DETAILED FACILITY STUDY

Public Safety Center

VOLUME II

FINAL 07.20.2015

CITY OF SAN RAFAEL

ESSENTIAL FACILITIES STRATEGIC PLAN

Prepared by:

MARY MCGRATH | ARCHITECTS

VOLUME II. DETAILED FACILITY STUDY - PUBLIC SAFETY CENTER

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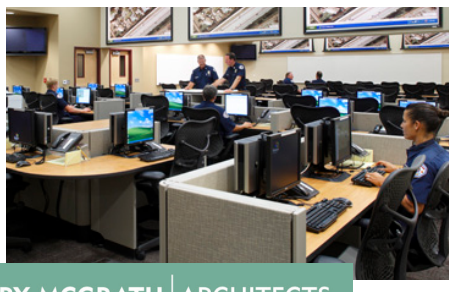
San Rafael Strategic Plan Tier 1 - Fire Station No. 51
Structural Review and Conditional Assessment
Prepared by Cornerstone Structural Engineering Group
Dated: June 23, 2015

Basis of Design Narrative - Fire Station 51
City of San Rafael - Essential Facilities Strategic Plan
MEP Review and Conditional Assessment
Prepared by Interface Engineering
Dated: June 22, 2015



VOLUME II. DETAILED FACILITY STUDY – PUBLIC SAFETY CENTER

A. INTRODUCTION

Initially, Space Needs Assessments were developed for a stand-alone police station and a replacement "Headquarters Fire Station" which comprised of Fire Station 51, Fire Administration functions and a new Emergency Operations Center. The police station and the headquarters fire station were each envisioned to be placed on separate sites. The replacement headquarters fire station was evaluated on a site near 2nd street and the police station was studied to be either added to City Hall or replaced across the street from City Hall on 5th Avenue. As the scenario study developed, it became apparent that these two stand-alone projects did not develop into a cost-effective solution for improving the seismic safety and operations of each department. It was determined that in order to maximize the funds available the following considerations would need to be made:

- A joint Public Safety Center would allow many of the spatial elements of a police and fire station to be shared. They include the lobby, public restrooms, staff break and restrooms, classroom, and all circulation and mechanical/electrical support spaces.
- If at all possible, the replacement facilities should be located on City-owned property. This would allow the maximum amount of available funds to be put toward facility improvements instead of property purchases.
- Evaluate alternative possibilities for moving Medic 51 closer to the freeway as a response to the recommendations of the Standards of Coverage Study in place of re-building space in a potential Public Safety Center (PSC) at its similar location (discussed in Volume I).
- Mission critical for both the San Rafael Fire and Police Departments (SRFD and SRPD) is to have all divisions located in the same building and moved from the leased spaces they currently occupy.

Concurrent with developing the Space Need Assessments for each department, the Design Team evaluated the existing facilities currently serving each group. The goal was to determine if the facilities could be cost-effectively renovated to serve the established needs and goals of providing operationally efficient and seismically safe facilities for each department. The Team evaluated the existing Fire Station 51 and the existing City Hall (SRPD is located in the first level of City Hall). In general, it was determined that neither renovating and adding to the existing City Hall, nor renovating and expanding the existing Fire Station 51 proved to be cost-effective or operationally efficient solutions to meeting the stated goals above. The detail behind these findings is presented in Section C of this report.

The proposed Public Safety Center (PSC), detailed in the following documents, recommends the development of a 44,666-square-foot PSC, located on City-owned property on 5th Avenue between C and D Streets.

PUBLIC SAFETY CENTER AT 1401 5TH AVENUE: $41M – $43M PROJECT BUDGET (INCLUDING RENTAL SAVINGS)

The following Overall Space Needs Summary, Space Standards and Component Diagrams, Site Arrangement Diagrams, and Overall Conceptual Project Budget provide the background detail which resulted in the proposed total square footage recommendation and overall project budget range. These documents will be used in the

subsequent phases of the Measure E, Essential Facility Improvement Program as a basis for design and budget confirmation.

FACILITY OVERVIEW

San Rafael Police Department (SRPD) features include:

- Adequate on-site storage area to eliminate off-site storage costs.
- Locates all SRPD units in the same building except the Youth Services Bureau and the Marine Unit.
- SRPD program provides 424 net square feet to accommodate future staffing levels including:
  - One new Street Crimes Officer – 24 SF work station
  - One new Motor Officer – 24 SF work station
  - One property and evidence assistant – 80 SF work station
  - One new investigator – 80 SF work station
  - Three additional records specialists – 216 SF

San Rafael Fire Department (SRFD) features include:

- Adequate on-site storage area to eliminate off-site storage costs.
- A fire department administrative program which provides 264 net square feet to accommodate future staffing levels including:
  - One new Fire Administrator – 120 SF office
  - One new Public Education Specialist – 72 SF work station
  - One new Emergency Medical Service (EMS) Clerk – 72 SF work station
- An Emergency Operations Center that includes seating for 60 and training at tables for 24 with support areas for the emergency management functions.
- The Fire Engine 51 Company with apparatus bay space for cross-staffing a ladder truck and a secure bay for the BC vehicle. It provides living accommodations for four fire fighters and the BC.

Joint Facilities include:

- Conference rooms
- Emergency Operations Center (EOC)/training room
- Break rooms
- Fitness room
- Lobby and public restrooms
- Men's and women's staff toilets
- All Infrastructure support areas including computer rooms, electrical rooms, etc.

Items and functions not included which will need to be accommodated at another location:

- Parking – only patrol vehicles and specialized support units (SWAT, CSI VAN, and various trailers) are planned to be on-site. Personal vehicles and un-marked SRPD vehicles will be parked off-site.
- The SRFD Apparatus Maintenance Program will be relocated to the Public Works Yard.
- Medic Unit 51 will be relocated to Fire Station 52.
- The Youth Services Bureau may be relocated to the first floor of the current City Hall.

B. PUBLIC SAFETY CENTER PROGRAM

OVERALL SPACE NEEDS SUMMARY AND SUMMARY OF BUILDING PER DEPARTMENT

The Space Needs Summary summarizes the anticipated building space needs into an outline form indicating each departments area requirements and the building support areas. The summary of space needs per department lists the anticipated space needs per department and provides a breakdown of the shared and non-shared space allocations.




COMBINED PD/FD - PUBLIC SAFETY CENTER

OVERALL SPACE NEEDS SUMMARY

Component	2015		2040		Comment
	Area Gross S.F.	Number of Personnel	Area Gross S.F.	Number of Personnel	
Office of the Police Chief	655	3.0	655	3.0	
Fire Administration	2,200	14.0	2,387	17.0	Includes Fire Administrator
Emergency Operations Center	2,079	1.0	2,079	1.0	Includes Large Training/EOC Room
Operations Division: Office	562	42.0	562	51.0	Includes Operations Captain Office
Street Crimes	580	3.0	611	4.0	
Patrol Sergeant Work Room	867		867		Staff counted in Operations: Office
Traffic	395	3.0	426	4.0	
Misc. Functional Spaces	125	6.0	125	7.0	Foot Beat
Cadets	248	6.0	248	6.0	
Patrol Support Areas	2,284		2,284		Staff counted in Operations: Office
Evidence Processing and Secure Storage	2,509	1.0	2,509	2.0	
Temporary Holding	2,698		2,698		
Investigations	3,414	11.0	3,518	12.0	Includes Admin. Captain Office
Professional Standards	738	3	738	3	
Youth Services Bureau	0	5	0	5	Location TBD
Records	1,877	6	2,157	9	
Dispatch	996	10	1,017	12	
Staff Support	5,388		5,388		
Facility Support	5,811		5,811		Size based on 2040 staffing
Station 51 Apparatus Bay and Support	3,931		3,931		
Station 51 Offices	635		635		
Station 51 Living Quarters	1,959		1,959		
Total Building Spaces	**39,950**	**111.0**	**40,605**	**133.0**	
Building Gross Factor - 10%	3,995		4,061		
Total Building Gross Square Footage	**43,945**		**44,666**		

Component	2015		2040		Comment
	Area Gross S.F.	Number of Personnel	Area Gross S.F.	Number of Personnel	
Ancillary Support - On-Site	1,771		1,771		Motors, Bicycles, Large Vehicle Storage. Store in Sub-Terrain Garage Area. Minimum improvements.
Exterior Spaces - Some parking level, Some at street level.	13,386		13,386		
Total Exterior and Building Spaces	**59,102**		**59,823**		
Ancillary Support - Parking Level	6,191		6,191		Trailers and vehicles

SUMMARY OF BUILDING SPACE PER DEPARTMENT				
	FD	**PD**	**Share**	
	Area Gross S.F.	Area Gross S.F.	Area Gross S.F.	
Office of the Police Chief		655		
Fire Administration	2,387			
Emergency Operations Center	2,079			
Operations Division: Office		562		
Street Crimes		611		
Patrol Sergeant Work Room		867		
Traffic		426		
Misc. Functional Spaces		125		
Cadets		248		
Patrol Support Areas		2,284		
Evidence Processing and Secure Storage		2,509		
Temporary Holding		2,698		
Investigations		3,518		
Professional Standards		738		
Youth Services Bureau		0		
Records		2,157		
Dispatch		1,017		
Staff Support			5,388	Shared 50/50
Facility Support			5,811	
Station 51 Apparatus Bay and Support	3,931			
Station 51 Offices	635			
Station 51 Living Quarters	1,959			
Total Building Spaces	10,990	18,416	11,199	
Building Gross Factor - 10%	1,099	1,842	1,120	
Total Building Gross Square Footage	**12,089**	**20,257**	**12,319**	**44,666**
Area percentage per Work Group:	27.07%	45.35%	27.58%	

B. PUBLIC SAFETY CENTER PROGRAM

SPACE NEEDS OUTLINE

This section identified and itemizes the building spaces into an outline form indicating each space, the required attributes and the required square footage. The space needs of the project have been established through meetings with both the police department and fire department design team, site visits and multiple review meetings. The square footage requirements for each space are derived through the development of "component diagrams" reflecting the operations-based layout of each space and the use of space standards




Combined PD/FD - Public Safety Center

SPACE NEEDS OUTLINE

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Office of the Chief of Police								
Office of the Police Chief								
Police Chief	O-1	1	224	224	1	224	1	Accommodate meetings of 4-5 people
Police Chief's Closet	CL-3	1	40	40		40		
Executive Assistant	O-4	1	120	120	1	120	1	Need space to hold project files, operating staff files
Senior Admin./Finance	O-4	1	120	120	1	120	1	Needs space to hold personnel files, billing files
Division Subtotal				504	3.0	504	3.0	
Efficiency Factor - 30%				151		151		
Office of the Chief TOTAL				**655**	**3.0**	**655**	**3.0**	
Office of the Fire Chief								
Fire Administration								
Fire Chief Office	O-1	1	224	224	1	224	1	Private office, lateral file cabinets, meeting table for 4, shelving
Fire Administrator	O-4	1	120	120	0	120	1	Private office, lateral file cabinets, shelving
Deputy Fire Marshal	O-4	1	120	120	1	120	1	Private office with plan layout desk, lateral file cabinets, shelving
Management Analyst	O-4	1	120	120	1	120	1	Private office, lateral file cabinets, shelving
EMS Coordinator	W-1	1	80	80	1	80	1	Semi-private open work station with supply storage
Medical Director	W-2	1	72	72	1	72	1	Semi-private open work station with supply storage

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Fire Administration - Continued								
Nurse Educator	W-2	1	72	72	1	72	1	Semi-private open work station with supply storage
Administrative Open Work Area (Two positions)	W-2	2	72	144	2	144	2	Open work stations adjacent to lobby, lateral file cabinets, shelving, adjacent to copy, file, supply room
EMS Open Work Area (Two Current Positions, One Future)	W-2	2	72	144	2	216	3	Open work stations adjacent to Administrative Work Area, one - "Times-two, 7 tier" file cabinet in open work area, shelving, adjacent to copy, file, supply room
Fire Prevention Open Work Area Fire Inspector II (Two Positions)	W-1	2	80	160	2	160	2	Open Work Area adjacent to Fire Marshall ; two work stations and work counter for plan layout, storage area for inactive files and plans; near Admin. Work area.
Vegetation Management Specialist	W-2	1	72	72	1	72	1	Open work station, lateral file cabinets, shelving
Environmental Management Coordinator	W-2	1	72	72	1	72	1	Open work station, lateral file cabinets, shelving
Future Public Education Specialist Office/Storage	W-2	1	72	0	0	72	1	Open work station, desk, files, shelving, adjacent to storage room.
Fire General Storage - Supply	CL-5	1	60	60		60		Full-height shelving. Public Ed. And Medical Supply Storage

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Fire Administration - Continued								
Fire Admin File Storage	F-4	7	16	112		112		File cabinets (locking); 4 - "Times-Two" - 7 tier file systems
Fire Admin Workroom/ Storage	F-3	3	40	120		120		Full-height shelving, open area for copy machine, central work counter for report assembly, storage for office supplies, form storage, mail box for each station and admin. personnel
Division Subtotal				1,692	14.0	1,836.0	17.0	
Efficiency Factor - 30%				508		551		
Fire Administration TOTAL				**2,200**	**14.0**	**2,387**	**17.0**	
Emergency Operations Center								
Main Response Room	C-4	1	960	960		960		Seating for 60; storage areas; counters; serves as EOC room and class-room, partition
Call Taker Room, Ham Radio	C-1	1	180	180		180		4 work stations
Equipment Storage	CL-5	3.25	60	195		195		Table and Chair storage, rations, cots, equipment
Task Force Conference Rm. (two total)	O-4	0	120	0		0		Removed from Program - Use Conference Rooms adjacent to lobby in major event
EOC Coordinator	O-4	1	120	120	1	120	1	Private office, lateral file cabinets, shelving

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Emergency Operations - Continued								
Wall Map	W-2	2	72	144	0	144		ROSS mapping, maps, TV monitors, CAD monitors
Division Subtotal				1,599.0	1.0	1,599.0	1.0	
Efficiency Factor - 30%				480		480		
Emergency Operations Center TOTAL				**2,079**	**1.0**	**2,079**	**1.0**	
Operations Division								
Operations Division: Office								
Operations Captain	O-3	1	132	132	1	132	1	
Operations Captain's Closet	CL-3	0.5	40	20		20		
Day Shift								
Day Shift Police Lieutenant	O-4	1	120	120	1	120	1	Shared office with Night Shift Lieutenant
Lieutenant's Closet	CL-3	0.5	40	20		20		
Patrol Team 1 Sergeant					1		1	Refer to Patrol Sergeant shared office space
Patrol Team 1					8		10	
Patrol Team 2 Sergeant					1		1	Refer to Patrol Sergeant shared office space
Patrol Team 2					9		10	
Night Shift								
Night Shift Police Lieutenant	O-4	1	120	120	1	120	1	Shared office with Day Shift Lieutenant
Lieutenant's Closet	CL-3	0.5	40	20		20		

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Night Shift - Continued								
Patrol Team 3 Sergeant					1		1	Refer to Patrol Sergeant shared office space
Patrol Team 3					9		10	
Patrol Team 4 Sergeant					1		1	Refer to Patrol Sergeant shared office space
Patrol Team 4					9		10	
Future CSO								
CSO					0		4	
Division Subtotal				432		432		
Efficiency Factor - 30%				130		130		
Operations Division Office TOTAL				**562**	**42.0**	**562**	**51.0**	
Street Crimes								
Street Crimes Sergeant	W-1	1	80	80	1	80	1	Street Crimes Sergeant office would be in Street Crimes work area, Adjacent to Patrol
Street Crimes Officers								
Street Crimes Work Area								
Workstations	W-4	1	24	48	2	72	3	
Case Files	F-1	8	5	40		40		
Equipment Storage	CL-1	3	8	24		24		Raid jackets, vests, thigh holsters, trackers, wires, locked.
Work Table	F-3	4	40	160		160		Table for 4- 6 with white board and covered bulletin board, away from the entry
Book shelves	SH-1	1	40	40		40		
File Cabinets	F-1	3	5	15		15		

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Operations Division - Continued								
K-9 Support								
Workstation	W-3	0	48					Staffed by Street Crimes Unit
Files	F-2	1	13.5	14		14		
Case Law Books	SH-4	1	12	12		12		
Equipment Cabinet	F-2	1	13.5	14		14		
Kennels								See Ancillary Police Support space list
Division Subtotal				446		470		
Efficiency Factor - 30%				134		141		
Street Crimes TOTAL				**580**	**3.0**	**611**	**4.0**	
Patrol Sergeant Work Room								
Sergeant Work Area								
Workstations	W-2	6	72	432		432		Four Patrol Team Sergeants and Foot Beat Sergeant, One Light duty. Refer to Unit for Staffing
Color Printer/Copier	F-3	1	40	40		40		
File Storage	F-1	6	5	30		30		
Forms Storage	F-1	1	5	5		5		
Resource Manuals	SH-4	1	12	12		12		
Briefing Table	B-1	6	18	108		108		
Equipment Storage	CL-1	5	8	40		40		
Division Subtotal				667		667		
Efficiency Factor - 30%				200		200		
Patrol Sergeant Work Room TOTAL				**867**	**0.0**	**867**	**0.0**	

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Operations Division - Continued								
Traffic								
Traffic Sergeant	W-1	1	80	80	1	80	1	Traffic Sergeant office would be in Traffic work area.
Motor Officers								
Traffic Work Area								
Workstations	W-4	1	24	48	2	72	3	
Color Printer/Copier	F-3	1	40	40		40		
Diagrams/Surveys Files	F-1	2	5	10		10		
Forms Storage	F-1	1	5	5		5		
Traffic Citations File	F-1	1	5	5		5		
Resource Manuals	SH-4	1	12	12		12		
Briefing Table	B-1	4	18	72		72		
Equipment Storage	CL-1	4	8	32		32		
Division Subtotal				304		328		
Efficiency Factor - 30%				91		98		
Traffic Work Area TOTAL				**395**	**3.0**	**426**	**4.0**	
Misc. Functional Spaces								
Foot beat								
Foot Beat Sergeant					1		1	Refer to Patrol Sergeant shared office space
Foot Beat Officers					3		4	
Mental Health Worker	W-3	1	48	48	1	48	1	Locate near Patrol Sergeants
Supply Storage	CL-1	6	8	48		48		Interior Storage for Misc. Supplies. See Exterior Storage for Bicycles Storage

