



SALIDA SCHOOL DISTRICT R-32-J
SALIDA ELEMENTARY SCHOOL (K-4)
22 MARCH 2013

SCHEMATIC DESIGN



**BENNETT WAGNER GRODY
ARCHITECTS**

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Salida Elementary School (K-4)

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PROJECT DIRECTORY

PROJECT LOCATION & OWNER	Salida Elementary School (K-4) 350 West 8th Street Salida, CO 81201		LANDSCAPE	Lime Green Design 900 E. Louisiana Avenue, Suite 209 Denver, CO 80210 303 733 7558	
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Salida School District R-32-J - Salida Elementary School
 Project Schedule
 March 22, 2013

Task	Start/End	2013												2014											
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
BUILDING DESIGN AND CONSTRUCTION																									
Kick-off meeting	1/23/13	X																							
A/E fees, contracts and negotiation																									
Programming / Conceptual Design 3 Weeks																									
DAG Workshop	1/23, 1/24	X																							
Community Meeting	1/23	X																							
A/E Coordination Meeting	1/24		X																						
Schematic Design 7 Weeks																									
DAG Workshop	2/6, 2/20, 3/6		X	X	X																				
Community Meeting	2/6, 2/20, 3/6		X	X	X																				
A/E Coordination Meeting	TBD			X	X	X																			
SD Report Due	3/22					X																			
CM/ GC Pricing	3/25-4/5																								
Owner Review	3/25-4/5																								
Owner Review Meeting/ Review Pricing	4/10						X																		
Design Development 8 Weeks																									
DAG Workshop	4/10						X																		
Community Meeting	4/10						X																		
A/E Coordination Meetings	TBD						X	X	X	X															
DD Drawings and Specs Due	5/31									X															
CM/ GC Pricing	6/3-6/21																								
Owner Review	6/10-6/21																								
Owner Review Meeting/ Review Pricing	6/24									X															
Construction Documents 10 Weeks																									
A/E Coordination Meetings	TBD									X	X	X	X	X	X										
Owner Review of Phase 2 Package (75% CDs)	8/5-8/16																								
Owner Review Meeting/ Phase 2- Final Owner Comments Due	8/19																								
Phase 2 (Construction Documents) Documents Due	8/30																								
Phase 1 (Early Site Utilities Package) Documents Due	7/19										X	X	X	X											
Phase 1 Permit, Bidding and Mobilization 2-3 weeks																									
Chaffee County/ City of Salida permit review	7/22-8/9																								
Bidding and bid review	7/22-8/9																								
Permit(s) Issued (On or before date)	8/9																								
Issue addenda (as req'd)	7/29-8/7																								
Phase 1 Construction - Early Site Utilities 4-6 weeks																									
Construction Period	8/12-9/20																								
Phase 2 Permit and Bidding 3 weeks																									
Chaffee County permit review	9/2-9/20																								
Bidding and bid review (3 1/2 Weeks)	9/2-9/23																								
Permit(s) Issued (On or before date)	9/20																								
Issue addenda (as req'd)	9/9-9/18																								
Phase 2 Construction - New Building 10 Months																									
Construction Period (8 months)	9/23/13-7/18/14																								
Punch/ Final Acceptance (2 Weeks)	7/7/14-7/18/14																								
Owner Relocation 3 Weeks																									
Pack Up and Clear Out (E) School (2 Weeks)	7/7/14-7/18/14																								
Move to New School (1 Week)	7/21/14-7/25/14																								
Demolition/ Removal of Existing School 4-5 Weeks																									
Abatement (1 Week)	7/28/14-8/1/14																								
Selective Salvage of (E) Building (2Weeks)	8/4/14-8/15/14																								
Demolition and Removal (2 Weeks)	8/18/14-8/29/14																								
Phase 3 Construction - Site Scope Completion 6 Weeks																									
Construction Period	8/18/14-9/26/14																								
School Starts (Classes Begin)	August 25 2014																								

PROGRAM

3



BEST Application Program

This space program was included in the BEST Grant application documentation, and is included here for reference only. Through the Programming and Schematic Design Phases, the Space Program was modified greatly to suit the actual space needs of the School.

Building Spaces:	No. of Spaces	Sq. Ft. per Space	Total Area
Academics			
Kindergarten	4	950	3,800
First Grade	4	825	3,300
Second Grade	4	750	3,000
Third Grade	4	750	3,000
Fourth Grade	4	750	3,000
Flex / Science Classrooms	2	825	1,650
Resource Room	1	600	600
Workrooms	3	100	300
Special Education Suite	1	950	950
Title One	1	600	600
Art Classroom	1	950	950
Music Classroom	1	1200	1,200
Technology Instruction	1	750	750
Subtotal			23,100
Library and Media Center			
Library	1	1,725	1,725
Computer Classroom	1	600	600
Library Office / Work Room / Circulation	1	200	200
Subtotal			2,525
Student Commons			
Commons / Cafeteria	1	2,500	2,500
Kitchen / Serving	1	1,050	1,050
Table Storage	1	250	250
Subtotal			3,800
Fitness			
Gymnasium	1	6,600	6,600
Equipment Storage	1	450	450
PE Office	1	100	100
Subtotal			7,150
Administration			
Reception	1	250	250
Principal	1	180	180
Secretaries	1	150	150
Records Storage	1	150	150
Social Worker / Psychologist	1	120	120
Conference Room	1	200	200
Health / Clinic	1	250	250
Staff Lounge / Mailboxes	1	400	400
Staff Toilets	2	50	100
Custodial Office	1	150	150
Subtotal			1,950
Support			
Boys Toilet	3	150	450
Girls Toilet	3	150	450
Public Toilets	2	125	250
Storage	3	125	375
Subtotal			1,525
Building Subtotal			40,050
Building Circulation, Mech, Elect.	28% of bldg SF		11,214
Building Total			51,264

Current SES Program

While the individual spaces and square footages differ greatly from the original space program included in the BEST Grant application, this working Space Program was developed hand-in-hand with the District, Teachers and other Stakeholders to best suit the actual space needs of the School. The overall square footage of the school is also in-line with the number in the BEST Grant application Program since we are bound to that maximum area for the project.

SALIDA SCHOOL DISTRICT R-32-J

Salida Elementary School Replacement Project

Educational Program Plan for New Facility (*Excludes Fifth Kindergarten Suite at 1,040 sf)

March 22, 2013

BUILDING SPACES	NO. OF SPACES	SF PER SPACE	TOTAL PROGRAM AREA	TOTAL ACTUAL AREA	PROGRAM NOTES
Academics					
Kindergarten	4	900	3,600	3,568	<i>Current=892 NSF per Suite</i>
First Grade	4	750	3,000	2,999	
Second Grade	4	750	3,000	2,999	
Third Grade	4	750	3,000	2,999	
Fourth Grade	4	750	3,000	2,999	
Flex Spaces in Academic Wings (AW)	4	450	1,800	1,812	
Resource Room	1	335	335	334	
K Workroom	1	92	92	92	
Grade 1-4 Workrooms	4	125	500	496	
Staff Toilets in Academic Wings	3	65	195	199	
Title One	1	650	650	659	
Title One Storage	1	60	60	59	
Art Classroom	1	935	935	934	
Music Classroom	1	1,025	1,025	1,028	
Music Classroom Steps	1	130	130	130	
Technology Instruction	1	750	750	751	<i>Adjacent to LMC</i>
Special Education/ Therapy					
SPED 1 Classroom	1	650	650	645	
SPED 2 Classroom	1	530	530	534	
SIED Classroom	1	285	285	286	
SPED Workroom/ ELL	1	90	90	92	
SPED Restroom	1	90	90	89	
Speech Office	1	175	175	176	
OT/ PT/ Psych Room (near Gym)	1	175	175	176	
Subtotal			24,067	24,056	
Library and Media Center					
Library and Media Center	1	1,725	1,725	2,405	<i>Stacks and Resource areas</i>
Computer Classroom (In LMC)	1	600	500	(in LMC)	<i>Lookup stations, Place inside LMC</i>
Library Office / Work Rm / Circulation (In LMC)	1	200	200	(in LMC)	<i>Place inside LMC</i>
Subtotal			2,425	2,405	
Student Commons					
Commons / Cafeteria	1	2,480	2,480	2,480	
Kitchen / Serving	1	1,050	1,050	1,055	
Chair Storage	1	150	150	155	
Subtotal			3,680	3,690	
Fitness					
Gymnasium	1	5,000	5,000	4,982	
Equipment Storage	1	415	415	417	
PE Office	1	90	90	90	
Subtotal			5,505	5,489	
Administration					
Reception / Secretaries	1	365	365	419	
Principal	1	180	180	187	
Assistant Principal	1	150	150	139	
Counselor	1	120	120	133	
Conference Room	1	200	200	192	
Health / Clinic	1	250	250	252	
Staff Lounge / Mailboxes	1	400	400	387	
Staff Toilets	2	50	100	112	
Subtotal			1,765	1,821	
Support					
Boys Toilet	2	150	300	318	<i>Academic Wing</i>
Girls Toilet	2	150	300	318	<i>Academic Wing</i>
Public Toilets	2	200	400	421	
Central Bldg Storage/ Custodial- First Floor	1	235	235	237	
Central Bldg Storage/ Custodial- Second Floor	1	235	235	250	
Subtotal			1,470	1,544	
Building Subtotal			38,912	39,005	Building Subtotal
Building Circulation/MPE	31.74%		12,351	30.97%	Building Circulation
Building Total (BEST#=51,264 GSF)			51,263		
Building Total GSF (Inside Exterior Wall)				51,083	<i>(Includes Alt #1 East Vestibule)</i>
				Delta = -180	
Fifth Kindergarten Suite (Add Alternate #1)				1,040	<i>(Gross, Includes exterior wall etc)</i>

Project Scope

The scope of work is outlined as follows:

- Approximately 52,000 square foot replacement school
- 4-round Kindergarten + additional (5th) round as Add-Alternate #1
- 4-round 1st– 4th grade (with infrastructure and site allowance for future expansion to 5-round).
- 2 story Academic Wing at the west end of the building.
- 1 story Kindergarten Wing at the east end of the building.
- Displacement ventilation system and radiant floor heating.
- Priority for energy efficient design- will be a CHPS Verified Project.

The design presented here is the collaborative effort of the Bennett Wagner & Grody Architects; RLH Engineering, the Salida School District Administration and the Design Advisory Group (DAG).

Site Layout, Building Massing and Orientation

To preserve open space on the south end of the site for play areas and a football field, the building is planned as a partial two-story keeping the footprint under 40,000 square feet. The careful organization of volumes and patterns are clean and contemporary with strong horizontal components to anchor the various volumes to the surrounding landscape.

Due to the phasing requirement of building the new school while the existing school is in session, the only portion of the remaining site appropriate for the new construction is to the north of the existing building, which is optimal since it is also the high side of the site and will improve site drainage conditions greatly.

Several site layouts outlining all options for vehicular access and parking on site were reviewed during the DAG sessions, Community Meetings, and meetings with the City of Salida. The option documented in this report was selected because it clearly separates the bus drop off, the parent drop off, the service access and staff parking. The site design is well balanced, maximizing pedestrian safety and open space while keeping parking and drives to a minimum.

Since the northwest corner of the site is the highpoint, and given that grades drop several feet over the length of the building, there was a need to step the first floor at some point to help resolve this grading condition. The decision to place the two story academic wing up 2 feet from the floor level of the main entrance was made since it's a 'clean' place to step up, and keeps the youngest kids from having to negotiate a ramp.

The site concepts and drainage issues are further developed under the landscape and civil narratives.

The portion of the site to the north of the existing building, where the new school will be located, is somewhat of a triangular shape. From an overall planning standpoint, it was a critical first step to try to keep the academic classroom wings oriented with their long axes running east-to-west such that they face as close to due north or due south as possible. This orientation optimizes daylighting harvesting while optimizing the effectiveness of shading devices required to prevent unwanted heat gain into the building. Daylighting of classrooms is one of the criteria the design team has to meet designing a High Performance Building.

The next main planning strategy was to orient the main entry near the middle of the site, so that it is visible from all vantage points and clearly identifiable as the main entrance to the building. In order to bolster this concept, the two story element comprised of the LMC over the Administration Suite was placed immediately adjacent to the main entrance. This two story element acts as a beacon or marker on the site and further identifies the entrance as well as lending an increased 'civic' presence of the school on the site. This school is not a 'Community Center', but it is certainly a Center of the Community. By creating this prominent entry element, we bolster this presence. In addition, locating the administration suite centrally in the building at the main entrance provides optimal internal functionality, convenience and supervision of the drop-off and entrance doors, and supervision of the entire playground area to the south as well.

The remaining portion of the site is the small triangle to the north. While not ideal from the standpoint of proximity to playgrounds (on the south end of the site), this is the only remaining location for the Gym, Commons, Music and Kitchen components of the school program. This location is ideal, however, for service access off of J-Street for the kitchen and trash enclosure area. The trash enclosure will be designed as an extension of the building to eliminate unpleasant views. The relationship of the Commons, Gym and Music room (described in more detail below) defined the geometry of this wing.

Building Materials/ Exterior Envelope

The architectural concept for the building is derived from the history, character and culture of the town of Salida. We looked to the local mining and railroad structures for inspiration. Some of the original structures, like railroad water tanks, are built of dark grey or rusted metal siding boxes perched on wood 'stick-frame' structures. The contrast of the solid shapes and the open stick-frame or trestle structure is translated in the architecture as articulation of solid walls and windows in an organized geometry. The pattern of window mullions adds another layer of 'sticks' further dividing the expanses of glass into manageable window panes.

It is important that the character of the building appeals to children as well as adults!

To help reduce the scale of the building, the facades are broken down in smaller shapes with different materials and colors. The red brick, used predominantly in downtown Salida and in the existing Longfellow Elementary School, makes the connection to the local culture. The siding material selected to balance the cost of the brick offers a great durable alternate material with a contrasting texture, and harkens back to the galvanized siding and sheet metal roofing prevalent in mountain communities like Salida. The further integration of natural materials such as wood beams and a stone wall near the entry ties the building to its site and the natural environment.

As for the selection of colors, they are driven from the surrounding landscape: the buff dry prairie grass, the red willow twigs, dark grey sage brush shrubs, the grey river bed and distant mountain peaks. The color scheme for the exterior materials will, therefore, be warm beige, charcoal grays and red brick (terracotta) colors. The sloped roofs with the glulam timber supporting structure will be covered with durable standing seam metal panels in a medium gray color. Brick is used on specific walls or more prominent volumes, close to pedestrian traffic or significant to the composition- prefinished metal wall panels are used higher up on the wall where wear and tear is less of an issue. These materials are also long-lasting, yet highly recyclable.

Given that CHPS has a large emphasis on daylighting, the current design for the school is showing a lot of glazed area. There will be continued refinement of the envelop during DD to balance the amount of glazing required to achieve daylighting points against the overall cost and thermal performance of the exterior skin of the building to ensure that the end product is optimally balanced across all parameter sets.

Interior Environment and Layout

Main Entry - As stated above, the main entry is meant to be very visible, identifiable, and prominent. There will be an outdoor plaza that will act as a gathering location for students before school as well as a community use space for gatherings, farmers markets, etcetera. For security purposes, the main entry vestibule will act as a secured holding area for visitors. Visitors will sign in at a secured window to the main office, and will then be allowed into the school (buzzed in) from there.

The building is zoned for security and for public use. The public spaces are grouped around the Main Entry and Lobby to accommodate after-school programs in restricted portions of the building. During public events, the academic wings can be closed off with pairs of doors, only allowing access to the Gym, Music Room, Commons/ Cafeteria, public toilet rooms and Media Center (upstairs), while maintaining required egress paths.

Lobby- The main entry lobby space acts as the main 'hub' of the school and connects all components together. It will be a two-story volume with a ribbon of daylighting clerestory windows along the eastern edge which will allow ample diffuse daylighting without hotspots, glare or heat gain. The floor will be polished concrete with in-slab radiant heating. The ceiling will be exposed timber beams to add warmth to the space, and to echo the heritage of the current Longfellow Elementary School building. This space will be vibrant and active, inspiring and comforting- the heart of the school.

Feature Stairway- The main stairway off the entry lobby will start with a raised tiered plinth that will also act as a small gathering/ instruction space. The stair will have perforated metal risers for a more open feeling, and porcelain tile treads for a richer look and feel and for a durable surface. Guardrails will be comprised of steel tube framing with perforated metal in-fill panels, again- for an open look and so that kids on the stairs can be observed from all vantage points. The main stairway will be a lively component in the main lobby space.

Administration- The administration suite is centrally located in the building just off the main entrance. This provides optimal internal functionality, convenience and supervision of the drop-off and entrance doors, and supervision of the entire playground area to the south as well. The Administration suite will house the Main Office, the Clinic (Nurse), the Staff Lounge, individual offices for the Principal, the Assistant Principal (future), and the Counselor. There will also be designated Staff restrooms. Floor finishes will be carpet, except vinyl composition tile inside the Clinic area. Ceilings will be acoustical lay-in with direct/ indirect lighting.

Commons- The Commons, Music Room and the Gymnasium are aligned to create their own wing and to allow the Music Room to be used as a stage, the Gym for the audience and the Commons as an accessory space to the performance space. The Commons is oriented to the east so that morning sun will serve to warm Commons and to provide daylight. In the mid-day and afternoon, the sun will have moved past, and the room will again be afforded ample diffuse daylighting without hotspots, glare or heat gain-

the views will be amazing from there as well, especially given that the floor level is raised up several feet over the adjacent 7th Street. The walls will be ground-faced concrete block for durability, sound attenuation and the warm rich appearance it provides. The floor will be polished concrete with in-slab radiant heating.

Gym- The Gymnasium will be relatively large for an elementary school. There will be a main court running north-south, as well as two practice courts with adjustable retractable goals running east-west in each half of the gym. There will be floor inserts and striping for volleyball. There will be crash pads at the run-outs at each end of the main court as well as on the walls under the practice court goals (4) as well. There will be clerestory windows along both the east and west sides of the gym to achieve, again, ample diffuse daylighting without hotspots, glare or heat gain- which is especially important in an athletic environment. For additional daylighting, there will also be (8) 21" tubular daylighting devices (Solatube or equal) in the Gym to provide even natural illumination over the entire fitness area/ court. Like the Commons, the walls will be ground-faced concrete block for durability, sound attenuation and the warm rich appearance it provides. The gymnasium will have poured rubber flooring for resiliency and cushion.

Music- The music room is located adjacent to the gym, but with a floor elevation 2' higher than the gym so that it can be used as a 'stage' for plays, awards ceremonies, small musical concerts, and so on. Seating can be set up in the Gym and overflow into the Commons as needed. The operable partition that separates the Music Room from the Gym will be rated for maximum acoustical separation (STC-55 or higher) and the soffit detail above will be carefully detailed with multiple layers of drywall and full acoustical batting to complete the acoustical separation. The operable partition will have whiteboards across the full length of the room on the Music Room side to act as the teaching wall when closed. There will be large casework for instrument storage. The ceiling will be exposed structure with suspended acoustical absorption panels. There will be additional acoustical absorption and diffusion panels on the walls between and above casework. The walls will be ground-faced concrete block for durability, sound attenuation and the warm rich appearance it provides. The floor will be carpet for softer feel and better acoustics.

Art Room- The Art room is intentionally located immediately off of the main Lobby area such that it can act as the 'art installation' for the space, and for the school. The large window between the Lobby and the Art room will allow students, staff and visitors to see the artwork being created, and the art OF the creation of artwork. There will be flat drying racks, 2 tub-type stainless steel sinks (with clay traps), and base/ upper casework similar to the typical classroom. All walls will be full height tackable (self-healing vinyl). The ceiling will be exposed structure with suspended acoustical absorption panels. The floor will be polished concrete with in-slab radiant heating.

LMC- The Library/ Media Center (LMC) is on the second floor, just off the main Lobby space, at the top of the center feature stair. It will be a large open volume with vaulted ceiling above. Similar to the Lobby, the LMC will also have a ribbon of daylighting clerestory windows along the eastern edge which will allow ample diffuse daylighting without hotspots, glare or heat gain. The flooring will be carpet to create a quieter, softer environment. The ceiling will be exposed timber beams to add warmth to the space, and to echo the heritage of the current Longfellow Elementary School building. The main feature of the LMC will be the amazing views to the south and west. From its perch above the Administration suite below, the LMC will be afforded outstanding views of the surrounding mountains, and it will also act as the 'beacon' or 'lantern' that will be the marker for the school and provide a civic presence while designating location for entry and engagement.

West Academic Wing (1-4)- The 1st through 4th graders occupy the first and second floors of the west academic wing. The wing is arranged with four classroom pods (2 per floor)- one pod for each grade level 1st through 4th. Each 'pod' contains four classrooms, a shared flexible use area, and a staff workroom for resources. Each floor also has a set of student restrooms which 'bridge' between pods, as well as a dedicated staff restroom at the end of the wing, one on each floor. Hallways will have acoustical ceilings with direct/ indirect recessed lights and carpeting on the floors for softer feel and better acoustics. The classrooms themselves will have acoustical ceilings with direct/ indirect suspended lights and fully washable carpeting (Flotex by forbo, or equal) on the floors for softer feel and better acoustics.

A main goal for the classrooms is daylighting and views. To this end, an attempt has been made to provide ample window area. There will be a few operable windows in each classroom (which will be tied to the HVAC system for control, so as to not waste energy). There will be exterior sunshades on the south-facing classrooms to control glare and heat gain, and there will be parabolic louvers in windows above the sunshades (Okasolar by Schott- between glass louvered panels, or Equal) to push harvested daylight further into the classrooms.

Another critical factor for classrooms is the acoustical performance. For starters, the partition walls between classrooms and hallways will be (2) total layers of 5/8" gypsum board drywall on 3 5/8" metal studs with full wall thickness glass fiber blankets for acoustical separation (STC 45-49 per GA File No. WP 1072). The partition walls between a classroom and an adjacent classroom will be (3) total layers 5/8" gypsum board drywall on 6" metal studs with full wall thickness glass fiber blankets for acoustical separation (STC 50-54 per GA File No. WP 1052). All walls will be full height to structural deck above.

See enlarged pod diagram for more information about classroom layouts, wall treatments, furnishings and equipment, millwork, etcetera..

East Academic wing (K)- Kindergarten classrooms are located in a separate wing with direct access to the front of the school and the parent drop-off/pick-up. These classrooms also have direct access to the kindergarten play area on the southeast portion of

the building. Each Kindergarten classroom will also share a pair of dedicated (unisex) restrooms and a vestibule with the adjacent classroom. The vestibule will also act as a mud-room of sorts for going in and out to play areas.

From a daylighting and views (fenestration) standpoint, the Kindergarten wing follows the thinking of the west academic wing. See above for full information on finishes, partition types, top of wall, sunshades and parabolic louvers, etcetera.

Hallways in the Kindergarten wing will have acoustical ceilings with direct/ indirect recessed lights and carpeting on the floors for softer feel and better acoustics. The classrooms themselves will have acoustical ceilings with direct/ indirect suspended lights and fully washable carpeting (Flotex by forbo, or equal) on the floors for softer feel and better acoustics.

Public Restrooms- The pair of large restrooms immediately south of the Commons/ Gym are intended not only for student use during the day, but also for community use for after-hours events or functions. They are sized to serve a larger occupant load that would be present in the school for these types of after-hours functions. They are centrally located, and are placed close to the Gym/ Commons for convenience. Ceilings would be drywall with recessed lighting. Floors would be porcelain tile and walls with plumbing fixtures would be porcelain tile full height for cleanability and durability. Toilet partitions would be solid phenolic resin panels by Bobrick or equal.

Staff Restrooms- Staff restrooms are distributed throughout the building for convenience and quick access. Ceilings would be drywall with recessed lighting. Floors would be porcelain tile and walls with plumbing fixtures would be porcelain tile full height for cleanability and durability.

Student Restrooms- Student restrooms are distributed throughout the building for convenience and quick access. The hand-washing sink is a ganged fixture to reduce plumbing infrastructure and cost of three fixtures vs. one (per restroom). The sink is proposed as a Bradley 3-station Express MG-3 model, or equal. Ceilings would be drywall with recessed lighting. Floors would be porcelain tile and walls with plumbing fixtures would be porcelain tile full height for cleanability and durability.

Overall Security- All doors to the exterior will be locked from the outside for security purposes, while still allowing for unencumbered egress as required by Code. Access control card-readers will be placed at exterior doors such that Staff can gain access to the building at locked locations. There will be door position sensors on all exterior doors which will tie to a control panel in the office. Any opened exterior door will indicate a red LED light on the control board so the Office Staff will know of any security breaches immediately so they can be addressed. Finally, security cameras will also be employed strategically inside and outside the building to achieve visual observation of all portions of the building from the central Main Office location.

General Interior Materials and Finishes- The north wing housing the Music Room, Gymnasium and Commons will be built with masonry bearing walls for sound attenuation and durability. The corridor walls in the rest of the building will be constructed partially of high impact drywall (up to 4 feet above the floor). Partition walls between rooms will be gypsum board drywall on metal studs (as indicated above). All interior partitions will be full height to structural deck above except in a few isolated instances.

Polished sealed concrete is proposed for the main entrance, public hallways, toilet rooms, art classroom and Commons/ cafeteria. This very durable finish requiring low maintenance is a very sustainable finish for a school. Vinyl composition tile flooring will be used at the health clinic and workrooms. Classrooms will be carpeted. The gymnasium will be poured rubber flooring and the kitchen will be high recycled content porcelain tile. Slat type permanent recessed walk-off mats will be required for the full extent of all vestibules to reduce outdoor contaminants as a part of CHPS criteria.

Maple finish doors and hollow metal frames will be a standard throughout the interior of the building. We are suggesting high efficiency aluminum doors and frames at entrances and windows. Further development of the interiors will occur during the Design Development phase of the work. Sustainable materials will be used as the budget will allow it.

Technical Information/ Exterior Assemblies

Roof systems

Roof System 1 (nominally flat, 3/8" per foot slope):

Steel structural framing (sloping or flat w/ tapers as applies) and metal decking

(2) layers 2 1/2" Polyiso roof insulation (staggered joints)

1/2" thickness high density Polyiso cover board

Tapers, where applicable

60 mil fully adhered white Class A 'DL60' membrane (20 yr Warranty) by Duro-Last.

(Option: 60 mil fully adhered white Class A TPO membrane (20 yr Warranty) by Firestone).

Roof System 2 (sloping 2" per foot min):

Heavy timber (Glu-Lam) framing (sloping) and metal decking

(2) layers 2 1/2" Polyiso roof insulation (staggered joints)

1/2" thickness high density Polyiso cover board

High temp self-sealing adhered underlayment membrane

Standing Seam metal roofing (Berridge Zee-Lock or Equal)

Wall Systems

Exterior Wall System EW-1:

Ground-Face CMU Structural wall backup (thickness varies)

3" spray foam or 3" extruded polystyrene insulation boards

Air Gap

Brick Veneer (color varies Red, Buff/Tan, Charcoal. Re: elevations)

Exterior Wall System EW-2:

Ground-Face CMU Structural wall backup (thickness varies)

3" Z-Furring strips attached to CMU

3" spray foam or extruded polystyrene insulation (depth of furring)

Metal Wall Panel (Berridge HS-8 or HR-16 Smooth, or Equal- color varies Red, Buff/Tan, Charcoal. Re: elevations)

Exterior Wall System EW-3:

Structural stud wall backup (with 5/8" Type X Gypsum board @ interior)

2" sprayfoam (backside of sheathing)

1 1/2" Thermax Polyiso Sheathing System

Air Gap

Brick Veneer (color varies Red, Buff/Tan, Charcoal. Re: elevations)

Exterior Wall System EW-4:

Structural stud wall backup (with 5/8" Type X Gypsum board @ interior)

2" sprayfoam (backside of sheathing)

1 1/2" Thermax Polyiso Sheathing System

1/2" Air Gap (furring to offset panel from sheathing)

Metal Wall Panel (Berridge HS-8 or HR-16 Smooth, or Equal- color varies Red, Buff/Tan, Charcoal. Re: elevations)

Window Systems

Typical Punched Opening:

EFCO Series 403 thermally broken Storefront System (2" x 4.5" mullion), or equal

Typical Storefront Window Assembly – Type 1:

EFCO Series 403 thermally broken Storefront System (2" x 4.5" mullion), or equal

(Locations: all storefront without integrated sunshades)

Typical Storefront Window Assembly – Type 2:

EFCO Series 406 thermally broken Storefront System (2" x 6.5" mullion), or equal

(Locations: all storefront with integrated sunshades. Sunshades will be supported from storefront system, not ancillary steel framing within plane of exterior wall)

Aluminum for windows and storefront mullions/ caps will be a custom color: Burnt Orange/ Rust.

Finish shall be Ultrapon 70% PVDF by EFCO (for maximum resistance to color fade and chalking- or Equal)

Aluminum for sunshades will be standard color: Charcoal Gray

Finish shall be Ultrapon 70% PVDF by EFCO (for maximum resistance to color fade and

chalking- or Equal)

Exterior glazing shall be 1" insulated glazing units, Solarban 70XL or equal, typ.

Summary

The site is defined by the property boundaries adjoining J. Street, 8th Street, H. Street and 7th Street. The site also includes a parking lot located at the corner of I. Street and 8th Street.

Improvements described in this narrative define the items as either on-site or off-site and also categorizes the items as base estimate items or add alternates. Improvements are listed by type, utilities grading & stormwater.

UTILITIES

Water:

Water service is separated into two categories, building supply and site irrigation.

[Base Estimate] The building supply will be provided by a new 6" water tap off of J. Street near the intersection of 7th Street. The water main is located near the center of J. Street and is 8" ductile iron. The offsite work is from the main to the property boundary perpendicular to the main. A hot tap is the preferred method of tapping the main. The main from the tap to the building shall be 6" Schedule 80 PVC. The main will enter the building at the mechanical room where it will split into domestic and fire sprinkler supplies. See the Mechanical Engineering section for details of interior piping and piping under the structure. It should be noted that all bends in the main must have mechanical joint restraints and thrust blocks. Inspection requirements include tap inspection by the city, Tap and main inspection to the building riser by the Civil Engineer and the State Fire Safety Inspector prior to burial.

[Base Estimate] The irrigation supply will be provided by an existing 2" irrigation water tap locate near the intersection of I. Street and 7th Street. No offsite work will be required for this tap. It is currently assumed that the existing meter pit and backflow preventer will be acceptable for the application.

[Base Estimate] Two additional existing water taps at the site will be abandoned. The first tap is a 2" irrigation tap on J. Street. This tap should be abandoned per the City Utility Standards during the early site utility work summer 2013 as the building construction is over this existing irrigation system. The second 4" tap to be abandoned is near the I. Street and 8th Street intersection. This tap serves the existing school building and will be abandoned after completion of the new school during the demolition of the existing school summer 2014. This work is primarily offsite. All work is to the City of Salida Utility Standards. <http://cityofsalida.com/wp-content/uploads/CityofSalidaStandardsSpecifications.pdf>

[Base Estimate] A new fire hydrant shall be installed at the corner of 8th Street and J. Street, and a new fire hydrant to be installed near the drop off loop location nearest the front entrance. It is assumed the fire connection will be near the front entrance.

Sewer:

There are two existing sewer mains crossing the site from 8th Street to 7th Street in previous alley ways that have been vacated. These sewer mains have city utility easements. The southeast easement aligned with the alley between I. Street and H. Street will remain unchanged along with its existing sewer main. The northwest easement will be abandoned and rerouted around the northwest perimeter of the site.

