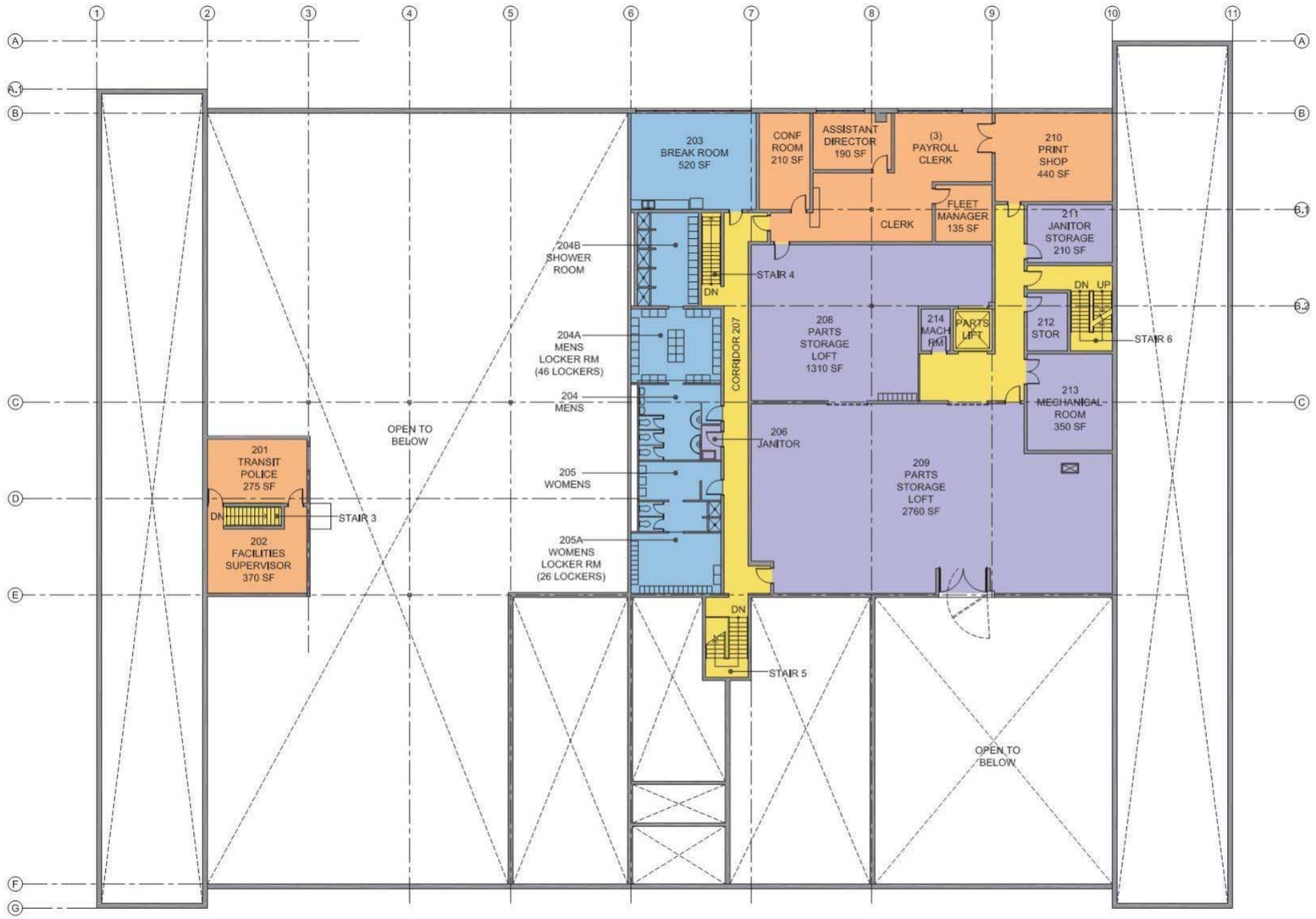


Figure 7. M – Existing Administration/Operations Building – Level 1

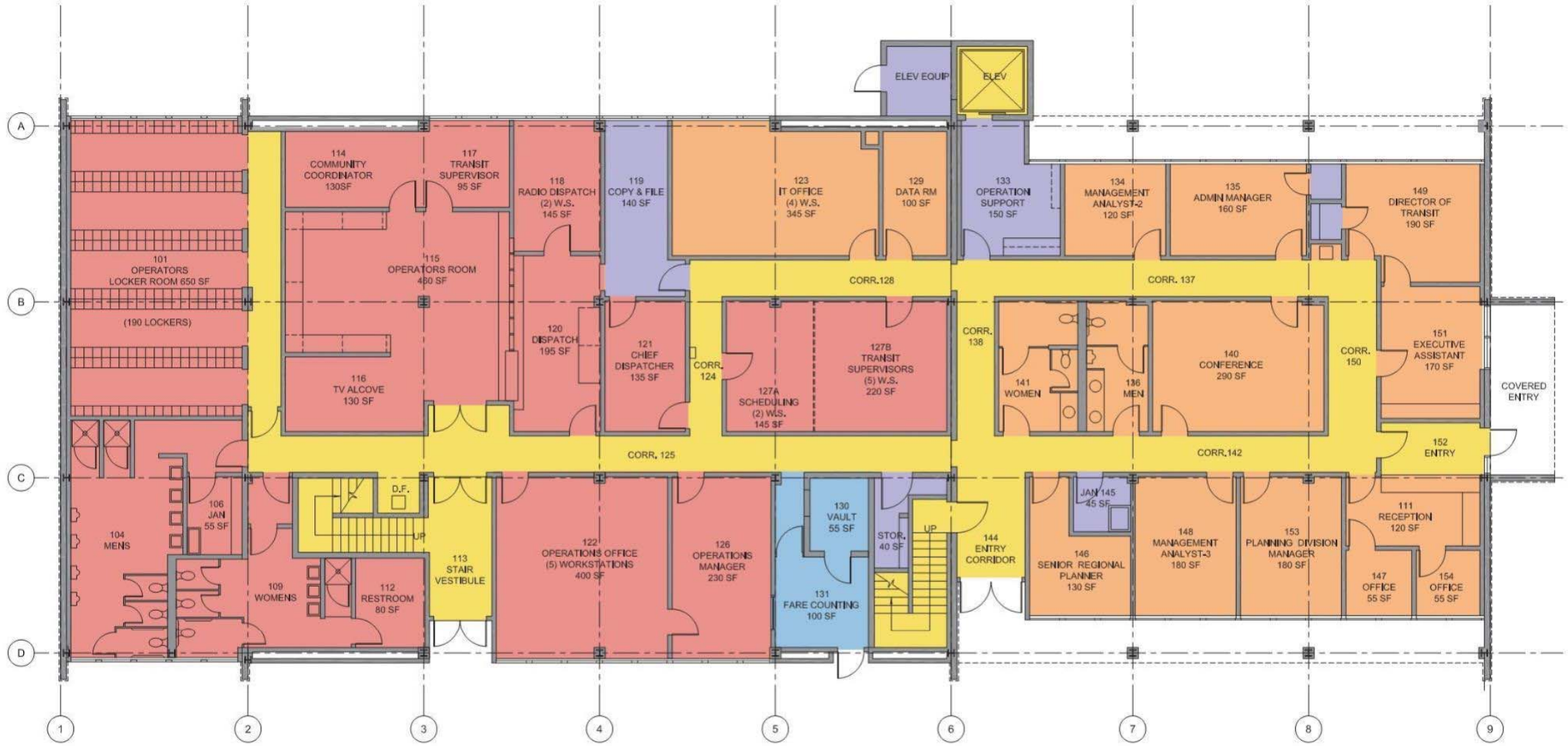


Figure 7. N – Existing Administration/Operations Building – Level 2

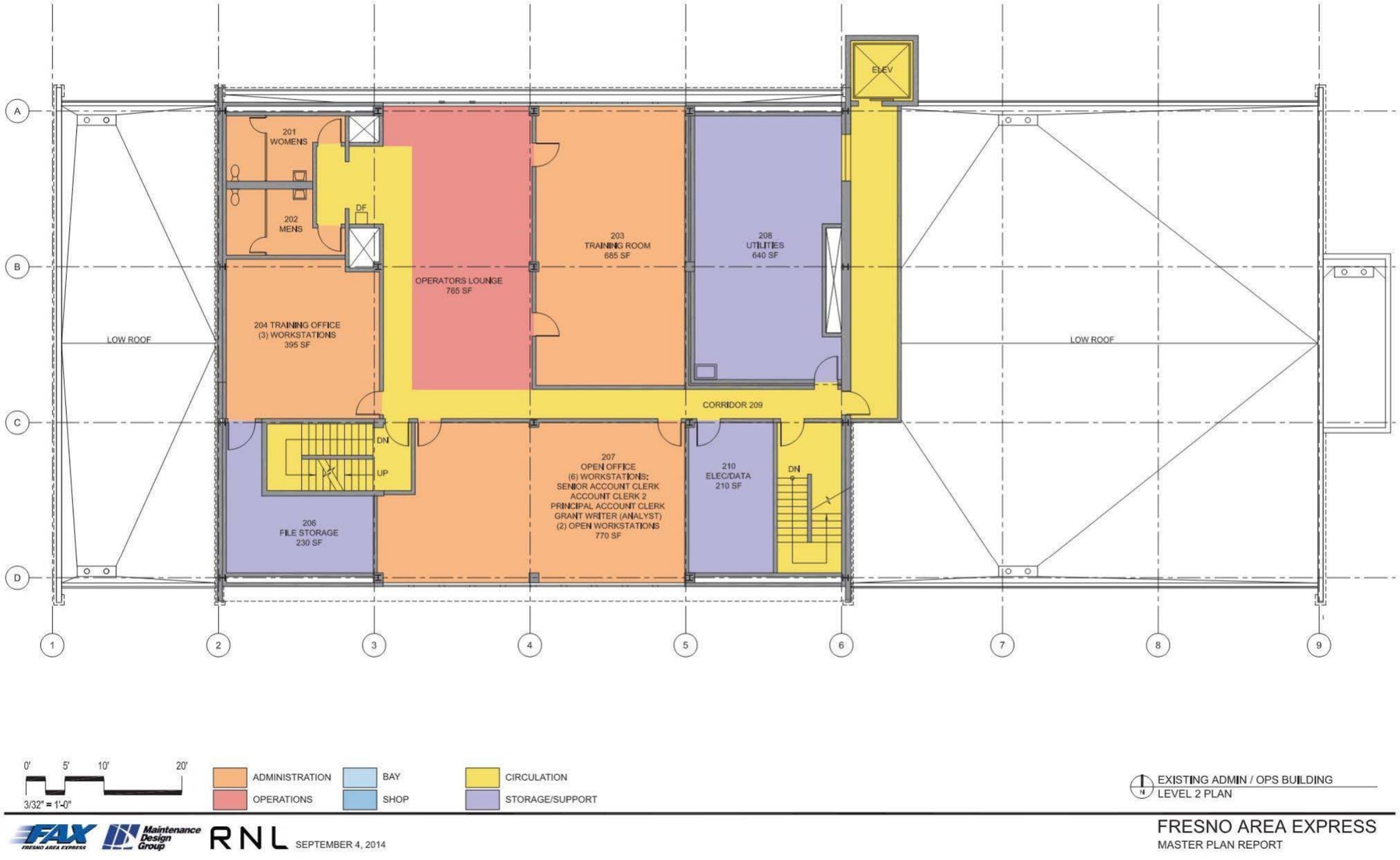
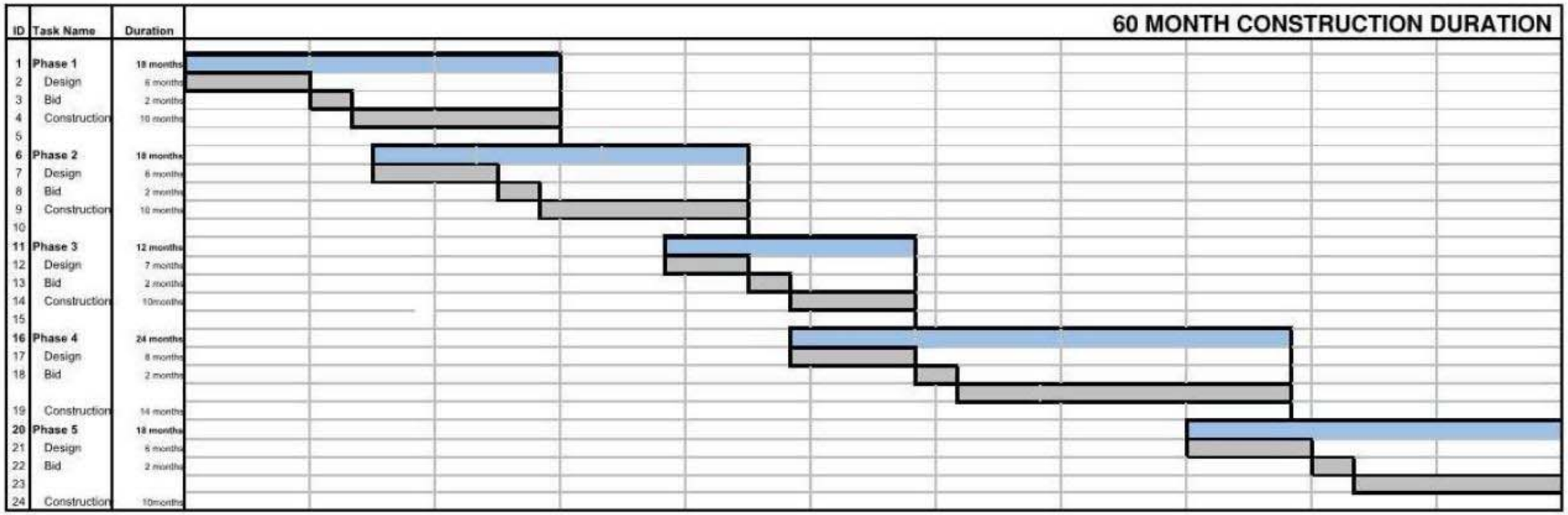


Figure 7. O – Construction Phasing Schedule



Appendix A

Existing Maintenance & Service Equipment Photo Inventory & Assessment

Inspection Bay/Shop, Room 101

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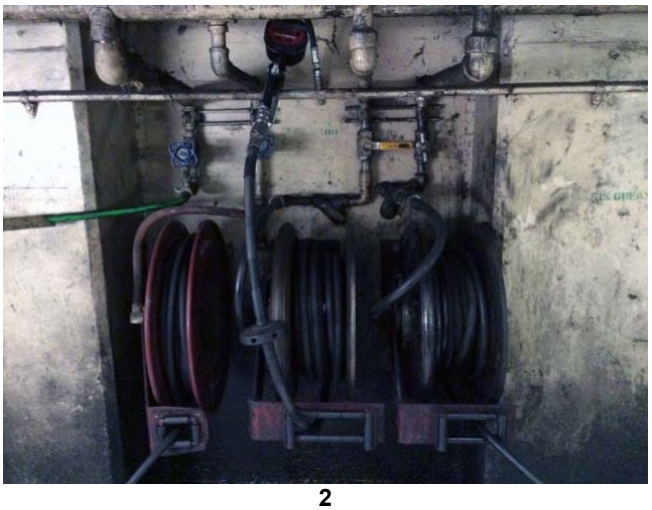

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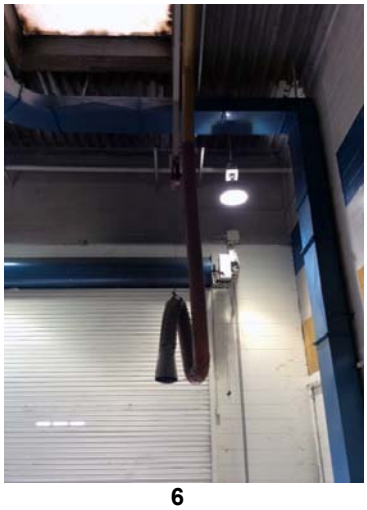

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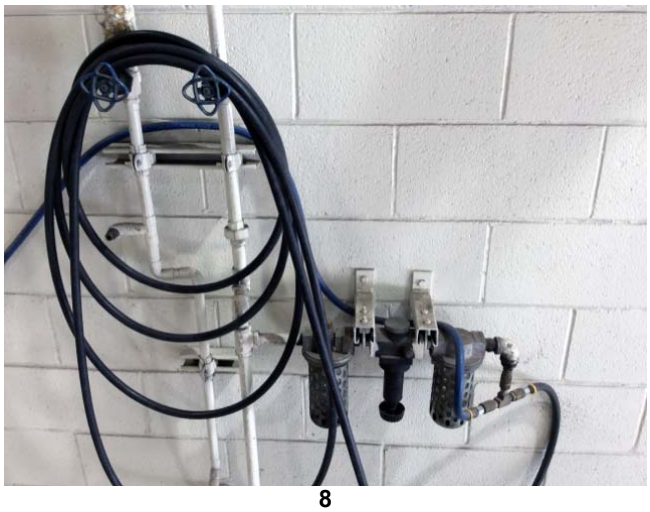

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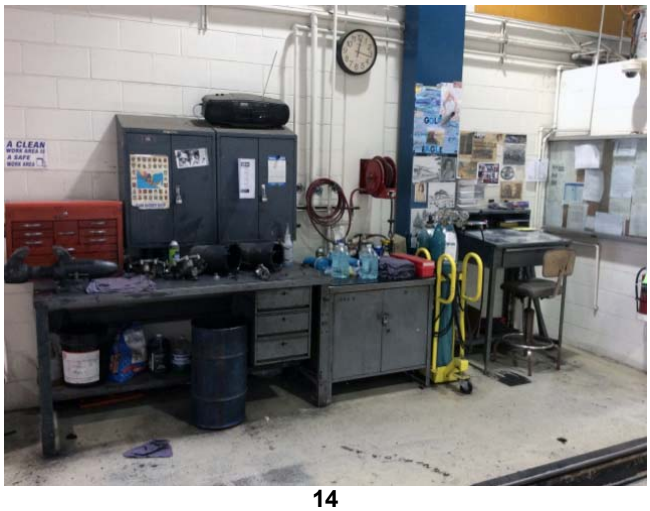

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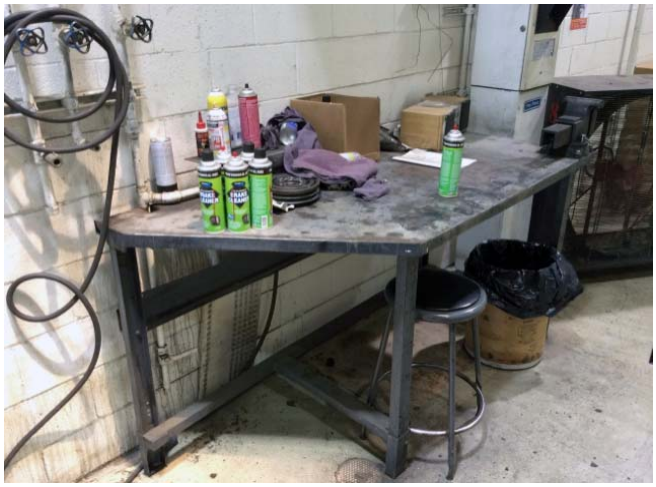

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Brake Shop, Room 103

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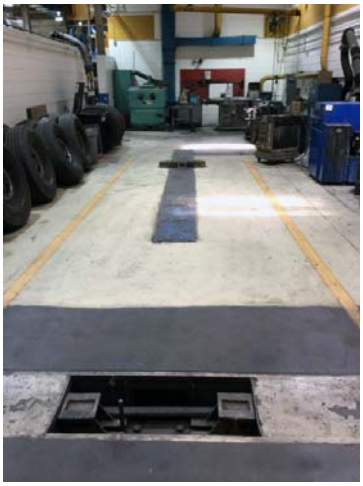

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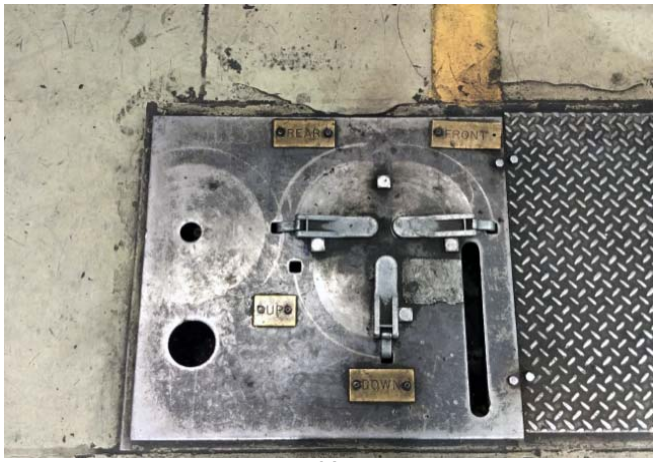

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Hose Crimping Room, Room 104

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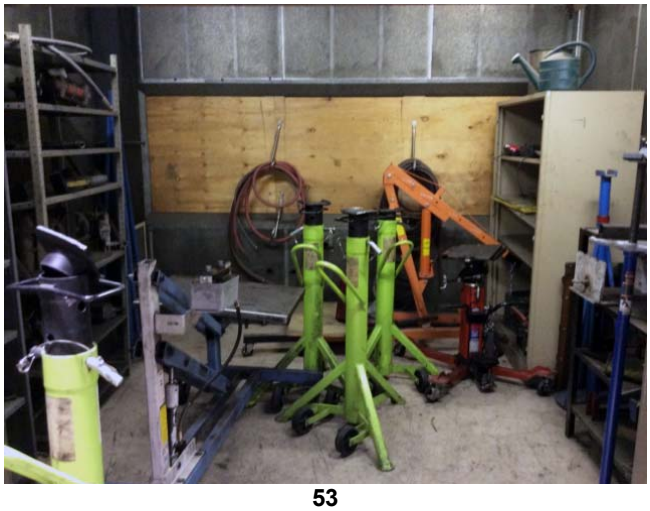
Portable Equipment Storage, Room 105



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A/C Shop/Storage, Room 105A

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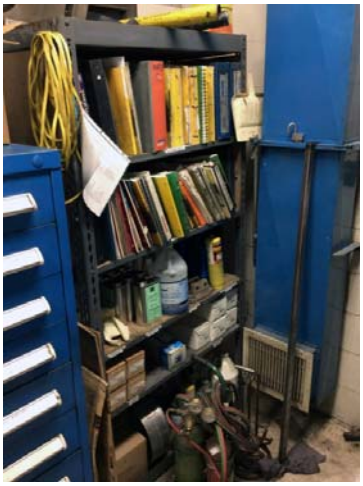

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A/C Bay & Repair Bays, Room 106W

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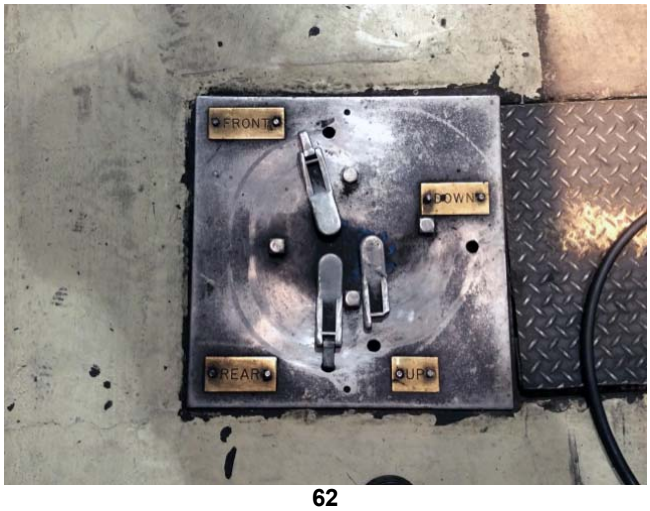

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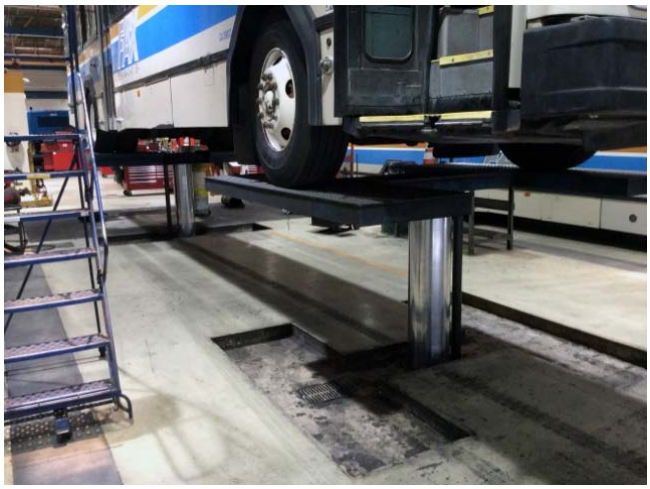

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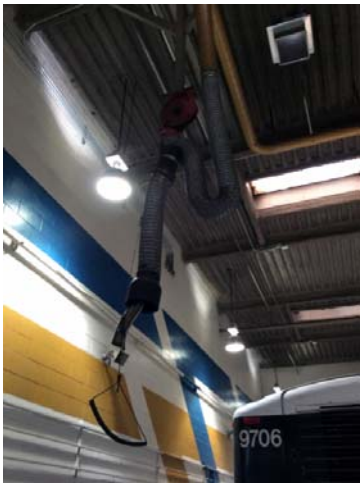

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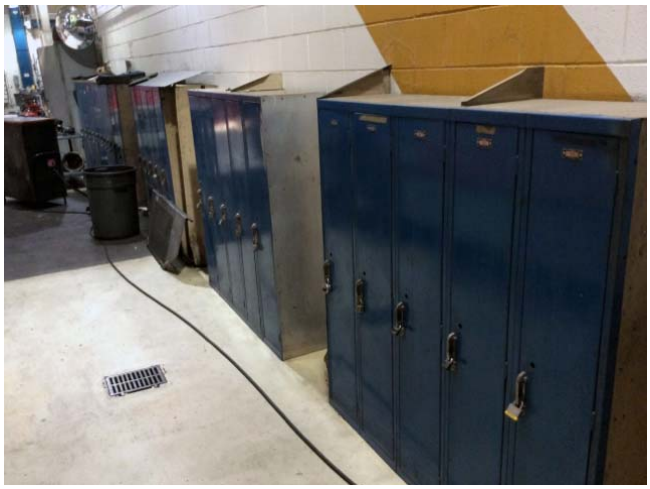

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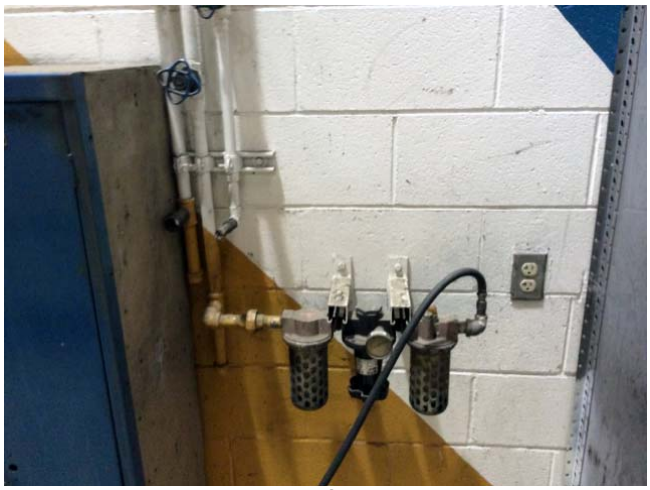

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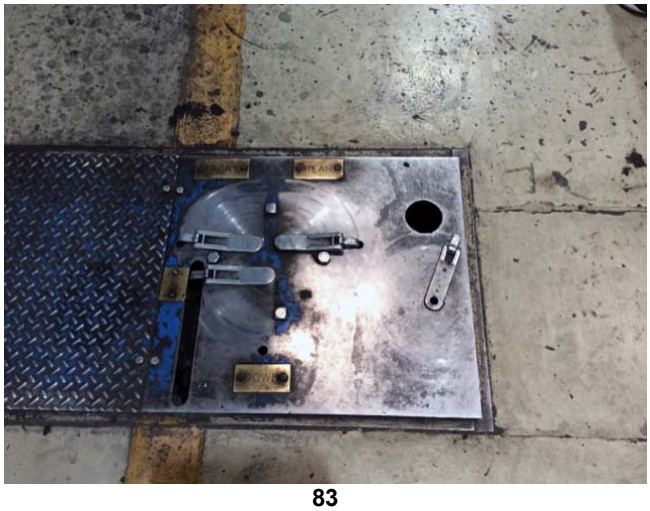
Repair Bay, 106E



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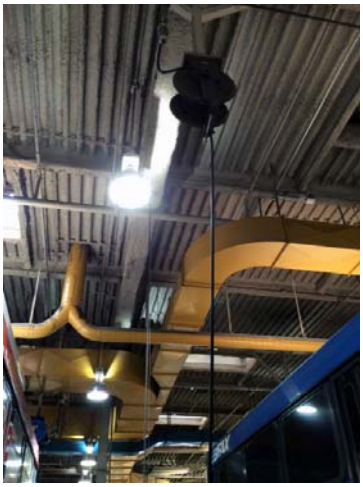

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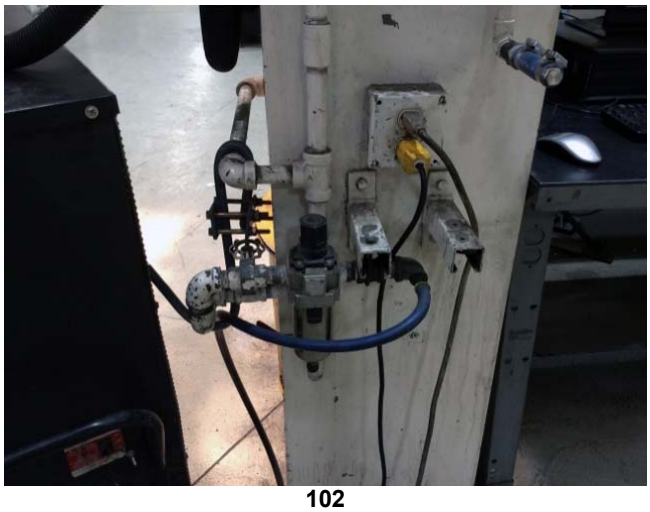

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Central Storage/Shop, Rooms 107-110

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Chassis Cleaning Bay, Room 111

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Parts Cleaning, Room 112

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Cleaning Equipment, Room 113

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Drum Storage & Pump, Room 114

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Tire Repair, Room 115

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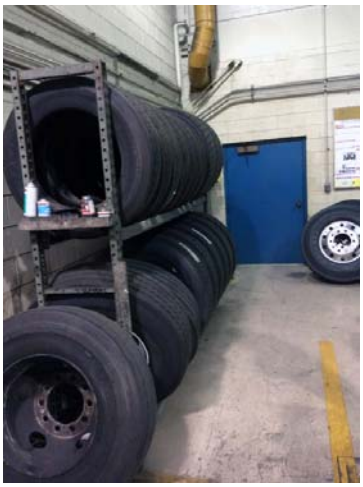

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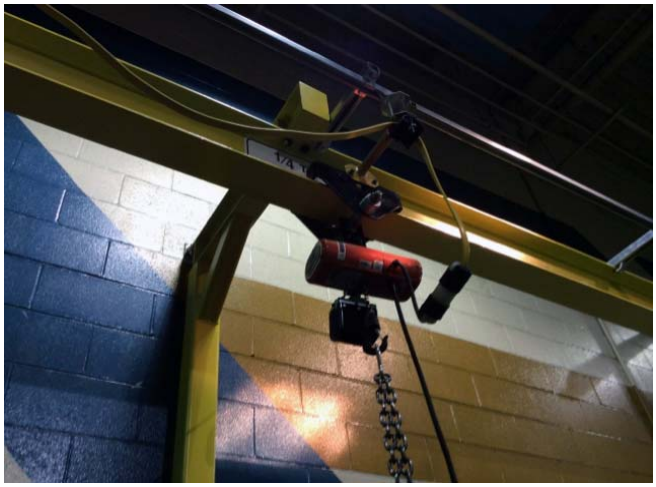

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Sheet Metal Shop, Room 116

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Body Shop, Room 117

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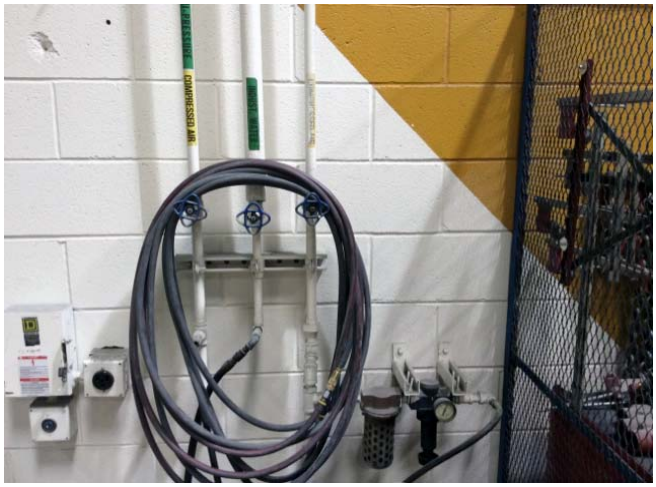

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Prep & Paint Shop, Room 118-121

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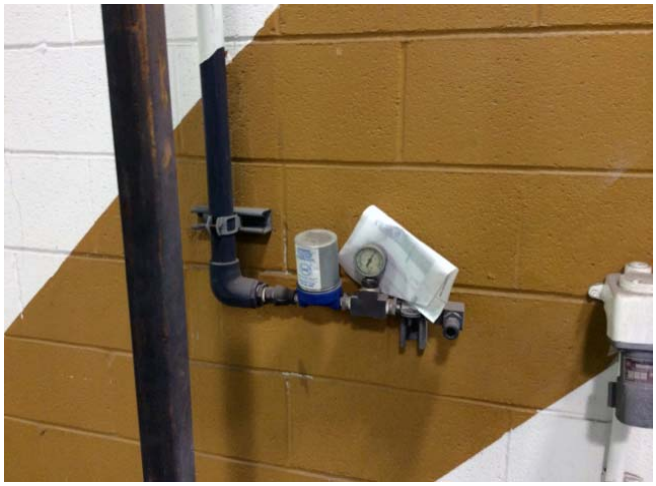

