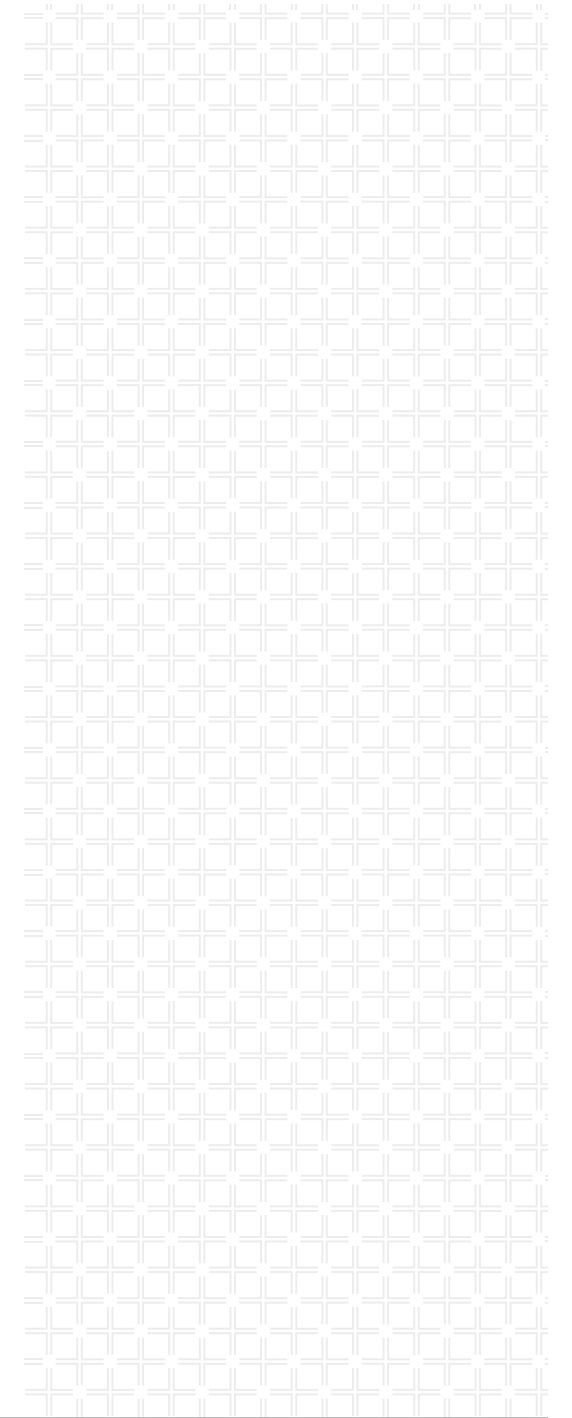




Huckabee



JARRELL INDEPENDENT SCHOOL DISTRICT
NEW OPERATIONS CENTER
October 18, 2023

SCHEMATIC DESIGN PRESENTATION



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THE PURPOSE

JARRELL ISD'S PLAN FOR AN OPERATIONS CENTER THAT SERVES ALL

In July of 2023 Jarrell Independent School District undertook an effort to engage their leadership team that oversees the transportation, maintenance, operations, and custodial services for the district. With the rapid growth that Jarrell ISD has experienced in recent years, district leadership felt it was necessary to address the support services that cater to campuses across the district, and make sure that they have the right facilities, amenities, and tools to provide the best service to their students, faculty and community. The plan and over all vision was to co-locate all services under one roof and in one location. The Jarrell ISD planning and vision process for the new operations center comprised several meetings to address the vision, needs, and wants of the District for support services as they move forward.

Each planning and vision meeting had a specific focus and explored opportunities and options for these specialized and vital services in the district. The information gathered was reviewed with District Leadership throughout the process.

ACKNOWLEDGING THE STAKEHOLDERS

The District leadership and Huckabee planning team would like to thank each and every one of the participants on this journey of planning and evaluation, who gave their time, energy, and ideas to develop the vision and goals for the new Operations Center at Jarrell ISD. We appreciate you!

DISTRICT LEADERSHIP

Dr. Toni Hicks, Superintendent of Schools
Robert Navarro, Chief Financial Officer

PROGRAM MANAGEMENT

Stephen Dorman, Vice President | Sledge Engineering
Kelly Dorman, Project Facilitator | Sledge Engineering

FACILITIES and MAINTENANCE

Gary Gadison, Director of Facilities

CUSTODIAL SERVICES

Gretchen Matthys, Custodial Director

TRANSPORTATION

Maria Bocanegra, Director of Transportation
Jesus Quezada Sr., Staff member transportation



GOAL SETTING AND VISION DISCOVERY

ESTABLISHING THE VISION

At the start of the design process the Jarrell ISD leadership and stakeholders participated in a series of conversations, exercises, and tours to explore and identify the goals, priorities, and vision for the new operations center.

These activities focused on a number of areas such as:

- + opportunities and priorities,
- + desired building functions, flow, and aesthetics,
- + immediate and long term plan for each of the services

The information captured through these activities serves as an inspiring guide and compass for both the layout as well as the design intent and direction for the new facility.

YESTERDAY, TODAY AND TOMORROW

While planning the future of Jarrell ISD's support services, it is important to give consideration to both the past and present. What aspects from the past and present facilities and set up do we want to take with us into the future? What aspects do we need to leave behind? And, what new opportunities do we envision for the years to come?

The team did not have any items from the present that they wanted to carry into the future, but did have some items they wanted to leave behind and had vision for a number of things for the future. Below is a summary of the findings.



WHAT DO WE LEAVE BEHIND?

- + Small spaces
- + No meeting rooms
- + Point to point Internet
- + Only 1 bay
- + Single user restroom
- + Combined break & meeting rooms
- + Combined office spaces

WHAT DO WE WANT FOR OUR FUTURE?

- + Collaboration area
- + Assigned office confidentiality
- + Conference Room – Multi Use Office
- + Various Repair Bays with lifts (3-4)
- + Fueling Station
- + Storage Space – Maintenance, Custodian, Transportation
- + Restroom – various
- + Lunch/Break Area
- + Locker Room with showers
- + Delivery bay
- + Tools
- + Washing bay 2-3
- + 2 story view to bay area
- + EV charging station
- + Conference room with divider walls for main., transp. & custodial
- + Separate entrances? Secure access, Central reception, secure vestibule with conference room adjacent
- + Single user restroom at entrance
- + Grounds equipment
- + Shipping / Receiving
- + Mail Slot

PRECEDENCE AND PREFERENCE

IF NOTHING ELSE THIS FACILITY MUST...

- | | |
|---|---|
| 1. ... have a conference room | 11. ... have shipping/receiving area |
| 2. ... have a lunch/ break room | 12. ... have office space, assigned offices |
| 3. ... have locker room with showers | 13. ... have collaboration space |
| 4. ... have storage | 14. ... have EV charging station |
| 5. ... have washing bays 2-3 total | 15. ... have bus bays |
| 6. ... have fueling station | 16. ... have operations center |
| 7. ... have restrooms for all | |
| 8. ... have mechanical/ repair bays 2-3 total | |
| 9. ... have tools | |
| 10. ... have a delivery bay | |

FACILITY TOURS

The new Operations Center stakeholders, visited 2 facilities during the course of half a day, going through various spaces of the reference facilities and engaging with the end users at each location to better understand the model for use in each and address any questions and concerns they may have. Facilities visited were:

Transportation Building Expansion, Marble Falls ISD
New Satellite Transportation Building, Killeen ISD



REVIEW OF SPECIFIC NEEDS AND DESIGN CHARRETTE

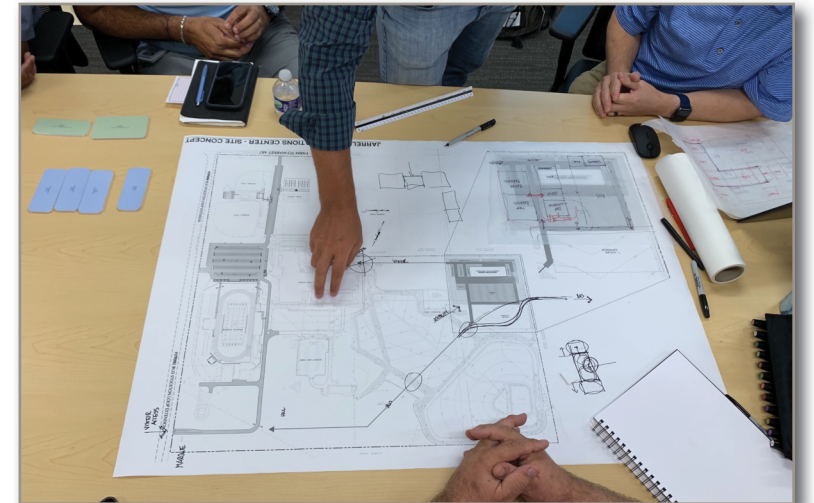
CONCEPTUALIZING THE PLAN AND STAKEHOLDER VISION

The Huckabee team worked through parts of two separate days, reviewing and establishing specific needs per department with leadership and stakeholders that would be housed in the new Operations Center. The team also worked through a design charrettes, developing early concepts for the design of the new Operations Center.

