



**Deer Park Police Department Renovation and EOC Expansion
Deer Park, Texas**

PGAL Project No.: 1005223

Conceptual Design Narrative

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PROJECT DESCRIPTION

The existing City of Deer Park – Police Station is located at: 2911 Center Street, Deer Park, Texas, 77536. The current Police Station is approximately 30,000 sq. ft. and is utilized for typical Law Enforcement activities. The facility consists of areas including restrooms, breakrooms, reception, open and enclosed porticos, restricted access areas, jail cells, offices, dispatch, and mechanical, electrical and plumbing closets. A public parking lot is located on the southwest side, and secure restricted access parking on the east side of the station.

The City of Deer Park is interested in updating the existing Police station. The updates to the Police station will include:

A new 7500 sf. multi-use single story building addition to predominately serve as a relocation of the existing Emergency Operation Center (EOC) and Dispatch Center, as well as the redesign and reuse of the existing EOC, Dispatch Center, Radio Equipment room and Records/Reception offices.

EXPANSION – BUILDING EXTERIOR

The single-story building expansion is a steel framed structure. The expansion itself will be connected to the existing exterior masonry wall and connected to a secure entry via a conditioned corridor. The roof will consist of both low sloped parapet style roofing and sloped standing seam metal roofing. Areas of low sloped roof deck will contain internal drains to an interior piped drainage system. The drain system will also accommodate and serve areas of the existing roof at points of connection to the new expansion

- The exterior wall material is a masonry veneer (to match existing brick Veneer). The exterior wall assembly will be composed of the brick veneer, 1" airspace, 2" rigid insulation, over fluid applied water proofing, over 7-5/8" CMU, developing an R value of 19 for the exterior wall.
- The window systems are to consist of a prefinished aluminum storefront system (Kynar coating to match existing). The glass for the new facility will be 1 5/16" impact-resistant insulating glass with a low-e coating (tinting to match existing).
- The roof for low slope areas will be a 4-ply SBS Modified Bitumen system over tapered rigid insulation (Minimum R-23). The system is to be compliant with all design and uplift tests as required for the region
- The roof for pitched areas will be a prefinished standing seam metal roof over ice and water shield over 7/16" nailer board over rigid insulation (Minimum R-23). The system is to be compliant with all design and uplift tests as required for the region

EXPANSION - BUILDING INTERIOR

The single-story building expansion is to contain the following Primary interior spaces. EOC, Dispatch, Admin Spaces, Break areas, Conditioned Connector Corridor, and associated support spaces

Primary Space

- The connector corridor for the building will consist of the following materials: Luxury Vinyl Plank flooring with a rubber base, painted gypsum board walls, 2'x2' exposed tee acoustical tile ceiling, direct/indirect LED lighting.
- The Break area will consist of the following materials: Luxury Vinyl Plank flooring with a rubber base, painted gypsum board walls, 2'x2' exposed tee acoustical tile ceiling, direct/indirect LED lighting.
- The EOC space will be a double height space with raised access flooring for electrical and data pathways and will consist of the following materials: carpet flooring and rubber base painted gypsum board walls, 2'x2' exposed tee acoustical tile ceiling, direct/indirect LED lighting.
- The Dispatch space will have access flooring for electrical and data pathways and will consist of the following materials: carpet flooring and rubber base painted gypsum board walls, 2'x2' exposed tee acoustical tile ceiling, direct/indirect LED lighting.
- Administrative Spaces will consist of the following materials: carpet flooring and rubber base, painted gypsum board walls, 2'x2' exposed tee acoustical tile ceiling, direct/indirect LED lighting.

Support Space

- The Restrooms will consist of the following materials: Porcelain tile floor and base, porcelain tile walls full height at wet walls and epoxy paint gypsum board walls and ceiling with compact fluorescent downlight and wall sconce
- The Janitor space will consist of the following materials: Sealed concrete floor, painted gypsum board walls and exposed structure ceiling.
- The Storage will consist of the following materials: VCT flooring and rubber base, painted gypsum board walls, 2'x2' exposed tee acoustical tile ceiling.
- The Mechanical/Electrical/Janitor spaces will consist of the following materials: Sealed concrete floor and rubber base, painted gypsum board walls and exposed structure ceiling.
- The IT Closet will consist of the following materials: Sealed concrete floor and rubber base, painted treated plywood over gypsum board and exposed structure ceiling.

EXISTING PD RENOVATION - BUILDING INTERIOR

The interior portion of the existing PD will be renovated as some of the function are being relocated into the new expansion. The following existing interior spaces will require renovation:
Dispatch, EOC, and Records

- The existing EOC will be expanded into a training space and will consist of the following

materials, carpet flooring and rubber base painted gypsum board walls, 2'x2' exposed tee acoustical tile ceiling, direct/indirect LED lighting.

- The existing Dispatch will be expanded into office space and will consist of the following materials, carpet flooring and rubber base painted gypsum board walls, 2'x2' exposed tee acoustical tile ceiling, direct/indirect LED lighting.
- The existing Records will be expanded to accommodate more storage and will consist of the following materials, carpet flooring and rubber base painted gypsum board walls, 2'x2' exposed tee acoustical tile ceiling, direct/indirect LED lighting.