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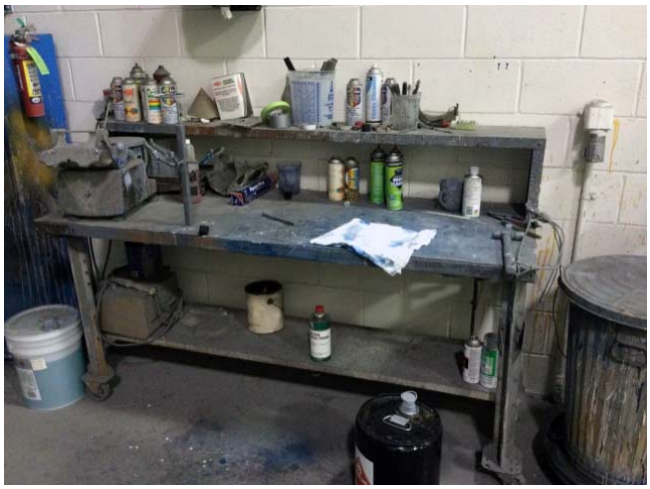

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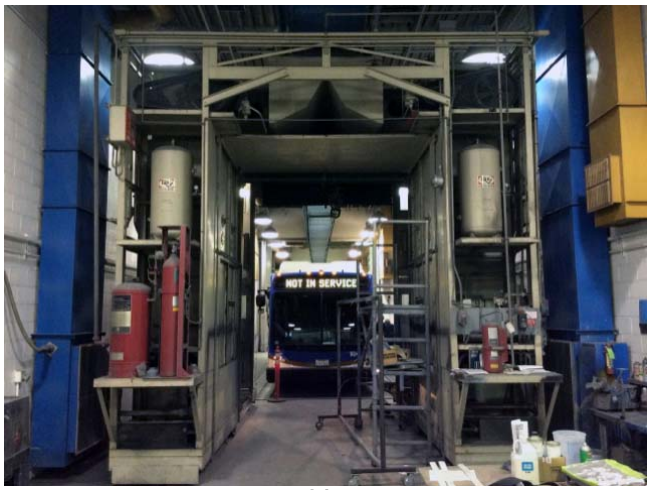

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Paint Storage, Room 123

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Radio Storage, Room 125

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Parts Storage, Room 126 & 133

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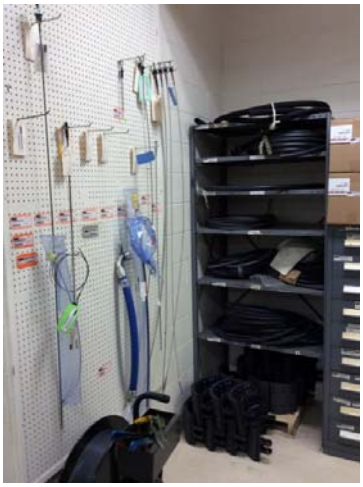

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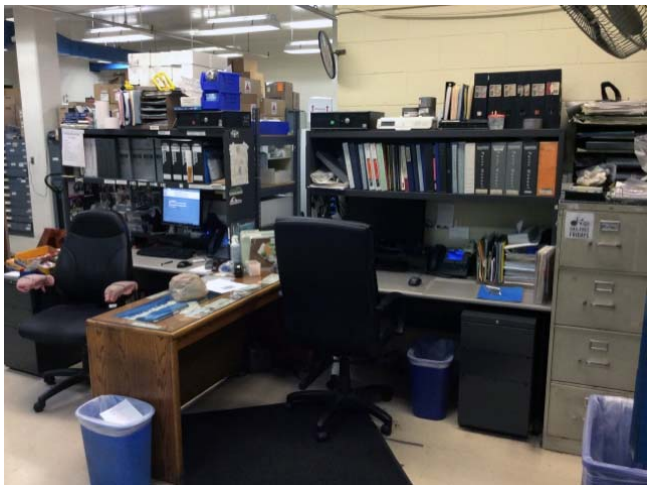

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Corridor

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Farebox Repair, Room 133

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Tool Storage, Room 135

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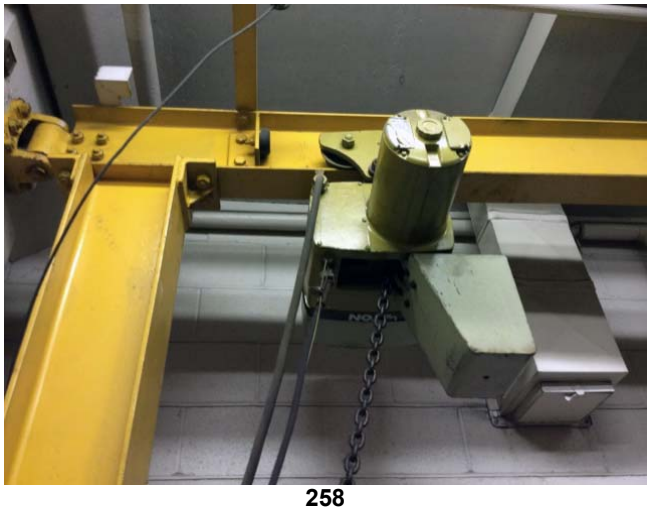

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Tool & Manual Storage, Room 137

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Electronic Storage, Room 138

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Parts Storage Lofts, Rooms 208 & 209

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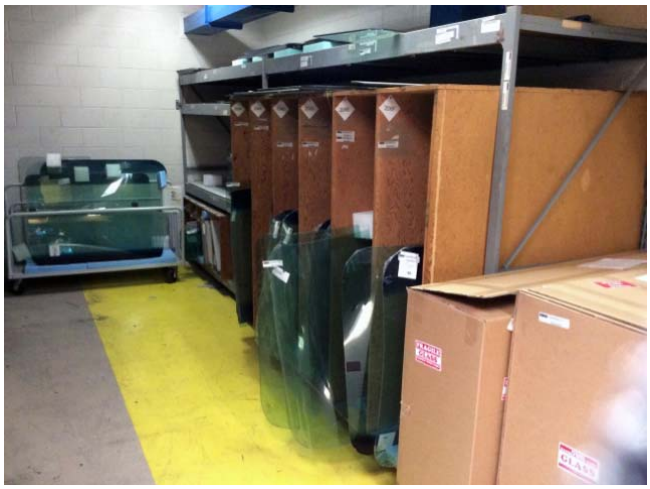

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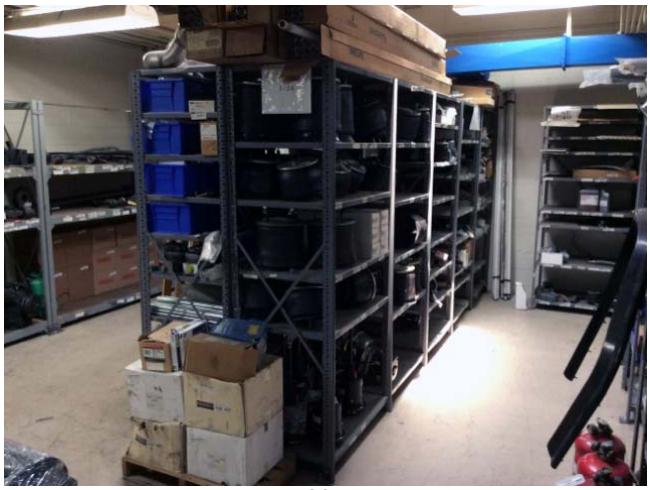

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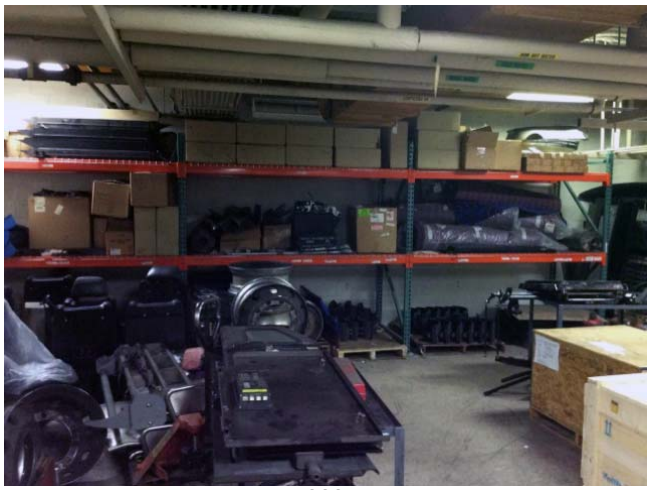

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Mechanical/Storage, Room 213

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Bus Wash Bays & Wash Equipment Area

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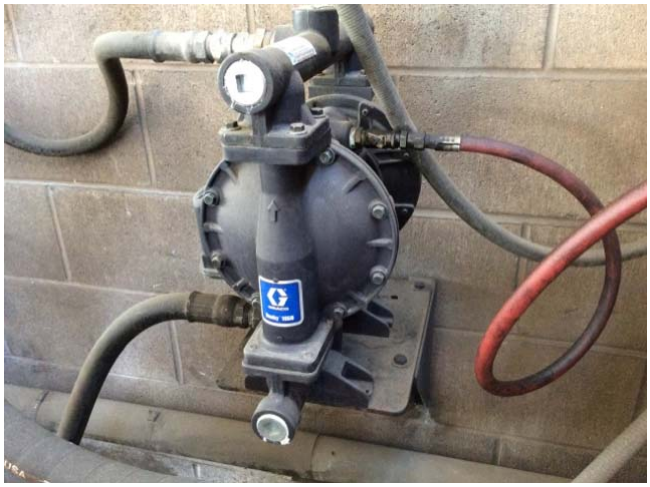

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Fueling Lanes


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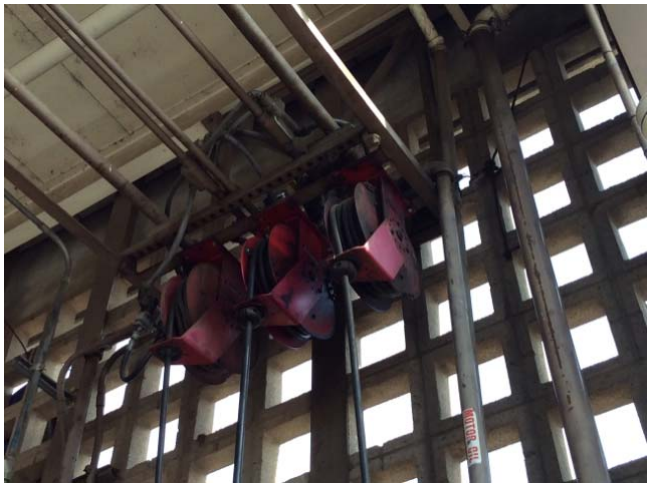

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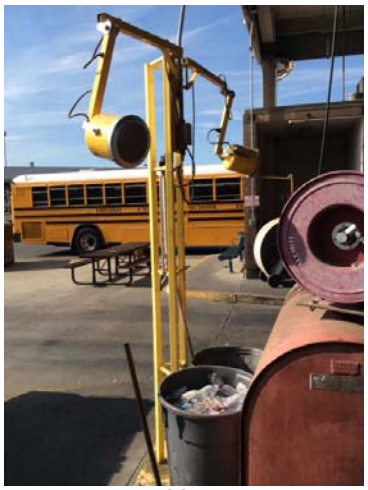

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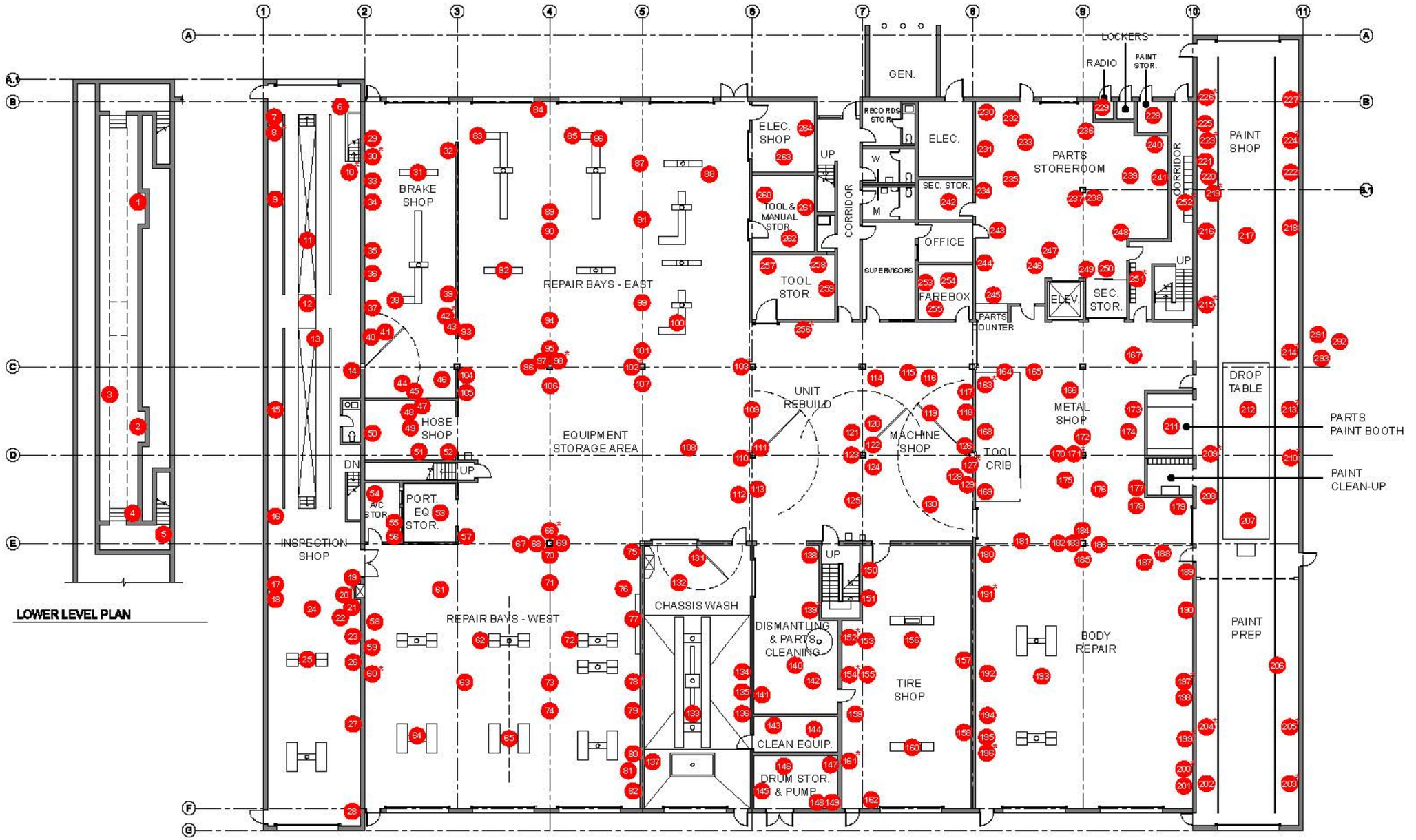
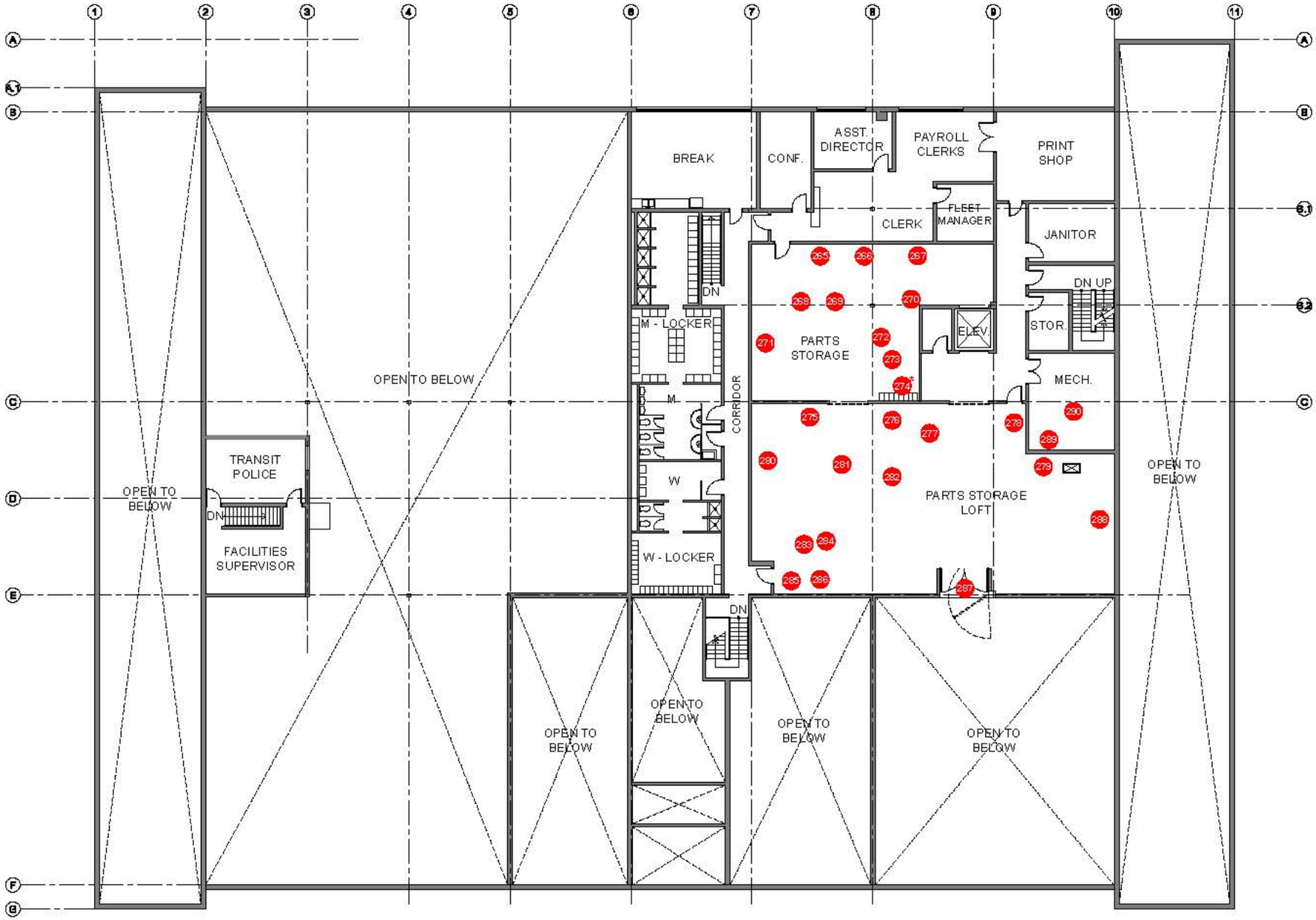
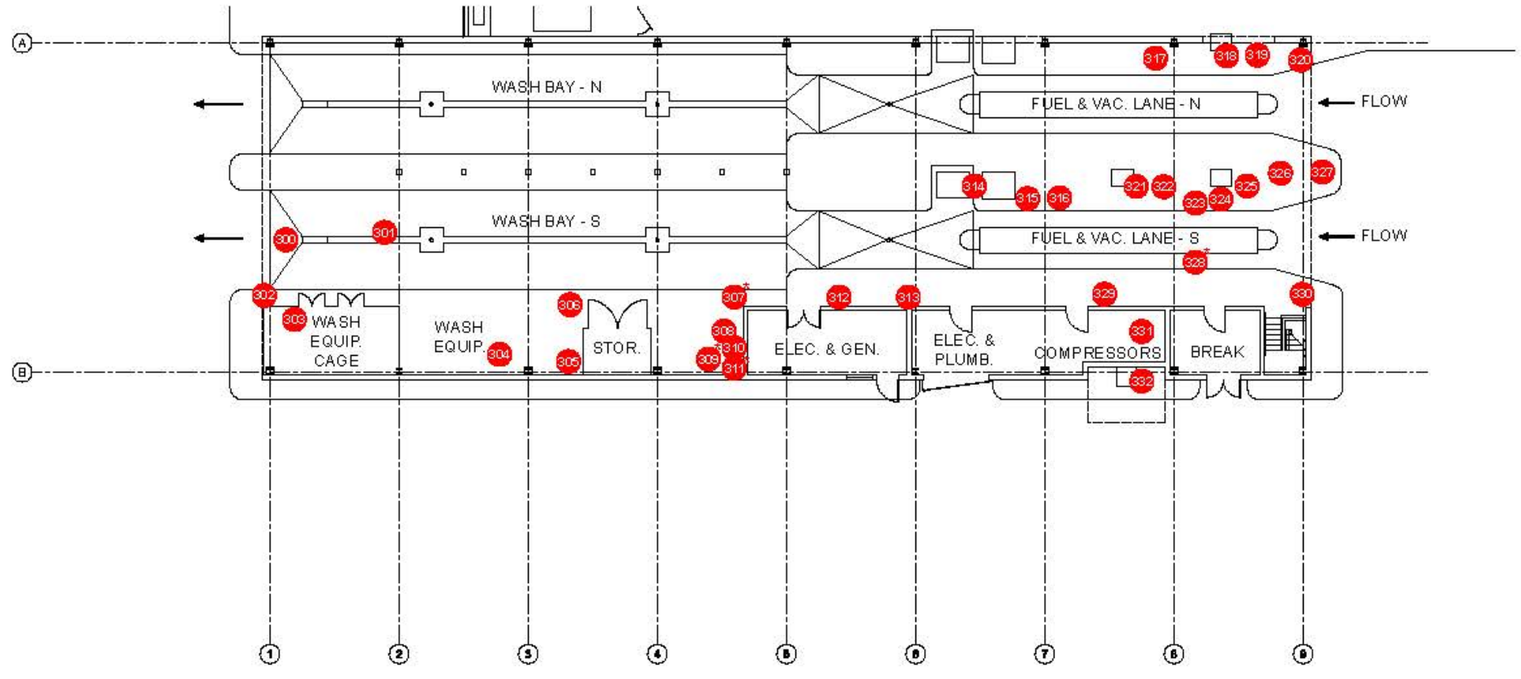

LOCKERS
RADIO
PAINT STOR.
GEN.
RECORDS STOR.
ELEC. SHOP
ELEC.
PARTS STOREROOM
CORRIDOR
PAINT SHOP
UP
W
M
SEC. STOR.
OFFICE
TOOL & MANUAL STOR.
SUPERVISORS
FAREBOX
PARTS COUNTER
ELEV.
SEC. STOR.
BRAKE SHOP
REPAIR BAYS - EAST
TOOL STOR.
DROP TABLE
UNIT REBUILD
METAL SHOP
HOSE SHOP
EQUIPMENT STORAGE AREA
MACHINE SHOP
TOOL CRIB
PARTS PAINT BOOTH
PAINT CLEAN-UP
DN
UP
PORT. EQ. STOR.
A/C STOR.
INSPECTION SHOP
REPAIR BAYS - WEST
CHASSIS WASH
DISMANTLING & PARTS CLEANING
CLEAN EQUIP.
DRUM STOR. & PUMP
TIRE SHOP
BODY REPAIR
PAINT PREP
LOWER LEVEL PLAN
EXISTING MAINTENANCE BUILDING
LEVEL 1 PLAN



EXISTING MAINTENANCE BUILDING
LEVEL 2 PLAN



EXISTING FUEL AND WASH BUILDING PLAN

Appendix B
Space Needs Program

Master Plan
Fresno FAX

June 20, 2014

Space Name	Space Standard	115 Facility Program (2014)			
		Qty.		Area	Remarks
		Staff	Space	(SF)	
Administration					
Office Areas					
Reception	80	1	1	80	Interacts with public
Storage	100		1	100	Bus passes, schedules etc.
Lobby Area	275		1	275	Waiting Area
Director Of Transportation	260	1	1	300	Private Office
Assistant Director of Transportation	260	1	1	220	Private Office
Executive Assistant	180	3	1	540	Private Office
Administration Manager	175	1	1	175	Private Office
Management Analyst II	200	1	1	200	Private Office
Community Coordinator	150	1	1	150	Private Office
Senior Planner	150	1	1	150	Private Office
Planning Manager	200	1	1	203	Private Office
IT Office	375	4	1	380	Private Office
IT Storage	120		1	120	Within IT office
Data Room	200		1	200	Direct access
Office	120	2	2	240	Private Office
Grant Analyst	180	1	1	170	Private Office
Print Shop Public Amentities					
Print Shop & Storage	400	1	1	400	Large format printer and storage
Accounting		1			
Principal Accountant Clerk	100		1	100	Open Work Space
Senior Account Clerk	100		1	100	Open Work Space
Account Clerk I/II	100		3	300	Open Work Space
Future Work Stations	80		9	720	Open Work Space

Master Plan
Fresno FAX

June 20, 2014		115 Facility Program (2014)			
Space Name	**Space Standard**	**Qty. Staff**	**Qty. Space**	**Area (SF)**	**Remarks**
Transit Police	82		1	82	
Transit Office	275	4	1	275	4 Workstations, base & upper cabinet storage
Support Spaces					
Conference Room 1	400		1	400	Off Lobby
Storage	45		1	45	
Conference Room 2	300		1	300	
Supply Room	230		1	230	
Break room	160		1	160	
Secure File Storage	140		1	140	
Men's Restrooms	240		1	240	
Women's Restrooms	240		1	240	
Janitor	100		1	100	
Subtotal		**24**		**7,335**	
Circ/Mech/Elec/Struct (Net:Gross)	**40%**			2,934	
Total Administration		**24**		**10,269**	

Master Plan
Fresno FAX

June 20, 2014		115 Facility Program (2014)			
Space Name	**Space Standard**	**Qty. Staff**	**Qty. Space**	**Area (SF)**	**Remarks**
Operations Areas					
Office Areas					
Public Reception	100		1	100	Located at Entry Vestibule
Storage	95		1	95	
Operations Managers	250	2	2	500	Adjacent to Operations Secretary & Clerks
Operations Secretary & Clerks	110	3	1	330	Adjacent to Operation Managers
Management Analyst III	230	1	1	230	Private Office
Report & Complant Room	125		1	125	4 Cubicles
Operations Open Office					Workstation
Dispatch Window	120	2	1	240	Shared office, Day pass window
Radio Dispatch	120	2	1	240	Day passes, delivery access
Scheduling	80	4	1	320	Workstations in Shared Office
Supervisors	50	6	1	300	Includes driver records
Operators	2.48 / bus	285			
First Shift	*83% total Bus*	*95*			
Second Shift	*82% total Bus*	*94*			
Third Shift	*8% total Bus*	*10*			
Classroom / Training Room	800		1	640	Movable Partition
Training Office	240	3	1	240	3 Workstations
Training Materials Storage	100		1	100	Secure
Interview Room	100		1	100	Quite Room

Master Plan
Fresno FAX

June 20, 2014		115 Facility Program (2014)			
Space Name	Space Standard	Qty. Staff	Qty. Space	Area (SF)	Remarks
Operations Areas (Cont'd)					
Drivers Room	1,840		1	1,140	20 SF x 80% Total Buses
Locker Alcove	1.5		285	670	1/2 lockers. 1 Locker / Operator 340 Total
Television Viewing Room	200		1	200	
Kitchenette/Vending	300		1	200	Stove, Refrigerator, 4 Microwaves
Dispatch Vestibule	200			200	
Interview Room	110		1	110	
Women's Restroom/Shower	300		1	300	1 Shower
Men's Restroom/Shower	400		1	400	1 Shower
Breakroom	190		1	190	
Custodian's Closet	85		1	85	
Subtotal		**308**		**7,055**	
Circ/Mech/Elec/Struct (Net to Gross)	**35%**			2,469	
Total Operations		**309**		**9,524**	

Master Plan
Fresno FAX

June 20, 2014		115 Facility Program (2014)			
Space Name	Space Standard	Qty. Staff	Qty. Space	Area (SF)	Remarks
Maintenance - Office Areas					
Maintenance Administration					
Maintenance Manager	260	1		260	Private Office
Assistant Manager	180	2		360	Private Office
General Clerk III	100	1		100	Workstation, adjacent to Manager
Copy/File/Work/Supply Room	200		1	200	
Conference Room	250		1	250	Up to 12 people
ERS Storage / Vehicle Info Archive	600		1	600	Secured location in Maintenance Building, adjacency to ERS Office not required. Not to be mixed with Parts and Materials Storage
Lunchroom/Vending/Kitchenette	250		1	250	Maintenance Administration only
Women's Restroom	80		1	80	
Men's Restroom	80		1	80	
Custodian	120		1	120	Space for cleaning carts, floor buffers and scrubbers, mop sink, and adequate shelving for storage
Subtotal		**4**		**2,300**	
Circ/Mech/Elec/Struct (Net:Gross)	**40%**			920	
Total Maintenance - Office				**3,220**	

Master Plan
Fresno FAX

June 20, 2014		115 Facility Program (2014)			
Space Name	Space Standard	Qty. Staff	Qty. Space	Area (SF)	Remarks
Maintenance - Support Areas					
Maintenance Support					
Instructor	150	1	1	150	Private Office
Classroom/Training Room	750		2	1,500	"Central" Maintenance Training, divider wall
Chair/Table Storage	150		1	150	
Training Materials Storage	100		1	100	
Lunchroom/Vending/Kitchenette	600		1	600	Space for 54
Data Room/Network Room	400		1	400	Size and shape to be confirmed
Women's Restroom/Shower	50		3	150	1 fixture (@50SF) for every 15 persons
Women's Locker Room	6.25		7	44	6.25 SF per locker x 20% of total # of maintenance staff
Men's Restroom/Shower	50		5	250	1 fixture (@50SF) for every 15 persons
Men's Locker Room	6.25		35	219	6.25 SF per locker x 100% of total # of maintenance staff
Laundry/Uniform Storage	200		1	200	
Exercise Room	-			-	Shared with Transportation
Custodian Room	120		1	120	Space for cleaning carts, floor buffers and scrubbers, mop sink and adequate shelving for storage
Subtotal		**1**		**3,883**	
Circ/Mech/Elec/Struct (Net:Gross)	**20%**			777	
Total Maintenance Support		**1**		**4,659**	

Master Plan
Fresno FAX

June 20, 2014		115 Facility Program (2014)			
Space Name	Space Standard	Qty. Staff	Qty. Space	Area (SF)	Remarks
Maintenance Shop					
Shop Office					Centrally located on Shop floor
Supervisor's	100	6	2	200	6 workstations, 6 file cabinets
Leads	24	6	3	72	2 work corrals
Mechanics	3.38 bus/Mech	35			
First Shift	*46% total Mech*	*16*			
Second Shift	*28% total Mech*	*10*			
Third Shift	*26% total Mech*	*9*			
ERS Office	80	5	2	160	Located on Shop Floor. Shared office, 2 workstations, 5-drawer file cabinets
Running Repair Bay - Standard	15 x 60		8	7,200	Use existing bays
Running Repair Bay - Articulated	15 x 100		3	4,500	Drive-thru capability, Use existing flat bay adjacent to in-ground lift bay
Inspection Bay - Standard	15 x 60		2	2,070	Use existing bays
Inspection Bay - Articulated	15 x 75		0	0	
Brake Inspection Bay	15 x 60		2	1,800	Use existing bays with in-ground lifts
Tool Crib	150		1	150	Controlled by Supervisors
Tool Box Storage	26		35	910	
Common Work Area	600		2	1,200	
Portable Equipment Storage	500		2	1,000	
Brake Shop	1000		1	1,000	2 lathes (1 for Drum and 1 for Disc)
Welding Shop	300		1	300	Adjacent to Body Shop

Master Plan
Fresno FAX

June 20, 2014

Space Name	Space Standard	115 Facility Program (2014) Qty. Staff	Qty. Space	Area (SF)	Remarks
Maintenance Shop (Continued)					
Non-Revenue Repair Bay	15 x 35		2	1,050	Use existing bays
Non-Rev Office	200	1		200	
Non-Rev Common Work Area	200		1	200	
Non-Rev Parts Storage	300		1	300	
Non-Rev Portable Equip Storage	200		1	200	
Battery Room	300		1	300	Charging and old batteries. Include 4 charging stations.
Store Office	120	1		120	
Store Clerks	24	3		72	Workstations near Stores Counter
Stores Counter	72		1	72	Adjacent to Stores Clerks
Materials Handling					
High-density storage	500		1	500	Vertical Storage System(s) (2 VLMS, 2 Carousels). Utilize main area for increased vertical storage height.
Bulk storage	500		1	500	Fast moving parts
Low-use parts storage	1,000		1	1,000	2 Stack systems
General Storage Mezzanine	863		1	863	7.5 SF per bus
Lube/Compressor Room	1,200		1	1,200	All above ground tanks
Hazardous Materials Storage					See Exterior Areas
Subtotal		**57**		**27,139**	
Circ/Mech/Elec/Struct (Net:Gross)	**15%**			4,071	
Total Maintenance - Shop Areas				**31,209**	

Master Plan
Fresno FAX

June 20, 2014		115 Facility Program (2014)			
Space Name	Space Standard	Qty. Staff	Qty. Space	Area (SF)	Remarks
Specialty Bays					
Tire Shop Mechanic Office	100	1		100	
Tire Changing Bay	25 x 75		1	1,875	
Tire Shop	600		1	600	
Tire Storage	1.5 SF/Tire using vertical system		1	450	Store close to 300 tires, mounted and unmounted. Use vertical storage system, requires 20' vertical clearance
General Equipment Wash Bay	20 x 75		1	1,500	Adjacent to Chassis Wash Bay
Wash Equipment Room	100		1	100	
Body Shop Supervisor	100	1		100	Private Office
Body Bay	30 x 75		1	2,250	
Body Shop Equipment Storage	600		1	600	
A/C Repair Bay	20 x 75		1	1,500	
A/C Shop/Storage	600		1	600	

Master Plan
Fresno FAX

June 20, 2014		115 Facility Program (2014)			
Space Name	Space Standard	Qty. Staff	Qty. Space	Area (SF)	Remarks
Specialty Bays (Continued)					
Electronics Shop					For Farebox and Destination Sign Repair
Electronic Shop Supervisor	120	1		120	Private Office
Clean Shop Area	80		3	240	3 workstations plus staging areas
Copy/File/Print	80		1	80	Network printer, copier, phone
Secure Equipment Storage	500		1	500	
Unisex Restroom	80		1	80	
Custodian Room	80		1	80	
Shop Sink	10		1	10	
Electrical Room	80		1	80	
Mechanical Room	150		1	150	
Compressor Room	100		1	100	
Subtotal		**3**		**11,115**	
Circ/Mech/Elec/Struct (Net:Gross)	**15%**			1,667	
Total Specialty Bays				**12,782**	
Total Maintenance Building		**65**		**56,804**	