A design charrette is a collaborative meeting during which members of the design team along with the stakeholders work together to bring the vision established to life and sketch designs to explore and share a broad range of design ideas and possibilities. Charrettes build consensus, formalize the project vision, streamline the design process, and by supporting setting specific goals, set the team up for success.

At the conclusion of the meetings there was a clear direction on the conceptual layout for the site and the building spaces, as well as adjacencies. In addition the team reviewed in detail the specific needs and the spaces they would need to accommodate it, and a program of spaces was developed.

This information would give clear guidance on the design direction moving forward on the new Operations Center.



CIVIL NARRATIVE

OVERVIEW

The proposed project site is on the west side of the existing Jarrell High School campus located at 1100 FM487, Jarrell, TX 76537. Aspects of the development will be subject to review by The City of Jarrell, WCESD#5 and the TCEQ. We have received a topographic survey and are awaiting a site geotechnical report. The information presented should not be considered final or complete and will be updated as the design progresses.

PAVING IMPROVEMENTS

Access to the new operations center site is expected to be from the existing high school site drives located to the east. Two drives are anticipated for circulation of busses and staff. The new site pavement is anticipated to be constructed using reinforced concrete pavement. The necessary subgrade treatment is unknown pending the geotechnical investigation.

GRADING IMPROVEMENTS

Topography falls generally from south to north from an elevation of 818 to 811 at the top of bank near the existing detention and water quality pond. Cut / fill values will be monitored throughout the design process to provide a site balance. The pending site geotechnical report will determine foundation type and subgrade treatment, which heavily influences the site grading design.

DRAINAGE IMPROVEMENTS

The development is anticipated to function primarily with surface drainage with the exception of select areas of landscaping and downspouts, which may be piped away from the vicinity of the proposed improvements. The outfall point impacted by the development is an existing detention/water quality pond located to the north of the proposed development.

WATER QUALITY

The site is located within the Edwards aquifer recharge zone. We will treat surface runoff with the existing water quality pond located to the north, which has been designed to accept on-site runoff for up to 65% impervious coverage. The site is currently around 30% IC with the existing infrastructure and projects in construction.

WATER IMPROVEMENTS

Water service is anticipated to be from the existing system that serves the High School building. Both domestic and fire lines are present along the west side of the existing high school building. We anticipate a private 8" on-site loop to service proposed fire hydrants and to connect to the riser room of the proposed building. A separate 3" waterline will be provided for the domestic connection.

WASTEWATER IMPROVEMENTS

Wastewater is anticipated to be a gravity system and connecting to the existing high school wastewater system. An existing manhole located just east of the proposed development is likely to be utilized. No off-site improvements are anticipated.

LANDSCAPE & IRRIGATION IMPROVEMENTS

Plantings will be geared to satisfy District and governing requirements. Areas disturbed by construction will be turf stabilized with either sod or seed. Irrigation will be provided where necessary to support required plant material.

ARCHITECTURAL NARRATIVE

SITE

The site for the New Operations Center is conveniently located adjacent to the existing high school with access via a new drive loop.

The New Operations Center metal building is set partially outside of a secure fenced area along the east access driveway providing a welcoming landmark to visitors. Twenty-four visitor and staff parking spaces will be provided on the east side of the building, with paved pedestrian access to the Operation Center main entrance.

The majority of the site will have restricted access with fencing. Entry to the secure fenced area side is allowed by badging via card reader key pad on a pedestal in the driveway median at the north vehicular gate entrance and will be mounted at heights to accommodate varying vehicle heights requiring entrance.

Current and future bus parking needs have been considered in the designed layout of parking on site. The secure parking lot includes 65 bus parking spaces with room for an additional 65 spaces in the future. In addition to bus parking, the site also includes parking for staff and Jarrell ISD fleet vehicles. Just beyond the vehicle access gate to the secured side of the site, a dedicated loading zone is designed adjacent to the warehouse for easy loading and unloading at shipping/receiving.

Conveniently located adjacent to the bus parking are the fueling station and above ground fuel storage tanks. Covered by a large canopy, the fueling station will include 6 diesel and 2 gas pumps operating on a fuel management system.

ADMINISTRATION AND OFFICES

The exterior of the New Operations Center metal building pulls materials and colors from recent Jarrell ISD projects, maintaining a similar design aesthetic and reinforcing a holistic design approach to the District's buildings. A "Jarrell Blue" metal wall panels with building signage provides a visual cue to direct visitors to the public entry. A large canopy shelters those arriving from the weather. A stone wainscot skirts the lower portion of the building, providing both texture to the exterior façade and also durability at the walls' most tested locations. Metal wall panels continue above the stone wainscot and terminate at the underside of the standing seam metal roof.

The front entrance opens to an Entry Vestibule and Waiting Area. Guests proceed to the Facility Reception where signage directs guests to an administrator for either Transportation or Operations departments located at either side of the reception. The Entry Vestibule also provides access to a guest restroom.

The Operation Center houses the Jarrell ISD departments of Custodial and Maintenance Administration, and Transportation. Each department's offices are located with close adjacencies to support staff, and storage and with direct visual access to the working areas associated with their department. In addition to dedicated department offices, several flex offices are provided in the admin area. Most of the offices can be secured after hours from the common spaces including restrooms, lounge/workroom, warehouse, and shop.

A conference rooms is located just behind the Facility Reception providing a centrally located meeting space. The conference room will be equipped with a display monitor for information sharing purposes. The walls at the perimeter of the conference rooms are reinforced concrete masonry with a composite deck above to provide additional protection for the building's occupants during a severe weather event. For a more finished aesthetic, the concrete masonry walls will be finished with gypsum board and paint. A large, open Lounge / Workroom space is located with close proximity to the Conference Rooms. It includes a workroom area, a kitchen, and space for various seating types. The kitchen includes ample counter space and room for residential grade appliances including two refrigerators, microwaves, and a range. The workroom will house a copier, 144 mail slots, casework for storage and work surface counters.

Group restrooms, located between the Conference Room and Lounge/Workroom, follow the natural flow of the more communal portions of the building. Two additional single user restrooms are provided within the main building; one accessed from the repair bays and one from the warehouse. An accessible shower is provided for employees.

MAINTENANCE & CUSTODIAL

The approximately 7.5k sf warehouse portion of the building is easily accessed through two overhead garage doors from the loading dock on the west side of the warehouse. Four pedestrian doors provide additional access to the exterior. A service window at the warehouse office allows for visibility and transactions from delivery personnel who require assistance.

TRANSPORTATION

The dispatcher office includes exterior views of the bus parking lot and easy access to an exterior door. The router office is in close proximity to the dispatcher and sized to allow room for future growth. The transportation portion of the New Operation Center includes an approximately 4k sf two repair bay shop that accommodate 2 buses each, for a total of 4 repair work bays. An adjacent repair/wash bay hybrid accommodates an additional 2 buses. The foundation and slab in the repair bay area will be designed to accommodate the load of a movable lift as preferred by the district. In addition, the repair bays will have direct access to a utility sink, ice maker, and an emergency shower and eye wash. Transportation storage rooms of various sizes are located with direct access to the repair bay area. A mechanical equipment platform and mezzanine are incorporated to minimize the building footprint and utilize the typically unused space above the ceilings. Additional storage space is also provided at the mezzanine.

ARCHITECTURAL NARRATIVE

INTERIOR

The interior of the New Operation Center Building will include finishes that are both durable and low maintenance while maintaining an appearance consistent with a professional setting.

Interior ceilings will be 2x2 lay-in suspended acoustic ceiling tile at private offices, corridors, and communal spaces and gypsum board ceilings at all restrooms. Exposed ceilings will be specified at Shop and Warehouse areas.

Interior partitions shall be metal stud construction, clad in Level 4 finished gypsum board, unless otherwise noted. Partitions shall extend to the structure above at the separation of conditioned and unconditioned spaces. Fire-retardant treated wood backing shall be provided for wall-mounted door hardware, wall-mounted handrails, casework (uppers & lowers), monitor/TV mounts, and lockers. All outside corners of gypsum board interior partitions shall have stainless steel corner guards up to 44" above the specified rubber base.