[Base Estimate} Above ground improvements such as playground equipment should not be placed over the southeast easement as the school would be responsible for removing and replacing the equipment if the city did maintenance or replacement on the sewer main. The demolition contractor for the existing school should be made aware of the existing sewer main and should be responsible for any repairs due to damage during demolition.

The existing manhole lid elevation in the center of the site will be reset to an elevation not to interfere with the playground while still providing ready access for city maintenance. Assume a soft surface protective cover over the manhole lid.

[Base Estimate] The 6 inch sewer main aligned with the alley between J. Street and I. Street is located under the new school building site. The baseline reroutes the sewer main from the manhole located on the west side of the site at 8th street to a new manhole on the edge of pavement (a minimum of 10 feet from the existing water main) on J. Street; along J. Street to the east side of 7th Street where a new manhole will be inserted into the existing 6 inch sewer main running southeast to the alley and then east. This option requires three new manholes and 560 feet of new 8 inch sewer main. The existing sewer tap for the existing school enters the manhole in the middle of the site and will require abandonment per the City Utility Standards.

Natural Gas:

[Base Estimate] The natural gas main is located on J. Street. It is assumed that Atmos Energy will tap this main for the school and the natural gas service line will enter the site directly to the mechanical room area. The estimate of main length is 200 feet.

Electrical Power:

[Base Estimate] The school will require a new underground power supply to the site and a new transformer with associated concrete pad. The size of the transformer is unknown at this time.

Phone:

[Base Estimate] The school will require a new underground phone connection. It is recommended the phone infrastructure cost be assumed to be equivalent of that for the new Salida High School.

Internet: Assumed covered in the technology narrative.

Onsite & Offsite Stormwater Management:

[Base Estimate] Offsite stormwater from the southwest currently enters the site through a culvert crossing 8th street. There are no visible indications of stormwater conveyance piping or swales leaving the site. The stormwater management system will consist of underground rock filled infiltration trenches, low profile bioswales integrated with landscape areas. The offsite flows entering the site from the culvert on 8th street will be directed into the infiltration trench system. Roof drains from flat roofs will be piped below the foundation and frost level and piped to rock infiltration trenches sufficient distance from the foundation. The classroom wings shall direct rainwater to the infiltration trenches in the front of the building. The gym roof should direct rainwater to the infiltration trench at the rear of the gym and to the infiltration trench along the 7th street boundary. Sloped roofs will use exterior rain gutters, downspouts and splash guards. Downspouts near sidewalks will require ACO type sidewalk trench drains to landscape bioswales away from sidewalk and pedestrian areas. Piping will be provided by the mechanical design to take downspout drainage below grade using pipe. Sidewalks and drive lanes will be sloped to drain away from structures at 2% and toward bioswales.

[Base Estimate] Assume 600 feet of 4 foot wide by 6 foot deep infiltration trench using native rock screened from the site under a one foot depth bio-swale vegetated with native grasses and a 6 inch sand filter. Assume an additional 400 feet of rain garden swales 4' wide and one foot deep. There will be no detention or retention ponds on the site.

Grading & Drainage:

[Base Estimate] Assume a balance of cut and fill for the site excluding areas under structures (The contractor should read the geotechnical report for information on structural fill requirements). Topsoil and man-made fill material removed from under structures and excess from utility trenches should provide sufficient material for grading of the site. Native materials and man-made fill should be screened to 3" minus for site grading material. Large river rock should be retained for landscape features and the infiltration trench rock.

While the geotechnical report recommends 3" of asphalt over compacted native, we will specify 3" of flexible asphalt over 6" of class V gravel for drives such as the parent drop off and utility drive.

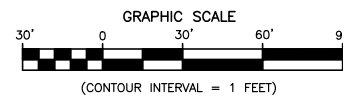
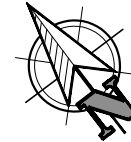
Sidewalks may be over compacted native, with a minimum of 4" of the native fill screened to 1" minus to remove rocks. All internal site sidewalks shall be 6.5 feet wide to accommodate motorized snow removal equipment.

The sidewalk along H. Street will be replaced with a 6 foot planter and 6.5 foot sidewalk; the street curb will remain unchanged. The sidewalk and curb along 7th street shall remain unchanged with the exception of the entry and exit drives for parent drop off. A new sidewalk will be constructed along J. Street with some of the sidewalk in the public right of way and some on site. The sidewalk and curb and gutter along 8th street will remain unchanged with infill of existing drive lanes to match the existing sidewalk pattern. The bus drop off area is shown with a 2 foot inset curb into the property line to provide the buses with a 10 foot parking lane, the sidewalk in this area will also be inset 2 feet to provide a contiguous width.

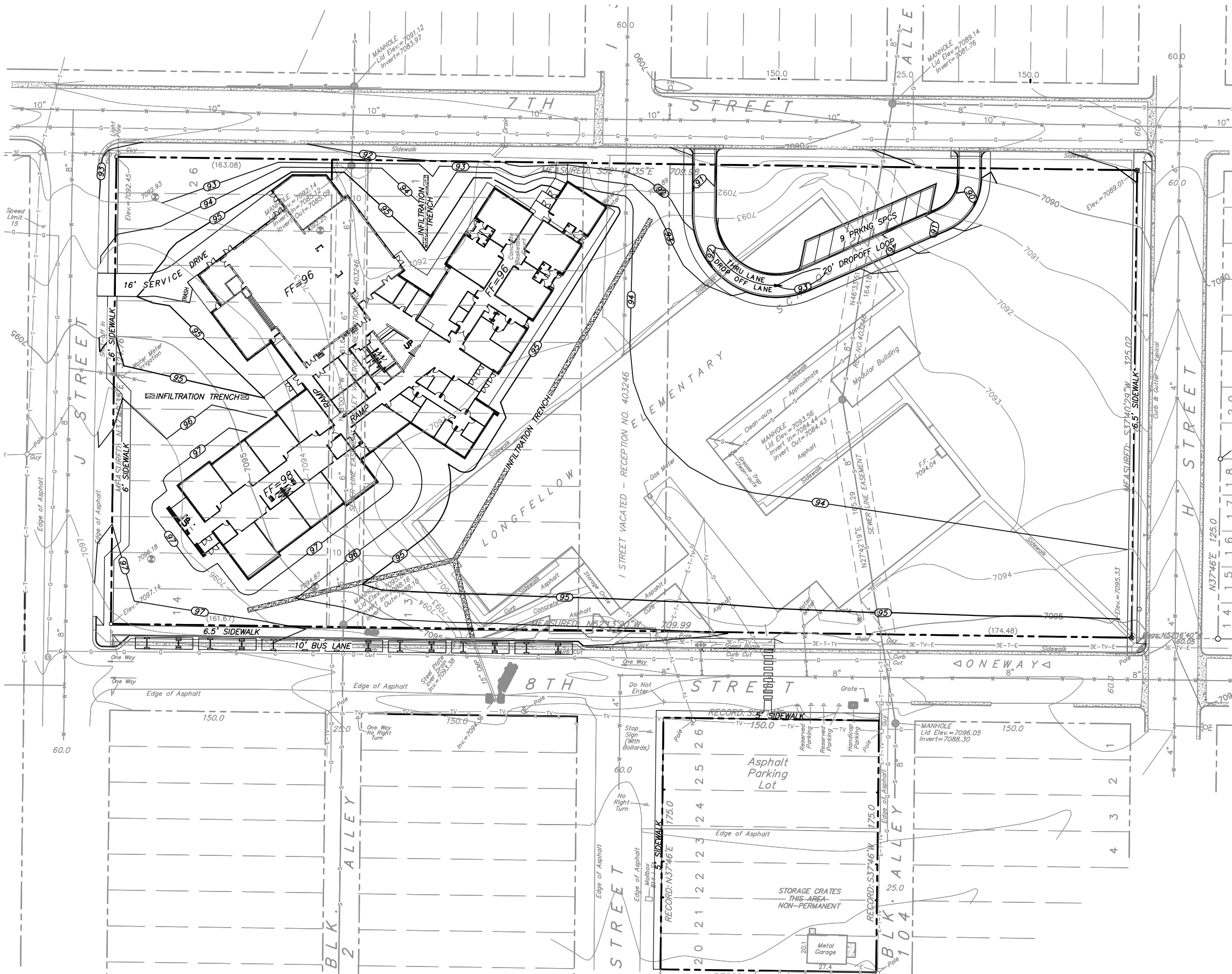
[Add Alternate] The offsite parking lot improvements shall be a add alternates. There is some existing paving on the lot; the remainder of the lot would be paved. The lot would be striped and parking blocks would be installed per the plan for 86 parking spaces. A 4 foot planter and 5 foot sidewalk would be installed to city standards with a flat curb without gutter.

Fencing:

Fencing is covered in the landscape section, where possible fences should be inset a minimum of 12 feet from the curb edge to allow for future wider sidewalks and planters. Where a gate is provided at a corner with a fire hydrant, it must have a Knox lock to allow fire personnel access. If a gate is not provided an opening in the fence is required. It is assumed the inside visitor drop off loop will be the fence perimeter.

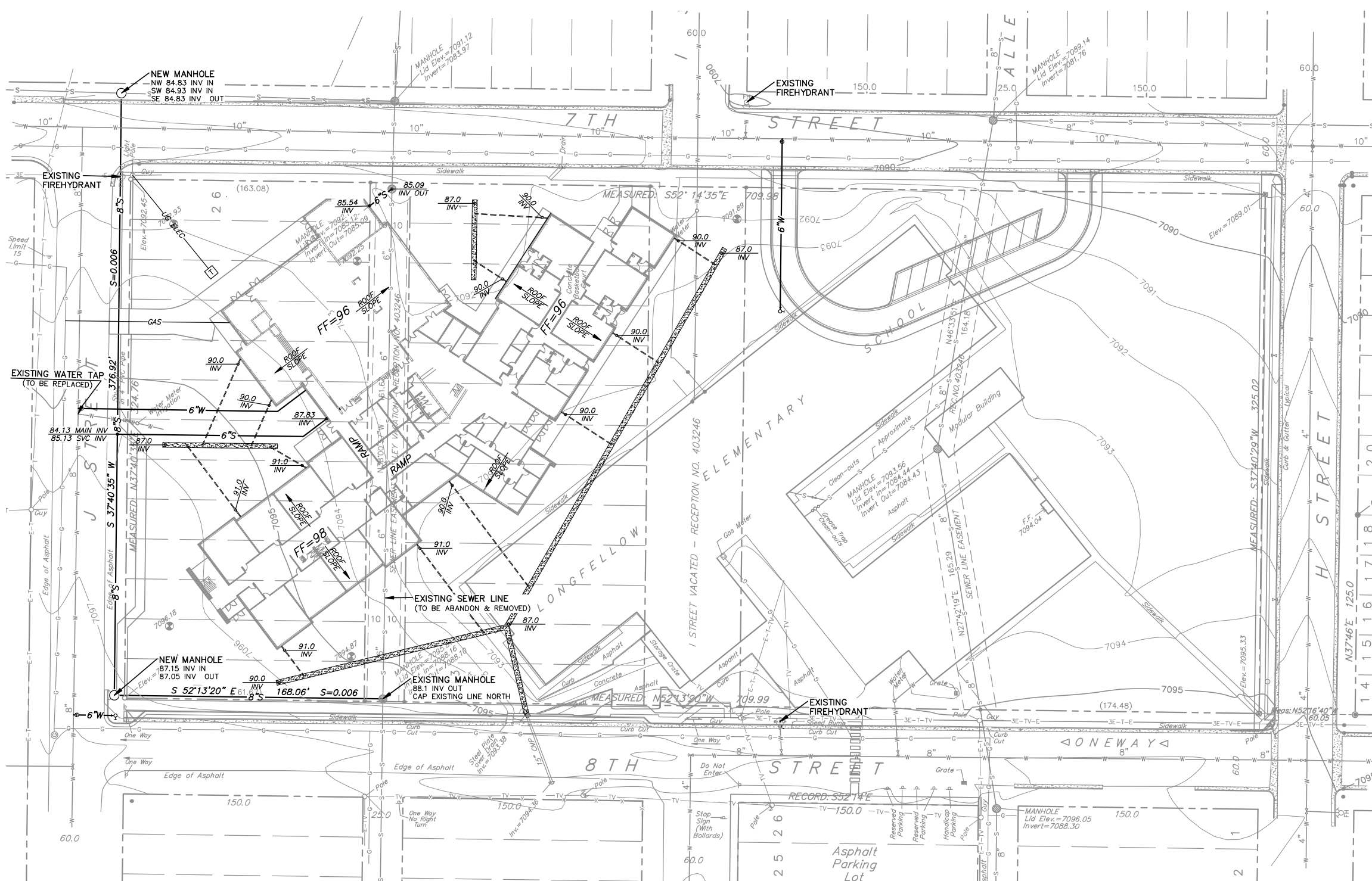
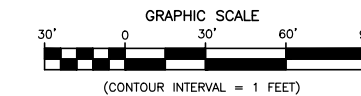


- LEGEND:**
- PROJECT BOUNDARY
 - EDGE OF NEW ROADWAY
 - EDGE OF EXISTING ROADWAY
 - EXISTING RIGHT-OF-WAY
 - EXISTING ROAD CENTERLINE
 - EXISTING LOT/PROPERTY LINE
 - NEW FRENCH DRAIN
 - EXISTING DITCH/CREEK BANK
 - EXISTING FENCE LINE
 - 8" S --- NEW SEWER MAIN (SIZE PER PLAN)
 - S --- EXISTING SEWER MAIN
 - 8" W --- NEW WATER MAIN (SIZE PER PLAN)
 - W --- EXISTING WATER MAIN
 - UGE/T --- EXISTING UNDERGROUND TELEPHONE/ELECTRIC LINE
 - E-TV --- EXISTING OVERHEAD ELECTRIC/TELEPHONE LINE
 - 85 --- PROPOSED MAJOR CONTOUR
 - 84 --- PROPOSED MINOR CONTOUR
 - 7080 --- EXISTING MAJOR CONTOUR
 - 7081 --- EXISTING MINOR CONTOUR
 - NEW CONCRETE SIDEWALK/PATH
 - NEW RIBBON GUTTER
 - NEW CURB & GUTTER
 - EXISTING CURB & GUTTER
 - EXISTING UTILITY POLE
 - NEW/EXISTING TRAFFIC SIGN
 - 2.0% --- NEW/EXISTING GRADIENT
 - 80.40 --- NEW/EXISTING SPOT ELEVATION
 - (82.8)FS* --- INTERPOLATED SPOT ELEVATION
 - NEW/EXISTING HANDICAP PAVEMENT MARKING
 - NEW/EXISTING FIRE HYDRANT ASSEMBLY
 - NEW/EXISTING SEWER MANHOLE
 - NEW/EXISTING WATER SERVICE LINE AND METER PIT
 - NEW/EXISTING VALVE (SIZE PER PLAN)



LONGFELLOW ELEMENTARY SCHEMATIC UTILITY DESIGN

SALIDA, COLORADO
MARCH 2013



LEGEND:

- PROJECT BOUNDARY
- NEW INFILTRATION TRENCH
- NEW SEWER MAIN (SIZE PER PLAN)
- EXISTING SEWER MAIN
- NEW WATER MAIN (SIZE PER PLAN)
- UNDERGROUND ROOF DRAIN
- EXISTING WATER MAIN
- EXISTING UNDERGROUND TELEPHONE/ELECTRIC LI
- EXISTING OVERHEAD ELECTRIC/TELEPHONE LINE
- EXISTING MAJOR CONTOUR
- EXISTING MINOR CONTOUR
- NEW/EXISTING FIRE HYDRANT ASSEMBLY
- NEW/EXISTING SEWER MANHOLE
- NEW/EXISTING SPOT ELEVATION

Landscape Concept

The new school building offers many opportunities to provide an exciting, stimulating outdoor play and learning environment. Some of the broader benefits include the location of the outdoor amenities to take advantage of the southern exposure, views from the site to the surrounding mountains, and the chance to anchor the school grounds in its unique environment.

Circulation:

The arrival at the school by vehicle has been formalized with private vehicle drop-off along on 7th Street, bus drop off on 8th Street, and access by foot provided at or close to all four corners of the site along sidewalks. In addition, a small internal visitor parking lot has been provided off 7th Street. Sidewalk connections into the site lead people directly to the main entry plaza. Teacher parking remains in its current location at I and 8th Streets, with a pedestrian crossing leading to one of the main 8' wide internal sidewalks leading to the front door. The outdoor play areas are bound by a 5' chain link fence with breaks where walks and driveways enter the site. The fence will be held off the back of the sidewalk by 18". Bike parking areas have been placed in close proximity to the walks leading to the building entrances. By focusing the pedestrian walks on the main entrance where the administrative offices are located, clear view lines are provided along these access routes and bike parking areas.

The main entry plaza is not only the focal point for the arriving and departing students but will also offer a gathering space for parents, students and teachers to mingle at the beginning and end of the school day. Seat walls, trees for shade and patterned paving support and enliven the use of this space.

Around the north side of the building a sidewalk along its perimeter provides access to all of the multiple doors, and limits the slopes away from the building to 2% providing flexibility in the site grading.

Site Concept and Play Areas:

The community has consistently expressed a desire that the site plan reflect the regional character of the community visually and programmatically. The play elements should emphasize a connection with nature and allow for a range of structured and free play expressed in an organic layout. In addition, the building should be considered a community resource. To this end the main entry plaza is designed to accommodate stalls for a farmers market, and access to the playgrounds allows for after school use.

Immediately adjacent to the entry plaza and outside the kindergarten classrooms is the kindergarten playground. This is fenced with a 4' high chain link fence, and access can be gained directly from the classrooms. In addition to a play pit containing age-appropriate play equipment, the pit is circumscribed with a trike track.

In conjunction with the site circulation patterns the site drainage sets up a connected series of outdoor spaces running from the south side of the building down to the south end of the site. This drainage is expressed in the form of a cobble-lined swale which picks up roof and hard surface run-off and is paralleled by a crusher fines trail. The additional moisture in the swale supports some natural vegetation. The layout of the play areas allows for good visual monitoring from the main entry plaza. Off this plaza a water pump with sluiceways offers a place for interactive water play. At the start of the swale adjacent to the main entrance an outdoor classroom comprises a small stone amphitheater surrounded with the vegetation which soaks up roof run-off in a lush rain garden. To the west of the outdoor classroom are raised beds for gardening. A small storage shed provides a place for tools and gardening supplies. Following the swale south, a look-out hill includes a slide with a vantage point of the whole site. On the back of the hill a secluded grove of aspens with a Trex deck providing a platform for imaginative play and performances. The swale proceeds along the edge of a natural playscape. An island in the middle has natural log balance beams, stump trails, a willow tunnel and musical instruments. A bridge across the swale provides access to more traditional play equipment and a climbing wall which includes opportunities for climbing and spinning for upper body strength and vestibular development. Further south are painted play courts – tetherball, four square, hopscotch and basketball. Adjacent to these courts are the swing sets, located to avoid cut-through traffic. The swale terminates in a wetland area which can be used for environmental education. At the south end of the site is an irrigated grass all-purpose play field.

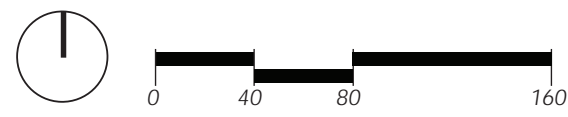
Landscape:

The landscape responds to a number of factors. The perimeter parkway between the sidewalk and streets, and the internal parking lot need to meet the City of Salida's design standards. In the areas on the north side of the building which will receive little, if any, active use, dryland seed will be installed. Where the sidewalk around the perimeter of the site is detached from the street the parkway will also be seeded with a dryland blend of grasses. These dryland areas will need to receive some basic maintenance to ensure a tidy appearance but will not require any irrigation. The existing conifers along the north edge of the property will be preserved where possible. Roof drainage will be directed to maximize the benefits for this xeric landscape.

On the south side of the building plantings will be used to provide shade in gathering and play spaces, screen and separate play areas, will be placed to benefit from channeled stormwater, provide opportunities for environmental education, and enhance the site aesthetics. Where appropriate small areas of lawn will be incorporated into the site to complement the play areas. The all-purpose play field will use a hard wearing turf blend. The irrigation system for all planted areas south of the building will be designed to deliver water in an efficient manner while balancing the need for durability and low maintenance. A rain sensor and 'smart' ET controller will help to manage the system for the best performance.

- A** BIKE PARKING
- B** VEGETABLE GARDEN
- C** AMPHITHEATER OUTDOOR CLASSROOM / RAIN GARDEN
- D** ENTRY PLAZA
- E** LOOK-OUT POINT / HILL SLIDE
- F** SWALE
- G** WATER PUMP / SLUICWAYS
- H** KINDERGARTEN PLAY PIT / TRIKE TRACK
- I** ENTRY MONUMENT
- J** VISITOR PARKING
- K** TREE DECK AND ASPEN GROVE
- L** NATURAL PLAYScape
- M** PRIMARY PLAY PIT
- N** HARD SURFACE COURTS
- O** WETLAND CLASSROOM
- P** SWINGS
- Q** MULTI-USE PLAY FIELD
- R** ART ROOM BREAK-OUT SPACE
- S** SERVICE ACCESS / TRASH ENCLOSURE
- T** BUS DROP-OFF
- U** PRESERVED EXISTING CONIFERS
- V** 4' FENCE @ KINDERGARTEN PLAY AREA
- W** 5' PERIMETER FENCE
- X** PARENT DROP-OFF

LANDSCAPE CONCEPT PLAN





explore

climb

balance

learn



imagine



contemplate



discover

grow



community



gather

music



teamwork



exercise



Introduction

The project consists of a new, approximately 52,000 square foot, K-4 school in Salida, Colorado.

The building will be a combination of one and two story construction.

Foundations

A sub-surface investigation for this project has been made by Mountain Engineering and Testing, Inc. (MET). In their report, number 12142, dated February 4, 2013, MET recommends a shallow spread footing foundation system bearing on native, medium dense gravel or structural fill placed directly on top of the native gravel layer.

With a spread footing foundation system, the exterior building walls and interior load bearing building walls are supported on a continuous concrete stem wall and strip footing. Exterior columns are supported on pilasters and spread footings constructed integrally with the perimeter stem wall and strip footing. Interior columns are supported on isolated concrete pedestals and pad footings. Interior stem walls and strip footings will also be used to connect columns at interior braced steel frames.

Concrete used for foundations will use Type I-II cement. Furthermore, air-entrainment will be required for all concrete subject to freeze-thaw action such as foundation walls.

Floor Slabs at Grade

The geotechnical engineer has recommended that grade level floors be slab-on-grade construction. The interior floor slab will be 5 inch thick normal weight concrete, reinforced with a two-way mat of mild steel deformed bars (#4 at 16 inches on center each way), positioned in the top half of the slab. The floor slab will be thickened beneath all non-structural interior masonry partitions. Slabs will be poured directly over a 15 mil vapor barrier placed on a 6 inch thick layer of free-draining clean gravel. The gravel layer will be placed on the subgrade consisting of structural fill on top of the native gravels. The installation of the gravel layer, subgrade and conditioning of the native gravel layer will be done in accordance with the recommendations of the soils report. All reinforcing will be supported at the proper heights using chairs placed directly on the vapor barrier.

Sawcut control joints will be made in slabs-on-grade in order to minimize cracking due to shrinkage. Control joints at exposed to view slabs-on-grade will be located at regular intervals spaced no greater than 7 feet on center and bounding no more than 50 square feet of floor area. Control joints at all other slabs-on-grade will be located at regular intervals spaced no greater than 11 feet on center and bounding no more than 120 square feet of floor area.

Slabs will be isolated from utility lines and building foundations, except at door thresholds. Isolation joint materials, blockouts and sleeves will be installed to permit movement of the slab-on-grade without causing damage to the building structure and utility lines. Similarly, non-load bearing partition walls will be isolated from the second level floor and roof structure to mitigate damage to either element should the slab move.

Concrete used for interior slabs-on-grade will use Type I-II cement.

Radiant heating tubes will be embedded in the slab-on-grade. Tubes will be positioned above the mat of reinforcing bars and secured to it in accordance with the tubing system specifications. Refer to the mechanical design narrative for additional information.

Floor Framing

The second floor structure of the classroom and library wing will be a 5 inch (total thickness) normal weight concrete slab on 1 1/2 inch deep composite galvanized metal floor deck supported on open web steel joists. The slab will be reinforced with a single layer of steel mesh if there are no radiant heat tubes embedded in it, or a two-way mat of mild steel deformed bars if the mechanical system specifies embedded radiant heat tubing. All slab reinforcing will be centered in the middle of the slab above the metal deck flutes. The joists will be supported on steel beam and column frames. Joists will be spaced between 2'-8" and 3'-4" on center. Steel frame members will consist of wide flange beams and tube steel columns.

Roof Framing

The structure of the flat roof areas of the building will be galvanized metal roof deck supported on open web steel joists and wide flange steel beams. Open web steel joists will be spaced between 4'-0" and 5'-0" on center except at the gymnasium where joists will be spaced between 8'-0" and 9'-4" on center. The structure of the sloped roof areas of the building will be galvanized metal roof deck supported on architecturally expressed glu-lam timber beams. The glu-lam timber beams will be installed in pairs with each set of coupled beams spaced between 8'-0" and 9'-4" on center.

At the flat roofs of the classroom wings, the joists will span between exterior and interior steel beam and column frames. Steel frame members will consist of wide flange beams and tube steel

columns. At the flat roofs of the gymnasium wing which includes the gym, gym storage, kitchen, music room, mechanical and electrical rooms, the joists will clear span the roof and bear on reinforced concrete masonry walls. At the sloped roofs of the library, main entry and central lobby, the glu-lam timber beams will span between exterior and interior steel beam and column frames. At the sloped roof of the commons, the glu-lam timber beams will span between exterior and interior reinforced concrete masonry walls.

The metal roof deck used at flat roof areas will be 1 1/2 inch deep 20 gage type B wide rib deck units except at the gymnasium where 3 inch deep 20 gage type N deck units will be used. The metal roof deck used at sloped roof areas will be 3 inch deep 20 gage type N deck units. Acoustical deck units will be used at the gymnasium, library, music room, main entry and central lobby. Metal deck supported by glu-lam timber beams will be screwed to the tops of the beams. Pre-drilling of the metal deck flutes will be required for this connection type.

In general, the flat roof structure will be sloped to achieve proper drainage. At areas where it is determined that a truly flat and level roof structure is preferable, tapered rigid insulation will be used to create roof slope and drainage.

Open web steel joists will have parallel top and bottom chord geometry except at the gymnasium and center (interior) bay over the two story classroom wing where joists will have double pitched top chords. All sloped open web steel joists will have sloped joist bearing seats.

Mechanical Roof Top Units and Screening

Primary mechanical roof top units (RTU) will be positioned at strategic locations on the various flat roofs of the building. RTU's positioned over the classroom wings will be centered about the ridge line of the center (interior) bay. Screening of the RTU's is not mandated by code or other design standards. However, screen walls will be constructed around RTU's which are not sufficiently screened by parapets, building walls or other building features. The screen wall structure will consist of field welded tubular steel posts and horizontal rails. The screening material will be a corrugated metal roofing product designed to span vertically between horizontal rails. The screen wall posts will penetrate the plane of the roof system and extend below the roof deck a minimum distance of 2 feet. The screen wall posts will be supported by a system of steel angle beams and diagonal braces which will transfer all screen wall loads to the primary roof joists and beams.

Lateral Force Resisting System

This building will have the following lateral force resisting systems.

Braced steel frames will be used at the one and two story classroom wings and for the lateral support of the two story areas of the central administration and library wing. Diagonal braces will be positioned within interior walls in a chevron (K) arrangement. Diagonal braces will be tube steel. Cantilevered tube steel columns will be used to transfer lateral loads from the high roofs along clerestory window lines at the east sides of the library and central lobby to the adjoining lower roof and second floor structures.

The east wall of the commons will utilize a structural steel rigid frame design made using wide flange steel beams and tube steel columns. Columns in this frame will be spaced at 8'-0" on center.

Reinforced concrete masonry shear walls will be used at the remaining single story building elements including the gymnasium, gymnasium storage, music room, kitchen, commons (except as noted above), mechanical and electrical rooms.

Exterior Wall System

There will be five primary exterior wall systems on this project:

1. Brick veneer with light gage metal stud wall back-up.
2. Brick veneer with CMU wall back-up.
3. Metal panel siding with light gage metal stud wall back-up.
4. Metal panel siding with CMU wall back-up.
5. Curtain wall.

For metal stud walls, the typical stud depth will be 6 inches except where vertical spans require the additional stiffness to be gained by using 8 inch deep studs. Typical field studs will have 1 5/8 inch wide flanges. Studs and tracks will be 16 gage minimum. Jamb studs will have flanges between 3 and 3 1/2 inches wide and will be range 16 and 12 gage. The minimum spacing of studs will be 16 inches on center. Metal stud wall components (field studs, jamb studs, tracks, connector plates, bridging, etc.) will be hot dip galvanized steel. Screw connectors will be stainless or corrosion resistant steel.

Metal stud wall construction will be balloon framed, extending from the top of foundation walls to the top of parapet and

bypassing the second floor and roof structures. In some instances, metal stud walls will start at a low roof level and extend continuously up to the top of parapet. Field and jamb studs will be connected to the edges of the second floor slab and metal roof deck using vertical slide connectors capable of transmitting horizontal loads only and allowing unimpeded vertical movement of the floor and roof structures.

Openings in metal stud walls will be framed using built-up box headers, track sills and multiple stud jambs. Built-up box headers will consist of two (2) studs with webs in a vertical plane capped by a continuous track member top and bottom. Most sills will be framed using a single track which caps the stud wall below. In some locations, sills will be strengthened by the addition of typical wall stud installed directly above the track. Jambs will be made using a minimum of two (2) jamb studs, stitch welded together full height.

A significant area of the exterior walls of the classroom wings, library and administration area will utilize sun shading devices to cut down on heat gain through the windows. The sunshades will be an integral component to the storefront window system. The vertical and lateral loads supported by all window systems (with or without integral sunshades) are ultimately transferred to the host wall. Where sunshades occur, these loads are notably higher on account of the additional wind and snow catch areas. Accordingly, metal stud framing around windows with integral sunshades can be expected to be stouter in construction than around plain non-shaded windows.

Concrete masonry walls will be single wythe construction. Concrete masonry unit (CMU) thickness will be 12 inches at walls around the gymnasium, commons and music room and 8 inches everywhere else. Walls around the music room will be solid grouted for improved acoustical performance. The west wall of the gymnasium will have a single wide opening for connection to the music room. This opening will be supported on an architecturally expressed wide flange steel girder bearing on reinforced concrete masonry piers at each end. The east wall of the gymnasium will have three (3) wide openings for connection to the commons. The header will consist of a deep reinforced concrete masonry beam continuous across all three openings. The piers which support the steel girder and masonry beam at the gymnasium wall openings will be design as reinforced tied masonry columns.