CIVIL

Site Work

- Clear vegetation on the SE corner of the existing building and demolish portion of the existing sidewalk and curb at the east parking lot (RE: C1.00). Prepare area for the building expansion slab installation and utilities.
- Remove and dispose concrete paving at the entrance and exit to/from the south parking area to accommodate installation of the proposed utilities (RE: C1.00). Replace the concrete paving to match existing conditions (RE: C2.00).
- Expand east concrete parking area (add 2 parking spaces), install curb and walkway to the building expansion entrance (RE: C2.00).
- Provide positive drainage away from the existing building and proposed building expansion.
- Install security fence and gate.
- All disturbed green areas to be restored and vegetation to be established.

Utilities

- New sanitary connection to the proposed building expansion is proposed. Route approximately 400 LF of 6" sanitary sewer to connect to the existing sanitary sewer on the west side of the building. Sewer manholes to be installed at all change of direction, elevation, and connection locations (RE: C4.00).
- Building expansion will require a new 2" domestic water line connection with a separate water meter and backflow preventor. Domestic 2" line will connect to the existing 10" waterline located on the east side of the Center Street (RE: C4.00).

- Portion of the existing storm system located at the building expansion area to be demolished (RE: C1.00). Existing storm system to be re-routed, upstream flow from existing inlets and building downspouts to be connected to the new U/G storm system (RE: C3.00).

STRUCTURAL

Structural Scope of Work

- Structural work includes pier foundations, slabs-on-grade, load-bearing CMU walls, and steel-framed roof for the new building addition.
- Foundations will be designed and detailed in strict accordance with the recommendations outlined in a Geotechnical Report prepared specifically for this project.
- The new addition will be constructed adjacent to the existing building but will be designed as an independent structure to resist lateral and uplift wind forces.

Design Criteria

- Applicable Codes and Design
 - 2012 International Building Code
 - ASCE 7-10 Minimum Design Loads for Buildings and Other Structures
 - ACI 318-11, Building Code Requirements for Reinforced Concrete
 - ACI 530, Building Code Requirements and Specifications for Masonry Structures
 - AISC Manual of Steel Construction – LRFD 14th Edition.
 - Live Loads: Roof 20 psf (unreducible)
 - Rooftop Mechanical Units: Actual Weight of Equipment
 - Superimposed Dead Loads: 15 psf (ceiling mechanical and miscellaneous)
 - Wind Design Criteria:
 - Basic Wind Speed 149 mph (3-second gust wind speed)
 - Building Category IV
 - Wind Exposure B

- Wind-borne Debris Region
 - Yes
- Earthquake Load
 - Using Site Classification D for stiff clay soils, site is in Seismic Design Category “A” per ASCE 7.
- Snow Load
 - Ground snow load, P_g is 0 psf.

Foundations

- A Geotechnical Report has not yet been provided, but information from the existing building drawings will be used as basis of design until the report is made available.
- Floor slab will be minimum 5-inches thick, reinforced with #4 at 15” on center. Control joints will be placed in slab at maximum spacing of 15 feet in each direction. The slab will be placed over prepared subgrade and 15-mil vapor barrier. General Notes on the existing building drawings required removal and replacement of 5-feet of existing soil with select fill. Select fill was specified to be sandy clay (SC) or clayey sand (CL) with liquid limit less than 30 and plasticity index (PI) between 4 and 15. Select fill will be placed in loose lifts not exceeding 8-inches and will be compacted to 95% of the maximum dry density at a moisture content between optimum and 2% wet of optimum as determined by ASTM D 698.
- Exterior grade beams will be approximately 18” wide by 24” deep and reinforced with 3 - #8 continuous bars top and bottom. Stirrups will be #3 bars spaced at 10 to 12-inches on center. Interior grade beams will be used to support interior CMU walls and will generally be 14” wide by 24” deep, reinforced with 2 - #8 bars top and bottom.
- Drilled piers on the existing building bear at depth of 15-feet below the finish floor level. Piers for the new addition will likely be drilled to same or slightly deeper bearing depth. Anticipated sizes will be 24” diameter shafts with bells ranging in size from 36” to 60”. Piers will be located below interior columns and below grade beams at spacing of 15 to 20 feet on center

Steel Roof Framing

- The roof will consist of 20- gauge, 1 ½” deep Type B, galvanized metal roof deck supported by steel bar joists and wide flange steel beams and perimeter masonry walls. Steel frames consisting of steel angles will be used to frame a continuous L3x3 edge angle will be provided at perimeter of roof.

- Heavy mechanical rooftop units will require steel wide flange beams, channels and posts to transfer loads to columns or walls below.
- Structural steel exposed to weather or in unconditioned space shall be hot-dipped galvanized or painted with a zinc-rich special coating.
- Exterior load-bearing CMU walls will support the steel joists and will also provide lateral resistance for wind loads. Walls will be 8-inch thick and will be reinforced with #5 rebar at 16 inches on center, in fully grouted cells.