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Marine								
Officer	W-3	0	48	0	1	0	1	Located Off-site
Supply Storage	CL-3	0	40	0		0		See Off-site Storage for additional supplies
Division Subtotal				96		96		
Efficiency Factor - 30%				29		29		
Misc. Functional Spaces TOTAL				**125**	**6.0**	**125**	**7.0**	
Cadets								
Cadet Work Area					6		6	Overseen by Traffic Sergeant, locate near patrol
Workstations	W-3	2	48	96		96		
Work Bench	F-3	1	40	40		40		
Equipment Storage	F-1	3	5	15		15		
Book Case	SH-4	2	12	24		24		
		1	16	16		16		
Division Subtotal				191		191		
Efficiency Factor - 30%				57		57		
Cadet Work Area TOTAL				**248**	**6.0**	**248**	**6.0**	
Volunteers								
Volunteer work station								18 total Volunteer - Not counting in staffing. Refer to Investigations and Records for work station locations

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Operations Division: Support Functions								
Patrol Support Areas								
Briefing Room								
Seating	B-1	20	18	360		360		reduced from 24 to 20
Presentation Area		1	40	40		40		
Duty Bag Room								
Duty Bag/2nd Bag Room	L-3	67	2.75	184.25		184		2 per sworn field ops personnel, 74 total Sworn. Less 7 Admin. 67 total storage lockers
Patrol Equipment	CL-4	2	40	80		80		Flashlight, Radios, Cameras, Keys, Gloves, Wipes
Equipment Room								
Patrol Equipment		1	120	120		120		Rifles, shotguns, ammo, handcuffs, vests
SWAT Equipment		1	120	120		120		SWAT Specialty rifles, Rams, ammo.
Armory								
Ammunition	SH-1	2	40	80		80		16’ of full height shelving
Gun cleaning station	F-3	1	40	40		40		Workbench with air tools, parts storage
Shotgun Storage	SH-2	3	56	168		168		24’ of full height shelving - 4’ deep
Training guns and supplies	SH-2	1	56	56		56		16’ of full height shelving - 4’ deep
Gun Clearing Station		2	9	18		18		
Report Writing Room								
Report Writing Stations	W-4	8	24	192		192		Includes two special program stations
Form Storage	F-1	2	5	10		10		
Officer Files	F-2	4	13.5	54		54		4 - 4-drawer high cabinets

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Patrol Support Areas - Continued								
Juvenile Holding								
Holding Room	I-3	1	100	100		100		Visual contact to report writing
Work Area	F-3	3	40	120		120		printer/copier, office supply storage, counter for report assembly, fax
Officer Mail Boxes		60	0.25	15		15		1 per sworn field ops personnel
Division Subtotal				1,757		1,757		
Efficiency Factor - 30%				527		527		
Patrol Support Work Area TOTAL				**2,284**	**0.0**	**2,284**	**0.0**	
Evidence Processing and Secure Storage								
Evidence Processing		1	250	250		250		Perimeter counter space with sink. Center island for evidence layout, fingerprint testing , weighing, photographing, (2 drying cabinets, 2 fume hoods), CSI supplies storage
Bag and Tag work area		1	60	60		60		Evidence processing supplies
Valtox Work area		1	60	60		60		Kit storage and workbench
Temporary Storage Lockers		1	60	60		60		Temporary storage while processing
Refrigerator/Freezer		1	18	18		18		Temporary storage while processing

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Evidence Processing and Secure Storage - Continued								
Property and Evidence Staff Office								
Property and Evidence Specialist	W-1	1	80	80	1	80	1	
P & E Assistant	W-3	1	48	48	0	48	1	
Files	F-2	3	13.5	40.5		41		forms storage, finger-print cards, photo/ latent files, evidence supplies
Shelving	SH-4	1	12	12		12		
Secure Evidence Storage Area								
Compact Evidence Storage System		6	75	450		450		6 rows
Gun Storage Cage	CL-4	1	40	40		40		
Narcotics Room	CL-4	1	40	40		40		
Safe		1	1	18		18		
Refrigerator		1	18	18		18		
Freezer		1	200	200		200		
Drying Locker		1	24	24		24		
Arson Locker		0	15	0		0		No arson items stored at PD
Bicycle Storage		16	12	192		192		Accessible to outdoor loading area
Bulky Evidence Storage	CL-4	8	40	320		320		Accessible to outdoor loading area
Evidence Processing Sup-port								
Evidence Processing Work Counter	F-3	2	40	80		80		With supplies storage in cabinetry
Hand Wash Sink and Counter	F-3	1	40	40		40		
Emergency Eyewash		1	10	10		10		
Evidence Receiving Counter		1	30	30		30		

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Evidence Processing and Secure Storage - Continued								
Vehicle Evidence Processing		0	400	0		0		Space Eliminated - Use County Facilities
Bulk Marijuana Temporary Holding								See Exterior Spaces space list
Large Evidence and Vehicle Storage								See Ancillary Police Support space list
Outdoor Loading Area								See Exterior Spaces space list
Subtotal				2,091		2,091		
Efficiency Factor -20%				418		418		
Evidence Processing/ Secure Storage TOTAL				**2,509**	**1**	**2,509**	**2**	
Temporary Holding								
Vehicle Sallyport		2	400	800		800		
Prisoner Sallyport		1	100	100		100		Between vehicle sallyport and holding
Prisoner Release Sallyport		1	50	50		50		Between public area and holding
Booking Area								
Staff Work Area and Counter		1	150	150		150		
Intoxilizer		1	40	40		40		
Photo Area		1	80	80		80		
Fingerprint Area		1	25	25		25		
Live Scan		1	25	25		25		
Prisoner Property		1	25	25		25		
Prisoner Booking		2	36	72		72		Secure Booking Area
Booking Interview Rooms	I-1	1	80	80		80		
Holding Cells		2	80	160		160		Temporary holding room with toilet, single occupancy, vision lite in door. Reduced from three to two.

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Temporary Holding - Continued								
Detainee Toilet	T-4	1	64	64		64		
Detainee Shower	T-5	1	80	80		80		
Staff Toilet	T-4	1	64	64		64		
Janitor Closet		1	50	50		50		
Safety Equipment Storage		1	40	40		40		
AV Monitoring Equipment		1	40	40		40		
Supplies Storage	CL-3	2	40	80		80		
Staff Sallyport		1	50	50		50		Between police building and holding
Division Subtotal				2,075		2,075		
Efficiency Factor - 30%				623		623		
Temporary Holding TOTAL				**2,698**		**2,698**		
Administrative Services Division								
Administrative Services Captain	O-3	1	132	132	1	132	1	
Captain's Closet	CL-3	0.5	40	20		20		
Investigations								
Investigations Lieutenant	O-4	1	120	120	1	120	1	
Police Lieutenant's Closet	CL-3	0.5	40	0		0		
Investigations Sergeant	O-4	1	120	120	1	120	1	
Investigators	W-1	1	80	560	7	640	8	
Briefing Table	B-1	8	18	144		144		
Mapping Wall	M-1	2	40	80		80		
Case Files	F-1	6	5	30		30		
Equipment Storage	F-1	8	5	40		40		Tactical vests, Jackets
Volunteer Workstation	W-4	2	20	40		40		Plan for two work stations

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Investigations - Continued								
Crime Analyst	O-4	1	80	80	1	80	1	
Investigation Work Room								
Color Printer/Copier	F-3	1	40	40		40		
File Storage	F-4	4	16	64		64		
Equipment Storage	CL-4	1	40	40		40		
Resource Manuals	SH-4	1	14	14		14		
Storage		1	16	16		16		
Investigation Conference Room	C-2	1	432	432		432		12-16 chairs
Staff Pantry	P-1	1	20	20		20		For coffee, water
Waiting Area	S-1	6	15	90		90		
Confidential Meeting Room	I-3	0	100	0		0		Eliminated. Use soft interview room
Interview Rooms								Share with Field Services
Interview Room (Soft)	I-2	2	120	240		240		Separate from hard interview rooms
Video Monitoring and Viewing	CL-3	2	40	80		80		For confidential meeting room, suspect interview and victim interview rooms. Reduced from three rooms to two
Monitoring/Computer/ Equipment Storage	CL-3	1	40	40		40		Surveillance, monitoring equipment
Interviewee Restroom	T-4	1	64	64		64		single-occupancy, unisex
Children's Waiting Room		1	120	120		120		Retained, confidential meeting room eliminated
Division Subtotal				2,626		2,706		
Efficiency Factor - 30%				788		812		
Administration and Investigations TOTAL				**3,414**	**11.0**	**3,518**	**12.0**	

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Professional Standards								
Professional Standards	O-4	1	120	120	1	120	1	
Uniform Storage	Cl-5	2	60	120		120		
Training Record File Storage	F-4	4	16	64		64		
Community Service Officers	W-2	1	72	144	2	144	2	Future CSO added to patrol.
CSO Storage Closet	CL-5	2	60	120		120		
Division Subtotal				568		568		
Efficiency Factor - 30%				170		170		
Professional Standards TOTAL				**738**	**3.0**	**738**	**3.0**	
Youth Services Bureau								
Program Supervisor	O-2	0	143	0	1	0	1	
Interns	W-3	0	48	0	4	0	4	
Confidential Meeting Rooms	I-2	0	120	0		0		Sound Proof with recording equipment
Conference Table	B-1	0	18	0		0		
Files, Supplies	F-2	0	13.5	0		0		
Kitchenette	K-1	0	40	0		0		Includes microwave, pantry storage
Waiting Area			120	0		0		Separate entrance from PD lobby
Staff Restroom	T-4	0	64	0		0		1 unisex
Recording equipment room		0	80	0		0		
Storage Closet	CL-5	0	60	0		0		
Division Subtotal				0		0		
Efficiency Factor - 30%				0		0		
Youth Services TOTAL				**0**	**5.0**	**0**	**5.0**	Bureau eliminated from program

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Records								
Records Staff								
Police Records/Dispatch Supervisor	O-4	1	120	120	1	120	1	
Police Records Specialist	W-2	1	72	360	5	576	8	
Volunteer Work Station	W-4	1	24	24		24		
Light-Duty Desk Officer Station	W-4	1	24	24		24		
Public Reception								Separation from work area
Counter		2	25	50		50		
Cash Register		1	25	25		25		
Computer Station	W-4	1	24	24		24		
Reporting Counter								Separation from work area
Counter		1	25	25		25		Separation from main lobby
Live Scan Room	I-3	1	100	100		100		Off of Main Lobby
Interview Room	I-3	1	100	100		100		Off of Main Lobby
Copier Room								
Document Imaging Systems (2)		2	30	60		60		
Recycling Area		1	25	25		25		
Workstation	W-4	1	24	24		24		
LETS/CLETS Terminal	W-4	1	24	24		24		
Microfiche Reader	W-4	1	24	24		24		
Printer	W-4	1	24	24		24		
Files (in open work area)								
Records Files	F-4	6	16	96		96		
290/11590/Gang Registrants	F-4	2	16	32		32		
Warrants	F-4	2	16	32		32		
Leads Storage	SH-1	1	40	40		40		
Mail Trays		30	0.25	7.5		8		
Storage Room								
Supplies Storage		1	16	16		16		

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Storage Room - Continued								
Purged Document Storage		6	5.5	33		33		
Safe		1	12	12		12		
Briefing Supplies		1	16	16		16		
Forms	SH-4	3	12	36		36		
Restraint, Cite Books, Citations	F-2	3	13.5	40.5		41		
Microfiches/Small AV Storage	F-2	1	13.5	13.5		14		
"Times-2" Record Storage	F-4	4	9	36		36		
Subtotal				1,444		1,660		
Efficiency Factor - 30%				433		498		
Records TOTAL				**1,877**	**6.0**	**2,157**	**9.0**	
Dispatch								
Dispatch Staff								
Lead Dispatcher	W-1	1	80	80	2	80	2	Lead Dispatchers share single office
Public Safety Dispatcher	W-3	4	48	192	8	192	10	3 on-duty, one special Ops, 4th call taking
Public Safety Dispatcher Trainee Station	W-3	1	48	48		48		Outside of dispatch room
Monitor wall		1	40	40		40		Radio, Vestas, CAD, MAP, security camera screens
Dispatch Files, Supplies	F-2	3	13.5	40.5		41		
Work Counter	F-3	1	40	40		40		
Credenzas		4	15	60		60		
Dispatch Reference Books	SH-4	1	12	12		12		
Personal Storage Lockers	CL-2	18	2	36		36		
Break Room								Adjacent to Dispatch

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Break Room - Continued								
Kitchenette	K-1	1	40	40		40		Includes refrigerator, microwave, pantry storage, bottles/cans recycling
Table	S-2	2	15	30		30		
Staff Restroom	T-4	1	64	64		64		1 unisex
Chairs		1	8	84		100		
Pantry	P-1	0	20	0		0		
Radio and 911 Equipment Room		0	240	0		0		Include in Building Wide Space
Division Subtotal				767		783		
Efficiency Factor - 30%				230		235		
Dispatch TOTAL				**996**	**10.0**	**1,017**	**12.0**	
Staff Support								
Training Room								See EOC Above
Men's Locker Room								PD Only
Officer Lockers	L-1	67	12	804		804		74 police officers total - assume 90% men Locker size reduced
Cadet Lockers	L-3	4	2.75	11		11		6 Cadets - assume 60% men
Non-Sworn Lockers	L-2	15	5.5	83		83		~30 non-sworn total - assume 50% men
Dispatcher Lockers	L-3	5	2.75	13.75		14		Smaller due to additional lockers in the work area. 12 dispatchers - assume 40% men
Restroom Facilities	T-1	1.5	200	300		300		4 toilet stalls, 1 urinal, 2 lavs
Shower Facilities	T-5	3	80	240		240		Three showers with dressing area

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Staff Support - Continued								
Women's Locker Room								PD ONLY
Officer Lockers	L-1	22	12	264		264		74 police officers - assume 30% women Locker size reduced
Cadet Lockers	L-3	4	2.75	11		11		6 Cadets - assume 60% women
Non-Sworn Lockers	L-2	52	5.5	286		286		~30 non-sworn total - assume 80% women
Dispatcher Lockers	L-3	10	2.75	27.5		28		Smaller due to additional lockers in the work area. 12 dispatchers - assume 80% women
Restroom Facilities	T-2	1	150	150		150		3 toilet stalls, 2 lavs
Shower Facilities	T-5	2	80	160		160		Two Showers with dressing area
Sleeping Rooms		2	80	160		160		Small room with bunk bed, can be trainee rooms for Fire too.
Fitness Room		1	800	800		800		Eliminated from FD Program, share with FD
Break Room								
Vending Machines	V-1	2	15	30		30		
Kitchen	K-1	3	40	120		120		sink, microwave, refrigerator, toaster oven, counter, bottled water storage
Seating	S-2	12	20	240		240		Increased for both PD and Fire
Lounge Area		0	120	0		0		Eliminated from Program
Dry Cleaning Closet	CL-3	1	40	40		40		
Men's Staff Toilets	T-3	3	125	375		375		Shared with FD Admin include lockers
Women's Staff Toilets	T-3	3	125	375		375		Shared with FD Admin. include lockers

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Staff Support - Continued								
Subtotal				4,490		4,490		
Circulation - 20%				898		898		
Staff Support TOTAL				**5,388**		**5,388**		
Facility Support								
Public Lobby								
Lobby Area		1	400	400		400		
Seats for Waiting	S-1	8	15	120		120		
Standing Area/ Reception Line		8	6	48		48		
Reception Counter		1	25	25		25		
Public Telephones	-	0	14	0		0		None Anticipated
Pamphlet Rack	-	1	12	12		12		
Display Area	-	1	80	80		80		
Public Restrooms	T-2	2	150	300		300		
Large Conference Room	C-2	1	432	432		432		Shared Space with PD
Small Conference	C-1	1	180	180		180		Shared Space with PD
Interview Room (Soft)	I-2	0	120	0		0		See Records
Janitor Closet	J-1	4	50	200		200		Throughout Building
Computer and Networking Room								
System Administrator Workstation	W-2	1	72	72		72		
Work bench		1	25	25		25		
Network Racks		3	48	144		144		
Storage		1	16	16		16		
Electrical Room		1	225	225		225		
Mechanical Rooms		2	400	800		800		
Fire Alarm Room		1	80	80		80		
UPS Room		1	100	100		100		
Elevator		4	80	320		320		Two total

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Facility Support - Continued								
Stairs		6	120	720		720		Three total
Maintenance and Supplies		1	200	200		200		4 supply cabinets in a central location
Recycling Areas		1	150	150		150		
Subtotal				4,649		4,649		
Circulation -25%				1,162		1,162		
Facility Support TOTAL				**5,811**		**5,811**		
Fire Station No. 51 with Battalion Chiefs								
Station 51 Apparatus Bay and Support								
Apparatus Bay (2 Back-in bays)		2	1000	2000	9	2,000	9	20’ x 50’ back-in bays
Apparatus Bay (single deep, back-up)		1	540	540	3	540	3	BC Vehicle
Medical Clean Up	W-1	1	80	80		80		Stainless Steel sink with drain board for hands washing and equipment cleaning, Shower for backboard wash down, drying racks
Medical Supply Storage	CL-3	1	40	40		40		Small storage cabinet for medical supplies
Yard Storage		0	0	0		0		Included in Facility Support
Turnout Gear Room	-	1	144	144		144		16-turnout gear open metal storage lockers; continuous exhaust fan, floor drain, heavy duty shelving; wildland gear bags

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Station 51 Apparatus Bay and Support - Continued								
Work Shop Alcove	-	1	90	90		90		Work bench/shop area for vise, peg board, tool storage with large flat work surface, solvent tank, tool chest, storage cabinet, shop sink and 6LF for Hose storage.
Janitor Closet	J-1	1	50	50		50		Apparatus Bay cleaning supplies, Mop sink
Special Project Room	-	1	80	80		80		Room for assigned support duty such as turn-out, mask repair, hose repair, allows outsourced projects to be brought in house.
Subtotal				3,024	12	3,024	12	
Circulation -30%				907		907		
Apparatus Bay and Support TOTAL				**3,931**		**3,931**		
Station 51 Offices								
Station 51 Night Lobby		1	84	84		84		Small entry point for public; with seating adjacent to the public restroom. Counter separation between office and lobby
Station 51 Public Restroom	T-4	1	64	64		64		unisex, accessible near Lobby
Station 51 Office	O-4	1	120	120		120		Shared office space for 2-persons; provide space for lat-eral file cabinets (one drawer per company) copy machine and office supply storage, book shelving.

