

**Agency: Commerce, Community and Economic Development****Grants to Named Recipients (AS 37.05.316)****Grant Recipient: Partners for Progress in Delta, Inc.****Federal Tax ID: 26-2495109****Project Title:****Project Type: New Construction and Land Acquisition**

# Partners for Progress in Delta, Inc. - Career Advancement Center Expansion

**State Funding Requested: \$5,635,543****House District: 6 / C**

One-Time Need

**Brief Project Description:**

Expand existing Partners for Progress campus.

**Funding Plan:**

Total Project Cost: \$5,635,543

Funding Already Secured: (\$0)

FY2014 State Funding Request: (\$5,635,543)

Project Deficit: \$0

*Funding Details:**FY13 Pliminary Design Funding \$45,000***Detailed Project Description and Justification:**

See Attached PDF.

**Project Timeline:**

FY14-18

**Entity Responsible for the Ongoing Operation and Maintenance of this Project:**

Partners for Progress in Delta, Inc.

**Grant Recipient Contact Information:**

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Title: Member

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Has this project been through a public review process at the local level and is it a community priority?  Yes  No

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**ACKNOWLEDGEMENTS**

**Client**

**Partners in Progress in Delta, Inc.**

PO Box 956  
Delta Junction, AK 99737  
Karen Cedzo, PPD Development & Coordination

**Consultant Team**

**Bettisworth North Architects and Planners**

*(Architect/Landscape Architect/Interior Designer)*

212 Front Street, Fairbanks, AK 99701  
Charles Bettisworth, Principal in Charge  
Tracy Vanairsdale, Principal, Project Manager  
Mark Kimerer, Project Landscape Architect  
Sara Ballenski, Interior Designer

**Shannon & Wilson, Inc. (Geotechnical)**

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Steve Adamczak, Principal Geotechnical Engineer

**PDC Inc. Engineers (Civil)**

1028 Aurora Drive, Fairbanks, AK 99709  
Keith Hanneman, Principal Civil Engineer

**Castner Consulting (Structural)**

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Fairbanks, AK 99701

**RSA Engineering (Mechanical/Electrical)**

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Anchorage, AK 99503

**Nortech (Environmental)**

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Fairbanks, AK 99709

**HMS Inc. (Cost Estimator)**

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Ehsan Mughal, Principal Cost Estimator

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### OVERVIEW

The Partners for Progress in Delta have identified a need for a new, more efficient and flexible regional training center, known as the Career Advancement Center. This project provides a one-story, wood-frame structure in accordance with the 2009 International Building Code.

### 2009 IBC CODE NARRATIVE (Prepared by Bettisworth North)

#### Code Summary

Occupancy Classification (301) .....	B (Classrooms For Students Above Grade 12)
Type Of Construction (601).....	V-B (Combustible, Non-Rated)
Automatic Sprinkler Protection .....	None
Basic Area (Table 503).....	9,000 Sq. Ft.
Increase Area For Fire Separation Distance (75%).....	6,750 Sq. Ft.
Increase Area For Sprinkler.....	0 Sq. Ft.
Allowable Per Story (Basic+Separation+Sprinklers).....	15,750 Sq. Ft.
Actual Area.....	8,724 Sq. Ft.
Stories – Allowable.....	3
Stories – Actual .....	1
Height – Allowable .....	60
Height – Actual.....	24

#### Automatic Sprinkler System

The building will not be protected with an NFPA 13 automatic sprinkler system.

#### Type of Construction

Non-rated, wood frame construction will be used throughout the structure.

#### Occupant Load

The total occupant load for the building is 205.

#### Corridor

The corridor serves an occupant load of more than 30. Table 1018.1 requires that the corridors be constructed as Fire Partitions with a fire-resistance rating of 1-hour. Openings shall be protected with 20-minute, self-closing, smoke and draft control assemblies.

#### Boiler Room

Table 508.2.5.2 requires boilers rooms with equipment over 15 psi and 10 horsepower be enclosed by Fire Barriers having a fire-resistance rating of 1-hour. Openings shall be protected with 60-minute, self-closing, assemblies.

#### Means of Egress

The minimum required number of means of egress is two. The building has three.

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### Plumbing Fixture Count

The following table lists the number of water closets and lavatories required in the building in accordance with the 1997 Uniform Building Code, Appendix Chapter 29, Table A-29-A, as adopted by the State of Alaska.

Sex	Fixture	Quantity
Men	Water Closet	4
Men	Lavatory	3
Women	Water Closet	4
Women	Lavatory	3

### **LANDSCAPE AND SITE DESIGN NARRATIVE (Prepared by Bettisworth North)**

#### **Design Criteria**

The facility site design will engage visitors with a transitional entry experience and conform to best practices for vehicle and pedestrian design, including ADA accessibility standards. The facility has been located on a slight topographical bench outside of the adjacent flood zone and oriented to specifically address concerns of snow-drifting at the main entry from high winds gusting from southeast to northwest in the winter months.

#### **Fire Protection and Emergency Vehicle Routes**

Site design solutions will be in accordance with fire and emergency access requirements as determined by local officials. All vehicular emergency routes are a minimum paved width of 20'-0" with a minimum inside radius of 35'-0" for maneuvering. Emergency routes shall be maintained for year round access.

#### **Pedestrian Access + Entries**

The new facility will be entered from both the southeast (main entry) and the north (service). Pedestrian access is directed to the main entry and a welcoming canopy by a series of 6'-0" wide reinforced concrete walks (4" depth, typ). An extended length of walk adjacent to the curb at the main entry has been designed to allow for passenger drop-off. From the extended walk, an 8'-0" wide pedestrian path navigates from the main entry area south across the first parking access drive to a curbside path adjacent to the southernmost parking spaces before crossing the main entry drive and continuing curbside to the existing CAC facility.

The parking area drive aisles have been oriented to provide for ease of movement for pedestrians after parking area snow clearing during winter months. It is recommended that no salt or chemical ice melt is used on pedestrian circulation surfaces to promote the health of the adjacent ecosystems.

#### **Parking**

Facility parking spaces will be paved and striped with a typical dimension of 9'W x 20'L for all standard 90-degree vehicle parking. Accessible parking spaces will be 8'W x 20'L accompanied by a 5'W x 20'L aisle. Parking spaces will be reduced to 18'L in locations where vehicle overhang does not

conflict with pedestrian circulation. Drive aisles that access parking areas will be a minimum width of 24'-0" for two-way traffic and maneuvering.

Parking areas will be graded to sheet drain into bioswales or vegetated areas at a 2% minimum, 5% maximum slope. Reinforced concrete curbs will be located along the main entry drive aisle to provide for proper vehicle/pedestrian separation. Flush curbs and curb ramps will be located as appropriate to provide an accessible route of travel from the existing campus and parking area to the new facility.