Master Plan
Fresno FAX

June 20, 2014		115 Facility Program (2014)			
Space Name	Space Standard	Qty. Staff	Qty. Space	Area (SF)	Remarks
Public Amentities					
Public Amentities Manager's Office	120	1		120	Private Office, adjacent to FM Shop
Facility Electronics Shop					Shared with Maintenance (if necessary), See Electronics Shop
Public Amentities Shop					
FM Leader	100	1		100	Private Office
FM Mechanics		4	2	200	
General Shop	600		1	600	
Parts Storage	500		1	500	Separate from Parts Storeroom
General Storage	500		1	2,000	Store equipment,shelter materials
Welding Area	100		1	100	
Tool Crib	100		1	100	Secured
Break Room	-			-	Shared with Maintenance

Master Plan
Fresno FAX

June 20, 2014 Space Name	Space Standard	115 Facility Program (2014) Qty. Staff	Qty. Space	Area (SF)	Remarks
Facilities Maintenance (Continued)					
Support Areas					
Crew Area	150		1	450	Conference table for 10
Manuals Library	120		1	120	Include two computer workstations, includes storage to accommodate manuals required at other divisions. Include copy and fax machine.
Men's Restroom/Shower	-			-	Shared with Maintenance
Women's Restroom/Shower	-			-	Shared with Maintenance
Subtotal		**6**		**4,290**	
Circ/Mech/Elec/Struct (Net:Gross)	**15%**			644	
Total Public Amentities Building				**4,934**	

Master Plan
Fresno FAX

June 20, 2014

Space Name	Space Standard	115 Facility Program (2014) Qty. Staff	Qty. Space	Area (SF)	Remarks
Fuel Facility					
Fuel Facility					
Service Supervisor	120	1		120	Private Office
Hostlers	5.43 bus/Hos.	21			
First Shift	*17% total Hos.*	*4*			
Second Shift	*66% total Hos.*	*14*			
Third Shift	*17% total Hos.*	*4*			
Fare Retrieval	-			-	Vaulting located at Fueling Lanes New Addition
Women's Restroom	120		1	120	
Men's Restroom	120		1	120	
Cleaner's Storage	400		1	400	
Vacuum Equipment Room	625		1	625	
Lube/Compressor Room	500		1	500	
Bus Fueling Lanes	17 x 75		2	2,550	CNG dispensers for standard and articulated buses. Ratio is 1 lane for every 75 buses.Includes Fare Retrieval. Existing lanes are 10' wide with 7' island.
Public Tandem Fueling Lanes	17 x 150		1	2,550	CNG dispensers for Public and MSC Vehicles
Subtotal		**22**		**6,985**	
Circ/Mech/Elec/Struct (Net:Gross)	**10%**			699	
Total Fuel Facility				**7,684**	

Master Plan
Fresno FAX

June 20, 2014 Space Name	Space Standard	115 Facility Program (2014) Qty. Staff	Qty. Space	Area (SF)	Remarks
Wash Facility					
Bus Washer	20 x 90		2	3,600	Standard ratio is 1 for every 125 buses. MDG recommends second washer for redundancy and backup system.
Wash Equipment Room	15 x 90		1	1,350	Include Chassis Wash Equipment
Chassis Wash Bay	20 x 90		1	1,800	Ratio is 1 for every 150 buses, with parallelogram lift equipment sized up to 45-foot bus.
Bus Interior Cleaning Bay	20 x 50		1	1,000	*Could be in bus parking*
Subtotal				**7,750**	
Circulation Factor	**10%**			775	
Total Wash Facility				**8,525**	
Exterior Areas					
Employee Patio	3,000		1	3,000	
Shelter Repair Area	2,500		1	2,500	
Smoking Patio	100		1	100	25 feet from any building entrance
Emergency Generator	400		1	400	
Scrap Metal Container	10 x 30		1	300	Covered
Trash	8 x 8		3	192	Enclosed, covered
Emergency Evacuation Storage Sheds	9 x 21		2	378	
CNG Equipment Area	4,800		1	4,800	Existing
Hazardous Materials Storage	10 x 30		1	300	
Total Exterior Areas				**11,970**	

Master Plan
Fresno FAX

June 20, 2014		115 Facility Program (2014)			
Space Name	Space Standard	Qty. Staff	Qty. Space	Area (SF)	Remarks
Bus Parking					
Standard Bus	12 x 45		104	55,890	Sized to accommodate 45' buses
Bad Order Parking	12 x 45		12	6,210	10% Total Buses
Articulated Bus	12 x 65		0	0	No artics serviced onsite, Use Bad
Subtotal				**62,100**	
Total Bus Parking			**115**	**62,100**	

Master Plan
Fresno FAX

June 20, 2014

Space Name	Space Standard	115 Facility Program (2014) Qty. Staff	Qty. Space	Area (SF)	Remarks
Automobile Parking - Onsite					
Administration	9 x 18		**85**	13,770	
Operations	10 x 19		**75**	14,250	
Staff	9 x 18		23	3,726	
Non-Revenue	9 x 18		8	1,242	Ratio 1 Non-Rev : 15 buses
Maintenance			**14**		
Maintenance Manager	9 x 18		1	162	
Assistant Manager	9 x 18		2	324	
General Clerk III	9 x 18		1	162	
Supervisor's	9 x 18		2	324	
Instructor	9 x 18		1	162	
Tire Shop Mechanic Office	9 x 18		1	162	
Electronic Shop Supervisor	9 x 18		1	162	
Tow Truck	11 x 45		1	495	Tow Truck size: 8.5' x 38'
Road Call Truck	14 x 30		1	420	Road Call Truck size: 12' x 23'
Yard Truck	9 x 25		1	225	Yard Truck size: 7' x 21'
Golf Carts	6 x 10		2	120	Golf Cart size: 4' x 8'
Service Staff			**1**		
Service Supervisor	9 x 18		1	162	May use potentially vacated

Master Plan
Fresno FAX

June 20, 2014		115 Facility Program (2014)			
Space Name	Space Standard	Qty. Staff	Qty. Space	Area (SF)	Remarks
Automobile Parking - Onsite (Continued)					
Public Amenities			**9**		
PA Supervisors	9 x 18		2	324	
PA Service Vehicles	9 x 18		6	972	
PA Bucket Truck	9 x 18		1	162	
Visitor Vehicles	9 x 18		**9**	1,458	*1 Visitor space for every 13 buses*
Disability Vehicles	14 x 18		**6**	1,512	301-500 = 6 Disability Spaces
Subtotal			**199**	**40,296**	
Site Circulation	**100%**			40,296	
Total On-Site Automobile Parking				**80,592**	

Master Plan
Fresno FAX

June 20, 2014		115 Facility Program (2014)			
Space Name	**Space Standard**	**Qty. Staff**	**Qty. Space**	**Area (SF)**	**Remarks**
Summary	**Existing**	**115 Facility Program (2014)**			
Total Administration		24		10,269	
Total Operations		308		9,524	
Total Administration/Operations Building	**14,526**	**332**		**19,793**	
Total Maintenance - Office		4		3,220	
Total Maintenance Support		1		4,659	
Total Maintenance - Shop Areas		57		31,209	
Total Specialty Bays		3		12,782	
Total Public Amentities Building		6		4,934	
Total Maintenance Building	**50,149**	**71**		**56,804**	
Total Fuel Facility	**4,560**	**22**		**7,684**	
Total Wash Facility	**8,814**			**8,525**	
Total Exterior Areas				**11,970**	
Total Bus Parking	**59,400**	**115**		**62,100**	
Total On-Site Automobile Parking		**199**		**80,592**	
SUBTOTAL SITE AREA				**247,468**	
Site Circ/Landscape/Set Back/Easements	**75%**			185,601	
TOTAL AREA REQUIRED				**433,069**	
TOTAL ACREAGE	**Current: 10.9 Acres**		**Min. 9.94 Acres**		

Appendix C

Participants Involved in Review Sessions

Maintenance Design Group
Excellence in Facility Design

MEETING ATTENDANCE SIGN IN SHEET

Date: ~~Robinson, Bruce~~ See Below

FAX/ Information Systems Manager: FAX Transit Operations & Maintenance Facility Master Plan

Project City, State: Fresno, CA

Contract No.:

MDG Project No: **14P017**

Meeting Information:

Date:	06/03/14 - 06/04/14	**Time:**	10:00am – 11:30am (Kick-Off), 4:00pm – 5:00pm (Materials Handling), 7:00am – 9:00am (Maintenance), 10:00am – 11:30am (Facilities), 2:00pm – 3:30pm (Transportation)	**Facilitator:**	Jon Holler
Location:	2223 G Street, Fresno, CA 93706, MSCA-Training Room, Building A Lower Training Room				

Meeting Subject: **Kick Off Meeting, Department Programming Interviews**

Kick Off 6/3	M.H. 6/3	Maint. 6/4	Fclty. 6/4	Trnsp. 6/4	Name	Company / Title	Email	Phone Number
					Brian Marshall	FAX/ Director		Bus: Cell:
				X	Jim Schaad	FAX/ Assistant Director	Jim.Schaad@fresno.gov	Bus: 559-621-1101 Cell:559-960-1178
	X				Arnold Napoles	FAX/ Facilities Supervisor	Arnold.Napoles@fresno.gov	Bus: 559-621-1450 Cell: 559-284-7558
					~~Dean Huss~~ Alan Jacobsen	FAX/ Operations Manager	alan.Jacobsen@fresno.gov	Bus: Cell:
					John Downs	FAX/ Planning Manager		Bus: Cell:

Maintenance Design Group
Excellence in Facility Design

MEETING ATTENDANCE SIGN IN SHEET

Kick Off 6/3	M.H. 6/3	Maint. 6/4	Fclty. 6/4	Trnsp. 6/4	Name	Company / Title	Email	Phone Number
JL					Jeff Long	FAX/ Planner	Jeff.long@fresno.gov	Bus: 621-1436 Cell:
				✓	Kathleen Healy	FAX/ Administrative Manager		Bus: Cell:
				✓	Joe Vargas	FAX/ Management Analyst	joe.vargas@fresno.gov	Bus: 621-1445 Cell:
					Darlene Christiansen	FAX/ Grants Analyst		Bus: Cell:
				✓	Bruce Robinson	FAX/ Information Systems Manager		Bus: 621-1499 Cell: 960-8205
					Duane Meyers	FAX/ Equipment Maintenance	Duane.Myers@Fresno.gov	Bus: 476-9761 Cell:
MS	MS	MS	MS		Miguel Sanchez	FAX/ Equipment Maintenance	MIGUEL.SANCHEZ@FRESNO.GOV	Bus: 621-1477 Cell: 960-8235
					Harold Schade	FAX/ Equipment Maintenance	HAROLD.SCHADE@FRESNO.GOV	Bus: 621-1477 Cell:
	✓				Larry Thompson	FAX/ Parts Supervisor		Bus: 621-1448 Cell: 240-5728
					Joseph Ayerza	FAX/ Municipal Fleet Manager	Joseph.Ayerza@Fresno.GOV	Bus: Cell: 559-907-1251
					Tim Olday	FAX/ Management Analyst, Municipal Fleet Acquisitions		Bus: Cell: [redacted]

Maintenance Design Group
Excellence in Facility Design

MEETING ATTENDANCE SIGN IN SHEET

Kick Off 6/3	M.H. 6/3	Maint. 6/4	Fclty. 6/4	Trnsp. 6/4	Name	Company / Title	Email	Phone Number
	X	X	/	/	Hector Enriquez	MDG/ Facility Designer	Hector.Eenriquez@mdg-llc.com	Bus: 626-389-2440 Cell:
	X	X	/	/	Fishman, Kai	MDG/ Senior Facility Designer	Kai.Fishman@mdg-llc.com	Bus: 626-389-2440 Cell:626-632-2420
					Guthrie, Reb	FS/ Principal	rebg@fuelsolutionsinc.com	Bus: 310-207-8548 Cell: 310-714-5132
	X	X	/	/	Holler, Jon	MDG/ Western Regional Manager	Jon.Holler@mdg-llc.com	Bus: 626-389-2440 Cell: 626-993-4187
	X	X	/	/	Todd, William	RNL/ Associate	Will.Todd@rnldesign.com	Bus: 213-955-3514 Cell:
	X	X	/	/	Ward, Stephen	MDG/ Facilities Design Manager	Stephen.Ward@mdg-llc.com	Bus: 626-389-2440 Cell: 720-629-4300
	X				Caleb Bowman	FAX Maint	Caleb.Bowman Williams@Fresno.gov	Bus: 621-1467 Cell: (559) [redacted]
								Bus: Cell:
								Bus: Cell:
								Bus: Cell:
								Bus: Cell:

PAGE

DATE 7/23/14

FAX MASTER PLAN CHARRETTE

DAY-1 SIGN-IN

NOTES

8:00AM

Name	email
Larry Thompson	Larry.Thompson@fresno.gov
MIGUEL SANCHEZ	Miguel.Sanchez@fresno.gov
Jim Schaad	Jim.Schaad@Fresno.gov
Caleb Bowman	Caleb.BowmanWilliams@Fresno.gov
Arnold Napoles	Arnold.napoles ~~A.Napoles~~@fresno.gov
Dean Hurst	Dean.Hurst@Fresno.gov
Kathleen Healy	Kathleen.Healy@Fresno.gov
John Downs	JohnDowns6@fresno.gov

COLIN WINCHEL

WILL TODD

KAI FISHMAN

STEPHEN WARD

2PM

Jim Schaad

Kathleen Healy

Bruce Robinson

~~Brian ? (Director)~~

Brian Marshall

PAGE | DATE

Charrette

Day-2 Sign-In

NOTES

8 AM

Arnold Napoles
Caleb Bowman
Larry Thompson
Bruce Robinson
Jim Schaad
Brian
~~John Downs~~
Kathleen Healy

---

3 PM

DAY-2 AFTERNOON MTG

John Downs
Brian Marshall
Larry Thompson
Miguel Sanchez
Bruce Robinson
Caleb Bowman
Kathleen Healy
Arnold Napoles
Jim Schaad

Appendix D
Conceptual Design Opinion of Cost

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FRESNO AREA EXPRESS FACILITY ASSESSMENT MASTER PLAN

MASTER PLAN DESIGN OPINION OF PROBABLE COST

JYI# C2008A-R2

August 29, 2014
Revised: September 30, 2014

PREPARED FOR:

MAINTENANCE DESIGN GROUP

BY:

JACOBUS & YUANG, INC.

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT — **JOB #: C2008A-R2**
LOCATION: FRESNO, CA — **DATE: 29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP — **REVISED: 30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - GRAND SUMMARY

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	SUMMARY OF ESTIMATE			**$**	**$**
	COST SUMMARY				
	PHASE 1				
	FUEL & WASH FACILITY ADDITION & RENOVATION	11,988	SF	166.65	1,997,786
	MAINTENANCE & SERVICE EQUIPMENT COSTS, INSTALLATION + TAXES	11,988	SF	101.64	1,218,476
	ADDITION & RENOVATION OF EXISTING RESTROOM/LOCKER ROOM BUILDING	690	SF	573.56	395,756
	RELATED SITEWORK	12,682	SF	21.08	267,398
	SUB TOTAL PHASE 1				**3,879,416**
	PHASE 2				
	MAINTENANCE BUILDING RENOVATION & ADDITION + RELATED SITEWORK	52,970	SF	150.01	7,946,259
	MAINTENANCE & SERVICE EQUIPMENT COSTS, INSTALLATION + TAXES	52,970	SF	82.75	4,383,456
	SUB TOTAL PHASE 2				**12,329,715**
	PHASE 3				
	NEW & EXISTING SOLAR CANOPY + RELATED SITEWORK	74,430	SF	62.77	4,672,183
	SUB TOTAL PHASE 3				**4,672,183**
	PHASE 4				
	ADMIN-OPS BUILDING RENOVATION & ADDITION	21,054	SF	317.76	6,690,161
	RELATED SITEWORK	104,160	SF	18.42	1,919,137
	SUB TOTAL PHASE 4				**8,609,298**
	PHASE 5				
	NEW PASSENGER AMENITIES BUILDING & CANOPY + RELATED SITEWORK	5,320	SF	355.88	1,893,304
	SUB TOTAL PHASE 5				**1,893,304**
	GENERAL SITEWORK (WORK NOT SPECIFICALLY INCLUDED IN PHASES INDICATED)				
	SITEWORK OUTSIDE PHASING WORK	289,670	SF	2.51	727,274
	SUB TOTAL GENERAL SITEWORK				**727,274**
	TOTAL ESTIMATED CONSTRUCTION COST WITH EQUIPMENT				**32,111,190**
	CNG FUELING SYSTEM -				N.I.C.
	TOTAL ESTIMATED CONSTRUCTION COST [W/ EQUIPMENT + W/O CNG EQUIPMENT]				**$ 32,111,190**

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ALTERNATES

SITEWORK ALTERNATE

SITEWORK PHASE 4	$ 4,050,095

TOTAL ESTIMATED CONSTRUCTION COST [WITH EQUIPMENT + ALTERNATE]	**$ 36,161,285**

NOTES:

GENERAL NOTES

1 PRICES BASED ON MIN. 4-5 COMPETITIVE RESPONSIVE BIDS RECEIVED FROM GENERAL CONTRACTORS

2 ESTIMATE IS DERIVED FROM SCHEMATIC DESIGN DRAWINGS & REPORTS: ARCHITECTURAL DRAWINGS & REPORT PREPARED BY RNL, STRUCTURAL & MEP REPORT PREPARED BY ARUP, & CIVIL REPORT PREPARED BY MDG, ALL DATED JULY/AUGUST 2014, RECEIVED 8/13/2014.

3 COSTS IN THIS ESTIMATE INCLUDE LABOR BASED ON PREVAILING WAGE RATES + MATERIAL & EQUIPMENT COSTS

4 COST OF REMOVAL OF (E) VAULTING EQUIPMENT FROM (E) ADMINSTRATION BUILDING AND RELOCATING TO PHASE 1 FUEL-WASH BUILDING

SPECIFIC EXCLUSIONS

1 F, F & E ARE EXCLUDED EXCEPT FOR MAINTENANCE EQUIPMENT & CNG INSTALLATION PER SUMMARY ABOVE

2 THE FOLLOWING COSTS ARE EXCLUDED: PROJECT SOFT COSTS BEYOND ESTIMATED CONSTRUCTION COST, LAND COSTS, CONSTRUCTION CONTINGENCY, OCCUPANT RELOCATION COSTS & TEMPORARY SWING SPACE PREPARATION

SPECIFIC INCLUSIONS

1 SITE OR BUILDING PAD OVER EXCAVATION IS INCLUDED.

2 NEW 2-STOP PASSENGER ELEVATOR @ MAINTENANCE BUILDING

3 GENERATOR REPLACEMENT @ MAINTENANCE BUILDING

4 RELOCATION OF (E) FUEL/WASH EQUIPMENT (VACUUM/CNG DISPENSERS)

5 MODIFICATION TO LEFT TURN POCKET & MEDIAN @ "G" STREET TO MEET CITY STANDARDS

6 ESCALATION INCLUDED IN THE ABOVE, IS BASED ON THE FOLLOWING:

ESCALATION CALCULATION

	PH 1	PH 2	PH 3	PH 4	PH 5
BASE MONTH	Aug-14	Aug-14	Aug-14	Aug-14	Aug-14
CONSTRUCTION START MONTH	Nov-15	Nov-16	Nov-17	Nov-18	Apr-20
CONSTRUCTION DURATION (MONTHS)	10	10	6	14	10
MID POINT OF CONSTRUCTION	Apr-16	Apr-17	Jan-18	Jun-19	Aug-20
% ANNUAL ESCALATION	3.75%	3.75%	3.75%	3.75%	3.75%
ALLOWANCE FOR ESCALATION (TO MIDPOINT OF CONSTRUCTION)	6.03%	10.02%	13.44%	19.14%	24.75%

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ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST

DEFINITIONS

OPINION OF COST

An Opinion of Cost is prepared from a survey of the quantities of work-items prepared from written or drawn information provided at the Conceptual stage of the design.

Historical costs, information provided by contractors and suppliers, plus judgmental evaluation by the Estimator are used as appropriate as the basis for pricing.

Allowances as appropriate will be included for items of work which are not indicated on the design documents, provided that the Estimator is made aware of them, or which, in the judgement of the Estimator, are required for completion of the work.

JYI cannot, however, be responsible for items or work of an unusual nature of which we have not been informed.

BID

An offer to enter a contract to perform work for a fixed sum, to be completed within a limited period of time.

MARKET CONDITIONS

In the current market conditions for construction, our experience shows the following results on competitive bids, as a differential from JYI final estimates:

Number of bids	Percentage Differential
1.....	+ 25 to 50%
2-3.....	+ 10 to 25%
4-5.....	+ 0 to 10%
6-7.....	+ 0 to - 5%
8 or more....	+ 0 to -10%

Accordingly, it is extremely important to ensure that a minimum of 4-5 valid bids are received

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SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - FUEL & WASH FACILITY RENOVATION & ADDITION (PHASE 1)		**BUILDING GFA:**	**11,988**

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
	SUMMARY OF ESTIMATE			**$**	**$**
1.0	GENERAL REQUIREMENTS				
2.0	EXISTING CONDITIONS			0.38	4,553
3.0	CONCRETE			9.82	117,757
4.0	MASONRY			17.87	214,183
5.0	METALS			10.28	123,190
6.0	WOOD, PLASTICS & COMPOSITES			0.30	3,596
7.0	THERMAL & MOISTURE PROTECTION			3.65	43,703
8.0	OPENINGS			2.51	30,057
9.0	FINISHES			10.38	124,418
10.0	SPECIALTIES			0.84	10,041
11.0	EQUIPMENT			104.30	1,250,326
12.0	FURNISHINGS				
13.0	SPECIAL CONSTRUCTION				
14.0	CONVEYING				
21.0	FIRE SUPPRESSION			1.29	15,507
22.0	PLUMBING			2.05	24,551
23.0	HVAC			6.35	76,101
26.0	ELECTRICAL			8.85	106,054
27.0	COMMUNICATIONS			0.89	10,672
28.0	ELECTRONIC SAFETY & SECURITY			4.08	48,902
	SUBTOTAL			**183.82**	**2,203,611**
50.0	PRORATES:				
50.1	GENERAL CONDITIONS	7.50%		13.79	165,271
50.2	CONTINGENCY	15.00%		29.64	355,332
50.3	ESCALATION (TO MIDPOINT)	6.03%		13.71	164,322
50.4	PROJECT PHASING PREMIUM	2.50%		6.02	72,213
50.5	MARKET FACTOR PHASING COST IMPACT				
	SUBTOTAL			**246.98**	**$2,960,749**
50.6	BONDS & INSURANCE	2.00%		4.94	59,215
50.7	CONTRACTOR'S FEE	6.50%		16.37	196,298
	TOTAL OF OPINION OF CONSTRUCTION COST			**268.29**	**$3,216,262**

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ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
1.0	GENERAL REQUIREMENTS				$
	SEE SUMMARY FOR GENERAL CONDITIONS				
	SUBTOTAL				
2.0	EXISTING CONDITIONS				$
	SITE DEMOLITION				
	SEE SEPARATE SITEWORK ESTIMATE				
	SELECTIVE BUILDING DEMOLITION				
	SAWCUT (E) BUS CONCRETE PAVING	18	LF	10.00	180
	SAWCUT (E) RAISED CONCRETE PAVING	27	LF	10.00	270
	DEMO/HAUL (E) RAISED CONCRETE PAVING	272	SF	3.00	816
	DEMO/HAUL (E) BUS CONCRETE PAVING	128	SF	3.00	384
	REMOVE (E) SINGLE DOOR/FRAME	1	EA	192.50	193
	REMOVE (E) EXT. 10'-0"W GATE	1	EA	300.00	300
	REMOVE PORTION OF (E) PRECAST CONCRETE PANEL FASCIA, +/-2.5'H	140	LF	7.50	1,050
	MISC. BUILDING DEMO WORK	1	LS	160.00	160
	HAZARDOUS ABATEMENT				
	ALLOWANCE FOR HAZARDOUS MATERIAL/LBP ABATEMENT	1	LS	1,200.00	1,200
	SUBTOTAL				**4,553**
3.0	CONCRETE				$
	FOUNDATION				
	SPREAD FOOTING	2	EA	1,866.67	3,733
	WALL FOOTING - PERIMETER	190	LF	155.56	29,556
	WALL FOOTING - INTERIOR	175	LF	97.22	17,014
	TIE FOOTING TO EXISTING	6	EA	125.00	750
	PAVING ON-GRADE				
	SLAB ON-GRADE - ASSUME 5"/4" - ENCLOSED AREAS	2,498	SF	7.82	19,534
	CONCRETE INFILL FOR RAISED PAVING - ASSUME 6"/6"	72	SF	9.43	679
	NEW RAISED CONCRETE PAVING - ASSUME 6"/6"	640	SF	9.43	6,035
	CONCRETE PAVING - ASSUME 7"/8" (BUS PAVING)	488	SF	10.45	5,100
	CONCRETE SLAB INFILL - ASSUME 7"/8"	108	SF	10.45	1,129
	SUSPENDED CONCRETE SLAB TO (E) STAIRWELL	60	SF	40.00	2,400
	TIE NEW RAISED SLAB TO EXISTING	42	LF	55.00	2,310
	TIE NEW BUS PAVING TO EXISTING	38	LF	35.00	1,330
	CONCRETE FASCIA				
	PRECAST CONCRETE PANEL FASCIA, +/-2.5'H TO MATCH EXISTING	238	LF	100.00	23,800
	MISC. CONCRETE				
	EQUIPMENT PAD	1	LS	1,500.00	1,500

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ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
	MISC. CONCRETE ALLOWANCE	3,318	SF	0.87	2,887
	SUBTOTAL				**117,757**
4.0	MASONRY				$
	CMU WALLS, LOAD BEARING				
	EXT. CMU WALL - ASSUME 8"	2,926	SF	26.00	76,076
	EXT. CMU WALL INFILL - ASSUME 8"	818	SF	31.63	25,873
	EXT. CMU STEM WALL	282	SF	26.00	7,332
	MISC. REPAIR ALLOWANCE TO (E) EXT. CMU WALL	3,360	SF	2.60	8,736
	INT. CMU WALL - ASSUME 8"	2,556	SF	26.00	66,456
	INT. CMU WALL INFILL - ASSUME 8"	806	SF	26.00	20,956
	INT. CMU STEM WALL	263	SF	26.00	6,825
	MISC. REPAIR ALLOWANCE TO (E) INT. CMU WALL	742	SF	2.60	1,929
	SUBTOTAL				**214,183**
5.0	METALS				$
	STEEL STRUCTURE				
	ROOF STEEL BEAMS/GIRDERS + DETAILS	17	TONS	4,800.00	83,215
	NEW STEEL COLUMN, +/-20'H + DETAILS	2	EA	2,270.40	4,541
	STEEL BRACE + DETAILS	2	EA	1,241.86	2,484
	METAL DECK - EXTENDED ROOF	3,318	SF	4.47	14,831
	MISCELLANEOUS METALS				
	ROOF HATCH + LADDER - ALLOWANCE	1	EA	2,925.00	2,925
	METAL LOUVER - ALLOWANCE	64	SF	75.00	4,800
	PIPE BOLLARDS - ALLOWANCE	8	EA	550.00	4,400
	MISC. METALS ALLOWANCE	11,988	GSF	0.50	5,994
	SUBTOTAL				**123,190**
6.0	WOOD, PLASTICS & COMPOSITES				$
	ROUGH CARPENTRY				
	ROUGH CARPENTRY ALLOWANCE	11,988	GSF	0.30	3,596
	SUBTOTAL				**3,596**
7.0	THERMAL & MOISTURE PROTECTION				$
	ROOFING				
	MEMBRANE ROOFING	3,318	SF	5.50	18,249
	ROOF COVERBOARD + 2" RIGID INSULATION	3,318	SF	4.75	15,761
	PARAPET COPING	220	LF	8.59	1,890
	CANT STRIP	220	LF	5.50	1,210
	MISCELLANEOUS				
	MISC. SHEET METAL ALLOWANCE	11,988	GSF	0.30	3,596

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ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
	CAULKING & SEALANT ALLOWANCE	11,988	GSF	0.25	2,997
	SUBTOTAL				**43,703**
8.0	OPENINGS				$
	EXTERIOR DOOR + HARDWARES				
	HM DOOR/HM FRAME, SINGLE	4	EA	2,075.00	8,300
	HM DOOR/HM FRAME, DUAL LEAF	1	PR	3,631.25	3,631
	METAL ROLL-UP DOOR, 10'W X 8'H	1	EA	3,200.00	3,200
	PAINT EXT. DOOR/FRAME, PER LEAF	6	EA	206.25	1,238
	INTERIOR DOOR + HARDWARES				
	HM DOOR/HM FRAME, SINGLE	6	EA	2,075.00	12,450
	PAINT INT. DOOR/FRAME, PER LEAF	6	EA	206.25	1,238
	SUBTOTAL				**30,057**
9.0	FINISHES				$
	EXTERIOR WALL				
	PAINT TO NEW & EXISTING EXT. CMU WALL	7,104	SF	1.00	7,104
	PAINT TO NEW & EXISTING INT. OF EXT. CMU WALL	4,492	SF	1.00	4,492
	EPOXY PAINT TO NEW & EXISTING INT. OF EXT. WALLS - ALLOWANCE @ WASH AREA WALLS	2,736	SF	4.78	13,078
	INTERIOR WALL				
	METAL STUD	120	SF	6.29	755
	BATT INSULATION	120	SF	1.00	120
	GWB + PAINT	240	SF	3.45	828
	CERAMIC WALL TILES + MORTAR - O/ CMU	272	SF	19.06	5,184
	PAINT - NEW & EXISTING INT. CMU WALL	10,620	SF	1.00	10,620
	EPOXY PAINT - NEW & EXISTING INT. CMU WALL @ WASH AREA	1,062	SF	4.78	5,076
	FLOORING + BASES				
	CERAMIC FLOOR TILE/BASE	80	SF	18.40	1,472
	VCT FLOOR/BASE	1,628	SF	5.18	8,433
	CONCRETE SEALER/HARDENER TO FLOORS	10,280	SF	1.20	12,336
	CEILING				
	GYPSUM BOARD + PAINT + FRAMES	250	SF	10.68	2,670
	ACT T-BAR CEILING SYSTEM	1,458	SF	4.26	6,211
	EPOXY PAINT TO WASH AREA OPEN CEILING	8,542	SF	4.78	40,831
	PAINT TO EXPOSED STRUCTURES	1,738	SF	1.25	2,173
	MISC. PAINTING				
	MISC. PAINTING ALLOWANCE	11,988	GSF	0.25	3,035
	SUBTOTAL				**124,418**

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ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
10.0	SPECIALTIES				$
	FIRE PROTECTION SPECIALTIES				
	FIRE EXTINGUISHER + CABINET - ALLOWANCE	2	EA	525.00	1,050
	MISC. SPECIALTIES				
	BUILDING SIGNAGE	11,988	GSF	0.25	2,997
	MISC. SPECIALTIES	11,988	GSF	0.50	5,994
	SUBTOTAL				**10,041**
11.0	EQUIPMENT				$
	FUEL & WASH EQUIPMENT				
	REMOVE (E) VACUUM EQUIPMENT	4	EA	2,675.00	10,700
	REMOVE & RELOCATE (E) CNG DISPENSER	2	EA	9,600.00	19,200
	EQUIPMENT PER MDG PRELIMINARY EQUIPMENT LIST (INCLUDES TAXES AND INSTALLATION FOR CF/CI ITEMS)				
	FUEL LANES (2)	1	LS	206,800.00	206,800
	VAULTING	1	LS	25,120.00	25,120
	LUBE COMPRESSOR ROOM	1	LS	53,180.00	53,180
	CLEANING SUPPLY STORAGE	1	LS	5,240.00	5,240
	DRIVE THROUGH WASH (2)	1	LS	580,000.00	580,000
	EQUIPMENT INSTALLATION COST	1	LS	348,136.00	348,136
	ALLOWANCE FOR REMOVE & RELOCATE VAULTING EQUIPMENT FROM ADMIN BUILDING	1	LS	1,950.00	1,950
	SUBTOTAL				**1,250,326**
12.0	FURNISHINGS				$
	NOT APPLICABLE				
	SUBTOTAL				
13.0	SPECIAL CONSTRUCTION				$
	NOT APPLICABLE				
	SUBTOTAL				
14.0	CONVEYING				$
	NOT APPLICABLE				
	SUBTOTAL				

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21.0	**FIRE SUPPRESSION**				$
	FIRE PROTECTION				
	FIRE SPRINKLER SYSTEM - NON WASH AREA	3,446	SF	4.50	15,507
	SUBTOTAL				**15,507**
22.0	**PLUMBING**				$
	PLUMBING SYSTEM				
	PLUMBING SYSTEM - PER FIXTURE, COMPLETE	2	EA	6,687.50	13,375
	BUILDING ROOF DRAINS	3,318	SF	1.50	4,977
	CONDENSATE DRAINS	11,988	GSF	0.25	2,997
	MISC. PLUMBING SYSTEM	11,988	GSF	0.27	3,202
	SUBTOTAL				**24,551**
23.0	**HVAC**				$
	HVAC SYSTEM				
	RELOCATE (E) DX SPLIT SYSTEM UNIT, COMPLETE	1	PR	1,620.00	1,620
	NEW SPLIT SYSTEM UNITS, COMPLETE	2	PR	3,500.00	7,000
	EXHAUST FAN - TOILET (80 SF)	1	EA	275.00	275
	EXHAUST FAN - LOCKER ROOM (114 SF)	1	EA	325.00	325
	ALLOWANCE FOR HVAC REMODEL WORK	8,670	SF	7.50	65,025
	MISC. HVAC SYSTEM	11,988	GSF	0.15	1,856
	SUBTOTAL				**76,101**
26.0	**ELECTRICAL**				$
	ELECTRICAL SYSTEM				
	NEW POWER - ADDITION	3,318	SF	12.50	41,475
	NEW LIGHTING - ADDITION	3,318	SF	10.00	33,180
	NEW HVAC POWER HOOK-UP	8	EA	450.00	3,600
	ALLOWANCE FOR POWER/LIGHTING REMODEL WORK	8,670	SF	2.75	23,843
	MISC. ELECTRICAL SYSTEM	11,988	GSF	0.33	3,956
	SUBTOTAL				**106,054**
27.0	**COMMUNICATIONS**				$
	COMMUNICATIONS SYSTEM				
	TELEPHONE/DATA SYSTEM - FARE COUNTING/OFFICE	1,150	SF	9.28	10,672
	SUBTOTAL				**10,672**