Design Criteria

In accordance with IBC 2009, this school building is assigned an Occupancy Category III for "Buildings and other structures containing elementary school, secondary school or day care facilities with an occupant load greater than 250." Accordingly, the building structure will be designed for the following code prescribed minimum loads:

1. Wind Forces: IBC 2009 with Chaffee County Amendments: Wind speed (fastest 3 second gust) of 90 mph, Exposure C, Importance Factor = 1.15
2. Seismic Forces: IBC 2009 with Chaffee County Amendments: Seismic Design Category C, Site Class D, Importance Factor = 1.25
3. Roof Structure: IBC 2009 with Chaffee County Amendments: Pg psf (ground snow load) with consideration for snow drifting and sliding in accordance with ASCE-7, Importance Factor = 1.10
4. Dead Load: Actual self-weight of all structural components, roofing and ceiling materials, exterior and interior suspended equipment plus walls, mechanical equipment plus walls and specialty equipment.

The building structure will be designed with the following minimum deflection criteria when subjected to the above design loads:

1. Wall lateral deflection at masonry veneer: L/420
2. Lateral deflection of curtain wall back-up structure: L/240
3. Vertical deflection of structure supporting masonry: L/600
4. Roof structure vertical deflection under live load: L/360
5. Floor structure vertical deflection under live load: L/360
6. Building lateral drift under wind load: H/400
7. Building lateral drift under seismic load: H/400

MECHANICAL SYSTEM:

The new elementary school will be designed to meet the requirements of either LEED for Schools Gold certification or Colorado Collaborative for High Performance Schools (CO-CHPS) Verified Leader certification. At this point it is believed that CO-CHPS will be the certification program of choice. Under CO-CHPS, the building (envelope, mechanical, and electrical) will need to have a minimum of 25% reduction in total energy cost savings compared to ASHRAE 90.1-2007. We anticipate that the system proposed below will exceed this minimum reduction and provide an energy savings of 30-40% as compared with ASHRAE 90.1-2007, corresponding to 7-11 points under CO-CHPS credit EE 1.1.

The proposed HVAC system for this school is an in-floor radiant heating system with dedicated outside air handling units with energy recovery wheels. Ventilation throughout the school will be a combination of displacement ventilation and traditional overhead supply depending on the space type. Air will be returned back to the units by means of an above-ceiling plenum. While only the administration area is currently planned to be occupied during the summer months, the entire system will be designed to have the capability to function year round if required.

The building heating plant will consist of two (2) high efficiency hot water condensing boilers. The basis of design will be Aerco Benchmark 2.0 or equivalent. Each boiler will be sized for the entire building heating load (approximately 2000 MBH) and will run in a primary/standby configuration. The primary/standby designation can be switched via an owner defined cycle to prolong the life of the boilers. An alternative would be to use traditional cast iron boilers. These boilers are much larger and would likely require the floor area of the mechanical room to be increased by roughly 25%. The building will be served by two (2) base-mounted centrifugal heating water pumps. The pumps will also run in a primary/standby configuration, which can also be cycled to prolong the life of the pumps. The heating water system will utilize a 3-way control valve to provide lower temperature water to the radiant floor systems, and higher temperature water to the other heating systems. The heating plant will also include an air separator, expansion tank, glycol feeder, and associated accessories. A 30% glycol level will be maintained in the heating water system.

Ventilation for the classrooms will be provided through two (2) dedicated outside air (DOA) units with an energy recovery wheel, heating water coil, evaporative cooling coil, and space for a future DX cooling coil. The future DX coil would only be required if the classrooms were regularly used during the summer months for summer school. One DOA unit will be approximately 12,000 CFM and will serve the 1st and 2nd floor classrooms on the west wing. The second DOA unit will be approximately 6,000 CFM and will serve the 1st floor classrooms on the east wing. The DOA units utilize the outgoing exhausted air to condition the incoming ventilation air by means of an energy recovery wheel. The evaporative cooling section will be located in the exhaust air stream of the unit to further increase the effectiveness of the heat

wheel. The supply fan will have a variable frequency drive and be controlled to maintain duct static pressure. The exhaust/return fan will have a variable frequency drive and be controlled with an offset from the supply fan to maintain building static pressure. Unit air filters will have a minimum efficiency reporting value (MERV) rating of at least MERV 8. 1 or 2 points are available under the CO-CHPS EQ2.1 Enhanced Filtration credit for the use of MERV 11 or MERV 13 filters, respectively. A higher MERV rating results in increased static pressure, thus increasing fan energy. A life cycle cost analysis will need to be performed to evaluate the potential use of increased filtration.

Air distribution will be either from conventional overhead supply diffusers or through low velocity displacement ventilation supply diffusers, depending on the space type. Displacement ventilation supplies air to the space at a low velocity usually at the floor level. The cool air is dispersed low through the space and rises as it is heated by occupants and equipment. A traditional system in cooling will typically supply air at 55 deg F, while displacement ventilation systems only require 65-68 deg F air. The higher temperature and low velocity of displacement ventilation achieves stratification in the space, and no mixing occurs. Air passes through the occupant breathing zone once before it is returned out of the space. This results in greater air quality, as air contaminants are carried away from the occupants, rather than being mixed in. Higher distribution effectiveness is also achieved, which results in reduced outdoor air requirements and consequently reduced energy costs. The lower velocity air can result in less mechanical noise, producing a quieter classroom environment. Use of displacement ventilation would assist in gaining CO-CHPS points for Indoor Environmental Quality under credits EQ2.4 Thermal Displacement Ventilation and EQ3.1 Improved Acoustical Performance. Displacement ventilation is not suitable for all applications. Several areas of the school will be better served by a traditional overhead system due to the space layout and occupancy type.

Descriptions of the specific spaces within the building and how this proposed mechanical system will integrate within those spaces is provided below:

1. Classroom Areas (Including Music Room)

Primary Design: The classroom spaces will be served by the dedicated outside air units utilizing displacement ventilation. Each classroom will be served by a dedicated VAV box ducted to a single displacement diffuser. Displacement diffusers will be Price model DF1 or equivalent. Each classroom diffuser will be recessed in the wall. The diffuser will have a 12" round duct routed within the chase and connected at the top of the diffuser. Approximate dimensions of each diffuser are 36"W x 60"H x 16"D. Refer to the supplemental portion of this narrative for a cut sheet of the proposed Price DF1 diffusers. Occupancy sensors will be installed in each classroom, which will control the lighting and each classroom VAV box. When the classroom goes into unoccupied mode, the VAV box will shut down. Heating in each classroom will be achieved by an in-floor radiant piping system. This radiant piping system will be sized to accommodate the building envelope loads on both the first and second floors and will

include a minimum of 2" thick rigid insulation (equivalent of R-10) beneath the slab on grade and either 2" thick rigid insulation or plenum rated spray foam insulation (with an equivalent insulation value) beneath the second floor floor structure. This insulation would be installed to increase the efficiency of the radiant piping system by directing the heating to the occupied space instead of the floor or grade below. Each classroom will have a section of operable window which will be interlocked with the HVAC system, corresponding to 2 points under CHPS EE 1.3 Natural Ventilation & Energy Conservation Interlocks. The Art classroom will have dedicated exhaust for the kiln.

Alternate design: Concerns were expressed with using in-floor radiant heat on the 2nd level. If not properly insulated, heat can escape through the bottom of the slab in addition to the top, thus decreasing the heating effectiveness. An alternative to in-floor radiant heat in the 2nd level classrooms would be the use of decorative hydronic baseboard along the perimeter.

2. LMC (Library)

The LMC will be served by a VAV rooftop unit which will also serve the Administration area. The unit will have 100% air economizer, heating water coil and DX cooling. Heating and cooling will be delivered by overhead ceiling diffusers. Supplemental heating will be provided by perimeter baseboard to cover the glazing load. The baseboard could be integrated with the casework/shelves along the perimeter.

3. Administration Area

The Administration area will be served by the same VAV rooftop unit which serves the LMC. The Administration area will consist of approximately 3-4 zones, with each zone being served by a VAV box with a hot water reheat coil. Heating and cooling will be delivered by overhead ceiling diffusers.

4. Technology Lab

The technology lab will be served by a packaged rooftop unit with DX cooling and a heating water coil. DX cooling capacity will be approximately 5 tons. The unit will have 100% air economizer capability. Heating and cooling will be delivered by overhead ceiling diffusers.

5. Gymnasium

The gymnasium will be served by a single zone VAV rooftop unit with energy recovery wheel, 100% air economizer, heating water coil, and evaporative cooling coil. The unit will include CO2 controls within the space to match the outside air quantity with the concentration of people in the space. Heating and cooling will be delivered via overhead distribution utilizing a Ductsox fabric ductwork system or equivalent. The fabric ductwork system is recommended in gymnasium areas due to the ease of installation as well as the flexibility. Fabric ductwork will not be a target for students as metal ductwork can traditionally be.



Figure 1: Ductsox fabric ductwork installation in a gymnasium

6. Commons

The cafeteria will be served by a single zone VAV rooftop unit with 100% air economizer, heating water coil, and evaporative cooling coil. The unit will include CO2 controls within the space to match the outside air quantity with the concentration of people in the space. Cooling and ventilation will be delivered by overhead ceiling diffusers. Heating will be decoupled from the ventilation and will be provided by decorative hydronic baseboard panels along the perimeter.



Figure 2: Runtal Baseboard Radiation Installation

7. Kitchen

The kitchen will be served by a make-up air unit with a hot water heating coil and evaporative cooling coil. Separate exhaust fans serving the dishwasher hood and main kitchen hood will be interlocked with the make-up air unit.

8. IDF/MDF Room

Both the IDF and the MDF room will be cooling only and be served by separate DX split systems with condensing unit on the roof. Cooling capacity will be approximately 3 tons for each room.

9. Restrooms

Exhaust air from restrooms (excluding administration area restrooms) will be routed to the dedicated outdoor air units through the air-to-air heat recovery wheels. No separate exhaust fans for these areas will be required. As the administration area is expected to be occupied during the summer when the classroom DOA units will likely not be running, exhaust for any administration restrooms, the janitor's closet, and the clinic will be handled by a separate exhaust fan. The exhaust fan will be approximately 500 CFM.

A complete Direct Digital Control (DDC) system will be used within the building. The system will be designed as a web-based standalone control system with remote monitoring and adjustment from the school district's main DDC system. All set points will have the ability to be modified remotely. An override button can be provided with each thermostat to bring the system to an occupied setting for a user-adjustable length of time. The entire building will be on an occupancy schedule with night setback capabilities. Data monitoring and trending of HVAC and domestic hot water systems is anticipated, in order to meet the requirements of CO-CHPS EE1.4 Energy Management Systems credit.

PLUMBING SYSTEM:

A 6" water main will serve the building. The domestic water and fire sprinkler piping will be split inside the building and the domestic water will be metered separately. The domestic water branch will have a reduced pressure backflow preventer assembly, and the fire sprinkler branch will have a double check valve assembly.

The building storm drainage will be via day lighting in lieu of routing to storm sewers. Overflow storm drains will terminate at downspouts at locations which avoid perimeter walkways, while still being easily visible.

Two (2) gas fired high efficiency water heaters will serve the building. One water heater will support the kitchen supplying 140 deg F water. The second water heater will serve the rest of the building supplying 110-120 deg F water.

Both water heaters will have a separate domestic water recirculation system with recirculating piping and recirculation pump. Each recirculation system will be controlled by the occupancy schedule to reduce unintended operation. The DDC system will also monitor the domestic water temperatures and provide an alarm for either high or low water temperatures.

Natural gas will be brought into the building to serve the boilers, kitchen appliances, and domestic water heaters.

High efficiency low-flow plumbing fixtures will be used throughout the building. This should allow us to easily meet the CO-CHPS WE2.0 prerequisite of 20% water reduction in indoor potable water use. It is also anticipated that at least a 30% potable water use reduction will be achieved, as well as a minimum of 35% reduction in potable water for sewage conveyance, which will lead to 3 combined points under CO-CHPS Water Efficiency credits WE2.1 and WE2.2. Lavatory faucets, water closet flush valves, and urinal flush valves will be provided with hardwired infrared sensors. A sink will be located in each classroom. All lavatories and sinks will be provided with ASSE 1070 compliant thermostatic mixing valves. Water bottle fill stations will be provided at all drinking fountain locations.

Point of use plaster/clay traps will be located as required in the art classroom and acid neutralization basins will be utilized at the science classroom sinks if necessary. The chemical waste system includes point of use basins in lieu of a centralized basin. This will eliminate the need to route a chemical waste and vent system in the building.

A grease interceptor will be provided for the kitchen area.

A pump and sand oil interceptor will be required for the elevator.

FIRE PROTECTION SYSTEM:

The building will be fully sprinkled with a wet pipe sprinkler system and quick response heads per the current edition of NFPA 13. The building will be protected as light hazard except storage rooms and the mechanical room, which will be protected as ordinary hazard.

The fire department connection will be located on the exterior of the building in a location acceptable to the Salida Fire Department.

ELECTRICAL NARRATIVE

Electrical Distribution:

The electrical load for the building is based on 52,068 square feet with a 1055 square foot warming kitchen for a total square footage of 53,123 square feet. It will consist of energy efficient lighting, general and special purpose receptacle, mechanical equipment, kitchen equipment and small miscellaneous equipment.

The electrical loads for lighting, receptacles and miscellaneous equipment are based on 6 watts per square foot with a total estimated load of 312kVA.

The electrical load for the kitchen equipment is estimated at 20 watts a square foot for a total estimated load of 21kVA.

The estimated electrical load for mechanical equipment is based on 12 watts per square foot for a total load of 637kVA.

The total estimated net load for this project will be 970kVA.

Xcel Energy will supply power to a main switchboard via a new pad mounted transformer. They will provide and install the primary conduit and conductors to the transformer. The electrical contractor shall be responsible for the transformer pad, and secondary conduit and conductors from the transformer to the main switchboard. The electrical contractor shall provide a 1" conduit with pull-string from the utility meter to the main communications room.

The new main switchboard shall be rated for 3000 Amps at 120/208 volt, 3-phase, 4-wire with a main circuit breaker. It will be located in the lower level main electrical room. A surge protection device (SPD) shall be provided integral to the main board. The switchboard shall provide power to sizeable mechanical equipment and branch circuit panelboards located centrally on each floor. The electrical service shall be sized at least 25% above calculated capacity for future expansion.

Lighting loads shall be fed from dedicated 250A, 120/208 volt, 3-phase, 4-wire, 42 branch circuit panelboards and will be located on the 1st and 2nd floors.

The Administration area will be fed from a dedicated 125A, 120/208V, 3phase, 4-wire 42 circuit panelboard.

Receptacles, computers and all other miscellaneous loads shall be fed from (3) 225A, 120/208 volt, 3-phase, 4-wire, 42 circuit panelboards. (2) Panelboards will feed the west wing 1st and 2nd floors, and (1) will feed the east wing.

Kitchen equipment shall be fed from a dedicated 100A, 120/208V, 3phase, 4-wire, 42 circuit panelboard.

The large mechanical loads shall be fed from the main switchboard with the smaller miscellaneous loads fed from a 200A, 120/208 volt, 3-phase, 4-wire, 42 circuit panelboard.

All panelboards shall be designed so there is a minimum of 25% spare capacity for future loads.

As an option a 480V, 3-phase service could be installed in lieu of a 208V, 3-phase service. This would reduce the service size to a 1600A, 277/480V, 3phase, 4 wire service. This however would require the installation of GFI protection at the services with multiple 480-120/208V, 3-phase transformers located in secondary locations. This would reduce the cost of the main service and associated distribution equipment. The availability of the required 480V will need to be confirmed with the serving utility company in the design phase of the project.

Power:

Duplex receptacles shall be provided throughout the building for convenience, computers, audio/video systems, projectors, TV's, copiers, printers, etc. and shall be installed in all areas per owner direction. Each classroom, instruction area, and the cafeteria shall have two duplex receptacles per wall. Offices shall be provided with one duplex receptacle per wall. GFCI receptacles shall be located as necessary per the National Electrical Code.

Electrical connections and controls shall be provided for a gymnasium electronic Daktronics scoreboard with (2) control stations.

Electrical connections and controls shall be provided for motorized backstops. The controls will be centrally located along with the light switches in a lockable enclosure.

Electrical connections shall be provided for kitchen equipment using receptacles, safety disconnects and thermal overload switches as directed by the kitchen consultant.

Mechanical equipment will consist of (6) rooftop units, (2) split system for the MDF and IDF rooms, a Make-up air unit and exhaust fan for the kitchen hood and the dishwasher hood, small horsepower exhaust fans in restrooms, (2) Gas fired boilers and (2) associated boiler pumps with emergency shut-down. Electrical connections will be provided to the mechanical control panels as required. Electrical connections shall be provided by using safety disconnects and thermal overload switches. Electrical connection shall be provided for an art room pottery kiln and will be interlocked with an exhaust fan.

Electrical connections shall be provided for a passenger elevator and will be fed from the main electrical service.

Provisions for a future 800A photovoltaic (PV) system shall be incorporated into this project as an ADD Alternate. The PV panels shall be located on the roof.

Lighting:

NOTE: Lighting will be circuited at 120V, single phase. As an option if a 277/480V service is provide all lighting will be circuited at 277V.

Reference attached lighting cut sheets for additional information. Lighting and Lighting Controls will be designed to meet the Innovation, Sustainable Sites, Energy Efficiency and Indoor Environmental Quality requirements as outlined in the 2009 Colorado Criteria for High Performance Schools (CO-CHPS). Plug load reduction will be accomplished by providing an additional Lutron PowPak or similar relay device connected to the occupancy sensor located within each space requiring plug load reduction to automatically switch off select receptacles when the space is unoccupied.

EXTERIOR:

Exterior lighting shall be designed and installed to produce a maximum initial illuminance value no greater than 0.1 foot-candles at the site boundary and no greater than 0.01 foot-candles 10 feet beyond the site boundary to meet the requirements of CO-CHPS – Light Pollution Reduction.

All exterior fixtures will utilize 4100K CCT LED light-bar or light-square technology and will have high/low output functionality.

Exterior pole-mounted architectural grade LED source fixtures with full-cutoff optics shall be provided along the new pedestrian path providing a minimum maintained level of 0.5 foot-candles. Poles shall be a maximum height of 15'-0" with a concrete base.

Building-mounted architectural grade LED source fixtures with full-cutoff optics and integral battery back-up will be installed outside of all egress doors to meet current Life Safety Code requirements. Additional building-mounted architectural grade LED source fixtures along the perimeter will be provided for security lighting.

Automatic lighting control will be achieved via the intelligent relay lighting control panel and a roof mounted photo sensor. The exterior lighting will be automatically switched on before ambient daylight levels fall below a usable level. At 10pm, the exterior lighting will go into set-back mode and all fixtures will be reduced to between 20-50% light output. Two hours prior to sunrise, the exterior lighting will return to 100% output and after ambient daylight levels return to a usable level, the exterior lighting will be automatically switched off.

INTERIOR:

All interior light fixtures shall have a correlated color temperature (CCT) of 3000K.

Suspended linear fixtures shall be no less than +7'-6" above finished floor level.

CLASSROOMS:

Classroom lighting will be designed to meet the CO-CHPS – Indoor Environmental Quality EQ1.3 requirements and an average illuminance of 40 foot-candles (f-c). The lighting system will consist of three rows of suspended linear indirect/direct fixtures suspended 15-18 inches from the ceiling; Corelite i2-WB series or similar. The fixtures will have (3) T8 lamps in cross section with an electronic addressable dimming ballast, Lutron H-Series or similar, for automatic daylight harvesting.

Both the indirect and the direct component of the first four feet of each row of fixtures nearest to the teaching board will be on its own switch leg for separate control.

The remainder of the rows of the fixtures will have two manual control points, one will control the indirect component of the fixtures and one will control the direct component of the fixtures. Additional daylight control zones will be as follows: the row nearest the window will be on a separate daylight control zone. The middle row will be on a separate daylight zone. And the row nearest the interior will be on a separate daylight zone for three total automatic daylight harvesting control "zones". One four-foot section of the fixture in each classroom, per classroom door (interior and exterior doors both count) will have an integral, self-diagnostic, high-lumen output emergency battery back-up that will require an additional, unswitched sensing circuit.

Exception:

The Technology Classroom will utilize 100% indirect fixtures of similar construction as the typical classrooms.

Automatic lighting control will be achieved with an intelligent, distributed, networkable lighting control system, Lutron manufacture or similar. There will be a ceiling mounted dual-technology occupancy sensor within each room. Upon entry to the space, the teaching board lights will automatically switch on and may be manually switched off via one of the two low

voltage switches, one located near the door into the classroom and one near the teacher's desk on the teaching board wall. The manual switch near the teacher's desk shall also have a button for scene control for A/V presentations. Manual on/automatic off of the other two switching zones (indirect and direct component of the fixtures) is achieved via the low voltage switches near the door into the classroom and the ceiling mounted occupancy sensor. Automatic daylight harvesting will be achieved via a ceiling mounted daylight sensor that will control the three rows of suspended linear fixtures at different rates. The row nearest the windows will dim at a greater rate than the fixtures nearest the interior corridor. Automatic dimming of the fixtures shall be at a very gradual rate so as not to disrupt teaching in the classroom.

SPECIAL EDUCATION:

Special Education Classroom lighting will be designed to meet an average illuminance of 30 foot-candles (f-c). The lighting system will consist of recessed 2'x4' LED source volumetric troffer utilizing constant current type 0-10V dimming driver; Metalux Accord series or similar.

Automatic lighting control will consist of a ceiling mounted dual-technology occupancy sensor and a low voltage switch with on/off and raise/lower buttons.

CORRIDORS/FLEX SPACE:

Corridors will be designed to meet an average illuminance of 10 f-c and Flex Space will be designed to meet an average illuminance of 20 f-c. The lighting system will consist of a combination of recessed, large, round fixtures with biax lamps and recessed, narrow aperture linear slot lights. The corridor lighting circuit will be routed through a centrally located, intelligent, networkable relay lighting control panel and will remain on during normal school hours and be swept off via time clock after normal hours. There will be low voltage switches at major entries into the school to manually turn on the corridor lighting. The egress lights will also be controlled via the relay lighting control panel for a completely dark interior after the school is vacated. The security system will be connected to the relay lighting control panel so that the egress lights will be switched on automatically upon intrusion detection or Card Access entry. The fire alarm system will also be connected to the relay lighting control panel so that all lights will be switched on automatically upon alarm status from the fire alarm control panel. The intelligent lighting control panel will also be interfaced with the BAS. Programming coordination will be required with the mechanical controls contractor for a fully integrated system.

RESTROOMS:

Restrooms will be designed to meet an average illuminance of 20 f-c. The lighting system will consist of linear cove fixtures over the mirror/lavatories and the wall above the water closets/urinals. Additional, square recessed LED source down lights will be located to supplement the lighting as needed. Automatic lighting control will be achieved via ceiling mounted dual-technology occupancy sensors for automatic off of lights in the restroom. An additional manual, keyed switch will provide manual control required by Code.

STORAGE, JANITOR'S, IDF, MDF, ELECTRICAL & MECHANICAL:

Storage and Janitor's Rooms will be designed to meet an average illuminance of 10 f-c and IDF, MDF, Electrical and Mechanical Rooms will be designed to meet an average illuminance of 20 f-c. The lighting system will consist of 4' fluorescent type wrap around fixtures. Electrical and mechanical rooms will be manual control via wall mounted snap switch only for safety considerations. Other spaces will have automatic control via a wall mounted passive infrared (PIR) or dual technology occupancy sensor switch depending upon size of the space and potential obstructions to the PIR view.

WORKROOMS & STAFF OFFICES:

Workrooms and Offices will be designed to meet an average illuminance of 30 f-c. The lighting system will consist of recessed, 2'x4' volumetric troffers; Metalux Accord series or similar. Automatic lighting control will consist of a wall mounted dual technology occupancy sensor switch. Additional, decorative pendant fixtures will be provided over the reception desk.

CLINIC:

The Clinic will be designed to meet an average illuminance of 30 f-c. The lighting system will consist of recessed, 2'x4' volumetric troffers; Metalux Accord series or similar. Automatic lighting control will consist of a ceiling mounted dual technology occupancy sensor switch with a manual snap switch on the wall near the door. An additional, square, recessed, LED source, down light with 0-10V dimming driver will be located over each inspection bed and will have a separate, manual 0-10V dimmer switch per fixture located near the inspection bed. There will be (2) inspection beds and the down lights will also be controlled for automatic off via the ceiling mounted sensor in the room.

LIBRARY/MEDIA CENTER, VESTIBULE & COMMONS:

The Library/Media Center will be designed to meet an average illuminance of 30 f-c. The Vestibule will be designed to meet an average illuminance of 10 f-c. The Commons will be designed to meet an average illuminance of 20 f-c. The lighting system will consist of decorative, architectural grade fixtures with LED source. Additional, decorative pendant fixtures will be provided over the checkout desk. Automatic lighting control will consist of daylight harvesting and automatic sweep off via the intelligent relay lighting control panel.

KITCHEN:

The lighting system will consist of recessed, 2'x4', 0.125" thick prismatic acrylic lensed and gasketed troffers designed to meet the average 50 f-c illumination requirement set by the Health Code. Automatic control will be achieved via the intelligent relay lighting control panel for automatic sweep off after normal school hours. Manual on/off control will be achieved via a low voltage switch located near the entry into the space.

GYMNASIUM:

The Gymnasium lighting will be designed to meet an average illuminance of 50 f-c. The lighting system will consist of high bay type fixtures. LED source fixtures will be considered for maintenance and controllability considerations. The high bay fixtures will be provided with 0-10V dimming for flexible use of the space in conjunction with the MUSIC room along with daylight harvesting. Automatic control will be achieved via the intelligent relay lighting control panel for automatic sweep off after normal school hours. Manual on/off control will be achieved via high abuse, low voltage switches in (5) locations within the GYMNASIUM. A manual 0-10V dimmer control will be located on the wall that separates the MUSIC ROOM and the GYMNASIUM, on the GYMNASIUM side. A daylight sensor located within the space will automatically dim the fixtures when sufficient daylight is available.

MUSIC:

The Music Room lighting will be designed to meet an average illuminance of 30 f-c. The lighting system will consist of recessed, 2'x4' volumetric troffers; Metalux, Accord series or similar. Additional, ceiling mounted theatrical style track lighting will be provided near the moveable wall between the MUSIC ROOM and GYMNASIUM on the MUSIC ROOM side. Automatic lighting control will consist of ceiling mounted dual technology occupancy sensors for automatic off of the light fixtures with manual control via a low voltage switch located at the door into the space and near the teacher's desk.

ART CLASSROOM:

The Art Classroom will utilize recessed, 2'x4' volumetric troffers; Metalux Accord series or similar. Additional low voltage track lighting will be provided with (2) 12' sections of low voltage track and (12) total LED source track lighting heads with an adjustable beam and high (90+) color rendering index (CRI).

LIFE SAFETY:

Thermoplastic housing, LED exit signs with a stencil face will identify the egress paths throughout the school. The exit signs shall be provided with integral emergency battery back-up with self-diagnostics and shall be connected to an unswitched leg of the local lighting circuit.

Life safety pathway emergency lighting shall be provided by integral battery back-up within the luminaires. They will be installed in the mechanical, electrical and IT rooms, several luminaires in the corridors, restrooms and classrooms as required. Light level shall meet minimum lighting levels to comply with Life Safety Code.

Special Sound Systems:

GYMNASIUM AND STAGE/MUSIC: The area shall be equipped with a portable theatrical sound system. The sound system shall consist of pendant mounted power type speakers and microphone outlets at the stair risers and (1) alternate location, with a control panel/sound rack, and associated wiring. The sound system rack shall also have audio inputs for a CD player and AM/FM tuner. Coordination with district during the DD phase will be required to determine the extent of what devices shall be incorporated into this sound system.

Fire Alarm System

The fire alarm system will be provided for a fully detected building. It will be a fully addressable type with a main fire alarm control panel (FACP) located in the main electrical room with the fire alarm annunciator panel (FAAP) located at the main entrance. Fire alarm devices shall consist of manual pull stations, smoke and thermal detectors, horn/strobes, duct detectors, and connection to the kitchen's ansul system, etc. Connections to flow and tamper switches will be installed for the fire sprinkler system in the fire entry room.

Security Systems

Main Entry access control will be provided at the front entry. It will consist of ADA operator, electric strikes with a control button for the staff to release the door.

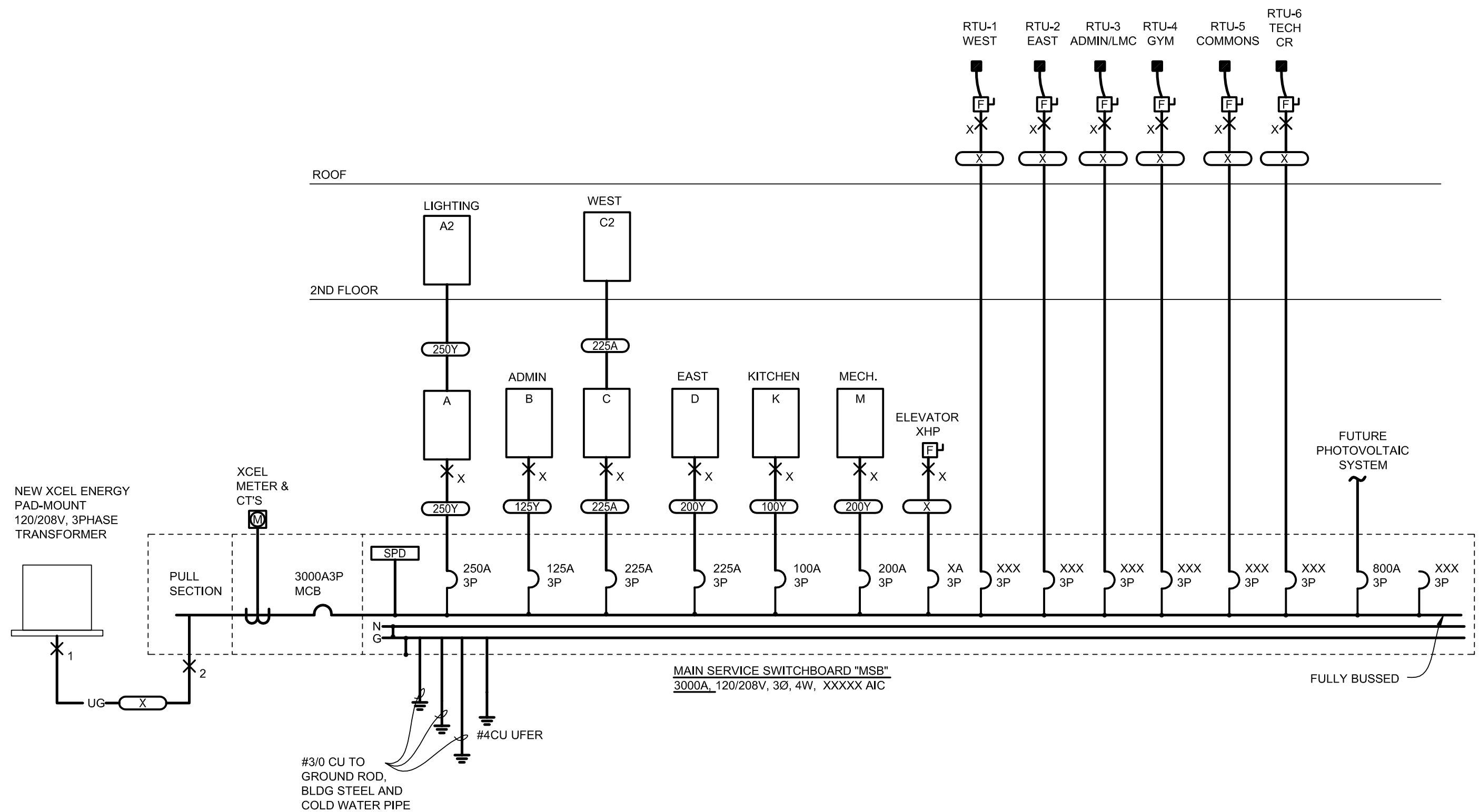
A card access system (CAS) shall be installed in this building. Each exterior corridor door and the exterior kitchen door shall be provided with a door position switch, electric lock and card reader. The CAS cards and readers will be proximity type, requiring no physical contact between reader and card thereby prolonging the life of the system. The CAS shall be PC-based and shall have packaged software for database management and administration. The CAS shall use distributed database architecture with real time processing occurring at each controller therefore allowing the controller to perform all monitoring and access decisions even if communications to other controllers or the administrative database is lost. The system will be equipped with an integral 90-minute back-up battery. All security wiring shall be installed in EMT conduit.