Snow clearing maneuvers will generally gather snow from south to north to minimize drifting in circulation areas and adjacent to the new facility. It is recommended that no salt or chemical ice melt is used in the parking area to promote the health of the adjacent ecosystems.

### Site Electrical Considerations

The new entry drive, parking area and entry areas of the facility will require site lighting for safety and wayfinding. A full cut-off LED site light (such as the Kim Lighting Warp9 LED) shall be mounted on 20'-0"ht. poles atop reinforced concrete footings with an exposed footing height of 2'-0", for a total height of 22'-0". Site lighting shall be placed a minimum of 4'-0" from adjacent circulation to minimize conflicts with snow clearing equipment. Wall mounted fixtures may be included in areas immediately adjacent to the new facility.

A new facility Monument Sign will include exterior grade LED light fixtures.

Headbolt heater outlets will be located in the parking area for (20) vehicles.

### Site Design Elements

The site design was purposefully laid out to begin the user experience at the intersection of North Clearwater and Kimball streets for safety and increased visibility. A curvilinear paved entry drive leads visitors past the southwest façade of the new facility and into a divided parking area that is broken into (3) distinct parking bays. There are a total of 66 parking spaces for the new facility; (3) accessible, (3) service and (60) visitor. The layout of the three parking bays allows for maintaining of existing mature vegetation on site and provides both physical and visual buffers for a more natural-feeling facility and a reduced perception of the size of the parking area. The parking bays will be graded to sheet flow into areas of existing vegetation. Long-term maintenance of the parking areas shall not include use of salt or chemical ice melt in order to maintain survivability of vegetation.

The entry and a new 8' wide curbside pedestrian path connect the new facility to the existing CAC facility.

A service area is located at the north end of the new facility and includes a 20'-0" wide paved access lane, (3) service parking spaces, a 8'-0" x 12'-0" dumpster pad, a 6'-0" x 8'-0" concrete pad for a portable generator and an 8'-0" x 12'-0" concrete pad for above-ground fuel oil tank (sized to Mechanical specifications) to service the energy needs of the building.

A septic area is located approximately 60'-0" to the northwest of the facility. Due to the lack of survey and soils testing available for the site it is roughly sized to match the existing CAC facilities septic system (100'-0" x 60'-0").

A new well to service the facilities potable water is located at the northeast corner of the parking area, approximately 360'-0" feet from the new septic system and 290'-0" from the existing septic system at the CAC. The well is carefully located to avoid subsurface drainage that typically flows from

southeast

to

northwest.

### **Landscape**

The existing site is predominately characteristic of native forest consisting of spruce and birch. Significant efforts will be focused on maintaining the aesthetic and experience of the existing site, including salvaging existing vegetation and re-vegetating areas with native and naturalized species. Landscape plantings have been identified for their uses in local food production as well their aesthetic qualities. Much of the site will be intended to return to the existing natural condition with the exception of the main entry. The main entry area will require minimal maintenance after establishment with periodic weeding, mulching and watering.

Relocation of existing plant materials to locations identified on-site prior to construction and the re-use of organic materials from clearing and grubbing operations have been identified as opportunities and will require continued design, specification and contractor coordination. The intent is to reduce required export and import of organic material and instead use what is available to create a functioning and attractive landscape that the community can identify as a long-term success.

Reuse of scrap building materials from site and facility construction for landscaping purposes (ie. raised beds, fence, compost, etc.) might be appropriate and will be coordinated as appropriate during final design.

### **Demonstration Gardens**

As part of the schematic site development an area approximately 13,000 square feet in size has been identified as an ideal location for a demonstration garden. The demonstration garden areas may require moderate to intensive maintenance and identifying a partner or program for continued attention will be required prior to construction. Possible partners include students at the adjacent school or local special interest groups. The intent to reuse site clearing and construction materials have been identified to be located in the areas designated as demonstration gardens. Further coordination is necessary to identify the end user.

The garden is split into (2) plots bisected by the entry drive and located southwest of the new facility. The garden provides an opportunity for organizations or community interest groups with the potential to exhibit specific gardening techniques (ie. permaculture, etc.) or native species nursery production for regional re-vegetation efforts to cultivate the land in a visible and educationally appropriate location.

**CIVIL DESIGN NARRATIVE (Prepared by PDC, Inc. Engineers)**

**General Requirements**

Applicable Codes and Standards:

- Alaska Department of Environmental Conservation (DEC)
  - Wastewater Disposal Standards 18 AAC 72
  - Drinking Water Standards 18 AAC 80
  - Manual for Conventional Onsite Domestic Wastewater Treatment and Disposal Systems (DEC Certified Installer’s Manual)
- Uniform Plumbing Code

On-site Utilities Design Criteria and Requirements

- Separation Distance: ..... 200 feet between well and septic tank, 200 feet between well and leach field, 4 feet above maximum water table elevation (septic system), 50 feet from leach field to any slope greater than 25 percent
- Minimum Burial Depth: ..... 4 feet (top of pipe and septic tank)
- Setback Requirements: ..... 10 feet from lot lines (septic and leach field)
- Space Requirements: ..... 4,000-gallon septic tank, 4,800 square foot leach field
- Peak Flow Estimate: ..... 135 gallons per minute (verify with RSA Engineering)

**Civil Design**

General Scope: The new Delta Career Advancement Center will be constructed on an undeveloped 22-acre site in Delta Junction, Alaska, and north of the existing career center. The proposed facility includes a DEC-approved commercial kitchen, well, and gravity sewer to an on-site septic tank and absorption (leach) field.

Civil engineering work for this project includes:

- Developing a conceptual well and septic system design
- Preliminary sizing and layout of on-site utilities
- Associated layout details including space requirements, setbacks, separation distances, and conceptual layout

**Well Design**

The well design is based on information found in the DEC files for the Delta School (now Delta High School [DHS]), DEC public water systems well chemical reports for the Delta School Vocational Education building, and DEC Drinking Water Standards. The well design is as follows:

- The proposed well is 180 feet deep with the well casing a minimum of 1 foot above the ground. The ground surface will slope away from the well for at least 10 feet in all directions to drain water away from the well. Due to the proximity of the school to the project site, PDC has assumed that the groundwater will be approximately the same depth and a well casing of similar depth and size will be required.

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- The pump inlet will be a minimum of 20 feet below the draw down water level. The service line to the building will have a minimum of 2 inches of waterproof insulation and be a minimum of 5 feet below ground surface (bgs). Both the well and service lines will be heat traced to prevent freezing.
- The proposed well is classified as a Class “A” public water system, because it will serve approximately 162 people (the design capacity of the building) for at least 6 months per year and is not a private (residential) water system. The estimated water usage for the facility is 3,650 gallons per day.
- The well will be approximately 200 feet from the septic tank and 200 feet from the leach field.