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Station 51 Offices - Continued								
Battalion Chief Office	W-1	3	80	240		240		Three work stations, Lateral file cabinets for three occupants, side table for 4
Subtotal				508		508		
Circulation -25%				127		127		
Station 51 Offices TOTAL				**635**		**635**		
Station 51 Living Quarters								
Kitchen		1	143	143		143		2-refrigerators; 2-shift pantries; 1-dish-washer; gas range/ oven with hood; large microwave; large double-bowl sink with disposer; prep sink at island; open to Dining Area
Dining Area	C-1	1	180	180		180		Seating for 6 persons; wall-mounted TV; open to kitchen; open to Day Room
Day Room		1	224	224		224		Seating for 6 with recliner chairs; entertainment center and book shelving; Open to Dining
Laundry Room	I-2	1	120	120		120		Service sink; countertop; janitorial supplies; mop rack; Washer/ Dryer
Firefighter Bedroom	O-3	4	132	528		528		4-separate bedrooms each containing 4-lockers, desk, chair, wall-mounted TV, 1 bed
Firefighter Bathroom, Accessible	T-5	1	80	80		80		Accessible restroom - shower, sink, toilet
Firefighter Bathroom	T-5	1	80	80		80		Restroom with shower, sink, toilet

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Station 51 Living Quarters - Continued								
BC Quarters	O-3	1	132	132		132		
BC Bathroom, Accessible	T-5	1	80	80		80		Accessible restroom - shower, sink, toilet
Fitness Room	-	0	0	0		0		Fitness room included in Staff Support
Subtotal				1,567		1,567		
Circulation -25%				392		392		
Station 51 Living Quarters TOTAL				**1,959**		**1,959**		
Ancillary Support - On-Site								
Patrol Bicycle Storage								Can share space with Motorcycle Garage
Bicycles		12	9	108		108		floor racks
Lockers	L-1	3	12	36		36		
Storage Cabinets/Shelving	SH-1	2	40	80		80		
Work Bench		1	50	50		50		
Motorcycle Garage								Can share space with Bicycle Patrol Storage
Motorcycle Parking		7	40	280		280		2 Motors are taken home at night, balance storage in motors garage.
Officer Locker	L-1	9	12	108		108		2 full time, nine part-time for events
Storage Cabinets/Shelving	SH-1	2	40	80		80		
Remote Radar Batteries	SH-1	2	40	80		80		
Work bench		1	50	50		50		oil check, fill tires, charging, platform lift
Kennels								
Kennels		2	32	64		64		2 for police K-9
Supplies Storage		1	60	60		60		
SWAT Storage								
Storage Cabinets/Shelving	SH-1	6	40	240		240		

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Swat Storage - Continued								
SWAT Van and Trailer		0	400	0		0		Store in parking area
CSI Storage								
Storage Cabinets/Shelving	SH-1	6	40	240		240		
CSI Panel Truck		0	200	0		0		Store in Parking Area
Subtotal				1,476		1,476		
Circulation -20%				295		295		
Ancillary Support - On-Site TOTAL				**1,771**		**1,771**		
Exterior Spaces - Some parking level, Some at street level.								
Evidence Loading Area		1	400	400		400		Adjacent to Property and Evidence
Bulk Marijuana Temporary Holding		2	50	100		100		In exterior storage units to avoid odors filtering into building through the mechanical system
Vehicle Inspection Area	-	1	400	400		400		Covered area with air, water, storage for windshield wipers, hoses, etc.
Parking								
Visitor Parking		0	350	0		0		All Visitor parking is off-site except ADA
Disabled Access Parking		4	500	2000		2,000		
Police Staff Parking		0	350	0		0		Limited, Use City parking above City Hall
Unassigned Vehicle Parking		0	200	0		0		
Police Patrol Vehicle Parking		18	400	7200		7,200	18	No Room for on-site vehicle growth
Police Unmarked Vehicle Parking		0	350	0		0	0	No Room for on-site vehicle growth
Trash Cans at Official Vehicle Parking Area		4	9	36		36		

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Exterior Spaces - Some parking level, Some at street level - Continued								
Site Development								
Landscaped Areas		1	0	-		0		Site Dependent
Outdoor Plazas		1	0	0		0		
Flagpole		1	50	50		50		
Staff Courtyards		1	400	400		400		Near lunch room
Patrol Ingress and Egress Points		2	600	1200		1,200		Minimum of 2
Entries								
Public Entry		1	200	200		200		
Staff Entry		1	200	200		200		
Patrol Entry		1	200	200		200		
Trash Dumpsters								
General Trash		1	200	200		200		
On-Site Fueling								
Above Grade fueling system		1	200	200		200		
Dispensing Area		1	400	400		400		
Emergency Power								
Emergency Generator		1	200	200		200		for24-hours min., 72 hours is ideal
Fuel Tank		0	400	0		0		Skid mounted tank
Exterior Spaces TOTAL				**13,386**		**13,386**		
Ancillary Support - Parking Level								4th Street?
Emergency Supply Storage Room		1	600	600		600		Conditioned room, secure from vermin. Emergency slights, kits, food, water, soups, coffee, IPhone Kits, Riot shields, extra gas masks, first aid supplies.

				2015		2040		
	Space Type	No. of Units	Area per Unit	Net Square Footage	No. of Staff	Net Square Footage	No. of Staff	
Ancillary Support - Parking Level - Continued								
Field Training Records		1	200	200		200		Conditioned room, secure from vermin. Limited Access
Marine Equipment Storage		1	100	100		100		Parts and accessories
Training Equipment Storage Room		1	200	200		200		Training dummy, mats, training materials, easels, tables and chairs, Phase Training Equipment,
Fleet Maintenance Storage								
Miscellaneous Storage		4	16	64		64		Tires?
Flares		4	16	64		64		
Large Evidence and Vehicle Storage		1	2000	2000		2,000		Moved from both DuBois and 4th street.
Homicide Evidence Storage		1	600	600		600		Moved from DuBois and other locations
Records Storage		1	600	600		600		Moved from DuBois
Message Board Trailer		1	200	200		200		Moved from street/ PD parking Lot
Radar Trailer		2	100	200		200		Moved from street/ PD parking Lot
ATV on Trailer		1	200	200		200		Moved from street/ PD parking Lot
Command RV		1	200	200		200		Moved from street/ PD parking Lot
Storage Trailer		1	200	200		200		Moved from street/ PD parking Lot
Humvee		1	200	200		200		Currently at 4th Street
Subtotal				5,628		5,628		
Circulation -10%				563		563		
Facility Support TOTAL				**6,191**		**6,191**		

B. PUBLIC SAFETY CENTER PROGRAM

SPACE STANDARDS AND COMPONENT DIAGRAMS

Space standards are developed using the area required for a function adding in the necessary space around the use for circulation. For instance, in determining the size of a lockeroom, each locker is counted plus the space in front of the locker to access it. This is a similar approach followed for each standard. Component diagram use space standards and expand them into room diagrams that graphically illustrate the equipment and furniture arrangements in each required space and are used to determine the room area requirements. Considerations include:

- Number of staff to occupy the space at any given time,
- Equipment size and operating clearances,
- Circulation within the space, and
- Furniture layout for efficient space use.



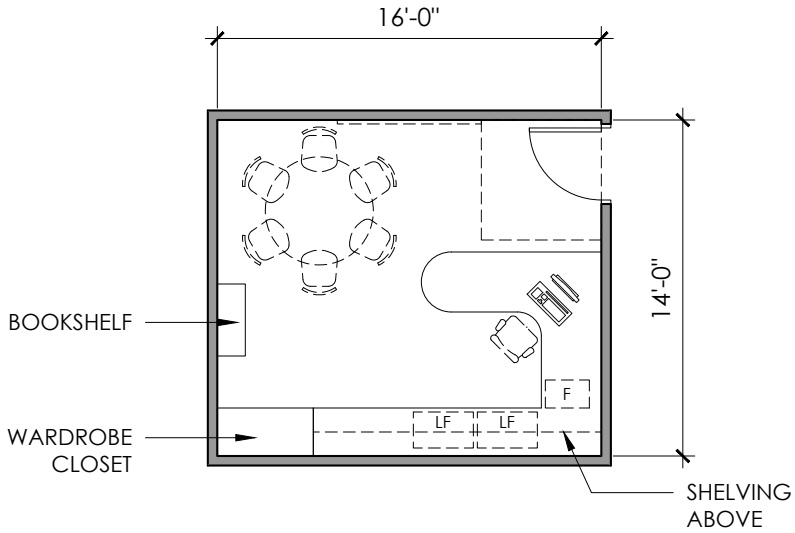

SPACE STANDARDS

Space Standard Category	Name/Type of Space	Space Categories	Standard Area (Sq. Ft.)	Comments/Approx. Dimensions
Offices	Office 1	O-1	224	14’ x 16’
	Office 2	O-2	143	11’ x 13’
	Office 3	O-3	132	11’ x 12’
	Office 4	O-4	120	12’-0” x 10’-0”
Workstations	Workstation 1	W-1	80	8’-0” x 10’-0”
	Workstation 2	W-2	72	8’-0” x 9’-0”
	Workstation 3	W-3	48	8’-0” x 6’-0”
	Workstation 4	W-4	24	4’-0” x 6’-0”
Conference Rooms	Seating		15 -25	Sq. ft. per occupant
	Conference 4	C-4	960	60 chairs
	Conference 3	C-3	400	20 chairs
	Conference 2	C-2	432	12 - 16 chairs
	Conference 1	C-1	180	8 chairs
Lecture/Training	Briefing/Training Room	B-1	18	Sq. ft. per occupant
Interview	Hard Interview	I-1	80	For 3 people
	Soft Interview	I-2	120	For 4 people
	Soft Interview - Small	I-3	100	For 4 people
	Multi-Purpose Room	I-4	80	
Files and Common Work Area	Letter Size File Cabinets	F-1	5	Sq. ft. each unit, 1’-3” x 4’-0”
	Lateral File Cabinets	F-2	13.5	Sq. ft. each unit, 1’-6” x 4’-0”
	Work Area	F-3	40	5’-0” x 8’-0”
	Times-2 Legal	F-4	16	Sq. ft. each unit, 4’-0” x 4’-0”
Shelving	2-Foot Deep Shelving	SH-1	40	2’-0” x 8’-0” + circulation
	4-Foot Deep Shelving	SH-2	56	4’-0” x 8’-0” + circulation
	High-density shelving	SH-3	0.16	1 s.f. per 6.4 l.f.. of storage
	Bookshelf	SH-4	12	1’-0” x 4’-0” + circulation
	Computer Rack	SH-5	36	4’-0” x 3’-0” + circulation
	Electronic Equipment Rack	SH-6	14	1’-7” x 3’-0” + circulation
Closets/Storage	Private Coat Closet	CL-1	8	2’-0” x 4’-0”

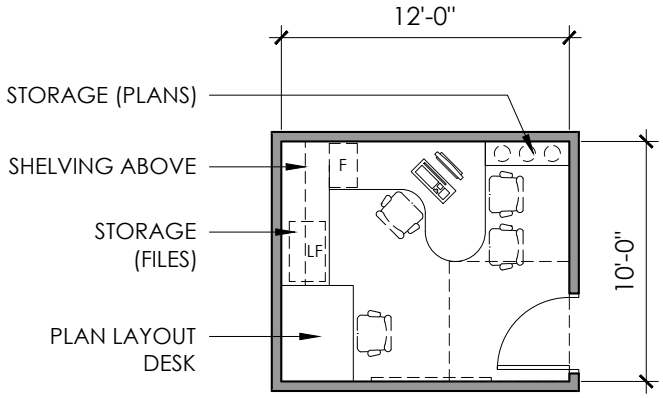
Space Standard Category	Name/Type of Space	Space Categories	Standard Area (Sq. Ft.)	Comments/Approx. Dimensions
	Unit Coat Closet	CL-2	2	2 sq. ft. per occupant, 2’-0” x 1’-0”
	Closed Storage Area	CL-3	40	Sq. ft.
Closet/Storage - Continued				
	Open Storage Area	CL-4	40	Sq. ft.
	Closed Storage Area	CL-5	60	Sq. ft.
Lockers	Officer Lockers	L-1	12	Sq. ft. each unit, 2’ x 2’ x 6’
	Staff Lockers	L-2	5.5	Sq. ft. each unit, 1’-0” x 2’-0” x 6’-0”
	Day Lockers	L-3	2.75	Sq. ft. each unit, 1’-0” x 2’-0” x 3’-0”
	Duty Bag Bins	l-3	3	
	Sleeping Area	L-4	60	
Janitor/Toilet/ Shower	Janitor’s Closet	J-1	50	Sq. ft. 6’-0” x 8’-0”
	Toilet 1	T-1	200	Sq. ft. - 4 stalls
	Toilet 2	T-2	150	Sq. ft. - 3 stalls
	Toilet 3	T-3	125	Sq. ft. - 2 stalls
	Toilet 4	T-4	64	Sq. ft. single occupancy
	Shower	T-5	80	Includes dressing area
Seating	Seating in Waiting Areas	S-1	15	
	Seating in Staff Lounges	S-2	15	
Lunch Room/ Support	Vending Machines	V-1	15	
	Kitchenette	K-1	40	
	Staff Pantry	P-1	20	

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  FIRE ADMINISTARTION



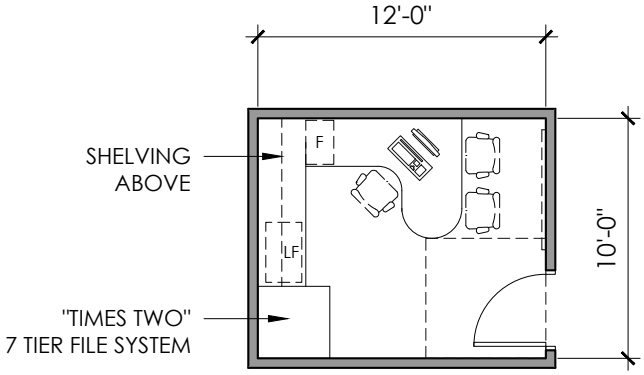
FIRE CHIEF OFFICE (224 S.F.)
SCALE: 1/8"=1'-0"



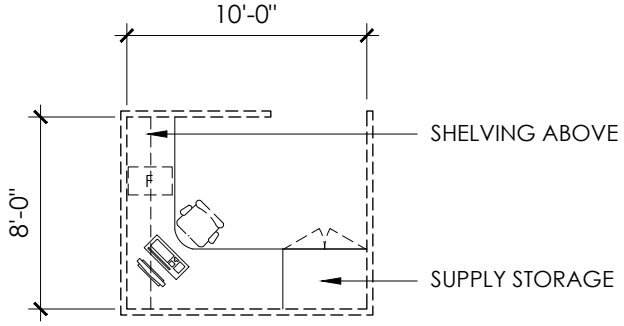
DEPUTY FIRE MARSHAL (120 S.F.)
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  FIRE ADMINISTARTION



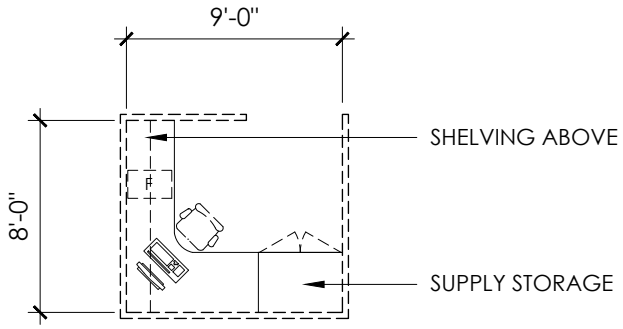
FIRE ADMINISTRATOR (120 S.F.)
MANAGEMENT ANALYST (120 S.F.)
SCALE: 1/8"=1'-0"



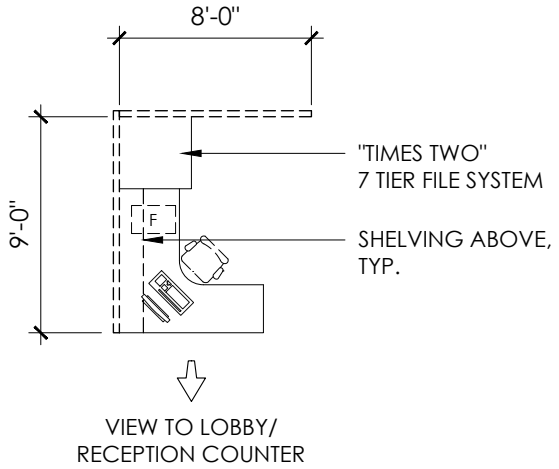
EMS COORDINATOR (80 S.F.)
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  FIRE ADMINISTARTION



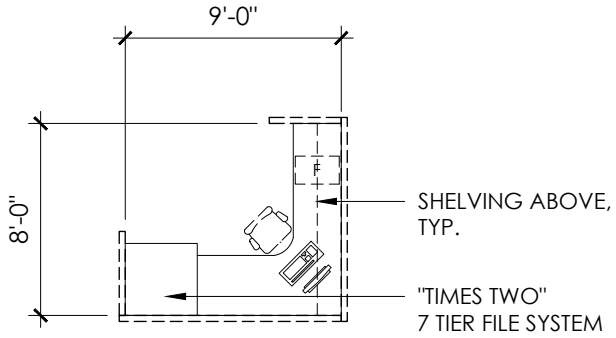
MEDICAL DIRECTOR (72 S.F.)
NURSE EDUCATOR (72 S.F.)
SCALE: 1/8"=1'-0"



ADMINISTRATIVE OPEN WORK AREA - 2 (144 S.F.)
SCALE: 1/8"=1'-0"

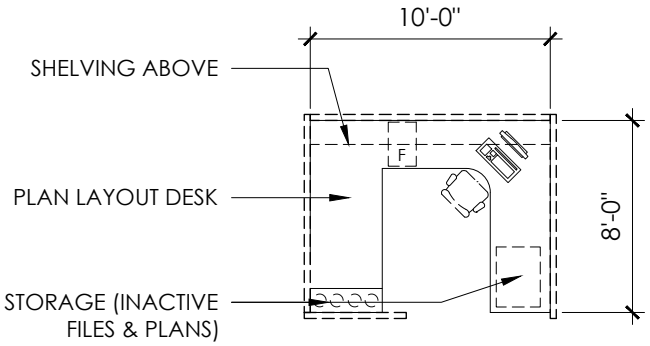
- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  FIRE ADMINISTARTION



EMS OPEN WORK AREA - 3 (216 S.F.)