An intrusion detection system with a keypad and camera shall be installed at the main entry with motion sensors installed in the main office, building entries, and the computer lab. 10-12 cameras will be installed and connected through-out the building at locations as directed by the school district.

The card access system and the intrusion detection system will communicate causing the intrusion detection system to go into alarm for unauthorized access to any door controlled by the card access system. Exterior classroom doors will also be monitored and will alarm if kept open for too long. This system will have the ability to call a remote monitoring service.

Through a graphical map in the administration office, the staff will be able to tell at a glance where any alarms are, which doors are secure, and remotely unlock doors.

ELECTRICAL ONE LINE DIAGRAM



ELECTRICAL ONE-LINE DIAGRAM
NO SCALE 3000A, 120/208V 3Ø4W

DESCRIPTION

The next generation addition to the Iridium family, the direct-indirect i2 series, offers a generous open center aperture for maximum versatility in optics, lamping and distribution. The i2 is also available with adjustable uplight and downlight optics for evolving interior spaces with Corelite's Slide-N-Lock (TM) optics accessory. i2 may be mounted individually or continuously with 4', 8', and 12' modular sections. Luminaires align with T-Grid and interface with all ceiling types. The i2 is ideally suited for open offices, conference rooms, classrooms, libraries, labs and public spaces.

Catalog #		Type
Project		
Comments		Date
Prepared by		

SPECIFICATION FEATURES

A ... Construction

Housing is one piece die-formed cold rolled steel, forming a 9" x 2-1/2" architectural profile. Standard 4'-0", 8'-0", and 12'-0" fixture lengths combine for continuous runs.

B ... End Caps

Standard Straight and optional Beveled end caps are precision die-cast aluminum mechanically attached without exposed fasteners.

C ... Louver

Semi-specular aluminum parabolic blades spaced 1-1/2" on-center with a 3-5/8" opening.

D ... Reflectors

Reflector pan is painted with a high reflectance white powder coat finish. Optional die-formed side reflectors are highly specular anodized aluminum.

E ... Electrical

Fixtures are prewired with quick wire connectors and use UL listed Class P, 265ma T8 instant start universal voltage electronic ballasts. Power factor of 95% with less than 10% THD. Fixtures and electrical components certified to UL and CUL standards.

F ... Finish

Fixture housings are standard white using electrostatically applied polyester powder coat paint.

Mounting

Standard aircraft cable mounts on 4'-0", 8'-0", and 12'-0" centers. Refer to installation section for various ceiling interface details.



i2 Parabolic Louver

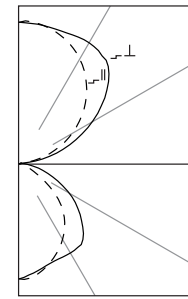
3T8

Suspended Direct/Indirect

Light Distribution
Indirect - 63.7%
Direct - 36.3%



SLIDE-N-LOCK™



I2-WB-3T8
(3) F32T8/TL835
3000 Lumens

E ciency 88.9%

Test Report #LS26349

Coefficients of Utilization

rc	Effective cavity reflectance																	
	80%				70%				20%									
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0%
0	92	92	92	92	84	84	84	84	67	67	67	52	52	52	39	39	39	32
1	85	81	78	75	77	74	71	68	60	58	56	47	46	44	35	34	33	28
2	77	71	66	62	70	65	60	57	53	50	47	41	39	38	31	30	29	24
3	71	63	57	52	64	57	52	48	47	43	40	37	34	32	28	26	25	21
4	65	56	49	44	58	51	45	40	41	37	34	33	30	28	25	23	21	18
5	59	49	43	37	54	45	39	35	37	33	29	29	26	24	22	20	19	16
6	55	44	37	32	49	41	34	30	33	29	25	27	23	21	20	18	16	14
7	50	40	33	28	46	37	31	26	30	26	22	24	21	18	19	16	15	12
8	47	36	30	25	42	33	27	23	27	23	20	22	19	16	17	15	13	11
9	43	33	27	22	39	30	25	21	25	21	18	20	17	15	16	13	12	10
10	41	30	24	20	37	28	22	18	23	19	16	19	15	13	15	12	11	9

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	889	10.0	11.3
0-40	1461	16.5	18.6
0-60	2512	28.4	31.9
0-90	2855	32.3	36.3
40-90	1394	15.8	17.7
60-90	343	3.9	4.4
90-180	5015	56.7	63.7
0-180	7870	88.9	100.0

Luminance Data

Angle in Deg	0-Deg cd/sm	45-Deg cd/sm	90-Deg cd/sm
45	8395	10336	12688
55	5320	8800	11918
65	2254	4507	9998
75	1643	1782	7761
85	1215	911	2473

Candela

Angle	Along ll	45°	Across l
0	1211	1211	1211
5	1211	1192	1177
15	1120	1092	1111
25	994	979	1085
35	836	886	1076
45	628	773	949
55	323	534	723
65	101	202	447
75	45	49	213
85	11	8	23
90	0	8	13
95	58	102	108
105	275	399	406
115	524	729	727
125	768	1038	1049
135	993	1238	1329
145	1187	1333	1448
155	1336	1395	1467
165	1439	1448	1464
175	1495	1482	1477
180	1487	1487	1487

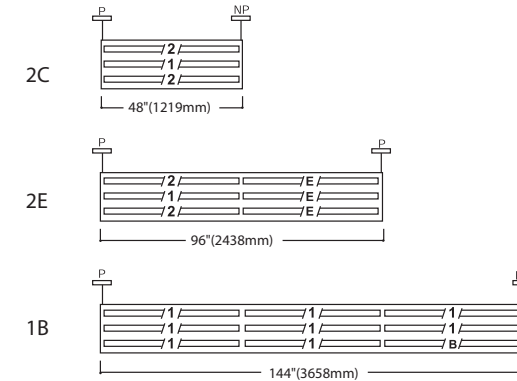
COMMON CIRCUIT CONFIGURATIONS FOR ONE LAMP SUSPENDED FIXTURES

2C=Two circuit luminaire
2E=Two circuit luminaire with emergency circuit
1B=Single circuit luminaire with battery pack

/1/ =Circuit 1
/2/ =Circuit 2
/E/ =Emergency Circuit
/B/ =Battery Circuit

P =Power Mount

NP =Non-Power Mount



STANDARD ROW CONFIGURATIONS

FIXTURE LENGTH	4'	8'	12'	16'	20'	24'	28'	32'	36'	40'	44'	48'	52'	56'	60'	64'	68'	72'	76'	80'	84'	88'	92'	96'	100'	104'	108'	
4'	1																											
8'		1																										
12'			1																									

ORDERING INFORMATION

Sample Number: I2-WB-3T8-1C-UNV-AC48-T1-12-ES

Series I2: i2 Suspended	Number of Lamps 3: 3 Lamps	Wiring 1 B: Battery Pack C: Standard Circuit D: Dimming E: Emergency T: Nightlight V: Daylight	Voltage 1 120: 120V 277: 277V 347: 347V UNV: Universal (120V-277V)	Suspension A: Aircraft Cable	Ceiling Type T1: 1" T-Bar T9: 9/16" T-Bar TS: Slotted T-Bar ST: Structure JB: 4" Octagonal J-Box	Options Slide-N-Lock™ DL1 DL2 DL3 DL4 DL5 DL6 DL7 DL8 Lamp Isolator Kit DL/UDU DL/DUD DL/UXU DL/DXD DL/XDX DL/XUX
Optics Up S: Specular W: White	Lamp Type T8: T8 Normal Output	Number of Circuits 1 1: 1 Circuit 2: 2 Circuits	Power Feed 1 C: Straight Cord K: Curly Cord	Suspension Length Adjustable Cable 48", 120", 240", 300", or 360" (infinite adjustment along entire length of cable)	Run Length Individually Mounted Luminaires may be 4', 8', or 12' in length Continuously Mounted Standard row configurations over 12' consist of 8' and 12' sections	ADE091599 09/27/2012 6:19:45 PM

DESCRIPTION

The Accord™ redefines fluorescent lighting by improving on aesthetics, comfort and energy savings. The Accord provides the right amount of light while eliminating surface shadows commonly found in parabolics. Therefore, Accord increases the comfort level while providing significant energy savings.

The Accord is the ideal solution for offices, schools, hospitals, retail and other applications.

Catalog #		Type	
Project			
Comments		Date	
Prepared by			

SPECIFICATION FEATURES

Construction

Shallow 3-1/4" deep housing is die formed of code gauge, prime cold rolled steel. Heavy gauge end plates are securely attached with screws for strength and rigidity and the elimination of gaps. Four auxiliary fixture end suspension points are provided. KOs for continuous row wiring. Large access plate for supply connection.

Electrical*

Ballasts are Class "P" and are positively secured. Rotor-lock lampholders ensure positive lamp retention. UL/CUL listed. Suitable for damp locations.

Ballast Access

Ballast can be removed from below without tools.

Finish

Durable cold rolled steel with multistage, iron phosphate pre-treatment and white enamel finish to ensure maximum bonding and rust inhibition.

Reflectors

Reflector has high reflectance baked matte white enamel finish for luminous uniformity.

Shielding

Positively retained frosted acrylic profile lenses provide a soft but effective distribution of light.

Air Return

Optional Air Return model provides air flow through air slots in the housing.



**2AC
232T8**

T8 LAMPS

2' x 4' Recessed Troffer Series



ENERGY DATA

Input Watts:
EB Ballast & STD Lamps @ 277V
232 (58)

Luminaire Efficacy Rating
LER =FL83 LPW
Catalog Number: 2AC-232

Yearly Cost of 1000 lumens,
3000 hrs at .08 KWH = \$2.89

*Reference the lamp/ballast data in the Technical Section for specific lamp/ballast requirements.
**Consult Pre Sales Technical Support.
***See Drywall Frame Kit Accessory

LAMPS CONTAIN MERCURY. DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS

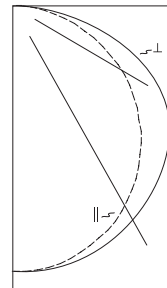


Safe and convenient means of disconnecting power.



ADF080359

PHOTOMETRICS



2AC-232-UNV-EB81
Electronic Ballast
(2) F32T8/835 Lamps
3100 Lumens each
Spacing criterion:
(H) 1.3 x mounting height, (L) 1.5 x mounting height
Efficiency 85%
Test Report:
241P14200
LER = FL83 LPW
Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = \$2.89

Candlepower

Angle	Along H	45°	Across L
0	1614	1614	1614
5	1607	1612	1618
10	1587	1596	1605
15	1551	1569	1587
20	1502	1531	1558
25	1440	1483	1521
30	1366	1425	1477
35	1280	1358	1425
40	1184	1282	1366
45	1080	1198	1298
50	967	1107	1221
55	848	1007	1134
60	723	899	1022
65	589	783	857
70	452	635	664
75	315	456	465
80	187	280	277
85	81	118	113
90	0	0	0

Coefficients of Utilization

rc	Effective floor cavity reflectance 20%																	
	80%			70%			50%			30%			10%			0%		
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR	0	101	101	101	101	99	99	99	99	94	94	94	90	90	90	87	87	85
1	92	87	83	80	89	85	82	79	82	79	76	78	76	74	75	73	72	70
2	83	75	69	64	81	74	68	63	71	66	62	68	64	60	65	62	59	57
3	75	66	58	53	73	64	58	52	62	56	51	59	54	50	57	53	49	47
4	69	58	50	44	67	57	49	44	55	48	43	53	47	42	51	46	42	40
5	63	51	43	38	61	50	43	37	49	42	37	47	41	36	45	40	36	34
6	58	46	38	33	56	45	38	32	44	37	32	42	36	32	41	36	31	30
7	54	42	34	29	52	41	34	28	40	33	28	38	32	28	37	32	28	26
8	50	38	30	25	48	37	30	25	36	30	25	35	29	25	34	29	25	23
9	46	35	28	23	45	34	27	23	33	27	22	32	27	22	31	26	22	21
10	44	32	25	21	42	32	25	20	31	25	20	30	24	20	29	24	20	19

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture	Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
0-30	1280	20.6	24.3	45	2188	2427	2630
0-40	2129	34.3	40.4	55	2118	2515	2832
0-60	3945	63.6	74.9	65	1996	2654	2905
0-80	5271	85.0	100.0	75	1743	2524	2574
0-180	5271	85.0	100.0	85	1331	1939	1857

Luminance Data

ORDERING INFORMATION

SAMPLE NUMBER: 2AC-232-UNV-EB82-U

Rating Blank=Standard NY=New York Rated ATW-SW4=Chicago Rated	Number of Lamps (Not included) 2=2 Lamp Wattage (Length) 32=32W T8 (48")	Shielding Blank=Frosted Acrylic SQP=Lens with Square Pattern Insert RDP=Lens with Round Pattern Insert	Lamps L8835=T8 Lamp, 17W and 32W, 3500K L8841=T8 Lamp, 17W and 32W, 4100K L8835HL=T8 Lamp, 32W, 3500K, 3100 Lumens L8841HL=T8 Lamp, 32W, 4100K, 3100 Lumens	Ballast Type EB8 =T8 Electronic Instant Start. Total Harmonic Distortion < 10% No. of Ballast 1 or 2 EB8 /PLUS=T8 Electronic Instant Start. High Ballast Factor >1.13.Total Harmonic Distortion < 20% No. of Ballast 1 or 2 ER8 =T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10% No. of Ballast 1 or 2 HPT8 Ballast HB8_L=T8 Electronic Instant Start. Low Ballast Factor .77 HB8 =T8 Electronic Instant Start. Ballast Factor .88 HB8_N=T8 Electronic Instant Start. Normal Ballast Factor 1.0 HB8_H=T8 Electronic Instant Start. High Ballast Factor 1.15-1.2 HR8_DIM=T8 Electronic Program Start Step Dimming. Ballast Factor .88 HR8_L=T8 Electronic Program Start. Low Ballast Factor .77 HR8 =T8 Electronic Program Start. Ballast Factor .88 HR8_H=T8 Electronic Program Start. High Ballast Factor 1.15-1.2 Fifthlight Ballasts ⁽²⁾ 5LT8 =T8 DALI Program Rapid Start. Total Harmonic Distortion < 10%. Ballast Factor 1.0 No. of Ballast 1 or 2	Packaging U=Unit Pack PALC=Job Pack, in carton
Width 2=2' Width	Series AC=Accord Series	Voltage ⁽¹⁾ UNV=Universal Voltage 120-277	Options GL=Single Element Fuse GM=Double Element Fuse Flex=Flex installed EL=Emergency Installed		

NOTES: ⁽¹⁾ Products also available in non-US voltages and frequencies for international markets. ⁽²⁾ For a complete listing of Fifthlight Technology products and other solutions from Cooper Controls, visit www.coopercontrol.com

For complete product data, reference the Fluorescent Specification binder. Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.

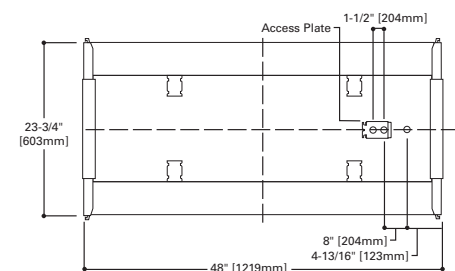
ACCESSORIES

T3A END E.Q. BRACKET PARTS BAG

SHIPPING INFORMATION

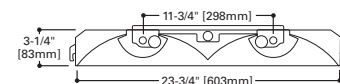
Catalog No.	Wt.
2AC-232	28 lbs.

MOUNTING DATA



NOTE: 2' x 2' and 2' x 4' allow for row mounting
(1' x 4' does not support feature)

LAMP CONFIGURATIONS



CEILING COMPATIBILITY

G	F	Ceiling Type**	Trim Type
Grid/Lay-in Standard	Drywall Frame Kit	Exposed Grid	G
		Concealed T	G or T
		Slot Grid	G or T
		Flange	***

COOPER LIGHTING

COOPER Lighting

Visit our web site at www.cooperlighting.com
Customer First Center 1121 Highway 74 South Peachtree City, GA 30269 770.486.4800 FAX 770.486.4801 8/12 ADF080359

NEO-RAY™

DESCRIPTION

A return to simplicity, elegance and minimalism ... Slender lines of light set in an architectural environment are the essence of Straight and Narrow. This series accommodates most architectural lighting design applications. Generation II enhancements and new features:

- Extruded housing offers precise in-line appearance and enhanced rigidity
- Staggered lamping minimizes socket shadow
- Flush and regressed lay in lens provides clean look and easy maintenance
- Unique snap in louver design for easy installation and better retention

SPECIFICATION FEATURES

Construction

Extruded aluminum housing. Nominal 3', 4', 6' or 8' fixtures.

Shielding

Trimless lay-in white, high transmission or regressed acrylic diffuser. Snap-in, high performance, parabolic louver with or without overlay.

Electrical

120, 277 or Universal Voltage (120-277) electronic ballast. Fixtures and electrical components certified to UL and CUL standards.

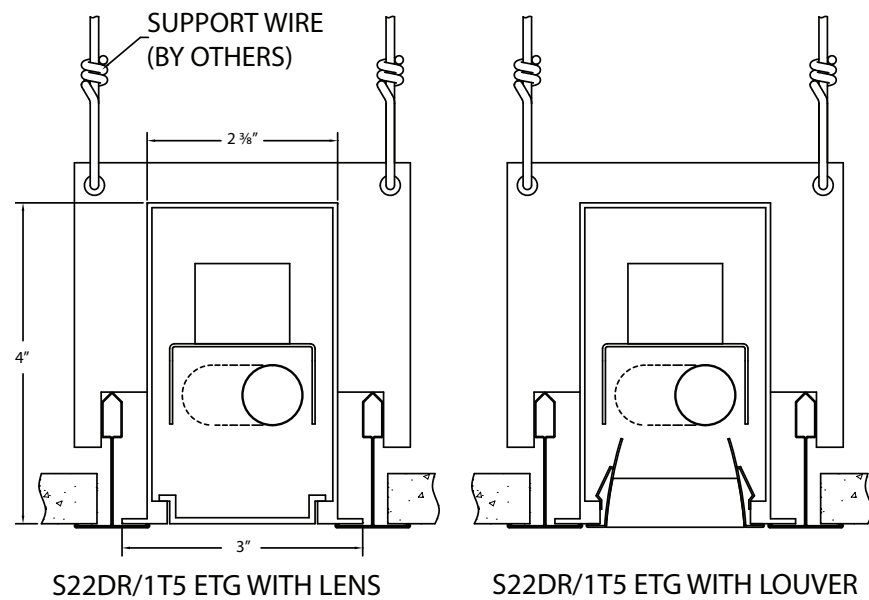
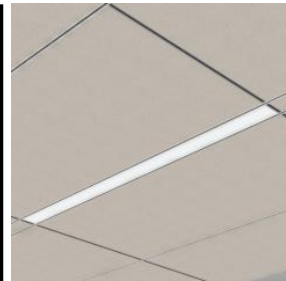
Finish

Durable, low gloss, white, powder coated acrylic. Optional custom finish.

Mounting

Recessed. Specify: (ETG) 15/16" Exposed T-grid (STG) 9/16" Screw Slot Grid (SR) Sheet Rock (Flanged) (FTG) 9/16" Exposed T-grid

Catalog #		Type	
Project			
Comments		Date	
Prepared by			



22DR Straight & Narrow Gen II

Individual
1 T5
1 T5HO

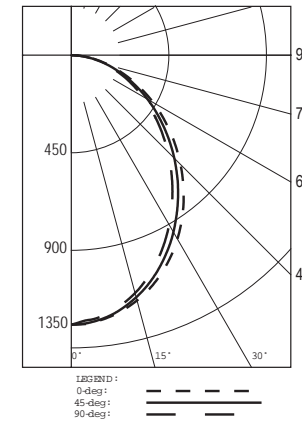
Recessed
Direct

Light Distribution:
Indirect = 0%
Direct = 100%

PHOTOMETRICS

Straight & Narrow - Gen II 22DR

22DR
S22DR/1T5HO/STG4D/UEB-SI-S92HT



Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixt
0-30	913.40	18.30	30.70
0-40	1448.08	29.00	48.70
0-60	2407.59	48.20	81.00
0-90	2973.02	59.50	100.00
0-180	2973.02	59.50	100.00

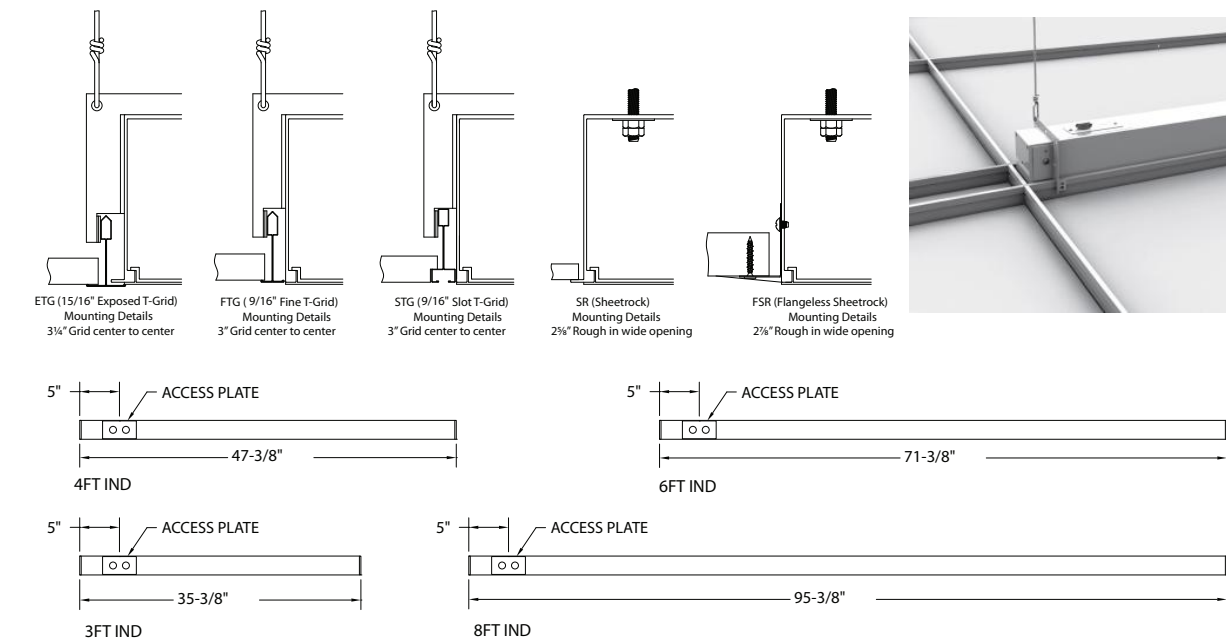
Total Luminaire Efficiency = 59.50%

(1) T5 Lamp
S92HT - High Transmission Lens
White Painted Upper Reflector
White Painted Optic Chamber
Efficiency: 59.50%
Report#: P30295

Candela

Angle	0	45	90
0	1243	1243	1243
5	1235	1232	1221
10	1210	1203	1187
15	1171	1156	1136
25	1054	1023	990
35	895	854	812
45	713	672	630
55	526	491	458
65	347	324	303
75	186	176	166
85	56	51	49
90	0	0	0

MOUNTING INFORMATION



ORDERING INFORMATION

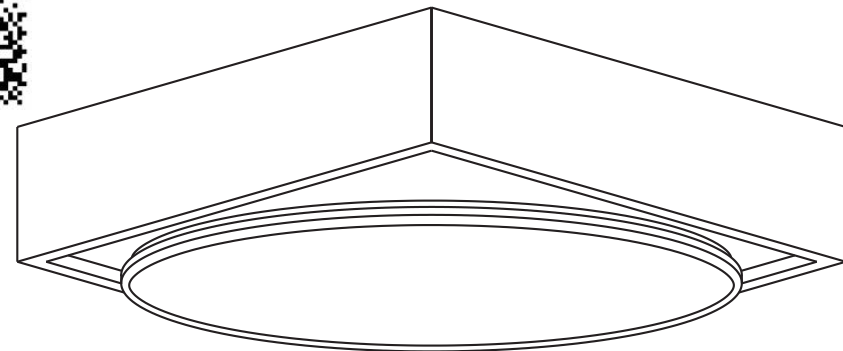
SAMPLE NUMBER: S22DR-1T5HO-ETG4D-1EB-EM-GLR-S92

22	D	R	1									
Series 22= Straight & Narrow	Mounting R=Recessed	Lamp Type T5 T5HO	Ceiling Type ETG =15/16\"/>									

FEATURES AND OPTIONS



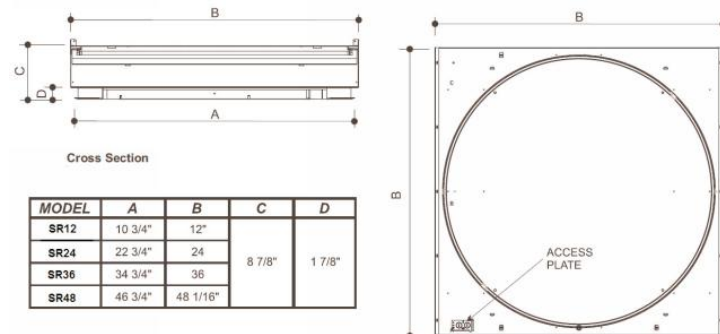
TYPE:



DIRECT RECESSED

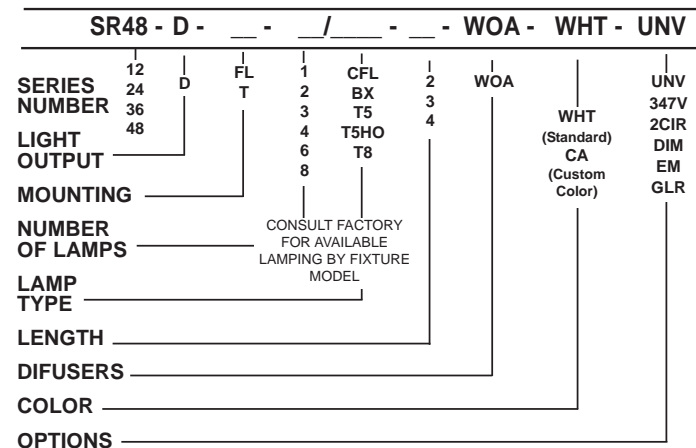
**SERIES
SR12
SR24
SR36
SR48**

- Options:
- Mounting Options:
FL - Flanged for plaster or dry wall ceilings
T - Standard T-grid ceiling
- Lamp Options:
CFL - Compact Fluorescent
BX - Biax
T5 - 5/8" diameter lamp
T5HO - 5/8" diameter lamp (*High output*)
T8 - 1" diameter lamp
- Difusers:
WOA - Concave white opal acrylic lens
- Color Options:
WHT - White trim (*Standard*)
CA - Custom colors for ceiling trim
- Electrical Options:
UNV - Universal voltage 120/277
347V - 347 volt operation
2CIR - 2 circuit wiring
DIM - Dimming ballast (*Consult factory*)
EM - Emergency ballast
GLR - In line fusing



The SR Series is a two part die formed housing of heavy gauge steel for structural stability. Shipped in two parts for ease in installation through ceiling opening. Housing will support round aluminum ring, trim ring and concave white opal difuser. Fixture is recessed and must be supported by structural ceiling. All PMC fixtures have powder coated housings, with precision-formed, high reflectance (Minimum Reflectance Factor 90%), enamel reflectors for optimal efficiency. Fixtures are UL listed, and have **standard electronic ballasts**. Each fixture is lamp-tested at the factory before shipment.

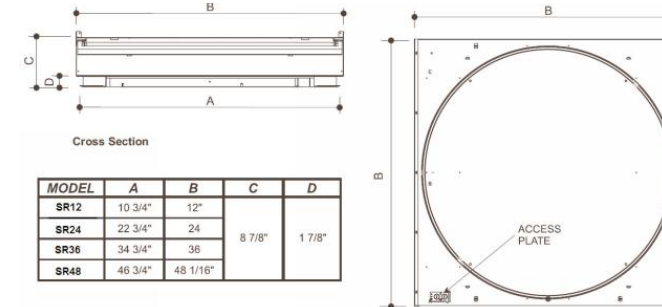
ORDERING INFORMATION



SERIES SR12 / SR24 / SR36 / SR48

MOUNTING: Ceiling type must be specified when ordering fixtures. Modifications to the ceiling interface may be possible to accommodate some contemporary ceiling configurations. Details are required prior to manufacture.

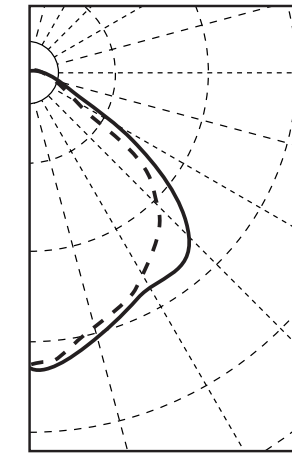
Please Note:
 All fixtures must be Supported by The Structural Ceiling (Tools by others)



PHOTOMETRY

Model No: SR24-D-T-4/T8-2'-WOA-WHT-120V
 4 Lamps•2850 Lumens

		80%			70%			50%		
RCR		70	50	30	70	50	30	50	30	10
1		.56	.54	.53	.51	.50	.49	.47	.46	.45
2		.52	.49	.46	.46	.44	.44	.43	.41	.39
3		.48	.44	.40	.41	.39	.40	.39	.37	.34
4		.45	.39	.36	.38	.34	.36	.35	.33	.30
5		.42	.36	.32	.34	.31	.33	.32	.30	.27
6		.39	.33	.29	.31	.28	.30	.30	.27	.24
7		.36	.30	.26	.29	.25	.28	.27	.25	.21
8		.34	.27	.23	.26	.23	.26	.25	.22	.19
9		.32	.25	.21	.24	.21	.24	.23	.21	.18
10		.30	.23	.20	.23	.19	.22	.22	.19	.16



CANDELLA DISTRIBUTION

SPECIFICATIONS

CONSTRUCTION: Fixture Chassis die-formed of 20 Gauge (or Heavier) CRS. Internal Bracketry and perforated steel diffusers of 20 Gauge Steel. Internal reflector of white enameled steel.

DIFFUSER: White opal material.
MOUNTING: Standard T-Bar Ceiling (**T**) OR Flanged fixtures for Plaster Ceilings (**FL**).

FINISH: Standard fixture trim and curved perforated areas are finished in matte white (**WHT**) Reflective internal components are finished in flat white enamel (Minimum Reflectance Factor 90%).