### Septic System Design

The septic system design is based on the existing DHS septic system. PDC was unable to obtain septic system information for the existing career center from DEC. Soil borings from 1981 provided by the client indicate coarse sand and sandy gravel in the area. This is supported by DHS well logs. A percolation factor of 1.2 gallons per day per cubic foot (4 min/in) was used for the design of the leach field. A daily flow rate of 3,600 gallons per day is based on design occupancies and DEC Certified Installer’s Manual flow rates. The leach field for the existing career center is approximately 60 x 90 feet (5,400 square feet). The septic system design is as follows:

- A 4,000-gallon steel septic tank located approximately 50 feet north of the building. A 4-inch gravity sewer will run from the building to the septic tank. The project is located within a flood plain, so the septic tank should be tied down to concrete deadman or a concrete slab so that it does not expected to become buoyant. The tank will have a minimum 2.5 inches of waterproof insulation.
- The leach field will be 4,800 square feet. (60 feet x 80 feet) with eight trenches (each 3 feet deep and 2.5 feet wide) down its length. The trenches will be 8 feet apart. Sixty feet of perforated PCV pipe will be placed in each trench (totaling 480 feet of pipe) at a slope of less than 25 percent. Two inches of rigid insulation should be placed within the trench above the leach rock/perforated pipe.

Final design of the septic system should be coordinated with the mechanical engineer (RSA Engineering) to ensure the system can accommodate peak flows. In order to ensure an accurate design, a percolation test should be performed during the geotechnical investigation. PDC also recommends a 17-foot bgs boring at the leach field location to verify there is no groundwater within 10 feet of the leach field.

**ARCHITECTURAL DESIGN NARRATIVE (Prepared by Bettisworth North)**

**Building Envelope**

Exterior Walls: 2x8 inch wood stud wall framing with minimum R-32 spray foam insulation between studs and R-12 expanded polystyrene insulation at exterior of framing, with plywood sheathing and weather barrier, providing a minimum wall assembly of R-40. Portions of the lower wall will be faced with a 4-inch thick concrete masonry unit exterior wainscot in areas requiring a more durable lower finish. Cementitious planks or panels, or metal siding panels, are installed as typical siding. A reinforced vapor retarder, 5/8" gypsum wall board, and applied paint finish with rubber base will be installed on the interior face of the stud.

Windows: High efficiency, fiberglass frames with some operable windows. Minimum U-factor rating of 0.26.

Doors: Wood with aluminum cladding at building entrances. Insulated hollow metal at service entrances.

Roof: Standing seam metal roofing with rigid insulation having an R-Value of 70.

Canopy: Main front canopy has wood structure with exposed tongue and groove wood decking; sloped structure to drain; all-weather plywood; and fully adhered EPDM with side scuppers for drainage.

**Building Interior**

See sheet A901 for individual room finishes.

Interior Walls: Typical wood stud frame construction with gypsum wall board and finish. Wet walls in the toilet rooms will receive ceramic mosaic wall tile. Sound walls will be constructed at corridors, toilet rooms and mechanical areas to achieve improved sound transmission ratings.

Interior Wall: Wall assembly at incidental use areas wood stud frame construction with 5/8" gypsum wall board and paint finish on both sides.

Interior Glazed Walls: Where shared light from exterior windows is desirable, interior borrowed lites will be installed to bring sunlight into interior spaces.

Doors: Solid hardwood veneer doors in hollow metal frames. Hollow metal doors and frames will be provided in Mechanical spaces.

Floors: The main entry, vestibules, will have walk-off carpet. Classrooms 1 and 2, offices, lounge area and main hallway will have carpet. Resilient flooring is provided for classroom 3 and Lecture room. The men's and women's toilet will have ceramic tile. The Kitchen floor will be quarry tile. Kitchen storage room and janitor's closet will have quarry tile. Facility storage, Fan room, mechanical and electrical rooms will have sealed concrete.

Ceilings: The typical ceiling is open to open-web wood joists; these areas have exposed plywood roof decking and mechanical ductwork. The offices, and Classroom 1 and 2 have acoustical ceiling tile. The main entry includes drop soffits with painted gypsum wall board ceilings. Vestibules, toilets, certain storage and service rooms have gypsum wall board ceilings.

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**PRODUCTS**

CATEGORY	PRODUCT
<b>Masonry</b>	
Concrete Masonry Units	Medium weight, color pigmented, split-face, 8x8x16-inches
<b>Roofing</b>	
Wood Structural Panel deck	As indicated by structural
Thermal Barrier Underlayment	Dens Deck, gypsum wall board, 5/8-inch, Type X
Expanded Polystyrene Insulation	Type II, ASTM C 578, 1.5 pcf density
Cover board	1/2-inch OSB
Metal Roof Panels, 2-coat fluoropolymer	Factory-formed, field-assembled, standing-seam panels, .028-inch thick,
<b>Windows</b>	
Fiberglass, 3-pane, air, Low-E	Milgard, Class LC, Grade 45, whole window U-factor .32 max.
<b>Siding</b>	
Fiber Cement Siding	Horizontal, factory primed, ASTM C 1186, Type A, Grade II
Metal Panels, 2-coat fluoropolymer	AEP Span, Prestige, Series PS-12, 24 gage, flat, factory-formed, field-assembled, concealed-fastener, lap-seam metal wall panels
Wood	Horizontal, lap, stained, 1x6-inches, Doug Fir
<b>Insulation</b>	
Unfaced Glass-Fiber Blanket	Type I, ASTM C 552, R21
Expanded Polystyrene Insulation	Type II, ASTM C 578, 1.5 pcf density
Closed-Cell Spray Polyurethane Foam	Type II, minimum density of 1.5 lb/cu. ft. (24 kg/cu. m), ASTM C 1029.
Vapor Retarder	Polyethylene, 8 mil.
Weather/Water Barrier	Vapro Shield, Wall Shield, polymeric-based barrier

<b>Architectural Woodwork (Cabinets, Countertops)</b>	
Grade and style	Custom Grade, flush overlay
Drawers	Bottom – Hardwood plywood Sides and Back – Thermoset decorative panels, LMA SAT-1, particleboard
Cabinet Shelves	Thermoset decorative panels, LMA SAT-1, particleboard
Plastic Laminate	Cabinet exterior, countertops, NEMA LD 3
Solid Surfacing Material	Countertops, Custom Grade, 1/2-inch, ISSFAA-2
Hardware	Hinges – Frameless, concealed Pulls – Back mounted Finishes – Satin stainless steel
Wall Shelving	Adjustable shelf standards and supports, BHMA A156.9, B04102; with shelf brackets, B04112.
<b>Composite Panel</b>	
Fiberglass Reinforced Panels	Crane Composites, Kemlite, Glasbord, Smooth, Class A, 0.075mm