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

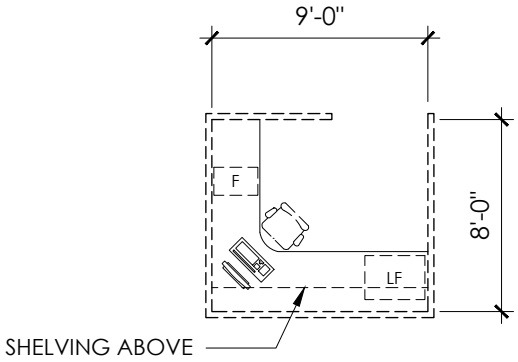


FIRE PREVENTION OPEN WORK AREA
FIRE INSPECTOR II - 2 (160 S.F.)

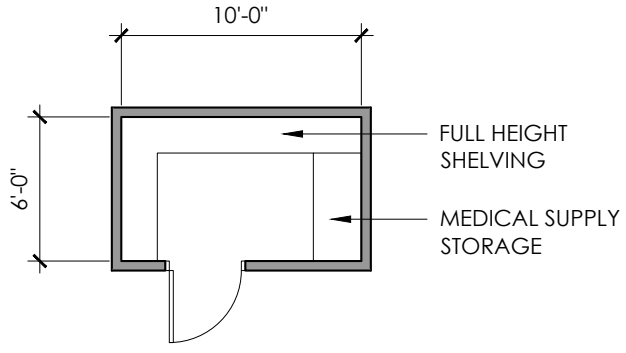
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  FIRE ADMINISTARTION



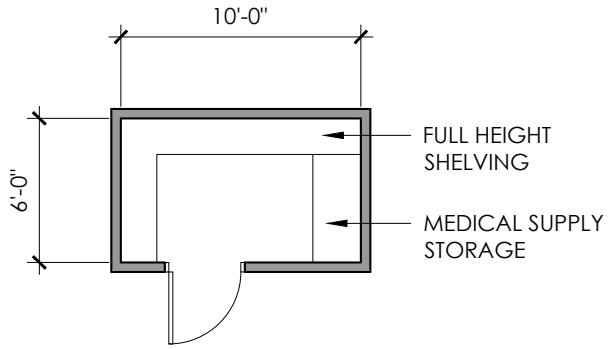
VEGETATION MANAGEMENT SPECIALIST (72 S.F.)
ENVIRONMENTAL MANAGEMENT COORDINATOR (72 S.F.)
FUTURE PUBLIC EDUCATION SPECIALIST OFFICE/STORAGE (72 S.F.)
SCALE: 1/8"=1'-0"



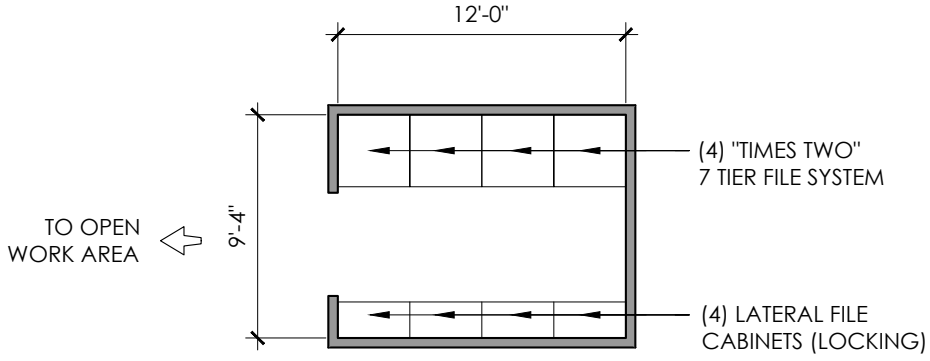
GENERAL STORAGE (60 S.F.)
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  FIRE ADMINISTARTION



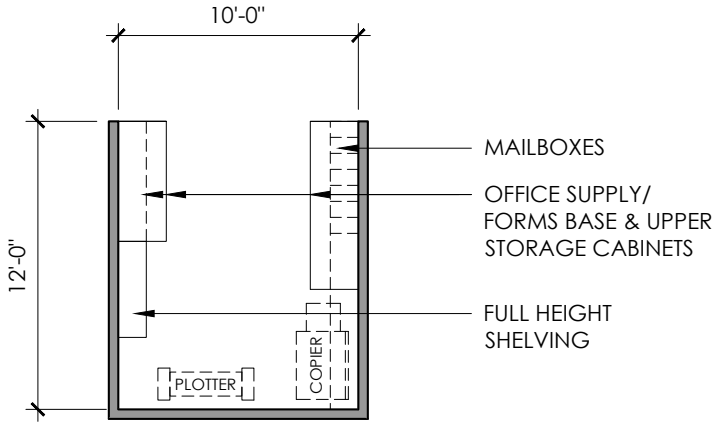
FIRE GENERAL STORAGE - SUPPLY (60 S.F.)
SCALE: 1/8"=1'-0"



FIRE ADMIN FILE STORAGE (112 S.F.)
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  FIRE ADMINISTARTION

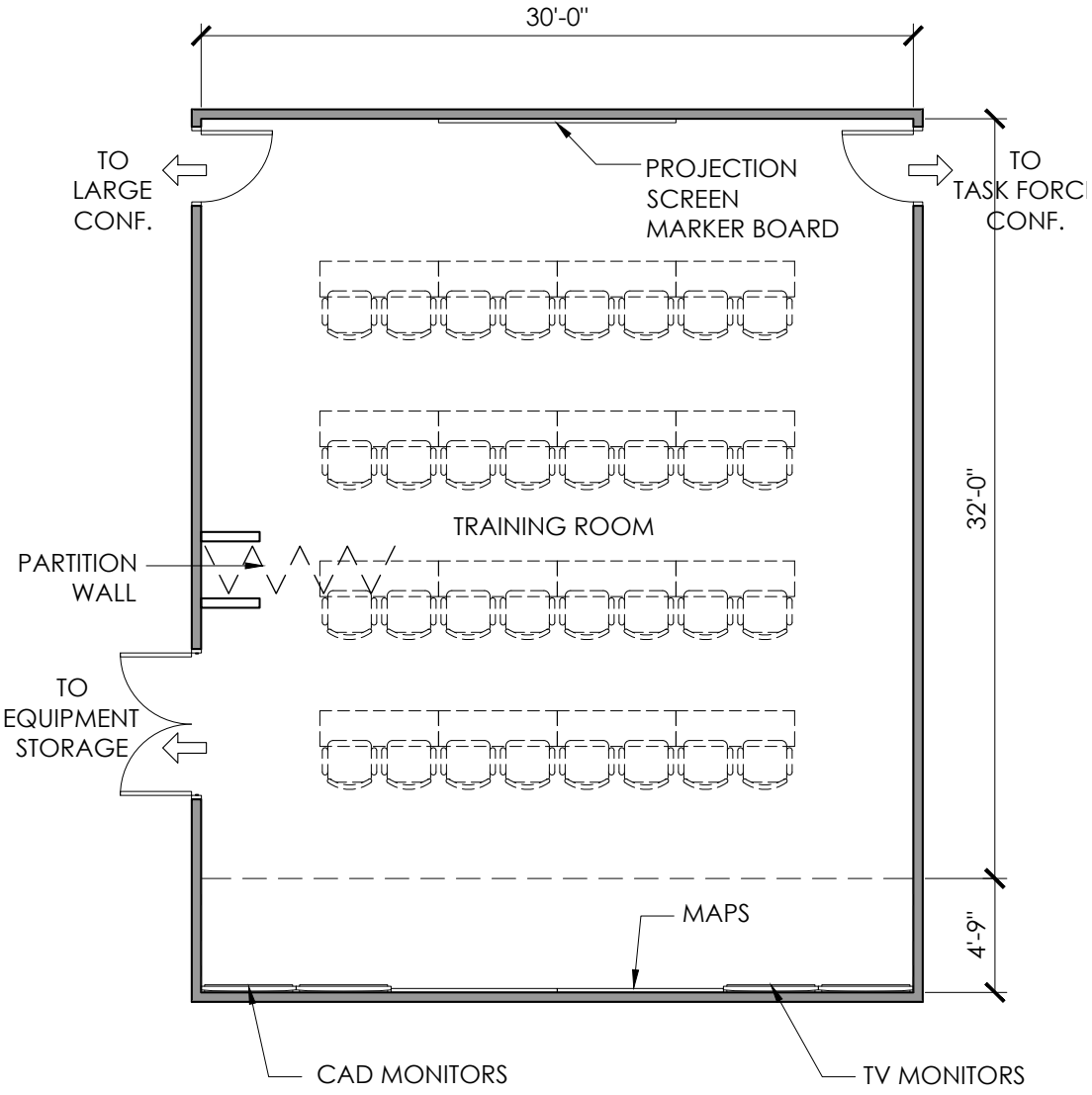


ADMIN WORKROOM/STORAGE (120 S.F.)

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

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  EMERGENCY OPERATIONS CENTER



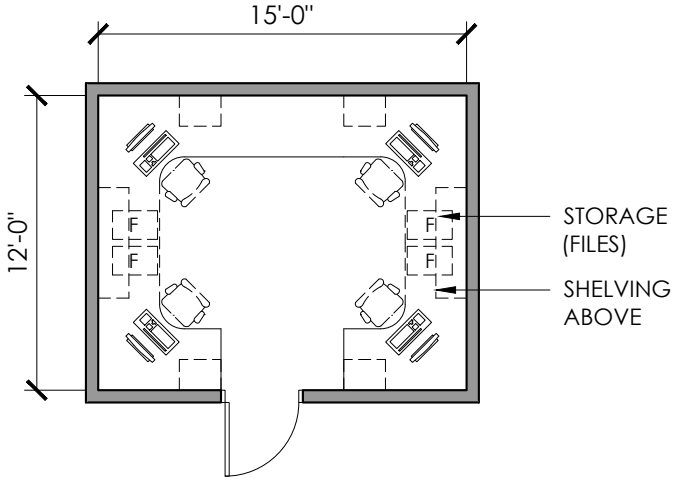
MAIN RESPONSE ROOM/TRAINING CLASSROOM (960 S.F.)

WALL MAP (144 S.F.)

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

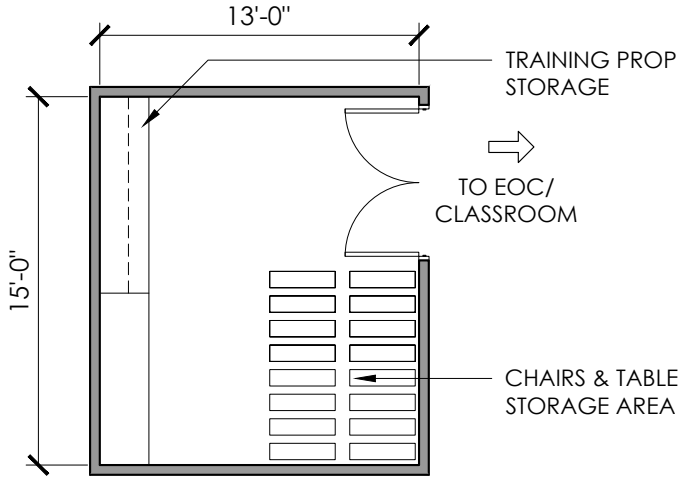
- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  EMERGENCY OPERATIONS CENTER



CALL TAKER ROOM, HAM RADIO (180 S.F.)

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

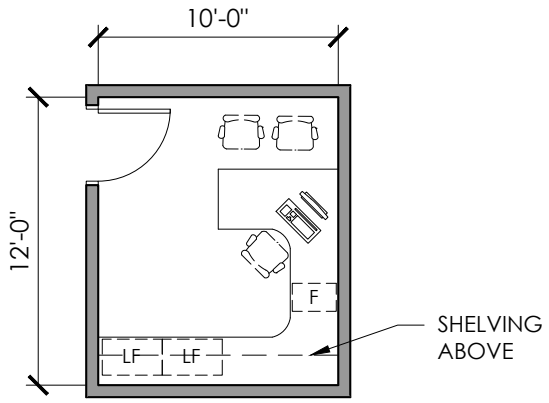


EQUIPMENT STORAGE (195 S.F.)

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

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  EMERGENCY OPERATIONS CENTER

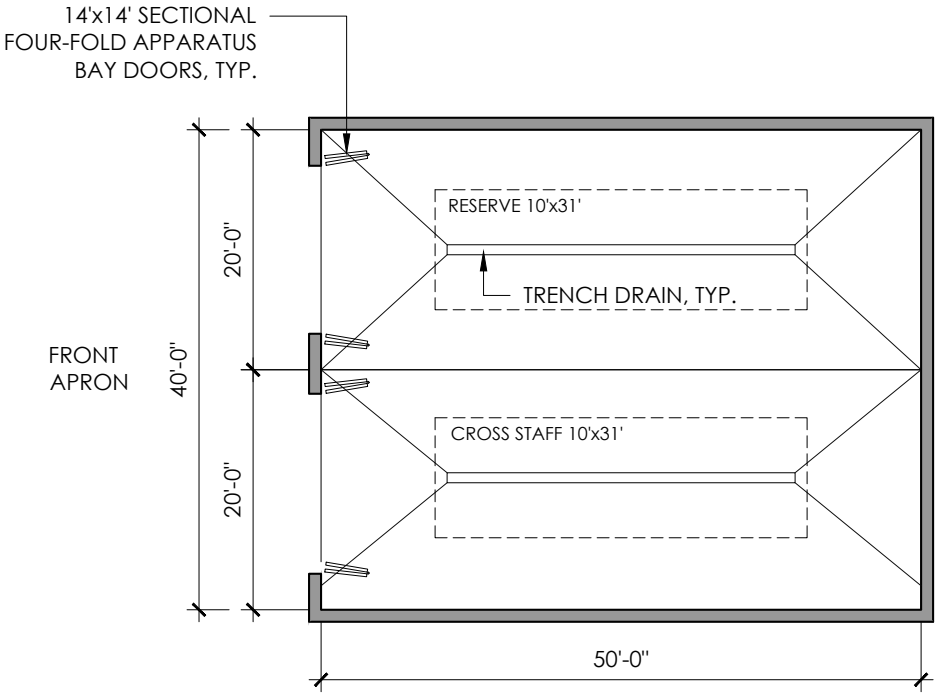


EOC COORDINATOR OFFICE (120 S.F.)

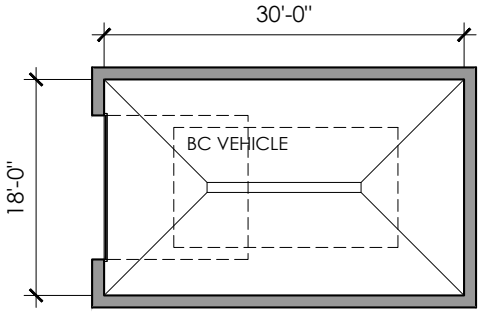
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  STATION - APPARATUS BAY/APPARATUS BAY SUPPORT



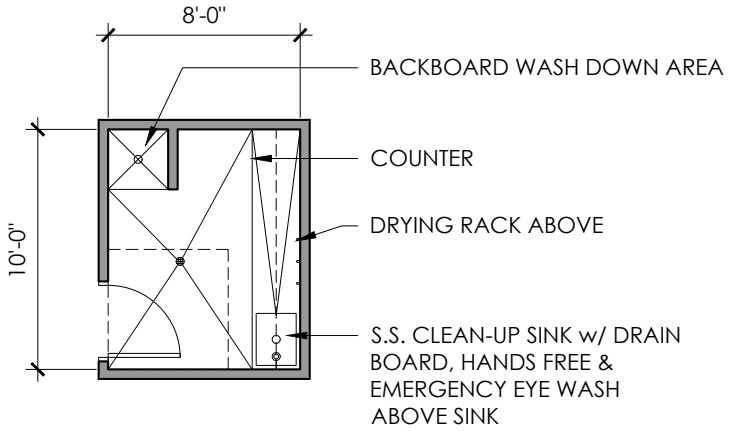
APPARATUS BAY (2,000 S.F.)
SCALE: 1/16"=1'-0"



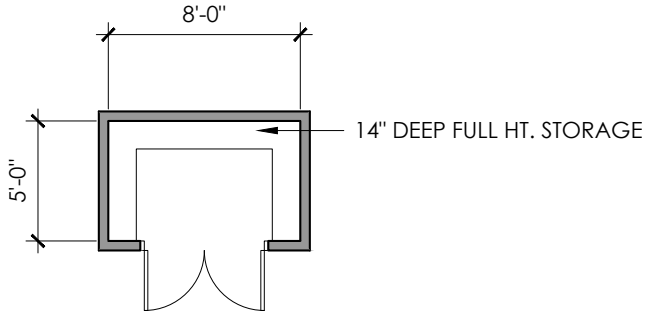
APPARATUS BAY - BC VEHICLE (540 S.F.)
SCALE: 1/16"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  STATION - APPARATUS BAY/APPARATUS BAY SUPPORT



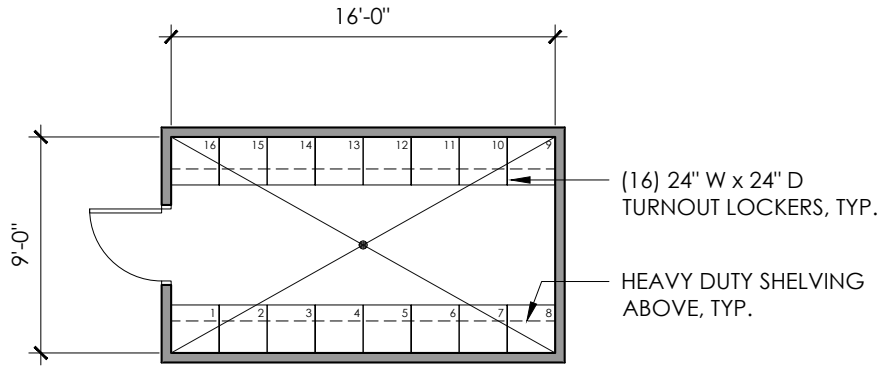
MEDICAL CLEAN UP (80 S.F.)
SCALE: 1/8"=1'-0"