Cast-in-Place Concrete

- Reinforcing Bars: ASTM A615, Grade 60
- Slabs-on-grade: 3,500 psi
- Grade Beams: 4,000 psi
- Drilled Piers : 4,000 psi

Concrete Masonry Units (CMU)

- Normal Weight CMU: ASTM C55 or ASTM C90
- Unit Compressive Strength: 1,900 psi
- Mortar: Portland cement/lime Type M or S , 1,800 psi compressive strength
- Grout: 3,000 psi compressive strength
- Control Joint Spacing: Max 20 feet

Structural Steel

- W- and WT-Shapes: ASTM A572, Grade 50
- Angles, Channels and Plates: ASTM A3
- Square/Rectangular HSS: ASTM A500, Grade B
- Round HSS: ASTM A501 or ASTM A53, Grade B

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**NOTE BY: ADAM BALLESTEROS,
CITY OF DEER PARK, CITY ENGINEER**

MEP General

Codes and Guidelines

- NFPA Standards (volumes 13, 14, 72 and others as applicable)
- National Electrical Code.
- International Building, Uniform Mechanical, International Plumbing and International Fire Codes (current editions) with **City of Baytown** Amendments.
- Texas Accessibility Standards (TAS).
- Accessibility Guidelines (ADAAG) of title III, Americans with Disabilities Act (ADA) of 1990. Note that ADA is Federal civil rights law. Enforcement of ADA is by Federal Agencies specified in the Act. Owners shall obtain appropriate legal counsel to determine methods of compliance for the specific Work of this project.
- Fire Alarm Rules of Texas Commission on Fire Protection.
- The International Energy Conservation Code and/or ASHRAE 90.1 as applicable with all relevant amendments.
- NFPA 101 Guidelines and Standard.
- Applicable ASHRAE guidelines and Standards.

MECHANICAL

HVAC Design Criteria

- Summer design outdoor condition: 100°F DB, 80°F WB.
- Summer outside air handling unit design conditions: 92°F DB, 80°F WB.
- Winter design temperature: 24°F
- Indoor design conditions
 - Occupied public spaces: 74°F (summer), 72°F (winter) maintained plus/minus 1°F. These values are within ASHRAE comfort guidelines

- Occupied office humidity range: 50%-60% RH (summer). No humidity controls provided.
- Non-occupied rooms: 85°F summer, 65°F winter.
- Outside air pre-treating: (summer), 40°F

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CITY OF DEER PARK, CITY ENGINEER

Lighting heat loads

- Main lobby areas: 1.5 watts per usable sq. ft.
- Office Areas: 1.3 watts per usable sq. ft.
- Other occupied areas: 1.0 watts per usable sq. ft.

Receptacles/Equipment (heat gain for calculation purposes).

- Occupied Tenant Space: 2.0 watts/sq. ft. of Tenant Full Floor Usable Area

Outside air

- Ventilation outside air will be based on the City of Baytown Building Code and ASHRAE Standard 62.1. (1 ACH = 1 air change per hour)

Occupancy

- Typical Tenant Space: 1 person/150 sq. ft. of Tenant Full Floor Usable Area for heating and cooling loads.
- Minimum air circulation per usable square foot within interior zone spaces – 0.65 CFM/sq. ft.

Air Load Factors

Cooling Heating

Coil Air Quantity

10% 5%

Motor Heat

5% ----

Heating System "Warm-up" Factor

--- 10%

The HVAC system shall be designed with the following goals for sound levels:

- General office, meeting rooms, public areas, and non-equipment areas – NC 40.
- Conference spaces, Boardroom, Command Center – NC 35.
- Spaces adjacent to air handling unit equipment rooms and equipment areas – NC 42 ± 2.

Air Side Systems

- Renovation area within existing building: The load associated with the renovated area is not expected to increase. Therefore, the existing base building HVAC equipment will be re-utilized to serve the renovated area. Existing main trunk ductwork will be reutilized, and existing grilles/registers will be relocated/replaced as necessary to accommodate the new space plan layout.
- New building addition: This system shall consist of two new 20-ton air-cooled single-zone VAV rooftop units (20 tons total). Each unit will be sized to handle approximately 65% of the peak building addition load. Each rooftop unit will supply a common supply duct that will serve the entire building addition. The building addition will be supplied from the rooftop units serving multiple VAV and Fan-powered terminals with electric heat. The rooftop unit will be provided with full economizer controls as well as management of outdoor air to meet ASHRAE 62 ventilation requirements. Rooftop air handling unit will be a custom unit with MERV 13 filters on both the return and outdoor air inlet. Unit will be provided with stainless steel cooling coils and frames, supply fans, face and bypass dampers, variable speed drives, internal vibration isolation, and roof curb sound attenuators. Air handling unit casing shall be 4" thick double wall construction.
- Building relief air shall be removed by a tap to the Toilet Exhaust. Toilet exhaust air will be removed from the space through exhaust registers located in the toilet rooms. Toilet Exhaust and Floor Relief Air shall utilize common duct system with an exhaust fan located within the building with discharge thru suitable exterior wall louvers (as approved by the Architect). Toilet exhaust air and relief air quantities shall be controlled as required by the outside air quantity. Minimum exhaust rate from toilet rooms shall be 2 cfm per square foot. Minimum building pressurization shall be maintained around 400 CFM positive.