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<b>Doors and Frames</b>	
Int. Flush Wood doors	Grade: Custom (Grade A faces). Species: Select white birch. Cut: Rotary cut. Match between Veneer Leaves: Book match. Pair and set match. Core: Structural composite lumber. Construction: Five or seven plies, bonded. Factory finished with catalyzed polyurethane.
Ext. Metal doors, insulated	Flush, Level 3, Performance Level A, Model 1, factory primed
Int. Metal doors	Flush, Level 2, Performance Level B, Model 1, factory primed
Metal Door Frames, face welded	Steel, .053-inch thick, factory primed
Hardware	Hinges – McKinney Exit Devices – Von Duprin Cylinders – Best Keyed Removable Mullion – Von Duprin Door Pulls - Tice Door Closers – LCN Kick Plates – Tice Overhead Stop – Glynn-Johnson Weather strip – Pemko Threshold – Pemko Door Bottoms – Pemko Office lockset – Best Classroom lockset – Best Entrance lockset – Best Privary lockset – Best
<b>Counter Doors</b>	
Horizontal Sliding	CR Laurence, Series 2600, satin anodized, pass-thru, 3 panels: 2 fixed, 1 sliding.
<b>Glazing</b>	
Monolithic	Hartung, Clear float glass, fully tempered, 6 mm
<b>Walls</b>	
Gypsum Wallboard	Regular, 5/8-inch, Level 4 Finish
<b>Ceiling</b>	
Suspended Acoustical Panel	Flammability: Class A Fire Rating, ASTM E 1264. Type and Form: Type III, mineral base with painted finish; Form 2, water felted. Pattern: CE (perforated, small holes and lightly textured). LR: Not less than 0.85. NRC: Not less than 0.65. CAC: Not less than 35. Thickness: 3/4 inch. Modular Size: 24 by 48 inches.
Gypsum Wallboard	Regular, 5/8-inch, Level 4 Finish

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<b>Tiling</b>	
Quarry Tile	Daltile, Quarry tile, 1/2-inch, 6x6-inches
Ceramic Tile	Daltile, Colorbody Porcelain, Veranda Solids & Tones
<b>Flooring</b>	
Linoleum	Armstrong, Marmorette, 2.5 mm, ASTM F 2034, Type I
Carpet Tile	Lees Carpet Tile, Sixth Sense Collection Fiber: Nylon. Construction: Tufted. Backing: ExoFlex ICT. Dye Method: Yarn. Face Weight: 22 oz./sq. yd. Size: 24x24 inches (610 by 610 mm).
Carpet Tile – walk-off	Lees Carpet, First Step, nylon, 5/32-inch, 24x24 inches, yarn dyed
<b>Painting</b>	
Exterior	Sherwin Williams, Latex acrylic, Semi-gloss
Interior	Sherwin Williams, Latex acrylic, Egg shell, Low VOC
<b>Folding Partition</b>	
Paired Panel, Operable Partition	Modernfold, Acousti-Seal, markerboard facing material, both sides
<b>Toilet Compartments</b>	
HDPE	NFPA 286: Class C Floor anchored, overhead braced Hardware & brackets: heavy-duty, SS, 18-8 S, type-304
<b>Toilet Accessories</b>	
Grab Bars	Bobrick, B-6806 Series, SS, 18-8, Type-304, concealed mounting
Toilet Paper Dispenser	Bobrick, B-386, roll toilet tissue, partition mounted, serves 2
Paper Towel Dispenser	Bobrick, B-72974, plastic, hands-free, roll paper towels, surface mount
Soap Dispenser	UltraClenz, Simplicity Plus Soap Dispenser, hands-free, wall mounted
Waste Receptacles	Bobrick, B-2260, SS, floor standing, open top, 13 gallon capacity
Napkin Disposer	Bobrick, B-270, surface mount, SS, 18-8, Type-304
Mirror	Bobrick, B-293, tilt, SS, 18-8, Type-304
<b>Tackboards</b>	
Cork, vinyl	Claridge, Fabricork, screw-on aluminum trim
<b>Window Treatment</b>	
Roller Window Shade	MecoShade, single roller, light-filtering fabric, PVC-coated polyester

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EQUIPMENT AND FURNISHINGS	
<b>Residential Appliance</b>	
Electric	Drop in Four burner coil
<b>Kitchen Equipment</b>	
3 Compartment Sink	Advance Tabco, DI-3-1612
Hand Sink	John Boos, PBHS-W-1410-1
Food Prep Sink	Advance Tabco, FC Series
Oven-Range	Garland, S684 Sentry Series
Refrigerator, Reach-In, 2 Section	Traulsen, RHT232DUT-FHS
Freezer, Reach-in, 2 Section	Traulsen, ALT232WUT-FHS
Dishwasher	Hobart, LXi
Tables, SS, Moveable	Metro, MWT309US HD Super™ Mobile Work Table, 96"W x 30"D, 14/304 stainless steel top, without splash
Overhead Demonstration Mirror	Advance Tabco, ceiling mount, 24x60-inches, SS, Type 304, 16 gauge

### **INTERIOR DESIGN NARRATIVE (Prepared by Bettisworth North)**

#### **Considerations**

All interior finishes have been selected with durability, ease of maintenance, acoustics and aesthetics as driving criteria.

We have called for an extensive area of commercial grade walk off carpet tiles at the main entrance and. The extent of these walk off tiles will help to extend the performance of other interior flooring finishes as well as reduce the amount of dirt brought into the facility. Carpet is present throughout the main areas of the facility and will help with overall acoustics.

Resilient flooring such as linoleum tiles have been selected to maintain the criterion standards in the flexible use areas such as classroom 3 and lecture room. The kitchen storage and janitor's closet will have a quarry floor tile and base with rigid vinyl wall protection.

Ceramic tiles have been selected for use on the floor and as a wainscot in the restrooms.

Storage and maintenance areas will have sealed concrete floors and impact resistant gypsum board walls.

The majority of the ceiling will be open to the structure incorporating suspended lighting, and exposed mechanical systems.

**STRUCTURAL DESIGN NARRATIVE (Prepared by Castner Consulting)**

**General**

The current structural building code for the State of Alaska is the International Building Code (IBC). In accordance with the 2009 IBC, snow, wind and earthquake loads will be developed using the American Society of Civil Engineers (ASCE) publication 7-05, Minimum Design Loads for Buildings and Other Structures. ASCE 7-05 also addresses loads due to drifting snow which are prevalent in Delta.

Structural design loads for the building include both gravity loads and lateral loads. Gravity loads consist of the weight of building materials (dead load), any equipment loads, and the weight of snow carried by the building. Lateral loads are caused by wind and earthquake forces.