All walls in toilet and locker rooms shall receive full height porcelain tile and epoxy grout. All toilet and locker room floors shall receive porcelain tile with epoxy grout. All toilet partitions shall be solid plastic (HDPE), floor mounted, and overhead braced. Fire-retardant treated wood backing shall be provided for all wall-mounted toilet room accessories. Vinyl plank flooring shall be specified at the Entry Vestibule/ Waiting Area and Facility Receptionist areas. In the remaining general admin and common areas of the building, the floor finish will be stained concrete. Repair bays, Warehouse, Storage Rooms, and ground floor MDF, Custodial, Electrical, Mechanical, and other support spaces will be sealed concrete. All casework and custom millwork shall be solid plywood construction. All base cabinets, drawers, and doors shall receive a plastic laminate finish. All interior faces of cabinets, drawers, and doors shall receive a white melamine finish. All floor cabinets shall have a 4" base. All casework, tall, uppers, and lowers shall have European hinges. All casework in reception shall be lockable.

All countertop finishes shall be attached to marine grade plywood substrate with 4" side and backsplashes, unless noted otherwise. In wet areas, countertop, side, and backsplashes shall be solid surface and caulked where countertop and backsplash meet and where backsplash abut walls. In Reception, a solid surface countertop shall be specified.

STRUCTURAL NARRATIVE

GENERAL:

References: The structural design will be made in accordance with the following codes:

- International Building Code, 2018 Edition.
- Structural Steel: ‘Specification for Structural Steel Buildings’, The American Institute of Steel Construction, Fifteenth Edition.
- Structural Concrete: “Building Code Requirements for Structural Concrete ACI 318-14”, The American Concrete Institute.
- Steel Joists: Steel Joist Institute, 2013.
- Metal Deck: Steel Deck Institute, 2008.
- Welding: Structural Welding Code – Steel, Latest Edition, American Welding Society (AWS D1.1 and AWS D1.3).
- Pre-Engineered Metal Building – Metal Building Manufacturers Association (MBMA) Latest Edition

WAREHOUSE BUILDING

Foundation and Floor Framing

The foundation design will be in accordance with the geotechnical engineering report, not yet available. We anticipate a significant amount of over-excavation and replacement with structural fill will be required to reduce the PVR to a value acceptable to the owner. We recommend the floor framing will be a “floating slab” without stiffened beams. A 16”x36” beams will be constructed along the perimeter of the building. The slab will be capable of supporting heavy vehicles, such as buses and other maintenance vehicles, as well as vehicle lifts. The slab will also be designed to support loads from rack systems, if applicable. We recommend the slab be placed in alternating lanes, approximately 25’ wide, with a minimum of 7 days between adjacent concrete placements. Joints will be sawcut in the direction 90 degrees to the control joints. We anticipate the use of drilled piers under columns only.

Equipment Platform

We recommend the equipment platform be constructed using a composite concrete deck over structural steel over the main conference room only. The remaining equipment platform and shop mezzanine will be constructed on steel bar joists and plywood deck. We recommend 2 layers of ¾” plywood be supported on steel bar joists spaced at 24” o.c Steel columns will support the equipment platform. Drilled piers will support the steel columns.

Roof Framing

We anticipate the use a pre-engineered metal building with purlins framing the roof. Lateral bracing will consist if rod bracing in the roof and walls.

FUEL FACILITY

We anticipate a significant amount of over-excavation and replacement with structural fill will be required to reduce the PVR to a value acceptable to the owner. We anticipate the floor framing will be a stiffened slab on grade with interior beams. The slab will be designed to support buses and other maintenance vehicles.

STRUCTURAL MEMBERS AND DESIGN:

Load Assumptions:

Dead Loads – loads actually calculated.

Live Loads

- Roof 20 PSF
- Office Area 100 PSF
- Warehouse Area 1000 PSF
- Bus Maintenance Bay and Fueling Vehicle loads

Member Stresses:

Concrete – 28 day ultimate compressive strength

- Drilled Piers 3,000 PSI
- Slabs on grade 4000 PSI
- Metal deck 36,000 PSI
- Concrete reinforcing steel 60,000 PSI

Structural steel

- Purlins Fy = 55,000 PSI
- Beams and Columns Fy= 50,000 PSI
- Rods Fy= 36,000 PSI

MECHANICAL, ELECTRICAL, AND PLUMBING NARRATIVE

PROJECT DESCRIPTION

The following narrative depicts a brief description of the mechanical, electrical, plumbing and fire protection systems planned for the new Jarrell ISD – New Operations Center

The scope of the project shall include design of Mechanical, Electrical and Plumbing systems.

All systems shall be installed in accordance with the 2018 IBC and the latest edition of all applicable Codes as approved by State Fire Marshal, NFPA, and NEC. The project will be designed and constructed with systems and materials appropriate for private development and good engineering practice.

- A. Applicable Codes, Regulations, and Design Standards
 - 1. National Electrical Code (NEC) - 2020 Edition.
 - 2. Occupational Safety and Health Act (OSHA).
 - 3. ANSI 17.1 Safety Code for Elevators and Escalators.
 - 4. National Fire Protection Association (NFPA 13) – Automatic Sprinkler Systems
 - 5. National Fire Protection Association (NFPA 14) – Standpipe Systems
 - 6. National Fire Protection Association (NFPA 20) – Centrifugal Fire Pumps
 - 7. National Fire Protection Association (NFPA 54) – National Fuel Gas Code
 - 8. National Fire Protection Association (NFPA-780) – Lightning Protection Code – 2004 Edition.
 - 9. American Society of Sanitary Engineers Standards as applicable.
 - 10. American Society of Plumbing Engineers Data Book for design standards.
 - 11. National Fire Protection Association (NFPA-101) – Life Safety Code – 2003 Edition.
 - 12. National Fire Protection Association (NFPA-110) – Emergency and Standby Power Systems.
 - 13. International Building Code (IBC) – 2018 Edition.
 - 14. International Fire Code (IFC) – 2018 Edition.
 - 15. International Plumbing Code (IPC) – 2018 Edition.
 - 16. International Mechanical Code (IMC) – 2018 Edition.
 - 17. International Energy Conservation Code (IECC) – 2018 Edition
 - 18. Texas Accessibility Standards, Architectural Barriers Act, Article 9102, Texas Civil Statutes.
 - 19. Americans with Disabilities Act of 2010.
 - 20. Underwriters Laboratory Requirements and Listings for Use in Fire Protective Signaling Systems.
 - 21. ASHRAE 90.1 Energy Standards for Buildings except Low-Rise Residential Building – 2007 Edition.
 - 22. ASHRAE 62.1 – 2007 Edition.
 - 23. NEMA – National Electrical Manufacturer’s Association.
 - 24. NECA – National Electrical Contractors Association.
 - 25. IEEE Standard 1100 – Powering and Grounding Sensitive Electronic Equipment.
 - 26. IEEE Standard 142 – Grounding of Industrial and Commercial Power Systems.
 - 27. IEEE Standard 241 – Electric Power Systems in Commercial Buildings.
 - 28. IEEE Standard 242 – Protection and Coordination of Industrial and Commercial Power Systems.

- 29. IEEE Standard 446 – Emergency and Standby Power Systems for Industrial and Commercial Applications.

MECHANICAL

A.The HVAC system shall be designed with energy efficient quality equipment, ease of maintenance and equipment accessibility in mind. The system will be designed to control the interior temperature and humidity to uniform comfort conditions. Large spaces may be zoned separately by exposure and space function. This will allow for controlling a specific area (zone) by temperature and run time to provide maximum energy efficiency.

Heating and Ventilation:

1. Heating and ventilation systems will be designed in accordance with the following data, factors and procedures:

a. Outside Design Conditions: Per ASHRAE Handbook of Fundamentals:

1) Summer design temperatures:

(ASHRAE 1% Column):

Outside dry bulb 100 degrees F.

Outside wet bulb 78 degrees F.

2) Winter design temperatures:

(ASHRAE 99% Column)

Outside dry bulb 24 degrees F.

3) Location: Jarrell, Texas

b. Interior Design Conditions (When Conditioned):

1) Winter:

Dry bulb temperature (Occupied) 72 degrees F.

2) Summer:

Dry bulb temperature (Occupied) 75 degrees F.

B. Calculation Method

1. Heat gain and loss calculations will be with factors from the ASHRAE Handbook of Fundamentals and ASHRAE 90.1 latest editions. The heating and cooling loads shall include building loads such as building envelope loads (wall, roof and glass), occupant loads, lighting loads, equipment and appliances loads, outside air (ventilation) loads in accordance with ASHRAE Standard 62. Component resistance values used in determining “U-factors” are taken from the ASHRAE Handbook of Fundamentals.