Air Distribution Devices

- Linear bar type architectural slot diffusers in all gyp board ceilings or walls of lobbies and public spaces.
- Sidewall, dual direction grilles in all "back-of-house" areas such as electrical rooms
- Typical "Omni" type 2'x2' ceiling diffusers:

Toilet Exhaust

- A toilet exhaust/building relief fan will be installed to exhaust the restrooms and provide relief for the outside air. A DDC controlled damper will monitor and regulate exhaust air CFM to provide proper relief of the outside air quantities to occupant's system in accordance with ASHRAE 62.1 Standards, while still maintaining proper floor pressurization.

Controls

- **Building Controls:** The building control system is an existing JCI system that that is currently be upgraded by the facility. The scope of this project for the existing renovation area will be to verify proper controls and sequences serving the area. For the new addition, all new equipment will be integrated into the existing control system including modifications to graphics and sequence addition to fully integrate the new addition into the existing Building Automation System. All necessary software and custom graphics will be included.

Air Balance

- The Contractor shall demonstrate equipment and system performance to the Engineer and Owner's representatives.
- An independent NEBB/AABC Certified test and balance contractor shall verify performance of air and water systems and provide written documentation of system performance
- Piping Systems
 - Condensate Drains: Type L hard drawn copper or Schedule 40 galvanized steel.
- Hangers
 - Split ring or adjustable clevis for single pipe-trapeze hanger for multiple pipes.
- Insulation
 - Supply and Outside Air Ductwork: 2" thick, one-pound density flexible fiberglass with foil face and vapor barrier K not higher than 0.25 at 100°F DB mean temperature difference
- Vibration Isolation
 - Air Handling Units - Roof Mounted: Internal isolation from the factory.
 - Fan Vent Sets: Amber/Booth Type SE with 1" Deflection.

ELECTRICAL

- The entire electrical distribution system shall comply with local codes and the current edition of the National Electrical Code.
- The renovated area will reutilize the existing power already serving the area. Existing panels on the current records room wall shall be relocated to the new wall that will be constructed 10 feet away.
- The new building addition will be served from the existing 480Y/277V, 3-phase, 4-wire, 1200A electrical service. A new 400amp distribution panelboard shall be provided and fed from the

existing main gear to serve the new building addition. The new DPB shall be provided with TVSS and metering compartment; bussing shall be arranged for future extension. The electrical distribution will originate from the main switchboard using a conduit and wire distribution system.

- Conductors connecting receptacle and switch circuits to lighting and power home run junction boxes in finished areas, in accordance with the NEC, may be multi-wire, steel jacketed, Type “MC” cable, consisting of one, two, three or four 12 AWG copper “THHN” or “THHN/THWN” insulated phase and neutral conductors. MC cable can be run for a maximum length of twenty-five feet from any piece of utilization equipment (J-box, receptacle, light fixture, switch, etc.) to a home run junction box. (The home run is defined as the conduit run from that home run junction box back to the panelboard.)
- MC cable shall not be installed exposed.
- Type “MC” steel jacketed cable termination fittings shall be T&B #253, O-Z Gedney C5, Steel City Series XC-400 or approved equal clamp type, malleable iron fittings. Die cast fittings are not acceptable.
- 480Y/277-volt panels will serve the lighting and HVAC equipment. All panels will have at least 20% spare capacity for future growth. Panels will be provided with internal surge protective device (SPD).
- Dry-type transformers (K-factor rated) and panelboards will serve the 208Y/120-volt occupant receptacle and equipment loads. 200% neutrals, IG ground bars, and surged protective device (SPD) shall be provided to all panelboards. New 208Y/120V panelboards and transformers shall be provided as dictated by the load.
- All line voltage wiring will be in rigid metal conduit or EMT, except for receptacle/switch drops where MC cable will be allowed for a maximum length of 25'. Utilize Schedule 40 PVC conduit where below grade or poured in slabs. All wiring will be copper. Wiring for individual fire alarm indicating and initiating devices shall be EMT or rigid metal conduit where exposed to the elements.

Standby Power

- An Outdoor weatherproof 200 kW, 480Y/277 volts, 3 Phase, 4 Wire diesel genset shall provide backup power to the new building addition. The genset shall be provided with a skid mounted UL2085 diesel fuel tank to provide 72 hours of run time a full rated capacity.
- Separate Isolation bypass automatic transfer switches shall be utilized to separate emergency and standby building loads.
- The generator system shall be capable of serving the loads for only the new building addition and not the existing building.

- Provisions shall be made to connect the building to a portable genset via cable tap box and manual transfer switch as well. An additional connection point to power the 911 room separately to a portable genset via cable tap box and manual transfer switch shall also be provided.
- A generator main switchboard shall be provided
- UPS System (serving the new building addition):

Topology

- Distributed redundant comprised of an 2N redundant system.
- Each system will consist of one 100kVA/100kW module
- (Vertiv EXM or approved equal). Each module will be provided with 20-year VRLA (GNB Absolyte IIP or approved equal) batteries for 5 min. runtime at 100% load.
- The two system shall be interconnected w/a Load Bus Sync module to facilitate static transfer switch (STS) sync for all downstream single corded devices.
- Each system will be provided with a 3-breaker maintenance bypass cabinet.
- Each UPS system shall be provided with 480 volts, 3 Phase, 3 Wire + Ground output power distribution panel to serve UPS loads throughout the new building addition.
- Two 75kVA power distribution units (PDUs) with sub-feeds will provide power to the server room in an A & B configuration for dual corded equipment.
- One 45kVA dual input PDU/STS shall be provided for single corded critical loads.