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28.0	ELECTRONIC SAFETY & SECURITY				$
	FIRE ALARM SYSTEM				
	FIRE ALARM - ADDITION	3,318	SF	5.27	17,486
	ALLOWANCE FOR FIRE ALARM REMODEL WORK	8,670	SF	0.71	6,156
	SECURITY SYSTEM				
	SECURITY SYSTEM	3,318	SF	5.00	16,590
	ALLOWANCE FOR SECURITY REMODEL WORK	8,670	SF	1.00	8,670
	SUBTOTAL				**48,902**

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RENOVATION OF EXISTING RESTROOM/LOCKER ROOM BLDG (PHASE 1)	**GFA:**	

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
	SUMMARY OF ESTIMATE			**$**	**$**
1.0	GENERAL REQUIREMENTS				
2.0	EXISTING CONDITIONS			28.64	19,759
3.0	CONCRETE			20.57	14,190
4.0	MASONRY			18.58	12,818
5.0	METALS			33.13	22,857
6.0	WOOD, PLASTICS & COMPOSITES			3.28	2,262
7.0	THERMAL & MOISTURE PROTECTION			3.33	2,299
8.0	OPENINGS			9.93	6,855
9.0	FINISHES			65.91	45,476
10.0	SPECIALTIES			14.09	9,724
11.0	EQUIPMENT			11.45	7,900
12.0	FURNISHINGS				
13.0	SPECIAL CONSTRUCTION				
14.0	CONVEYING				
21.0	FIRE SUPPRESSION			4.50	3,105
22.0	PLUMBING			136.22	93,991
23.0	HVAC			4.42	3,047
26.0	ELECTRICAL			14.48	9,992
27.0	COMMUNICATIONS				
28.0	ELECTRONIC SAFETY & SECURITY			5.27	3,636
31.0	EARTHWORK			1.33	915
32.0	EXTERIOR IMPROVEMENTS			3.66	2,522
33.0	UTILITIES			14.21	9,803
	SUBTOTAL			**392.97**	**271,151**
50.0	PRORATES:				
50.1	GENERAL CONDITIONS	7.50%		29.47	20,336
50.2	CONTINGENCY	15.00%		63.37	43,723
50.3	ESCALATION (TO MIDPOINT)	6.03%		29.30	20,220
50.4	PROJECT PHASING PREMIUM	2.50%		12.88	8,886
50.5	MARKET FACTOR				
	SUBTOTAL			**527.99**	**$364,316**
50.6	BONDS & INSURANCE	2.00%		10.56	7,286
50.7	CONTRACTOR'S FEE	6.50%		35.01	24,154
	TOTAL OF OPINION OF CONSTRUCTION COST			**573.56**	**$395,756**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - RENOVATION OF EXISTING RESTROOM/LOCKER ROOM BLDG (PHASE 1)	**BUILDING GFA:**	**690**

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
1.0	GENERAL REQUIREMENTS				$
	SEE SUMMARY FOR GENERAL CONDITIONS				
	SUBTOTAL				
2.0	EXISTING CONDITIONS				$
	SELECTIVE BUILDING DEMOLITION				
	REMOVE (E) EXT. DOOR/FRAME, PER LEAF	2	EA	227.50	455
	SAWCUT/REMOVE (E) EXT. CMU WALL	228	SF	5.56	1,268
	REMOVE (E) INT. DOOR/FRAME, PER LEAF	3	EA	192.50	578
	REMOVE (E) LAVATORY COUNTER	11	LF	25.00	275
	REMOVE (E) LOCKERS & CURB	33	EA	13.09	432
	REMOVE (E) TOILET ACCESSORIES, PER FIXTURE	8	FIXT	75.00	600
	REMOVE (E) TOILET PARTITION	2	EA	308.00	616
	REMOVE (E) WALL TILE	98	LF	3.50	343
	REMOVE (E) INT. FURRING WALL	80	SF	1.00	80
	REMOVE (E) INT. WALL	630	SF	2.78	1,751
	REMOVE (E) INT. WALL, DOUBLE	60	SF	4.00	240
	REMOVE (E) WALL CURB	70	LF	10.00	700
	REMOVE (E) FLOOR FINISHES	540	SF	1.50	810
	REMOVE (E) CEILING FINISHES	540	SF	1.35	729
	REMOVE (E) PLUMBING EQUIPMENT & ASSOCIATED PIPINGS, COMPLETE	1	EA	500.00	500
	REMOVE (E) PLUMBING FIXTURES & ASSOCIATED PIPINGS, COMPLETE	9	EA	448.00	4,032
	REMOVE (E) HVAC EXHAUST SYSTEM	540	SF	1.50	810
	REMOVE (E) BRANCH POWER	540	SF	0.88	475
	REMOVE (E) LIGHTING	540	SF	1.29	697
	SAWCUT/REMOVE PORTION OF (E) EXT. PAVING, 5' BEYOND FROM NEW FOOTPRINT	264	SF	2.41	635
	MISC. DEMO & PROTECTION WORK	1	LS	800.00	800
	HAZARDOUS ABATEMENT				
	ALLOWANCE FOR HAZARDOUS MATERIAL/LBP ABATEMENT	690	LS	4.25	2,933
	SUBTOTAL				**19,759**
3.0	CONCRETE				$
	FOUNDATION				
	NEW WALL FOOTING	27	LF	77.78	2,100
	SLAB ON-GRADE/CURB				
	SLAB ON-GRADE + BASE/V.B.	150	SF	8.26	1,239
	CONCRETE CURB, 6"W	45	LF	18.52	833
	CONCRETE CURB, 12"W	8	LF	37.04	296
	LOCKER CURB, 24"W	30	LF	44.44	1,333

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST -		**BUILDING**	**690**
RENOVATION OF EXISTING RESTROOM/LOCKER ROOM BLDG (PHASE 1)		**GFA:**	

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
	JOIN NEW SLAB TO EXISTING	20	LF	35.00	700
	JOIN NEW CURBS TO (E) SLAB	83	LF	35.00	2,905
	MISC. CONCRETE				
	ALLOWANCE FOR SLAB CUTTING & PATCHING DUE TO NEW PLUMBING FIXTURES LAYOUT	1	LS	4,680.00	4,680
	MISC. CONCRETE ALLOWANCE	690	GSF	0.15	104
	SUBTOTAL				**14,190**
4.0	MASONRY				$
	CMU WALLS				
	EXT. CMU WALL - ASSUME 8"	436	SF	26.00	11,336
	EXT. CMU STEM WALL	57	SF	26.00	1,482
	SUBTOTAL				**12,818**
5.0	METALS				$
	STEEL STRUCTURE				
	ROOF STEEL BEAMS	1,403	LBS	2.40	3,366
	METAL DECK - ROOF	150	SF	4.47	671
	CANOPY				
	NEW CANOPY, COMPLETE	305	SF	35.00	10,675
	WALL ATTACHMENT	65	LF	75.00	4,875
	MISCELLANEOUS METALS				
	ROOF HATCH + LADDER - ALLOWANCE	1	EA	2,925.00	2,925
	MISC. METALS ALLOWANCE	690	GSF	0.50	345
	SUBTOTAL				**22,857**
6.0	WOOD, PLASTICS & COMPOSITES				$
	FINISH CARPENTRY				
	LAVATORY COUNTER	13	LF	105.00	1,365
	MISC. FINISH CARPENTRY ALLOWANCE	690	GSF	1.00	690
	ROUGH CARPENTRY				
	ROUGH CARPENTRY ALLOWANCE	690	GSF	0.30	207
	SUBTOTAL				**2,262**
7.0	THERMAL & MOISTURE PROTECTION				$
	ROOFING				
	MEMBRANE ROOFING	150	SF	5.50	825
	ROOF COVERBOARD + 2" RIGID INSULATION	150	SF	4.75	713
	PARAPET COPING	28	LF	8.59	241
	CANT STRIP	28	LF	5.50	154

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST -		**BUILDING**	**690**
RENOVATION OF EXISTING RESTROOM/LOCKER ROOM BLDG (PHASE 1)		**GFA:**	

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
	MISCELLANEOUS				
	MISC. SHEET METAL ALLOWANCE	690	GSF	0.28	193
	CAULKING & SEALANT ALLOWANCE	690	GSF	0.25	173
	SUBTOTAL				**2,299**
8.0	OPENINGS				$
	EXTERIOR DOOR + HARDWARES				
	HM DOOR/HM FRAME, PER LEAF + PAINT	3	EA	2,285.00	6,855
	SUBTOTAL				**6,855**
9.0	FINISHES				$
	EXTERIOR WALL				
	SEALER - EXT. CMU WALL	436	SF	0.65	283
	PAINT - INT. OF EXT. CMU WALL	1,240	SF	1.00	1,240
	INTERIOR WALL				
	METAL STUD	460	SF	6.29	2,893
	DOUBLE METAL STUD	80	SF	11.64	931
	CEMENT PLASTER + PAINT	1,080	SF	3.45	3,726
	CERAMIC WALL TILES - STUD WALLS	480	SF	15.56	7,469
	CERAMIC WALL TILES + MORTAR - O/ CMU	360	SF	19.06	6,862
	FLOORING + BASES				
	CERAMIC FLOOR TILE/BASE	662	SF	18.40	12,181
	SEALED CONCRETE	28	SF	1.20	34
	CEILING				
	GYPSUM BOARD + PAINT + FRAMES	646	SF	10.68	6,899
	C. PLASTER + PAINT + FRAMES	44	SF	18.00	792
	MISC. PAINTING				
	MISC. PAINTING ALLOWANCE	690	GSF	3.14	2,166
	SUBTOTAL				**45,476**
10.0	SPECIALTIES				$
	RESTROOM/JANITOR SPECIALTIES				
	TOILET PARTITION	3	EA	1,200.00	3,600
	URINAL SCREEN	1	EA	656.00	656
	SHOWER CURTAIN	2	EA	150.00	300
	TOILET ACCESSORIES, PER FIXTURE	8	EA	300.00	2,400
	SHOWER ACCESSORIES, PER STALL	2	EA	450.00	900
	HAND DRYER - ALLOWANCE	2	EA	675.00	1,350
	MISC. SPECIALTIES				
	BUILDING SIGNAGE	690	GSF	0.25	173

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST -		**BUILDING**	**690**
RENOVATION OF EXISTING RESTROOM/LOCKER ROOM BLDG (PHASE 1)		**GFA:**	

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
	MISC. SPECIALTIES	690	GSF	0.50	345
	SUBTOTAL				**9,724**
11.0	EQUIPMENT				$
	EMPLOYEE STORAGE EQUIPMENT				
	METAL LOCKER, 16"W X 24"D - ASSUME 2-TIER	20	EA	350.00	7,000
	LOCKER BENCH	12	LF	75.00	900
	SUBTOTAL				**7,900**
12.0	FURNISHINGS				$
	NOT APPLICABLE				
	SUBTOTAL				
13.0	SPECIAL CONSTRUCTION				$
	NOT APPLICABLE				
	SUBTOTAL				
14.0	CONVEYING				$
	NOT APPLICABLE				
	SUBTOTAL				
21.0	FIRE SUPPRESSION				$
	FIRE PROTECTION				
	NEW FIRE SPRINKLER SYSTEM - BUILDING	690	SF	4.50	3,105
	SUBTOTAL				**3,105**
22.0	PLUMBING				$
	PLUMBING SYSTEM				
	EQUIPMENT + ROUGH-INS	1	LS	4,375.00	4,375
	PLUMBING SYSTEM - PER FIXTURE, COMPLETE	12	EA	7,000.00	84,000
	ADDITIONAL BUILDING ROOF DRAINS	150	SF	3.00	450
	CONDENSATE DRAINS	690	GSF	1.00	690
	MISC. PLUMBING SYSTEM	690	GSF	6.49	4,476
	SUBTOTAL				**93,991**
23.0	HVAC				$
	HVAC SYSTEM				
	NEW EXHAUST FAN, 75 CFM	2	EA	300.00	600

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - RENOVATION OF EXISTING RESTROOM/LOCKER ROOM BLDG (PHASE 1)		**BUILDING GFA:**	**690**

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
	SHOWER EXHAUST FAN W/ S/S DUCTWORK	2	EA	975.00	1,950
	MISC. HVAC SYSTEM	690	GSF	0.72	497
	SUBTOTAL				**3,047**
26.0	ELECTRICAL				$
	ELECTRICAL SYSTEM				
	NEW BRANCH POWER	690	GSF	3.50	2,415
	NEW LIGHTING	690	GSF	7.03	4,851
	POWER HOOK-UP - HAND DRYERS	2	EA	225.00	450
	POWER HOOK-UP - HVAC UNITS	4	EA	450.00	1,800
	MISC. ELECTRICAL SYSTEM	690	GSF	0.69	476
	SUBTOTAL				**9,992**
27.0	COMMUNICATIONS				$
	NOT APPLICABLE				
	SUBTOTAL				
28.0	ELECTRONIC SAFETY & SECURITY				$
	FIRE ALARM SYSTEM				
	NEW FIRE ALARM	690	GSF	5.27	3,636
	SUBTOTAL				**3,636**
31.0	EARTHWORK				$
	SITE PREPARATION				
	SITE CLEARING	264	SF	0.12	32
	ROUGH GRADING	264	SF	0.18	48
	OVER EXCAVATION, SITE PAVING, ASSUME 2'D	8	CY	10.50	89
	OVER EXCAVATION - ADDED BUILDING PAD, ASSUME 3'D BELOW FOOTING (6'D TOTAL)	33	CY	10.50	350
	EROSION CONTROL/SWPPP	264	SF	1.50	396
	SUBTOTAL				**915**
32.0	EXTERIOR IMPROVEMENTS				$
	HARDSCAPE				
	CONCRETE WALKWAY, MATCH EXISTING	114	SF	7.39	842
	TIE NEW PAVING TO EXISTING	48	LF	35.00	1,680
	SUBTOTAL				**2,522**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - RENOVATION OF EXISTING RESTROOM/LOCKER ROOM BLDG (PHASE 1)	**BUILDING GFA:**	**690**

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
33.0	UTILITIES				$
	PLUMBING UTILITIES				
	FIRE SPRINKLER SYSTEM - NEW CANOPY	305	SF	4.50	1,373
	MODIFICATIONS TO (E) COLD WATER SERVICE TO TOILET - ALLOWANCE	1	LS	1,800.00	1,800
	MODIFICATIONS TO (E) SANITARY SEWER DISCHARGE PIPE - ALLOWANCE	1	LS	3,000.00	3,000
	ELECTRICAL				
	LIGHTING TO CANOPY	305	SF	6.00	1,830
	INCOMING POWER MODIFICATIONS - ALLOWANCE	1	LS	1,800.00	1,800
	SUBTOTAL				**9,803**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - SITEWORK (PHASE 1)		**BUILDING GFA:**	**12,682**

ITEM NO.	DESCRIPTION		EST QTY	UNIT COST	TOTAL COST
	SUMMARY OF ESTIMATE			**$**	**$**
1.0	GENERAL REQUIREMENTS				
2.0	EXISTING CONDITIONS			1.61	20,368
31.0	EARTHWORK			2.12	26,889
32.0	EXTERIOR IMPROVEMENTS			5.45	69,102
33.0	UTILITIES			5.27	66,848
	SUBTOTAL			**14.45**	**$183,207**
50.0	PRORATES:				
50.1	GENERAL CONDITIONS	7.50%		1.08	13,741
50.2	CONTINGENCY	15.00%			29,542
50.3	ESCALATION (TO MIDPOINT)	6.03%		1.08	13,662
50.4	PROJECT PHASING PREMIUM	2.50%		0.47	6,004
50.5	MARKET FACTOR				
	SUBTOTAL			**19.41**	**$246,155**
50.6	BONDS & INSURANCE	2.00%		0.39	4,923
50.7	CONTRACTOR'S FEE	6.50%		1.29	16,320
	TOTAL OF OPINION OF CONSTRUCTION COST			**21.08**	**$267,398**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - SITEWORK (PHASE 1)		**BUILDING GFA:**	**12,682**

ITEM NO.	DESCRIPTION	EST QTY		UNIT COST	TOTAL COST
1.0	**GENERAL REQUIREMENTS**				$
	SEE SUMMARY FOR GENERAL CONDITIONS				
	SUBTOTAL				
2.0	**EXISTING CONDITIONS**				$
	SITE DEMOLITION				
	SAWCUT/DEMO (E) BUS PAVING	1,248	SF	2.41	3,008
	SAWCUT/DEMO (E) RAISED PAVING	852	SF	3.50	2,982
	SAWCUT/DEMO (E) ASPHALT PAVING/BASE	12,760	SF	1.00	12,760
	DEMO (E) ISLAND/P.A./CURB, COMPLETE	1,140	SF	0.75	855
	PROTECT (E) CHAINLINK FENCE @ NORTH PROPERTY	75	LF	3.50	263
	MISC. SITE DEMO & PROTECTION WORK	1	LS	500.00	500
	SUBTOTAL				**20,368**
31.0	**EARTHWORK**				$
	SITE PREPARATION				
	SITE CLEARING, GROSS SITE	16,000	SF	0.12	1,920
	ROUGH GRADING	16,000	SF	0.18	2,880
	OVER EXCAVATION, SITE PAVING, ASSUME 2'D	892	CY	10.50	9,366
	BUILDING PAD OVER EXCAVATION, ASSUME 5'D BELOW FOOTING (8'D TOTAL) - ADDITION	983	CY	10.50	10,323
	EROSION CONTROL/SWPPP	16,000	SF	0.15	2,400
	SUBTOTAL				**26,889**
32.0	**EXTERIOR IMPROVEMENTS**				$
	CONCRETE PAVING & CURBS				
	RAISED CONCRETE PAVING	544	SF	15.00	8,160
	CONCRETE PAVING, MATCH EXISTING - ASSUME 8"/8" (BUS PAVING)	318	SF	10.94	3,479
	JOIN PAVING TO EXISTING	77	LF	35.00	2,695
	CONCRETE CURB	342	LF	25.00	8,550
	MISC. CONCRETE PADS - EQUIPMENT	1	LS	110.00	110
	ASPHALT PAVING				
	ASPHALT PAVING - VISITOR/EMPLOYEE PARKING (ASSUME 3"/8")	11,180	SF	3.38	37,788
	LANDSCAPING				
	PLANTING + IRRIGATION	640	SF	7.70	4,928
	SITE MISCELLANEOUS				
	PARKING STALL STRIPING	27	EA	50.00	1,350
	PAVING ARROW STRIPING	4	EA	35.00	140

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - SITEWORK (PHASE 1)		**BUILDING GFA:**	**12,682**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	MISC. SITE SIGNAGE	12,682	SF	0.15	1,902
	SUBTOTAL				**69,102**
33.0	UTILITIES				$
	EXISTING FUEL/VENT U/G LINES				
	RELOCATE (E) U/G FUEL/VENT LINES FOR NEW VAULTING ADDITION	160	LF	220.00	35,200
	SITE PLUMBING UTILITIES				
	COLD WATER SERVICE TO NEW TOILET	1	LS	2,500.00	2,500
	SANITARY SEWER - DISCHARGE PIPE + CONNECTIONS	1	LS	5,000.00	5,000
	STORM DRAINS - DISCHARGE PIPE + CONNECTIONS	1	LS	3,500.00	3,500
	SITE ELECTRICAL				
	SITE LIGHTING ALLOWANCE	12,682	SF	1.20	15,218
	INCOMING COMMUNICATIONS TO NEW OFFICE	1	LS	3,800.00	3,800
	MISC. SITE UTILITY				
	ALLOWANCE FOR MISC. SITE UTILITY	12,682	SF	0.13	1,630
	SUBTOTAL				**66,848**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - MAINTENANCE BUILDING RENOVATION + RELATED SITEWORK (PHASE 2)	**BUILDING GFA:**	**52,970**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	SUMMARY OF ESTIMATE			**$**	**$**
1.0	GENERAL REQUIREMENTS				
2.0	EXISTING CONDITIONS			8.89	471,036
3.0	CONCRETE			4.44	235,319
4.0	MASONRY			7.30	386,871
5.0	METALS			3.87	204,910
6.0	WOOD, PLASTICS & COMPOSITES			0.89	47,230
7.0	THERMAL & MOISTURE PROTECTION			2.08	110,150
8.0	OPENINGS			2.16	114,187
9.0	FINISHES			7.36	389,966
10.0	SPECIALTIES			0.87	45,979
11.0	EQUIPMENT			83.38	4,416,491
12.0	FURNISHINGS			0.05	2,906
13.0	SPECIAL CONSTRUCTION				
14.0	CONVEYING			1.70	90,000
21.0	FIRE SUPPRESSION			1.92	101,770
22.0	PLUMBING			3.36	178,181
23.0	HVAC			5.42	287,178
26.0	ELECTRICAL			7.24	383,694
27.0	COMMUNICATIONS			0.99	52,277
28.0	ELECTRONIC SAFETY & SECURITY			5.62	297,946
31.0	EARTHWORK			0.37	19,346
32.0	EXTERIOR IMPROVEMENT			0.57	30,256
33.0	UTILITIES			5.21	276,017
	SUBTOTAL			**$153.70**	**$8,141,710**
50.0	PRORATES:				
50.1	GENERAL CONDITIONS	7.50%		11.53	610,628
50.2	CONTINGENCY	15.00%		24.78	1,312,851
50.3	ESCALATION	10.02%		19.03	1,008,170
50.4	PROJECT PHASING PREMIUM	2.50%		5.23	276,834
50.5	MARKET FACTOR				
	SUBTOTAL			**$214.27**	**$11,350,193**
50.6	BONDS	2.00%		4.29	227,004
50.7	CONTRACTOR'S FEE	6.50%		14.21	752,518
	TOTAL OF OPINION OF CONSTRUCTION COST			**$232.77**	**$12,329,715**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - MAINTENANCE BUILDING RENOVATION + RELATED SITEWORK (PHASE 2)	**BUILDING GFA:**	**52,970**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
1.0	GENERAL REQUIREMENTS				$
	SEE SUMMARY FOR GENERAL CONDITIONS				
	SUBTOTAL				
2.0	EXISTING CONDITIONS				$
	SITE DEMOLITION				
	SAWCUT (E) EXT. PAVING	300	LF	5.00	1,500
	REMOVE (E) EXT PAVING	5,000	SF	2.00	10,000
	MISC. SITE DEMO	1	LS	575.00	575
	SELECTIVE BUILDING DEMOLITION				
	REMOVE (E) EXT. DOOR/FRAME, PER LEAF	7	EA	227.50	1,593
	REMOVE (E) EXT. ROLL-UP DOOR, 14' X 14'	3	EA	630.00	1,890
	REMOVE (E) MAIN ENTRY STOREFRONT W/ SINGLE DOOR	100	SF	10.00	1,000
	REMOVE (E) EXT. WINDOWS	120	SF	8.50	1,020
	REMOVE PORTION OF (E) EXT. 12" CMU WALL	1,356	SF	5.56	7,539
	REMOVE (E) CEMENT PLASTER SOFFIT/FRAMES	40	SF	2.75	110
	REMOVE PORTION OF (E) CEMENT PLASTERED FASCIA/FRAMES, ASSUME +/-3'H	91	LF	10.50	956
	SAWCUT/REMOVE PORTION OF (E) SLAB FOR NEW TIRE REPAIR BAY PIT, 8.5' X 53'	1	EA	1,892.10	1,892
	SAWCUT/REMOVE PORTION OF (E) MEZZANINE SLAB FOR NEW ELEVATOR PIT	1	EA	600.00	600
	SAWCUT/REMOVE PORTION OF (E) MEZZANINE SLAB FOR NEW ELEVATOR SHAFT	1	EA	480.00	480
	REMOVE (E) INT. ROLL-UP DOOR, 9'W X 8'H	1	EA	576.00	576
	REMOVE (E) INT. DOOR/FRAME, PER LEAF	28	EA	192.50	5,390
	REMOVE (E) INT. FURRING WALLS - MEZZ.	540	SF	1.00	540
	REMOVE (E) INT. WALLS - MEZZ.	4,580	SF	1.25	5,725
	REMOVE (E) INT. 8" CMU WALLS	6,874	SF	3.72	25,571
	REMOVE (E) INT. 12" CMU WALLS	1,992	SF	5.56	11,076
	STRIP (E) WALL FINISH	1,838	SF	1.25	2,298
	REMOVE (E) 4'W METAL STAIR, STRAIGHTFLIGHT + RAILINGS - TO MEZZANINE	1	FLT	2,250.00	2,250
	REMOVE PORTION OF (E) MEZZANINE FLOOR (R.C. FLAT SLAB CONSTRUCTION)	720	SF	6.00	4,320
	REMOVE (E) BREAK ROOM COUNTER	12	LF	40.00	480
	REMOVE (E) PARTS COUNTER	8	LF	25.00	200
	REMOVE (E) LOCKERS & CURB	72	EA	13.09	942
	REMOVE (E) FLOOR FINISHES/BASES - ADMIN AREAS @ 1ST FLOOR	1,804	SF	1.50	2,706
	REMOVE (E) FLOOR FINISHES/BASES - MEZZANINE	5,246	SF	1.50	7,869
	REMOVE (E) CEILING FINISHES - ADMIN AREAS @ 1ST FLOOR	1,804	SF	1.35	2,435

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - MAINTENANCE BUILDING RENOVATION + RELATED SITEWORK (PHASE 2)		**BUILDING GFA:**	**52,970**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	REMOVE (E) CEILING FINISHES - MEZZANINE	5,246	SF	1.35	7,082
	REMOVE (E) 10' X 42' DROP TABLE - PAINT	1	EA	420.00	420
	REMOVE (E) PAINT EQUIPMENT/BOOTH	1	LS	3,500.00	3,500
	REMOVE (E) CHASSIS WASH EQUIPMENT	1	LS	23,750.00	23,750
	REMOVE (E) JIB CRANE, 10'L	2	EA	660.00	1,320
	REMOVE (E) PLUMBING FIXTURE & ALL ASSOCIATED PIPINGS, COMPLETE	26	EA	448.00	11,648
	REMOVE (E) HV UNITS, 4900 & 7000 CFMS	2	EA	825.00	1,650
	REMOVE (E) MU UNITS (1-7600 CFM, 3-18400 CFM)	4	EA	1,734.00	6,936
	REMOVE (E) EVAP COOLER	1	EA	1,456.00	1,456
	REMOVE (E) EXHAUST FAN UNITS	14	EA	350.00	4,900
	DEMO ELECTRICAL - MODERATE	50,090	SF	1.75	87,658
	MISC. SELECTIVE BUILDING DEMO	1	LS	6,300.00	6,300
	HAZARDOUS MATERIAL ABATEMENT				
	ALLOWANCE FOR HAZARDOUS MATERIAL/LBP ABATEMENT	50,090	GSF	4.25	212,883
	SUBTOTAL				**471,036**
3.0	CONCRETE				$
	BUILDING FOUNDATION				
	INT. WALL FOOTING - NEW CMU WALLS	441	LF	81.02	35,730
	EXT. WALL FOOTING - NEW CMU WALLS	257	LF	116.67	29,984
	TIE NEW FOOTING TO EXISTING	28	LOC	162.50	4,550
	NEW ELEVATOR PIT, COMPLETE	1	EA	12,000.00	12,000
	SLAB ON-GRADE/CURB				
	SAWCUT/PATCH (E) SLAB FOR NEW INT. CMU WALL FOOTING	427	LF	80.00	34,160
	SLAB ON-GRADE + BASE/V.B. - NEW CHASSIS WASH	2,298	SF	8.33	19,142
	SLAB ON-GRADE + BASE/V.B. - EXTENDED SPECIALTY BAYS	1,302	SF	8.33	10,846
	MISC. REPAIR/PATCH TO (E) SLAB ON-GRADE	36,278	SF	0.42	15,237
	TIE NEW SLAB TO EXISTING	91	LF	35.00	3,185
	LOCKER CURB, 18"W	87	LF	33.33	2,900
	LOCKER CURB, 24"W	23	LF	44.44	1,022
	TRENCH PIT + GRATE, ASSUME 2'-0"W	50	LF	150.00	7,500
	HOLDING PIT + GRATE, 8'W X 14'L	1	EA	16,800.00	16,800
	REPAIR BAYS				
	NEW TIRE REPAIR BAY PIT	1	EA	30,000.00	30,000
	MISC. REPAIR/PATCH & CLEANING TO (E) ARTIC BAY PITS SLABS/WALLS (8.5' X 61')	5	EA	2,028.75	10,144
	MISC. CONCRETE				
	MISC. CONCRETE/PADS ALLOWANCE	52,970	GSF	0.04	2,119
	SUBTOTAL				**235,319**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
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CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - MAINTENANCE BUILDING RENOVATION + RELATED SITEWORK (PHASE 2)	**BUILDING GFA:**	**52,970**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
4.0	**MASONRY**				$
	EXT. CMU WALLS				
	EXT. CMU WALL, 12"	5,420	SF	27.50	149,050
	EXT. CMU STEM WALL, 12"	387	SF	27.50	10,643
	SAWCUT/REMOVE PORTION OF (E) EXT. 8" CMU WALL FOR NEW WINDOW OPENING	118	SF	12.50	1,469
	8" EXT. CMU INFILL TO (E) WINDOW OPENING	20	SF	31.63	633
	8" EXT. CMU INFILL ABOVE STOREFRONT	40	SF	31.63	1,265
	INT. CMU WALLS				
	SAWCUT/REMOVE PORTION OF (E) INT. 8" CMU WALL FOR NEW DOOR OPENING, PER LEAF	5	EA	315.00	1,575
	REMOVE PORTION OF (E) INT. 8" CMU WALL FOR NEW 6'W X 8'H OPENING	1	EA	720.00	720
	8" CMU INFILL TO (E) SINGLE DOOR OPENING, MATCH EXISTING	8	EA	664.13	5,313
	INT. CMU WALL, 8"	7,654	SF	26.00	199,004
	INT. CMU STEM WALL, 8"	662	SF	26.00	17,199
	SUBTOTAL				**386,871**
5.0	**METALS**				$
	STEEL STRUCTURE				
	CHASSIS WASH NEW ROOF STEEL FRAMES	17	TONS	4,800.00	82,728
	EXTENDED REPAIR BAY NEW ROOF STEEL FRAMES	10	TONS	4,800.00	46,872
	STEEL FRAME ATTACHMENT TO (E) CMU WALL	91	LF	58.33	5,308
	STEEL FRAME ATTACHMENT TO (E) ROOF FRAMES	91	LF	75.00	6,825
	METAL DECK - CHASSIS WASH ROOF	2,298	SF	4.47	10,272
	METAL DECK - EXTENDED REPAIR BAY ROOF	1,302	SF	4.47	5,820
	METAL CANOPY				
	NEW METAL CANOPY, COMPLETE	200	SF	70.00	14,000
	METAL FABRICATIONS				
	PIPE BOLLARDS	12	EA	550.00	6,600
	MISC. METALS ALLOWANCE	52,970	GSF	0.50	26,485
	SUBTOTAL				**204,910**
6.0	**WOOD, PLASTICS & COMPOSITES**				$
	FINISH CARPENTRY				
	NEW CASEWORK	85	LF	350.00	29,750
	MISC. FINISH CARPENTRY ALLOWANCE	52,970	GSF	0.03	1,589
	ROUGH CARPENTRY				
	ROUGH CARPENTRY ALLOWANCE	52,970	GSF	0.30	15,891
	SUBTOTAL				**47,230**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - MAINTENANCE BUILDING RENOVATION + RELATED SITEWORK (PHASE 2)	**BUILDING GFA:**	**52,970**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
7.0	**THERMAL & MOISTURE PROTECTION**				$
	ROOFING				
	MEMBRANE ROOFING	3,600	SF	5.50	19,800
	ROOF COVERBOARD + RIGID INSULATION	3,600	SF	4.75	17,100
	MEMBRANE TO ROOFSIDE PARAPET	516	SF	5.00	2,580
	PARAPET COPING	258	LF	8.59	2,216
	CANT STRIP	440	LF	5.50	2,420
	RE-PAINT (E) PARAPET COPING	742	LF	2.10	1,558
	MISC. REPAIR TO (E) ROOFING MEMBRANE	38,870	SF	0.83	32,262
	SKYLIGHT				
	MISC. REPAIR/CLEANING TO (E) ROOF SKYLIGHTS	1	LS	3,080.00	3,080
	MISCELLANEOUS				
	MISC. SHEET METAL ALLOWANCE	52,970	GSF	0.30	15,891
	CAULKING & SEALANT ALLOWANCE	52,970	GSF	0.25	13,243
	SUBTOTAL				**110,150**
8.0	**OPENINGS**				$
	EXTERIOR DOOR + HARDWARES				
	AL-GLASS DOOR/AL FRAME, SINGLE	1	EA	2,520.00	2,520
	HM DOOR/HM FRAME, PER LEAF + PAINT	2	EA	2,285.00	4,570
	METAL ROLL-UP DOOR, 14'W X 14'H	3	EA	4,900.00	14,700
	INTERIOR DOORS + HARDWARES				
	REVERSE OPENING OF (E) DOOR/FRAME, PER LEAF	2	EA	318.50	637
	HM DOOR/HM FRAME, PER LEAF + PAINT	12	EA	2,285.00	27,420
	WD DOOR/HM FRAME, PER LEAF + PAINT	14	EA	1,985.00	27,790
	METAL ROLL-UP DOOR, 14' X 14'	1	EA	6,860.00	6,860
	PAINT TO (E) INT. DOOR/FRAME, PER LEAF	17	EA	196.43	3,339
	METAL ROLL-UP COUNTER DOOR, 4'W X 6'H - NEW PARTS WINDOW	1	EA	1,350.00	1,350
	EXTERIOR WINDOWS				
	NEW STOREFRONT, INSULATED	79	SF	72.00	5,688
	NEW EXT. WINDOWS	258	SF	75.00	19,313
	SUBTOTAL				**114,187**
9.0	**FINISHES**				$
	EXTERIOR WALL				
	SEALER TO NEW CMU WALL - EXTERIOR FACE	5,480	SF	0.65	3,562
	SEALER TO (E) CMU WALL - EXTERIOR FACE	17,180	SF	0.65	11,167
	EPOXY PAINT TO NEW CMU WALL - INT. OF EXT. @ CHASSIS WASH	2,732	SF	5.00	13,660
	SEALER TO NEW CMU WALL - INT. OF EXT.	2,172	SF	0.65	1,412
	SEALER TO (E) CMU WALL - INT. OF EXT.	15,691	SF	0.65	10,199
	PAINT TO (E) CMU WALL - INT. OF EXT.	605	SF	0.65	393