MECHANICAL, ELECTRICAL, AND PLUMBING NARRATIVE

C. Mechanical Systems

1. Various Spaces: Training room, break room, offices, conference rooms and lobby area will be handled by high efficiency one to one VRF split systems with indoor air handlers located on a mechanical platform and exterior units ground mounted on the exterior in a mechanical yard. Shop/Warehouse areas will be heated and ventilated only.
2. Technology Rooms: MDF data room will have separate air conditioning systems for 24/7 control. Mini split – 2-ton Base Bid: Daikin
3. Mechanical tonnage SD estimate 350 sqft per ton per zone rounded to nearest unit tonnage available, minimum.
4. Basis of Design:
 - a. VRF
 - 1) Base Bid: Daikin
 - 2) Alternate: Mitsubishi
 - b. EF – Greenheck or Cook
 - c. MAU/ERV – Daikin

D. Ventilation Requirements and Pressure Relationships

1. All floors of the building will have ventilation rates per IMC 2018 and ASHRAE 62.1 and the building will be under positive pressure. IAQ procedure will also be used for outside air requirements.
2. Outside Air: A split system makeup air unit (MAU) shall be used to provide neutral ventilation air to offices. Large spaces and low occupant load space may have raw OA through damper, less than 10% of unit load.

E. Controls and EMS

1. Provide a direct digital electronic automatic temperature control system for the entire complex. The system shall consist of direct digital control (DDC) systems for the HVAC equipment, an operator's terminal with keyboard for communication with and programming of the distributive memory in the direct digital controllers, and shall incorporate all equipment necessary to provide the sequence of operation. All digital equipment designed to provide protection against interference by external voltages when operated in a commercial environment. This system shall use electronic temperature sensors, interfaced through standalone DDC controllers and unitary controllers. Control system shall have graphics indicating building floor plan, equipment identification and equipment indication and monitoring.
2. All temperature control devices shall be standard catalog products and shall essentially duplicate equipment which has been in satisfactory service for at least 3 years. A minimum of 90% of the control equipment shall be by the installing manufacturer.
controls, valves, dampers, relays, control modules, sensing devices, switches, and instrumentation

3. Work to include a complete automatic temperature control system including any and all control devices, 120 volt (not provided by electrical contractor) and low voltage wiring and conduit, DDC controls, valves, dampers, relays, control modules, sensing devices, switches, and instrumentation necessary to obtain all functions and sequences.
4. Control System Software shall provide for monitoring and recording of after-hours operation of units.
5. Temperature Sensors:
 - a.Space Temperature Sensors: Provide with blank institutional type locking cover, single scaled set point adjustment and zone bus jack for zone terminal connection. All space sensors shall have built-in override switch and local set point adjustment.
6. Brand Basis of Design for DDC shall be: Climatec.
Controls coordinate with Owner requirements.
7. Power Monitoring: Power Monitoring shall be provided for project on all new construction. CT's by Veris or equal and all controllers, software and programming for owner to view power consumption in Total Building, HVAC, Lighting, Receptacles.

F. Bipolar Ionization (IAQ)

1. Bipolar Ionization device will be implemented throughout the new HVAC system. Based on the use of these devices ASHRAE allows as IAQ improvement we are allowed to adjust the HVAC system and Outside Air strategy to provide a more Energy Efficient and complete system. Additional benefits include lower first cost of system as well as lower energy cost ongoing for operations. Manufacturer also makes claims for effectiveness against odors, allergens, Covid-19 and many others. Please consult their literature for additional information on this topic direct from the manufacturer.

G. COVID-19 Measures

- The industry is still discovering the best method to protect building occupants from the spread of infectious disease. We are implementing the most common sense effective strategies known to protect the inhabitants with the most reasonable cost.
1. Dedicated Outside Air – Fresh treated outside air ensures that IAQ levels are meet in each space.
 2. Filtration – Standard Specification is MERV 8. Filtration can be increased up to MERV 13 without changing out of standard filter sizes. MERV 8-13 is considered in the normal filtration range with 13 being on the cleaner side, and also more expensive. This is Owner preference.
 3. Bipolar Ionization – Bipolar Ionization is being implemented with specific strategy from HCE for best protection. This means that if an infected person does come into spaces, in addition to other measures, this technology does its best to render viruses inert with enough exposure time. See manufacturer's data for actual claims. These devices are a one time cost and last for many years without annual parts or maintenance. Once they reach end of useful life then they should be replaced.

MECHANICAL, ELECTRICAL, AND PLUMBING NARRATIVE

H. Ductwork Construction

1. Ductwork Construction:

- a. Ductwork, unless otherwise specified herein, shall be constructed of new, prime grade, continuous hot dip mill galvanized, lock forming quality steel sheets and shall have a galvanized coating of 1-1/4 ounces total for both sides per square foot. The gauges of metal to be used and the methods of duct construction shall conform to the requirements for the class of work involved as set forth in the latest edition of "Standard Practice in Mechanical Sheet Metal" as published by SMACNA. Each sheet shall be stenciled with the gauge and manufacturer's name. If coil steel is used, coils shall be stenciled throughout, on ten foot (10') centers with the gauge and manufacturer's name.
- b. All dimensions are inside clear dimensions. Sheet metal size shall be increased to allow for duct liner where applicable.
- c. Seal all transverse joints, seams and fitting connections with "KINGCO 11-376 Super Seal", UL listed Mastic to prevent air leakage. Oil base caulking and glazing compounds are not acceptable.

2. Rectangular Ducts

- a. Where special rigidity or stiffness is required, construct ducts of metal two gauge numbers heavier.
- b. Ducts larger than 30" and larger to have Ductmate 35 slide on connections. Use metal cleats, metal corner cleats for non-breakaway joints, use plastic cleats for breakaway joints, ductwork 440 tape, #795 duct sealer and 5511M sealant. Fabricate and install per manufacturer's instructions.

3. Ductwork shall be internally lined with acoustical liner with antimicrobial coating for sound attenuation at discharge of units.

4. Ductwork shall be externally insulated as follows:

- a. The Contractor may use a 3/4, 1 or 1-1/2 pound density product with a minimum thickness of two inches (2") and a minimum installed R-value of 6.0. Density, thickness and installed R-value to be clearly indicated on submittal. Installed R-value must be 6.0 or higher. necessary to obtain all functions and sequences.
- b. Fiberglass duct wrap insulation is to have a factory FSK or FRK facing which acts as the vapor barrier. Maximum permeability rating is 0.02 perms.
- c. Use only labeled Type UL181AP tape. Maintain a complete vapor barrier throughout all ductwork insulation applications.

5. All return air boots to be internally lined with acoustical liner.

6. Flexible Duct: Only above suspended or hard ceilings:
 - a. Provide duct listed as UL-181 Class I air duct, and constructed in compliance with NFPA 90A. ATCO Series 36.
 - b. Maximum length five feet (5'). Install with not more than one (1) 90 full radius degree bend.
 - c. Make joints with Nashua brand UL181A-P duct tape and 1/2" wide positive locking panduit straps.
 - d. Exterior skin is to be tough vapor barrier reinforced metalized polyester jacket, tear and puncture resistant.
 - e. Airtight inner core with no fiberglass erosion into airstream.
 - f. R-Value: 6.0 at 75 degrees F. mean temperature.

I. Air Filters

1. All air filters to be listed as Class 2 by Underwriters Laboratory, Inc., Building Materials Directory.
2. Media: Non-woven, lofted cotton bonded to 96% free area welded wire support grid. Not less than 6.6 square feet media area per square foot of filter face area. Arranged in radially pleated configuration and bonded continuously to inside perimeter of high wet-strength beverage board cell sides.
3. Cell Design: 2" deep with beverage board diagonal supports at entering air and leaving air faces of each cell.
4. Air Cleaning Performance: Minimum MERV 8.

J. Fire and Smoke Dampers

1. Provide and install all fire dampers in all ductwork which passes through any rated egress pathways, as required by Local Building and Fire Safety Codes.
2. All dampers UL approved and of type required by NFPA 90A.
3. Install all dampers per manufacturer's instructions.
4. All dampers shall have a UL555S leakage classification of II.
5. Sleeves for fire dampers shall be of gauge as described in NFPA 90A and as a minimum of 18 gauge for dampers up to thirty-six inches (36") wide and fourteen (14) gauge for dampers which exceed thirty-six (36") in width.
6. Manufacturers: Ruskin, Air Balance, Arrow, Nailor or approved equal.

K. Ductwork Supports

1. Support all duct work to prevent sag, undue play and swing. Provide a hanger within twelve inches (12") from unit supply and return.
2. Low Pressure Ductwork:
 - a. Ducts 40" and Less: Provide with 1" x 18 gauge straps fastened to ductwork and to building construction. Space not more than eight feet (8') on center. Hanger straps shall lap under duct a minimum of one inch (1") and have a minimum of one (1) fastening screw on the bottom and two (2) on the side.