Lighting Systems

- Lighting system will be flexible with modular wiring technology. The lighting goal shall be 1.0 watts/sq. ft. with lighting controls in compliance with current IECC.
- Utility room and “back-of-house” lighting shall consist of 1’x4’ fluorescent chain hung fixtures with cover guards and T5 lamps.
- Office area standard lighting will consist of the fixtures specified on the architectural drawings. Each fluorescent fixture will utilize electronic ballasts (less than 10% THD). The fixtures shall be designed to comply with the ‘preferred’ recommendations of the IES RP-24 for lighting levels and cutoff for areas in which extensive VDT usage is expected. Lighting for equipment areas will be designed and fixtures selected for individual needs.

- All enclosed rooms throughout the building shall be provided with individual occupancy sensors with manual override control; occupancy sensors shall be either wall mounted, or ceiling mounted depending on the size of the space.
- A centralized, programmable lighting control relay panel system and infrastructure will be installed and integrated into the new building management system.
- All open work area lighting shall be controlled via the programmable lighting control system with tenant override switches located within the open area space.
- At a minimum, all lighting controls shall conform to current IECC guidelines.

Fire Alarm Systems

- A complete code and ADA compliant, fully addressable fire alarm system shall be provided. The system shall include a minimum of the following:
 - Manual pull stations.
 - Multi-sensor smoke detectors located within the common spaces.
 - Speaker horns and visual strobes (ADA approved).
 - Cross zoned multi-sensor (photo-electric and heat) detectors at elevators lobbies, which interface with the elevator control system.
 - Additional monitoring and indicating devices as required by local codes.

Lighting Systems

- Furnish and install a UL Master Label lightning protection system for the new building addition to be tied into the existing lightning protection system for the existing building. The system shall be designed to comply with requirements of the National Fire Protection Association and the Underwriters Laboratories, Inc. The system shall be designed to qualify for the maximum insurance rate reduction allowed for lightning protection for this type of construction.
- Grounding System shall be based utilizing Motorola R56 standard.
- Grounding Electrode System: Bond grounding electrodes together (as defined by the National Electrical Code) to comprise the grounding electrode system. Provide a buried ground ring for the building with ground rods spaced no more than 60 feet apart.

Plumbing

Domestic Cold Water

- Provide a system of domestic cold water to all fixtures and equipment requiring cold water.
- For the new addition, hose bibs will be provided in mechanical rooms and under the counter in the men's restrooms. A freeze-proof wall hydrant will be provided on each exterior face of the building.
- The renovated area will reutilize existing domestic cold water already serving the existing building. For the new addition, new cold-water service will be brought in from the west side of the addition.

Sanitary Waste and Vent System

- For the renovated area, connect all new waste and vent piping to the existing systems. Saw cut and patch existing concrete as necessary.
- For the new addition, provide a diverse system of waste and vent piping throughout. Provide waste and vent stacks in toilet chases extending to below grade to 5' 0" outside of building. All floor drains shall be vented, and trap primed.

Storm Drainage System

- For the new addition, provide a system of roof drains and internal primary and overflow risers connected to the site storm sewer system (re: civil). Collect drains into vertical leaders extending below grade. Extend storm lines from vertical leaders to 5'-0" outside building. Roof drains and horizontal runs of piping from roof drains shall be insulated. Overflow drains shall be independent risers daylight through the outside building wall near grade.

Fire Protection System

- The existing building is, and the new building addition will be fully sprinklered. Quick response concealed type heads with white cover plates and adjustable inlets will be provided in all public spaces. All areas without ceilings will have exposed heads. Branch sprinkler piping shall be located near structural slab or deck. Design to be based on NFPA 13 and local code requirements.
- All critical areas (UPS room, Server Room, Radio Room, etc.) will be served by a pre-action fire suppression system complete with alarm initiation and notification devices. The pre-action system shall be interlocked with the building fire alarm system.
- UL listed/FM approved flexible fire protection sprinkler drops (such as manufactured by FlexHead Industries) shall be used in lay-in ceiling areas to allow for low-cost, rapid relocations of sprinkler heads during renovations.

- Quick response concealed type heads with white cover plates and adjustable inlets will be provided in all public spaces. All areas without ceilings will have exposed heads. Branch sprinkler piping shall be located near structural slab or deck. Design to be based on NFPA 13 and local code requirements.
- Design sprinkler densities are NFPA 13 light hazard densities. These densities should be reviewed with the insurance carrier, and if they agree, can be reduced to NFPA light hazard requirements:
 - Office Areas and Public Areas: 0.14 gpm/sq. ft. over 2000 sq. ft.
 - Work Areas with Equipment: 0.19 gpm/sq. ft. over 2000 sq. ft.
 - Storage Areas: 0.20 gpm/sq. ft. over 3000 sq. ft.
 - Mechanical Equipment Rooms: 0.20 gpm/sq. ft. over 1500 sq. ft.