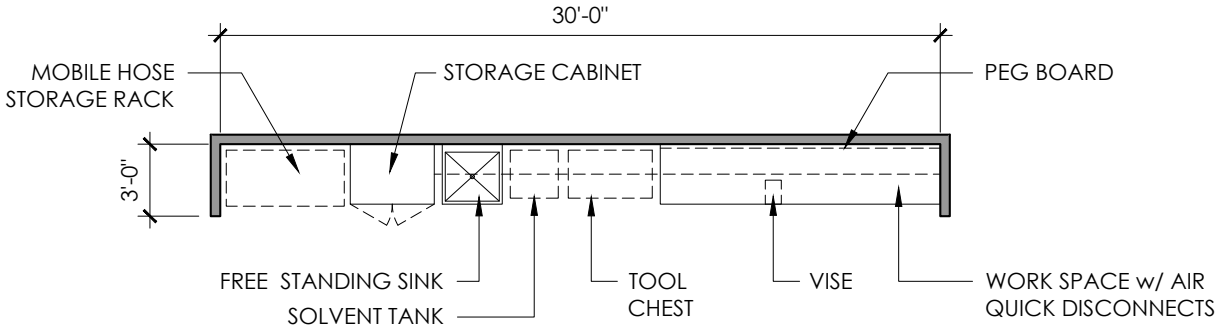
MEDICAL SUPPLY STORAGE (40 S.F.)
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  STATION - APPARATUS BAY/APPARATUS BAY SUPPORT



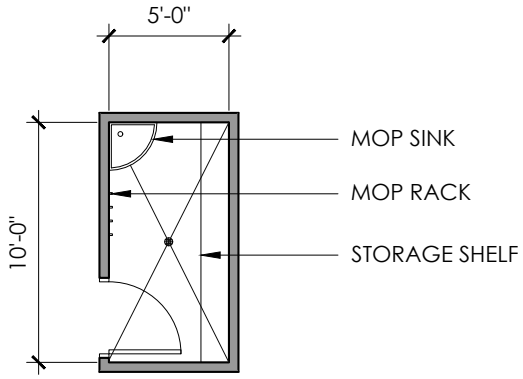
TURNOUT GEAR ROOM (144 S.F.)
SCALE: 1/8"=1'-0"



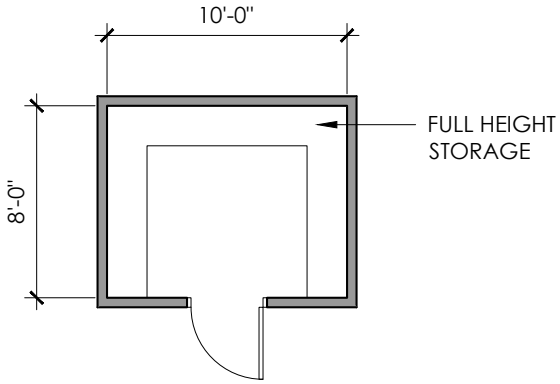
WORKSHOP ALCOVE (90 S.F.)
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  STATION - APPARATUS BAY/APPARATUS BAY SUPPORT



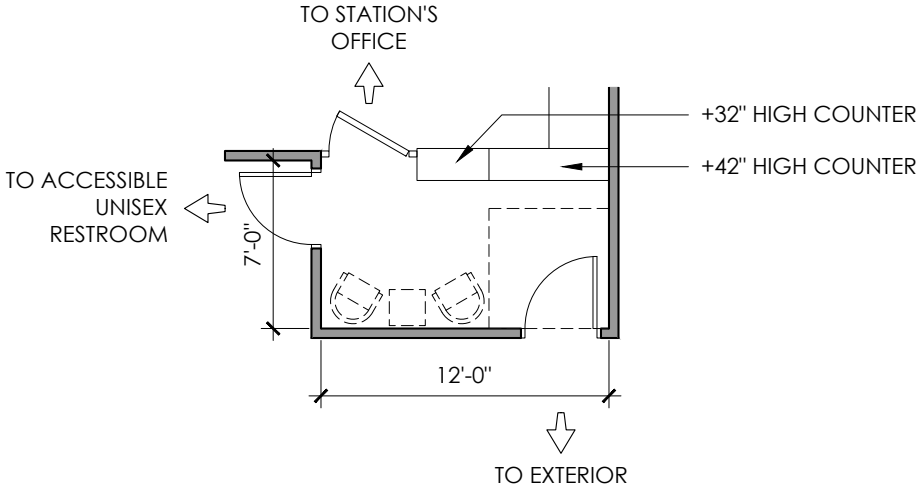
JANITOR CLOSET (50 S.F.)
SCALE: 1/8"=1'-0"



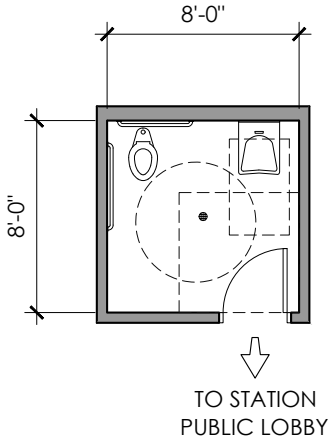
SPECIAL PROJECT ROOM (80 S.F.)
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  STATION - FIREFIGHTER OFFICES



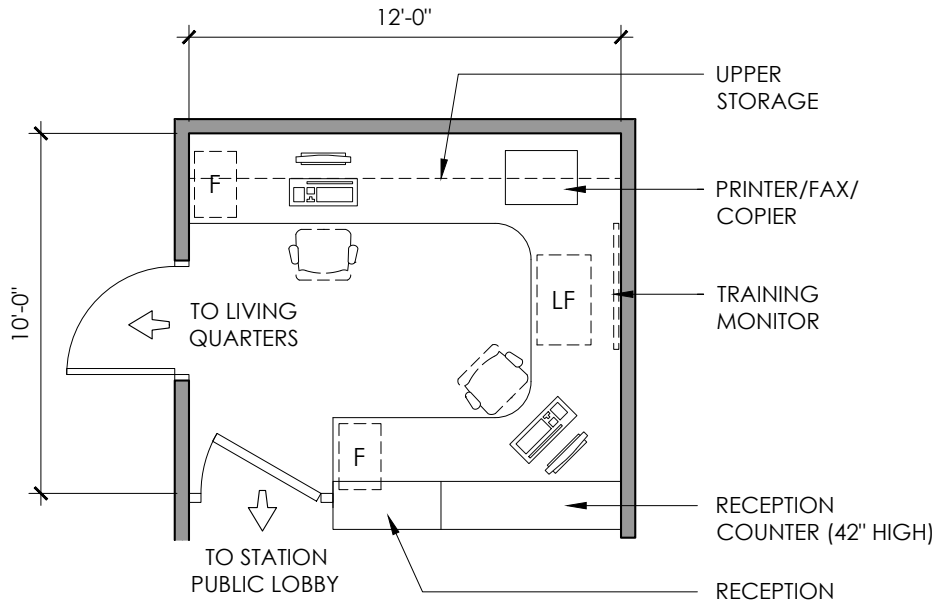
STATION NIGHT LOBBY (84 S.F.)
SCALE: 1/8"=1'-0"



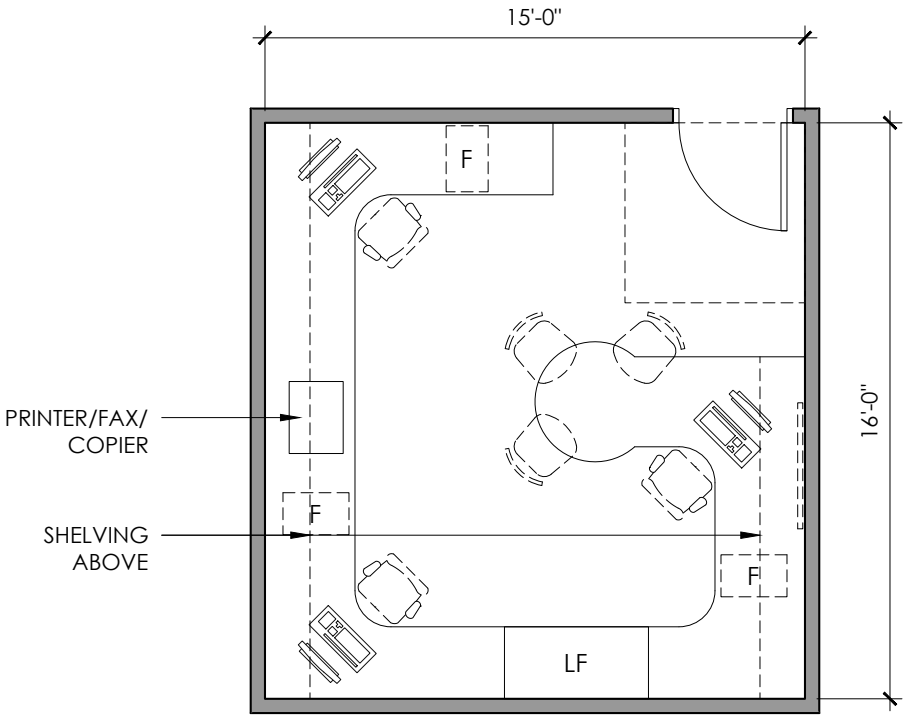
FS13 - STATION PUBLIC RESTROOM - UNISEX (64 S.F.)
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  STATION - FIREFIGHTER OFFICES



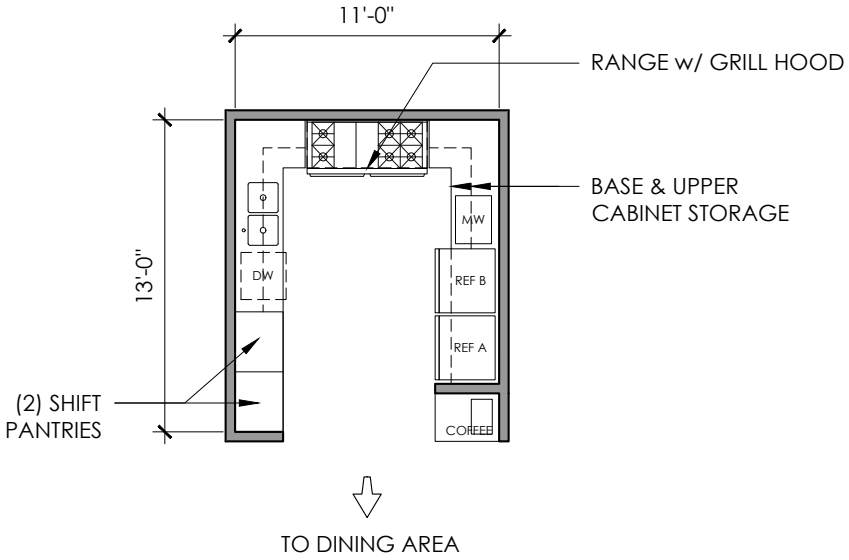
STATION OFFICE (120 S.F.)
SCALE: 3/16"=1'-0"



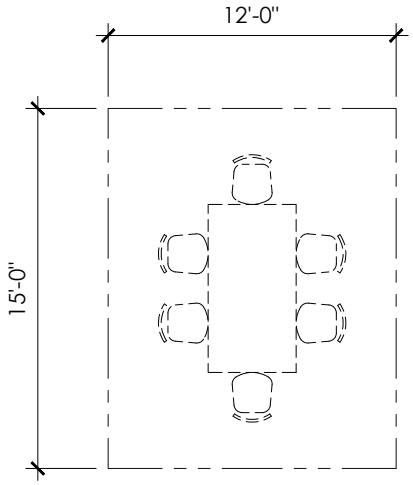
BATTALION CHIEF OFFICE (240 S.F.)
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  STATION - FIREFIGHTER QUARTERS



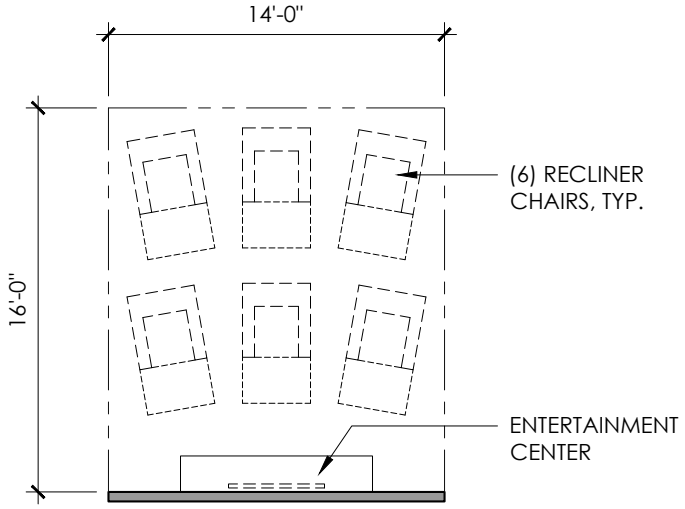
KITCHEN (143 S.F.)
SCALE: 1/8"=1'-0"



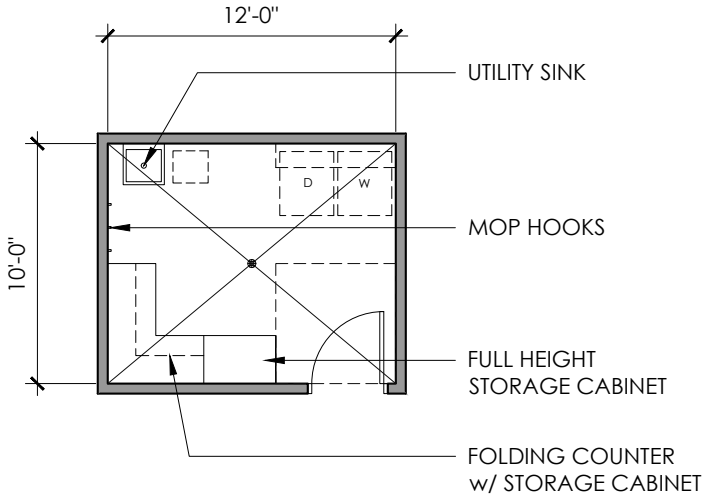
DINING AREA (180 S.F.)
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  STATION - FIREFIGHTER QUARTERS



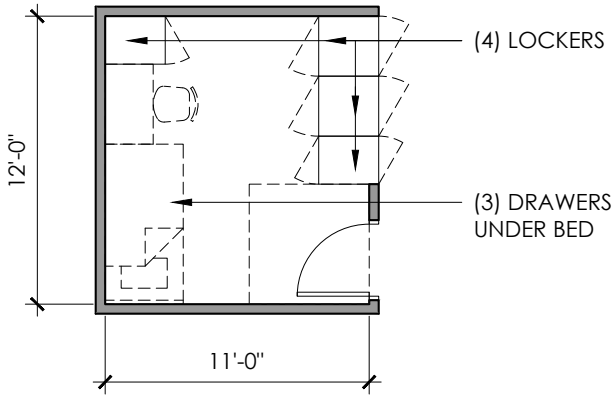
DAYROOM (224 S.F.)
SCALE: 1/8"=1'-0"



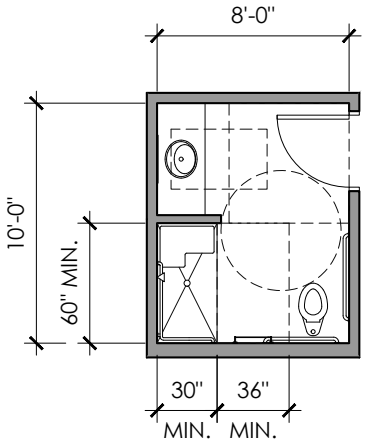
LAUNDRY ROOM (120 S.F.)
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  STATION - FIREFIGHTER QUARTERS



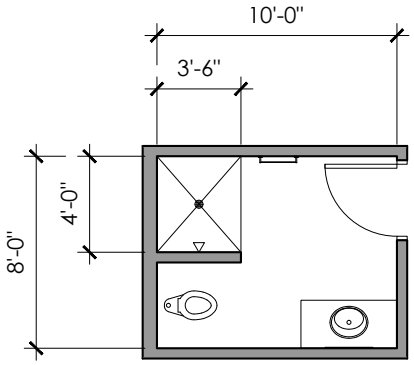
FIREFIGHTER BEDROOM - 4 (528 S.F.)
SCALE: 1/8"=1'-0"



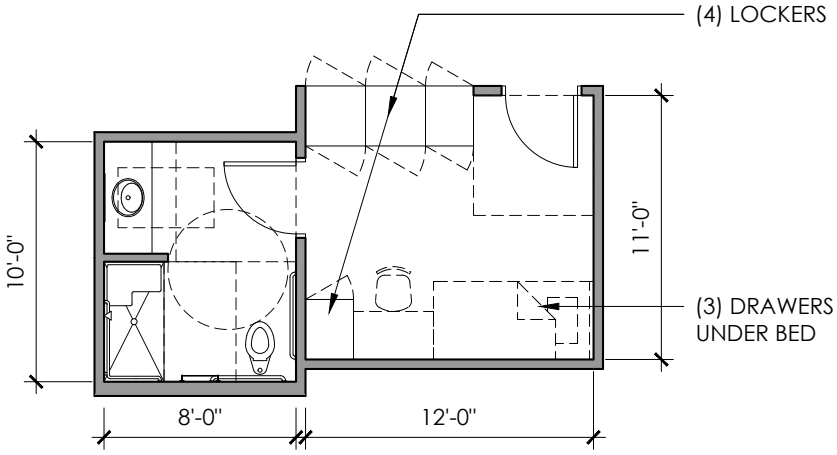
FIREFIGHTER BATHROOM, ACCESSIBLE (80 S.F.)
SCALE: 1/8"=1'-0"

- **COMBINED PD/FD - PUBLIC SAFETY CENTER**

  FIRE STATION No. 51
  STATION - FIREFIGHTER QUARTERS



FIREFIGHTER BATHROOM (80 S.F.)
SCALE: 1/8"=1'-0"



BC QUARTERS (132 S.F.)
BC BATHROOM, ACCESSSIBLE (80 S.F.)
SCALE: 1/8"=1'-0"

B. PUBLIC SAFETY CENTER PROGRAM

OVERALL PROJECT BUDGET

This section identifies an overall project budget based on the following items:

- Building and Site Construction Costs w/ Equipment and Furnishings,
- Design and other Related Fees,
- Administrative, Permit, Bidding Costs, and
- Project Contingencies.