MECHANICAL, ELECTRICAL, AND PLUMBING NARRATIVE

3. Ducts Over 40": Provide mild steel rods fastened to angle iron stiffeners with nuts and to building construction with appropriate inserts, flanges or clamps. Space not more than four feet (4') on center with rods and angle supports.
4. Use minimum twelve (12) gauge wire with saddle for support of flex duct. Maximum permissible sag is 1/2" per foot of spacing between supports. Use one inch (1") strap (minimum) for all round sheetmetal runouts; minimum 8'-0" o.c.

PLUMBING SYSTEMS

A. Domestic Cold Water Supply System

1. A new underground domestic cold water service will be provided to the building, supplied from a site water main. Where the domestic water service enters the building a shut-off valve will be provided. Throughout the building, domestic cold water will be routed to plumbing fixtures. The piping system will be sized based on the Plumbing Code requirements. The piping system will be insulated to prevent condensation from occurring on the exterior of the pipe.
2. Service valves will be provided at each branch line serving two or more plumbing fixtures. All plumbing fixtures and equipment connections will be provided with local stop valves. Additional service valves will be provided, to isolate the system for maximum maintainability.
3. Access panels will be provided with adequate space to operate the valves in walls and non-accessible ceilings.
4. Shock arrestors will be provided on all water rough-ins serving plumbing fixtures.
5. Basis of Design: Copper Pipe.

B. Domestic Hot Water Supply System

1. Domestic hot water will be generated using two natural gas fired water heaters with integral storage tanks. The storage tanks will be constructed of unlined duplex alloy stainless steel. The units will be insulated, in compliance with ASHRAE 90.1 for thermal efficiency, and will have a minimum efficiency of 90%. The water heaters will generate and store hot water at 140°F. Point-of-use thermostatic mixing valves will reduce final delivery temperatures of hot water to the building plumbing fixtures to 110°F. The hot water piping system will have in-line circulation pumps to maintain the hot water temperature to within 10 degrees of the supplied temperature.
2. Water Heaters:
 - a. Remote Water Heaters – 40 gallon electric. Basis of Design A.O. Smith
3. The domestic hot water piping system will be sized similar to the domestic cold water system. The hot water supply and return piping will be insulated to minimize heat loss.
4. Basis of Design: Piping Material - Copper Pipe.

C. Sanitary Waste and Vent Systems

1. A complete waste and vent system will be provided to collect sanitary waste from all plumbing fixtures, floor drains, and any other equipment, in accordance with the Plumbing Code, unless indicated otherwise.
2. The drainage piping system will be designed with a minimum slope of 1/4-inch per foot for pipe sizes less than 3-inch and 1/8-inch per foot for sizes 3-inch and larger.
3. The building will have sanitary sewer lines discharging to the site sanitary sewer system.
4. Floor and wall cleanouts will be strategically placed to avoid being located in sensitive areas.
5. Floor drains will be provided for each air handling device, equipment requiring drains, Toilet rooms with water closets, and mechanical equipment rooms. A floor sink will be provided at each emergency shower unit.
6. Each floor drain will be provided with a p-trap and a trap primer.
7. Basis of Design: Waste Schedule 40 PVC solid wall DWV Piping. Vent Piping Material – Cast Iron, Tyler Pipe American Made to maintain 20/50 flame/smoke rating in plenum.

D. Storm Drainage System

(roof drains and overflow with piping or Downspouts and Gutters by Architect)

1. The roof drainage system shall be sized based on 6 inches per hour rainfall rate, according to the Plumbing Code.
2. Majority of roof drainage is planned to be handled by collector and downspouts by Architect.
3. Overflow drains (if required) will be provided to protect the roof in case of a primary roof drain blockage. The overflow drain lines will be piped separate from the roof drainage system extending to downspout nozzles on the exterior of the building.
4. The roof drainage system will be insulated to prevent condensation from occurring on the exterior of the pipe. Roof drain bodies, overflow drain bodies and the horizontal piping from each drain will be insulated, extending to the first vertical drop and any horizontal offsets that occur (if needed).
5. Basis of Design: Rain Leader Piping Material – Cast Iron

E. Plumbing Fixtures

1. Plumbing fixtures will be Grade A commercial quality and will be low water consumption type fixtures. Water closets will be dual flush type with 1.28 gallon per flush fixtures. The urinals will be 0.125 gallon per flush fixtures. Lavatories will have 0.50 gpm faucets and the sinks will have a 1.5 gpm flow control devices. Water closets will be floor mounted and urinals will be wall hung and provided with concealed support carriers. Lavatories, mop sinks, laboratory sinks and kitchen sinks will be provided with domestic hot and cold water. All vitreous china fixtures will be white in color. Where applicable, fixtures will be in compliance with the Americans with Disabilities Act. Basis of Design: Sloan, Zurn, American Standard
2. Wall hydrants will be provided on the exterior walls to provide wash down of entries, and other exterior areas around the building. Hydrants will be freeze-proof recessed type with hinged door, integral vacuum breakers and loose key.

MECHANICAL, ELECTRICAL, AND PLUMBING NARRATIVE

F. Propane (LP) System

1. Propane (LP) gas will be provided to the building from the Owner's propane supplier. Reference Civil drawings for routing. A gas meter with regulator will be located outside the building, by the Owner's propane supplier. The gas piping system will enter the building and be piped to the heaters in the Shop/Warehouse areas. The gas piping system will be sized based on the International Fuel Gas Code.

FIRE PROTECTION SYSTEMS

A. The building will be provided with an automatic fire protection sprinkler system. A fire water service supply will be extended into the building. Dry type sprinkler systems will be provided for areas where the sprinkler heads and piping will be exposed to freezing conditions external to the buildings. The dry type sprinkler systems will include air compressor, dry pipe valve, air maintenance device, etc. The wet and dry sprinkler systems will be hydraulically designed in accordance with the requirements of all agencies having jurisdiction. System will include piping, sprinklers, wet and dry alarm valve assemblies, tamper switches, flow switches, valves, drains, inspector test, test drains, fire department connections, sprinkler heads, roof manifolds, etc.

B. Sprinkler heads in light hazard finished areas with suspended ceiling will be quick response, flush concealed with white cover plates. Heads in non-finished areas such as Mechanical Equipment Rooms, Electrical Rooms, etc., will be chrome-plated brass. (Verify for use in Electrical rooms).

C. The sprinkler systems will conform with all applicable provisions of the Owner's Insurance, NFPA Standards 13, 14 and other appropriate NFPA Standards, state and local codes.

D. A fire pump is not anticipated to be required.

E. IT Rooms: Pre-action, double interlock wet pipe system to be used in server room and IT machine room.(verify owner preference)

ELECTRICAL SYSTEMS

A. Electrical Utilities:

1. Electric Service: Power will be brought to the building from the local electric utility company. The service to the building will be 480Y/277V, 3-phase, 4-wire on the secondary of the building pad mount/pole mount transformer. Lighting will be served at 277V and motors larger than 1/2 horsepower will be served at 480V, 3-phase. Energy-efficient, low voltage, indoor, dry-type transformers that are DOE 2016 compliant will be used inside the building electrical rooms to transform down to 208Y/120V for convenience receptacles and other small loads.

2. Generator: Critical systems are to be backed up on Emergency Power, by a Natural Gas Generator. Assume 250kw – 480v-3ph genset.

3. Automatic Transfer Switch: Due to critical nature of facility, assume ATS switch to be bypass isolation type to allow service of ATS while building remains operational. 400 amp – 480v-3ph-nema 3r. Basis of Design: Russ Electric

4. Building surge suppression systems will be installed in the building at the main switchgear, 480Y/277V distribution panels, and 208Y/120V branch circuit panelboards for protection of building loads from surges both from lightning and utility transients as well as building switching transients. Basis of Design: Current Technologies

B. Interior Electrical Distribution System

1. Furnish all labor, testing, supplies and materials, including but not limited to, installation of light fixtures, cutting and chasing, coordination with other trades on the job, etc, necessary for the installation of complete electrical systems. Include empty conduit as required for the telephone systems. Include temporary electrical power and lighting to satisfy OSHA requirements. Verify all conditions and measurements at site.

2. The building main electrical room shall house the building switchboard. The main electrical room personnel doors shall open in the direction of egress and shall be equipped with panic bars, pressure plates or other devices that are normally latched but open under simple pressure in accordance with N.E.C article 110.26 (c)(3).