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SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - MAINTENANCE BUILDING RENOVATION + RELATED SITEWORK (PHASE 2)	**BUILDING GFA:**	**52,970**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	INTERIOR WALLS				
	METAL STUD + BATT + PAINTED GWB BOTH FACE - MEZZANINE	2,546	SF	13.75	35,008
	CERAMIC WALL TILES + MORTAR	1,208	SF	19.06	23,024
	CEMENT PLASTER TO WALLS	2,542	SF	5.75	14,617
	NEW ELEVATOR SHAFT LINER	768	SF	5.00	3,840
	PAINT TO (E) WALLS - MEZZ.	8,990	SF	1.00	8,990
	SEALER TO NEW INT. CMU WALLS	15,644	SF	0.65	10,169
	SEALER TO (E) INT. CMU WALLS	39,750	SF	0.65	25,838
	FLOOR				
	CERAMIC FLOOR TILES + BASE	1,374	SF	18.40	25,282
	VCT FLOOR + BASE	4,846	SF	5.18	25,102
	CONCRETE SEALER/HARDENER TO FLOORS	44,452	SF	1.20	53,342
	EPOXY PAINT @ CHASSIS WASH FLOOR	2,298	SF	6.00	13,788
	CEILING				
	GWB CEILING + PAINT + FRAMES	1,374	SF	9.68	13,300
	ACT T-BAR CEILING SYSTEM	4,846	SF	4.26	20,644
	PAINT TO EXPOSED DECK/STRUCTURES	44,452	SF	1.25	55,565
	EPOXY PAINT @ CHASSIS WASH EXPOSED DECK/STRUCTURES	2,298	SF	3.45	7,928
	EXTERIOR SOFFITS				
	REPAIR/PATCH & PAINT (E) EXT. SOFFIT	1,158	SF	3.13	3,625
	MISC. PAINTING				
	MISC. PAINTING ALLOWANCE	52,970	GSF	0.18	9,511
	SUBTOTAL				**389,966**
10.0	SPECIALTIES				$
	RESTROOM/JANITOR SPECIALTIES				
	TOILET PARTITION	5	EA	1,200.00	6,000
	SHOWER DOOR/CURTAIN	7	EA	500.00	3,500
	TOILET ACCESSORIES, PER FIXTURE	15	EA	300.00	4,500
	BREAK ROOM SINK ACCESSORIES, PER FIXTURE	1	EA	300.00	300
	SHOWER ACCESSORIES	7	EA	350.00	2,450
	JANITOR ACCESSORIES, PER ROOM	1	EA	400.00	400
	HAND DRYER	2	EA	675.00	1,350
	FIRE PROTECTION SPECIALTIES				
	FIRE EXTINGUISHER + CABINET - ALLOWANCE	2	EA	525.00	1,050
	MISC. SPECIALTIES				
	MARKER BOARDS/VISUAL AIDS	144	SF	18.00	2,592
	BUILDING SIGNAGE	52,970	GSF	0.35	18,540
	MISC. SPECIALTIES	52,970	GSF	0.10	5,297
	SUBTOTAL				**45,979**

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SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - MAINTENANCE BUILDING RENOVATION + RELATED SITEWORK (PHASE 2)	**BUILDING GFA:**	**52,970**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
11.0	**EQUIPMENT**				$
	MAINTENANCE EQUIPMENT				
	EQUIPMENT PER MDG PRELIMINARY EQUIPMENT LIST (INCLUDES TAXES AND INSTALLATION FOR CF/CI ITEMS)				
	CHASSIS WASH BAY (1)	1	LS	225,000.00	225,000
	WASH EQUIPMENT AREA	1	LS	11,000.00	11,000
	PM INSPECTION BAY	1	LS	48,820.00	48,820
	BRAKE SHOP	1	LS	53.200.00	53.200
	LOWER LEVEL WORK AREA	1	LS	17,220	17,220
	REPAIR BAYS	1	LS	1,936,600	1,936,600
	STORE ROOM	1	LS	67,000.00	67,000
	PORTABLE EQUIPMENT STORAGE	1	LS	17,000.00	17,000
	HOSE CRIMPING SHOP & STORAGE	1	LS	1,600.00	1,600
	SHOP & STORAGE	1	LS	250,000.00	250,000
	BODY & PAINT PREP BAYS	1	LS	254,800.00	254,800
	PAINT BOOTH	1	LS	10,100.00	10,100
	PAINT MIXING ROOM	1	LS	6.000.00	6.000
	PAINT BOOTH	1	LS	232,700.00	232,700
	EQUIPMENT INSTALLATION COST	1	LS	1,252,416	1,252,416
	BREAK ROOM EQUIPMENT				
	BREAK ROOM EQUIPMENT - SINGLE SIDE-BY-SIDE S/STEEL COMMERCIAL GRADE REFRIGERATORS	524	SF	10.00	5,240
	EMPLOYEE STORAGE EQUIPMENT				
	METAL LOCKER, 18"W X 24"D - FULL HT.	14	EA	335.00	4,690
	METAL LOCKER, 18"W X 18"D - FULL HT.	38	EA	295.00	11,210
	METAL LOCKER, 12"W X 18"D - FULL HT.	15	EA	265.00	3,975
	LOCKER BENCH, ALLOWANCE - ASSUME INTEGRAL W/ LOCKERS	99	LF	80.00	7,920
	SUBTOTAL				**4,416,491**
12.0	**FURNISHINGS**				$
	WINDOW SHADES				
	ALLOWANCE FOR WINDOW SHADES, MANUAL - NEW & EXISTING WINDOWS	375	SF	7.75	2,906
	FF & E				
	N.I.C.				
	SUBTOTAL				**2,906**
13.0	**SPECIAL CONSTRUCTION**				$
	NOT APPLICABLE				
	SUBTOTAL				

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SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - MAINTENANCE BUILDING RENOVATION + RELATED SITEWORK (PHASE 2)	**BUILDING GFA:**	**52,970**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
14.0	CONVEYING				$
	PASSENGER ELEVATOR				
	NEW ELEVATOR, 2-STOP	1	EA	90,000.00	90,000
	SUBTOTAL				**90,000**
21.0	FIRE SUPPRESSION				$
	FIRE PROTECTION				
	NEW FIRE SPRINKLER SYSTEM - CHASSIS WASH	2,298	SF	4.27	9,812
	FIRE SPRINKLER SYSTEM - EXTENDED SPECIALTY BAY	1,302	SF	4.27	5,560
	MODIFY (E) FIRE SPRINKLER SYSTEM - MEZZANINE FLOOR	10,500	SF	1.75	18,375
	MODIFY (E) FIRE SPRINKLER SYSTEM - GROUND FLOOR	38,870	SF	1.75	68,023
	SUBTOTAL				**101,770**
22.0	PLUMBING				$
	PLUMBING SYSTEM - CHASSIS WASH				
	INDUSTRIAL COLD WATER	2,298	SF	5.00	11,490
	INDUSTRIAL WASTE SYSTEM (includes clarifier, holding tank, specialties, & rough-ins)	2,298	SF	8.25	18,959
	AIR COMPRESSOR DISTRIBUTION	1	LS	7,500.00	7,500
	VACUUM PIPING DISTRIBUTION	1	LS	5,000.00	5,000
	ROOF DRAINS	2,298	SF	1.50	3,447
	CONDENSATE DRAINS	2,298	SF	0.50	1,149
	MISC. PLUMBING SYSTEM	2,298	SF	0.05	115
	PLUMBING SYSTEM - EXTENDED SPECIALTY BAY				
	ROOF DRAINS	1,302	SF	1.50	1,953
	MISC. PLUMBING SYSTEM	1,302	SF	2.50	3,255
	PLUMBING SYSTEM - EXISTING MAINTENANCE				
	PLUMBING FIXTURE + ROUGH-INS AT & LOCALIZED ROUGH-INS FOR	24	EA	2,650.00	63,600
	MISC. RE-WORK TO (E) PLUMBING SYSTEM	49,370	SF	1.25	61,713
	SUBTOTAL				**178,181**
23.0	HVAC				$
	HVAC SYSTEM				
	MAKE-UP AIR UNIT & EXHAUST FAN, 3000 CFM - CHASSIS WASH	1	PR	15,750.00	15,750
	NEW EXHAUST FANS	14	EA	1,200.00	16,800
	NEW HV UNITS, 4900 & 7000 CFMS	2	EA	29,750.00	59,500
	NEW MAU (1-7600 CFM, 3-18400 CFM)	4	EA	7,600.00	30,400

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SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - MAINTENANCE BUILDING RENOVATION + RELATED SITEWORK (PHASE 2)		**BUILDING GFA:**	**52,970**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	NEW PAINT BOOTH EXHAUST SYSTEM	1	EA	3,200.00	3,200
	MODIFICATIONS TO (E) HVAC SYSTEM - ALLOWANCE	49,370	SF	3.13	154,528
	MISC. HVAC SYSTEM	52,970	GSF	0.13	7,000
	SUBTOTAL				**287,178**
26.0	ELECTRICAL				$
	ELECTRICAL SYSTEM				
	RE-WORK TO (E) DISTRIBUTION BOARDS & PANEL BOARDS INCLUDING SECONDARY FEEDERS	1	LS	26,485.00	26,485
	NEW ELECTRICAL SYSTEM - CHASSIS WASH	2,298	SF	30.00	68,940
	POWER HOOK-UP - NEW HVAC EQUIPMENT	21	EA	450.00	9,450
	POWER HOOK-UP - ELEVATOR	1	EA	506.25	506
	MODIFICATION TO (E) BRANCH POWER	49,370	SF	0.88	43,446
	MODIFICATION TO (E) LIGHTING SYSTEM	49,370	SF	3.50	172,795
	NEW BRANCH POWER - ADDED BAY	1,302	SF	3.50	4,557
	NEW BRANCH LIGHTING - ADDED BAY	1,302	SF	10.00	13,020
	MISC. ELECTRICAL SYSTEM	52,970	GSF	0.84	44,495
	SUBTOTAL			7.24	**383,694**
27.0	COMMUNICATIONS				$
	COMMUNICATIONS SYSTEM				
	NEW SIGNAL SYSTEM - CHASSIS WASH	2,298	SF	3.50	8,043
	NEW SIGNAL SYSTEM - ADDED REPAIR BAY	1,302	SF	3.50	4,557
	MODIFICATIONS TO (E) SIGNAL SYSTEM	49,370	SF	0.75	37,028
	MISC. SIGNAL SYSTEM	52,970	GSF	0.05	2,649
	SUBTOTAL				**52,277**
28.0	ELECTRONIC SAFETY & SECURITY				$
	FIRE ALARM SYSTEM				
	NEW FIRE ALARM SYSTEM - CHASSIS WASH	2,298	SF	5.27	12,110
	NEW FIRE ALARM SYSTEM - ADDED REPAIR BAY	1,302	SF	5.27	6,862
	MODIFICATIONS TO (E) FIRE ALARM SYSTEM	49,370	SF	2.50	123,425
	MISC. FIRE ALARM SYSTEM	52,970	GSF	0.13	6,886
	SECURITY SYSTEM				
	NEW SECURITY SYSTEM - CHASSIS WASH	2,298	SF	5.00	11,490
	NEW SECURITY SYSTEM - ADDED REPAIR BAY	1,302	SF	5.27	6,862
	MODIFICATIONS TO (E) SECURITY SYSTEM	49,370	SF	2.50	123,425
	MISC. SECURITY SYSTEM	52,970	GSF	0.13	6,886
	SUBTOTAL				**297,946**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - MAINTENANCE BUILDING RENOVATION + RELATED SITEWORK (PHASE 2)	**BUILDING GFA:**	**52,970**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
31.0	EARTHWORK				$
	SITE PREPARATION				
	SITE CLEARING, GROSS SITE	5,000	SF	0.12	600
	ROUGH GRADING	5,000	SF	0.18	900
	OVER EXCAVATION, SITE PAVING, ASSUME 2'D	104	CY	10.50	1,089
	BUILDING PAD OVER EXCAVATION, ASSUME 5'D BELOW FOOTING (8.5'D TOTAL)	1,429	CY	10.50	15,007
	EROSION CONTROL/SWPPP	5,000	SF	0.35	1,750
	SUBTOTAL				**19,346**
32.0	EXTERIOR IMPROVEMENT				$
	CONCRETE PAVING TO MATCH EXISTING				
	REINF. CONCRETE PAVING - ASSUME 8"/8" BASE - BUS PAVING	1,400	SF	10.94	15,316
	JOIN NEW PAVING TO EXISTING	300	LF	35.00	10,500
	EQUIPMENT PAD	296	SF	15.00	4,440
	SUBTOTAL				**30,256**
33.0	UTILITIES				$
	PLUMBING UTILITIES				
	INDUSTRIAL WATER SERVICE TO CHASSIS WASH	1	LS	3,500.00	3,500
	SEWER PIPE EXTENSION	280	LF	30.00	8,400
	STORM DRAINS - DISCHARGE PIPE + CONNECTIONS	1	LS	8,800.00	8,800
	RELOCATE (E) MANHOLE ACCESS HATCHES FOR BURIED TANKS	2	EA	650.00	1,300
	RELOCATE (E) U/G WATER VALVE/BOX	1	EA	1,140.00	1,140
	RELOCATE (E) SEWER MANHOLE	1	EA	4,950.00	4,950
	RELOCATE (E) SEWER PIPE	115	LF	60.00	6,900
	EXTERIOR GENERATOR				
	ALLOWANCE FOR REPLACE (E) GENERATOR & EXTEND PAD	1	EA	234,297.00	234,297
	MISC. SITE UTILITY				
	ALLOWANCE FOR MISC. SITE UTILITY	1	LS	6,730.00	6,730
	SUBTOTAL				**276,017**

Prepared by: Jacobus &Yuang, Inc.

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - NEW & EXISTING SOLAR CANOPY + RELATED SITEWORK (PHASE 3)		**CANOPY AREA:**	**74,430**

ITEM NO.	DESCRIPTION	EST QTY	UNIT COST	TOTAL COST
	SUMMARY OF ESTIMATE		**$**	**$**
1.0	GENERAL REQUIREMENTS			
2.0	EXISTING CONDITIONS		0.15	10,830
31.0	EARTHWORK			
32.0	EXTERIOR IMPROVEMENTS		39.63	2,949,904
33.0	UTILITIES		0.42	31,313
	SUBTOTAL		**40.20**	**$2,992,047**
50.0	PRORATES:			
50.1	GENERAL CONDITIONS	7.50%	3.01	224,404
50.2	CONTINGENCY	15.00%		482,468
50.3	ESCALATION (TO MIDPOINT)	13.44%	6.68	497,185
50.4	PROJECT PHASING PREMIUM	2.50%	1.41	104,903
50.5	MARKET FACTOR			
	SUBTOTAL		**57.79**	**$4,301,006**
50.6	BONDS & INSURANCE	2.00%	1.16	86,020
50.7	CONTRACTOR'S FEE	6.50%	3.83	285,157
	TOTAL OF OPINION OF CONSTRUCTION COST		**62.77**	**$4,672,183**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - NEW & EXISTING SOLAR CANOPY + RELATED SITEWORK (PHASE 3)		**CANOPY AREA:**	**74,430**

ITEM NO.	DESCRIPTION	EST QTY		UNIT COST	TOTAL COST
1.0	GENERAL REQUIREMENTS				$
	SEE SUMMARY FOR GENERAL CONDITIONS				
	SUBTOTAL				
2.0	EXISTING CONDITIONS				$
	SITE DEMOLITION				
	CORE DRILL/DEMO (E) BUS PAVING FOR NEW CANOPY COLUMN FOOTINGS	18	EA	585.00	10,530
	MISC. SITE DEMO WORK	1	LS	300.00	300
	SUBTOTAL				**10,830**
31.0	EARTHWORK				$
	NOT APPLICABLE				
	SUBTOTAL				
32.0	EXTERIOR IMPROVEMENTS				$
	NEW SOLAR CANOPY				
	COLUMN FOOTING - ASSUME 36"Ø CAISSON X 8'D	18	EA	1,780.24	32,044
	CONCRETE COLUMNS - ASSUME 24" X 17.5'H	18	EA	2,203.70	39,667
	STEEL BEAMS/GIRDERS	94	TONS	4,800.00	451,248
	METAL DECK	22,120	SF	4.47	98,876
	PAINT TO CONCRETE COLUMNS	315	LF	10.00	3,150
	PAINT TO U/S DECK/STEEL FRAMES/FASCIA	22,120	SF	1.00	22,120
	ROOF DRAIN SYSTEM	22,120	SF	1.25	27,650
	FIRE SPRINKLER SYSTEM	22,120	SF	3.75	82,950
	SOLAR PANEL + SECONDARY FRAMES	22,120	SF	80.00	1,769,600
	LIGHTING, CONTROLS, & CIRCUITS	22,120	SF	7.00	154,840
	EXISTING SOLAR CANOPY				
	RETROFIT (E) CONCRETE COLUMNS - WRAP COLUMNS W/ FIBER-REINFORCED POLYMER	44	EA	2,100.00	92,400
	RE-PAINT TO (E) U/S DECK/STEEL FRAMES/FASCIA	52,310	SF	1.00	52,310
	RE-PAINT (E) FIRE SPRINKLER PIPINGS	52,310	SF	0.56	29,294
	CLEAN (E) SOLAR PANELS	52,310	SF	1.75	91,543
	SITE MISCELLANEOUS				
	NEW BUS CANOPY SIGNAGE	22,120	SF	0.10	2,212
	SUBTOTAL				**2,949,904**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - NEW & EXISTING SOLAR CANOPY + RELATED SITEWORK (PHASE 3)	**CANOPY AREA:**	**74,430**

ITEM NO.	DESCRIPTION	EST QTY		UNIT COST	TOTAL COST
33.0	UTILITIES				$
	SITE PLUMBING UTILITIES				
	STORM DRAIN CONNECTIONS & PIPINGS TO NEW BUS CANOPIES ROOF DRAINS	2	EA	750.00	1,500
	SITE ELECTRICAL				
	ELECTRICAL CONNECTIONS & CONDUIT/WIRES TO NEW BUS CANOPIES LIGHTING	2	EA	600.00	1,200
	SOLAR PANEL EQUIPMENT TO NEW CANOPIES	2	EA	344.25	689
	U/G CONDUIT/WIRES + DUCTBANK - FOR LIGHTING	300	LF	36.98	11,093
	U/G CONDUIT/WIRES + DUCTBANK - FOR PV PANELS	300	LF	36.98	11,093
	CUT & PATCH (E) SITE PAVING	300	LF	19.13	5,738
	SUBTOTAL				**31,313**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - ADMIN & OPERATIONS BUILDING RENOVATION & ADDITION (PHASE 4)		**BUILDING GFA:**	**21,054**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	SUMMARY OF ESTIMATE			**$**	**$**
1.0	GENERAL REQUIREMENTS				
2.0	EXISTING CONDITIONS			10.49	220,873
3.0	CONCRETE			3.29	69,289
4.0	MASONRY			5.65	118,989
5.0	METALS			18.02	379,493
6.0	WOOD, PLASTICS & COMPOSITES			5.03	105,971
7.0	THERMAL & MOISTURE PROTECTION			4.45	93,698
8.0	OPENINGS			12.42	261,483
9.0	FINISHES			33.91	713,844
10.0	SPECIALTIES			5.44	114,518
11.0	EQUIPMENT			7.74	162,884
12.0	FURNISHINGS			0.75	15,791
13.0	SPECIAL CONSTRUCTION				
14.0	CONVEYING				
21.0	FIRE SUPPRESSION			2.59	54,456
22.0	PLUMBING			14.08	296,474
23.0	HVAC			24.08	506,880
26.0	ELECTRICAL			39.63	834,288
27.0	COMMUNICATIONS			2.36	49,788
28.0	ELECTRONIC SAFETY & SECURITY			3.83	80,544
	SUBTOTAL			**$193.75**	**4,079,263**
50.0	PRORATES:				
50.1	GENERAL CONDITIONS	7.50%		14.53	305,945
50.2	CONTINGENCY	15.00%		31.24	657,781
50.3	ESCALATION	19.14%		45.86	965,468
50.4	PROJECT PHASING PREMIUM	2.50%		7.13	150,211
50.5	MARKET FACTOR				
	SUBTOTAL			**$292.51**	**$6,158,668**
50.6	BONDS	2.00%		5.85	123,173
50.7	CONTRACTOR'S FEE	6.50%		19.39	408,320
	TOTAL OF OPINION OF CONSTRUCTION COST			**$317.75**	**$6,690,161**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - ADMIN & OPERATIONS BUILDING RENOVATION & ADDITION (PHASE 4)		**BUILDING GFA:**	**21,054**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
1.0	GENERAL REQUIREMENTS				$
	SEE SUMMARY FOR GENERAL CONDITIONS				
	SUBTOTAL				
2.0	EXISTING CONDITIONS				$
	SITE DEMOLITION				
	SEE SEPARATE PHASE 4 SITEWORK ESTIMATE				
	SELECTIVE BUILDING DEMOLITION				
	REMOVE (E) EAST CANOPY CMU WALLS	174	SF	3.72	647
	REMOVE (E) EAST CANOPY ROOFING, FASCIA, & STEEL FRAMES/DECK	156	SF	5.00	779
	REMOVE (E) EXT. DOOR/FRAME, PER LEAF	7	EA	227.50	1,593
	REMOVE (E) EXT. GLAZINGS/FRAMES	993	SF	8.50	8,441
	REMOVE (E) EXT. CMU WALLS/METAL PANELS	3,594	SF	3.00	10,782
	REMOVE (E) LOW ROOFING & ACCESSORIES, COMPLETE	5,020	SF	1.30	6,526
	REMOVE (E) EXT. SOFFIT/FRAMES	672	SF	3.60	2,419
	SAWCUT/REMOVE PORTION OF (E) LOW ROOF STEEL DECK & FRAMES, COMPLETE	172	SF	3.00	516
	REMOVE (E) FURRING TO INT. OF EXT. WALLS, COMPLETE	2,470	SF	1.00	2,470
	SAWCUT/REMOVE PORTION OF (E) SLAB ON-GRADE	68	SF	2.00	136
	REMOVE (E) TOILET/SHOWER/JANITOR FIXTURE ACCESSORIES - PER FIXTURE	31	EA	350.00	10,850
	REMOVE (E) TOILET PARTITIONS	9	EA	100.00	900
	REMOVE (E) SHOWER PARTITIONS	3	EA	67.50	203
	REMOVE (E) CASEWORK	150	LF	40.00	6,000
	REMOVE (E) LOCKERS	190	EA	150.00	28,500
	REMOVE (E) INT. DOOR/FRAME, PER LEAF	42	EA	192.50	8,085
	REMOVE (E) INT. GLAZINGS/FRAMES	68	SF	8.50	578
	SAWCUT/REMOVE PORTION OF (E) INTERIOR WALLS FOR NEW WINDOW OPENING	60	SF	5.56	334
	SAWCUT/REMOVE PORTION OF (E) INTERIOR WALLS FOR NEW SINGLE DOOR OPENING	4	EA	243.75	975
	REMOVE (E) INT. PARTITIONS, +/-13'H - 1ST FLR	1,050	LF	16.25	17,063
	REMOVE (E) WALL CONCRETE CURB	258	LF	10.00	2,580
	REMOVE (E) LOCKER CONCRETE CURB	200	LF	13.09	2,618
	REMOVE (E) SWITCHBACK METAL PAN STAIR/RAILINGS, COMPLETE	2	FLT	2,700.00	5,400
	2ND FLOOR INTERIOR DEMO WORK - PARTITIONS, DOORS, WINDOWS, SPECIALTIES, ETC.	5,418	SF	1.75	9,482
	REMOVE (E) CEILING FINISHES/FRAMES	15,068	SF	3.00	45,204

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - ADMIN & OPERATIONS BUILDING RENOVATION & ADDITION (PHASE 4)		**BUILDING GFA:**	**21,054**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	REMOVE (E) FLOOR FINISHES/BASES	15,068	SF	1.50	22,602
	MISC. BUILDING DEMO WORK	1	LS	9,780.00	9,780
	HAZARDOUS ABATEMENT				
	ALLOWANCE FOR HAZARDOUS MATERIAL/LBP ABATEMENT	21,054	SF	0.73	15,410
	SUBTOTAL				**220,873**
3.0	CONCRETE				$
	BUILDING FOUNDATION				
	WALL FOOTING - PERIMETER	188	LF	155.56	29,245
	WALL FOOTING - INTERIOR	18	LF	97.22	1,750
	TIE FOOTING TO EXISTING	15	EA	125.00	1,875
	SLAB ON-GRADE/CURB				
	SLAB ON-GRADE + BASE/V.B.	1,018	SF	8.26	8,409
	CONCRETE CURB, 6"W	194	LF	18.52	3,593
	CONCRETE CURB, 12"W	212	LF	27.78	5,889
	TIE NEW SLAB TO EXISTING	157	LF	35.00	5,495
	LIGHTWEIGHT CONCRETE				
	ALLOWANCE FOR REPAIR/PATCH & INFILL TO (E) L.W. CONCRETE TOPPING @ NEW 2ND FLOOR (FORMERLY LOW ROOF AREAS)	4,708	SF	2.50	11,770
	MISC. CONCRETE				
	MISC. CONCRETE ALLOWANCE	21,054	GSF	0.06	1,263
	SUBTOTAL				**69,289**
4.0	MASONRY				$
	CMU WALLS, LOAD BEARING				
	EXT. CMU WALL - ASSUME 8" - 1ST FLR	3,975	SF	26.00	103,350
	EXT. CMU WALL INFILL - ASSUME 8"	78	SF	26.00	2,028
	EXT. CMU STEM WALL	524	SF	26.00	13,611
	SUBTOTAL				**118,989**
5.0	METALS				$
	STEEL STRUCTURE				
	ADDITIONAL STEEL BEAMS/FRAMES TO (E) LOW ROOF STEEL FRAMES AS NEW 2ND FLOOR EXPANSION	12	TONS	4,800.00	57,888
	NEW 2ND FLR STEEL BEAMS/GIRDERS, COLUMNS & BRACES	0.3	TONS	4,800.00	1,584
	NEW LOW ROOF STEEL BEAMS/GIRDERS, COLUMNS & BRACES	3	TONS	4,800.00	12,593

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - ADMIN & OPERATIONS BUILDING RENOVATION & ADDITION (PHASE 4)	**BUILDING GFA:**	**21,054**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	NEW HIGH ROOF STEEL BEAMS/GIRDERS, COLUMNS & BRACES	42	TONS	4,800.00	203,861
	TIE NEW STEEL FRAMES/DECK TO (E) HIGH ROOF FRAMES & DECK	148	LF	75.00	11,100
	REPAIR/REFURBISH & PAINT (E) EXT. STEEL COLUMNS, +/-13'H + SHORING	6	EA	195.00	1,170
	METAL DECK - NEW LOW ROOF	318	SF	4.47	1,421
	METAL DECK - ADDED 2ND FLR	40	SF	4.47	179
	METAL DECK - NEW & EXTENDED HIGH ROOF	5,396	SF	4.47	24,120
	METAL PAN STAIR				
	SWITCHBACK, 3.5'W X 22 TREADS/RISERS + 36 SF MIDLANDING + HANDRAILS, COMPLETE	2	FLT	19,050.00	38,100
	METAL CANOPY				
	CANOPY @ MAIN ENTRY	280	SF	15.00	4,200
	CANOPY @ DRIVER'S ENTRANCE	190	SF	15.00	2,850
	CANOPY @ DISPATCH VESTIBULE	170	SF	15.00	2,550
	CANOPY @ EMERGENCY EXIT	95	SF	15.00	1,425
	MISCELLANEOUS METALS				
	ROOF HATCH + LADDER - ALLOWANCE	1	EA	2,925.00	2,925
	METAL LOUVER - ALLOWANCE	40	SF	75.00	3,000
	MISC. METALS ALLOWANCE	21,054	GSF	0.50	10,527
	SUBTOTAL				**379,493**
6.0	WOOD, PLASTICS & COMPOSITES				$
	FINISH CARPENTRY				
	CASEWORK - 1ST FLR	137	LF	350.00	47,950
	CASEWORK - 2ND FLR	10,368	SF	4.52	46,863
	MISC. FINISH CARPENTRY ALLOWANCE	21,054	GSF	0.23	4,842
	ROUGH CARPENTRY				
	ROUGH CARPENTRY ALLOWANCE	21,054	GSF	0.30	6,316
	SUBTOTAL				**105,971**
7.0	THERMAL & MOISTURE PROTECTION				$
	ROOFING				
	NEW MEMBRANE ROOFING	5,714	SF	5.50	31,427
	ROOF COVERBOARD + 2" RIGID INSULATION	5,714	SF	4.75	27,142
	PARAPET COPING	380	LF	8.59	3,264
	CANT STRIP	432	LF	5.50	2,376
	ALLOWANCE - REPAIR/PATCH (E) HIGH ROOFING	5,418	SF	1.50	8,127
	ALLOWANCE - ADDITIONAL WALKWAY PAD	286	SF	5.75	1,643

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - ADMIN & OPERATIONS BUILDING RENOVATION & ADDITION (PHASE 4)	**BUILDING GFA:**	**21,054**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	SKYLIGHT				
	ALLOWANCE FOR ROOF SKYLIGHT, ASSUME TUBULAR, 21" DIAM.	8	EA	1,070.00	8,560
	MISCELLANEOUS				
	MISC. SHEET METAL ALLOWANCE	21,054	GSF	0.28	5,895
	CAULKING & SEALANT ALLOWANCE	21,054	GSF	0.25	5,264
	SUBTOTAL				**93,698**
8.0	OPENINGS				$
	EXTERIOR DOOR + HARDWARES - 1ST FLR				
	AL-GLASS DOOR/AL FRAME, DUAL LEAF	4	PR	4,662.00	18,648
	AL-GLASS DOOR/AL FRAME, SINGLE	1	EA	2,520.00	2,520
	HM DOOR/HM FRAME, SINGLE	2	EA	2,075.00	4,150
	EXTRA FOR PANIC HARDWARE	9	EA	950.00	8,550
	PAINT EXT. DOOR/FRAME, PER LEAF	2	EA	206.25	413
	INTERIOR DOOR + HARDWARES - 1ST FLR				
	AL-GLASS DOOR/AL FRAME, DUAL LEAF	1	PR	4,662.00	4,662
	AL-GLASS DOOR/AL FRAME, SINGLE	1	EA	2,520.00	2,520
	WD DOOR/HM FRAME, SINGLE	21	EA	1,775.00	37,275
	EXTRA FOR PANIC HARDWARE	3	EA	950.00	2,850
	PAINT INT. DOOR/FRAME, PER LEAF	20	EA	206.25	4,125
	EXTERIOR GLAZING/FRAMES - 1ST FLR				
	EXTERIOR WINDOWS	654	SF	75.00	49,050
	STOREFRONT	434	SF	72.00	31,248
	INTERIOR GLAZING/FRAMES - 1ST FLR				
	INTERIOR WINDOWS	60	SF	55.00	3,300
	SECOND FLOOR OPENINGS				
	NEW 2ND FLOOR INTERIOR DOORS & EXT./INT. WINDOWS, COMPLETE	10,368	SF	8.89	92,172
	SUBTOTAL				**261,483**
9.0	FINISHES				$
	EXTERIOR WALLS				
	METAL STUD + BATT + SHEATHING + PORCELAIN ENAMEL PANEL/V.B. - 2ND FLR	2,160	SF	40.37	87,199
	SEALER TO NEW & EXISTING CMU WALLS	7,225	SF	0.65	4,696
	FURRING STUD + BATT + GWB + PAINT - INT. OF EXT. CMU WALLS	4,840	SF	3.45	16,698
	GWB + PAINT - INT. OF EXT.	7,000	SF	3.45	24,150
	PAINT TO CMU WALL - INT. OF EXT.	460	SF	1.00	460

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - ADMIN & OPERATIONS BUILDING RENOVATION & ADDITION (PHASE 4)	**BUILDING GFA:**	**21,054**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	INTERIOR WALLS - 1ST FLR				
	METAL STUD/BATT/GWB + PAINT - INFILL TO (E) SINGLE DOOR OPENING	4	EA	294.00	1,176
	METAL STUD	8,229	SF	6.29	51,760
	METAL STUD, DOUBLE	546	SF	11.64	6,355
	GWB + PAINT	17,550	SF	3.45	60,548
	CERAMIC WALL TILES + CEMENT BOARD	2,544	SF	19.06	48,489
	BATT INSULATION	9,321	SF	1.00	9,321
	REPAIR/PATCH & PAINT (E) WALLS	2,054	SF	1.50	3,081
	REPAIR/PATCH & PAINT (E) COLUMN FURRING	1,085	SF	1.50	1,628
	REPAIR/PATCH & PAINT (E) ELEV. SHAFT WALLS	325	SF	1.50	488
	RE-FRAME EDGES OF NEW SINGLE DOOR OPENING	4	EA	280.00	1,120
	RE-FRAME EDGES OF NEW 5' X 4' WINDOW OPENING	1	EA	360.00	360
	RE-FRAME EDGES OF NEW 10' X 4' WINDOW OPENING	1	EA	560.00	560
	FLOORING + BASES - 1ST FLR				
	CERAMIC FLOOR TILE & BASE	1,292	SF	18.40	23,773
	OTHER FLOOR FINISHES - ASSORTED	9,308	SF	5.00	46,540
	CEILING - 1ST FLR				
	CEILING FINISHES - ASSORTED	10,600	SF	7.50	79,500
	EXTERIOR SOFFIT				
	C. PLASTER SOFFIT/FRAMES - 1ST FLR	86	SF	18.00	1,557
	C. PLASTER SOFFIT/FRAMES - 2ND FLR	248	SF	18.00	4,464
	C. PLASTER FASCIA/FRAMES, +/-3'H - 2ND FLR	180	LF	54.00	9,720
	SECOND FLOOR FINISHES				
	NEW 2ND FLOOR PARTITIONS, FLOOR & CEILING FINISHES, COMPLETE	10,368	SF	22.00	228,096
	MISC. PAINTING				
	MISC. PAINTING ALLOWANCE	21,054	GSF	0.10	2,105
	SUBTOTAL				**713,844**
10.0	SPECIALTIES				$
	RESTROOM/JANITOR SPECIALTIES - 1ST FLR				
	TOILET PARTITION, ADA	4	EA	1,200.00	4,800
	TOILET PARTITION, STANDARD	9	EA	1,050.00	9,450
	URINAL SCREEN	5	EA	656.00	3,280
	SHOWER CURTAIN	2	EA	150.00	300
	TOILET ACCESSORIES, PER FIXTURE	28	EA	300.00	8,400
	KITCHEN/BREAK ROOM SINK ACCESSORIES, PER FIXTURE	2	EA	300.00	600
	SHOWER ACCESSORIES - ADA	2	EA	450.00	900
	JANITOR ACCESSORIES, PER ROOM	1	EA	400.00	400
	HAND DRYER - ALLOWANCE	4	EA	675.00	2,700