Combined PD/FD - Public Safety Center

OVERALL PROJECT BUDGET

A. Construction with Contingencies and Escalation

	QUANT	UNIT	Cost per Unit	Total	Notes
Public Safety Center					
Replacement PSC	44,666	LS	$500	$22,332,819	Cost per square foot budget
On-Site Improvements (Fifth Street)	40,000	SF	$50	$2,000,000	Retaining walls, utility, Grading and Drainage, parking, fences and gates, landscaping.
Haz Mat Demo/Bldg. Demo	10,000	SF	$15	$150,000	Demolition of 4 existing buildings
Off-Site Improvements	1	LS	$250,000	$250,000	Allowance
Temporary Facilities	1	LS	$500,000	$500,000	FD to relocated during construction
Specialty Equipment	5%	%	$25,232,819	$1,261,641	Contractor Provided Equipment
Construction Subtotal:				**$26,494,460**	
Project Design Unknowns	15%	%	$26,494,460	$3,974,169	Allowance
Construction with Design Unknowns Subtotal:				**$30,468,629**	Project Allowance
Construction Contingency (10% of Construction)	10%	%	$30,468,629	$3,046,863	Allowance
Construction with Change Order Contingency Subtotal:				**$33,515,492**	Project Allowance
Project Escalation (5% per annum, compounded yearly)	12%	%	$33,515,492	$4,021,859	Annual rate to midpoint of Construction = 24 months (14 months design and 20 months construction)
Construction (Building Site, Equipment, Contingencies, Escalation):				**$37,537,350**	
Construction Cost per SF of Building Area:				**$1,112**	

B. Design and Other Related Fees

	QUANT	UNIT	Cost Per Unit	TOTAL	Notes
Design Fees (A, C, L, S, MEP) - BASIC ON-SITE	10%	%	$37,537,350	$3,753,735	A/E fees including entitlements

B. Design and Other Related Fees - Continued					
	QUANT	**UNIT**	**Cost Per Unit**	**TOTAL**	**Notes**
Off-site/Street Improvement Drawings	15%	**%**	$250,000	$37,500	design for off site improvements
Cost Estimating	1	**LS**	$35,000	$35,000	Estimate for each phase of development
Boundary and Topographic Surveys	1	**LS**	$25,000	$25,000	Includes recording map
Erosion Control Plan	1	**LS**	$7,500	$7,500	Per Bldg. Department Requirements
Waterproofing Consultant	1	**LS**	$30,000	$30,000	Consultant to City
Lighting Designer	1	**LS**	$30,000	$30,000	Optional
Head In Data, Phone, Response, Security, AV Consultant	1	**LS**	$75,000	$75,000	Consultant to City or Arch.
LEED Documentation	1	**LS**	$100,000	$100,000	Energy Modeling, LEED submittal and Tracking
Construction Management (5% of construction value)	5%	**%**	$37,537,350	$1,876,868	Day to day management during construction
Geotechnical Investigation	1	**LS**	$30,000	$30,000	Includes geohazards report
Haz Mat Study (Ground and (E) buildings)	1	**LS**	$30,000	$30,000	Study only
Environmental (CEQA) Documentation	1	**LS**	$50,000	$50,000	Assume Neg Dec.
Commissioning	1	**LS**	$50,000	$50,000	As Required for LEED Gold
Continuous Inspection, Testing During Construction	1	**LS**	$150,000	$150,000	Allowance
			Subtotal Design Fees:	**$6,280,603**	
Fee Contingency (5% of total Fees)	5%	**%**	$6,280,603	$314,030	Allowance
Reimbursables (5% of total Fees)	5%	**%**	$6,280,603	$314,030	Project Allowance
			Total Design and Other Related Fees:	**$6,908,663**	
C. Administrative, Permit and Bidding Costs					
	QUANT	**UNIT**	**Cost Per Unit**	**Total**	**Notes**
Administration Costs	-	**LS**	$0	$0	Assume none charged to project

C. Administrative, Permit and Bidding Costs - Continued					
	QUANT	**UNIT**	**Cost Per Unit**	**TOTAL**	**Notes**
Legal Fees	1	**LS**	$60,000	$60,000	Allowance
Building Permit Costs	1%	**%**	$37,537,350	$375,374	Per Building Department
Plan Check Fees	0.5%	**%**	$37,537,350	$187,687	Per Building Department
SWPP Fees (State Board Compliance)	1	**LS**	$5,000	$5,000	Allowance
Planning/Environmental Review Fees	1	**LS**	$40,000	$40,000	Allowance
Temporary Storage Costs	-	**LS**	$25,000	$0	Assume none required
Public Art	1	**LS**	$50,000	$50,000	Allowance
Specialty Equipment	3%	**%**	$24,332,819	$729,985	Allowance for Owner provided Equipment
Furnishings	5%	**%**	$22,332,819	$1,116,641	Allowance
Bidding/Printing (noticing, blueprints, etc.)	1	**LS**	$10,000	$10,000	Allowance
Moving Costs (one move)	1	**LS**	$15,000	$15,000	Allowance
Utility Fees - (PG&E, sewer, water, telecom, other)	1	**LS**	$250,000	$250,000	Allowance
Subtotal Administrative Costs:				**$2,839,686**	
Administrative Cost Contingency (5% of total Fees)	5%	**%**	$2,839,686	$141,984	Allowance
Total Administrative, Property, and Bidding Costs:				**$2,981,670**	

Division Totals:		
	Total	**Notes**
A. Construction with Contingencies and Escalation	$37,537,350	
B. Design and Other Related Fees	$6,908,663	
C. Administrative, Permit and Bidding Costs	$2,981,670	
Overall Project Budget:	**$47,427,683**	
Project Cost Per SF : $40,405,249/41,840 SF=	**$1,405**	

Exclusions:

1. Program Level Bond Management Fees

B. PUBLIC SAFETY CENTER PROGRAM

SITE ARRANGEMENT DIAGRAMS

These studies graphically illustrate the initial arrangement concepts developed through discussion with the Project Design Team. Considerations in each scheme include:

- Circulation to and from site,
- Visitor parking and pedestrian access,
- Site operations adjacencies and activities, and
- City of San Rafael planning ordinances




SITE/FIRST LEVEL LAYOUT

SCALE: 1:500

SITE/SECOND LEVEL LAYOUT

SCALE: 1:500

SITE/FIRST & SECOND LEVEL LAYOUT

SCALE: 1:500

VOLUME II. DETAILED FACILITY STUDY – PUBLIC SAFETY CENTER

EXISTING FACILITY ASSESSMENTS

FIRE STATION 51 – 1039 C STREET

Fire Station 51 is located at the corner of C Street and 5th Avenue in downtown San Rafael and serves the downtown and western portions of the City. Fire Station 51 was originally built in 1917, and as the oldest fire station in San Rafael has been upgraded several times, most recently in 1986 to its current size of 9,411 square feet. Fire Station 51 is a two-story facility that was initially designed before the Uniform Building Code. Beyond seismic and building system obsolescence, renovation of the structure would be significantly hampered by the fact that the first floor has many levels and the second story is without code required exiting or accessibility elements.

The station serves as the headquarters and administration for SRFD. The administrative offices, originally built to accommodate a smaller number of employees, are overcrowded and do not fulfill the needs of the department. The Fire Prevention Bureau and clerical staff squeeze into cubicles designed for half as many personnel and these functions occur on two different levels within the same space without accessible ramps or lifts. The conference room doubles as records storage, and is lined with file cabinets. Members of the public who visit the offices find that there is little space available for activities such as plan checks.

Due to the station's construction date many aspects of the building are not code compliant and would require updating that would render the station unusable from a spatial standpoint. As noted above, Fire Station 51 is built on a sloping site and has many stair transitions throughout the building interior. Meeting accessibility requirements with transitions between the three levels would utilize a significant amount of floor space rendering the station mostly unusable for fire suppression and protection services. Additionally, the second floor does not have a code compliant stair or a code compliant second exit for the second floor. The facility is not served by an elevator which would be required in any renovation. Adding two stairs and an elevator would take up more necessary operational area. There is not space on the site to add either and maintain current operations. In addition, the station lacks insulation and has single glazed windows. The outdated electrical and plumbing systems, poor air conditioning system, and inefficient single glazed windows result ineffective work environments, potential safety hazards and costly maintenance and repairs.

In addition to obsolete seismic and building systems, the fire station layout lacks spaces necessary to support a modern work force. Spaces lacking but required for firefighter safety include dedicate turnout storage, medical clean up and medical supply storage, and a dedicated fitness room. The station also lack privacy necessary to support a diverse workforce including private sleeping and bathing facilities for female firefighters.

At 98-years-old, this station is beyond modernization and is at the end of its life-cycle.

Primary deficiencies include:

- Even with renovation in the 1980s, the station remains seismically unsafe and has failing structural systems. The Essential Services Building Act, enacted in 1990, outlines that "It is the intent of the Legislature that

essential service buildings, which shall be capable of providing essential services to the public after a disaster, shall be designed and constructed to minimize fire hazards and to resist, insofar as practical, the forces generated by earthquakes, gravity, and winds." This facility was assessed in 2003 and then again through this study. Both assessments concluded that, structurally, Fire Station 51 has significant dry rot damage, differential settlement of perimeter walls, water damage, and seismic cracking. Repairing these deficiencies while updating the facility to meet current seismic code would be cost prohibitive compared to providing a new facility.

- Fire Station 51, as currently exists, is built on a sloping site and has many stair transitions throughout the building interior. Meeting accessibility requirements with transitions between the three levels would utilize a significant amount of floor space rendering the station mostly unusable for fire suppression and prevention services.
- The second floor does not have a code compliant stair or a code compliant second exit for the second floor. There is not space on the site to add either and maintain current operations.
- Fire Station 51 does not have an elevator which would be required in any significant upgrade and there is no site area to provide one.
- The current apparatus bays openings are not large enough to accommodate a fire truck. A fire truck at this location will provide a key response improvement in the downtown response area and in the proposed Public Safety Facility program.
- The fire station layout lacks basic operational spaces required to accommodate todays firefighting operations and a modern workforce.
- The existing plumbing systems in the building are mostly original and are nearing the end of their service life. The existing fixtures are outdated and are not water-conserving fixtures.
- The mechanical systems in both the fire station and the administrative areas are greater than 15 years old, are not energy efficient and have outlived their average service life and would require complete replacement.
- The building is not supported by a fire alarm system nor is it protected by fire sprinklers. These would need to be added.
- The communications room is installed under a significant plumbing route and there have been ongoing issues with plumbing line leaking on to sensitive data equipment. It would need to be relocated.

Supporting Documents including a detail seismic analysis, mechanical, electrical and plumbing assessments follow in the attached appendix.

San Rafael Strategic Plan Tier 1 - Fire Station No. 51
Structural Review and Conditional Assessment
Prepared by Cornerstone Structural Engineering Group
Dated: June 23, 2015

Basis of Design Narrative - Fire Station 51
City of San Rafael - Essential Facilities Strategic Plan
MEP Review and Conditional Assessment
Prepared by Interface Engineering
Dated: June 22, 2015

CITY HALL – 1400 5TH AVENUE

City Hall is a 26,500-square-foot structure that was originally constructed in 1965. The building was originally designed using the 1964 Uniform Building Code. The facility consists of the main building which is occupied by the city offices and police station and the council chambers building that is constructed to the west of the main building. The main building and council chambers are connected at the second floor level of the main building by a 1,100-square-foot lobby. The design of this facility is shown on the architectural drawings prepared by San Rafael Architects Associated and the structural drawings prepared by Engle and Engle, Civil and Structural Engineers. The drawings are dated April 19, 1965. The building is of mixed concrete and reinforced masonry construction.

The building, when studied in 2003, was found to be in "fair" condition seismically and is "likely to survive a major earthquake with moderate damage". The most recent renovation was to the first floor police area primarily to install an energy efficient HVAC system. It was also intended to improve the safety of the lobby and create new locker spacing for both male and female officers and staff. In addition to the newer locker and restrooms the space includes a group of private and open office spaces, meeting rooms and storage. Modular trailers and storage units have been added in the parking lot to support the police operations.

As a part of this Essential Facilities Strategic Plan process one option included an evaluation of upgrading the City Hall building and adding an annex in the east parking lot area to accommodate the Police Department programmed needs. It was determine that the entire City Hall building would require a seismic upgrade and new fire sprinklers to house the SRPD in just a small portion of it. The added cost to the Measure E program to upgrade City Hall to meet only a portion of the Police Department need did not make sense. It was reaffirmed that the Measure E funds were dedicated to providing seismic safe essential facilities and the cost to update City Hall was not necessarily part of that mandate. Also, the cost to upgrade the entire City Hall and add an approximately 25,000-square-foot annex was significantly more than it would cost to build a new police station across the street and this option was consequently eliminate. The first floor area of City Hall will become available to other City functions once the new Public Safety Center is completed. However, the new users have not yet been identified and the scope of needed adjustments has not been defined. The budget range is a placeholder until additional programming takes place.

APPENDIX

San Rafael Strategic Plan Tier 1 - Fire Station No. 51
Structural Review and Conditional Assessment
Prepared by Cornerstone Structural Engineering Group
Dated: June 23, 2015

Basis of Design Narrative - Fire Station 51
City of San Rafael - Essential Facilities Strategic Plan
MEP Review and Conditional Assessment
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Dated: June 22, 2015




CORNERSTONE
structural
engineering
group

San Rafael Strategic Plan Tier 1 - Fire Station No. 51

City of San Rafael
San Francisco, CA

Structural Review and Conditional Assessment FINAL DRAFT

June 23, 2015

Structural Engineering • Construction Services • Engineering Solutions • Project Management

40 Federal Street
San Francisco, CA 94107
tel (415) 369-9100
fax (415) 369-9101

CORNERSTONE
structural
engineering
group

www.cseg.com

June 23, 2015
2015014.11

Mary McGrath Architects
505 17th Street, 2nd Floor
Oakland, CA 94612

Attention: Mary McGrath

Subject: San Rafael Strategic Plan – Fire Station No. 51
Tier 1 Structural Assessment of Public Safety Facilities
San Rafael, CA

Dear Mary

Cornerstone Structural Engineering Group would like to present this initial structural assessment report for the subject project. In accordance with our proposal, we have performed a structural review and seismic risk assessment for the existing Fire Station Building No. 51 in San Rafael. This report contains the evaluations of the two-story cast-in-place concrete and wood frame building with shear walls originally constructed in approximately 1915.

We completed a site visit in March 2015, and have reviewed the available structural plans. This review includes a Tier 1 ASCE 31 seismic evaluation for Immediate Occupancy in addition to a conditional assessment of the buildings. The Tier 1 assessment includes a general review of the vertical and lateral systems of the structures.

The following report describes the findings of our structural review and seismic risk assessment for the buildings. We have included information on the performance of the buildings in a code-level earthquake.

Sincerely,
CORNERSTONE STRUCTURAL
ENGINEERING GROUP, INC.

Thomas L. Swayze, S.E.
Principal

40 Federal Street
San Francisco, CA 94107
tel (415) 369-9100
fax (415) 369-9101

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PART 1: INTRODUCTION

The following represents a general structural conditional and seismic assessment of the existing Fire Station No. 51 located in San Rafael, California. Fire station 51 is a two story concrete and wood framed structure on a sloping site in downtown San Rafael. There are two apparatus bays within the station and one additional bay exiting to 5th Avenue that was added at the rear of the station in 1986. The original construction is from approximately 1915.

Figure 1: Station 51

A site visit was performed on March 20, 2015 to observe the existing structural conditions of the fire station building.

The report conclusions are limited by the availability of as-built construction documents and by the level of access possible for the observation of the building. This report describes the findings of our structural review, and provides recommendations for seismic upgrade and conditional structural repairs as applicable.

PART 2: SEISMIC PERFORMANCE EVALUATION

2.1 *Methodology*

The potential damage to a structure in an earthquake can be evaluated provided that, (1) seismic hazards which affect the structure and site can be estimated and, (2) the vulnerability of the structure to those hazards are known or can be estimated.

Seismicity of the fire stations was determined using the United States Geologic Survey (USGS) web based Seismic Hazard Curves, Response Parameters and Design Parameters program. Seismic short period S_S and one second S_1 response acceleration parameters were obtained using latitude and longitude coordinates of the fire station location.

Seismic evaluations of the buildings were conducted using the ASCE 31-03 – Seismic Evaluation of Existing Buildings. The ASCE 31 provides a three-tiered process for seismic evaluation of existing buildings based on building type and the level of seismicity for the building location. The Tier 1 study is an initial checklist evaluation of structural, non-structural and foundation/geologic hazard elements of a building and site conditions that is intended to screen for potential seismic deficiencies. Tiers 2 and 3 studies are more in-depth analysis procedures for a building or component that is identified by the Tier 1 screening process as structurally deficient.

This assessment of the fire station building utilizes the Tier 1 screening procedure to identify deficiencies as possible with the information available.

2.2 *Performance Level*

ASCE 31 evaluation of a building can be performed for either Life Safety (LS) or Immediate Occupancy (IO) performance level.

ASCE 31 generalizes the two performance levels as follows:

- LS Performance Level: At least some margin against either partial or total collapse remains, and that the overall risk of life-threatening injury as a result of structural damage is expected to be low.
- IO Performance Level: After an earthquake, the basic vertical and lateral force-resisting systems retain nearly all of their pre-earthquake strength, very limited damage to structural and non-structural components has occurred and that critical parts of the building are habitable.

The fire station building was evaluated using the Immediate Occupancy (IO) performance level criteria.

2.3 *Seismic Source*

The general seismicity in the San Francisco Bay Area is influenced by several known faults, their potential faulting length, and relative orientation. The San Andreas Fault system, which separates the North American plate from the Pacific plate, is located approximately 15 km west of the fire stations. Other known, nearest-site faults with recorded activity, such as the Hayward Fault are listed in Table 1.

Recent earthquakes in Southern and Central California – namely Coalinga, Whittier Narrows, and Northridge – have occurred along blind-thrust faults. These faults do not have readily identifiable surface features and are not extensively mapped. The potential for strong-ground motion to occur due to blind-thrust faulting in Northern California is somewhat in doubt. However, a moderate to large earthquake centered even closer to the site cannot be completely ruled out.

Distance (km)	San Andreas Fault [Type A]	San Gregorio Fault [Type B]	Hayward Fault [Type A]
Estimated MCE (M_W)	**7.1**	**7.2**	**6.4**
Station 51	14.6	15.8	13.7

Table 1: Active Near Source Faults

Based on the 2008 USGS mapping, the 475-year peak ground acceleration (PGA) for the site is 0.500g. The 475-year earthquake is the design basis for a standard structure in the California Building Code (CBC) and is based on a 10 percent probability of exceedance within a 50 year time frame.