Preliminary gravity design loads for the Career Center building include the following:

roof dead load	18	pounds per square foot
wall dead load	15	pounds per square foot
uniform snow load	45	pounds per square foot
drift snow load surcharge	84 (max)	pounds per square foot

Preliminary lateral design load data for the Career Center building include the following:

ASCE structural building category	II	standard occupancy
basic wind speed ( 3 sec gust)	90	miles per hour
wind exposure	C	
seismic short term spectral response parameter, $S_s$	61.5	% of acceleration due to gravity
one second spectral response parameter, $S_1$	26.3	% of acceleration due to gravity
seismic soil site class	D	

**Building Foundation**

The Career Center building will be founded on conventional concrete strip and isolated column footings. Footings typically bear on compacted structural fill materials. Footings supporting exterior walls will be approximately four feet below existing grade, unless the results of the geotechnical investigation indicate problematic soils. Concrete foundation walls will support above grade framing at the perimeter of the building. The floor is currently specified to be a six inch thick concrete slab on grade. The thickness of the slab may appear to excessive, however, due to the proposed location of hydronic heat piping the effective thickness of the slab is considerably less than six inches. All concrete will contain steel reinforcing bars to provide tensile strength and limit cracking.

**Roof Structure**

The roof structure will be composed of plywood sheathing fastened to wood chord/steel web joists, commonly referred to as open web joists. The open web joists will bear on wide flange steel beams at

the peak of the roof, and wood framed bearing walls at the perimeter of the building. The wide flange steel beams will be supported by steel hollow structural section (HSS) columns. The HSS columns are square which provides an efficient cross section for transferring gravity loads to the foundation.

### **Lateral Load Resisting Systems**

Lateral loads due to wind will be collected by the exterior envelope of the building and distributed vertically to the building floor and roof structure. The roof structure will act as horizontal diaphragms, transferring the lateral load to the vertical lateral load resisting elements. The vertical lateral load resisting elements will be plywood sheathed, wood framed shear walls.

Lateral loads due to an earthquake, or seismic event, are proportional to the weight of the structure. These seismic loads are concentrated at the building roof and floor levels and then distributed to the shear walls in the same manner as wind loads.

### **MECHANICAL DESIGN NARRATIVE (Prepared by RSA Engineering)**

#### **Design Criteria**

The building mechanical and plumbing design will conform to the latest adopted editions of the following codes:

- IBC International Building Code
- IMC International Mechanical Code
- UPC Uniform Plumbing Code
- IFC International Fire Code
- IECC International Energy Conservation Code
- NFPA 13 Standard for the Installation of Sprinkler Systems
- NFPA 31 Standard for the Installation of Oil-Burning Equipment
- ASHRAE
- ASHRAE 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings
- ASHRAE 62.1 Ventilation for Acceptable Indoor Air Quality
- NSF 60 & 61 National Sanitation Foundation
- ADAAG Americans with Disabilities Act Accessibility Guidelines

Design conditions for determining building loads and equipment sizing will be in accordance with climatic conditions as outlined in the American Society of Heating Refrigeration and Air Condition Engineers (ASHRAE) Handbook. Specific conditions pertaining to this site are listed below:

- WMO# 702670
- Latitude: 64.00 North

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- Longitude: 145.72 West
- Elevation: 1,273' ASL
- Winter Design: -40.1° F
- Summer Design: 78.3° F
- Indoor Design Temperature: 72° F

The design parameters listed in this document may be considered a working document as well. As the design progresses the parameters in this document may be revised as a result of changing technology, payback analysis and/or feedback from owner's personnel.

### Fire Protection

The facility will not incorporate an automatic sprinkler fire suppression system since the building is on a well system. The kitchen hood will be protected with a self-contained "Ansul" R102 chemical based fire protection system.

### Domestic Water

Domestic water for the facility will be produced by an on-site well system designed by others; we recommend the use of a variable speed submersible pump. The cold water piping will enter the building in the boiler room, a hydro-pneumatic pressure tank and pressure switch will be utilized. It is not anticipated that water softening or iron reduction system will be required.

Domestic water will be provided to all plumbing fixtures, drinking fountains, sinks, and any other devices or fixtures that require a domestic water supply. The domestic water piping will be designed to provide water to the plumbing fixtures at a minimum pressure of 30 psig the maximum flow velocity will not exceed 8 fps. Domestic hot and cold water systems will be piped with ASTM B88, Type L copper tubing with lead free solder joints or code approved PEX tubing.

Domestic hot water will be produced by an electric water heater, generated and stored at 140°F. The new water heater will be located in the boiler room. The water heater installation will utilize a check valve, expansion tank and tempering valve which will temper the domestic hot water down to 110° F for all non-kitchen uses. A hot water circulation system will be designed to ensure timely delivery of hot water to the fixtures.

1/4 turn ball valve angle stops or ball valves will be provided at all fixtures, equipment and major branches to facilitate maintenance.

Water hammer arrestors with accessible isolation valves will be provided at all quick closing valves and at other potential water hammer sources as required by code.

### **Waste and Vent System**

The sanitary waste piping system will consist of gravity sanitary waste piping from the fixtures to the on-site septic system. The sanitary waste piping mains will be routed under the slab. All plumbing vents will be extended through the roof and provided with piping insulation, metal jacketing and 5 watts/foot electrical heat trace to prevent frost closure. A pilot light wall switch in the boiler room will turn the heat trace on and off.

All waste and vent piping will be hubless cast iron pipe per CISPI 301. Fittings will be cast iron with hubless joints consisting of neoprene gaskets and stainless steel clamp-and-shield assemblies.

### **Plumbing Fixtures**

Toilet rooms will be provided in the building in accordance with the architectural drawings. Low flow, vitreous china, floor mounted, tank type toilets and wall mounted urinals will be specified. Water conserving flush valves will be provided on the urinals and metered or automatic faucets will be provided on all lavatories. Each restroom with more than one toilet will be equipped with a floor drain. The janitors closets will be provided with a floor mounted mop sink and floor drain.

Single bowl stainless steel sinks complete with bubbler will be provided in the classrooms where indicated.

The kitchen requires a 3-compartment sink, prep sinks, hand sink and a mop sink. The 3-compartment sink will drain through a grease interceptor. The prep sinks will drain through an air gap to a floor sink. A commercial under-counter dishwasher will be hard piped to the drain system protected from backflow with a floor drain installed immediately upstream of the connection point. Cooking appliances in the kitchen will be electric. An Ice maker rough-in will be provided for the refrigerator. 140° F hot water will be supplied to the 3-compartment sink.