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - ADMIN & OPERATIONS BUILDING RENOVATION & ADDITION (PHASE 4)	**BUILDING GFA:**	**21,054**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	MOVABLE PARTITION - 1ST FLR				
	MOVABLE PARTITION, +/-10'H + CEILING TRACK	19	LF	750.00	14,250
	EXTRA FOR HOUSING	1	EA	1,500.00	1,500
	FIRE PROTECTION SPECIALTIES - 1ST FLR				
	FIRE EXTINGUISHER + CABINET - ALLOWANCE	4	EA	525.00	2,100
	MISC. SPECIALTIES - 1ST FLR				
	MARKER BOARDS/VISUAL AIDS	96	SF	18.00	1,728
	SIGNAGE	10,600	SF	0.35	3,710
	MISC. WALL COVERINGS	1	LS	7,500.00	7,500
	MISC. SPECIALTIES	10,600	SF	0.10	1,060
	SECOND FLOOR SPECIALTIES				
	NEW 2ND FLOOR SPECIALTIES	10,368	SF	5.00	51,840
	SUBTOTAL				**114,518**
11.0	EQUIPMENT				$
	ADMIN-OPS EQUIPMENT				
	REMOVAL & RELOCATION COSTS OF (E) VAULTING EQUIPMENT FROM THIS FACILITY ARE INCLUDED WITH PHASE 1 FUEL-WASH BUILDING				
	KITCHENETTE/BREAK ROOM EQUIPMENT				
	KITCHENETTE EQUIPMENT - ASSUME LARGE S/STEEL COMMERCIAL GRADE REFRIGERATORS	422	SF	60.00	25,320
	EMPLOYEE STORAGE EQUIPMENT				
	METAL LOCKER, 12"W X 12"D - ASSUME 2-TIER	170	EA	350.00	59,500
	LOCKER BENCH, ALLOWANCE - ASSUME INTEGRAL W/ LOCKERS	170	LF	75.00	12,750
	EXTRA FOR ADA BENCH	4	EA	120.00	480
	AUDIO-VISUAL EQUIPMENT - ALLOWANCES				
	OVERHEAD PROJECTOR				**N.I.C.**
	PROJECTION SCREEN - ALLOWANCE	4	EA	2,200.00	8,800
	OTHER EQUIPMENT				
	MISC. EQUIPMENT ALLOWANCES	1	LS	10,000.00	10,000
	SECOND FLOOR EQUIPMENT				
	NEW 2ND FLOOR EQUIPMENT ALLOWANCE	10,368	SF	4.44	46,034
	SUBTOTAL				**162,884**
12.0	FURNISHINGS				$
	BUILDING FURNISHINGS				
	ALLOWANCE FOR BUILDING FURNISHINGS EXCLUDING FF & E	21,054	GSF	0.75	15,791
	SUBTOTAL				**15,791**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - ADMIN & OPERATIONS BUILDING RENOVATION & ADDITION (PHASE 4)		**BUILDING GFA:**	**21,054**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
13.0	SPECIAL CONSTRUCTION				$
	THIS SECTION NOT APPLICABLE				
	SUBTOTAL				
14.0	CONVEYING				$
	PASSENGER ELEVATOR				
	EXISTING - NO WORK				
	SUBTOTAL				
21.0	FIRE SUPPRESSION				$
	FIRE PROTECTION				
	NEW FIRE SPRINKLER SYSTEM - ADDITION	6,052	SF	4.66	28,202
	MODIFY (E) NEW FIRE SPRINKLER SYSTEM - ALLOWANCE	15,002	SF	1.75	26,254
	SUBTOTAL				**54,456**
22.0	PLUMBING				$
	PLUMBING DEMO				
	REMOVE (E) PLUMBING FIXTURE & ALL ASSOCIATED PIPINGS, COMPLETE - 1ST FLR	32	FIXT	450.00	14,400
	REMOVE (E) PLUMBING SYSTEM - 2ND FLOOR	5,418	SF	1.39	7,531
	MISC. PLUMBING DEMO WORK	15,068	SF	0.07	1,097
	PLUMBING SYSTEM				
	NEW FIXTURES + ROUGH INS - 1ST FLR	30	EA	4,885.00	146,550
	RE-WORK TO (E) EQUIPMENT	1	LS	4,950.00	4,950
	NEW PLUMBING SYSTEM - 2ND FLR	10,368	SF	7.50	77,760
	NEW STORM DRAINS - ADDITION	5,714	SF	1.20	6,857
	RE-WORK TO (E) STORM DRAINS - ADDITION	5,418	SF	0.75	4,064
	NEW CONDENSATE DRAINS	21,054	GSF	0.25	5,264
	GAS SYSTEM - RE-WORK ALLOWANCE	21,054	GSF	1.10	23,159
	MISC. PLUMBING SYSTEM	21,054	GSF	0.23	4,842
	SUBTOTAL				**296,474**
23.0	HVAC				$
	CHILLER YARD - ADJACENT TO BUILDING				
	COMMISSION PROPERLY (E) 25 TONS CHILLERS TO DIAGNOSE ISSUE OF FAILURE	2	EA	6,000.00	12,000

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - ADMIN & OPERATIONS BUILDING RENOVATION & ADDITION (PHASE 4)		**BUILDING GFA:**	**21,054**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	FIX ANY DAMAGED PIPING INSULATION IN THE IMMEDIATE FUTURE & CLEAN THE CONDENSER SECTION	2	EA	4,800.00	9,600
	BUILDING HVAC SYSTEM				
	REPLACE (E) ROOFTOP AIR HANDLING UNITS, 6955 & 8960 CFMs & ALL ASSOCIATED ACCESSORIES	2	EA	35,319.38	70,639
	TEST & SEAL (E) CONTROL & SYSTEM LINE PRESSURE (HEATING HOT WATER SYSTEM)	21,054	GSF	1.00	21,054
	MISC. HVAC DEMO WORK	15,068	SF	0.50	7,534
	NEW DIRECT DIGITAL CONTROL (DDC) SYSTEM TO REPLACE (E) PNEMATIC SYSTEM	21,054	GSF	5.75	121,061
	NEW HVAC SYSTEM - ADDITION	6,052	SF	25.00	151,300
	MISC. HVAC SYSTEM/MODIFICATIONS	21,054	GSF	5.40	113,692
	SUBTOTAL OF HVAC				**506,880**
26.0	ELECTRICAL				$
	ELECTRICAL DEMO				
	REMOVE (E) PANEL BOARD & ALL ASSOCIATED WIRINGS	5	EA	450.00	2,250
	REMOVE (E) BRANCH POWER & LIGHTING	15,068	SF	1.25	18,835
	MISC. ELECTRICAL DEMO WORK	15,068	SF	0.75	11,301
	ELECTRICAL				
	MISC. RE-WORK TO (E) ELECTRICAL EQUIPMENT	1	LS	19,220.00	19,220
	NEW PANEL BOARD	5	EA	2,800.00	14,000
	NEW BRANCH POWER	21,054	GSF	18.00	378,972
	NEW HVAC POWER	21,054	GSF	1.25	26,318
	NEW LIGHTING SYSTEM	21,054	GSF	12.50	263,175
	MISC. ELECTRICAL SYSTEM	21,054	GSF	4.76	100,217
	SUBTOTAL				**834,288**
27.0	COMMUNICATIONS				$
	SIGNAL SYSTEM				
	NEW SIGNAL SYSTEM - ADDITION	6,052	SF	5.00	30,260
	MODIFY (E) SIGNAL SYSTEM	15,002	SF	1.00	15,002
	MISC. COMMUNICATIONS SYSTEM	21,054	GSF	0.21	4,526
	SUBTOTAL				**49,788**
28.0	ELECTRONIC SAFETY & SECURITY				$
	FIRE ALARM SYSTEM				
	NEW FIRE ALARM SYSTEM - ADDITION	6,052	SF	5.27	31,894

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - ADMIN & OPERATIONS BUILDING RENOVATION & ADDITION (PHASE 4)	**BUILDING GFA:**	**21,054**

ITEM NO.	DESCRIPTION	EST QTY	UNIT	UNIT COST	TOTAL COST
	MODIFY (E) FIRE ALARM SYSTEM	15,002	SF	1.05	15,812
	MISC. FIRE ALARM SYSTEM	21,054	GSF	0.06	1,193
	SECURITY SYSTEM				
	NEW SECURITY SYSTEM - ADDITION	6,052	SF	2.50	15,130
	MODIFY (E) SECURITY SYSTEM	15,002	SF	1.00	15,002
	MISC. SECURITY SYSTEM	21,054	GSF	0.07	1,513
	SUBTOTAL				**80,544**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - SITEWORK (PHASE 4)		**BUILDING GFA:**	**104,160**

ITEM NO.	DESCRIPTION	EST QTY	UNIT COST	TOTAL COST
	SUMMARY OF ESTIMATE		**$**	**$**
1.0	GENERAL REQUIREMENTS			
2.0	EXISTING CONDITIONS		1.36	142,130
31.0	EARTHWORK		0.97	100,998
32.0	EXTERIOR IMPROVEMENTS		6.39	665,256
33.0	UTILITIES		2.51	261,792
	SUBTOTAL		**11.23**	**$1,170,176**
50.0	PRORATES:			
50.1	GENERAL CONDITIONS	7.50%	0.84	87,763
50.2	CONTINGENCY	15.00%	1.81	188,691
50.3	ESCALATION (TO MIDPOINT)	19.14%	2.66	276,954
50.4	PROJECT PHASING PREMIUM	2.50%	0.41	43,090
50.5	MARKET FACTOR			
	SUBTOTAL		**16.96**	**$1,766,673**
50.6	BONDS & INSURANCE	2.00%	0.34	35,333
50.7	CONTRACTOR'S FEE	6.50%	1.12	117,130
	TOTAL OF OPINION OF CONSTRUCTION COST		**18.42**	**$1,919,137**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - SITEWORK (PHASE 4)		**BUILDING GFA:**	**104,160**

ITEM NO.	DESCRIPTION	EST QTY		UNIT COST	TOTAL COST
1.0	GENERAL REQUIREMENTS				$
	SEE SUMMARY FOR GENERAL CONDITIONS				
	SUBTOTAL				
2.0	EXISTING CONDITIONS				$
	SITE DEMOLITION				
	SAWCUT/DEMO (E) CONCRETE SIDEWALK	550	SF	3.50	1,925
	SAWCUT/DEMO (E) CONCRETE CURB & GUTTER	60	LF	10.00	600
	SAWCUT/DEMO (E) 12"W ASPHALT STRIP	60	LF	3.50	210
	DEMO (E) ISLAND/P.A./CURB, COMPLETE	20,500	SF	0.75	15,375
	DEMO (E) CONCRETE PAVING/WALKWAY/PATIO	6,652	SF	1.50	9,978
	DEMO (E) ASPHALT PAVING/BASE	76,798	SF	1.00	76,798
	DEMO (E) FENCE/GATE	405	LF	5.40	2,187
	DEMO (E) TREE	55	EA	475.00	26,125
	DEMO (E) TREE @ NORTHSIDE OF PROPERTY				BY FAX
	REMOVE (E) GRATED INLET	1	EA	462.00	462
	PROTECT (E) TREE	14	EA	125.00	1,750
	PROTECT (E) PERIMETER METAL FENCE	410	LF	5.00	2,050
	PROTECT (E) CHAINLINK FENCE @ NORTH PROPERTY	240	LF	5.00	1,200
	MISC. SITE DEMO & PROTECTION WORK	1	LS	3,470.00	3,470
	SUBTOTAL				**142,130**
31.0	EARTHWORK				$
	SITE PREPARATION				
	SITE CLEARING, GROSS SITE	104,040	SF	0.12	12,485
	ROUGH GRADING	104,040	SF	0.18	18,727
	OVER EXCAVATION, SITE PAVING, ASSUME 2'D	5,374	CY	10.50	56,428
	BUILDING PAD OVER EXCAVATION, ASSUME 5'D BELOW FOOTING (8'D TOTAL) - ADDED ADMIN-OPS BUILDING SLAB ON-GRADE	380	CY	10.50	3,994
	EROSION CONTROL/SWPPP	104,040	SF	0.09	9,364
	SUBTOTAL				**100,998**
32.0	EXTERIOR IMPROVEMENTS				$
	OFF-SITE WORK				
	CONCRETE PAVING - ENTRY DRIVEWAY TO ADMIN/OPS PARKING	400	SF	8.33	3,332
	CONCRETE CROSS GUTTER/SPANDREL, ASSUME 8"/8", REINF.	180	SF	10.94	1,969
	CONCRETE PAVING - SIDEWALK	120	SF	7.39	887

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - SITEWORK (PHASE 4)		**BUILDING GFA:**	**104,160**

ITEM NO.	DESCRIPTION	EST QTY		UNIT COST	TOTAL COST
	EXTRA FOR CURB RAMP + DETECTABLE SURFACE	2	EA	585.00	1,170
	CONCRETE CURB	28	LF	25.00	700
	12"W ASPHALT PAVING STRIP - STREET	60	LF	15.00	900
	JOIN (N) SIDEWALK TO EXISTING	20	LF	60.00	1,200
	MODIFY (E) LEFT TURN POCKET & MEDIAN @ "G STREET" TO MEET CITY STANDARDS	400	SF	10.00	4,000
	TRAFFIC CONTROL	3	DAYS	1,575.00	4,725
	ON SITE WORK				
	CONCRETE PAVING & CURBS				
	CONCRETE PAVING - AROUND ADMIN-OPS BLDG	980	SF	7.39	7,242
	CONCRETE ISLAND - PARKING ENTRY	140	SF	7.39	1,035
	CONCRETE CURB	3,040	LF	25.00	76,000
	CONCRETE V-GUTTER, +/-3'W	880	LF	22.17	19,510
	MISC. CONCRETE PADS - EQUIPMENT	1	LS	1,040.00	1,040
	ASPHALT PAVING				
	ASPHALT PAVING - VISITOR/EMPLOYEE PARKING (ASSUME 3"/8")	67,270	SF	3.38	227,373
	LANDSCAPING				
	PLANTING + IRRIGATION	30,450	SF	7.70	234,465
	WALLS, FENCES & GATES				
	DRIVER'S PATIO WALL - ASSUME 8" CMU, 6'H + FOOTING	67	LF	292.22	19,579
	8'H METAL FENCE - ON SITE	230	LF	92.00	21,160
	CONTROLLED GATE, 20'L	1	EA	5,600.00	5,600
	VEHICULAR GATE, 10'W X 8'H	2	EA	2,800.00	5,600
	FLAGGER, 10'L + POST	2	EA	650.00	1,300
	SITE MISCELLANEOUS				
	PARKING STALL STRIPING	198	EA	50.00	9,900
	PAVING ARROW STRIPING	27	EA	35.00	945
	SITE SIGNAGE	104,160	SF	0.15	15,624
	SUBTOTAL				**665,256**
33.0	UTILITIES				$
	SITE PLUMBING UTILITIES				
	ALLOWANCE FOR MODIFICATIONS TO EXISTING - STORM DRAINS - SANITARY/INDUSTRIAL WASTE SYSTEM - DOMESTIC/FIRE WATER SYSTEM - NATURAL GAS SYSTEM	104,160	SF	1.00	104,160
	NEW GRATED INLET	5	EA	1,500.00	7,500
	SITE ELECTRICAL				
	SITE LIGHTING ALLOWANCE	104,160	SF	1.20	124,992
	RELOCATE (E) POWER POLES & O/H LINES	3	EA	6,250.00	18,750

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - SITEWORK (PHASE 4)	**BUILDING GFA:**	**104,160**

ITEM NO.	DESCRIPTION	EST QTY		UNIT COST	TOTAL COST
	MISC. SITE UTILITY				
	ALLOWANCE FOR MISC. SITE UTILITY	104,160	SF	0.06	6,390
	SUBTOTAL				**261,792**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - PASSENGER AMENITIES BUILDING + CANOPY (PHASE 5)	**BUILDING GFA:**	**5,320**

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
	SUMMARY OF ESTIMATE			**$**	**$**
1.0	GENERAL REQUIREMENTS				
2.0	EXISTING CONDITIONS			5.62	29,875
3.0	CONCRETE			13.18	70,116
4.0	MASONRY			17.32	92,131
5.0	METALS			34.01	180,935
6.0	WOOD, PLASTICS & COMPOSITES			0.30	1,596
7.0	THERMAL & MOISTURE PROTECTION			11.55	61,464
8.0	OPENINGS			5.13	27,295
9.0	FINISHES			19.68	104,689
10.0	SPECIALTIES			1.01	5,367
11.0	EQUIPMENT				
12.0	FURNISHINGS				
13.0	SPECIAL CONSTRUCTION				
14.0	CONVEYING				
21.0	FIRE SUPPRESSION			2.91	15,507
22.0	PLUMBING			4.24	22,565
23.0	HVAC			7.51	39,964
26.0	ELECTRICAL			25.00	133,000
27.0	COMMUNICATIONS			0.50	2,640
28.0	ELECTRONIC SAFETY & SECURITY			6.27	33,356
31.0	EARTHWORK			6.40	34,031
32.0	EXTERIOR IMPROVEMENTS			33.34	177,388
33.0	UTILITIES			13.28	70,630
	SUBTOTAL			**207.25**	**1,102,549**
50.0	PRORATES:				
50.1	GENERAL CONDITIONS	7.50%		15.54	82,691
50.2	CONTINGENCY	15.00%		33.42	177,786
50.3	ESCALATION (TO MIDPOINT)	24.75%		63.41	337,356
50.4	PROJECT PHASING PREMIUM	2.50%		7.99	42,510
50.5	MARKET FACTOR				
	SUBTOTAL			**327.61**	**$1,742,892**
50.6	BONDS & INSURANCE	2.00%		6.55	34,858
50.7	CONTRACTOR'S FEE	6.50%		21.72	115,554
	TOTAL OF OPINION OF CONSTRUCTION COST			**355.88**	**$1,893,304**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - PASSENGER AMENITIES BUILDING + CANOPY (PHASE 5)	**BUILDING GFA:**	**5,320**

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
1.0	GENERAL REQUIREMENTS				$
	SEE SUMMARY FOR GENERAL CONDITIONS				
	SUBTOTAL				
2.0	EXISTING CONDITIONS				$
	SITE DEMOLITION				
	DEMO (E) PRE-ENGINEERED METAL BLDG, COMPLETE	1,270	SF	3.75	4,763
	DEMO (E) PRE-ENGINEERED METAL CANOPY, COMPLETE	850	SF	3.00	2,550
	SAWCUT (E) PAVING	332	LF	3.50	1,162
	REMOVE (E) PAVING, 5' BEYOND FOOTPRINT	6,880	SF	1.00	6,880
	CORE DRILL/DEMO (E) BUS PAVING FOR NEW CANOPY COLUMN FOOTINGS	9	EA	390.00	3,510
	MISC. SITE DEMO WORK	1	LS	940.00	940
	HAZARDOUS ABATEMENT				
	ALLOWANCE FOR HAZARDOUS MATERIAL/LBP ABATEMENT - METAL BUILDING & CANOPY	2,120	SF	4.75	10,070
	SUBTOTAL				**29,875**
3.0	CONCRETE				$
	FOUNDATION				
	BUILDING FOUNDATION, COMPLETE	2,120	SF	11.15	23,638
	SLAB ON-GRADE/CURB				
	SLAB ON-GRADE + BASE/V.B.	5,320	SF	8.26	43,943
	CONCRETE CURB, 6"W	45	LF	18.52	833
	MISC. CONCRETE				
	MISC. CONCRETE ALLOWANCE	5,320	GSF	0.32	1,702
	SUBTOTAL				**70,116**
4.0	MASONRY				$
	CMU WALLS				
	EXT. CMU WALL - ASSUME 8" @ 8.5'H	2,046	SF	26.00	53,183
	EXT. CMU STEM WALL	438	SF	26.00	11,388
	INT. CMU WALL - ASSUME 8" @ 8.5'H	901	SF	26.00	23,426
	INT. CMU STEM WALL	159	SF	26.00	4,134
	SUBTOTAL				**92,131**
5.0	METALS				$
	STEEL STRUCTURE				
	ROOF STEEL BEAMS/BRACES/COLUMNS	31	TONS	4,800.00	147,470
	METAL DECK - ROOF	5,320	SF	4.47	23,780

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - PASSENGER AMENITIES BUILDING + CANOPY (PHASE 5)		**BUILDING GFA:**	**5,320**

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
	MISCELLANEOUS METALS				
	ROOF HATCH + LADDER - ALLOWANCE	1	EA	2,925.00	2,925
	METAL LOUVER - ALLOWANCE	40	SF	75.00	3,000
	PIPE BOLLARDS - ALLOWANCE	2	EA	550.00	1,100
	MISC. METALS ALLOWANCE	5,320	GSF	0.50	2,660
	SUBTOTAL				**180,935**
6.0	WOOD, PLASTICS & COMPOSITES				$
	ROUGH CARPENTRY				
	ROUGH CARPENTRY ALLOWANCE	5,320	GSF	0.30	1,596
	SUBTOTAL				**1,596**
7.0	THERMAL & MOISTURE PROTECTION				$
	ROOFING				
	MEMBRANE ROOFING	5,320	SF	5.50	29,260
	ROOF COVERBOARD + 2" RIGID INSULATION	5,320	SF	4.75	25,270
	PARAPET COPING	292	LF	8.59	2,508
	CANT STRIP	292	LF	5.50	1,606
	MISCELLANEOUS				
	MISC. SHEET METAL ALLOWANCE	5,320	GSF	0.28	1,490
	CAULKING & SEALANT ALLOWANCE	5,320	GSF	0.25	1,330
	SUBTOTAL				**61,464**
8.0	OPENINGS				$
	EXTERIOR DOOR + HARDWARES				
	HM DOOR/HM FRAME, PER LEAF + PAINT	7	EA	2,285.00	15,995
	METAL ROLL-UP DOOR, 10'W X 8'H	2	EA	3,200.00	6,400
	METAL ROLL-UP DOOR, 14'W X 14'H	1	EA	4,900.00	4,900
	SUBTOTAL				**27,295**
9.0	FINISHES				$
	EXTERIOR WALL				
	METAL STUDS	3,281	SF	7.50	24,608
	BATT INSULATION	2,697	SF	1.00	2,697
	GWB + PAINT	2,697	SF	3.45	9,305
	METAL PANEL + SHEATHING/V.B.	3,281	SF	4.78	15,683
	SEALER - EXT. CMU WALL	2,046	SF	0.65	1,330
	SEALER - INT. OF EXT. CMU WALL	2,046	SF	0.65	1,330
	INTERIOR WALL				
	METAL STUD	1,007	SF	6.29	6,334
	BATT INSULATION	1,007	SF	1.00	1,007

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - PASSENGER AMENITIES BUILDING + CANOPY (PHASE 5)		**BUILDING GFA:**	**5,320**

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
	GWB + PAINT	2,014	SF	3.45	6,948
	CERAMIC WALL TILES + MORTAR - O/ CMU	170	SF	19.06	3,240
	INT. PARTITION, COMPLETE - AMENITY SHOP	792	SF	13.50	10,692
	FLOORING + BASES				
	CERAMIC FLOOR TILE/BASE - TOILET	84	SF	18.40	1,546
	VCT FLOOR/BASE - AMENITY SHOP	528	SF	5.18	2,735
	CONCRETE SEALER/HARDENER TO FLOORS	4,708	SF	1.20	5,650
	CEILING				
	GYPSUM BOARD + PAINT + FRAMES	84	SF	10.68	897
	ACT T-BAR CEILING SYSTEM	528	SF	4.26	2,249
	PAINT TO EXPOSED STRUCTURES	4,708	SF	1.25	5,885
	MISC. PAINTING				
	MISC. PAINTING ALLOWANCE	5,320	GSF	0.48	2,553
	SUBTOTAL				**104,689**
10.0	SPECIALTIES				$
	TOILET SPECIALTIES				
	TOILET ACCESSORIES, PER FIXTURE	2	EA	300.00	600
	FIRE PROTECTION SPECIALTIES				
	FIRE EXTINGUISHER + CABINET - ALLOWANCE	3	EA	525.00	1,575
	MISC. SPECIALTIES				
	BUILDING SIGNAGE	5,320	GSF	0.40	2,128
	MISC. SPECIALTIES	5,320	GSF	0.20	1,064
	SUBTOTAL				**5,367**
11.0	EQUIPMENT				$
	STORAGE EQUIPMENT				
	SEE GRAND TOTAL SUMMARY FOR EQUIPMENT ALLOWANCE				
	SUBTOTAL				
12.0	FURNISHINGS				$
	NOT APPLICABLE				
	SUBTOTAL				
13.0	SPECIAL CONSTRUCTION				$
	NOT APPLICABLE				
	SUBTOTAL				

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - PASSENGER AMENITIES BUILDING + CANOPY (PHASE 5)		**BUILDING GFA:**	**5,320**

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
14.0	CONVEYING				$
	NOT APPLICABLE				
	SUBTOTAL				
21.0	FIRE SUPPRESSION				$
	FIRE PROTECTION				
	FIRE SPRINKLER SYSTEM - BUILDING	3,446	SF	4.50	15,507
	SUBTOTAL				**15,507**
22.0	PLUMBING				$
	PLUMBING SYSTEM				
	PLUMBING SYSTEM - PER FIXTURE, COMPLETE	2	EA	7,000.00	14,000
	BUILDING ROOF DRAINS	5,320	GSF	1.50	7,980
	MISC. PLUMBING SYSTEM	5,320	GSF	0.11	585
	SUBTOTAL				**22,565**
23.0	HVAC				$
	HVAC SYSTEM				
	ALLOWANCE FOR EXHAUST & VENTILATION SYSTEM - TOILET	84	SF	8.00	672
	ALLOWANCE FOR EXHAUST & VENTILATION SYSTEM - AMENITY STORAGE/STORE ROOM OVERFLOW	4,708	SF	7.00	32,956
	COOLING/HEATING - AMENITY SHOP	528	SF	12.00	6,336
	SUBTOTAL				**39,964**
26.0	ELECTRICAL				$
	ELECTRICAL SYSTEM				
	ELECTRICAL SYSTEM, COMPLETE	5,320	GSF	25.00	133,000
	SUBTOTAL				**133,000**
27.0	COMMUNICATIONS				$
	COMMUNICATIONS SYSTEM				
	TELEPHONE/DATA SYSTEM - AMENITY SHOP	528	SF	5.00	2,640
	SUBTOTAL				**2,640**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - PASSENGER AMENITIES BUILDING + CANOPY (PHASE 5)	**BUILDING GFA:**	**5,320**

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
28.0	ELECTRONIC SAFETY & SECURITY				$
	FIRE ALARM SYSTEM				
	FIRE ALARM	5,320	GSF	5.27	28,036
	SECURITY SYSTEM				
	SECURITY SYSTEM	5,320	GSF	1.00	5,320
	SUBTOTAL				**33,356**
31.0	EARTHWORK				$
	SITE PREPARATION				
	SITE CLEARING	6,880	SF	0.05	344
	ROUGH GRADING	6,880	SF	0.12	826
	OVER EXCAVATION, SITE PAVING, ASSUME 2'D	1,560	CY	10.50	16,380
	OVER EXCAVATION - BUILDING PAD, ASSUME 3'D BELOW FOOTING (6'D TOTAL)	1,491	CY	10.50	15,655
	EROSION CONTROL/SWPPP	6,880	SF	0.12	826
	SUBTOTAL				**34,031**
32.0	EXTERIOR IMPROVEMENTS				$
	HARDSCAPE				
	CONCRETE PAVING, MATCH EXISTING - ASSUME 8"/8"	1,560	SF	10.94	17,066
	TIE NEW PAVING TO EXISTING	332	LF	35.00	11,620
	CANOPY				
	METAL CANOPY - DECK + STEEL FRAMES	4,500	SF	29.00	130,500
	STEEL COLUMNS, +/-17.5'H + PAINT	9	EA	175.00	1,575
	COLUMN FOOTING	9	EA	829.63	7,467
	PATCH (E) PAVING	9	EA	165.00	1,485
	CANOPY DRAINS	4,500	SF	1.25	5,625
	MISCELLANEOUS				
	PARKING STALL STRIPING	5	EA	50.00	250
	SIGNAGE	1	LS	1,800.00	1,800
	SUBTOTAL				**177,388**
33.0	UTILITIES				$
	PLUMBING UTILITIES				
	FIRE SPRINKLER SYSTEM - CANOPY	4,500	SF	4.50	20,250
	COLD WATER SERVICE TO TOILET	1	LS	2,500.00	2,500
	SANITARY SEWER - DISCHARGE PIPE + CONNECTIONS	1	LS	5,000.00	5,000
	STORM DRAINS - DISCHARGE PIPE + CONNECTIONS	1	LS	3,500.00	3,500
	RELOCATE (E) STORM DRAIN INLET & PIPING	1	EA	4,950.00	4,950
	RELOCATE (E) FIRE HYDRANT & PIPING	1	EA	2,560.00	2,560

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - PASSENGER AMENITIES BUILDING + CANOPY (PHASE 5)	**BUILDING GFA:**	**5,320**

ITEM NO.	DETAIL OF ESTIMATE	EST QTY	UNIT	UNIT COST	TOTAL COST
	ELECTRICAL				
	LIGHTING TO CANOPY	4,500	SF	6.00	27,000
	INCOMING POWER - ALLOWANCE	1	LS	1,800.00	1,800
	INCOMING COMMUNICATIONS	1	LS	1,350.00	1,350
	MISC. SITE UTILITY				
	ALLOWANCE FOR MISC. SITE UTILITY	1	LS	1,720.00	1,720
	SUBTOTAL				**70,630**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - GENERAL SITEWORK		**EXISTING SITE AREA:**	**289,670**

ITEM NO.	DESCRIPTION	EST QTY	UNIT COST	TOTAL COST
	SUMMARY OF ESTIMATE		**$**	**$**
1.0	GENERAL REQUIREMENTS			
2.0	EXISTING CONDITIONS			
31.0	EARTHWORK			
32.0	EXTERIOR IMPROVEMENTS		1.72	498,289
33.0	UTILITIES			
	SUBTOTAL		**1.72**	**$498,289**
50.0	PRORATES:			
50.1	GENERAL CONDITIONS	7.50%	0.13	37,372
50.2	CONTINGENCY	15.00%		80,349
50.3	ESCALATION (TO MIDPOINT)	6.03%	0.13	37,157
50.4	PROJECT PHASING PREMIUM	2.50%	0.06	16,329
50.5	MARKET FACTOR			
	SUBTOTAL		**2.31**	**$669,496**
50.6	BONDS & INSURANCE	2.00%	0.05	13,390
50.7	CONTRACTOR'S FEE	6.50%	0.15	44,388
	TOTAL OF OPINION OF CONSTRUCTION COST		**2.51**	**$727,274**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - GENERAL SITEWORK		**EXISTING SITE AREA:**	**289,670**

ITEM NO.	DESCRIPTION	EST QTY		UNIT COST	TOTAL COST
1.0	GENERAL REQUIREMENTS				$
	SEE SUMMARY FOR GENERAL CONDITIONS				
	SUBTOTAL				
2.0	EXISTING CONDITIONS				$
	NOT APPLICABLE				
	SUBTOTAL				
31.0	EARTHWORK				$
	NOT APPLICABLE				
	SUBTOTAL				
32.0	EXTERIOR IMPROVEMENTS				$
	ASPHALT PAVING				
	REPAIR/PATCH (E) PAVING - ALLOWANCE	289,670	SF	0.25	72,418
	WALLS, FENCES & GATES				
	8'H CMU SECURITY WALL + FOOTING	993	LF	344.22	341,810
	8'H METAL FENCE - ON SITE	200	LF	46.00	9,200
	BUS ENTRY GATE, 26'L	1	EA	7,280.00	7,280
	BUS SLIDING GATE, 58'L	1	EA	15,680.00	15,680
	FLAGGER, 10'L + POST	2	EA	650.00	1,300
	SITE MISCELLANEOUS				
	PAVING STRIPING - 5.5'W WALK PATHWAY	5,720	SF	1.25	7,150
	MISC. SITE SIGNAGE	289,670	SF	0.15	43,451
	SUBTOTAL				**498,289**
33.0	UTILITIES				$
	NOT INCLUDED				
	SUBTOTAL				

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - SITEWORK ALTERNATE (PHASE 4)		**BUILDING GFA:**	**113,660**

ITEM NO.	DESCRIPTION	EST QTY	UNIT COST	TOTAL COST
	SUMMARY OF ESTIMATE		**$**	**$**
1.0	GENERAL REQUIREMENTS			
2.0	EXISTING CONDITIONS		2.71	307,579
31.0	EARTHWORK		1.29	147,170
32.0	EXTERIOR IMPROVEMENTS		70.98	8,067,693
33.0	UTILITIES		1.72	195,585
	SUBTOTAL		**76.70**	**$8,718,027**
50.0	PRORATES:			
50.1	GENERAL CONDITIONS	7.50%	5.75	653,852
50.2	CONTINGENCY	15.00%	12.37	1,405,782
50.3	ESCALATION (TO MIDPOINT)	6.03%	5.72	650,097
50.4	PROJECT PHASING PREMIUM	2.50%	2.51	285,694
50.5	MARKET FACTOR			
	SUBTOTAL		**103.06**	**$11,713,452**
50.6	BONDS & INSURANCE	2.00%	2.06	234,269
50.7	CONTRACTOR'S FEE	6.50%	6.83	776,602
	TOTAL OF OPINION OF CONSTRUCTION COST		**111.95**	**$12,724,323**
	DEDUCT WORK:			
	SITEWORK PHASE 1 - PORTION ONLY			($64,929)
	SITEWORK PHASE 4			($1,919,137)
	ADMIN-OPS BUILDING RENOVATION & ADDITION			($6,690,161)
	TOTAL OF OPINION OF CONSTRUCTION COST - SITEWORK ALTERNATE PHASE 4		**35.63**	**$4,050,095**