The calculated site specific S_{DS} and S_{D1} response acceleration parameters for the fire station are 1.0 and 0.60 respectively and use a site soil classification D per USGS Soil Type and Shaking Hazard in the San Francisco Bay Area Map. Based on S_{DS} and S_{D1} values, ASCE 31 categorizes the seismicity of the fire station as 'High.'

2.4 *Liquefaction, Landslide, and other Geologic Hazard*

Currently published California Geological Survey (CGS) liquefaction hazard zone maps do not include this part of California yet. According to the Association of Bay Area Governments Earthquake Liquefaction Susceptibility maps, the fire station is located

within a 'Low' zone for liquefaction, see Figure 5. Liquefaction is the loss of bearing strength of saturated, cohesionless soils under strong ground motions, which can cause building settlement by consolidation of soils susceptible to liquefaction. Based on the hazard maps and a cursory knowledge of the soils in the area, the potential for liquefaction due to strong ground motions at station 51 is considered to be low.

The building is situated on various kinds of sites within a developed area. The potential for seismically induced landslide is therefore considered to be minimal. Currently published CGS maps for landslide vulnerability do not include this area yet.

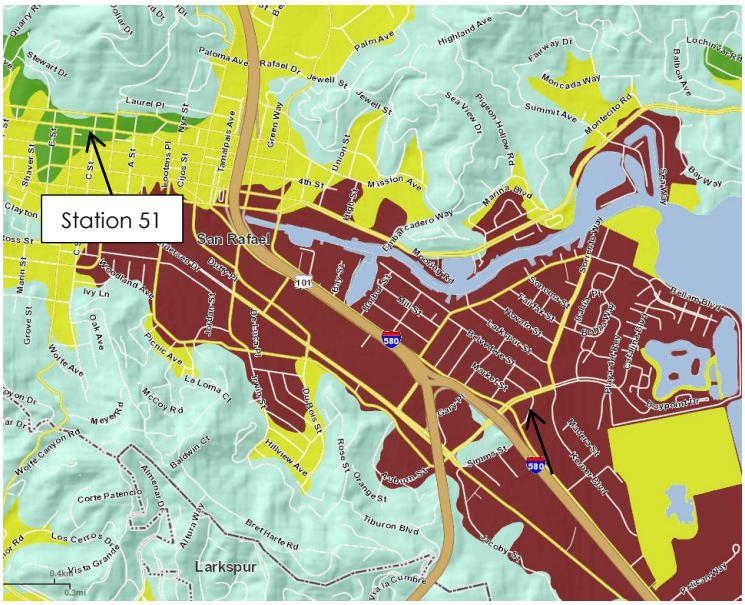


Figure 2: Association of Bay Area Governments Earthquake Liquefaction Susceptibility Map – Very High (Maroon) & Low (Green)

The fire station is not located within a Special Study Zone as defined by the Alquist-Priolo Earthquake Fault Zoning Act. The potential for surface fault rupture is considered to be low.

It should be noted that a more thorough explanation of site seismicity, liquefaction and specific faulting hazards should be provided by a geotechnical engineer. The conclusions above rely on general USGS & CGS published data for the San Francisco Bay Area.

PART 3: STRUCTURAL EVALUATION

3.1 *Evaluation*

An ASCE 31 Tier 1 seismic evaluation of the fire station was performed using the Immediate Occupancy performance level. The building was evaluated for Basic Structural (Sec. 3.7), Supplemental Structural (Sec. 3.7S) and Geologic Site Hazard and Foundation (Sec. 3.8) checklists. This report does not evaluate the buildings for the Nonstructural (Sec. 3.9) checklist, which is typically performed by an Architect or other qualified professional.

3.2 *Documentation*

No original written documentation available for the 1915 construction or subsequent remodels.

- Plans from a 1986 modernization are available. Structural Drawings by Robelo/Kocjan Associates from Redwood City. Sheets FS1-FS5. Drawings dated March 19, 1986.

The information provided within this report regarding the buildings is based on field observation and review of available as-built drawings.

3.3 *Vertical Load Systems*

Note this data is based on previously issued conceptual framing plans from an evaluation report performed in 2002 and from the 1986 modernization plans.

- The upper roof and second floor framing likely consists of 3/4 inch straight sheathing over wood framing and wood and steel beams. The original apparatus bay appears to have cast-in-place concrete wall construction (possibly with encased structural steel columns and beams) surrounding the apparatus bay with a concrete slab on grade.
- The one story low wing on the north was added after the original construction and appears to be wood framed with wood framing and straight sheathing. This section of the building appears to be supported on mostly wood framed studwalls and likely founded on conventional spread footings. There appear to be some existing concrete walls in this area from the 1986 drawings. There is a raised wood framed floor at the ground level
- The apparatus bay at the rear of the station (1986 addition) and the small bay on the south side of the building appear to have been added after the original construction. The south wing consists entirely of wood frame construction likely on conventional spread footings, while the rear bay consists of wood roof framing on CMU (Concrete Masonry Unit) walls, likely on conventional spread footings

3.4 *Lateral Load System*

Lateral loads acting on the fire station building result from either wind pressure or earthquake-induced inertia forces acting on structural and non-structural elements. Lateral loads acting on the structure are transferred through flexible roof and floor diaphragms to the primary lateral-force resisting system of the structure. The primary lateral-force resisting systems consist of the following systems (limited anecdotal information available):

- Roof and floor diaphragms are likely constructed of straight sheathed diaphragms spanning to archaic cast-in-place concrete, CMU, or wood shear walls (undocumented) which transfer lateral loads down to the concrete spread footings.

3.5 *Conditional Review*

Based on our review, the fire station building appears to be in general compliance with the codes and standard construction practices in effect at the time of their construction. The exterior, interior, and portions of the roof of the fire station were observed during the site visit on March 20, 2015. Based on our cursory observations, the building appears to be in overall good condition, except for the following specific conditions as noted (see Appendix for photos referenced):

- Some evidence differential settlement of the perimeter walls at various additions and window openings is evident. (See Photos 2 & 3)
- Dry rot damage is evident at apparatus bay door and wooden windows. Although structural elements are not visible, it is likely that this damage extends to lower portions of wood stud walls. (See Photos 4 & 5)

- Previous water damage is evident from the underside of the first floor. (See Photo 6)
- Seismic cracking is evident in surface plaster at building interior. Anecdotally, this damage is a result of the recent Napa earthquake. (See Photo 7)

3.6 *Seismic Evaluation Findings*

Based on the ASCE 31 Tier 1 review, the following items are of significance for the performance of the building when subjected to strong ground motions during an earthquake. Note that limited as-built information is available.

Positive Features

- Low rise wood framed structures are relatively lightweight and historically perform well in seismic events.

Negative Features

- The longitudinal shear walls at the first floor are likely to be overstressed per the allowable limits within the Tier 1 evaluation.
- Wood shear walls do not appear to have hold-down anchors to the foundation.
- Footing information is not available but it is likely that footings are inadequate for primary system seismic forces.
- Shear walls do not likely have interconnection between the first and second stories capable of transferring overturning and shear forces through the floors to shear walls below.
- There exists a split-level diaphragm between the second floor and the low roof above the offices and other added areas. This effectively splits the building in multiple parts and presents vulnerability for separation at this joint where the floor step occurs.
- There appears to be a lack of roof and floor –to-wall ties for out-of-plane seismic forces, as well as a lack of cross building ties for concrete perimeter walls at apparatus bays.

PART 4: CONCLUSION AND RECOMMENDATIONS

4.1 *Expected Performance*

Findings within this report provide a general structural conditional and seismic assessment of the existing building of the San Rafael Fire Station No. 51 located at 1039 C. Street in San Rafael, CA. Our evaluation concludes that the building fails to meet full compliance for ASCE 31 Tier 1 Immediate Occupancy performance criteria.

The following structural relative performance descriptions are based on our professional engineering judgment and experience, and are not part of the ASCE 31 Tier 1 checklist. These descriptions are included to provide a general estimation of seismic performance of the structure, based on component evaluations provided by the Tier 1 evaluation procedure. We expect the building to perform as follows:

- The building is anticipated to perform below average in comparison to buildings of similar construction when subjected to a design level earthquake, due to overstressed shear walls, discontinuous shear walls, lack of hold downs, and geometric irregularities.

4.2 *General Recommendation for Conditional Issues*

The following recommendations are provided to address issues concerning the condition of the existing fire station building. While none of these represent immediate life safety issues; it is recommended that these issues be addressed in the near future to prevent further deterioration from occurring:

- There is evidence of water damage and dry rot at exposed wood elements around the perimeter of the building. It is likely that sill plates and lower portions of stud wall framing will be discovered as conditions are exposed. Many areas of wood framing are covered by architectural finishes and cannot be observed without destructive investigation. A significant allowance should be maintained to accommodate moisture damage repairs in kind.
- First floor framing should be exposed, evaluated and replaced in kind as water staining and damage was noted in both joists and decking elements.
- Seismically damaged elements from the recent Napa earthquake should be removed and replaced.

4.3 *Seismic Recommendations*

The following qualitative recommendations are provided to address our opinion of the potential remediation options for identified seismic deficiencies. These methods are based on our evaluations described elsewhere in this report and engineering judgment. While the recommendations listed below do not represent any immediate concerns that warrant facility closure, they do describe building components that are non-compliant per the ASCE 31 Tier 1 checklist review for Immediate Occupancy performance or as identified by conditional or systemic deficiencies. We recommend these repairs and seismic upgrades are programmed into a future project:

- Add plywood sheathing to roof, second floor, first floor, perimeter wood walls and designated interior wood walls.
- Add new reinforced concrete (shotcrete) walls over existing concrete walls in discrete locations in apparatus bay. New footings will be required at new concrete overlays.
- Provide out-of-plane roof to wall ties to concrete wall elements along with cross building ties to wood diaphragms.
- Install new hold-downs and potentially new footing supplements at existing shear walls at the ground floor slab/foundation level.
- Install straps between first and second story shear walls to provide inter-story continuity.
- Provide a collector tie at shear wall lines along the roof, second floor and at roof plane discontinuity interfaces to provide continuity across the split-level diaphragms so that seismic load can be delivered to shear walls as they occur.

Note: The existing station 51 has been renovated and remodeled many times since its original construction and there is virtually no documentation on the various systems used. This means that during execution of a seismic retrofit, it should be expected that a number of unforeseen issues will arise that will need to be dealt with during construction. Given the extent of the suggested strengthening components, and the demolition necessary to access those areas, it may be difficult to justify the costs necessary to strengthen the building versus total replacement. Feasibility of re-use of the facility should be carefully considered with the programming needs and anticipated construction costs prior to proceeding with a seismic retrofit design.

PART 5: APPENDIX - PHOTOS

Photo 1: Station 51, Front View of Building

Photo 2: Station 51, Cracks in Perimeter Walls

Photo 3: Station 51, Cracks in Perimeter Walls

Photo 4: Station 51, Dry Rot Damage on App Bay Doors

Photo 5: Station 51, Dry Rot Damage on Wood Studs

Photo 6: Station 51, Water Damage on Underside of Floor

Photo 7: Station 51, Seismic Cracking in Plaster

Basis of Design Narrative - Fire Station 51

City of San Rafael - Essential Facilities Strategic Plan
2015-0131

prepared for:
Mary McGrath Architects

prepared by:
Eunice Yoon, PE, LEED AP, BD+C
Jared Doescher, PE, LEED AP
Jason Lau, PE, LEED AP
Thomas de Senna, PE

June 22, 2015

INTERFACE ENGINEERING

Assessment of Current City of San Rafael Essential Facilities Fire Station #51

- **Mechanical Assessment**

  Fire Station #51 is a two-story building with attached single story office building. The living quarters are located on the second floor and are served by a 17-year old, 6-ton rooftop package unit (RTU) located on the roof. The RTU provides electric cooling and gas-furnace heating. The majority of the ductwork is round, roof mounted ductwork. The ductwork appears to be reasonable shape for 17 years old. Ventilation is provided by the RTU. Operable windows are currently installed. This RTU also serves the workout room and small front office. This RTU has outlived the average service life of 15 years.

  The kitchen is has a commercial range/oven with an inefficient oversized commercial exhaust hood. The kitchen hood is exhaust directly by an upblast exhaust fan on the roof. Make-up air for the hood is provided by a rooftop forced air furnace, age unknown but appears to be over 20 years. The Toilet and Shower rooms are provided with ceiling mounted exhaust grilles connected to an inline exhaust fan and terminates at roof louvers/hood.

  The Admin Office area has a 16-year-old, 5-ton gas/electric rooftop package unit. Ductwork is located above the ceiling, serving ceiling diffusers in the offices. This RTU has outlived the average service life of 15 years.

  The Apparatus Bay portion of the building has no cooling system and has gas unit heaters mounted close to the roof. The engine exhaust duct system seems to be working properly and well maintained.

- **Plumbing Assessment**

  The existing piping systems in the building are mostly original and are nearing the end of their service life.

  The sewer lateral from the building flows to a city main in "C" Street. We were unable to verify the size or assess the condition of the underground and below slab piping. The original design drawings indicate that the lateral may be 4".

  Roof drainage is by roof drains and downspouts and spills to grade. Some of the downspouts are corroded.

  The building is served by a 1-1/2" city water and water meter located in the pavement at the "C" street of the building. A backflow preventer is not installed at the point of connection to the building. Above grade piping at the point of connection to the building is copper piping. We were unable to assess the condition of the underground piping. Hot water is supplied from a gas fired water heater of unknown age. The domestic hot water system is circulated through single circulating pump.

  The existing bathroom plumbing fixtures and faucets appear to be outdated and are not water conserving fixtures.

  Natural gas service enters at the fifth avenue corner of the building. It runs overhead in the building, attached directly to the structure, and above ceiling to serve the water heater

and furnace. The piping inside of the building appears to be in functional condition. Piping outside of the building shows signs of corrosion.

- **Electrical Assessment**

  Fire Station #51 is currently served by a single PG&E service. Power is derived from an underground PG&E vault outside the fire station to a main switchboard located in the Apparatus Bay. The PG&E meter number is #1008846559. The main switchboard is rated at 225A, 120/240V, 3-phase, 4-wire with a 225A main breaker. The switchboard is manufactured by Square D and was replaced as part of a renovation project in 1986. The main switchboard feeds the following:

  - RTU-1 (via 70A/3P breaker)
  - RTU-2 (via 50A/3P breaker)
  - MU2-1(via 20A/3P breaker)
  - Welder (via 40A/2P breaker)
  - Nederman Exhaust (via 100A/2P breaker)
  - Air Compressor (via 30A/3P breaker)
  - Miscellaneous spare breakers
  - Emergency Circuit Panel #2. Panel is rated at 125A, 120/240V, 1-phase, 3-wire with 12 poles. Residential tandem breakers are installed. Located in Apparatus Bay inside of an enclosure. Manufacturer is by Crouse-Hinds. Appears in fair condition but near end of manufacturer's recommended design life.
  - Emergency Circuit Panel #3 (via 80A/2P breaker). Panel is rated at 125A, 120/240V, 1-phase, 3-wire with 12 poles. Located in Apparatus Bay. Manufacturer is by General Electric. Appears in fair condition but near end of manufacturer's recommended design life.
  - Panel "N" (225A, 120/240V, 1-phase, 3-wire with 42 poles). Located in Apparatus Bay. There are (13) single pole spares available within the panelboard. Manufacturer is by Square D. Appears in fair condition near end of manufacturer's recommended design life.

  There is an antiquated Panel "B" that is apparently still in service, even though it was part of the original construction in 1916. The panel consists of fuses and switches in a glass display enclosure. This serves loads for the main floor bench, club room, fire alarm, and 2nd floor dorms.

  Emergency power is derived from a permanent diesel-engine generator. The generator is a Kohler #20ROZJ61 rated at 25kVA, 120/240V, 1-phase, 3-wire with a 120 gallon fuel tank that can provide approximately 54 hours runtime at full load. An automatic transfer switch is located across from the generator and is outfitted with a separate manual transfer switch that allows for provisions to connect to a portable generator, should the

existing generator fail. The generator feeds a main Emergency Panel "EM1", rated at 100A, 30-pole, 120/240V, 1-phase, 3-wire. Panel "EM1" feeds the "Emergency Panel" in the Apparatus Bay via the Automatic Transfer Switch. Panel "EM1" also feeds a load called "Dispatch" via a 50A/2P breaker. The emergency generator does not provide backup power for the entire fire station.

Existing lighting system appears to be updated from the original construction in the building, consisting of fluorescent and incandescent luminaires. Fluorescent luminaires consist of striplights with (2)-32 watt T8 lamps in the Apparatus Bay. Incandescent and fluorescent luminaires were located within the office and living quarters of the building. Luminaires appeared in antiquated condition. Toggle switches controlled the majority of the luminaires. There does not appear to be automatic lighting shutoff for the building, only contactors for control of outdoor lighting. The outdoor lighting consists of antiquated HID floodlights and incandescent cylinders.

The existing building does not appear to be supported by a fire alarm system. There are individual battery-operated smoke detectors located within the living quarters. No smoke detectors were observed in the Apparatus Bay Building. The new building will require an addressable fire alarm system.

- **Telecommunications Assessment**

Telecommunication service for the fire station terminates to a telecom located next to the Apparatus Bay. Security equipment and other low voltage equipment enclosures are located within the closet and mounted on the plywood backboard and equipment rack. There is plumbing piping routed in the ceiling of the telecom room, which is not an ideal location. The fire station has experienced ongoing issues with leakage involving the sewage piping. Water leakage was observed dripping onto the equipment enclosures during the site survey.

Recommendation for New City of San Rafael Essential Facilities Fire Station #51

- **HVAC System Description**

Option 1: HVAC system: VRF/HR with Fan coils to provide space heating & cooling.

Commercial VRF Condensing Units: Provide (1) condensing unit to be located on a pad located outdoors in close proximity to the building or on the roof. VRF units shall provide heat recovery ability. Basis of Design is Mitsubishi R2 units. Fan coils with outside air connections will serve individual rooms and each room will have temperature control. The IT room will have a 24/7 cooling only split system Preliminary condensing units sized as follows:

- Living quarters and Offices: 12 tons
- IT Room: 1.5 tons

Commercial Kitchen: Kitchen hood exhaust duct will rise up thru the roof.

Residential Laundry room: Gas dryer vent duct with maximum 4" diameter up thru the roof. Combustion air intake louvers on laundry closet door/ wall provide required makeup air for dryer operation.