ELECTRICAL: All fixtures are UL listed, and are shipped fully wired, individually tested, with Electronic Ballasts shipped as standard equipment

OPTIONS:

FINISH:The perforated metal surface and trim can be finished in a range of custom colors to meet Architect specifications. Please consult the factory.

ELECTRICAL:
 277 Volt Ballast (**277**).

Dimming Ballast (DIM).
Emergency Ballast (EM) Note: unless specified, PMC will select ballasts to meet requirements.
In Line Fusing (GLR).
2 Circuit Wiring (2CIR).

All dimensions are subject to change, Consult the factory before making structural alterations.



100 Gilbane Street / Warwick, RI 02886 • 401.738.7266 FAX.401.738.0618 • www.pmcighting.com

RDI-10

NEO-RAY™

DESCRIPTION

79OS is an enhanced addition to the perimeter wall wash family. This open slot wall washer in a simple format, just a wall disappearing into an open slot trimmed out with a room side extrusion, which totally hides the lamps from any viewing angle. Smooth graduated wall illumination. Telescopic housing eliminates all fillers, and provides for an easy to install adjustable run configuration.

Catalog #		Type	
Project			
Comments		Date	
Prepared by			

SPECIFICATION FEATURES

A ... Construction

20-gauge steel telescopic housing with 16" of adjustability.

B ... Electrical

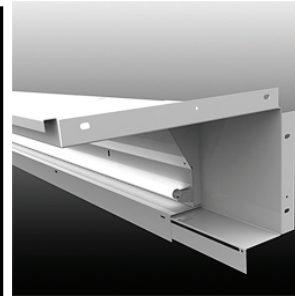
120, 277, 347, or Universal Voltage electronic ballast. Fixtures and electrical components certified to UL and CUL standards.

C ... Finish

Durable, low gloss, white, powder coated finish.

Mounting

Recessed.

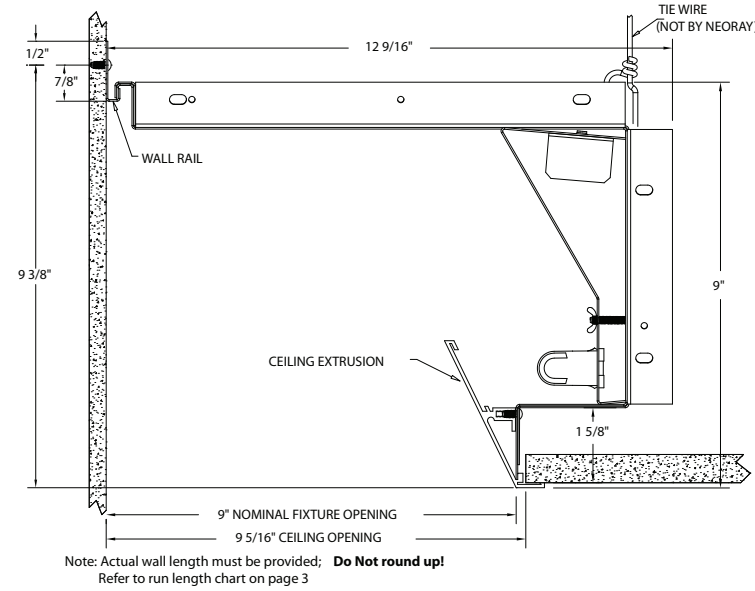


79-OS Continuous

1T8
1T5
T5HO

Perimeter
Direct Wall Wash

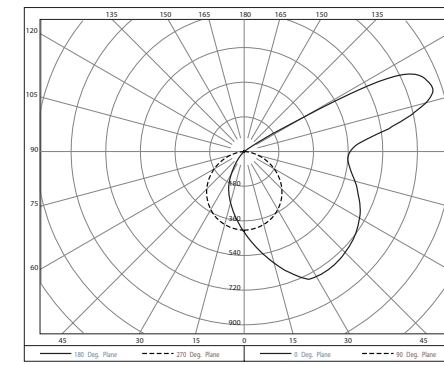
Light Distribution:
Indirect - 0.0%
Direct - 100.0%



Photometrics

79OS

79OS-1T5HO-4I-2EB-SI



Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixt
0-30	345.86	7.90	14.70
0-40	586.04	13.30	24.90
0-60	1111.32	25.30	47.20
0-90	1749.96	39.80	74.40
0-180	2352.63	53.50	100.00

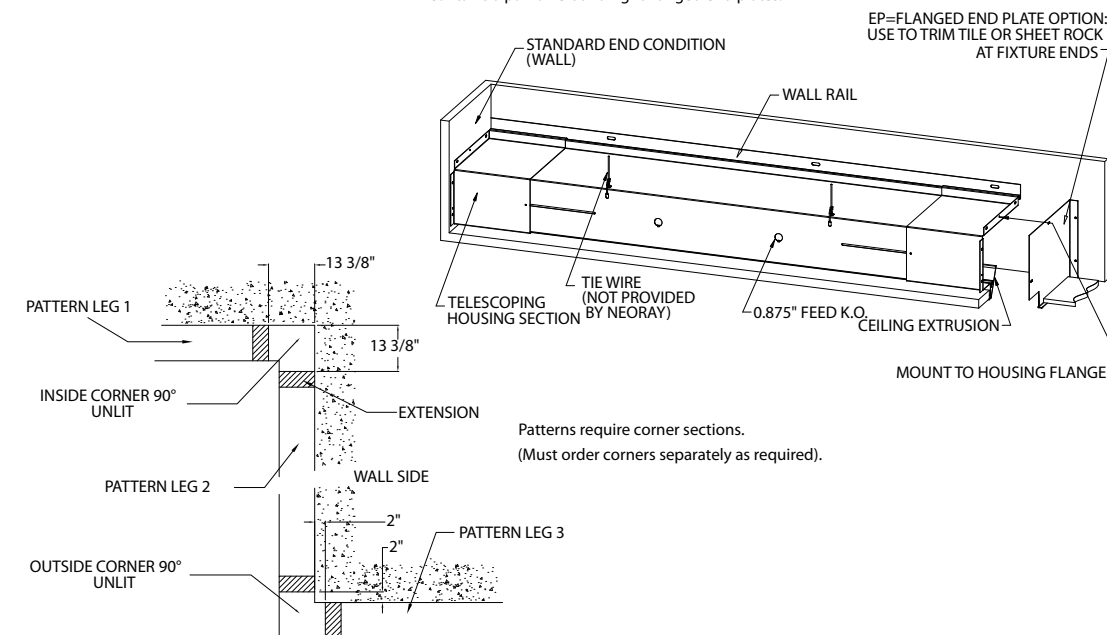
Total Luminaire Efficiency = 53.50%
 Total Rated Lamp Lumens 4400
 Total Luminaire Watts 59
 Ballast Factor 1.00
 CIE Type Semi-Direct
 Luminous Length (0-180) 0.74 ft
 Luminous Width (90-270) 3.83 ft
 Luminous Height 0.67 ft
 Report#: 12281

Candela

Angle	0	45	90
0	413	413	413
5	475	448	406
10	537	484	401
15	600	519	393
25	726	589	366
35	753	642	327
45	742	620	277
55	714	567	214
65	664	510	145
75	596	427	74
80	562	383	41
90	550	344	0

Mounting Information

NOTE: No flanged end plates are provided. Wall serves as the end condition. If flanged end plate is required, order "EP". EP contains a pair of left and right flanged end plates.



Ordering Information

Sample Number: 79OS-1T5-300-UEB-SI

79OS	1							
Series 79OS = 79OS	Number of Lamps 1=1 Lamp	Lamp Type T8=T8 T5=T5 T5HO=T5HO	Length of run along the wall ² ___ Ft ___ In	Voltage ¹ 1=120V 2=277V 3=347V U=Universal	Ballast EB=Electronic Ballast DB=Dimming Ballast	Switching Options Sl= Single Switching	Fusing GLR=GMR GMF=GMF	Flanged End Plate Option ³ EP=End Plate
				Emergency EM= Emergency Pack EC= Emergency Circuit				

Notes:
 1 Not all options available. Please consult your Cooper Lighting Representative for availability.
 2 Do not round up.
 3 No flanged end plates are provided. Wall serves as the end condition. If flanged end plate is required, order EP. See graphics on page 2.

Specify wall length in ___ Ft ___ Inches. Do not round up.
Table below depicts resulting run lengths based only on nominal lengths.

NOMINAL LENGTH (FEET)	T5		T8		NOMINAL LENGTH (FEET)	T5		T8	
	MINIMUM LENGTH (LIGHTED)	MAXIMUM LENGTH	MINIMUM LENGTH (LIGHTED)	MAXIMUM LENGTH		MINIMUM LENGTH (LIGHTED)	MAXIMUM LENGTH	MINIMUM LENGTH (LIGHTED)	MAXIMUM LENGTH
3'	2' 10 1/4"	4' 2 1/4"	3' 0"	4' 4"	52'	51' 9 1/4"	53' 1 1/4"	52' 0"	53' 4"
4'	3' 10 1/8"	5' 2 1/8"	4' 0"	5' 4"	53'	52' 9 1/8"	54' 1 1/8"	53' 0"	54' 4"
5'	4' 8 3/4"	6' 0 3/4"	5' 0"	6' 4"	54'	53' 8 7/8"	55' 0 7/8"	54' 0"	55' 4"
6'	5' 8 1/2"	7' 0 1/2"	6' 0"	7' 4"	55'	54' 7 1/2"	55' 11 1/2"	55' 0"	56' 4"
7'	6' 8 3/8"	8' 0 3/8"	7' 0"	8' 4"	56'	55' 7 3/8"	56' 11 3/8"	56' 0"	57' 4"
8'	7' 8 1/8"	9' 0 1/8"	8' 0"	9' 4"	57'	56' 7 1/8"	57' 11 1/8"	57' 0"	58' 4"
9'	8' 6 3/4"	9' 10 3/4"	9' 0"	10' 4"	58'	57' 7 1/16"	58' 11 1/16"	58' 0"	59' 4"
10'	9' 6 5/8"	10' 10 5/8"	10' 0"	11' 4"	59'	58' 5 5/8"	59' 9 5/8"	59' 0"	60' 4"
11'	10' 6 3/8"	11' 10 3/8"	11' 0"	12' 4"	60'	59' 5 3/8"	60' 9 3/8"	60' 0"	61' 4"
12'	11' 6 1/4"	12' 10 1/4"	12' 0"	13' 4"	61'	60' 5 1/4"	61' 9 1/4"	61' 0"	62' 4"
13'	12' 4 7/8"	13' 8 7/8"	13' 0"	14' 4"	62'	61' 5 1/16"	62' 9 1/16"	62' 0"	63' 4"
14'	13' 4 5/8"	14' 8 5/8"	14' 0"	15' 4"	63'	62' 3 5/8"	63' 7 5/8"	63' 0"	64' 4"
15'	14' 4 1/2"	15' 8 1/2"	15' 0"	16' 4"	64'	63' 3 1/2"	64' 7 1/2"	64' 0"	65' 4"
16'	15' 4 1/4"	16' 8 1/4"	16' 0"	17' 4"	65'	64' 3 1/4"	65' 7 1/4"	65' 0"	66' 4"
17'	16' 2 7/8"	17' 6 7/8"	17' 0"	18' 4"	66'	65' 3 1/8"	66' 7 1/8"	66' 0"	67' 4"
18'	17' 2 3/4"	18' 6 3/4"	18' 0"	19' 4"	67'	66' 1 3/4"	67' 5 3/4"	67' 0"	68' 4"
19'	18' 2 1/2"	19' 6 1/2"	19' 0"	20' 4"	68'	67' 1 1/2"	68' 5 1/2"	68' 0"	69' 4"
20'	19' 2 3/8"	20' 6 3/8"	20' 0"	21' 4"	69'	68' 1 3/8"	69' 5 3/8"	69' 0"	70' 4"
21'	20' 1 1/16"	21' 5 1/16"	21' 0"	22' 4"	70'	69' 11 3/4"	71' 3 3/4"	70' 0"	71' 4"
22'	21' 0 3/4"	22' 4 3/4"	22' 0"	23' 4"	71'	70' 11 5/8"	72' 3 5/8"	71' 0"	72' 4"
23'	22' 0 5/8"	23' 4 5/8"	23' 0"	24' 4"	72'	71' 11 3/8"	73' 3 3/8"	72' 0"	73' 4"
24'	23' 11 1/16"	25' 3 1/16"	24' 0"	25' 4"	73'	72' 11 1/4"	74' 3 1/4"	73' 0"	74' 4"
25'	24' 10 7/8"	26' 2 7/8"	25' 0"	26' 4"	74'	73' 9 7/8"	75' 1 7/8"	74' 0"	75' 4"
26'	25' 10 5/8"	27' 2 5/8"	26' 0"	27' 4"	75'	74' 9 5/8"	76' 1 5/8"	75' 0"	76' 4"
27'	26' 10 1/2"	28' 2 1/2"	27' 0"	28' 4"	76'	75' 9 1/2"	77' 1 1/2"	76' 0"	77' 4"
28'	27' 9 1/8"	29' 1 1/8"	28' 0"	29' 4"	77'	76' 9 1/4"	78' 1 1/4"	77' 0"	78' 4"
29'	28' 8 7/8"	30' 0 7/8"	29' 0"	30' 4"	78'	77' 7 7/8"	78' 11 7/8"	78' 0"	79' 4"
30'	29' 8 3/4"	31' 0 3/4"	30' 0"	31' 4"	79'	78' 7 3/4"	79' 11 3/4"	79' 0"	80' 4"
31'	30' 8 1/2"	32' 0 1/2"	31' 0"	32' 4"	80'	79' 7 1/2"	80' 11 1/2"	80' 0"	81' 4"
32'	31' 7 1/8"	32' 11 1/8"	32' 0"	33' 4"	81'	80' 7 3/8"	81' 11 3/8"	81' 0"	82' 4"
33'	32' 7 1/16"	33' 11 1/16"	33' 0"	34' 4"	82'	81' 6 1/16"	82' 10 1/16"	82' 0"	83' 4"
34'	33' 6 3/4"	34' 10 3/4"	34' 0"	35' 4"	83'	82' 5 3/4"	83' 9 3/4"	83' 0"	84' 4"
35'	34' 6 5/8"	35' 10 5/8"	35' 0"	36' 4"	84'	83' 5 5/8"	84' 9 5/8"	84' 0"	85' 4"
36'	35' 5 1/4"	36' 9 1/4"	36' 0"	37' 4"	85'	84' 5 3/8"	85' 9 3/8"	85' 0"	86' 4"
37'	36' 5 1/16"	37' 9 1/16"	37' 0"	38' 4"	86'	85' 4 1/16"	86' 8 1/16"	86' 0"	87' 4"
38'	37' 4 7/8"	38' 8 7/8"	38' 0"	39' 4"	87'	86' 3 7/8"	87' 7 7/8"	87' 0"	88' 4"
39'	38' 4 5/8"	39' 8 5/8"	39' 0"	40' 4"	88'	87' 3 5/8"	88' 7 5/8"	88' 0"	89' 4"
40'	39' 3 1/4"	40' 7 1/4"	40' 0"	41' 4"	89'	88' 3 1/2"	89' 7 1/2"	89' 0"	90' 4"
41'	40' 3 1/8"	41' 7 1/8"	41' 0"	42' 4"	90'	89' 2 1/8"	90' 6 1/8"	90' 0"	91' 4"
42'	41' 2 7/8"	42' 6 7/8"	42' 0"	43' 4"	91'	90' 1 7/8"	91' 5 7/8"	91' 0"	92' 4"
43'	42' 2 3/4"	43' 6 3/4"	43' 0"	44' 4"	92'	91' 1 3/4"	92' 5 3/4"	92' 0"	93' 4"
44'	43' 1 3/8"	44' 5 3/8"	44' 0"	45' 4"	93'	92' 1 1/2"	93' 5 1/2"	93' 0"	94' 4"
45'	44' 1 1/8"	45' 5 1/8"	45' 0"	46' 4"	94'	94' 0 1/16"	95' 4 1/16"	94' 0"	95' 4"
46'	45' 1 1/16"	46' 5 1/16"	46' 0"	47' 4"	95'	94' 11 3/4"	96' 3 3/4"	95' 0"	96' 4"
47'	46' 11 3/8"	48' 3 3/8"	47' 0"	48' 4"	96'	95' 11 5/8"	97' 3 5/8"	96' 0"	97' 4"
48'	47' 11 1/4"	49' 3 1/4"	48' 0"	49' 4"	97'	96' 10 1/4"	98' 2 1/4"	97' 0"	98' 4"
49'	48' 11 1/16"	50' 3 1/16"	49' 0"	50' 4"	98'	97' 10 1/16"	99' 2 1/16"	98' 0"	99' 4"
50'	49' 10 7/8"	51' 2 7/8"	50' 0"	51' 4"	99'	98' 9 7/8"	100' 1 7/8"	99' 0"	100' 4"
51'	50' 9 1/2"	52' 1 1/2"	51' 0"	52' 4"	100'	99' 9 5/8"	101' 1 5/8"	100' 0"	101' 4"

COOPER LIGHTING - METALUX®

DESCRIPTION

The SNF Series is a functional and multi-purpose narrow strip family that incorporates premium performance and construction durability. Designed with our easy-to-use Flip-Up socket design, the SNF significantly reduces installation time. The performance and application versatility of this series can be increased by incorporating symmetrical or asymmetrical reflectors. The SNF Series can be installed using various mounting methods and numerous options and accessories are available. The small size of the SNF makes it an ideal choice for size-restricted architectural applications. The SNF Series can be the illumination solution in commercial, industrial, retail and residential applications. Fixtures can be used in storage/utility areas, coves, display cases, shops, task and general area lighting.

SPECIFICATION FEATURES

A... Construction

Channel is die formed cold rolled steel with numerous KOs for ease of installation. Groove for Tong Hanger. End plate quickly converts to snap-in channel connector for continuous row alignment. Lamp holder bracket flips in place. Channel/wireway cover secured with quarter-turn fasteners.

B... Electrical*

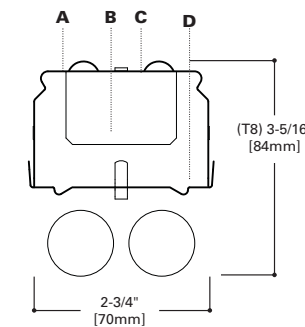
Ballasts are CBM/ETL Class "P" and are positively secured by mounting bolts. Rotor Lock lamp-holders. UL/CUL listed. Suitable for damp locations.

C... Finish

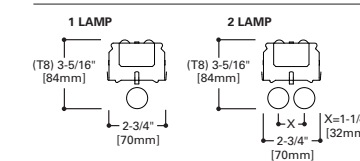
Multistage iron phosphate pre-treatment ensures maximum bonding and rust inhibitor. Lighting upgrade, baked white enamel finish. Pre-painted material is standard, PAF optional.

D... Channel/Wireway Cover

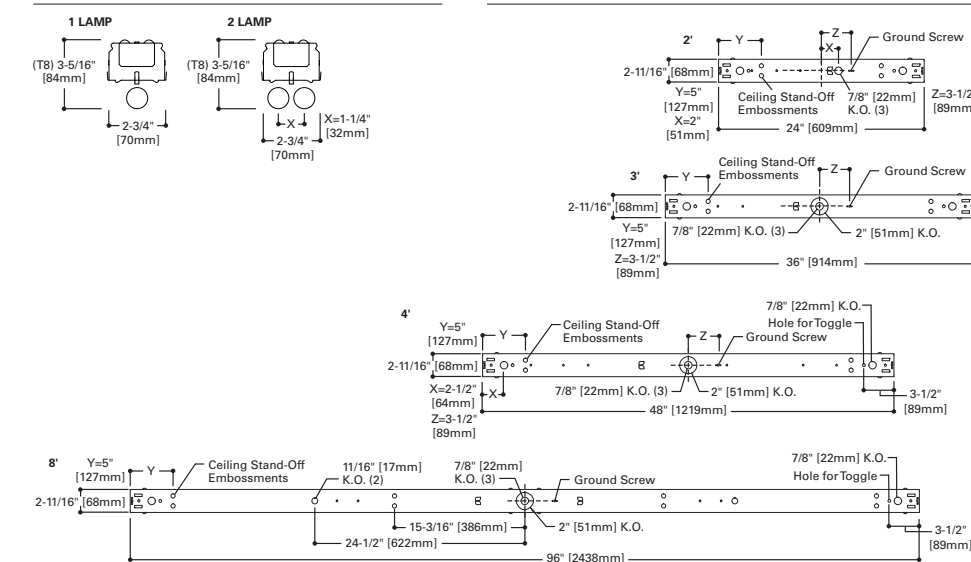
Die formed heavy gauge steel. Tight fit for ease of maintenance. Easily removed without use of tools. Optional reflector available incorporating silver technology enhancements (Silver Lining). Consult Pre Sales Technical Support.



LAMP CONFIGURATIONS



MOUNTING DATA



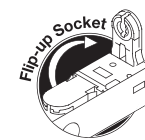
COOPER LIGHTING

Catalog #		Type
Project		
Comments		Date
Prepared by		



SNF
117, 125
125
128T8, 132
217, 225
228T8, 232

2', 3' OR 4' STRIP
1 OR 2 T8 LAMPS
Narrow Striplite



ENERGY DATA

Input Watts:
EB Ballasts Normal Ballast Factor
117 (20), 217 (34), 125 (23),
128T8 (28), 132 (31), 225 (53),
228T8 (49), 232 (58)
HB Ballasts Normal Ballast Factor
117 (18), 217 (31), 128T8 (25),
228T8 (48), 132 (28), 232 (53)
EB Ballasts Low Ballast Factor
125 (21), 128T8 (22), 132 (25),
225 (40), 228T8 (44), 232 (48)

Luminaire Efficacy Rating
LER = FS-85
Catalog Number: SNF-132

Yearly Cost of 1000 lumens,
3000 hrs at .08 KWH = \$2.82

*Reference the lamp/ballast data in the Technical Section for specific lamp/ballast requirements. 1 One lamp only.

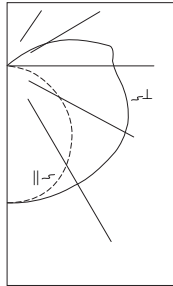
LAMPS CONTAIN MERCURY. DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS



ADF081660



PHOTOMETRICS



SNF-132
Electronic Ballast
F32T8/35K Lamps
2900 Lumens
Spacing criterion:
(H) 1.2 x mounting
height, (L) 1.5 x
mounting height
Efficiency 93.4%
Test Report:
SN132.IES
LER = FS-85
Yearly Cost of 1000
lumens, 3000 hrs at
.08 KWH = \$2.82

Coefficients of Utilization

rc	Effective floor cavity reflectance																	
	80%			70%			50%			30%			10%			0%		
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	107	107	107	107	102	102	102	102	94	94	94	86	86	86	79	79	79	76
1	94	89	84	79	90	85	80	76	77	74	70	71	68	65	64	62	60	57
2	84	75	68	61	80	72	65	59	66	60	55	60	55	51	54	51	48	44
3	76	65	57	50	72	62	55	48	57	51	45	52	47	42	47	43	39	36
4	69	57	48	41	66	55	47	40	50	43	38	46	40	35	42	37	33	30
5	63	50	41	34	60	48	39	33	44	37	31	40	34	29	37	31	27	25
6	58	44	35	29	55	43	34	28	39	32	27	36	30	25	33	27	23	21
7	53	40	31	25	50	38	30	24	35	28	23	32	26	21	29	24	20	18
8	49	36	27	21	46	34	26	21	31	24	20	29	23	18	26	21	17	15
9	45	32	24	18	43	31	23	18	28	21	17	26	20	16	24	19	15	13
10	42	29	21	16	40	28	21	16	26	19	15	24	18	14	22	17	13	11

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	391	13.5	14.4
0-40	662	22.8	24.5
0-60	1307	45.1	48.3
0-90	2192	75.6	81.0
90-180	515	17.8	19.0
0-180	2708	93.4	100.0

Candela

Angle	Along H	45°	Across L
480	481	481	
10	474	478	479
20	448	468	481
30	405	447	479
40	347	421	480
50	278	393	481
60	201	367	474
70	120	332	449
80	44	278	408
90	2	237	368
100	2	213	367
110	2	120	259
120	2	38	144
130	3	2	42
140	0	0	0
150	0	0	0
160	0	0	0
170	0	0	0
180	0	0	0

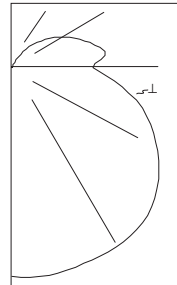
ORDERING INFORMATION

SAMPLE NUMBER: SNF-232-UNV-EB81-U

Tandem Blank=2', 3' or 4' Length 8T=8' Length	Number of Lamps⁽¹⁾ 1=1 Lamp 2=2 Lamp (Not Included)	Voltage⁽²⁾ 120V=120 Volt 277V=277 Volt 347V=347 Volt UNV=Universal Voltage 120-277	Ballast Type^{(2), (6)} EB8_=T8 Electronic Instant Start. Total Harmonic Distortion < 10% No. of Ballast 1 or 2 EB8_/PLUS=T8 Electronic Instant Start. High Ballast Factor >1.13. Total Harmonic Distortion < 10% No. of Ballast 1 or 2 ER8_=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10% No. of Ballast 1 or 2 ER8_/PLUS=T8 Electronic Program Start. High Ballast Factor >1.13. Total Harmonic Distortion < 10% No. of Ballast 1 or 2 HPT8 Ballast HB8_=T8 Electronic Instant Start. Low Ballast Factor .77 HB8_=T8 Electronic Instant Start. Ballast Factor .88 HB8_N=T8 Electronic Instant Start. Normal Ballast Factor 1.0 HB8_H=T8 Electronic Instant Start. High Ballast Factor 1.15-1.2 HR8_DIM=T8 Electronic Program Start Step Dimming. Ballast Factor .88 HR8_L=T8 Electronic Program Start. Low Ballast Factor .77 HR8_=T8 Electronic Program Start. Ballast Factor .88 HR8_H=T8 Electronic Program Start. High Ballast Factor 1.15-1.2	Options RIF1=Radio Interference Suppressor 6-3/18 SJT-C&P-515P= Cord & Plug (120V) (15 AMP) ⁽⁸⁾ 6-3/18 SJT-C&P L715P= Cord & Plug (277V) (15 AMP) ⁽⁸⁾ PI/CPI=Plug-In Option ⁽⁸⁾	Packaging U=Unit Pack 6B=6 Bulk Packing (96 ⁷⁾
Series SNF=Commercial Narrow Striplite	Wattage 17=17W T8 (24") 25=25W T8 (36") 28T8=28W T8 (48") ⁽⁷⁾ 32=32W T8 (48")	Options⁽²⁾ GL=Single Element Fuse GM=Double Element Fuse EL4LP=Low Profile Emergency Installed ^{(4), (5)}			

NOTES: ⁽¹⁾2 lamps T8 only. ⁽²⁾Products also available in non-US voltages and frequencies for international markets. ⁽³⁾For SilverLining reflector add SS in Catalog Number, Example: SNFASY-SS-4. ⁽⁴⁾Not available for 2' version. ⁽⁵⁾Maximum width clearance for ballast in channel is 2-7/32". ⁽⁶⁾Socket brackets left uninstalled. ⁽⁷⁾When utilizing 28W T8 lamps, HPT8 Ballast must be specified. Other ballast restrictions may apply. Consult your Cooper Lighting Representative for availability and ordering information.

Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.



SNF-232
Electronic Ballast
Two F32T8/35K Lamps
2800 Lumens
Spacing criterion:
(H) 1.2 x mounting
height, (L) 1.5 x
mounting height
Efficiency 90.1%
Test Report:
SNF232.IES
LER = FS-
Yearly Cost of 1000
lumens, 3000 hrs at
.08 KWH = \$

Coefficients of Utilization

rc	Effective floor cavity reflectance																	
	80%			70%			50%			30%			10%			0%		
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	103	103	103	103	99	99	99	99	90	90	90	83	83	83	76	76	76	72
1	91	86	81	77	87	82	78	74	75	72	68	68	66	63	62	60	58	55
2	82	73	66	60	78	70	64	58	64	59	54	58	54	50	53	50	47	44
3	74	64	55	49	70	61	53	47	55	49	44	51	45	41	46	42	38	35
4	67	56	47	41	64	53	45	39	49	42	37	44	39	35	41	36	32	30
5	62	49	41	34	58	47	39	33	43	37	31	40	34	29	36	31	27	25
6	57	44	36	30	54	42	34	29	39	32	27	36	30	25	33	28	24	22
7	52	40	31	26	50	38	30	25	35	28	24	32	27	22	30	25	21	19
8	49	36	28	23	46	35	27	22	32	25	21	29	24	20	27	22	19	17
9	45	33	25	20	43	32	25	20	29	23	19	27	22	18	25	20	17	15
10	42	30	23	18	40	29	22	18	27	21	17	25	20	16	23	18	15	13

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	805	14.4	16.0
0-40	1364	24.4	27.0
0-60	2638	47.1	52.3
0-90	4049	72.3	80.3
90-180	993	17.7	19.7
0-180	5043	90.1	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg fcd/sm
45	13624	17577	20140
55	12829	19375	22766
65	11676	22113	27282
75	9619	28523	36952
85	5173	56907	82706

Candela

Angle	Along H	45°	Across L
0	989	989	989
10	974	986	991
20	924	958	989
30	835	918	995
40	716	868	982
50	572	797	921
60	413	689	829
70	248	563	715
80	92	412	566
90	1	272	420
100	1	304	490
110	0	240	410
120	1	179	325
130	1	121	235
140	2	66	149
150	2	18	69
160	3	2	9
170	3	2	0
180	2	2	2

ACCESSORIES

(Order Separately)
AYC-Chain/Set=36" Chain Hanger (Use 1 Set Per Fixture)
SCF=Fixed Stem Set (Specify Length)
SCS=Swivel Stem Set (Specify Length)
SCA=Adjustable 48" Stem Set
EYE-CHAIN/SET-B=Eye Bolt Chain (Use 1 Set Per Fixture)
SNF-ASY-4⁽³⁾=3" Asymmetric Reflector (Specify 2', 3' or 4')
SNF-SYM-4⁽³⁾=6" Symmetric Reflector (Specify 2', 3' or 4')
SNF-REV-4⁽³⁾=Reverse Asymmetric Reflector (Specify 2', 3' or 4')
WG/SNF-2FT=2' Wire Guard
WG/SNF-3FT=3' Wire Guard
WG/SNF-4FT=4' Wire Guard
A1B/Spacer-U=Spacer 1-1/2" to 2-1/2" from ceiling (Use 2 Per Fixture)
TOGGLE=Single Toggle NO. 2 (Specify Length)
Y-TOGGLE=Y Toggle NO. 2 (Specify Length)
 (Additional Accessories Available. See Options and Accessories Section.)

SHIPPING INFORMATION

Catalog No.	Wt.
SNF-117	5 lbs.
SNF-217	5 lbs.
SNF-125	6 lbs.
SNF-225	6 lbs.
SNF-132	12 lbs.
SNF-232	12 lbs.
SNF-128T8	12 lbs.
SNF-228T8	12 lbs.
8TSNF-132	14 lbs.
8TSNF-232	14 lbs.



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DESCRIPTION

GC8 is a premium grade specification lensed troffer series. This innovative, high quality luminaire is dedicated to the latest T8 lamp and micro electronic ballast technology for optimal performance and energy efficiency. The GC8 is compatible with all of today's popular ceiling systems and is available with a number of options and accessories for application versatility.