### **Heating System**

The heating plant will consist of two (2) commercial grade oil-fired high efficiency, three pass boilers equipped with on-off oil burners. Each boiler will be sized at approximately 60% of the total heating load of the facility. A packaged boiler control panel will be used to control the firing rate and to stage boilers on and off, with outputs to the DDC system for monitoring loop temperatures and alarm status. The boiler system will be designed that a bio-mass boiler system can be easily integrated at a future date,

The hydronic heating system will be piped in a primary/secondary arrangement. The primary boiler loop will inject heat into the secondary loop via constant speed boiler circulation pumps. Secondary building loop circulators with variable frequency drives will circulate the secondary loop to supply the terminal heating equipment and air handling unit heating coils. The secondary loop will be piped in a direct return arrangement utilizing pressure independent, flow control valves coupled with a 2-way

modulating control valves. The direct return system allows the maximum possible savings for the variable speed pumps. Piping installation costs are reduced when compared with a reverse return system since there is less overall piping. Pump electrical energy costs are reduced since the VFD pumps modulate to match the required heating water flow rate as sensed by a DDC pressure sensor. The intent is to operate the pumps at the minimum capacity needed to provide the required flow at any time.

The hydronic heating system will utilize a 50/50 propylene glycol/water solution with inhibitors to protect heating coils from freezing. Glycol will be supplied to the site in sealed drums and mixed to 50/50 using on site water. A packaged glycol fill station will be used to fill and maintain the hydronic system after maintenance.

The primary heat for the facility will be provided by a hydronic radiant slab heating system. Duct reheat coils will be installed in the VAV terminal units allowing tempering of the supply air and to provide supplemental space heating. Entry areas will be heated using low temperature cabinet unit heaters with the storage rooms and other unoccupied utility spaces utilizing low temperature hydronic unit heaters.

Above grade heating piping will be Type "L" insulated copper with Pex tubing complete with an oxygen diffusion barrier used for the in-slab radiant heat. Wall recessed tubing manifolds will be placed throughout the facility as required providing zoning and minimizing overall tubing lengths for the radiant heating system.

### **Ventilation System**

A single, variable volume air-handling unit will be utilized to provide ventilation to the facility. The air distribution system will be designed to conform to ASHRAE Standard 62 to ensure good indoor air quality. The air-handling unit will include an internally isolated fan section, heating coil section, winter filter section, pre-heat coil, summer filter section and mixing section. Air filters will be MERV 8 and have an average efficiency of 25-30% when tested in accordance with ASHRAE standards.

The ventilation system will be designed to provide ventilation and cooling air to each of the various spaces within the building. Neither mechanical refrigeration nor humidification systems will be provided for this facility. The ventilation system will utilize an economizer cycle to provide up to 100% outside air to cool the building. The quantity of outside air being supplied for ventilation will be controlled by carbon dioxide sensors located in the return air stream. The quantity of outside air supplied will be the minimum required for good indoor air quality. This will reduce the amount of outside air that must be heated to a minimum. The air-handling unit will be installed on a 4-inch thick concrete housekeeping pad to reduce low frequency noise to the spaces below. The ductwork out of the air-handling unit will have sound lining to reduce noise transmission.

Medium pressure ductwork will be routed through the facility supplying variable air volume (VAV) terminal units. Variable air volume terminal units will be provided at each control zone. We anticipate providing individual control zones for the classrooms, common areas, kitchen, staff area, and offices.

The relief air system will consist of a roof curb mounted relief fan to ensure air turnover during economizer operation. The speed of the relief fans will be varied to maintain a pressure differential between the indoor spaces and outdoor.

In areas with suspended grid ceilings, 24-inch square, four-way throw diffusers will be installed. Areas with exposed structure will have exposed spiral ductwork with sidewall grilles mounted to the ducts or round diffusers connected to branch ducts. Eggcrate and louvered type grilles will be used for exhaust, return, and transfer air applications.

General exhaust will be provided in the toilet rooms, copy room, kitchen and janitor rooms as required by code. Where appropriate, the exhaust fan will be interlocked with the local lighting circuit.

The kitchen will include a "Type I" grease hood and associated exhaust fan. The grease ductwork serving the Type I hood will be constructed of continuously welded stainless steel complete with UL listed fire wrap insulation and routed through the roof to a curb mounted up-blast exhaust fan. Supply/make-up air will be provided by the VAV box serving the kitchen. We do not anticipate using a dedicated make-up air unit for the kitchen.

The server/telephone room will be cooled with dedicated, direct expanding, R-407C refrigerant based air conditioning system consisting of a wall mounted, glycol-cooled, close-coupled evaporator/condensing unit and an exterior fluid cooler. This system allows the use of free-cooling during the cooler months resulting in significant energy savings.

The boiler room will incorporate an engineered ventilation/combustion air system. A duct sized to provide adequate combustion air will be installed with no obstructions to the outside except for an exterior louver. A ventilation fan assembly will be installed to provide adequate cooling for the room and be cycled by a room temperature sensor. The assembly is comprised of a control damper on the outside and an interlinked return air damper open to the boiler room. The two dampers are modulated to provide a mixed air temperature of 50° F. When the ventilation fan is in operation, the combustion air duct serves as the air relief air duct to the exterior.

All control dampers that communicate with the exterior will be specified to incorporate thermally broken frames, coupled with thermally insulated blades with silicone blade and side seals providing energy savings due to thermal efficiency and low air leakage rates.

### **Controls**

A microprocessor based direct digital control (DDC) system will be specified for the facility. The control system will be performance specified by the engineer to meet the sequence of operations listed in the

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contract documents. The control system will be specified to be native BACnet. Sequences of operation will be configured to provide energy efficient operation of the mechanical systems, and will be described in the contract documents.

### **Fuel Oil**

A 2,500 gallon, UL-142 listed, skid mounted, double wall fuel tank will be specified to be located adjacent to the boiler room. The tank design shall incorporate the appropriate appurtenances. No electronic tank monitoring is anticipated; a clock style level gauge and visual interstitial monitor will be specified. A UL-971 listed, buried, coaxial piping product will be specified for the fuel oil piping between the tank to the boiler room.

A 25 gallon, UL-142 listed, day tank complete with rupture basin, duplex pumps and controller will be specified to supply the boilers. The fuel oil piping serving the day tank boilers will be schedule 40 with screwed fittings. "Tiger Loop" De-aerators complete with 15 micron spin-on filters will be specified at each burner to simplify piping and to increase combustion efficiency.

### **Mechanical Insulation**

All domestic hot, cold, and hot water recirculation piping will be insulated with fiberglass insulation. Cold water pipe insulation will be specified with a complete vapor barrier. All hydronic heating piping will be insulated with fiberglass insulation. All plumbing vents will be insulated three feet down from the roof termination point with fiberglass insulation with all-purpose facing. The hot water and waste piping under lavatories and sinks designated to be ADA compliant will be insulated with pre-formed, closed cell insulation with white cleanable plastic surfaces.

Insulated pipe in the boiler and mechanical fan rooms, as well as all exposed piping within 10 feet of the floor will have a PVC jacketing system covering all pipes and elbows. All other pipe will utilize all-purpose facing.