Bathroom Exhaust System: Each Restroom/Shower Room shall be provided with a ceiling or roof mounted exhaust fan ducted through the roof for discharge.

Control System: DDC system to be provided by the VRF system manufacturer for mechanical system control and monitoring capability. Additional control of the radiant ceiling panels to be provided for temperature and humidity control.

Option 2: HVAC system: Rooftop Package Unit Gas Heat and Electric Cooling.

Commercial Gas/Electric Rooftop Package Unit to provide cooling, heating and ventilation to living quarters and offices. Basis of Design is Trane Precedent rooftop system units The IT room will have a 24/7 cooling only split system Preliminary condensing units sized as follows:

- Main Two-Story Building : 6 tons
- Office Building: 5 tons
- IT Room: 1.5 tons

Commercial Kitchen: Kitchen hood exhaust duct will rise up thru the roof.

Residential Laundry room: Gas dryer vent duct with maximum 4" diameter up thru the roof. Combustion air intake louvers on laundry closet door/ wall provide required makeup air for dryer operation.

Bathroom Exhaust System: Each Restroom/Shower Room shall be provided with a ceiling mounted exhaust fan ducted through the roof for discharge.

Control System: Programmable thermostats for each system. Switch/occupancy control for exhaust fans.

Analysis of Existing Energy & Water Use versus Potential Savings of New Systems:

- The current HVAC systems of the three buildings are using old equipment and inefficient system layouts. Providing updated equipment with more controllability would significantly provide energy savings. HVAC may be provided with natural ventilation where possible in conjunction with a VRF/HR (Variable Refrigerant Flow /Heat Recovery) system. In spaces that natural ventilation is not possible, outside air may be directly ducted to fan coils. Currently, the VRF with heat recovery is the most efficient system.
- Another option would be to replace the rooftop package equipment with new, more efficient rooftop package units. Ideally space would be provided for ductwork below the roof to extend the life of the ductwork.

- **Plumbing System Description**

  Sanitary Sewer and Vent System: Provide the following:

  - Replace all existing below and above grade waste and vent piping to the point of connection to the city sewer in "C" Street.

  - New waste and vent piping to all plumbing fixtures such as water closet, lavatory, tub/shower, kitchen sinks, washing machine, janitor mop sinks, floor drain and sinks, indirect waste receptors, and other fixtures.

  - Pipe condensate from mechanical equipment to indirect receptors.

  Storm Drainage System: Replace and relocate roof drains and downspouts and correct site grading to properly conduct storm drainage away from the building and toward site storm drains and catch basins.

  Domestic Water System:

  - Replace all existing above and below ground domestic water piping from the point of connection to the water meter.
  - Provide new domestic CW and HW to the following:
    - Bathroom fixtures (water closets, urinals, lavatories, and showers)
    - Kitchen Sinks, refrigerator ice maker, and dishwasher
    - Washing machine box
    - Janitor mop sinks
    - Trap primers(CW only) to serve floor drains
    - Mechanical equipment requiring make-up water with backflow device.
    - Hose bibs

  - Provide a reduced-pressure type backflow preventer or acceptable equivalent per Water Department requirement.

  - Provide a new gas fired domestic water heater and circulating pump.

  - Provide irrigation water to planters as required.

  Plumbing Fixtures: Provide the following:

  - Provide all new plumbing fixtures as follows:

    - Water closets: Wall-hung with 1.28 gallons per flush, flush valves
    - Urinals: Wall-hung with 1/8 gallon per flush, flush valve
    - Private Lavatories: Wall hung or counter mounted fixture with 1.0 gpm faucet
    - Public lavatories: Wall-hung or counter-mounted fixture with 0.5 gpm faucet
    - Kitchen Sink: Stainless steel or refer to architectural for final fixture selection. Provide with 1.5 gpm max flow faucet.
    - Shower: 1.8 gpm shower head.

- Provide interior and exterior hose bibs with vacuum breakers.

- New floor drains and floor sinks with trap primers. Locate trap primer where accessible or in-wall with access panel.

Natural Gas: Provide the following:

- Replace all natural gas piping from the point of connection to the PG&E gas meter.

- Provide natural gas to all gas fired appliances such as heater, furnaces, water heaters, ranges, and dryers.

Piping materials: Provide all new materials as follows:

- Sanitary sewer (SS) and vent system: Service weight no-hub cast iron soil pipe and fittings with standard couplings above ground and heavy weight cast iron soil pipe and fittings with heavy-duty couplings below ground. Provide corrosion protection for below grade piping as recommended by Geotechnical Engineer.

- Potable domestic cold water (CW) system: Type L hard drawn copper tube above ground; Type K hard drawn copper tube below ground.

- Potable domestic hot water (HW) system: Type L hard drawn copper tube aboveground.

Natural gas system:

- Above ground: Schedule 40, A53 black steel pipe and threaded malleable iron fittings. Galvanized steel for piping exposed to weather.

- Below ground: Schedule 40, A53 black steel pipe and threaded malleable fittings 2-1/2 inches and smaller. Welded pipe 3 inches and larger. Pipe below grade wrapped with double thickness Scotchwrap No. 51 applied over Scotchwrap pipe primer. Factory applied epoxy coating to equivalent thickness with field wrapped or epoxied joints approved. Alternately, Polyethylene piping with tracer-wire to meet CMC.

Condensate drain system: Type M copper tube with solder joints.

- **Electrical System Description**

Service Capacity:

The existing 400A electrical service appears to be sufficient in size for the remodel. Depending on the budget and extent of remodel, it is recommended to change the PG&E service voltage from a 400A, 120/240V, 3-phase, 4-wire system to a 400A, 120/208V, 3-phase, 4-wire system. The 120/240V system is a high-leg delta system that is an antiquated system that has restrictions on how loads can be connected. Based on the age and condition of the existing main switchboard and the recommendation for service voltage upgrade, the existing main switchboard is recommended for replacement. A new

400A, 120/208V, 3-phase, 4-wire, main switchboard with PG&E meter would be provided at the same location.

Existing normal branch and emergency panels would all be replaced with new 42-pole, 120/208V panelboards. The following shall be provided as part of the renovation and replacement:

- Panel "N" to be replaced with new 42-pole, 225A, 120/208V, 3-phase, 4-wire panelboard at the same wall location.
- Replace original 1916 panel with a new 30-pole, 100A, 120/208V, 3-phase, 4-wire panelboard. Relocate as needed to accommodate remodel.
- Emergency Circuit Panel #2 and #3 to be replaced and consolidated with a new 42-pole, 100A, 120/208V, 3-phase, 4-wire panelboard. Relocate as needed to accommodate remodel.

New Generator System:

A new emergency generator is recommended to provide emergency power to support the entire fire station, as the existing generator does not appear to support the entire fire station. Space will need to be allocated for the new generator, as the size will increase and existing location does not appear to have sufficient space and working clearances. The emergency generator should be provided in a sound attenuated, weatherproof enclosure. The emergency generator will be rated at 100kW/125kVA, 120/208V, 3-phase, 4-wire, with a 100 gallon sub-base fuel tank. Based on the size of the fuel tank, the generator can provide approximately 8 hours runtime at 100% full load.

An automatic transfer switch shall be provided, rated at 400A, 208V, 3-phase, and located within close proximity of the emergency generator. A 400A, 120/208V, 3-phase, 4-wire emergency main panel shall be provided.

Site Lighting:

As part of the new construction, existing exterior lighting shall be replaced with new luminaires utilizing LED lamps. All exterior lighting will be controlled via photocell and lighting control panel.

Interior Lighting:

New lighting shall consist of LED luminaires to comply with Title 24 requirements and achieve energy efficiency and cost savings. Residential occupancy areas such as kitchens, bathrooms, and bedrooms shall be provided with high-efficacy LED luminaires. Non-residential areas shall be controlled via occupancy sensors or lighting control panel. Residential areas shall be controlled via manual controls or vacancy sensors. D. A tap-out system should be provided to serve the remodeled fire station. Upon activation, the tap-out system shall energize lighting within the bedrooms, hallways, lobby, kitchen, offices/work areas, and apparatus bay and de-energize kitchen equipment.

Power Distribution:

Where receptacles provided for the office areas, a controlled receptacle capable of automatic shutoff shall be provided within 6’ of each uncontrolled receptacle. AFCI protection shall be provided for all circuits serving outlets for the kitchen, family room, dining room, living room, bedroom, sunroom, recreation room, closets, hallways, laundry areas, or similar rooms. GFCI receptacles shall be provided for all circuits serving bathrooms, garages (Apparatus Bay), outdoors, kitchen countertops, within 6’ of sink edge, and laundry areas.

- **Telecommunication System Description**

Incoming cable terminations shall remain in the same location if the location of the telephone equipment does not change. Otherwise, the cable terminations shall be relocated to a new location such as a new IT room. ¾-inch by 4-foot by 8-foot fire rated plywood backboards will be provided on every wall in the IT room. The IT room will have a telecommunications ground bus bar with a #3/0 copper ground to the main electrical panel and to building steel. Termination blocks will be wall mounted and will cross-connect with the PBX switch and distribute dial tone throughout the facility.

Metallic 2-gang outlet boxes with single gang adapters with 1 inch metallic conduit/raceways to accessible ceiling space will be provided for routing and termination of voice, data and CATV cabling. Telecom locations will be based on Owner input. Raceway installed per ANSI/TIA/EIA-569-B standards.

Electronic card key access will be provided at identified entry doors and any site gates that are secure. All exterior doors will be monitored via door position switches and CCTV. A keypad with and LCD display will be provided at the main entrance for arm/disarm operation as well as determining which doors are operational or not.

Metallic single-gang outlet boxes with ½ -inch metallic conduit/raceways to accessible ceiling space will be provided for routing and termination of the security/access control cabling. Security/access control locations will be based on Owner input. Raceway installed per ANSI/TIA/EIA-569-B standards.

The paging system will be designed to provide program distribution and all-call to speakers throughout and provide local amplification. Coverage will be included for the entire interior of both buildings as well as exterior areas as designated by the Owner. The system will be required to be interfaced to the telephone system for general paging from any telephone instrument.

One inch metallic conduit/raceways will be provided for routing and termination of the Paging System. Speaker and volume control locations will be based on Owner input. Raceway installed per ANSI/TIA/EIA-569-B standards.

.

Electrical Appendix

Figure E1: Main Switchboard and Panel “N” in Apparatus Bay

Figure E2: Antique Panel “B” from 1916 in Apparatus Bay

Figure E3: Emergency Generator System

Figure E4: Automatic Transfer Switch with Cables for Portable Generator Connection

Figure E5: Emergency Panel “EM1” next to Generator

Figure E6: Emergency Panel in Apparatus Bay

Figure E7: Leaking Sewage Piping In Telecom Room

Mechanical Appendix

Figure M1: Main Building Rooftop Package Unit and Rooftop Ductwork

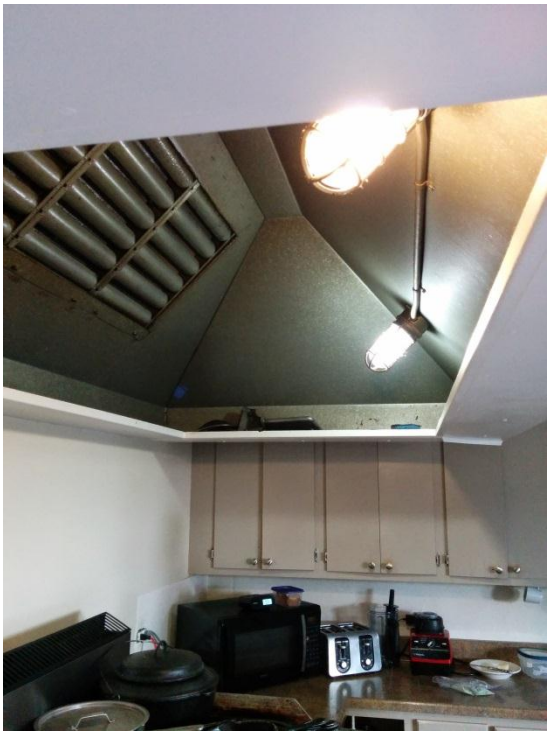


Figure M2: Kitchen Commercial Type I Grease Hood

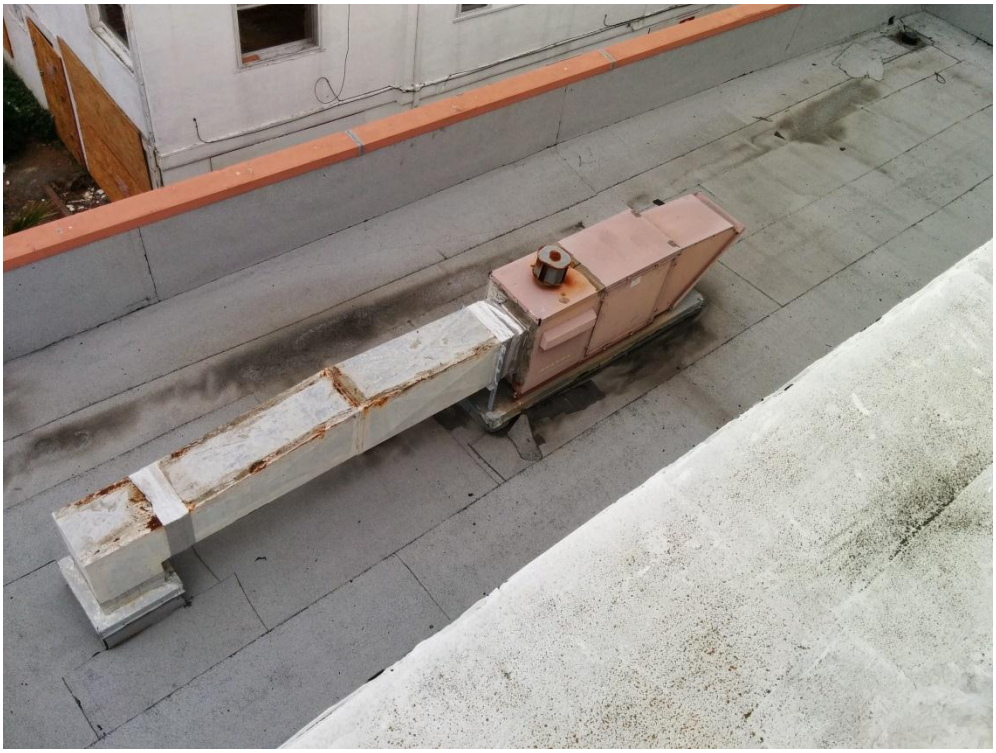
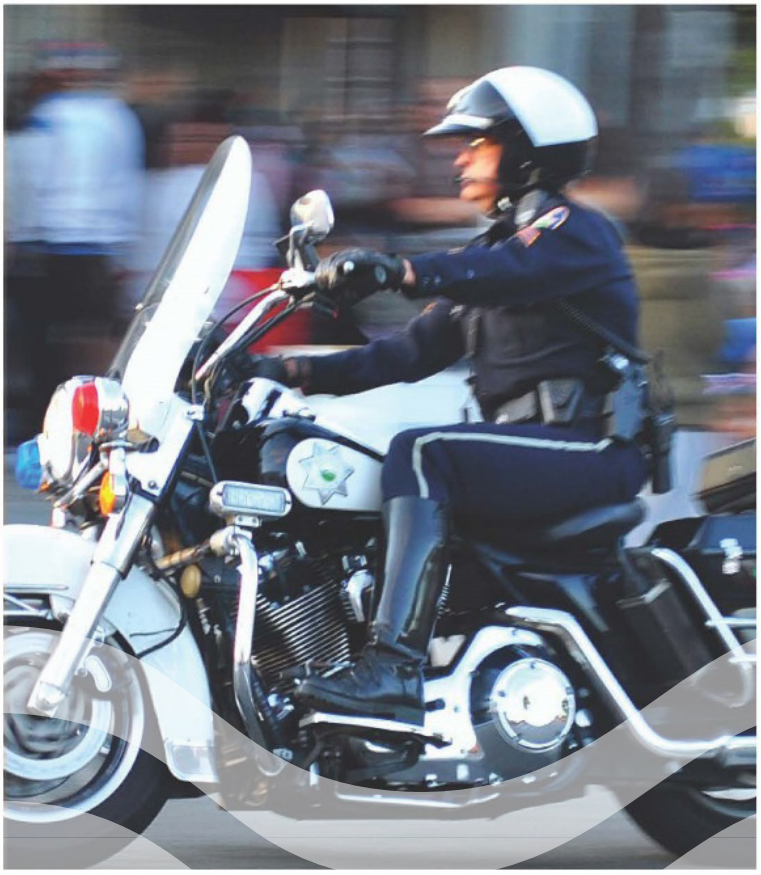
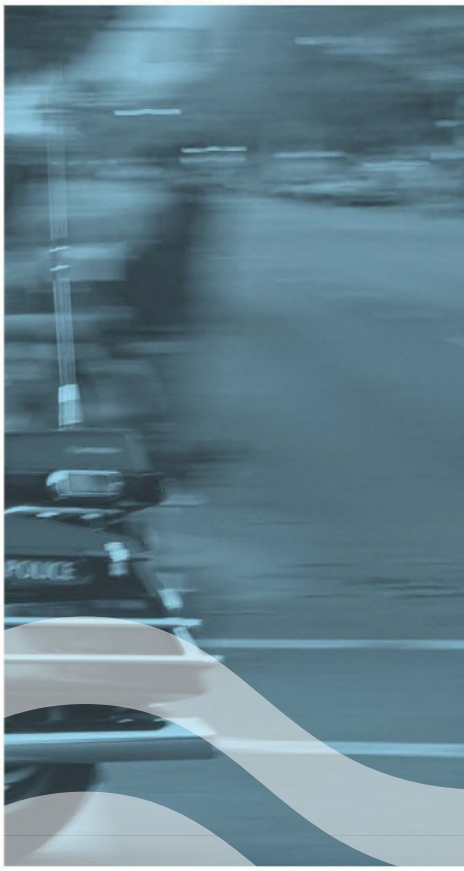


Figure M3: Rooftop Package Unit on Lower roof Serving Offices

Figure M4: Force Air Unit Heater in Maintenance Bay

Figure M5: Force Air Unit Heater in Apparatus Bay





MARY MCGRATH | ARCHITECTS

505 17th STREET, 2nd FLOOR ■ OAKLAND, CALIFORNIA 94612 ■ O 510.208.9400 ■ WWW.MARYMCGRATHARCHITECTS.COM