The GC8 series features efficiency, quality and performance. The series is an excellent choice for commercial office spaces, schools, hospitals or retail merchandising areas.

Catalog #		Type	
Project			
Comments		Date	
Prepared by			

SPECIFICATION FEATURES

Construction

Rigid housing is die formed of code gauge prime cold rolled steel and features full length die-formed stiffeners and unibody endplate for added strength. Side flanges are hemmed. Innovative design provides superior lens brightness uniformity and visual comfort. Micro ballast cover*** reduces ballast shadow for superior lens brightness uniformity and is easily removed without tools. Die formed captive lampholder brackets fully enclose lampholder wiring permitting easy lampholder replacement. Unibody endplates are securely attached with interlocking tabs and screws. Four auxiliary fixture end suspension points provided. KOs for continuous row wiring. Endplates have integral Grid-lock feature for safety and convenience.

Electrical

Ballasts are CBM/ETL Class "P" and are positively secured by mounting bolts. Rotor lock lampholders. UL/CUL listed. Suitable for damp locations.**

Finish

Multistage, iron phosphate pretreatment ensures maximum bonding and rust inhibition. Housing and ballast cover finished with new 90% reflective white enamel for superior performance. "PAF" Painted After Fabrication option also available.

Hinging/Latching

Positive spring loaded steel latches with baked white enamel finish. Safety-lock T-hinges allow hinging and latching either side.

Frame/Shielding

Die formed, heavy gauge, flat steel door with reinforced mitered corners and baked white enamel finish. Flat and regressed aluminum doors also available. Positive light seals. Light stabilized, acrylic prismatic lens. Standard #12 pattern. Numerous additional shielding options available.



2GC8
228T8
232
428T8
432

2' X 4' TROFFER
2 OR 4 LAMP

Specification T8 Troffer



ENERGY DATA

Input Watts:
HB Ballast & STD Lamps
228T8 (48), 232 (53)
428T8 (96), 432 (107)

Luminaire Efficacy Rating
LER = FL-80
Catalog Number: 2GC8-232A

Yearly Cost of 1000 lumens,
3000 hrs at .08 KWH = \$3.00

*Reference the lamp/ballast data in the Technical Section for specific lamp/ballast requirements.

**Consult Pre Sales Technical Support.

***Full sized ballast cover for biaxial lamps and emergency option may apply.

***When ordering Flange Kit for installation in drywall ceilings, see options and accessories compatibility section and ordering logic.

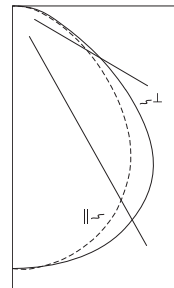
LAMPS CONTAIN MERCURY. DISPOSE ACCORDING TO LOCAL, STATE OR FEDERAL LAWS

LINEAR DISCONNECT
Safe and convenient means of disconnecting power.



ADF091407

PHOTOMETRICS



2GC8-232A
Electronic Ballast
(2) F032/35K
T8 lamps
3100 lumens

Spacing criterion:
(H) 1.2 x mounting height,
(L) 1.4 x mounting height

Efficiency 84.7%

Test Report:
2GC8-232A.IES
LER = FL-80
Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = \$3.00

Candela

Angle	Along H	45°	Across L
0	1963	1963	1963
5	1966	1957	1962
10	1940	1941	1956
15	1895	1914	1944
20	1834	1876	1924
25	1753	1820	1883
30	1646	1741	1822
35	1525	1640	1745
40	1373	1502	1635
45	1186	1323	1463
50	986	1131	1235
55	795	917	974
60	623	677	734
65	471	460	528
70	347	295	383
75	247	198	288
80	175	151	212
85	93	92	118
90	7	16	23

Coefficients of Utilization

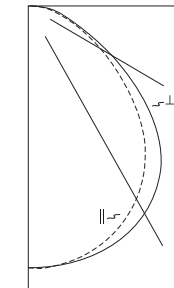
rc	Effective floor cavity reflectance 20%																	
	80%			70%			50%			30%			10%			0%		
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	101	101	101	101	99	99	99	99	94	94	94	90	90	90	86	86	86	85
1	93	89	85	82	90	87	84	81	83	81	78	80	78	76	77	75	74	72
2	85	78	73	68	83	77	71	67	74	69	66	71	67	64	68	65	63	61
3	78	69	63	57	76	68	62	57	65	60	56	63	59	55	61	57	54	52
4	71	62	54	49	69	60	54	49	58	53	48	56	51	47	55	50	47	45
5	66	55	48	42	64	54	47	42	52	46	42	51	45	41	49	45	41	39
6	61	50	42	37	59	49	42	37	48	41	37	46	41	36	45	40	36	34
7	56	45	38	33	55	45	38	33	43	37	33	42	37	32	41	36	32	30
8	53	41	34	29	51	41	34	29	40	34	29	39	33	29	38	33	29	27
9	49	38	31	27	48	37	31	26	37	31	26	36	30	26	35	30	26	25
10	46	35	28	24	45	35	28	24	34	28	24	33	28	24	32	27	24	22

Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	1565	25.2	29.8
0-40	2585	41.7	49.2
0-60	4403	71.0	83.8
0-90	5254	84.7	100.0
0-180	5254	84.7	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	2690	3001	3319
55	2223	2564	2724
65	1788	1746	2004
75	1531	1227	1785
85	1712	1693	2172



2GC8-432A
Electronic Ballast
(4) F032/35K
T8 lamps
3100 lumens

Spacing criterion:
(H) 1.2 x mounting height,
(L) 1.3 x mounting height

Efficiency 81.6%

Test Report:
2GC8-432A.IES
LER = FL-85
Yearly Cost of 1000 lumens, 3000 hrs at .08 KWH = \$2.82

Candela

Angle	Along H	45°	Across L
0	3892	3892	3892
5	3891	3875	3885
10	3838	3839	3865
15	3750	3777	3826
20	3626	3687	3758
25	3460	3561	3654
30	3256	3388	3510
35	3001	3164	3321
40	2700	2878	3071
45	2329	2520	2728
50	1924	2136	2295
55	1543	1724	1825
60	1203	1288	1386
65	907	877	1004
70	669	563	729
75	472	378	547
80	335	287	405
85	182	175	228
90	15	32	48

Coefficients of Utilization

rc	Effective floor cavity reflectance 20%																	
	80%			70%			50%			30%			10%			0%		
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	97	97	97	97	95	95	95	95	91	91	91	87	87	87	83	83	83	82
1	89	86	82	79	87	84	81	78	80	78	76	77	75	73	74	73	71	69
2	82	75	70	66	80	74	69	65	71	67	63	68	65	62	66	63	61	59
3	75	67	60	55	73	65	60	55	63	58	54	61	57	53	59	55	52	50
4	69	59	53	47	67	58	52	47	56	51	46	55	50	46	53	49	45	43
5	64	53	48	41	62	53	46	41	51	45	40	49	44	40	48	43	40	38
6	59	48	41	36	57	47	41	36	46	40	36	45	39	35	43	39	35	33
7	55	44	37	32	53	43	37	32	42	36	32	41	35	31	40	35	31	30
8	51	40	33	29	50	40	33	29	38	33	28	37	32	28	36	32	28	27
9	48	37	30	26	46	36	30	26	35	30	26	35	29	26	34	29	25	24
10	45	34	28	23	44	34	28	23	33	27	23	32	27	23	31	27	23	22

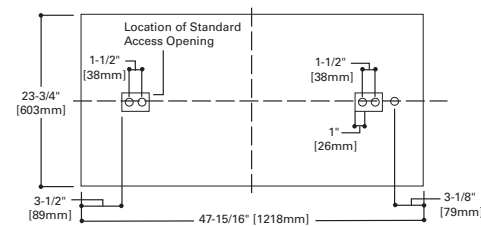
Zonal Lumen Summary

Zone	Lumens	%Lamp	%Fixture
0-30	3075	24.8	30.4
0-40	5048	40.7	49.9
0-60	8502	68.6	84.0
0-90	10124	81.6	100.0
0-180	10124	81.6	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	5283	5716	6188
55	4315	4821	5104
65	3442	3329	3811
75	2925	2343	3390
85	3349	3221	4196

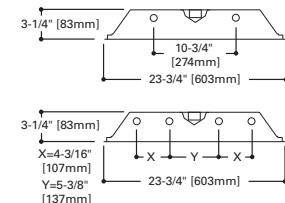
MOUNTING DATA



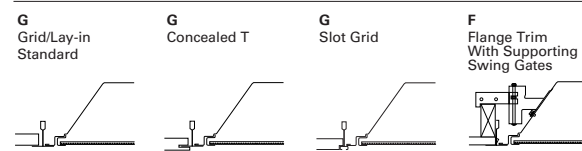
DOOR FRAMES



LAMP CONFIGURATIONS



CEILING COMPATIBILITY



Ceiling Type	Trim Type
Exposed Grid	G
Concealed T	G
Slot Grid	G
Flange	F

(Verify compatibility/ consult factory.)

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ORDERING INFORMATION

SAMPLE NUMBER: 2GC8-232A-UNV-HB81-U

<p>Rating⁽⁵⁾ Blank=Standard ATW-SW4=Chicago Rated</p> <p>Width Z=2' Width</p> <p>Trim Type G=Grid/Lay-in (Standard)⁽¹⁾ G=Concealed T G=Slot Grid F=Flange Trim</p> <p>Series C8=Specification T8 Troffer</p> <p>Door Frame Standard=Flat White Steel Door (Leave Blank) FA=Flush White Extruded Aluminum c/w Spring Latch RA=Regressed White Extruded Aluminum FAN=Flush Natural Anodized Extruded Aluminum RAN=Regressed Natural Anodized Extruded Aluminum FAB=Flush Black Extruded Aluminum RAB=Regressed Black Extruded Aluminum</p>	<p>Number of Lamps⁽²⁾ 2 or 4 Lamps (Not included)</p> <p>Wattage (Length) 28T8=28W T8 (48") 32=32W T8 (48")⁽⁸⁾</p> <p>Shielding A=#12 Acrylic Pattern A125=#12 Acrylic Pattern (.125" Thickness) A19/156=#19 Acrylic Pattern (.156" Thickness) PB1S=1/2" x 1/2" x 1/2" Silver Parabolic Louver (Styrene)</p> <p>Option - Aluminum Flange Trim⁽⁶⁾ Blank=SW (Single White) Type _____ Color _____ 'S' Single 'N' Natural 'R' In Row 'W' White 'E' End of Row</p> <p>Voltage⁽³⁾ 347V=347 Volt UNV=Universal Voltage 120-277⁽⁴⁾</p> <p>Options GL=Single Element Fuse GM=Double Element Fuse Lamps=Lamps Installed Flex=Flex Installed EL=Emergency Installed</p>	<p>Ballast Type EB8_=T8 Electronic Start. Total Harmonic Distortion < 10%</p> <p>EB8_/PLUS=T8 Electronic Start. Total Harmonic Distortion < 10%. High Ballast Factor > 1.15.</p> <p>ER8_=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%</p> <p>High Performance T8 Ballasts HB8_=T8 Electronic Instant Start. Total Harmonic Distortion < 10%. Standard Ballast Factor .86-.88</p> <p>HB8_L=T8 Electronic Instant Start. Total Harmonic Distortion < 10%. Low Ballast Factor .77-.82</p> <p>HB8_N=T8 Electronic Instant Start. Total Harmonic Distortion < 10%. Normal Ballast Factor 1.0</p> <p>HB8_H=T8 Electronic Instant Start. Total Harmonic Distortion < 10%. High Ballast Factor 1.15-1.20</p> <p>HR8_T8=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%. Standard Ballast Factor .86-.88</p> <p>HR8_DIM=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%. Step Dimming. Ballast Factor .88</p> <p>HR8_L=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%. Low Ballast Factor .71-.79</p> <p>HR8_H=T8 Electronic Program Rapid Start. Total Harmonic Distortion < 10%. High Ballast Factor 1.15-1.20</p> <p>Fifthlight Ballasts⁽⁷⁾ 5LT8_=T8 DALI Program Rapid Start. Total Harmonic Distortion < 10%. Ballast Factor 1.0</p> <p>Number of Ballasts 1=1 Ballast 2=2 Ballasts 3=3 Ballasts</p>	<p>Options FR=Fire Rated Label REP=Riveted EndPlates PAF=Painted After Fabrication</p> <p>Packaging U=Unit Pack PAL=Job Pack, out of carton PALC=Job Pack, in carton</p>
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NOTES: ⁽¹⁾An EQ Grid Clip is recommended for all 9/16" ceiling systems. ⁽²⁾Standard off-center ballast on 3-lamp fixtures. ⁽³⁾Products also available in non-US voltages and frequencies for international markets. ⁽⁴⁾Not available when specifying emergencies, voltage must be specific. ⁽⁵⁾For NYC rated product, see separate specification sheets. ⁽⁶⁾Specify row configuration, type in catalog number when ordering complete fixture. ⁽⁷⁾For a complete listing of Fifthlight Technology products and other solutions from Cooper Controls, visit www.coopercontrol.com. ⁽⁸⁾Ballast Factor is 0.88 for 4 lamp 32W T8 fixtures.

Specifications & dimensions subject to change without notice. Consult your Cooper Lighting Representative for availability and ordering information.

SHIPPING INFORMATION

Catalog No.	Wt.
2GC8-228T8A	20 lbs.
2GC8-232A	20 lbs.
2GC8-428T8A	20 lbs.
2GC8-432A	20 lbs.

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DESCRIPTION

The HB LED is an outstanding value for a wide variety of applications and mounting heights. Precision designed optics, multiple distributions, lumen outputs and color temperatures make the HB LED ideal for industrial, commercial, manufacturing, gymnasium and other applications that utilize traditional HID and linear fluorescent high bays. The proprietary low-power, low-brightness LED module assembly offers exceptional optical performance, equivalent to or greater than fluorescent systems, with the enhanced benefits of LED lighting, including energy savings, extended system life, a reduced carbon footprint.

SPECIFICATION FEATURES

Construction
Full body construction is achieved with channel and end plates, along w/stiffening brackets and side rails to help create a strong, clean finished frame for this luminaire. Side rails are standard on all HBLED products.

Electrical
Long-life LED system coupled with electrical driver to deliver optimal performance. LED's available in 4000k and 5000k with a CRI ≥ 80. Projected life is 50,000 hours at 70% lumen output. cULus listed. Electronic drivers are available for 120-277V applications. An optional 0-10V dimming driver is available.

Finish
White enamel finish preceded by a multistage cleaning cycle, iron phosphate coating with rust inhibitor to protect against contaminants and oxidation.

Optics
Precision designed optics deliver even illumination. General and aisle distribution ensures superior performance to key areas within an application.

Shielding
Door frame and lens assembly is optional for more demanding environments.

Options
Integral Occupancy Sensor available and provides from 600 sq. ft. up to 1250 sq. ft. of coverage in a maximum mounting height of 40' using interchangeable lens caps provided.

Catalog #	Type
Project	
Comments	Date
Prepared by	

Mounting
The HBLED series is ideally suited for suspension mounting with optional wire hook and chain set, or cable mounting. Single monopoint mounting is also available with SPM tong hanger.

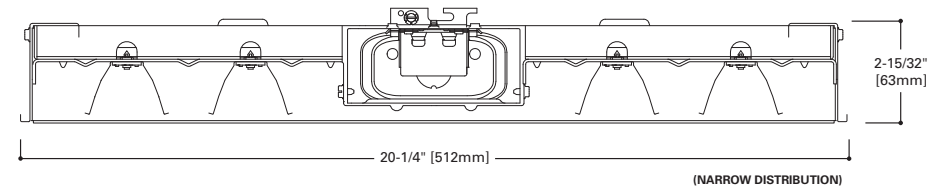
Compliance
Luminaires are cULus listed for damp locations -40°C - 50°C ambient environments in open configurations with fixed output (ED option) drivers and 40°C with dimming drivers (CD option) or lensed configurations. RoHS compliant, and LED modules comply with IESNA LM-79 and LM-80 standards.



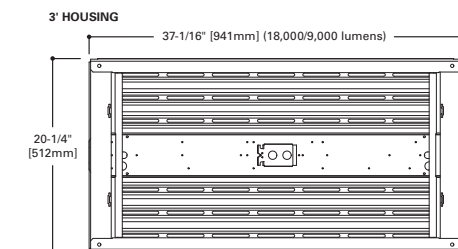
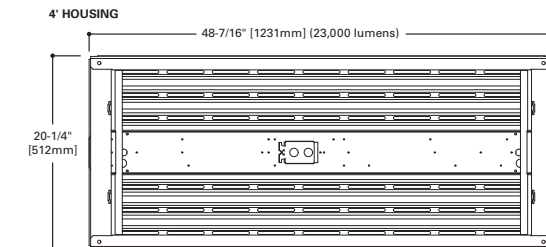
HB LED Series

20" X 48"
20" X 37"

LED High Bay Efficiency Luminaire



DIMENSION TOP VIEW



ENERGY DATA
Input Watts:
9 (9,000 lumens)=99.8W
18 (18,000 lumens)=197.4W
24 (24,000 lumens)= 267.7W

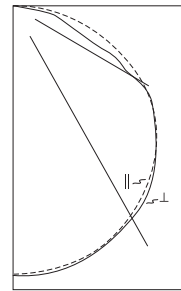


ADF120692



BENNETT WAGNER GRODY ARCHITECTS

PHOTOMETRICS



HBLED-LD2-18-W-L850
Fixed Output Driver
Linear LED 5000K
Spacing criterion:
(II) 1.3 x mounting
height, (L) 1.3 x
mounting height
Efficiency: 100%
Lumens: 18638
Input Watts: 198.8
Efficacy: 93.7 LPW
Test Report: P22693

Candela				
Angle	Along II	45°	Across L	
0	5860	5860	5860	
5	5811	5836	5876	
10	5769	5801	5847	
15	5693	5737	5764	
20	5567	5627	5647	
25	5395	5468	5474	
30	5177	5268	5256	
35	4923	5031	5002	
40	4640	4754	4698	
45	4319	4440	4358	
50	3960	4091	3989	
55	3551	3717	3600	
60	3109	3296	2776	
65	2639	2834	1788	
70	2154	2039	1249	
75	1591	1066	986	
80	1079	787	283	
85	544	175	166	
90	0	0	0	

Coefficients of Utilization

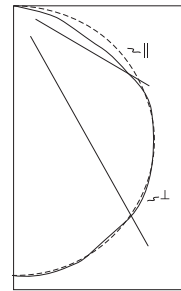
rc rw RCR	Effective floor cavity reflectance 20%																	
	80%			70%			50%			30%			10%			0%		
	70	50	30	70	50	30	70	50	30	70	50	30	70	50	30	70	50	30
0	119	119	119	116	116	116	111	111	111	106	106	106	102	102	102	100	100	100
1	109	104	99	106	101	97	94	97	94	91	93	91	88	90	87	85	83	83
2	98	90	83	96	88	82	76	84	79	74	81	77	73	78	74	71	69	69
3	89	79	70	87	77	69	63	74	67	62	71	65	61	69	64	60	57	57
4	82	69	60	79	68	59	53	65	58	52	63	57	51	61	55	51	49	49
5	75	62	52	73	61	52	45	58	51	45	56	50	44	54	49	44	42	42
6	69	55	46	67	54	46	39	53	45	39	51	44	39	49	43	38	36	36
7	64	50	41	62	49	41	35	48	40	34	46	39	34	45	39	34	32	32
8	59	45	37	58	45	36	31	43	36	31	42	35	30	41	35	30	28	28
9	55	42	33	54	41	33	28	40	33	27	39	32	27	38	32	27	25	25
10	52	38	30	51	38	30	25	37	30	25	36	29	25	35	29	24	23	23

Zonal Lumen Summary

Zone	Lumens	%Fixture
0-30	4698	25.2
0-40	7833	42.0
0-60	14494	77.8
0-90	18638	100.0
0-180	18638	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	13939	14330	14065
55	14129	14789	14324
65	14251	15304	9655
75	14029	9400	8694
85	14245	4582	4347



HBLED-LD2-24-W-L850
Fixed Output Driver
Linear LED 5000K
Spacing criterion:
(II) 1.3 x mounting
height, (L) 1.3 x
mounting height
Efficiency: 100%
Lumens: 24568
Input Watts: 267.3
Efficacy: 92 LPW
Test Report: P22740

Candela				
Angle	Along II	45°	Across L	
0	7735	7735	7735	
5	7684	7695	7750	
10	7628	7643	7707	
15	7515	7548	7600	
20	7349	7397	7420	
25	7118	7184	7190	
30	6831	6919	6900	
35	6488	6603	6551	
40	6099	6228	6148	
45	5668	5814	5700	
50	5209	5350	5213	
55	4688	4843	4681	
60	4136	4299	3573	
65	3531	3702	2550	
70	2887	2676	1727	
75	2135	1567	1266	
80	1471	1023	410	
85	754	234	221	
90	0	0	0	

Coefficients of Utilization

rc rw RCR	Effective floor cavity reflectance 20%																	
	80%			70%			50%			30%			10%			0%		
	70	50	30	70	50	30	70	50	30	70	50	30	70	50	30	70	50	30
0	119	119	119	116	116	116	111	111	111	106	106	106	102	102	102	100	100	100
1	108	104	99	106	101	97	94	97	94	91	93	90	88	89	87	85	83	83
2	98	90	83	96	88	81	76	84	79	74	81	76	72	78	74	71	69	69
3	89	78	70	87	77	69	63	74	67	62	71	65	61	68	64	59	57	57
4	82	69	60	79	68	59	53	65	58	52	63	57	51	61	55	51	48	48
5	75	62	52	73	60	52	45	58	51	45	56	50	44	54	48	44	42	42
6	69	55	46	67	54	46	39	52	45	39	51	44	39	49	43	38	36	36
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8	59	45	37	58	45	36	31	43	36	30	42	35	30	41	35	30	28	28
9	55	42	33	54	41	33	27	40	32	27	39	32	27	38	32	27	25	25
10	52	38	30	50	38	30	25	37	30	25	36	29	25	35	29	24	23	23

Zonal Lumen Summary

Zone	Lumens	%Fixture
0-30	6189	25.2
0-40	10309	42.0
0-60	19028	77.4
0-90	24568	100.0
0-180	24568	100.0

Luminance Data

Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
45	13672	14024	13749
55	13940	14401	13920
65	14250	14941	10291
75	14070	10326	8343
85	14756	4579	4325

ORDERING INFORMATION

SAMPLE NUMBER: HBLED-LD2-18-W-UNV-L850-ED2-U Includes V Hangers for rapid installation⁽⁵⁾

<p>Series⁽¹⁾ HBLED=LED High Bay Linear</p>	<p>Voltage⁽¹⁾ UNV=Universal 120/277 120V=120 Volt 277V=277 Volt</p>	<p>Driver Type CD=0-10V Dimming Driver ED=Electronic Fixed Output Driver</p>	<p>Options MP=Modular Power Receptacle (used for all Cord or Cord and Plug options)⁽³⁾ MS=360° or 180° motion sensor installed, 120V through 277V⁽²⁾</p>	<p>Packaging U=Unit Pack PALC=Job Pack In Carton</p>
<p>Lamp Type LD2=LED 2.0</p>	<p>Options EL=Emergency Installed, 700 lumens⁽¹⁾ EL14=Emergency Installed, 1400 lumens⁽¹⁾</p>	<p>Number of Drivers 1=1 Driver (9,000 lumen version) 2=2 Drivers (9,000 or 18,000 lumen version) 3=3 Drivers (24,000 lumen version)</p>	<p>Accessories (order separately) HBL-SPM=Single Monopoint Hanger w/Hub RH-1=Retrofit Hanger FH-1=Fixture Hook FL-1=Fixture Loop Y-TOGGLE=Y Mounting Toggle, #2 Cable (Specify 10" or 30") HBAYC-CHAIN/SET/U=(2) V-Hook Hangers, 36" Chain Sets w/S-Hooks MPC3=3" Modular Power Cord & Plug (Specify Voltage) MC6=6" Modular Power Cord MPC6=6" Modular Power Cord & Plug (Specify Voltage) MMS=360° or 180° Aisle Motion Sensor with Modular Power Receptacle (120-277V)⁽⁴⁾</p>	
<p>LED Lumen Output 3' Housing 9=9000 Lumens 18=18,000 Lumens 4' Housing 24=24,000 Lumens</p>	<p>Lamps Installed L840=4000K L850=5000K</p>			
<p>Distribution N=Narrow (Aisle) W=Wide (General)</p>				
<p>Shielding [Blank]=None WG=Wireguard A=Prismatic Acrylic Lens & Doorframe CL=Clear Acrylic Lens & Doorframe A/WG=Acrylic Lens, Wireguard & Doorframe CL/WG=Clear Lens, Wireguard & Doorframe AI=Prismatic Acrylic Lens Insert CLI=Clear Acrylic Lens Insert</p>				

NOTES: ⁽¹⁾ Voltage must be specified when ordered with plugs, motion sensor or emergency ballasts. ⁽²⁾ When ordering MS option, specify as UNV (for 120 or 277V), 347 or 480V. ⁽³⁾ Requires use of MC_ or MPC_ cord accessories, specify voltage for plugs. ⁽⁴⁾ MMS options available with AI or CLI lens options or non-lensed configurations only. ⁽⁵⁾ DesignLights™ Consortium Qualified (both lumen versions). Refer to www.designlights.org Qualified Products List under Family Models for details.

Modular F-Bay Power Supply Option

Cooper Lighting's F-Bay Modular Power Supply option is available for use with all F-Bay products. The modular power supply allows external fixture access for safe and easy servicing. There is no need to remove lamps or reflectors to disconnect fixture power with F-Bay Modular Power Supply. Access to the individual fixture's power supply allows servicing without turning off all the fixtures, disrupting occupants. F-Bay Modular Power Supply is a time saver in installation – **simply plug & power.**



1. Modular Power Supply Receptacle supplied mounted into fixture Access Plate
 2. Modular Power Cord & Plugs in 120, 277, 347, & 480V configurations for easy plug & power into existing supply
- No internal fixture access required for installation or disconnecting power
- Modular Motion Sensor Option supplied with Mounting Box and Modular Power Supply Receptacle

Code Compliance

- UL/cUL Certified for Make/Break under load (UL2549)
- Meets NEC requirements for ballast disconnect (NEC 410.73G)
- Allows for addition of Occupancy Sensor without hard connections
- Receptacles complete with insulating/dust cap

SHIPPING INFORMATION

Catalog No.	Wt.
HBLED-LD2-9	18 lbs.
HBLED-LD2-18	20 lbs.
HBLED-LD2-24	24 lbs.

DESCRIPTION

4 inch LED square recessed downlight with 50° cut off specially designed for LED technology. Two-stage reflector system produces smooth distribution with excellent light control and low aperture brightness. Lumen packages include 900 and 1300 delivered lumens with color temperatures of 2700K, 3000K, 3500K, 4000K. Suitable for commercial construction and exceeds high efficacy requirements (with designated trims) for Title 24-2008 and IECC-2009.

Catalog #		Type
Project		
Comments		Date
Prepared by		

SPECIFICATION FEATURES

Lower Parabolic Reflector

Parabolic aluminum lower reflector in combination with a lensed upper optical chamber provides superior lumen output with minimal source brightness. Available in all Portfolio Alzak® finishes.

Trim Retention

Reflector is retained with two torsion springs holding the flange tightly to the finished ceiling surface.

Plaster Frame / Collar

Galvanized steel plaster frame with adjustable collar adjusts for up to 2" thick ceilings and rotates +/- 7.5°.

Universal Mounting Bracket

Accepts 1/2" EMT, C channel and bar hangers and adjusts 5" vertically from above and below the ceiling.

Junction Box

(4) 1/2" and (2) 3/4" trade size pry outs positioned to allow straight conduit runs. Listed for (8) #12 AWG (four in, four out) 90°C conductors and feed thru branch wiring.

Thermal

Extruded aluminum heat sink conducts heat away from the LED module for improved performance and longer life.

LED

LED system contains a plurality of high brightness white LED's combined with a high reflectance upper reflector and convex transitional lens producing even distribution with no pixilation. Rated for 50,000 hours at 70% lumen maintenance. Auto resetting, thermally protected, LED's are turned off when safe operating temperatures are exceeded. Color variation within 3-step MacAdam ellipses. Flexible disconnect allows for tool-less replacement of LED engine from below ceiling.

Driver

Driver can be serviced from above or through the aperture.

Environmental

Fixture should not be operated in ambient temperatures above 40° C.

Code Compliance

Thermally protected and cULus listed for protected wet locations. Optional City of Chicago environmental air (CCEA) marking for plenum applications. EMI/RFI emissions per FCC 47CFR Part 18 Class B consumer limits. Non-IC rated - Insulation must be kept 3" from top and sides of housing. RoHS Compliant. Title 24 2008 Compliant with designated trims. ARRA Compliant. Photometric testing completed in accordance with IES LM 79 standards. LED life testing completed in accordance with LM 80 standards.

Warranty

5 year warranty.

PORTFOLIO™



**LDSQ409
LDSQ413**

4LSQ

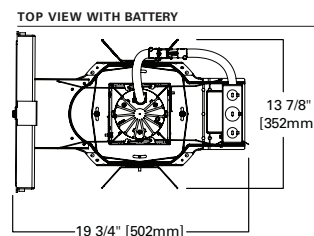
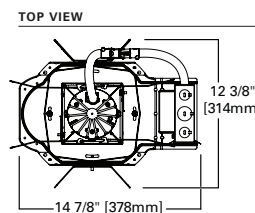
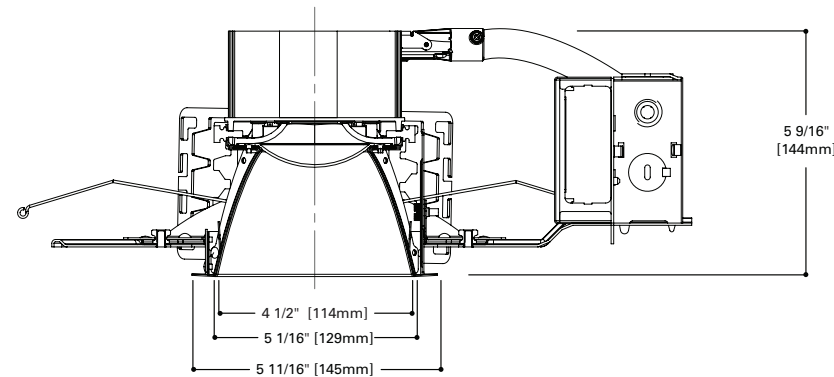
LED

**4 Inch
Square Downlight**



Qualified & Compliant with designa LED modules and trims.