3. Separate dedicated electrical rooms shall be provided as required. These rooms shall be strategically and centrally located within the building to minimize voltage drop problems. The electrical rooms will have branch circuit panelboards, DOE 2016 compliant dry type transformers and 208Y/120 Volt branch circuit panelboards. Separate dedicated 480Y/ 277 Volt panelboards for HVAC equipment and lighting branch circuits shall be provided.

4. DOE 2016 complaint, aluminum windings dry type transformers shall be provided to serve all non-linear load branch circuit panelboards. Basis of Design Transformers: Powersmith

5. Basis of Design Panels and Switchgear: Square D, ABB, Siemens, Eaton (confirm with owner)

C. Interior Lighting Systems

1. LED lighting will be utilized throughout the building. Building interior lighting control schemes shall comply with the requirements of the current edition of IECC. All offices and classrooms shall be provided with dual technology occupancy sensors, and switches for a dimming lighting control system. Lighting control schemes will be further discussed with the Owner as the design progresses.

2. All lighting will be provided with a color temperature of 3500°K and a color rendering index of 85 (CRI = 85).

3. Emergency lighting and means of egress lighting shall be provided in accordance with NFPA Life Safety Code (NFPA 101), and shall all be served by battery packs.

4. All exit light fixtures shall be LED type.

5. Illumination levels shall comply with the requirements set forth by IES, allowable power densities, and the building program requirements unless otherwise indicated by the Owner. Footcandle levels shall be minimized in areas where task lighting is used.

6. All exterior lighting shall be LED type lighting in weatherproof fixtures mounted on poles, walls, or soffits as required to meet lighting requirements.

7. Exterior Lighting Control: Lighting contactor controlled by DDC.

MECHANICAL, ELECTRICAL, AND PLUMBING NARRATIVE

8. Provide life-safety lighting in all exit paths in accordance with IES minimum foot-candle recommendations and AIA guidelines. Provided by Frog-Eye type emergency fixture or Battery Back-up in LED fixtures. (confirm owner preference)

9. All requirements of the current edition of IECC will be adhered to during the design of the lighting, this will include the use of automatic shut-off via time of day schedule, occupancy sensors and/or dual level switching.

10. All specialty lighting will coordinated with Architect.

11. Basis Of Design: Light Fixtures - Acuity Brands - Lithonia

12. Basis of Design: Lighting Controls – Acuity nLight (wired controls)(stand alone)

D. Building Security System and Telecommunications Systems

1. Building security and telecommunication systems shall be provided in accordance with the Owner requirements. This system shall be designed by another consultant.

E. Fire Alarm System

1. A digital, addressable voice alarm closed circuit, electrically supervised automatic and manual fire detection alarm system shall be provided. The system will consist of manual pull stations and audio-visual devices at means of egress throughout corridors, area smoke detectors, heat detectors in equipment rooms and smoke detectors in storage rooms. Duct mounted detectors in supply and return duct of air handling equipment for air handling system shutdown as required by code. The fire alarm system design will comply with the Americans with Disabilities Act regulations, and Texas Accessibility Standards (TAS), and the National Fire Protection Association NFPA 101, and NFPA 72, and the International Building Code (IBC). FACP in MDF ROOM, FAAP in lobby and Fire Riser Room.

2. System to connect to Fire Sprinkler system.

3. Basis of Design: Silent Knight 6820xl with Voice Evacuation

TECHNOLOGY NARRATIVE

PROJECT SCOPE OF WORK

- A. The scope of work for this project includes the new Operation Center. This will include the implementation of new telecommunication spaces, structured cabling, facility intercom system, local sound systems, physical security systems including access control and surveillance.
- B. There is currently no storm shelter required within this jurisdiction.
- C. This section is intended to define the standards, criteria and assumptions used for the development of design documentation concerning the structured cabling, AV and security systems infrastructure.
- D. The systems design and specifications are based on Jarrell ISD Guidelines, client input, industry standards and best practices

STRUCTURED CABLING

Basis of Design

- A. The Structured Cabling System design provided shall be Owner Furnished and Installed (OFOI). CRUX shall provide construction documents that will assist with coordinating this system with the General contractor providing rough in, electrical and pathways.
- B. The scope of work for structured cabling shall include new physical fiber optic cabling and termination hardware utilizing Passive Optical Networking (PON) from Tellabs. The system design shall include passive fiber optic splitters located in the ceilings of the building, Optical Network Terminals (ONT's) installed in ceilings shall provide PoE and network connectivity to wireless access points, surveillance cameras, VoIP handsets and standard data cabling connectivity. The Optical Line Terminal (OLT) will be installed in the MDF room. The MDF shall also support the centralized power supply for the building.
- C. Optical splitters shall be designed in ceiling enclosures.
- D. All fiber shall be Single Mode.
- E. Copper cabling
 - a. Copper cabling shall be designed between all ONT devices and their supported connections to include all wireless access points, VoIP handsets, displays, projectors, computers, printers, access control panels, building management systems and surveillance cameras.
- F. Termination support equipment / MDF and IDF room build out
 - a. The MDF shall support the OLT and fiber termination hardware and all power for the PON system shall be centralized in this space. The MDF shall include all equipment racks, back boards, ladder rack, and grounding bars as per District standards.
- G. Termination support equipment / Data Center, MDF and IDF room build out - One MDF and multiple new IDF rooms will be constructed for this project. All racks, termination hardware etc. shall match Owner specifications.

- H. Grounding – All equipment in the MDF and IDF(s) will be properly bonded and grounded per TIA standards and BICSI best practices.
- I. Area network requirements - Two four-inch conduit shall be installed between the MDF location and the Service Provider pedestal at the street. Fabric innerduct shall be installed to provide separate pathways inside the conduit.
- J. Digital signage locations will receive network cabling as-required for functionality.
- K. Wi-Fi – General
 - Wireless access point locations will receive network cabling as-required.
 - Wireless access points will be furnished and installed by Jarrell ISD IT.
- L. Office
 - Shall receive two data drops each at one location and will originate from the nearest optical splitter.
- M. Pathways
 - Will consist of j-hooks and/or basket tray in corridors and accessible ceiling spaces.
 - Conduits and sleeves will be required for locations with inaccessible ceilings such as clear story/high volume, hard-lid/gypsum, etc.
- N. Costing for the fiber network system is pending finalized design and input from Tellabs.

NETWORK ELECTRONICS, WIRELESS ACCESS POINTS AND UPS EQUIPMENT

Basis of Design

- A. Jarrell ISD IT shall furnish and install active electronics and UPS equipment for network connectivity such switches, routers, bridges, and wireless access points.

PHONE SYSTEM

Basis of Design

- A. The complete phone system will be furnished and installed by Jarrell ISD IT.

BUILDING PAGING & CLOCK SYSTEM

Basis of Design

- A. Shall be Owner furnished and Installed (OFOI).
- B. A new intercom system shall be based on the existing District specifications.
 - 1. Valcom
- C. Intercom speakers shall be added to all corridors, and general areas.
- D. Exterior speakers are required on all sides of the building - two at each corner and every 100ft in between.
- E. Clocks will be installed inside the main building in the corridors, office, gym, and cafeteria area. system with the General contractor providing rough in, electrical and pathways.

TECHNOLOGY NARRATIVE

CONFERENCE ROOM AUDIO VISUAL SYSTEMS

Basis of Design

- A. The Conference Room Audio Visual System design provided shall be Owner Furnished and Installed (OFOI). CRUX shall provide construction documents that will assist with coordinating this system with the General contractor providing rough in, electrical and pathways.
- B. VIDEO SYSTEMS
 - 1. Owner furnished, and Contractor installed wall wall-mounted flat panel display.
 - 2. HDMI transmitter in floor box underneath conference table.
- C. AUDIO SYSTEMS
 - 1. Built-in display speakers.

ACCESS CONTROL SYSTEM (ACS)

Basis of Design

Access control and/or door monitoring shall be provided as follows:

- A. The Access Control System design provided shall be Owner Furnished and Installed (OFOI). CRUX shall provide construction documents that will assist with coordinating this system with the General contractor providing rough in, electrical and pathways.
- B. ACS system Manufacturer: Verkada
- C. Card reader Manufacturer: Verkada
- D. Door hardware Manufacturer: Allegion
- E. Door monitoring via Door Position Sensor will be at all exterior door locations and roof hatches.
- F. Request to exit (REX) devices will be used on all exterior doors. Door hardware will have integrated REX wired into the panic hardware.
- G. Card readers shall be deployed to areas identified by the Owner including main entry and staff entry.
- H. Wall mounted access control panels shall be installed in the MDF as needed to support the ACS.
- I. Lock down buttons will be installed at the main reception desk and other area(s) as defined by the Owner.
- J. A door release button shall be installed in the reception area for controlling the door leading from the reception into the main building area.
- K. Additional credentials and other consumables shall be determined by the Owner during the design phase.