Outside air and combustion air ductwork will be insulated with rigid fiberglass board with a canvas finish suitable for painting. All exhaust ductwork within 5 feet of the exterior will be insulated with fiberglass with an FSK finish in concealed spaces or canvas finish in exposed areas and mechanical rooms. Duct and plenum sound absorption lining will be specified to be fiber-free with cleanable interior surfaces.

### **Test and Balancing**

A NEBB certified contractor specializing in the balancing and testing of mechanical systems will accomplish the testing and balancing. The contractor will verify system operation, control integration and adjust the systems to the design flow rates. All balance points will be marked in the field on the balance valves and dampers as well as included in the balancing report that will become part of the operation and maintenance manual.

**ELECTRICAL DESIGN NARRATIVE (Prepared by RSA Engineering)**

**Design Parameters:**

The latest adopted version of the following codes and standards are currently applicable for this project:

International Building Code  
International Fire Code  
International Energy Conservation Code  
National Electrical Code  
NFPA 72 National Fire Alarm Code  
Americans with Disabilities Act (ADA)  
National Electrical Safety Code  
TIA/EIA Telecommunications Building Wiring Systems  
IES Lighting Handbook, Tenth Edition  
ASHRAE/IES Standard 90.1

The design parameters listed in this narrative may be considered a working document. As the design progresses, the parameters in this document may be revised as a result of changing technology, payback analysis and/or feedback from the Owner.

**Power Distribution**

Preliminary load calculations indicate an NEC demand load of approximately 320A. To accommodate this, a 400A, 208V, 3-phase, 4-wire electrical service will be provided. Underground secondary service laterals will be routed from the utility transformer to a NEMA 3R exterior Current Transformer (CT) enclosure, meterbase and 400A/3P fused disconnect on the building exterior.

From the service entrance disconnect 4" C, 4#500kcmil, 1#3 copper conductors will be routed via an exterior NEMA 3R manual transfer switch into the main electrical room to a 400A, 120/208V, 3-phase, 4-wire distribution panel 'MDP'.

The MDP will feed (3 ea) 200A branch panelboards located in the main electrical room.

**Standby Power**

A NEMA 3R, 400A, 208V, 3-pole manual transfer switch will be installed on the exterior of the building to allow a portable generator to be wheeled up and provide power to the entire facility.

The electrical service, all panelboards and feeders will be sized with a minimum of 20% spare capacity to allow for future growth.

Loads on general use and lighting branch circuits will be kept to approximately 80% of their rated capacity to allow for future load growth. A minimum of 10 percent spare circuit breakers will be provided in all branch circuit panelboards. All distribution and panelboard busses will be copper. Power will be distributed from the various branch panelboards to appropriately located convenience outlets as well as power for computers and other special equipment. The panelboard(s) serving computer and telecommunications equipment will be provided with internal transient voltage surge suppression (TVSS) units and 200% neutral.

Motors  $\frac{3}{4}$  horsepower and over and large equipment loads will be operated at 208 Volt three-phase. In general, lighting will be operated at 120 Volts.

### Utilization Devices

General-purpose outlets will be provided for cleaning and general maintenance in corridor and common areas. Unless otherwise specified, duplex receptacle outlets will be placed at an average of 6 feet on center in all instructional areas or office and no less than two on 12-foot wall. In the classrooms, the general receptacle circuits will have no more than 4-duplex receptacles per circuit, in order to provide plenty of spare capacity for future equipment. Office areas will have at least one receptacle on each wall, plus additional dedicated circuits where large equipment such as copiers or printers are located. Duplex receptacle outlets are to be provided at approximately 20 ft interval in corridors and hallways. Outlet locations will be adjusted according to the configuration and usage of the room and the specific equipment use expected in a room. Additional receptacles will be provided in classrooms as needed for anticipated equipment and at computer locations. GFCI duplex receptacle outlets will be provided in restroom, kitchen and janitor areas. Cover plates will be satin finish stainless steel.

GFCI duplex receptacle outlet with while-in-use weatherproof cover will be provided on the exterior areas.

Power will be provided for all equipment supplied by others such as the kitchen and mechanical equipment, etc. Coordination will be performed with all disciplines to provide power as needed for all equipment.

### Grounding System

The facility grounding system will consist of earth electrode ground rods and grounding electrode conductor. The earth electrode ground rod will be  $\frac{3}{4}$  inch by 10 feet, copper or copper-clad steel. The top of the vertically driven ground rod will be a minimum of 12 inches below grade. The grounding electrode conductor will be bonded to the earth electrode ground rod with an exothermic welded joint or clamp. The electrical service system neutral will be grounded at service entrance equipment to building metal water piping, structural steel, and telecommunications system.

Service equipment enclosures, exposed non-current carrying metal parts of electrical equipment, metal raceway system, cable tray, equipment-grounding conductor in all feeders and branch circuits and receptacle grounding connectors will be bonded.

Equipment grounding conductor will always be a GREEN insulated copper conductor unless otherwise indicated. There will be no interconnection between equipment grounding conductors and neutral conductors except at the main service grounding point. All connections to equipment to be grounded will be made with a grounding connector specifically intended for that purpose.

Bare wire, wrapped around mounting bolts and screws, is not acceptable as a grounding connection. All ground lugs will be of a non-corrosive material suitable for use as a grounding connection, and must be compatible with the type of metal being grounded. All mating surfaces and connections will be between cleaned bare metal to bare metal surfaces.

### Lighting / Emergency Lighting System

All lighting will meet current Illuminating Engineering Society (IES) lighting standards per the IES Lighting Handbook. Although not required by this project, the lighting design will attempt to comply with the Lighting Unit Power Densities in accordance with ASHRAE/IES Standard 90.1 and LEED where practical.

High performance pendant linear LED fixtures with fully dimmable 0-10V drivers will be provided in the classrooms. In addition to being energy efficient, the LED fixtures have built-in dimming capability at no additional cost. This can allow the teacher to set the light level to whatever task is being performed. Multi-zone lighting controls will be provided so that the lighting near the teacher board can be independently controlled from the remainder of the room.

Lighting in Mechanical/Electrical Room, Custodian, and Storage Rooms and similar spaces will consist of either surface or pendant mounted LED or fluorescent strip fixtures with wire guards. The lighting will be controlled by a standard light switch at room entrance (mech/elec areas) or wall or ceiling mounted occupancy sensors (storage/janitor rooms).

Lighting in Office areas will consist of 2x4 recessed, LED fixtures, with fully dimmable 0-10V drivers. Fixtures will provide low glare and greater visual comfort. The dimmable driver will allow the user full comfort control of their lighting.

Lighting in Corridor and Lobby/Common area will consist of a combination of wall/pendant LED or recessed downlight LED fixtures. Corridor and Lobby/Common area lighting will be controlled by occupancy sensors with override switches at entrances. Multiple zones will be provided for the corridor lighting.