Materials

- Fixtures: Vitreous china plumbing fixtures, chrome plated brass trim, and stainless-steel ADA compliant drinking fountains.
- Domestic Cold Water:
 - Inside: Type “L” copper or Schedule 40 galvanized steel.
 - Outside: Type “K” copper or Class 52 ductile iron.
- Domestic Hot Water: Type “L” copper or Schedule 40 galvanized steel.
- Sanitary Waste and Vent:
 - Inside: Cast iron bell and spigot with elastomeric joints on no-hub cast iron.
 - Outside and Below Slab: Cast iron bell and spigot with elastomeric joints.
 - Vents: Cast iron bell and spigot with elastomeric joints or no-hub cast iron.
- Storm Drainage.
 - Inside Building: Cast iron bell and spigot with elastomeric joints or no-hub cast iron.
 - Below Slab and Outside: Cast iron bell and spigot with elastomeric joints.
- Fire Protection:

- Sprinkler piping inside - Schedule 40 black steel.

IT / Security

The telecommunication system for this project will be comprised of several components including the structured cabling system (SCS), telephone system, active data network system, Cable Television (MATV), and Radio System. These components, as well as other related components, will be discussed individually in the following sections. The related components of the telecommunication system include grounding, administration, MEP requirements, architectural requirements as well as interfacing with other systems such as security and building automation.

The telecommunications system design will be based on the Telecommunications Industries Association (TIA) standards as well as the Building Industry Consulting Services, Inc. (BICSI) standards. In addition, the design will comply with Deer Park IT standards.

This project consists of two (2) separate scopes of work. One is the renovation of the existing facility and the second is the construction of a new Emergency Operation facility.

Renovation Building Scope

- The existing building consists of multiple separate rooms containing the technology equipment. These rooms consist of the following:
 - Telephone Room #136. This room currently is the service entrance room for the facility. Service is being provided by PS Lightwave, Comcast, Phonoscope as well as AT&T. In addition, there is singlemode fiber routing to the City Hall Server Room. This room is protected by a dry chemical suppression system and power is by generator and UPS. This room includes the horizontal cabling to all of the work area devices. This room is planned to remain. There are also some radio RF signals coming into this room. There is no scope for this room.
 - Computer Room #122. This room includes a single cabinet and houses many of the data servers for this facility. This room has both generator and UPS power supplying the equipment. There is no scope for this room.
 - Dispatch Equipment Room 1 (Rm #132A). This room is located within the construction area. It includes the Motorola radio equipment (7), Distributed Antenna System (DAS), Radio Cable entrance facilities, the S2 NetBox Extreme security equipment and associated servers, a PLC cabinet, two (2) Telecor T3-SC Security Intercom Controller, intercom cabinet, dedicated earth ground for GHC 911 Room, a ground plate and the power is both generator and UPS. This room will remain at its present location. The security equipment will be removed and replaced. All intercom and radio equipment will remain. Services will be extended from this room to the new Technology Room in the new facility.
 - Dispatch Equipment Room 2 (Rm #132B). This room is dedicated to GHC 911 equipment. There are two (2) cabinets of equipment. This room will be relocated to the new facility.
 - Office Space. The dispatch and emergency operation functions for the building will be removed. All associated cables that are no longer required will be removed back to source and

disconnected from the source. The floor space will be renovated following the architectural plans. All new horizontal cables will follow the structured cabling equipment requirements as noted below.

- **Specific Technology Cabling Scope.** For the renovated area, new wireless access coverage will be provided to ensure full coverage of the renovated space. At all renovated office locations, the following cabling will be provided:
 - **Desk Position:** Two (2) Cat 6 Cables for standard office. Additional cable drops for large offices with conference table or administrative assistant offices with printers.
 - **Printer Location:** Two (2) Cat 6 Cables
 - **Monitoring Equipment Locations:** One (1) Cable Drop. These locations include lighting panels, BAS panels, etc.
 - **Wireless Access Points:** Two (2) Cat 6A cables
 - **Additional Cable drops** as noted on AV Plans or Security Plans.

New Building Scope

The new Building will include an Emergency Operations Facility, Dispatch, Break Room, Office Space, Conference Rooms and support spaces including two Technology Rooms. One technology Room is dedicated to GHC 911 and one room is dedicated to Deer Park. Refer to the General Requirements Section for the Technology Room requirements.

- **Specific Technology Cabling Scope:**
 - For the new building, wireless access coverage will be provided to ensure full coverage of the space. The following cabling will be provided:
 - **Desk Position:** Two (2) Cat 6 cables for standard offices. Additional cable drops for large offices with conference table or administrative assistant offices with printers.
 - **Operators Console Position:** Four (4) Cat 6 cables per desk position
 - **Training Room:** One (1) Cat 6 cable per desk position.
 - **Printer Location:** Two (2) Cat 6 Cables
 - **Monitoring Equipment Locations:** One (1) Cable Drop. These locations include lighting panels, BAS panels, etc.
 - **Wireless Access Points:** Two (2) Cat 6A cables

- Additional Cable drops as noted on AV Plans or Security Plans.