Energy Data	
Sound Rating: Class A standards	
Operating Temperature: 40°C (104°F)	
1300 Lumen D010V	
(Values at non-dimming line voltage)	
Minimum Starting Temp: -30°C (-22°F)	
EMI/RFI: FCC Title 47 CFR, Part 18, Class B	
Input Voltage: UNV (90V - 305V)	
Power Factor: >0.90 (at nominal input 120/230/240/277 VAC & 100% of Rated Output Power)	
Input Power: 24.8W	THD: <21%
120V Input Current: .21A	277V Input Current: .09A
Maximum Non-IC Ambient Continuous	
Input Frequency: 47-63Hz	
Rated Wattage: 24.8W	
900 Lumen D120 / D010V	
(Values at non-dimming line voltage)	
Minimum Starting Temp: -30°C (-22°F)	
EMI/RFI: FCC Title 47 CFR, Part 18, Class B (Consumer)	
Input Voltage: 120/120-305V	
Power Factor: >0.90	
Input Power: 14.3/17.5W	THD: <20%
Input Frequency: 50/60Hz	
Rated Wattage: 14.3W/17.5W	



LDSQ409 LDSQ413 4LSQ

PORTFOLIO™

ORDERING INFORMATION

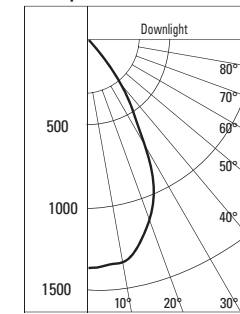
Example:
LDSQ413D010 ESQ4835 4LSQ0LI = 4" Square LED Downlight, 1300 Lumen, 3,500° K CCT with Universal 120 - 277V, 0 - 10 Driver

Housing	Delivered Lumens ¹	Driver	Options	Power Module	Color	Reflector	Finish	Options	Accessories
LDSQ4 = 4" square aperture LDSQ4CP = 4" square aperture, CCEA listed for City of Chicago plenum requirements	09 = 900 lumens 13 = 1300 lumens	D010 = 10 to 100% dimming, 120-277V, 50/60Hz, 0-10V D120 = 15 to 100% dimming, 120V, 2 wire phase control, 900 lumen only DLUT = 1 to 100% dimming, 120-277V Lutron Hi-Lume (registered) A Series	EM = Iota Emergency module with remote test switch ² EMBOD = Bodine Emergency module with remote test switch ^{2, 3}	ESQ4 = 4" module for square reflector	827 = 80 CRI, 2700° K 830 = 80 CRI, 3000° K 835 = 80 CRI, 3500° K 840 = 80 CRI, 4000° K 827CP = 80 CRI, 2700° K, Chicago Plenum 830CP = 80 CRI, 3000° K, Chicago Plenum 835CP = 80 CRI, 3500° K, Chicago Plenum 840CP = 80 CRI, 4000° K, Chicago Plenum	4LSQ0 = Reflector lens assembly polymer trim ring 4LSQ1 = Reflector lens assembly, self flanged	LI = Specular Clear H = Semi-Specular Clear WMH = Warm Haze G = Specular Gold WH = Wheat WHH = Wheat Haze GP = Graphite GPH = Graphite Haze B = Specular Black W = Gloss White	WF = White painted flange (self flanged only) IP66 = IP66 Gasket	H277 = 277 to 120V step down transformer, 300VA H347 = 347 to 120V step down transformer, 75VA H347200 = 347 to 120V step down transformer, 200VA HB26 = C Channel Bar Hanger, 26" Long, Pair HB50 = C Channel Bar Hanger, 50" Long, Pair RMB22 = Wood Joist Bar Hanger, 22" Long Pair

Notes: 1 Nominal delivered Lumens will vary depending on selected CCT, driver and reflector finish.
2 Not available with Chicago Plenum.
3 Not CSA approved.

PHOTOMETRICS

Candlepower Distribution Curve



Test No. P84772
LDSQ413D010 ESQ4835 4LSQ1LI
Lumens = 1258
Watts = 24.6 Watts
LPW = 51.1
CCT = 3500K
SC = 0.9

Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5.5'	45	5'
7'	28	6.5'
8'	21	7.5'
9'	17	8'
10'	14	9'

Candela Distribution

Degrees Vertical	Candela
0	1353
5	1334
15	1208
25	906
35	377
45	74
55	13
65	3
75	1
85	0
90	0

Zonal Lumen Summary

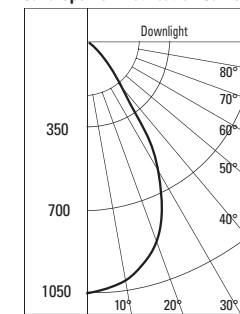
Zone	Lumens	% Fixture
0-30	889	70.7
0-40	1164	92.5
0-60	1253	99.6
0-90	1258	100.0
90-180	0	0.0
0-180	1258	100.0

Luminance

Average Candela/M ²		
Degrees	Avg. 0° Luminance	
45	6288	
55	1208	
65	392	
75	163	
85	0	

PHOTOMETRICS

Candlepower Distribution Curve



Test No. P84773
LDSQ413D010 ESQ4835 4LSQ1H
Lumens = 1173
Watts = 24.6 Watts
LPW = 47.6
CCT = 3500K
SC = 0.9

Cone of Light

Distance Fixture to Lighted Plane	Initial Footcandles at Nadir	Beam Diameter
5.5'	35	5.5'
7'	16	7'
8'	13	8'
9'	10	9'
10'	10	10'

Candela Distribution

Degrees Vertical	Candela
0	1046
5	1028
15	954
25	781
35	389
45	118
55	39
65	13
75	3
85	2
90	0

Zonal Lumen Summary

Zone	Lumens	% Fixture
0-30	726	61.9
0-40	1008	85.9
0-60	1156	98.5
0-90	1173	100.0
90-180	0	0.0
0-180	1173	100.0

Luminance

Average Candela/M ²		
Degrees	Avg. 0° Luminance	
45	10063	
55	3719	
65	1440	
75	504	
85	499	

DESCRIPTION

The Accord™ redefines lighting by improving on aesthetics, comfort and energy savings. The Accord provides the right amount of light while eliminating surface shadows commonly found in parabolics. Therefore, Accord increases the comfort level while providing significant energy savings.

The Accord is the ideal solution for offices, schools, hospitals, retail and other applications. It is designed for installations when the housing will be in direct contact with insulation.

SPECIFICATION FEATURES

Construction

Shallow 3-1/4" deep housing is die formed of cold gauge, prime cold rolled steel. Heavy gauge end plates are securely attached with screws for strength and rigidity and the elimination of gaps. End plates have integral grid-lock feature for safety and convenience. Four auxiliary fixture end suspension points are provided. KOs for continuous row wiring. Large access plate for supply connection.

Controls

The Accord LED is equipped standard with a 0-10V continuous dimming driver that works with any standard 0-10V control/dimmer. Combine with energy-saving products like occupancy sensors, daylighting controls, and lighting relay panels from Cooper Controls (www.coopercontrol.com) to maximize energy savings.

Electrical

Long-Life LED system coupled with electrical driver to deliver optimal performance. LED's available in 3000, 3500 or 4000k with a CRI ≥ 85. Projected life is 50,000 hours at 70% lumen output. cULus listed. Electronic drivers are available for 120-277V applications. A 0-10V dimming driver is standard.

Driver Access

Drivers can be removed from below without tools.

Finish

Durable cold rolled steel with multistage, iron phosphate pretreatment and white enamel finish to ensure maximum bonding and rust inhibition.

Reflectors

Reflector has high reflectance baked matte white enamel finish for luminous uniformity.

Shielding

Positively retained frosted acrylic profile lenses provide a soft but effective distribution of light.

Compliance

Modules are UL recognized components and indoor luminaires are cULus listed for 25°C ambient environments, RoHS compliant, and LED modules comply with IESNA LM-79 and LM-80 standards. DesignLights™ Consortium Qualified (both lumen versions). Refer to www.designlights.org Qualified Products List under Family Models for details.

Catalog #		Type	
Project		Date	
Comments			
Prepared by			



2AC LED

2' X 4' TROFFER LED LAMPS

Specification Architectural Troffer
For Use in Insulated Ceilings



ENERGY DATA

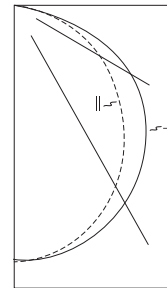
Input Watts:
47=46W
53=54W

***See Drywall Frame Kit Accessory



ADF120112

PHOTOMETRICS



2AC-LD2-47-UNV-L835-CD1-U
Dimming Driver
Linear LED 3500K
Spacing criterion: (H) 1.2 x mounting height, (L) 1.3 x mounting height
Efficiency: 100%
Lumens: 4705
Input Watts: 45.7W
Efficacy: 103 LPW
Test Report: 2AC-LD2-47-UNV-L835-CD1-U.IES

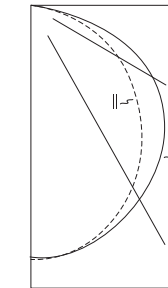
Angle	Candlepower		
	Along H	45°	Across L
0	1605	1605	1605
5	1592	1597	1603
10	1567	1578	1591
15	1524	1546	1563
20	1466	1499	1522
25	1391	1439	1471
30	1306	1368	1410
35	1202	1287	1340
40	1089	1196	1261
45	970	1097	1174
50	847	991	1079
55	722	880	977
60	599	765	857
65	479	649	696
70	362	517	492
75	251	360	302
80	150	203	166
85	65	80	67
90	0	0	0

Coefficients of Utilization

rc	Effective floor cavity reflectance																	
	80%			70%			50%			30%			10%			0%		
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	109	104	99	95	106	101	97	94	97	94	91	93	91	88	90	87	85	83
2	99	90	83	77	96	88	82	76	85	79	75	81	77	73	78	75	71	69
3	90	79	71	64	87	77	70	63	74	68	62	72	66	61	69	64	60	58
4	82	70	61	54	80	68	60	54	66	59	53	64	57	52	61	56	51	49
5	75	62	53	46	73	61	53	46	59	51	46	57	50	45	55	49	45	42
6	69	56	47	40	68	55	46	40	53	46	40	51	45	39	50	44	39	37
7	64	51	42	36	63	50	41	35	48	41	35	47	40	35	45	39	35	33
8	60	46	38	32	58	46	37	32	44	37	31	43	36	31	42	36	31	29
9	56	42	34	28	55	42	34	28	41	33	28	40	33	28	39	32	28	26
10	52	39	31	26	51	39	31	26	38	30	26	37	30	25	36	30	25	24

Zonal Lumen Summary

Zone	Lumens	%Fixture	Luminance Data			
			Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
0-30	1251	26.6	45	1845	2087	2233
0-40	2053	43.6	55	1693	2064	2291
0-60	3667	77.9	65	1524	2065	2215
0-90	4705	100.0	75	1304	1871	1569
0-180	4705	100.0	85	1003	1235	1034



2AC-LD2-53-UNV-L835-CD2-U
Dimming Driver
Linear LED 3500K
Spacing criterion: (H) 1.2 x mounting height, (L) 1.3 x mounting height
Efficiency: 100%
Lumens: 5368
Input Watts: 53.8W
Efficacy: 100 LPW
Test Report: 2AC-LD2-53-UNV-L835-CD2-U.IES

Angle	Candlepower		
	Along H	45°	Across L
0	1822	1822	1822
5	1805	1812	1819
10	1775	1789	1804
15	1725	1750	1770
20	1658	1696	1723
25	1574	1626	1664
30	1472	1544	1594
35	1357	1451	1515
40	1233	1347	1429
45	1102	1239	1332
50	967	1122	1231
55	831	999	1121
60	696	872	988
65	561	742	809
70	428	592	590
75	300	418	382
80	179	242	212
85	77	89	75
90	0	0	0

Coefficients of Utilization

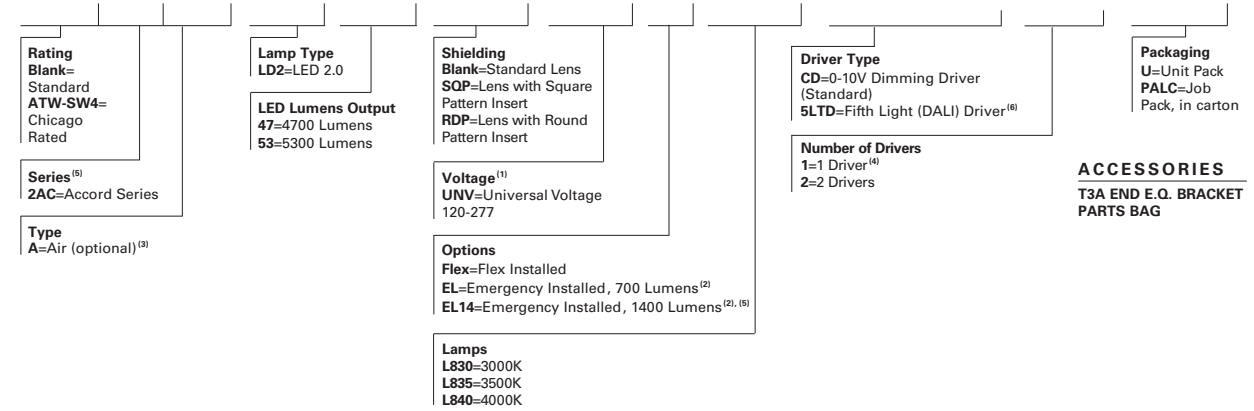
rc	Effective floor cavity reflectance																	
	80%			70%			50%			30%			10%			0%		
rw	70	50	30	10	70	50	30	10	50	30	10	50	30	10	50	30	10	0
RCR																		
0	119	119	119	119	116	116	116	116	111	111	111	106	106	106	102	102	102	100
1	108	104	99	95	106	101	97	94	97	94	91	93	90	88	89	87	85	83
2	98	90	83	77	96	88	82	76	84	79	74	81	77	73	78	74	71	69
3	89	79	70	64	87	77	69	63	74	67	62	71	66	61	69	64	60	58
4	82	70	61	54	79	68	60	53	66	58	53	63	57	52	61	56	51	49
5	75	62	53	46	73	61	53	46	59	51	45	57	50	45	55	49	44	42
6	69	56	47	40	67	55	46	40	53	45	40	51	44	39	50	44	39	37
7	64	50	42	36	62	50	41	35	48	40	35	47	40	35	45	39	34	32
8	60	46	37	31	58	45	37	31	44	36	31	43	36	31	42	35	31	29
9	56	42	34	28	54	42	34	28	40	33	28	39	33	28	38	32	28	26
10	52	39	31	26	51	38	31	26	37	30	25	36	30	25	36	30	25	23

Zonal Lumen Summary

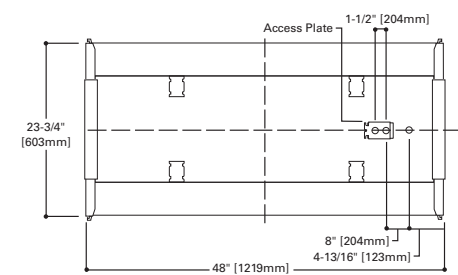
Zone	Lumens	%Fixture	Luminance Data			
			Angle in Deg	Average 0-Deg cd/sm	Average 45-Deg cd/sm	Average 90-Deg cd/sm
0-30	1416	26.4	45	2234	2512	2700
0-40	2321	43.2	55	2077	2496	2801
0-60	4156	77.4	65	1903	2517	2744
0-90	5368	100.0	75	1661	2315	2116
0-180	5368	100.0	85	1266	1464	1233

ORDERING INFORMATION

SAMPLE NUMBER: 2AC-LD2-53-UNV-L835-CD2-U

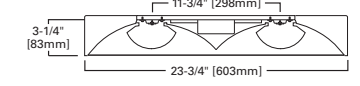


MOUNTING DATA



NOTE: 2' x 2' and 2' x 4' allow for row mounting (1' x 4' does not support feature)

LAMP CONFIGURATIONS



CEILING COMPATIBILITY

G	F	Ceiling Type**	Trim Type
Grid/Lay-in Standard	Drywall Frame Kit	Exposed Grid	G
		Concealed T	G or T
		Slot Grid	G or T
		Flange	***

COOPER LIGHTING

COOPER Lighting

COOPER LIGHTING - SURE-LITES®

DESCRIPTION

LPX Series LED Exit is a polycarbonate unit suitable for general purpose applications. With the new advanced standard features and industry leading innovations, they are now the most universal, energy friendly, easiest to stock and install, and safest Exits in their class.

Catalog #		Type	
Project			
Comments		Date	
Prepared by			

SPECIFICATION FEATURES

Electrical

General Features

- Field selected red and green sign capability standard on all units (units shipped red, field convert to green with supplied parts).
- Dual Voltage Input 120/277 VAC, 60Hz
- AC Only
- Optional 2C (Two circuit, FTBR) available in 120/277 VAC in standard and emergency operation
- Self Powered
- Sure-Lites EZ Key patented external battery disconnect feature – prevents unnecessary battery drainage, saves on installation time
- Solid-state Voltage Limited Charger
- Brownout Circuit
- Low-Voltage Disconnect
- Test Switch/Power Indicator Light
- Standard 24 hour recharge time (max)
- Eagle Eye™ Self-Diagnostic feature available as option

Housing Construction

- All components are injection molded, color stable, high impact UL 94-5VA rated polycarbonate material
- White or black textured finish standard
- Components are of snap-fit construction to facilitate under 5-minute installation
- Reinforcing ribs throughout to provide maximum strength
- Molded-in wireways facilitate internal wire routing and connections
- All components including battery and electronics are located inside the exit housing
- Snap-out or snap-in chevron directional indicators have full 3/4" stroke
- Knockout provided on housing for surface attachment
- Universal exits can be field configured as single face or double face
- Snap-fit canopy with captive mounting screws included with all exits
- Exit can be ceiling, wall, or end mounted
- Universal J-box mounting pattern

Lamp Data

- AC LED: Red and green LED lamps provide uniform diffused illumination
 - DC: Red and green LED DC lamps (Brighter in emergency mode)
- Code Compliance**
- UL 924 Listed
 - UL Damp Location (0-40° C)
 - Life Safety NFPA 101
 - NEC/OSHA
 - Most State and Local Codes
 - Suitable for Floor Proximity Installation
 - UL Listed for 2C (FTBR)
 - Patent Numbers 5,735,498 and 5,678,336

Warranty

- Exit: 1-Year
- Battery: 15-year pro-rata



LPX SERIES

POLYCARBONATE EXIT
SURFACE MOUNT
LED LAMPS
EXIT LIGHTING

ENERGY DATA

Maximum power consumption under all charge conditions:

AC Only, 120V - Red
Amps: 0.07
Watts: 0.98
Power Factor: 0.12

AC Only, 120V - Green
Amps: 0.07
Watts: 1.02
Power Factor: 0.13

AC Only, 277V - Red
Amps: 0.07
Watts: 1.04
Power Factor: 0.06

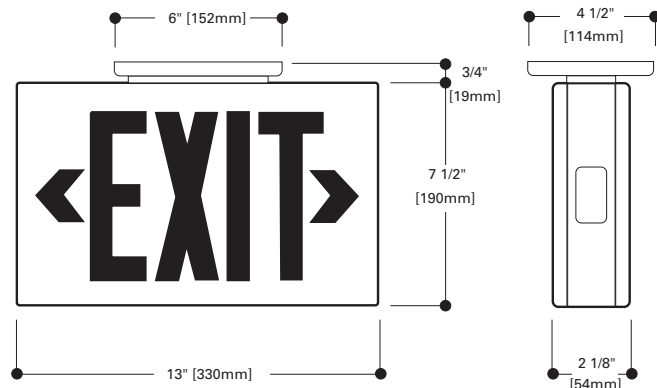
AC Only, 277V - Green
Amps: 0.07
Watts: 1.12
Power Factor: 0.06

Self Powered, 120V - Red
Amps: 0.07
Watts: 0.98
Power Factor: 0.12

Self Powered, 120V - Green
Amps: 0.07
Watts: 1.00
Power Factor: 0.13

Self Powered, 277V - Red
Amps: 0.07
Watts: 1.03
Power Factor: 0.06

Self Powered, 277V - Green
Amps: 0.07
Watts: 1.09
Power Factor: 0.05



ORDERING INFORMATION

Sample Number: LPX7, LPX7SD90, LPX6SG8, LPX7SD23050

Family LPX = Polycarbonate Exit, LED	Options Blank = No additional options 2C = Two Circuit Option (LPX6 only) SD = Self Diagnostics Option (LPX7 only) 22050 = 220V 50 Hz 23050 = 230V 50 Hz 24050 = 240V 50 Hz 34760 = 347V 60 Hz	Protection Devices WG10 = Wall mount wire guard WGS11 = Ceiling or End VS1 = Polycarbonate Vandal Shield VS1WP = Polycarbonate Vandal Shield, Weather Proof
Series 1 6 = AC Only 7 = Self Powered	SD Options Blank = No additional options 20 = Flasher 90 = Fire Alarm Interface	Pendant Kit LPX18PKWH = 18" Pendant Kit, White LPX18PKHTWH = 18" Hang True Pendant Kit, White LPX18PKBK = 18" Pendant Kit, Black LPX18PKHTBK = 18" Hang True Pendant Kit, Black
Face Options Blank = Single and Double		
Housing Finish Blank = White BK = Black		

¹ Also available in stock LPX6 and LPX7 units with the initial setup as Green with the capability to convert to Red in the field. To order these units, please use the catalog number LPX6-G or LPX7-G.

TECHNICAL DATA

Lamps

LPX Series Exits use energy efficient, long life LED's to provide uniform diffuse illumination of the exit face. These red and green LEDs require no maintenance and consume less than one watt, on average.

Housing Construction

Rugged, durable, injection molded polycarbonate materials are used throughout the LPX Series Exits. All structural components are designed with reinforcing ribs to add additional rigidity and to maximize structural integrity. These materials are impact and scratch resistant, and they have been UV stabilized to resist discoloration due to age and ultraviolet radiation. All components are designed to be of snap-fit construction - no mechanical fasteners - to facilitate installation in under 5-minutes. Any components required for installation (wirenuts, wire leads, universal metal J-box bracket, etc.) are all included with each exit. The universal design of the LPX Series Exits enables universal exits to be configured as single face or double face in the field. All LPX Series Exits can be wall, ceiling, or end mounted; a rugged, snap-fit, low profile canopy with captive screws is included with every exit for ceiling and end mounting applications.

Lens

Lenses for the LPX Series Exits are made from durable, impact resistant polycarbonate. All exit faces are designed with full 3/4" stroke snap-out or snap-in chevron directional indicators to insure maximum visibility and compliance with the latest codes. Units come with red lenses installed and green lenses included for field selectable red or green signs.

Sure-Lites EZ Key External Battery Disconnect (Self Powered Only)

Patented technology that allows installers to externally control the battery connection. Better than line latching, allows installers to choose when the battery is connected so that it stays fresh longer. Allows battery to be disconnected after installation but before building is occupied, enabling emergency circuit to be shut down for power savings.

Brownout Circuit (Self Powered Only)

The brownout circuit on Sure-Lites' exits monitors the flow of AC current to the exit and activates the emergency lighting system when a predetermined reduction of AC power occurs. This dip in voltage will cause most ballasted fixtures to extinguish causing loss of normal lighting even though a total power failure has not occurred.

Solid-State Transfer (Self Powered Only)

The LPX Series Exit incorporates solid-state switching which eliminates corroded and pitted contacts or mechanical failures associated with relays. The switching circuit is designed to detect a loss of AC voltage and automatically energizes the lamps using DC power. Upon restoration of AC power, the DC power will be disconnected and the charger will automatically recharge the battery.

Low Voltage Disconnect (Self Powered Only)

When the battery's terminal voltage falls, the low-voltage circuitry disconnects the lighting load. The disconnect remains in effect until normal utility power is restored, preventing deep battery discharge.

Test Switch/Power Indicator Light (Self Powered Only)

A test switch located on the side of the exit permits the activation of the emergency circuit for a complete operational systems check. The Power Indicator Light provides visual assurance that the AC power is on.

Sealed Nickel Cadmium Battery (Self Powered Only)

Sure-Lites sealed nickel cadmium batteries are maintenance-free with a life expectancy of 15 years. The sealed rechargeable nickel cadmium battery offers high discharge rates and stable performance over a wide range of temperatures, from 0-40° C. The specially designed re-sealable vent automatically controls cell pressure, assuring safety and reliability. This battery is best suited for harsh ambient temperatures because the electrolyte is not active in the electrochemical process.

"2C" (AC Only)

The "2C" Option enables the Exits to operate per the requirements of UL 924 when connected simultaneously to both normal and emergency power circuits (two circuit operation—UL Category FTBR—Emergency Lighting and Power Equipment). The "2C" Option is a factory assembly change which alters the standard Exit such that it complies with and is UL Listed under the FTBR Category. This option should only be used for exits which are intended to be connected simultaneously to normal and emergency power circuits. Both circuits have universal 120/277 VAC standard.

Eagle Eye™ Self Diagnostics Option (Self Powered Only)

The self-diagnostic unit will automatically perform all tests required by UL924, and NFPA 101. The system indicates the status of the exit all times using the LED indicator near the test switch on the side of the unit. A 90 minute battery power (emergency mode) simulation test will occur randomly once every 12 months. A 30 second battery power simulation test will occur every 30 days.

Warranty

All Sure-Lites' products are backed by a firm one-year warranty against defects in material and workmanship. Maintenance-free, long-life, sealed nickel cadmium batteries carry a fifteen-year pro-rata warranty.

Summary

In general, the technology systems installed shall increase the productivity of staff and create a better learning environment. No system is to be too complicated, as they need to be easy to service and maintained through the community. Below is a basic summary of each system. A kick-off meeting is required with the district to further detail the systems for this school and the district as a whole.

Outside Plant Cabling

The electrical contractor shall provide (2) 4" conduits from the telecommunications pedestal to the MDF room. The location of the pedestal shall be coordinated with the telephone utility company. The electrical contractor shall provide (1) 4" conduit from the cable TV pedestal to the MDF room. The location of the pedestal shall be coordinated with the cable TV utility company.

The cabling and innerduct in each of the conduits will be coordinated with the utility companies.

Structured Cabling

The structured cabling system will be composed of the horizontal cables from a Telecommunications Distribution Room (TDR) to an end device that connects to the building data network. These devices include PCs, IP phones, printers, etc. The cabling system will also support building systems such as security, BAS, AV, wireless network and overhead paging. The cables will be routed above the ceiling on j-hooks and bridle rings.

The structured cabling system includes the backbone fiber and copper cabling to connect the TDRs to a central MDF where the building's servers and main services reside. The cabling system will be built to EIA/TIA and other industry standards.

CATV Cabling

The CATV system consists of amplifiers, taps and splitters to distribute the TV signal from the service provider to television sets throughout the building based on user request. CATV can be distributed via traditional coax, UTP cable (Cat. 6), or IP over the network.

TDR/TER Rooms

The Telecommunication Distribution Rooms (TDR) and the Telecommunication Equipment Room (TER), also known as MDF will be designed to house the equipment needed to support the systems in the building. The TER and each TDR will be sized per EIA/TIA requirements to allow plenty of workspace and room for expansion. The systems that may be housed in these rooms are network switches, CATV taps and splitters, security system panels, BAS panels, overhead paging equipment. Fire Alarm will need to be coordinated for whether it will be housed in the TDR.

The TDR and TER will have telecom racks and wire managers to terminate the structured cabling and hold the network switches. The TER may have a cabinet to house servers. Each room will have ladder rack tray to neatly route cabling to each system.

There is currently no generator planned. Each TDR and TER will have a local UPS to allow critical systems to stay online through short outages and give staff a chance for proper shutdown of systems.

The rooms will be cooled with mechanical cooling and thermostat separate from the building system to handle the heat load of these systems. This will stay on and cool at all times even when the rest of the building HVAC is turned off overnight and on weekends/holidays.

Overhead Paging/Intercom System

The overhead paging/intercom system consists of speakers and microphones grouped in zones throughout the interior and exterior of the building. Various inputs such as central microphone or telephone can put a page onto the system for mass notification of important messages. Addressing individual classrooms will also be possible. Individuals in classrooms will be able speak back through a microphone in the ceiling to respond to pages. The paging system will integrate with the bell system.

802.11 Wireless System

The wireless network will support data and voice connections including IP phones, iPads, PCs and other wireless learning devices. The exact manufacturer, bandwidth requirements, security, etc. will be coordinated with the district.

Audio-Visual System

Each classroom will have a Smart Board with short throw projector and sound bars, which would match the HS. The boards will be provided by the district. The project will prep the backing, power and network cabling (if needed).

Gymnasium and Stage/Music: The area shall be equipped with a portable theatrical sound system. The sound system shall consist of pendant mounted power type speakers, microphone outlets at the stair risers and (1) alternate location, with a control panel/sound rack, and associated wiring. The sound system rack shall also have audio inputs for a CD player and AM/FM tuner. Coordination with district during the DD phase will be required to determine the extent of what devices shall be incorporated into this sound system.

Classrooms and Commons: All of the classrooms and the commons area shall be equipped with a sound amplification system to ensure that all students can hear the teacher. The electrical contractor shall provide the necessary components and electrical connections for this type of system. Coordination with Salida School district will need to occur during the design phase to determine if a portable or permanent system will be used. A permanent system incorporates ceiling-mounted speakers, a microphone, and a control panel for each classroom. This can be combined with the overhead paging system with some IP based system manufacturers.

Other AV requirements for other various rooms will be coordinated with the district.

Description of Work:

Salida Elementary School is planning to construct a new replacement school warming and serving kitchen. The kitchen will serve 2-3 lunch periods in a 25 minute time period. K-2 will be served a set meal to keep the line moving. K3-4 will be given option selections. The total area of the kitchen is 1055 SF. We have created a cost estimate and approximate utility loads for all the equipment. The open space from the Commons or visible serving line allows the children to see and experience the warming kitchen. This type of design embraces the children because they become part of the kitchen by observing the prepping and rethermalizing of the food.

Walk-in Cooler

A small 50 sq.ft. walk-in cooler for holding will be provided at the receiving area.

Rest Room

Next to the Cooler is an employee restroom.

Dry Storage

Next to the restroom will be Dry Storage area for dry and disposable items.

Prep Areas

There are two prep areas with two compartment sink incorporated into the plan for set-up.

Cooking

Two double Convection Ovens for rethermalizing under a type 1 hood.

Warming Cabinets and Refrigeration

We have two cook & hold warming cabinet and single reach-in refrigerator at the serving line for holding and replenishing food to the Serving Tables.

Serving

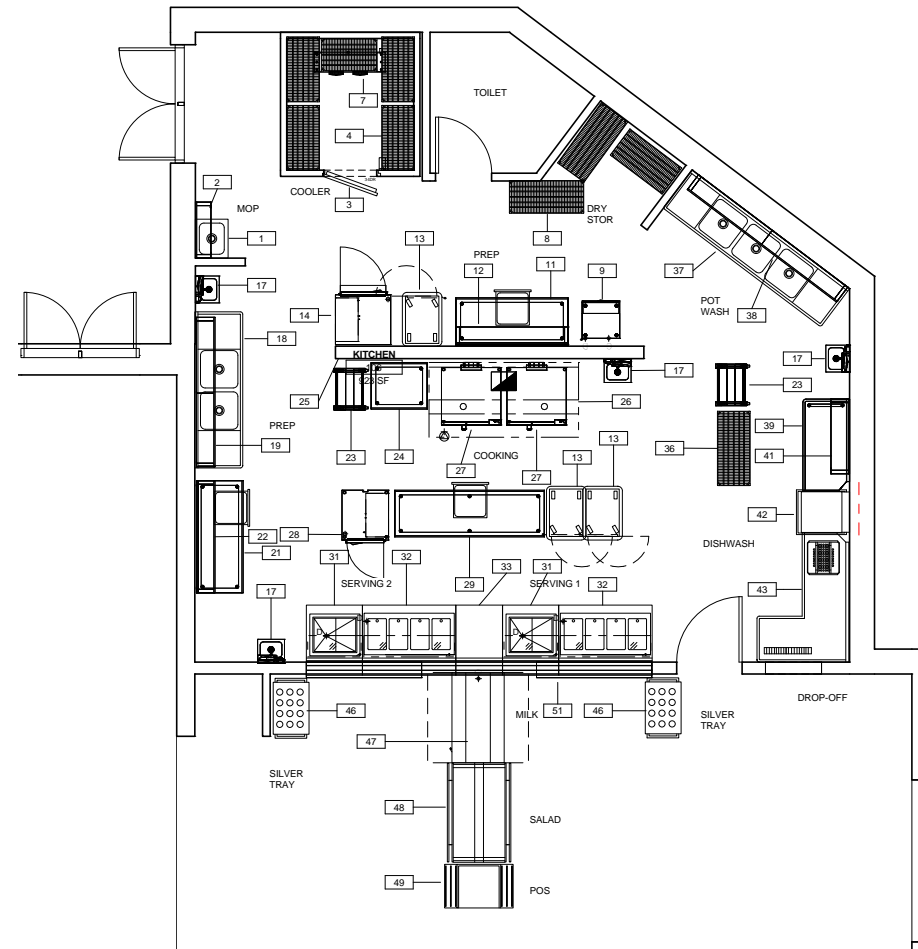
We will have two serving lines of hot and cold food mobile tables with sneeze guards for serving of food. The height of the counters are 34 inches for ADA compliance.