Lighting in Restrooms will consist of wall mounted LED fixtures located above each mirror and recess mounted LED lighting fixtures. Restroom lighting will be controlled by occupancy sensor. Special use areas will receive lighting design appropriate for the activities associated with the space. Task lighting can be provided under cabinets or over specific furnishing as desired.

### Emergency Lighting

Exit signs will consist of energy efficient, LED type, self-contained emergency power pack with green letters on white background. Exit signs will be mounted above doors and along egress pathways. *Basis of Design: Lithonia #LQC series*

Emergency egress lighting will be provided in all exit corridors, Mechanical/Electrical Room, and other locations as required by NFPA 101 and the IBC. Emergency lighting will consist of selected LED fixtures with emergency battery inverters or emergency drivers, which will provide an average of 1 foot-candle along egress paths in the event of a power outage. Emergency egress lighting will be extended on the building exterior to a gathering area. *Basis of Design: Bodine #BSL series and Iota #IIS-125*

### Exterior Lighting

New site lighting will consist of pole-mounted and building mounted LED area lights for the parking areas with 30'-0" round, tapered steel poles. Lower wattage building-mounted LED fixtures will be used at all entrances to provide normal area lighting and also emergency egress lighting. These LED fixtures

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are very energy-efficient and have a long lamp life (over 100k hours), which will help reduce both energy consumption and maintenance costs over the life of the building. *Basis of Design: Lithonia #DSX1LED*

All exterior lighting will be controlled by photocell and time clock connected to the building controls, so lights will be on only when required, reducing energy costs for the facility. In addition, the area lights will be bi-level with occupancy sensors to reduce lighting levels further after normal hours when the parking and driveway areas are unoccupied.

### **Energy Conservation**

Interior lighting control will be accomplished in accordance with ASHRAE 90.1 requirements, using occupancy sensors, photocells, ambient sensors near re-light and windows and manual switching. Occupancy sensors with manual override will be provided to control lighting in all Restrooms. Corridor and public areas will be controlled by keyed switches and will be connected to the building controls to reduce energy costs. Classrooms and Office areas will be provided with ambient sensors and dimming-ballast to allow for lower lighting levels when desired and for energy savings. *Basis of Design: Wattstopper #DLM series*

### **Interactive Whiteboard System**

Classroom, and the conference room will be outfitted with an Owner furnished interactive whiteboard system. The system will consist of the interactive touch-screen whiteboards and above whiteboard mounted projector system. Wall and conduit connection boxes will be roughed-in to allow for tie-in of the instructor computer to the interactive whiteboard system. The system will be outfitted with Owner provided speakers to allow for audio distribution (4 speaker locations per classroom). Conduit and boxes will be provided for cable routing and termination of Owner provided equipment.

### **Fire Alarm System**

A new Class B, supervised, addressable panel will be installed in the front office area and a new remote LCD text annunciator will be installed in the entry vestibule. The current IBC/IFC requirements for a manual and automatic fire alarm system in a Type E occupancy is limited to duct detectors in ducts over 2000 CFM, pull stations at all exits, and smoke detection at the location of the fire alarm control panel. However, since the building will not be sprinklered, we strongly recommend providing an automatic fire alarm detection system with smoke or heat detection throughout the facility. Smoke detectors will be utilized for all spaces except where prone to false alarms such as near the kitchen areas and vestibules. In those spaces, multi-sensors will be utilized which are much less likely to go into alarm unless there is truly a fire. Heat detectors will be utilized in mechanical rooms.

New horn/strobes will be installed throughout the facility to provide audible alarms at 15dB above the ambient noise level. Strobes will be provided in all classrooms, corridors, toilet rooms, and other public spaces as required by ADA.

The fire alarm panel will have an integral digital alarm communicator/transmitter (DACT) to transmit an alarm or trouble signal to the central monitoring station.

Addressable Pull Station will be single action and will be provided at each exit door.

### **Telecommunications**

A new service will be brought to the facility consisting of (1 ea) 4" PVC conduit will be installed from the telephone pedestal to the Main Comm room.

A complete telecommunication system will be provided for the facility. The enhanced cable plant will consist of unshielded twisted pair (UTP) copper cabling for video, data and voice transmissions. Backbone cabling will consist of plenum-rated Category 6 UTP cable to connect the Ethernet switches and plenum-rated multi-pair telephone cables for voice lines. The horizontal cabling will be plenum-rated Category 6 UTP cable that runs from each telecom outlet to the designated patch panel in the Main Comm Room.

All horizontal and backbone cabling will be distributed throughout the building via the cable tray and J-hook pathways located above accessible ceilings. Conduit will be used from the telecom outlet to the space above the accessible ceiling, as well as in all inaccessible areas. All horizontal and backbone cabling will be terminated on modular patch panels that are installed in 19" racks located in the Main Comm Room. Sufficient space will be provided in each rack for the installation of new network switching equipment. The entire cabling infrastructure will be designed and engineered to be in compliance with NFPA 70, ANSI/TIA/EIA 568-B, 569, and all applicable local, state and federal codes, rules, regulations and ordinances. All telecommunication system cables and components will be clearly marked and labeled and will conform to ANSI/TIA/EIA-606 Standards. Telecommunications systems grounding and bonding will be provided in accordance with TIA/EIA-607.

Telecommunication outlets will be provided throughout the facility. The horizontal cabling system will allow any jack to be connected as voice, data, or video by cross-connecting to the associated patch panel in the telecom room.

Dedicated phone lines will be provided for the fire alarm system, as well as the building automation system if required. All telecommunications jacks will be type RJ-45, Category 6, T568A/B, 8P8C, single white finish, telecommunications jack with 45 degree exit for wall outlets and flush exit for outlets in horizontal dual-channel surface raceway.

Evenly spaced throughout the facility will be single jack telecommunication outlets for a wireless network infrastructure. Depending on discussion with the Owner's IT department, this system might be self-administrated and powered-over-Ethernet type or conventional which would require power next to the data outlet. The conventional system would need to be located below the accessible ceiling, while the power-over-Ethernet type can be located above an accessible ceiling with only the antenna being visible below.

1" minimum conduit with telecommunication cables should be routed to each telecommunication outlet location.

### **Clock/Intercom/Sound Systems:**

These systems are not anticipated to be required.

### **Security/Video**

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We recommend that a security system be provided for the new facility. We recommend a simple system that consists of motion sensors at entry vestibules, door contacts at all exterior doors, and glassbreak sensors in all rooms with windows.

We also recommend providing a new IP video (CCTV) system in the building. We estimate approximately 6-7 color, high-resolution, day/night fixed IP cameras. All cameras will be connected to the head-end via Cat 6 cable. The head-end will consist of a video storage appliance (a server) in the main telecom closet, along with video management system software on selected client computers in the facility to provide review and playback capability.