VIDEO SURVEILLANCE SYSTEM (VSS)

Basis of Design

- A. The Video Surveillance System design provided shall be Owner Furnished and Installed (OFOI). CRUX shall provide construction documents that will assist with coordinating this system with the General contractor providing rough in, electrical and pathways.
- B. Video management server: Verkada.
- C. Camera manufacturer: Verkada.
- D. Camera types (fixed, ptz, etc.): Fixed domes and bullet style cameras will be used. Typically interior cameras are domes and exterior cameras are bullets.
- E. Interior cameras shall observe the following: Corridors, entries/exits, gathering spaces and the main office.
- F. Exterior cameras shall observe the following: Exterior areas and other areas as-directed by Jarrell ISD IT.
- G. Pole mounted cameras: none.
- H. Video programming requirements: TBD
- I. Storage Server: Storage is included on each camera and video footage is available via the Verkada cloud.
- J. VMS: Verkada
- K. Licenses: To be furnished by the contractor for each camera in-scope.

INTRUSION ALARM

Basis of Design

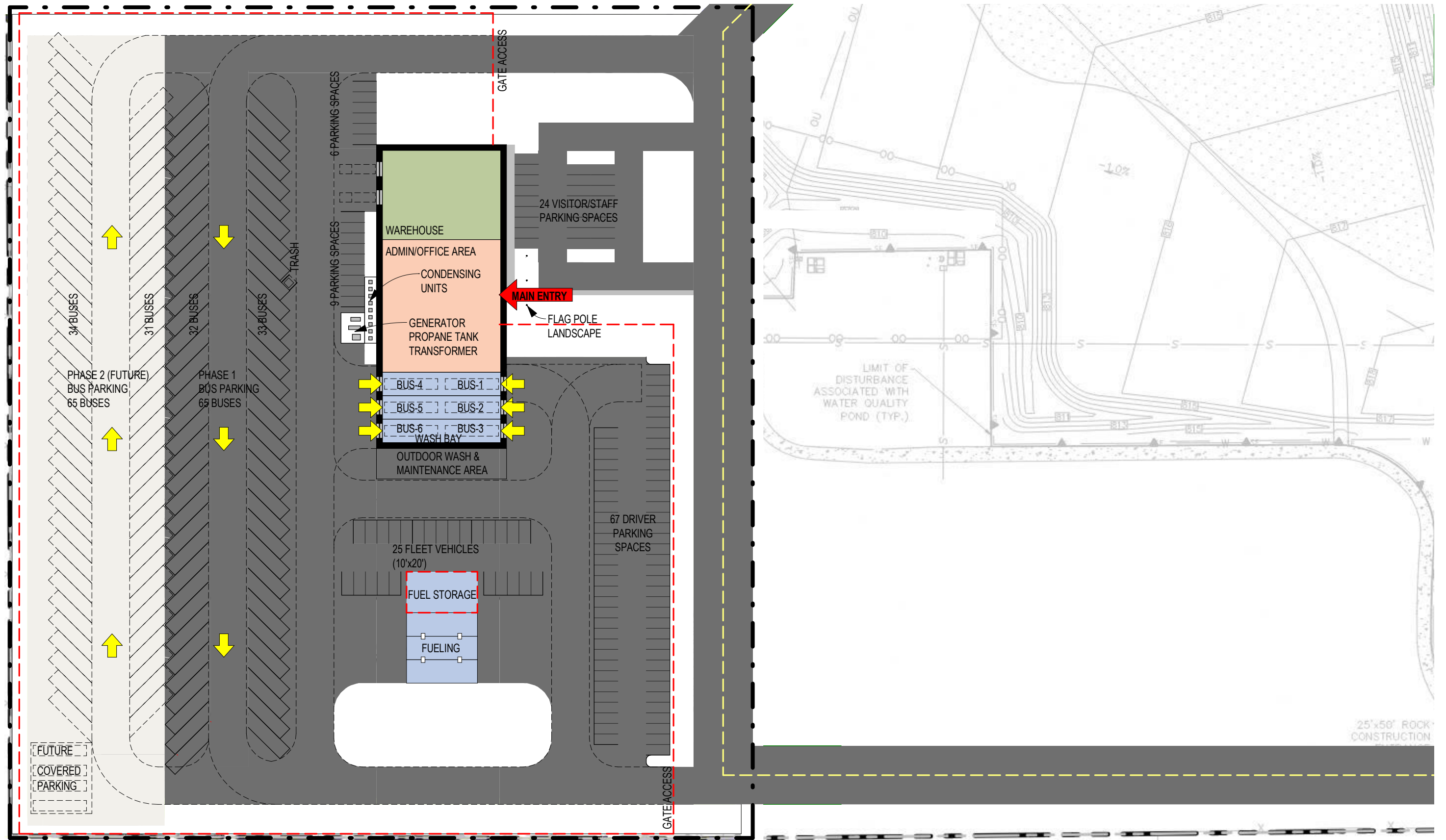
- A. There is no stand-alone intrusion system for this project. In areas where cameras are present, the cameras will serve as motion detectors in the Verkada VMS.

EXCLUSIONS:

- A. None at this time

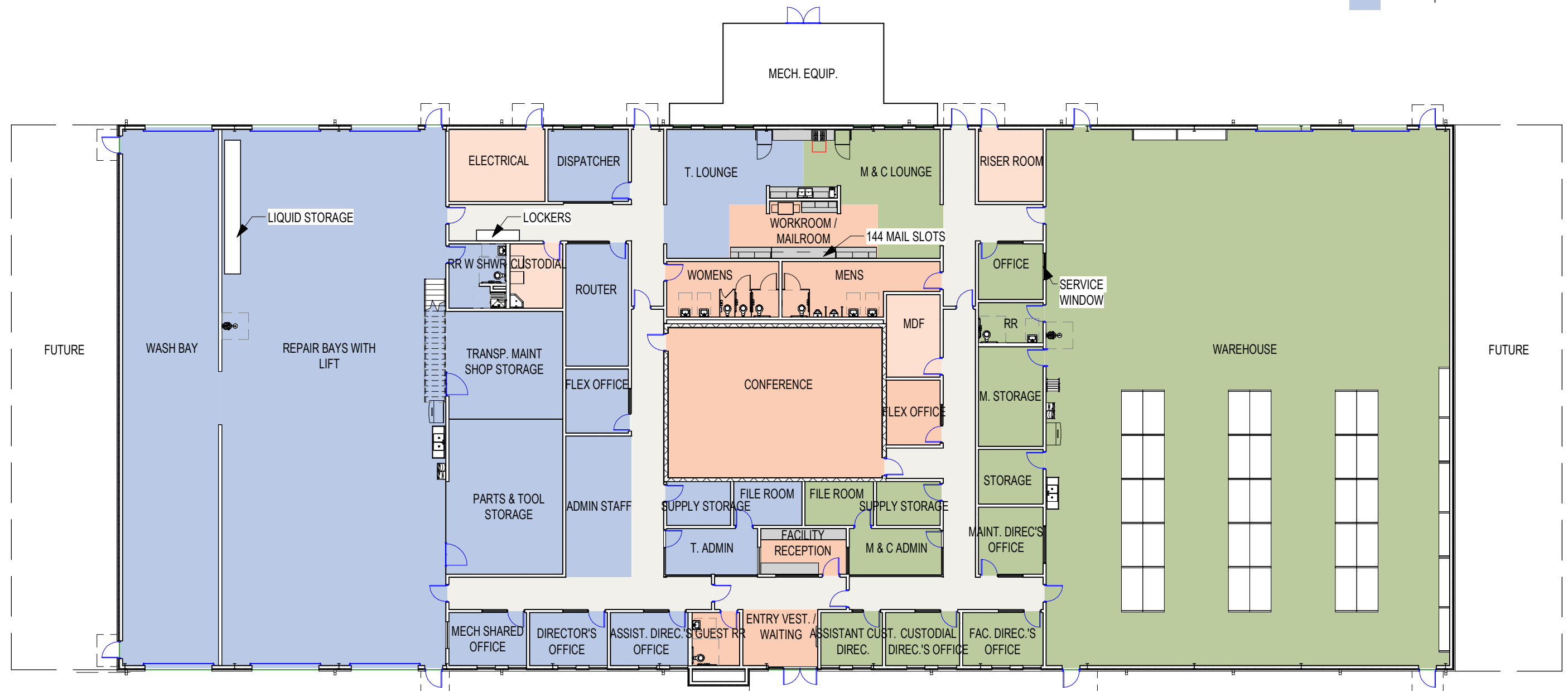
NEW OPERATIONS CENTER BUILDING PROGRAM

CIRCULATION & WALLS	6,655
MAINTENANCE AND CUSTODIAL	9,610
SHARED	2,385
SUPPORT	675
TRANSPORTATION	9,510
<hr/>	
BUILDING GROSS SF TOTAL	28,835 GSF