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA		**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP		**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - SITEWORK ALTERNATE (PHASE 4)		**BUILDING GFA:**	**113,660**

ITEM NO.	DESCRIPTION	EST QTY		UNIT COST	TOTAL COST
1.0	GENERAL REQUIREMENTS				$
	SEE SUMMARY FOR GENERAL CONDITIONS				
	SUBTOTAL				
2.0	EXISTING CONDITIONS				$
	SITE DEMOLITION				
	DEMO (E) 2-STORY ADMIN-OPS BUILDING, COMPLETE	15,068	SF	5.85	88,148
	SAWCUT/DEMO (E) CONCRETE SIDEWALK	550	SF	3.50	1,925
	SAWCUT/DEMO (E) CONCRETE CURB & GUTTER	60	LF	10.00	600
	SAWCUT/DEMO (E) 12"W ASPHALT STRIP	60	LF	3.50	210
	DEMO (E) ISLAND/P.A./CURB, COMPLETE	21,640	SF	0.75	16,230
	DEMO (E) CONCRETE PAVING/WALKWAY/PATIO	6,652	SF	1.50	9,978
	DEMO (E) ASPHALT PAVING/BASE	85,058	SF	1.00	85,058
	DEMO (E) FENCE/GATE	410	LF	5.40	2,214
	DEMO (E) TREE	59	EA	475.00	28,025
	DEMO (E) TREE @ NORTHSIDE OF PROPERTY				BY FAX
	REMOVE (E) GRATED INLET	1	EA	462.00	462
	PROTECT (E) TREE	9	EA	125.00	1,125
	PROTECT (E) PERIMETER METAL FENCE	410	LF	5.00	2,050
	PROTECT (E) CHAINLINK FENCE @ NORTH PROPERTY	315	LF	5.00	1,575
	MISC. SITE DEMO & PROTECTION WORK	1	LS	5,940.00	5,940
	HAZARDOUS ABATEMENT				
	ALLOWANCE FOR HAZARDOUS MATERIAL/LBP ABATEMENT - BUILDING DEMO	15,068	SF	4.25	64,039
	SUBTOTAL				**307,579**
31.0	EARTHWORK				$
	SITE PREPARATION				
	SITE CLEARING, GROSS SITE	123,000	SF	0.12	14,760
	ROUGH GRADING	123,000	SF	0.18	22,140
	OVER EXCAVATION, SITE PAVING, ASSUME 2'D	6,190	CY	10.50	64,991
	BUILDING PAD OVER EXCAVATION, ASSUME 5'D BELOW FOOTING (8'D TOTAL) - NEW ADMIN-OPS BUILDING	3,961	CY	10.50	41,589
	EROSION CONTROL/SWPPP	123,000	SF	0.03	3,690
	SUBTOTAL				**147,170**
32.0	EXTERIOR IMPROVEMENTS				$
	OFF-SITE WORK				
	CONCRETE PAVING - ENTRY DRIVEWAY TO ADMIN/OPS PARKING	400	SF	8.33	3,332

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT		**JOB #:**	**C2008A-R2**
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SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - SITEWORK ALTERNATE (PHASE 4)		**BUILDING GFA:**	**113,660**

ITEM NO.	DESCRIPTION	EST QTY		UNIT COST	TOTAL COST
	CONCRETE CROSS GUTTER/SPANDREL, ASSUME 8"/8", REINF.	180	SF	10.94	1,969
	CONCRETE PAVING - SIDEWALK	120	SF	7.39	887
	EXTRA FOR CURB RAMP + DETECTABLE SURFACE	2	EA	585.00	1,170
	CONCRETE CURB	28	LF	25.00	700
	12"W ASPHALT PAVING STRIP - STREET	60	LF	10.00	600
	JOIN (N) SIDEWALK TO EXISTING	20	LF	60.00	1,200
	MODIFY (E) LEFT TURN POCKET & MEDIAN @ "G STREET" TO MEET CITY STANDARDS	400	SF	10.00	4,000
	TRAFFIC CONTROL	3	DAYS	1,575.00	4,725
	ON SITE WORK				
	NEW ADMIN-OPS BUILDING				
	NEW ADMIN-OPS BLDG, 2-STORY, COMPLETE	21,054	SF	350.00	7,368,900
	CONCRETE PAVING & CURBS				
	CONCRETE PAVING - AROUND ADMIN-OPS BLDG	980	SF	7.39	7,242
	CONCRETE ISLAND - PARKING ENTRY	140	SF	7.39	1,035
	CONCRETE CURB	3,080	LF	25.00	77,000
	CONCRETE V-GUTTER, +/-3'W	840	LF	22.17	18,623
	MISC. CONCRETE PADS - EQUIPMENT	1	LS	850.00	850
	ASPHALT PAVING				
	ASPHALT PAVING - VISITOR/EMPLOYEE PARKING (ASSUME 3"/8")	78,380	SF	3.38	264,924
	LANDSCAPING				
	PLANTING + IRRIGATION (W/ TREES)	28,840	SF	7.70	222,068
	WALLS, FENCES & GATES				
	DRIVER'S PATIO WALL - ASSUME 8" CMU, 6'H + FOOTING	67	LF	292.22	19,579
	8'H METAL FENCE - ON SITE	230	LF	92.00	21,160
	CONTROLLED GATE, 20'L	2	EA	5,600.00	11,200
	VEHICULAR GATE, 10'W X 8'H	2	EA	2,800.00	5,600
	FLAGGER, 10'L + POST	2	EA	650.00	1,300
	SITE MISCELLANEOUS				
	PARKING STALL STRIPING	232	EA	50.00	11,600
	PAVING ARROW STRIPING	28	EA	35.00	980
	SITE SIGNAGE	113,660	SF	0.15	17,049
	SUBTOTAL				**8,067,693**
33.0	UTILITIES				$
	SITE PLUMBING UTILITIES				
	REMOVE (E) ABANDONED 30" SD PIPE	200	LF	24.68	4,936
	MODIFY (E) 30" RCP SD PIPE	160	LF	40.11	6,417
	NEW GRATED INLET	5	EA	1,500.00	7,500
	RELOCATE (E) POTABLE, IRRIGATION, & FIREWATER SYSTEMS BACKFLOW PREVENTION DEVICES, FDCs, & APPURTENANCES	1	LS	23,070.00	23,070

PROJECT: FRESNO AREA EXPRESS FACILITY ASSESSMENT	**JOB #:**	**C2008A-R2**
LOCATION: FRESNO, CA	**DATE:**	**29-Aug-14**
CLIENT: MAINTENANCE DESIGN GROUP	**REVISED:**	**30-Sep-14**
SUBJECT: MASTER PLAN DESIGN OPINION OF PROBABLE COST - SITEWORK ALTERNATE (PHASE 4)	**BUILDING GFA:**	**113,660**

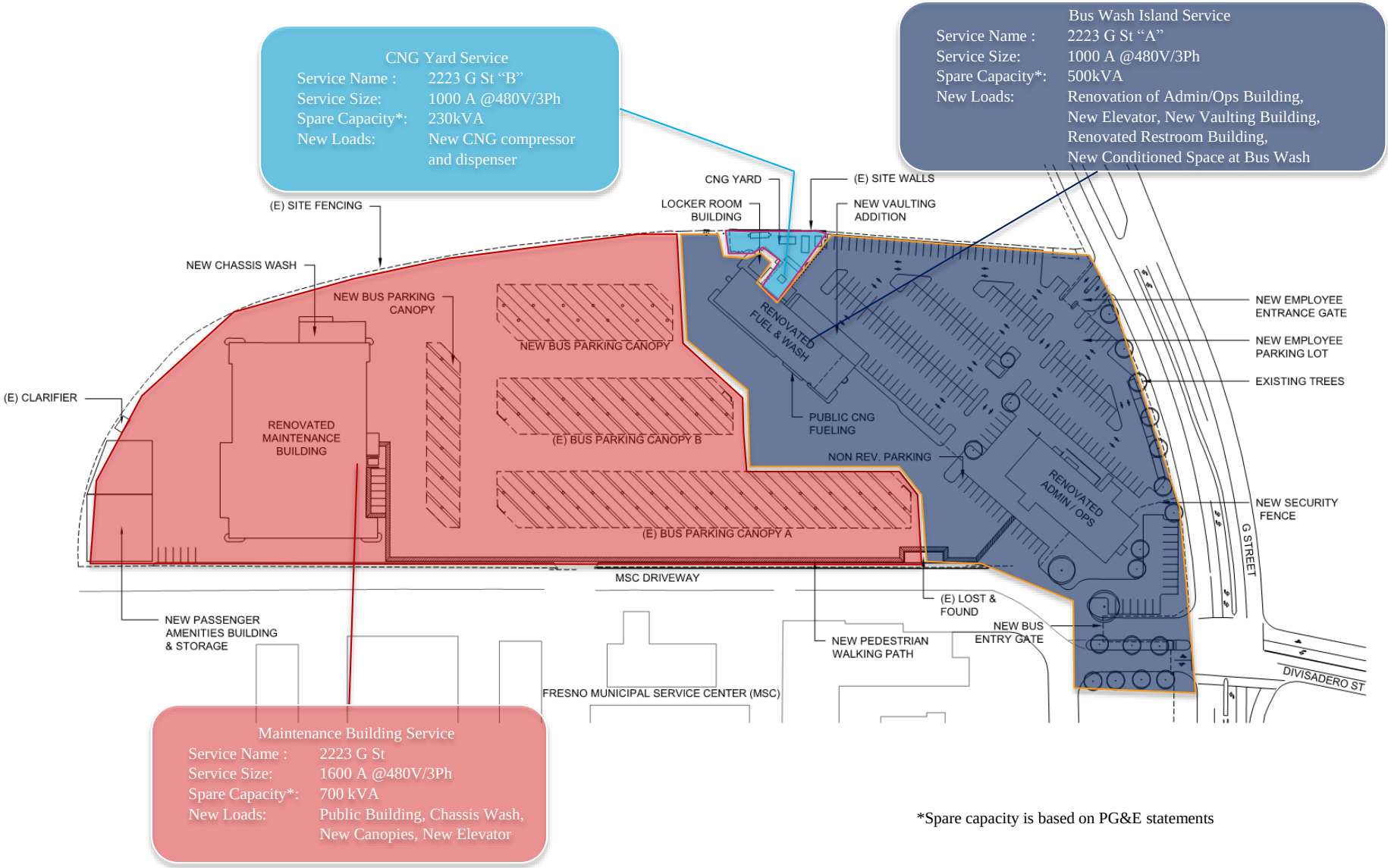
ITEM NO.	DESCRIPTION	EST QTY		UNIT COST	TOTAL COST
	SITE ELECTRICAL				
	SITE LIGHTING ALLOWANCE	113,660	SF	1.20	136,392
	RELOCATE (E) POWER POLES & O/H LINES	2	EA	6,250.00	12,500
	MISC. SITE UTILITY				
	ALLOWANCE FOR MISC. SITE UTILITY	113,660	SF	0.04	4,770
	SUBTOTAL				**195,585**

Appendix E
Master Plan Electrical Report

FAX Area Express Bus Terminal

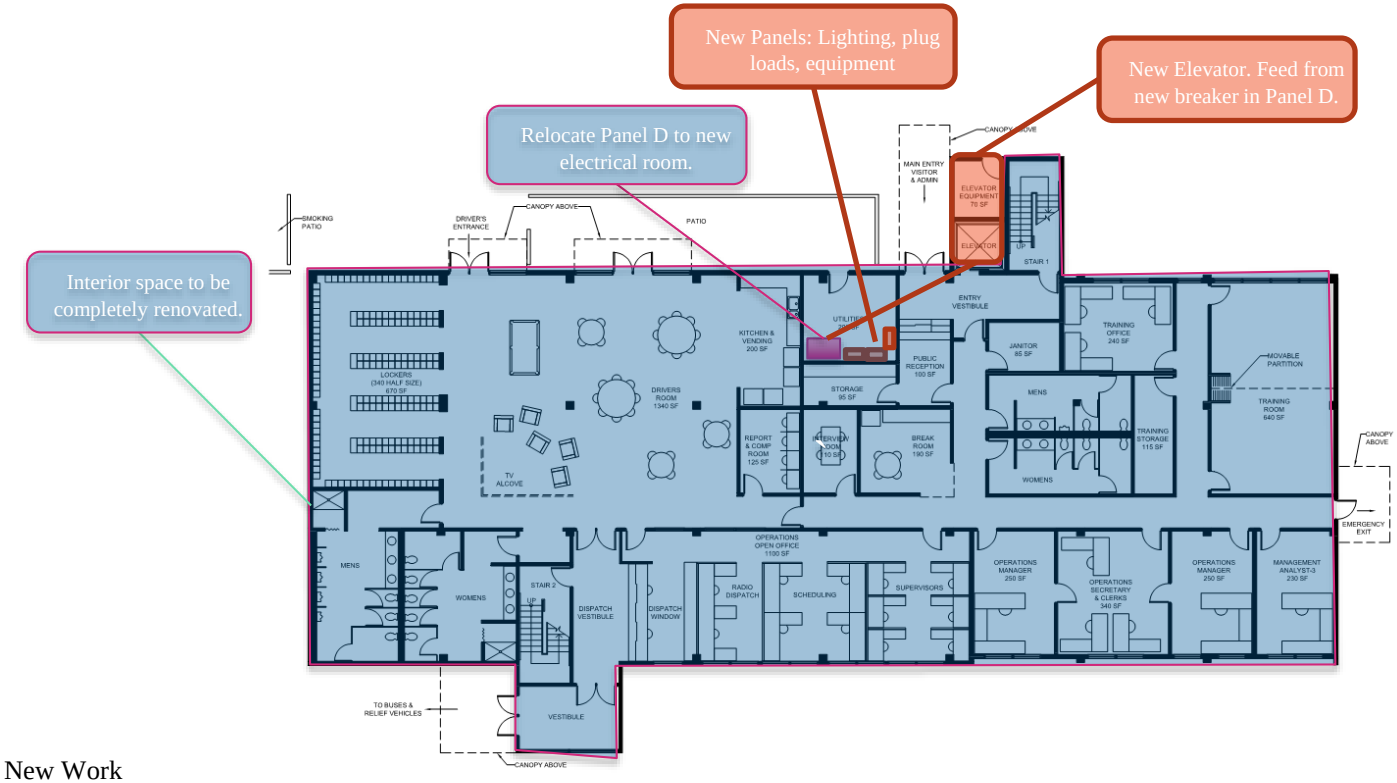
Electrical Report for MDG Master Plan

ARUP



*Spare capacity is based on PG&E statements

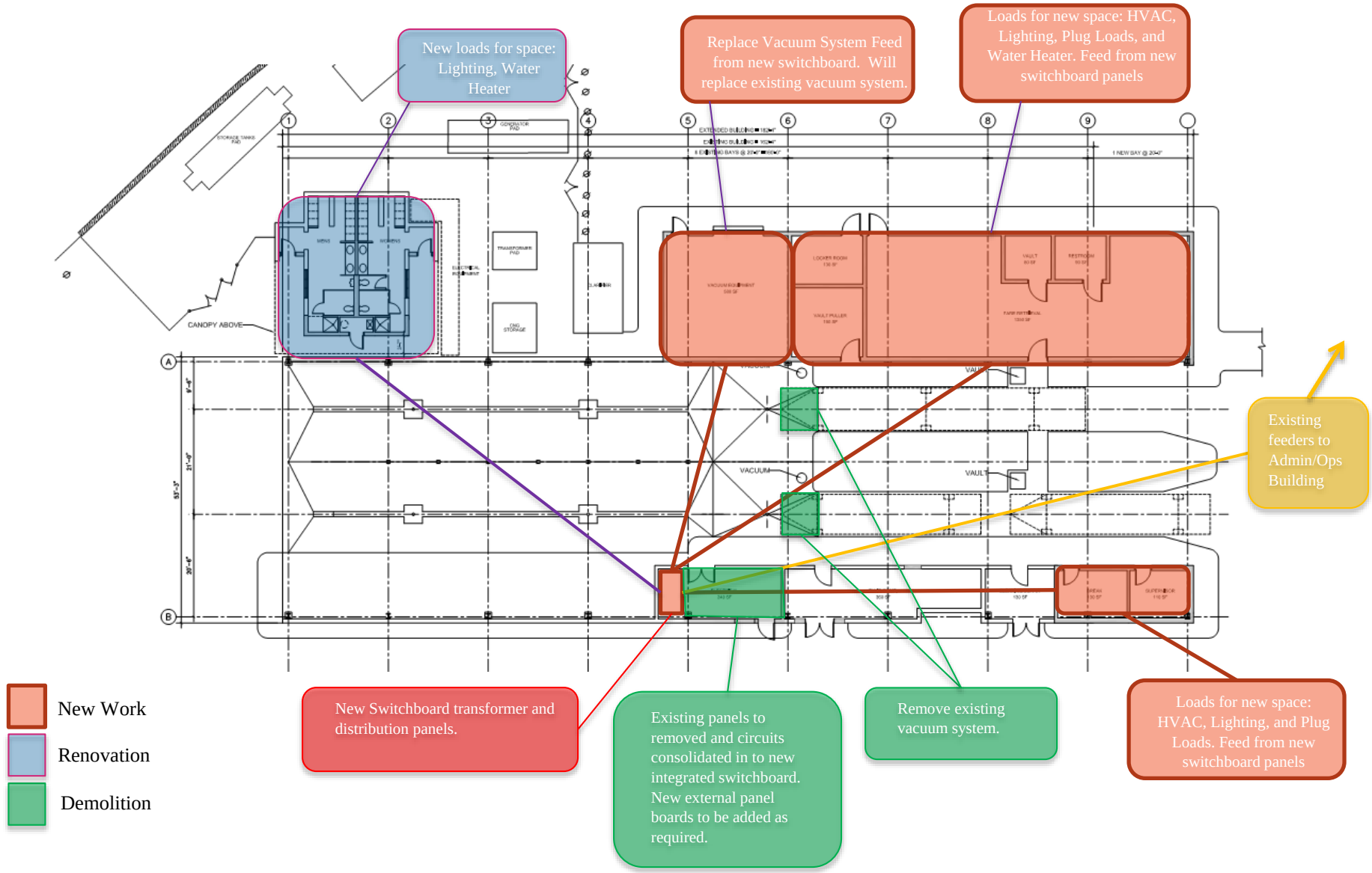
Electrical Site Plan



1. Additional electrical panel and transformer to be located on 2nd floor for plug loads.
2. Existing panels could be reused to save costs, however additional panels will be required.

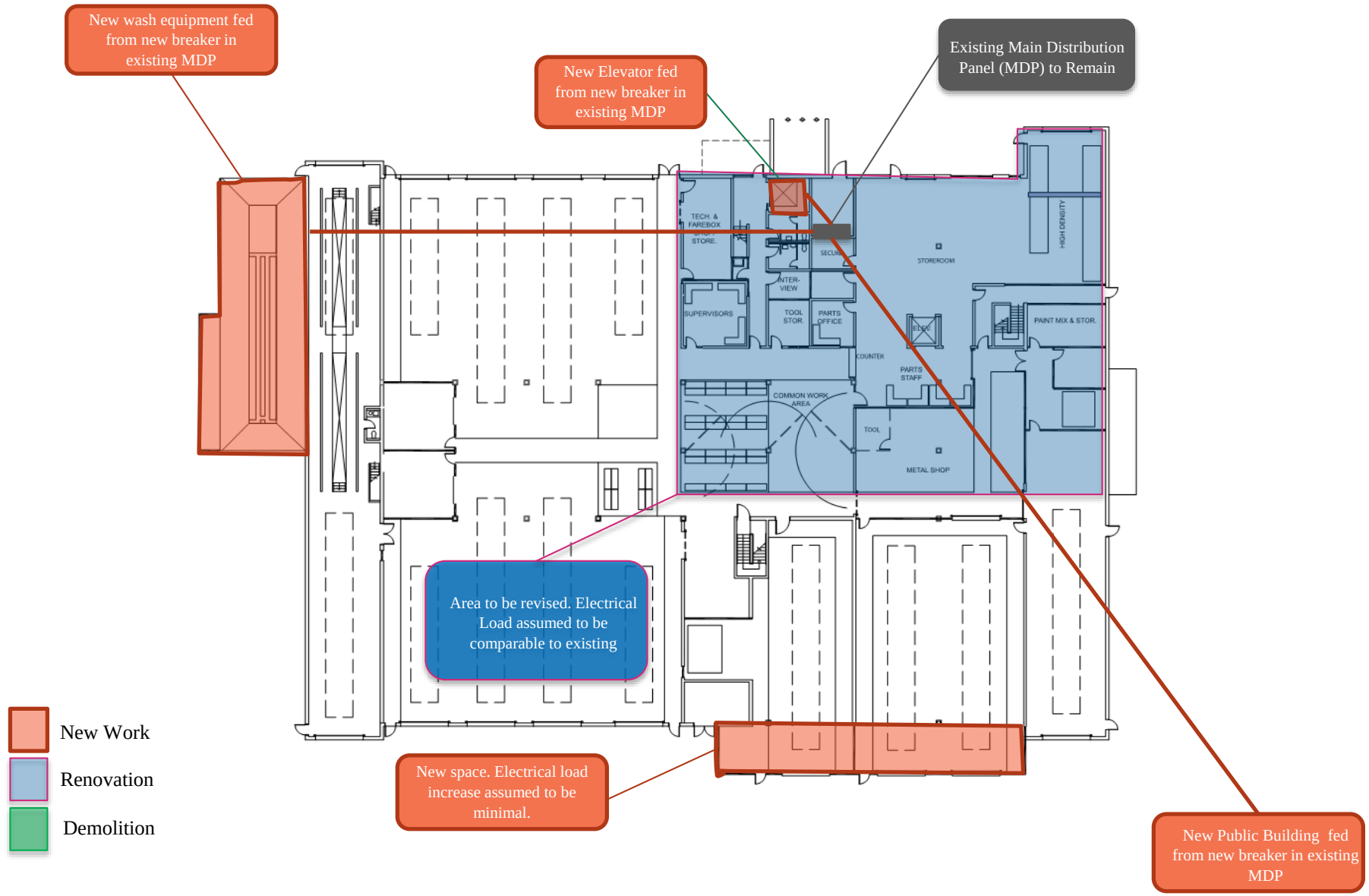
Administration/Operations Building Electrical Plan

ARUP



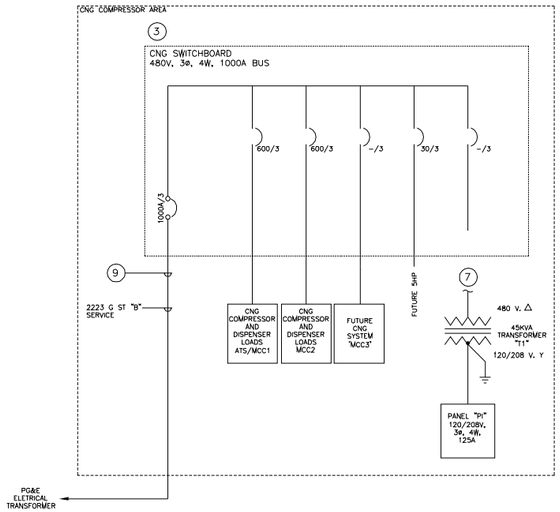
Bush Wash Electrical Plan

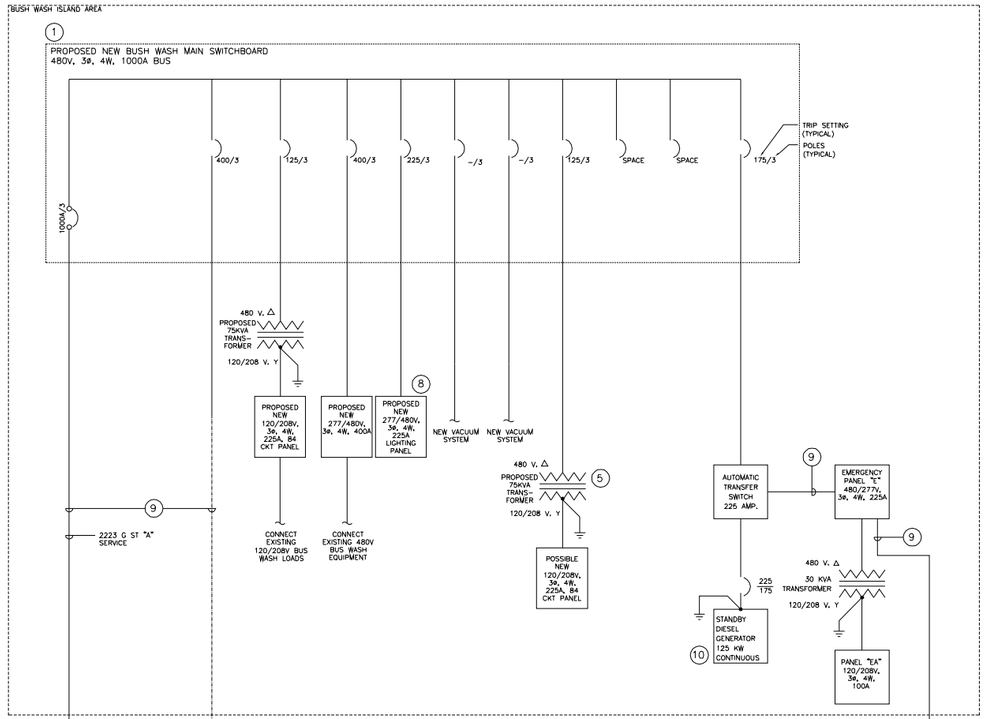
ARUP

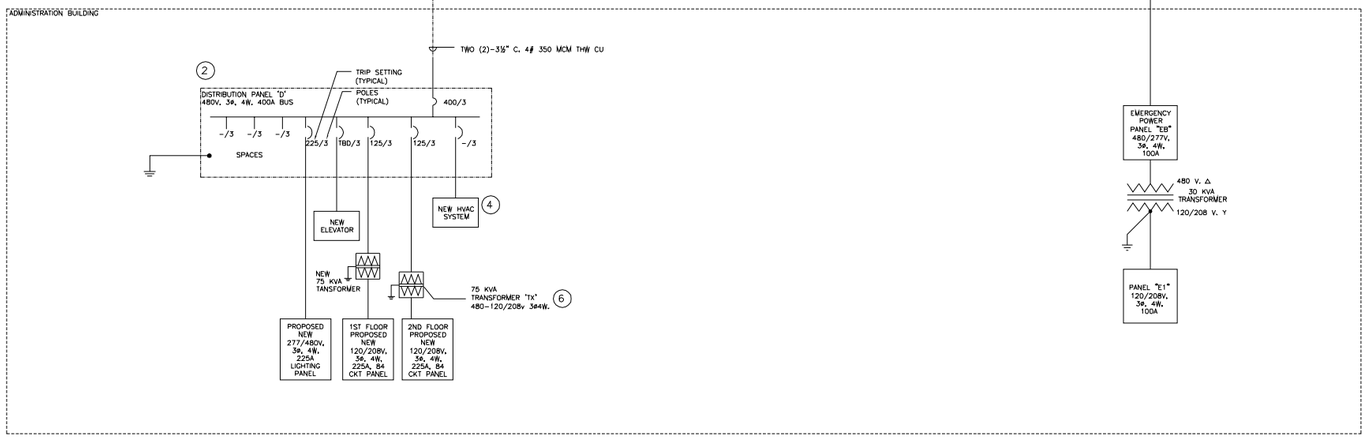


Maintenance Building Electrical Plan

ARUP







GENERAL NOTES

1. THE INFORMATION PRESENTED IS BASED ON THE BEST DATA WE WERE ABLE TO OBTAIN FROM OUR SITE WALK AND DOCUMENTS PROVIDED TO US BY MDG AND FAX.
2. TO MEET TITLE 24 REQUIREMENTS LOADS MUST BE SEPARATED FOR METERING PURPOSES, ALL LIGHTING AND PLUG LOADS SHOULD BE LOCATED SEPARATE DEDICATED PANELS. AS AN ALTERNATIVELY, CURRENT TRANSFORMERS(CTs) AND AGGREGATE METERING DEVICES CAN BE USED TO GROUP LIKE CIRCUITS FROM MULTIPLE PANELS IN CLOSE PROXIMITY.

KEYED NOTES

1. REPLACEMENT DISTRIBUTION PANEL FOR PG&E ELECTRICAL SERVICE 2223 G ST. "A". THIS SWITCHBOARD FEEDS THE BUS WASH AREA AND THE ADMINISTRATION BUILDING. PG&E STATEMENTS SHOW A PEAK POWER DEMAND OF 160KVA. THIS WOULD LEAVE APPROXIMATELY 500 KVA OF CAPACITY. IT IS OUR UNDERSTANDING THAT THE BUSH WASH EQUIPMENT AND ADMINISTRATION BUILDINGS BOTH DEMAND ABOUT 160KVA BUT AT DIFFERENT PARTS OF THE DAY. IF ALL LOADS ARE TO OPERATED AT THE SAME TIME IN THE FUTURE THEN OWNER SHOULD CONSIDER LARGER ELECTRIC SERVICE OR SEPARATE FEED FOR THE ADMINISTRATION BUILDING.
2. THIS PANEL IS LOCATED IN AND SUPPLIES THE ADMINISTRATION BUILDING. THERE ARE NO METERING PROVISION HERE SO THE ELECTRICAL LOAD WAS TAKEN FROM PG&E STATEMENTS FOR METER SUPPLYING BUS WASH ISLAND MAIN SWITCHBOARD. WE RECOMMEND KEEPING THIS PANEL AND INSTALLING METERING PROVISIONS TO MONITOR BUILDING ELECTRICAL PARAMETERS AND MEET TITLE 24 METER REQUIREMENTS. THE PANEL'S REQUIRED SHORT CIRCUIT CURRENT RATING AT NEW PROPOSED LOCATION SHOULD BE REVIEWED TO DETERMINE IF REPLACEMENT IS REQUIRED.
3. PG&E ELECTRICAL SERVICE ENTRANCE FOR 2223 G ST. "B". THIS EQUIPMENT SUPPLIES THE CNG EQUIPMENT BEHIND THE BUS WASH AREA. PG&E STATEMENTS SHOW A PEAK POWER DEMAND OF 430 KVA. THIS WOULD LEAVE ABOUT 230 KVA OF SPARE CAPACITY. SOME PROVISIONS ARE IN PLACE FOR A THIRD NEW COMPRESSED NATURAL GAS(CNG) MOTOR CONTROL CENTER(MCC).
4. SUPPLY FOR HVAC SYSTEM.
5. NEW PANEL TO CONNECT NEW PLUG LOADS.
6. EXISTING 75 KVA TRANSFORMER "TX" TO BE REUSED.
7. THIS PANEL WAS LOCATED IN THE FIELD BUT IT CONNECTION TO THE ELECTRICAL DISTRIBUTION SYSTEMS IS UNKNOWN.
8. THIS PANEL IS TO SERVE ALL LIGHTING LOADS INCLUDING THE BUS WASH ISLAND, THE NEW VAULTING BUILDING, AND RESTROOM BUILDING.
9. THE CURRENT SHOULD BE MEASURED AT THESE LOCATIONS FOR A PERIOD OF AT LEAST 24 HOURS TO DETERMINE THE ELECTRICAL DEMAND.
10. REPLACEMENT OF AGING GENERATOR IS RECOMMENDED. EXISTING AND FUTURE EMERGENCY LOADS SHOULD BE EVALUATED FOR SIZING.

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NO.	REVISIONS	DATE

Client: MAINTENANCE DESIGN GROUP

Job Title: FRESNO AREA EXPRESS

Key Plan:

Drawing Title: ELECTRICAL ONE-LINE BUS WASH AND ADMINISTRATION BLDG.

Scale: NTS
File Name: ONE-LINE SKETCH.DWG
Drawing Status: **SKETCH**
Drawn By: XX
Checked By: XX
Job No: **236920**
Drawing No: **SK-E1**

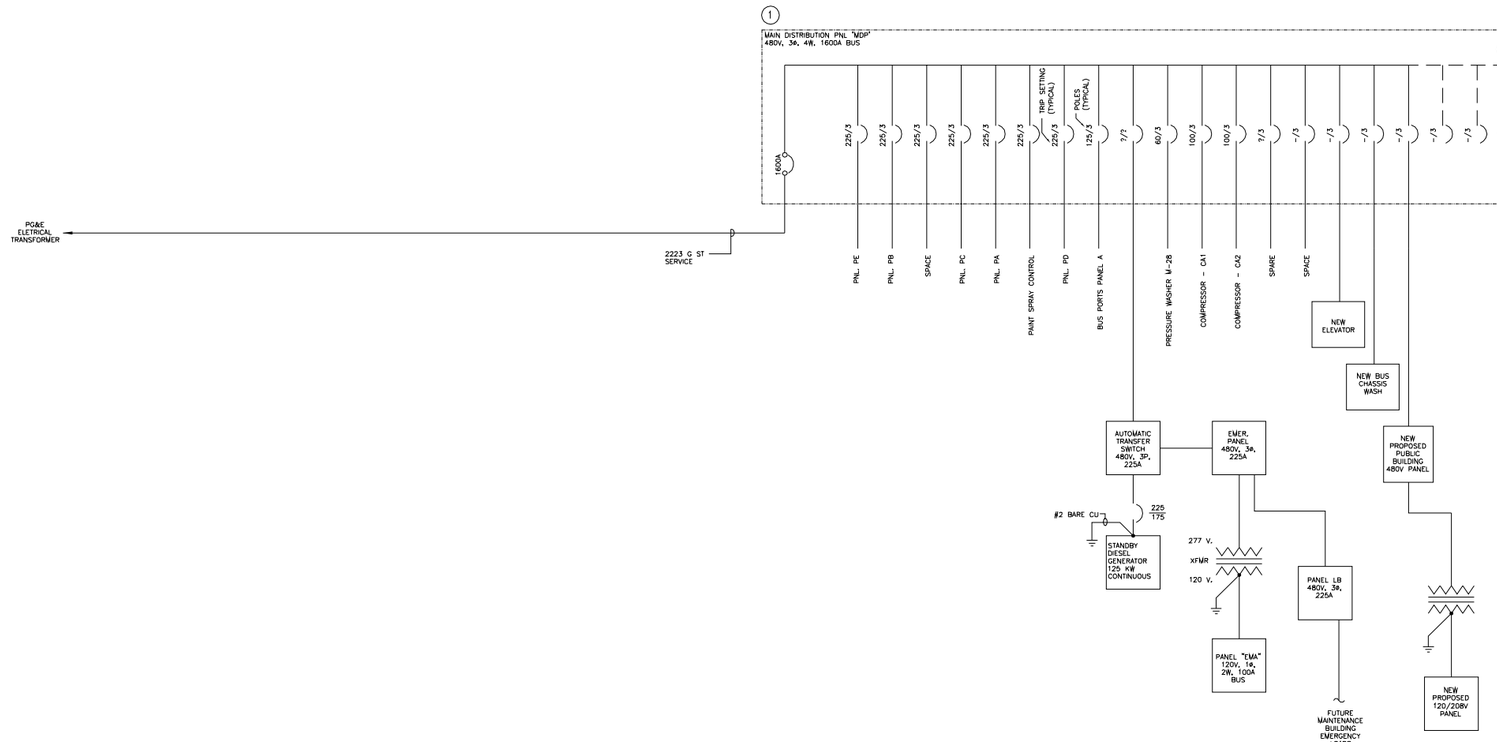
11x17

GENERAL NOTES

1. THE INFORMATION PRESENTED IS BASED ON THE BEST DATA WE WERE ABLE TO OBTAIN FROM OUR SITE WALK AND DOCUMENTS PROVIDED TO US BY MDG AND FAX.
2. TO MEET TITLE 24 REQUIREMENTS LOADS MUST BE SEPARATED FOR METERING PURPOSES. ALL LIGHTING AND PLUG LOADS SHOULD BE LOCATED SEPARATE DEDICATED PANELS. AS AN ALTERNATIVELY, CURRENT TRANSFORMERS(CTs) AND AGGREGATE METERING DEVICES CAN BE USED TO GROUP LIKE CIRCUITS FROM MULTIPLE PANELS IN CLOSE PROXIMITY.