Cable Media

The telecommunications cabling media assessment will include the backbone cables, horizontal cables and connectors. This is a high-performance cabling system and requires a 20-year warranty which is typical for structured cabling systems (SCS). Only certain manufacturer solutions will be allowed for this system.

- Approved SCS Manufacturers. CommScope Systimax, Leviton/Berk-Tek, Panduit/General
- Backbone Cables. Backbone cables will consist of a combination of 50-micron laser optimized multimode fiber as well as singlemode fiber. In addition, two (2) bundles of Cat 5E cables will be routed to the existing Telephone Room from the new Dispatch Technology Room.
- Horizontal Cables. The horizontal cables will be Cat 6 rated cables. For wireless access points, the cables will be Cat 6A rated. The cables will route from the Technology Room to the communication outlet or device. All runs must be within the 295' distance limitations.
- Horizontal Patch Cables. All patch cords must match the rating of the cable to which they are patching. The cables are color coded based on the application for easy visual distinction as follows:
 - Blue = Data
 - Black = Surveillance
 - White = Voice
 - Red = Security
- Horizontal Terminations
 - All terminations will be RJ45 connectors with same rating as the terminating cable. Blue jacks will be used for data, white jacks for voice and orange jacks for Cat 6A cables.
- Backbone Cable Terminations.
 - All terminations will be splice-on LC type. They will terminate into minimum 2RU termination panels.

Pathways and Spaces

The structured cabling will utilize wire mesh cable tray located in the main corridor spaces. When cables exit the tray, Cat 6 rated cable hangers will be used thru the accessible ceiling spaces and conduit will be used thru any inaccessible ceiling spaces. Conduit will be used to all wall boxes to the accessible ceiling space.

New backbone cables will primarily use the cable tray system. Where backbone cables exit the cable tray system, they must be installed in conduit. New and existing communication pathways will be utilized for the backbone cable distribution.

The minimum size for conduit for horizontal cables will be 1". Where multiple cables are run parallel, one larger size conduit may be used to minimize the use of 1" branch conduits.

- Distance Limitations
 - 295' Horizontal Cables
 - 2000m Singlemode Fiber
- Electromagnetic Interference (EMI). EMI must be considered when routing data cables as they are very susceptible to EMI which can, in turn, create problems with the electronics or end devices from working properly. EMI can be limited by keeping horizontal cable pathways clear from radiating sources such as power wiring, motors and ballasts as well as properly shielding and grounding the cables.
- The following cable clearances should always be maintained for structured horizontal cables
 - 3 feet from motors and generators
 - 6 inches from electrical conductors (120V-480V)
 - 5 inches from fluorescent sources
 - 12 inches from 480v and above

Lightning Immunity

The communication cabling infrastructure and electronics are very sensitive to lightning strikes and electrical surges of any kind. Any IT device that is located below the building roofline and attached to the building may use copper (CAT 6/6A) connectivity. Any IT device that rises above the roof line should use fiber connectivity in order to provide immunity from the impacts of lightning. If an IT device is detached from the building and below roofline, then it may utilize copper connectivity if it is located within the cone of the building lightning protection coverage.

Requirements for Technology Rooms (TR)

- The TR rooms will require a minimum ceiling height of 9.0' AFF to structure. No false ceilings are allowed in these rooms.
- The rooms shall have lockable doors minimum of 3'-0" wide by 84 inches tall with full 180-degree swing. Door sills are not allowed. Swing door outward whenever possible. The door must have a keyed locking mechanism or electronic card access.
- Flooring shall consist of non-carpeted static resistant flooring such as sealed (anti-static floor sealant) concrete. If floor tiles are installed, they must be static dissipative tile (SDT). It is recommended to treat walls and ceilings to reduce dust and static electricity.
- HVAC for this room shall consist of continuous 24-hour environmental control to maintain a temperature of 64 to 75 degrees with a relative humidity of 30%-55%. Maintain positive pressure inside the room.
- No wet piping route into these rooms. If a sprinkler is required, then it shall be installed with a wire cage to prevent accidental leakage and located so that it is not above any equipment cabinets.
- No HVAC condensers or compressors are allowed inside the MTR or TR Rooms.
- Minimum floor loading shall be 50 lb/ft.
- Lighting shall consist of 50 foot-candles minimum and be located at least 8.5 feet AFF. Locate lighting higher, if possible, in order to maintain at least 18 inches from the cable tray system.

Additional Requirements for TR Rooms for Emergency Operations

- Redundancy in the backbone cabling from the MTR to the TR's.
- Redundancy in the service provider entrance facilities. Redundancy may include multiple points of entry as well as multiple service providers.
- Room located above flood plain and generally recommended to be above the first level.
- Redundancy in the power system. Power to the room should come from separate sources, should include UPS as well as generator back-up.
- The electronics should have dual power supplies for automatic fail-over.
- The room HVAC unit should be on the generator power supply.
- Dry-type fire suppression system.

Grounding

- Grounding and Bonding of the telecommunications system will follow the TIA-607 standards. It will include all metallic cable jackets, cable tray and racks, grounding busbars, etc. as defined in the standards.

Facility Systems Monitored

- It is important for the facility to monitor technology systems in order to minimize any potential failures. Monitoring will be performed on the technology UPS, generator, building management system, and other systems deemed essential.