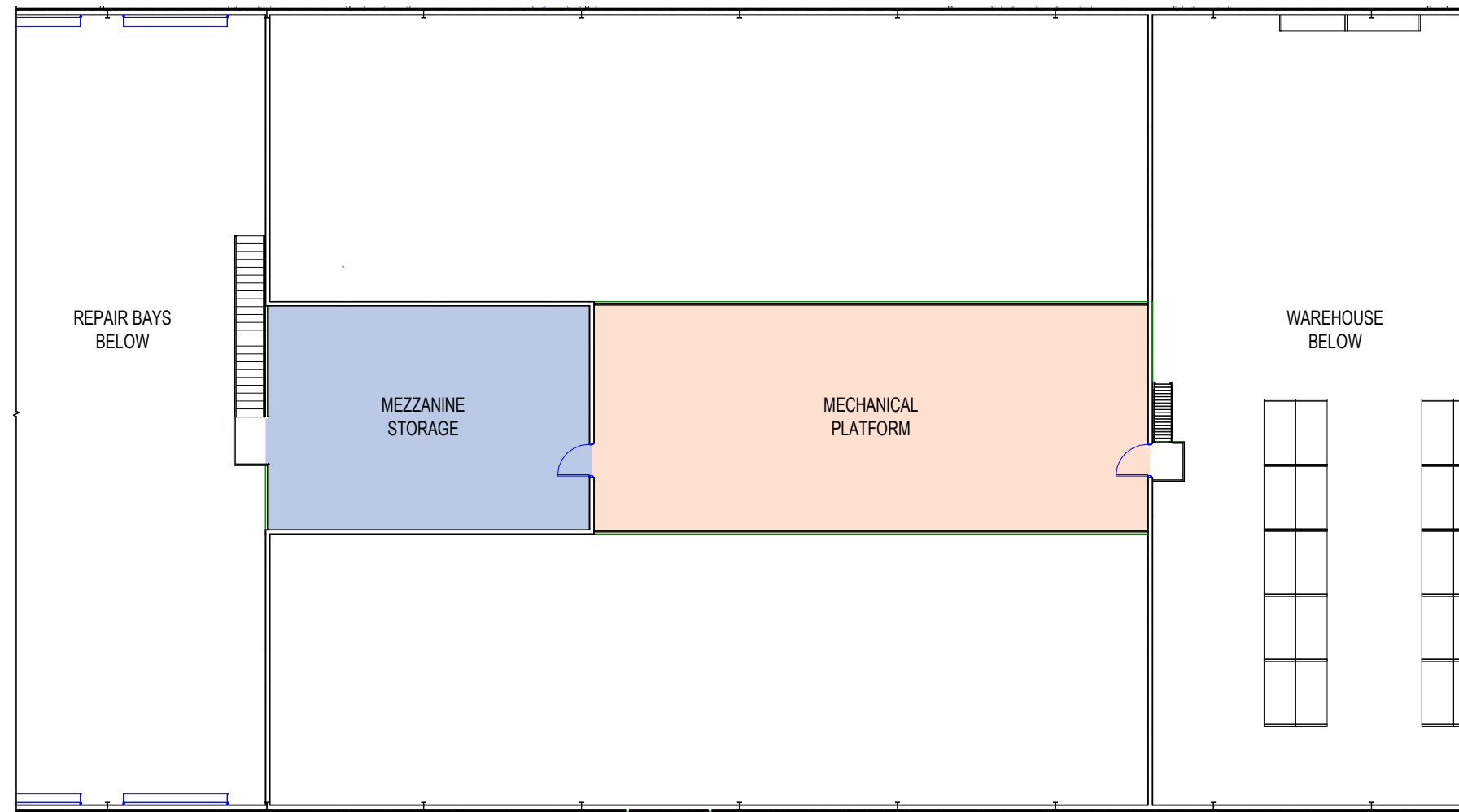
COLOR LEGEND

- Circulation
- Maintenance & Custodial
- Shared
- Support
- Transportation



COLOR LEGEND

- Circulation
- Maintenance & Custodial
- Shared
- Support
- Transportation



MEZZANINE LEVEL



NORTH





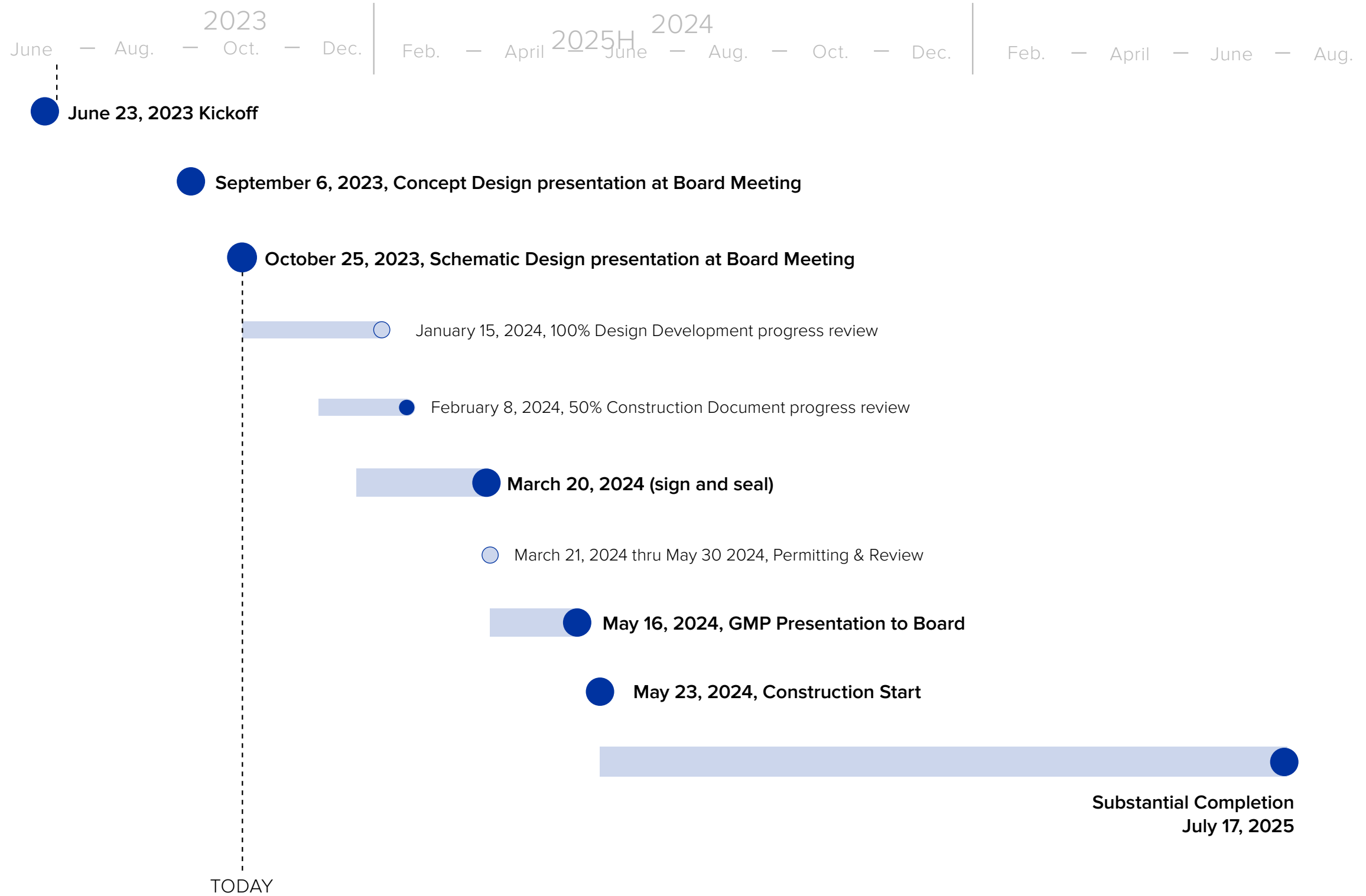
COSTS

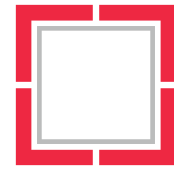
NEW OPERATIONS CENTER OPINION OF PROBABLE COST

\$14,400,000

BEGINNING OF CONSTRUCTION MAY 2024

PROJECT DATES
Kickoff
Concept Design
Schematic Design
Design Development
Construction Documents
Permitting
Bid & Award
Construction





MORE THAN ARCHITECTS