KEYED NOTES

1. ELECTRICAL SERVICE ENTRANCE FOR 2223 G ST. THIS IS THE MAIN SWITCHGEAR THAT SUPPLIES THE MAINTENANCE BUILDING. PG&E STATEMENTS SHOW A PEAK POWER DEMAND OF APPROXIMATELY 200KVA. BASED ON SITE OBSERVATIONS THIS LEAVES ABOUT 700KVA OF SPARE CAPACITY AT 480V/3ø.
2. FUTURE LOADS FOR MAINTENANCE BUILDING LIGHTING AND MECHANICAL SYSTEMS. A NEW 480V-120V TRANSFORMER WILL BE REQUIRED FOR ELECTRICAL RECEPTACLES AND OTHER 120V LOADS.
3. ADDITIONAL SPACES AVAILABLE IN PANEL. VERIFY BUSSING IS INSTALLED.



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NO.	REVISIONS	DATE

Client: MAINTENANCE DESIGN GROUP

Job Title: FRESNO AREA EXPRESS

Key Plan:

Drawing Title: ELECTRICAL ONE-LINE MAINTENANCE BLDG.

Scale: NTS
File Name: ONE-LINE SKETCH.DWG
Drawing Status: **SKETCH**
Drawn By: XX
Checked By: XX
Job No: **236920**
Drawing No: **SK-E2**

PLOT BY: Jonathan.Gervais
PLOT TIME: 8/25/2014 7:39 PM
MOD. BY: Jonathan.Gervais
MOD. TIME: 8/25/2014 7:39 PM
DWG NAME: C:\Users\jonathan.gervais\Documents\FAX\Electrical Analysis\One-Line Sketch.dwg

Appendix F
Master Plan Lighting Report

FAX Area Express Bus Terminal

Masterplan Lighting Report

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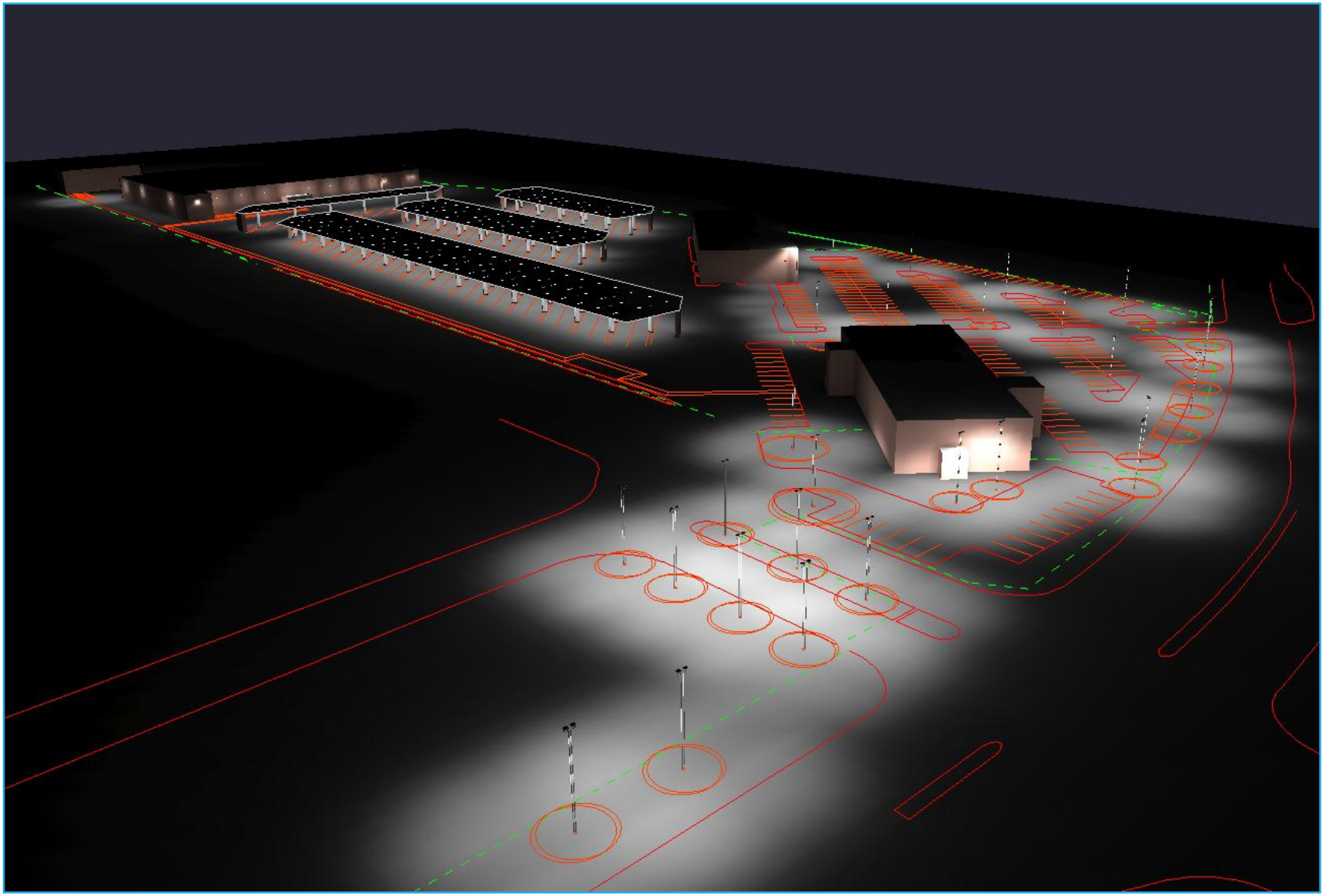
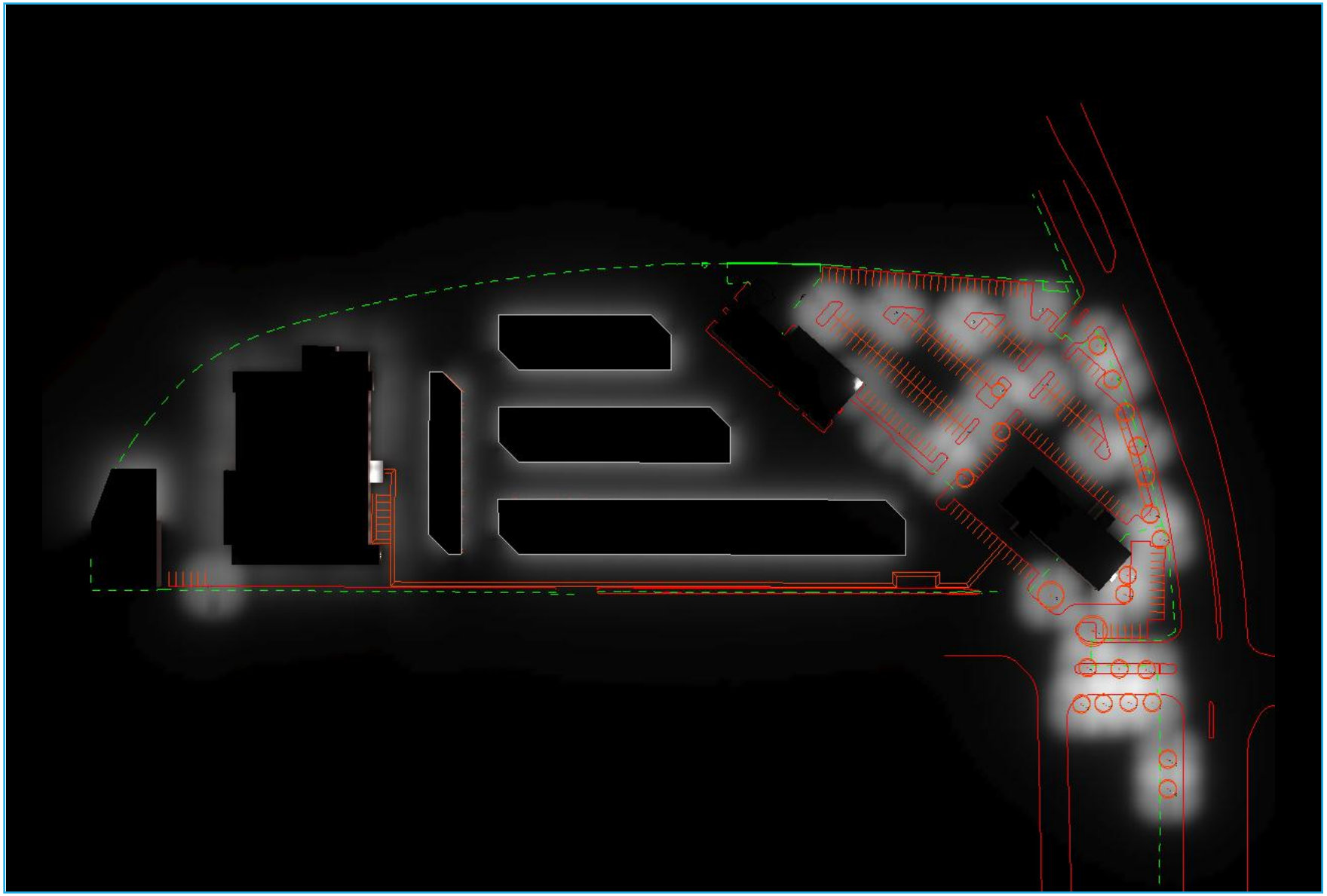


Agi-32 Masterplan lighting rendering



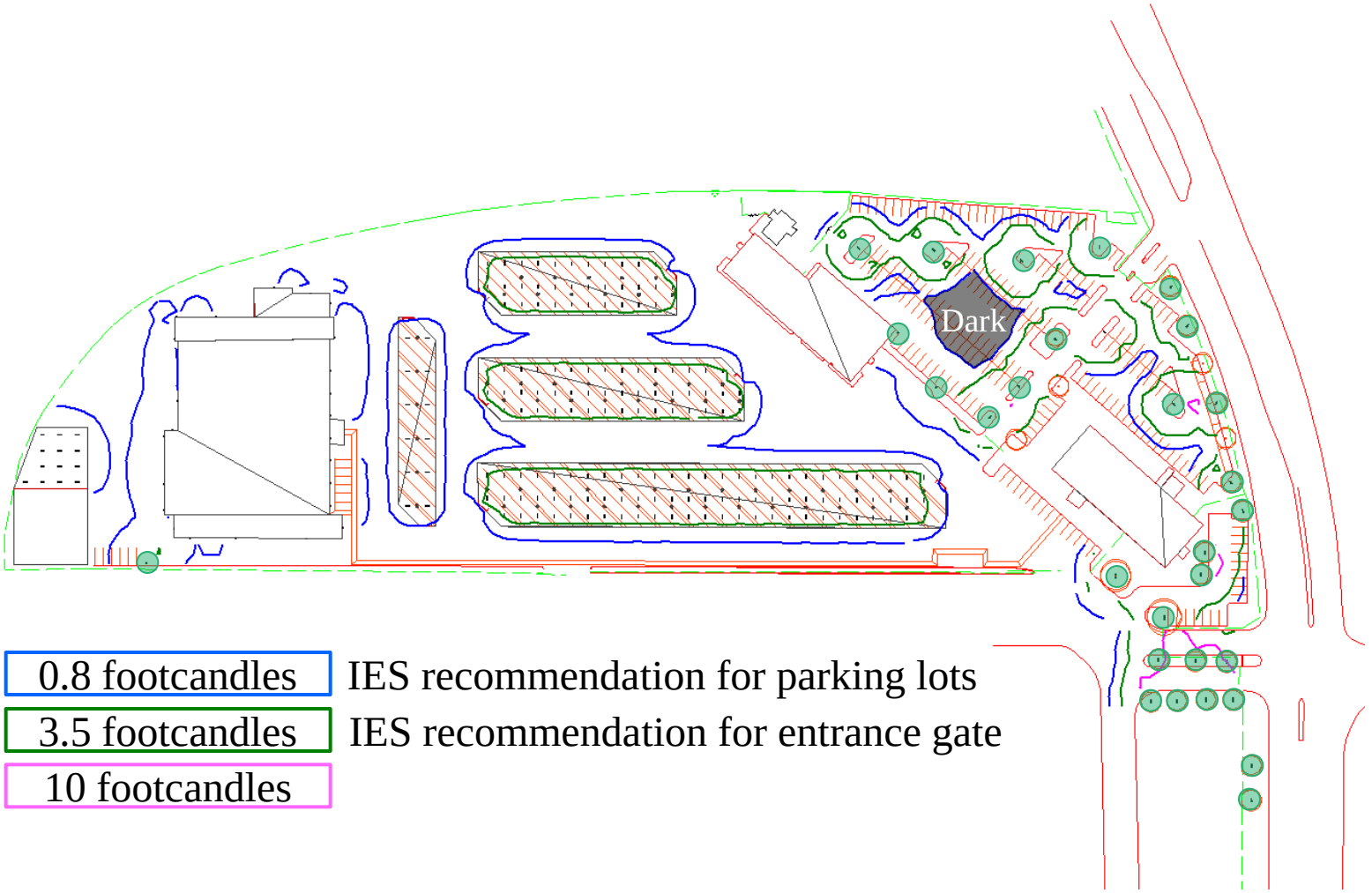
Agi-32 Masterplan lighting rendering

LED Linear
[Lithonia FEM LED]

LED Wallpack
[Lithonia TWH LED]

LED Pole
[Lithonia D-Series Size 2 LED]

Agi-32 Masterplan lighting calculations



Agi-32 Masterplan lighting calculations

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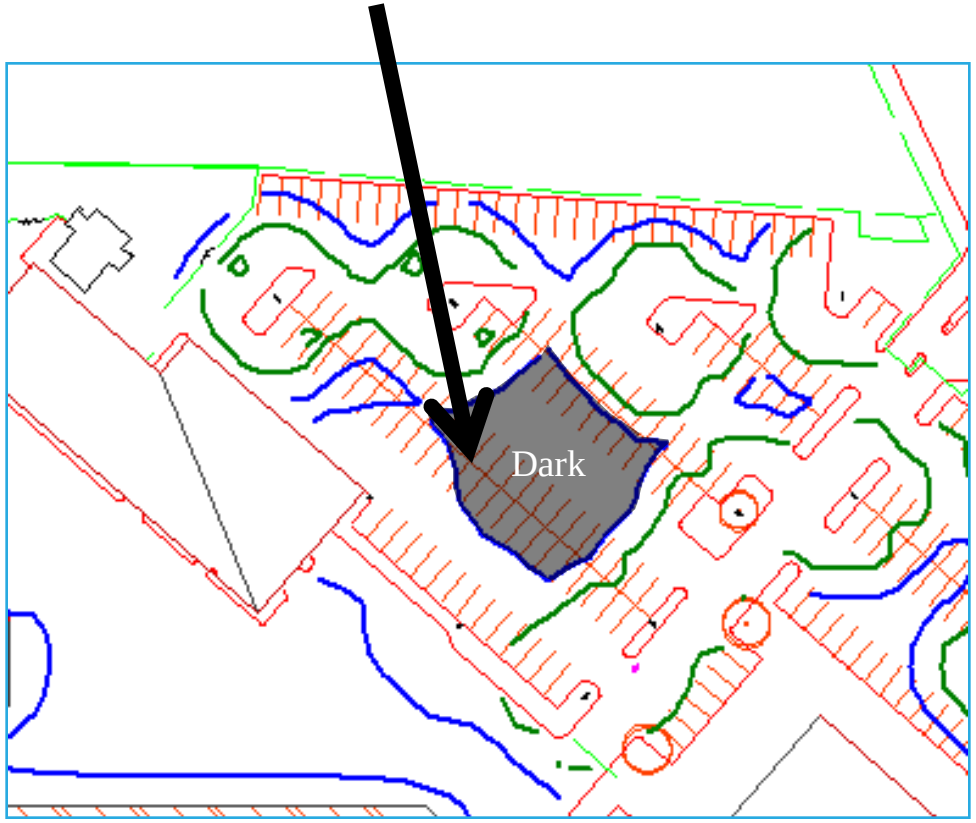
Master Plan Recommendations

- Add a pole mounted fixture in the center of the largest strip of parking spaces.



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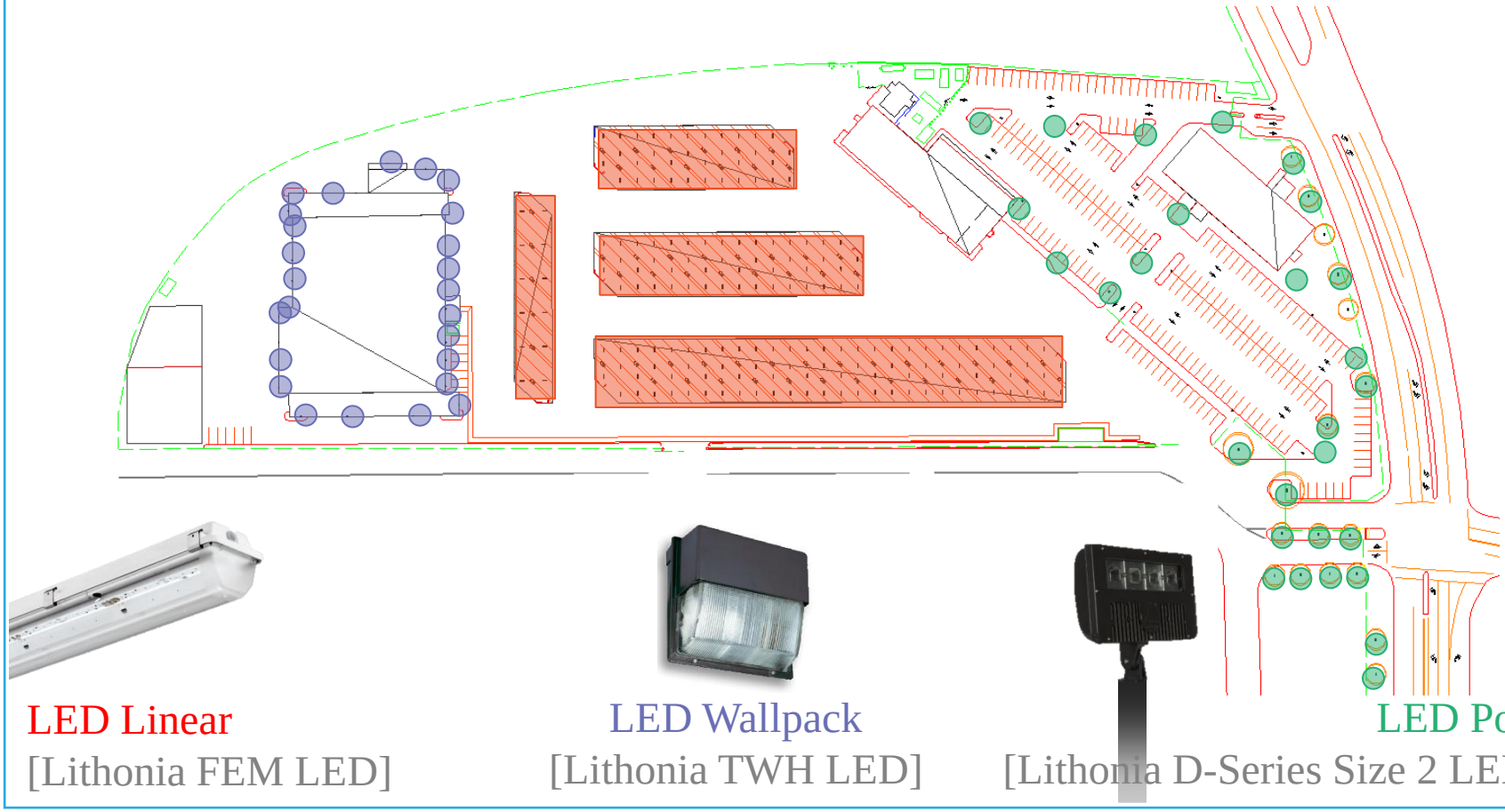
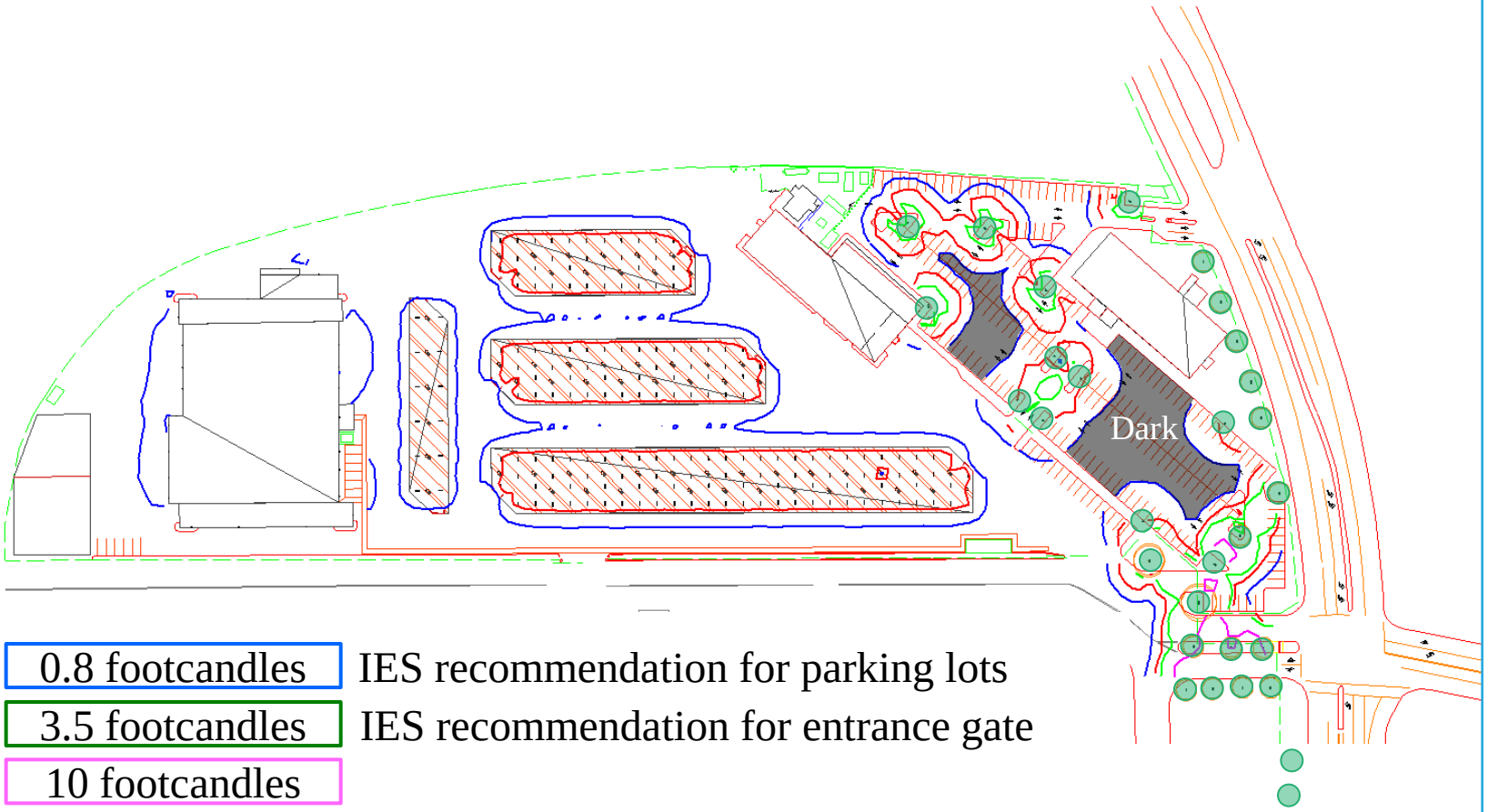


LED Linear
[Lithonia FEM LED]

LED Wallpack
[Lithonia TWH LED]

LED Pole
[Lithonia D-Series Size 2 LED]

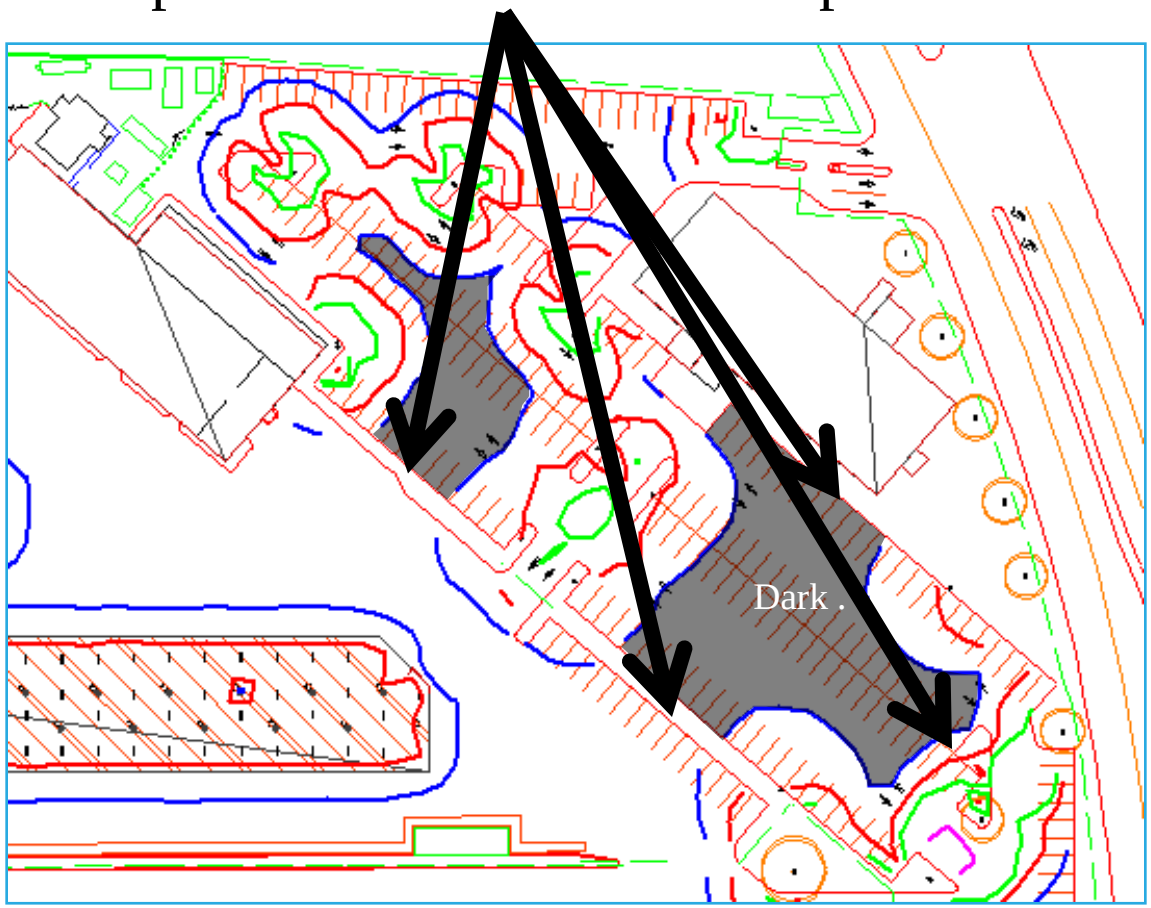
Agi-32 Alternate masterplan lighting calculations



Agi-32 Alternate lighting calculations

Alternate Master Plan Recommendations

- Add pole mounted fixtures in specified locations



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Title 24 Compliance

	Option A	Option B	Option C
Number of fixtures replaced	0% - 10%	10% - 50%	> 50%
Compliance	none	only altered luminaires are required to meet the requirements listed in § 130.0, 130.2, and 130.4	All of the lighting in that application is required to meet the requirements listed in § 130.0, 130.2, 130.4 and 140.7

Codes		
	Requirement	**Additional work required?**
Zonal Lumens	Luminaires over 150W to comply with BUG distributions	No. All luminaire cutsheets submitted comply already.
Controls	Auto-off during the day	Yes – see control plan
	Motion-sensors, with 40-80% step switching or continous dimming	Yes – see control plan
	1,500W max control zone	Yes – see control plan
Power Density	≤ 59,543 W for this site lighting	No. Current layout uses only 16,454 watts.

- Motion sensor controls not required for luminaires mounted more than 24 feet above grade
- Allowable power is:
  $0.9W/SF_{total}$
  $+ 0.408W/SF_{under\text{-}canopy}$
  $+ 0.6\ W/LF$
  $+ 770W$
- See CEC § 130.2 for details

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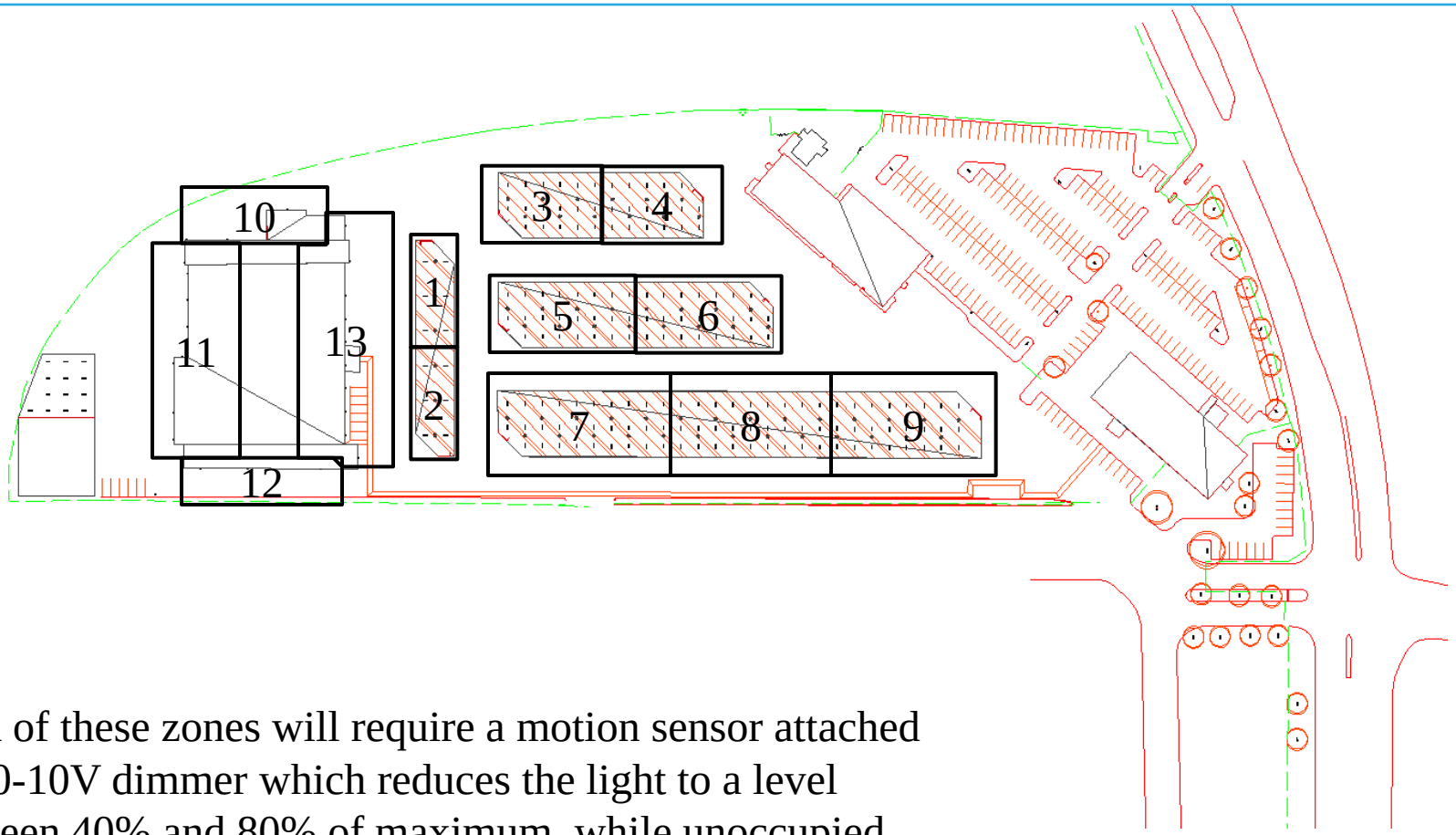
Control Zone Plan



Each of these zones will require a motion sensor attached to a 0-10V dimmer which reduces the light to a level between 40% and 80% of maximum, while unoccupied.

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