Telecommunications Administration

- The Telecommunications System administration and identification is important for proper maintenance and troubleshooting of the structured cabling system. The administration will follow the TIA-606 standards. All horizontal, backbone, grounding, termination hardware, racks, etc. should follow these standards. Refer to Figure below for typical labeling. All wire labels should fully wrap the cable jacket and be repetitive using black letters on a white tape with minimum 12pt font.

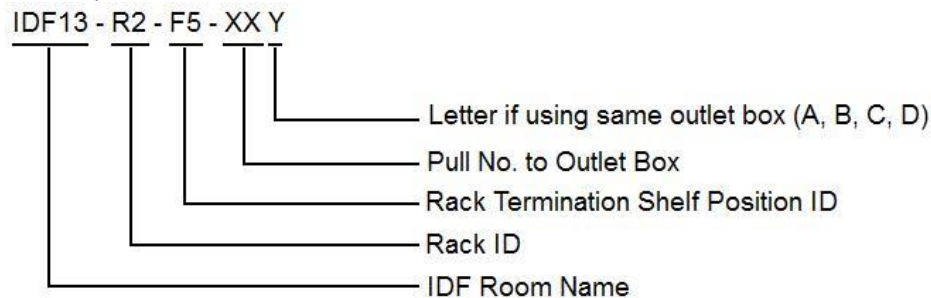


Figure 1.1.8-A Proposed SCS Labeling

- Quality Assurance
 - Quality Assurance will be maintained by requiring a track record of communication experience and experienced personnel. Also, an RCDD must be present during the construction and testing of the telecommunications system. The selected contractor for the SCS must be a certified and currently registered Partner for the respective SCS capable of issuing a numbered registration certificate for the entire Cabling System.
- Installation Requirements
 - The telecommunications cabling is a high-performance infrastructure and must be installed correctly. The installer will conform to the manufacturers and TIA guidelines for installing the cabling such as bend radius, cable untwist, slack cables, grounding, identification, terminations, stretching, etc. All installation requirements will be clearly identified in the specifications

Warranty

- The telecommunications system shall include a 20-year warranty on the performance standards, materials and installation.

Security Systems

The existing security system for the existing facility will remain unchanged. The existing systems will be expanded to support the new facility.

Surveillance System

The existing security system is unknown. New IP cameras with associated licenses will be required to monitor the new building as well as the parking gates. All new cameras will have a minimum of 1MP resolution. They will be comprised primarily of fixed cameras with wide dynamic range for light sensitivity. All exterior cameras will include the day/night feature.

- All cameras will be recorded on motion. The compression will be H.264. New video recorders will be required and will provide enough storage for 30 days of video retention.
- Video Coverage will be provided for the following areas:
 - All access-controlled portals including both pedestrian and vehicular.
 - The building perimeter
 - The secured parking facility in areas where sensitive or valuable equipment is located
 - The secured building facilities in areas where sensitive or valuable equipment is located
 - All MTR and TR Rooms
 - All entry and exit doors (this should also fall under access-controlled portals)

Access Control System

- The current access control system is an S2 NetBox Extreme System.
- New access control will be required for the following areas:
 - All entry and exit doors
 - The rooms within the facility which contain valuable or sensitive equipment.

- Areas within the building with difference security access levels such as securing the public side from the operation side. There also may be differing access levels within the operational side such as securing the command center, IDF Rooms or other areas where there may be differing security clearances required.

Security Systems General Requirements

- Cable Infrastructure
 - All security system cabling will follow the structured cabling system installation requirements with the following exception. Access control cabling must be installed in conduit for the complete route from the end device back to the owner’s security cabinet.
- Access Control Cabling.
 - The access control cable will be as follows:
 - Card Reader cable: 6-conductor, #18AWG stranded bare copper, shielded
 - Alarm Point cable: 2-pair, #18AWG stranded bare copper, shielded
 - Panic Hardware cable: 3-pair, #18AWG stranded bare copper, shielded
 - Electronic Lock cable: 2-pair, #16AWG stranded bare copper, shielded
 - Request-to-Exit cable: 2-pair, #22AWG stranded bare copper, shielded
 - Intrusion Alarm cable: 2-pair, #18AWG stranded bare copper, shielded
- Surveillance System Cabling
 - All new cameras will be IP-based cameras. Therefore, the cables will be installed following the structured cabling requirements for data cables. The cables will originate in the TR room and terminate at the camera location.
 - A slack loop of approximately 20’ prior to termination of the cable provides flexibility for future modifications.
- Quality Assurance
 - Quality Assurance will be maintained by requiring a track record of communication experience and experienced personnel. The contractor must be certified by the manufacturer of the products to be installed, adhere to the engineering, installation and testing procedures, and utilize the authorized manufacturer components and distribution channels in provisioning this Project.

- All members of the installation team must be factory certified by the manufacturer(s) as having completed the necessary training to complete their part of the installation. Written confirmation of such certification by manufacturer(s) shall be submitted to the Owner if requested.
- Security System Monitoring
 - The security system will be monitored from workstations within certain offices in the facility with the ability to monitor the system offsite.

END OF CONCEPTUAL DESIGN NARRATIVE