The height of the counters are 34 inches for ADA compliance.

Two silver tray carts will begin the serving line proceeding through pick-up. A double sided milk cooler and mobile salad bar will be on the way out to the Point Of Sale.

Dishwashing

Dishwashing will have a drop-off window for trays going to a Ventless high temp dishmachine for sanitizing. A three compartment sink will be provided for pots and pan washing.

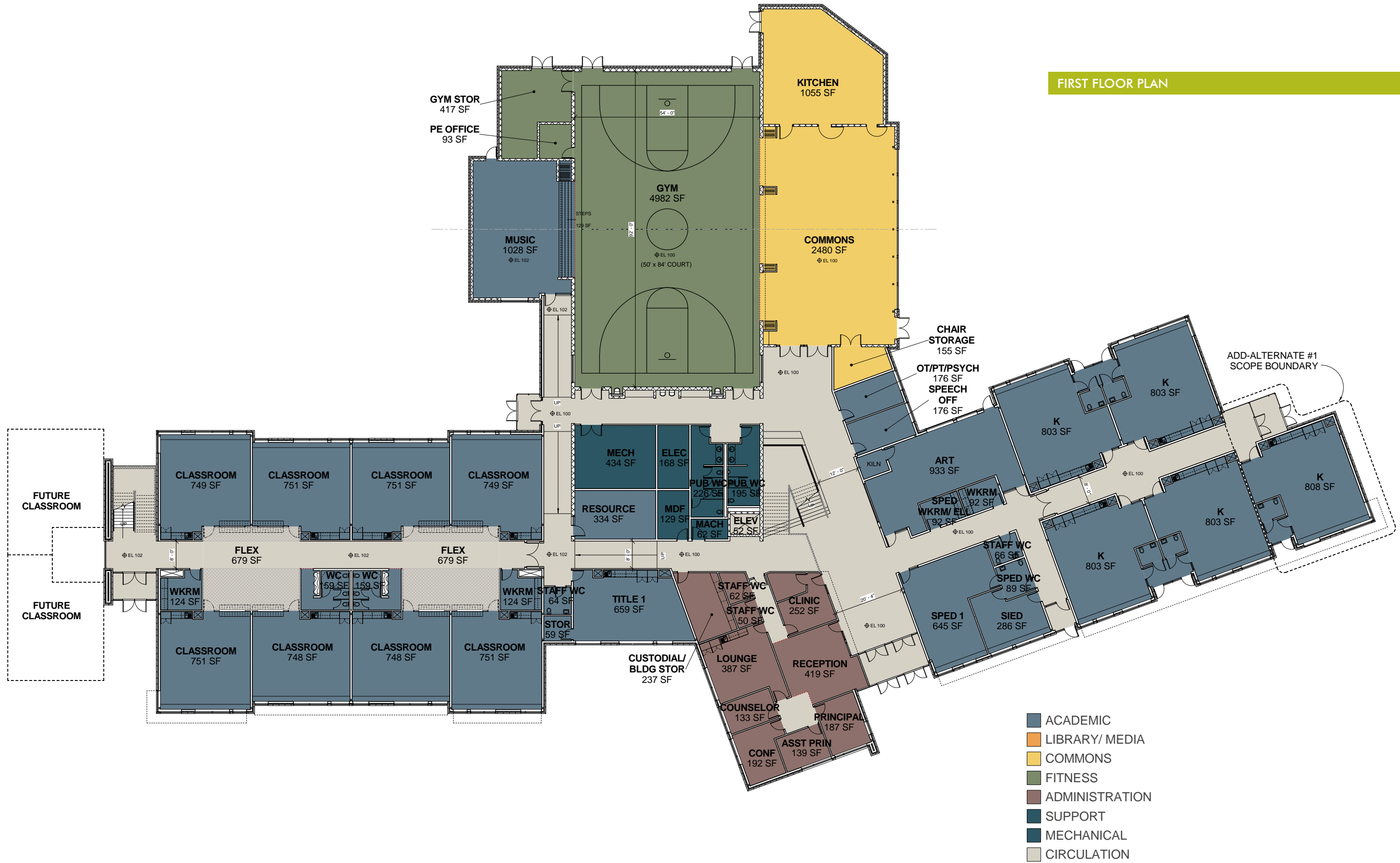


1 Kitchen Equipment Plan
1/4" = 1'-0"

Specialty Equipment Schedule			
Item #	Qty	Description	Remarks
1	1	Sink, Mop	
2	1	Wall Mounted Shelf	
3	1	Door, Walk-In Cooler/Freezer	
4	1	Shelving, Plastic, Louvered	
5	1	Remote Compressor	
6	1	Spare Number	
7	1	Low Profile Evaporator	Part Of #5
8	1	Shelving, Plastic, Louvered	
9	1	Ice Maker w/ Bin	
10	1	Spare Number	
11	1	Work Table W/ Drawer	
12	1	Wall Mounted Shelf	
13	3	Holding Cabinet, Heated	
14	1	Refrigerator, Roll-In	
15	1	Spare Number	
16	1	Spare Number	
17	4	Soap and Towel Dispenser Sink	
18	1	2 Compartment Prep Sink	
19	1	Wall Mounted Shelf	
20	1	Spare Number	
21	1	Work Table W / Sink	
22	1	Wall Mounted Shelf	
23	2	Rack, Utility	
24	1	Work Table	
25	1	Wall Flashing	
26	1	Hood, Exhaust	
27	2	Oven, Convection, Gas	
28	1	Refrigerator, Reach-In	
29	1	Flat Top, Undershelf, 14 Ga. 304 S/S	
30	1	Fire Suppression System	
31	2	Buffet/Cafeteria, Cold Food Station	
32	2	Buffet/Cafeteria, Hot Food-Soup Station	
33	1	Buffet/Cafeteria, Flat Top	
34	1	Spare Number	
35	1	Spare Number	
36	1	Shelving, Plastic, Louvered Shelving	
37	1	3 Compartment Sink	
38	1	Wall Mounted Shelf	
39	1	Straight Clean Dishtable	
40	1	Spare Number	
41	1	Wall Mounted Shelf	
42	1	Dishwasher, Hood Type, Ventless	
43	1	Soiled Dishtable, 'L' Shape, 14 gauge	
44	1	Spare Number	
45	1	Spare Number	
46	2	Cart, Tray & Silver	
47	1	Milk Cooler	
48	1	Buffet/Cafeteria, Food Bars	
49	1	Buffet/Cafeteria, Cashier Station	
50	1	Spare Number	
51	1	Tray Slide	

PROJECT PLANS & IMAGES

FIRST FLOOR PLAN



SECOND FLOOR PLAN



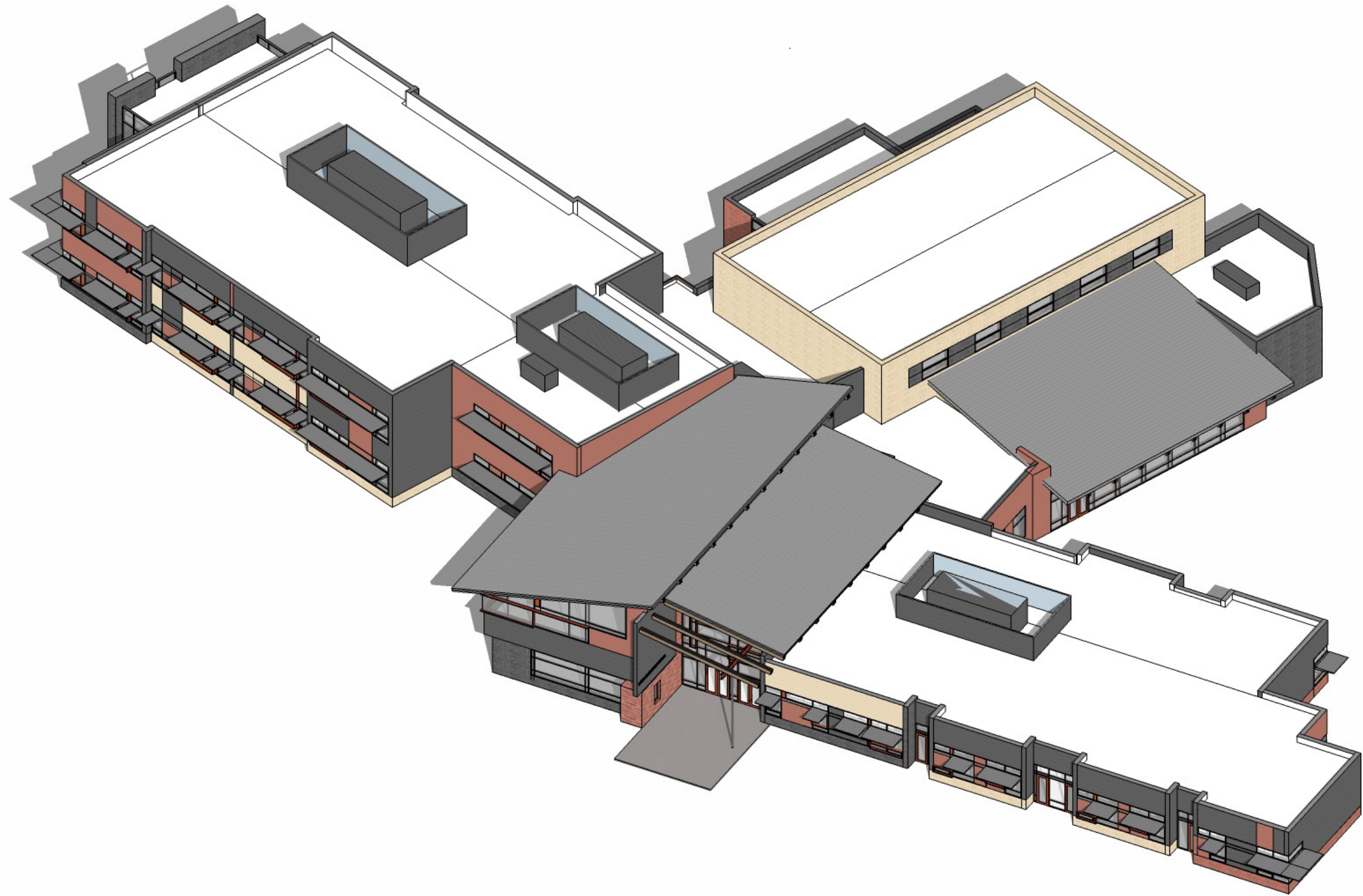
- ACADEMIC
- LIBRARY/ MEDIA
- COMMONS
- FITNESS
- ADMINISTRATION
- SUPPORT
- MECHANICAL
- CIRCULATION

ROOF PLAN

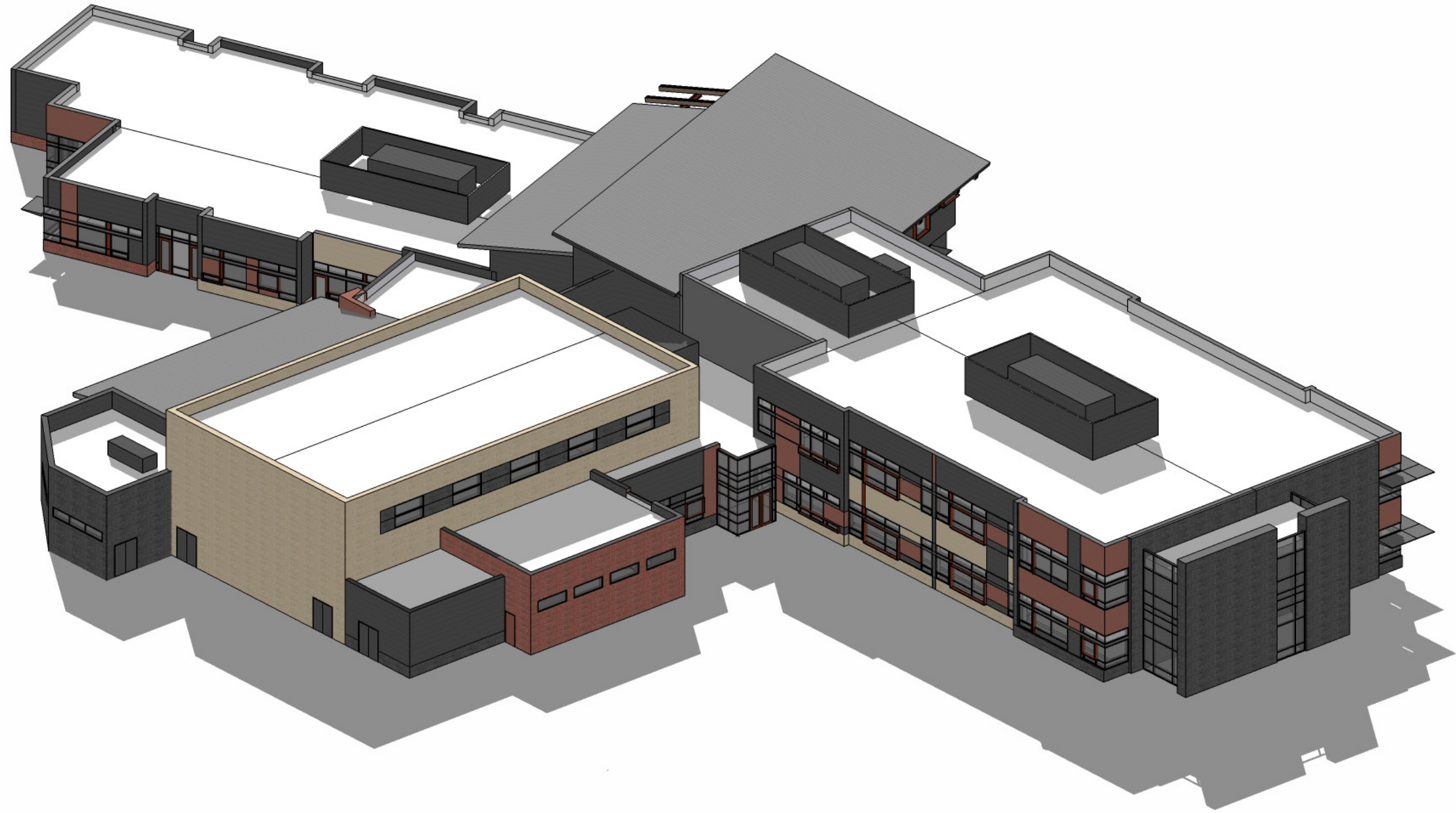
NOTE:
RS-1= ROOF SYSTEM 1
RS-2= ROOF SYSTEM 2

REFER TO ARCHITECTURAL NARRATIVE
FOR ROOF ASSEMBLY DESCRIPTIONS













SOUTH PERSPECTIVE



ENTRY PERSPECTIVE



SOUTHEAST PERSPECTIVE



NORTHEAST PERSPECTIVE



NORTHEAST PERSPECTIVE



NORTHWEST PERSPECTIVE



SOUTH PERSPECTIVE

KEYNOTE LEGEND

- 4.1 BRICK VENEER TYPE 1- RED
- 4.2 BRICK VENEER TYPE 2- GRAY
- 4.3 BRICK VENEER TYPE 3- BUFF/ TAN
- 4.4 NATURAL STONE DRYSTACK VENEER
- 7.1 PREFINISHED METAL WALL PANEL TYPE 1- RED
- 7.2 PREFINISHED METAL WALL PANEL TYPE 2- GRAY
- 7.3 PREFINISHED METAL WALL PANEL TYPE 3- BUFF/ TAN
- 8.1 ALUMINUM WINDOW
- 8.2 ALUMINUM STOREFRONT
- 8.3 ALUMINUM CURTAINWALL
- 8.4 ALUMINUM STOREFRONT SUNSHADE



ACADEMIC WING NORTH ELEVATION



ACADEMIC WING SOUTH ELEVATION

KEYNOTE LEGEND

- 4.1 BRICK VENEER TYPE 1- RED
- 4.2 BRICK VENEER TYPE 2- GRAY
- 4.3 BRICK VENEER TYPE 3- BUFF/ TAN
- 4.4 NATURAL STONE DRYSTACK VENEER
- 7.1 PREFINISHED METAL WALL PANEL TYPE 1- RED
- 7.2 PREFINISHED METAL WALL PANEL TYPE 2- GRAY
- 7.3 PREFINISHED METAL WALL PANEL TYPE 3- BUFF/ TAN
- 8.1 ALUMINUM WINDOW
- 8.2 ALUMINUM STOREFRONT
- 8.3 ALUMINUM CURTAINWALL
- 8.4 ALUMINUM STOREFRONT SUNSHADE



ENTRY- SOUTH ELEVATION



ENTRY- WEST ELEVATION

KEYNOTE LEGEND

- 4.1 BRICK VENEER TYPE 1- RED
- 4.2 BRICK VENEER TYPE 2- GRAY
- 4.3 BRICK VENEER TYPE 3- BUFF/ TAN
- 4.4 NATURAL STONE DRYSTACK VENEER
- 7.1 PREFINISHED METAL WALL PANEL TYPE 1- RED
- 7.2 PREFINISHED METAL WALL PANEL TYPE 2- GRAY
- 7.3 PREFINISHED METAL WALL PANEL TYPE 3- BUFF/ TAN
- 8.1 ALUMINUM WINDOW
- 8.2 ALUMINUM STOREFRONT
- 8.3 ALUMINUM CURTAINWALL
- 8.4 ALUMINUM STOREFRONT SUNSHADE



KINDERGARTEN WING- NORTH ELEVATION



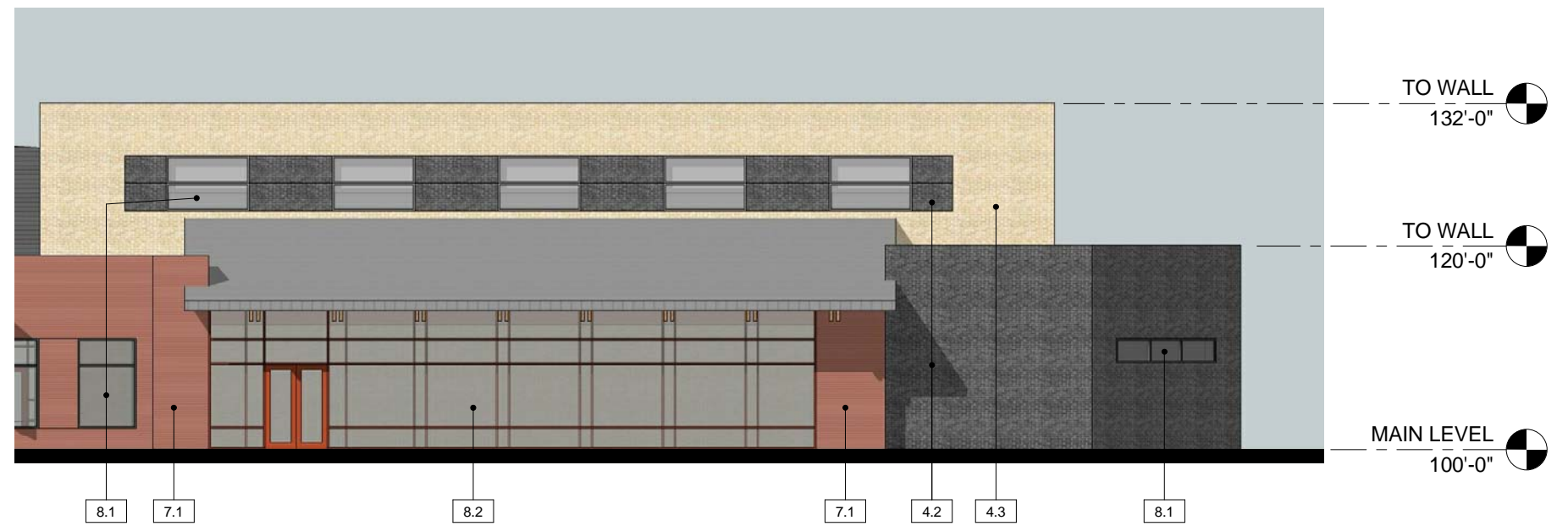
KINDERGARTEN WING- EAST ELEVATION



KINDERGARTEN WING- SOUTH ELEVATION

KEYNOTE LEGEND

- 4.1 BRICK VENEER TYPE 1- RED
- 4.2 BRICK VENEER TYPE 2- GRAY
- 4.3 BRICK VENEER TYPE 3- BUFF/ TAN
- 4.4 NATURAL STONE DRYSTACK VENEER
- 7.1 PREFINISHED METAL WALL PANEL TYPE 1- RED
- 7.2 PREFINISHED METAL WALL PANEL TYPE 2- GRAY
- 7.3 PREFINISHED METAL WALL PANEL TYPE 3- BUFF/ TAN
- 8.1 ALUMINUM WINDOW
- 8.2 ALUMINUM STOREFRONT
- 8.3 ALUMINUM CURTAINWALL
- 8.4 ALUMINUM STOREFRONT SUNSHADE



COMMONS- EAST ELEVATION



GYMNASIUM- NORTH ELEVATION

KEYNOTE LEGEND

- 4.1 BRICK VENEER TYPE 1- RED
- 4.2 BRICK VENEER TYPE 2- GRAY
- 4.3 BRICK VENEER TYPE 3- BUFF/ TAN
- 4.4 NATURAL STONE DRYSTACK VENEER
- 7.1 PREFINISHED METAL WALL PANEL TYPE 1- RED
- 7.2 PREFINISHED METAL WALL PANEL TYPE 2- GRAY
- 7.3 PREFINISHED METAL WALL PANEL TYPE 3- BUFF/ TAN
- 8.1 ALUMINUM WINDOW
- 8.2 ALUMINUM STOREFRONT
- 8.3 ALUMINUM CURTAINWALL
- 8.4 ALUMINUM STOREFRONT SUNSHADE



CLASSROOM- WEST ELEVATION



GYMNASIUM- WEST ELEVATION

Classroom Window 'Diagram':

Daylighting is obviously critical to the High Performance Learning environment, and views to the exterior from the school to the surrounding mountain landscape will be spectacular, but they are also critically important parts of the CHPS Verification criteria as well. To that end, the design includes a healthy amount of windows, especially in the Classroom learning environments to meet the daylighting and views criterion.

In order to try to reduce the cost of what might otherwise be large single openings with structural steel framing, the design team is proposing a hybrid approach of smaller individual windows within more standard and less expensive stud-pack jambs and headers. In addition, to eliminate structural steel girts in the walls to hold sunshade assemblies, the design team is proposing that a storefront system be specified that is designed to 'carry' the sunshade itself. By keeping the openings within the capacity of structural stud wall framing and by eliminating extra steel for sunshades, the goal is to maintain a large daylighting aperture while still controlling complexity and cost. In addition, projected mullion caps are used strategically, mainly at larger openings, to help control low-angle morning and afternoon sun in lieu of more vertical mullions, which can obstruct views, or additional vertical sunshading devices which can add cost and complexity.

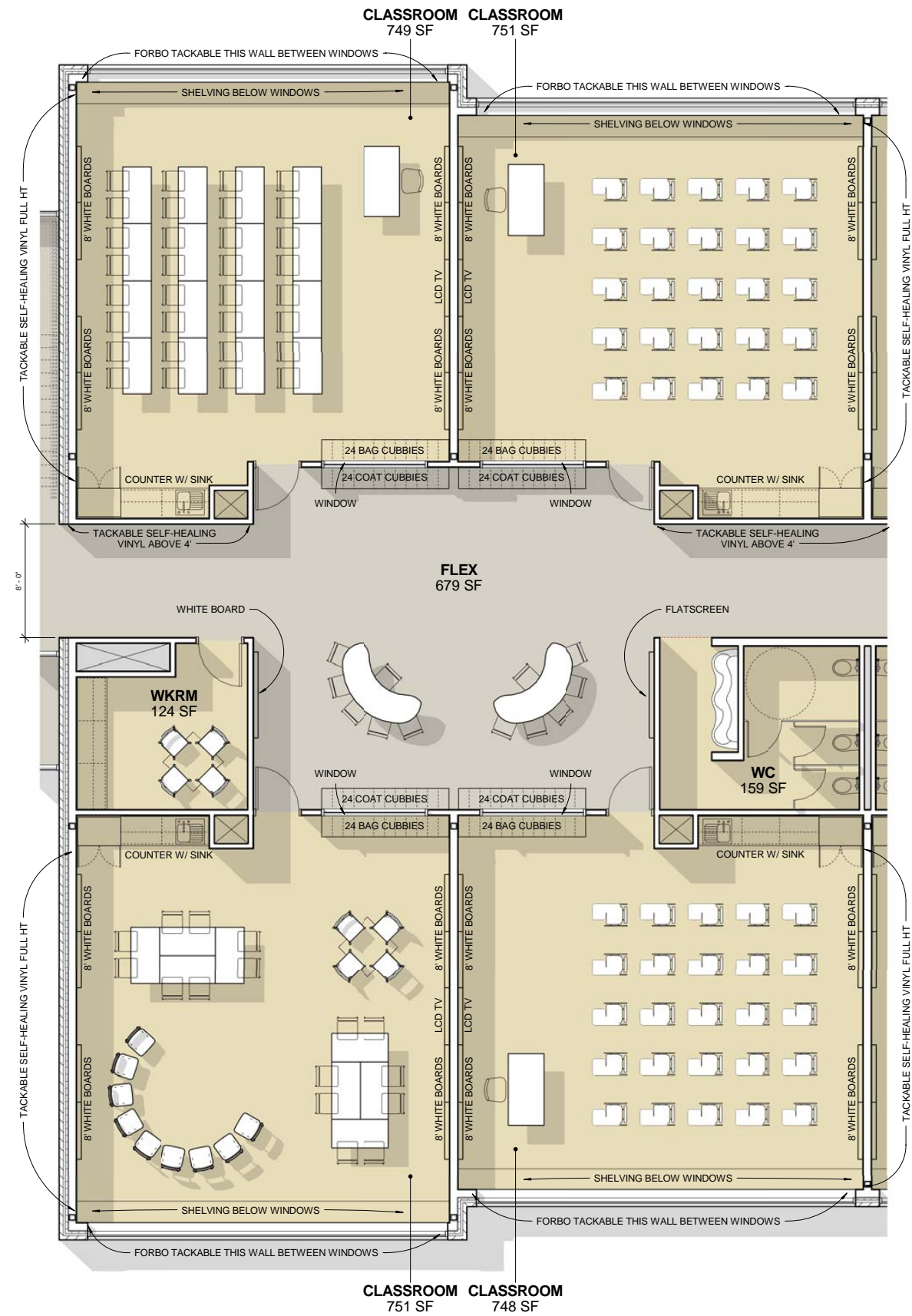
For more information, please refer to the Architectural and Structural Narratives.



Enlarged Classroom Pod Diagram:

This diagram illustrates a typical academic 'Pod' that would be typical of First through Fourth grades. Each 'pod' contains four classrooms, a shared flexible use area, and a staff workroom for resources. The diagram illustrates the current thinking on sink locations, casework, white-board extents and locations, tackable wall covering areas, and more. There will also be an LCD screen at the front of the room for interactive display/ instruction. This can be interfaced with the Teacher's computer, tablet device, or with a student's computer or tablet. Multiple desk/ furniture layouts are explored to see how the space will work for different learning configurations as well. This diagram will continue to evolve and be discussed at length during Design Development to ensure that the classrooms are properly and optimally endowed.

For more information, please refer to the Architectural Narrative.



CoCHPS NARRATIVE & SCORECARD

CoCHPS Scorecard

As a part of the BEST Grant funding structure, the new Salida Elementary School Project needs to be either LEED Gold Accredited (Leadership in Energy and Environmental Design) or CoCHPS 'Verified' (Colorado Collaborative for High Performing Schools). The project team (A/E Group, DAG and CM/GC Partners) and the School Board have elected to take the CoCHPS Verified approach for numerous reasons. Primarily, CHPS was selected due to its stronger emphasis toward schools and creating high performance learning environments, not just high performance 'building's like LEED. CHPS focusses on education-specific criteria such as indoor air quality, daylighting and acoustics which are critical to learning environments, as well as sustainable and energy-efficient materials and design practices- so it's the best of both worlds- and clearly optimally suited to a new Elementary School. Second, CHPS assigns a representative to the project which allows the design process to be more of a dialogue, whereas with LEED, it is often very difficult and very time-intensive to attempt to get credit interpretations or feedback on innovation credits. As an extension of this, it takes a great deal of time to get the final accreditation 'verdict' so if points are still needed to achieve the desired accreditation, they are often very difficult to incorporate since the project is 'complete', occupied, and the construction crews have all moved on. Third, CHPS is also more tuned to Colorado climate and regional-specific conditions which provides better sustainability solutions for our geographic location and 'local' natural resource infrastructures. Lastly, CHPS verification is less documentation intensive which allows the project to save money on sustainability 'accounting' and keep those dollars earmarked for direct application to academic and sustainability strategies that will actually benefit, directly, the students, staff, and community users of the new Salida Elementary School.

This scorecard is the tracking mechanism for CHPS Verification. 60 points out of a possible 120 are required for Verification. We will shoot for 70-75 to make sure we have a little 'margin'.

Many of the points will be incorporated into the design by the A/E team through drawings, detailing or specification language.

Some points will involve the general contractor and subcontractors like ME1.0, ME2.0, ME2.1, ME6.1, and others more indirectly.

Several of the points will involve Owner input and commitments, so those will be discussed in more detail at the DD kickoff. They include, but are not limited to, the following:

LE1.1, LE1.2, SS1.3, SS2.3, WE3.1, EE3.1, CL1.1, EQ2.6, EQ2.7

Collaborative for High Performance Schools (CHPS)										
PROJECT APPLICATION										
Based on the 2009 Edition										
III. CHPS Scorecard										
When your project is ready to be screened and reviewed, notify CHPS by faxing or emailing the registration form signed. On this scorecard, you should have placed a check mark in the "ready for review" column for the design review, and when it is time for the construction review for each prerequisite and credit claimed signifying that its template has been completed and that all supporting attachments and documents have been uploaded to your project CHPS website. Check with CHPS for alternative, equivalent submittals that may be acceptable.										
Key: T-Template Required, A-Attachment Required, CD-Construction Document Required, CA - Construction Audit Requirement										
CHPS SECTION	CREDIT NUMBER	TITLE	POSSIBLE POINTS	POINTS CLAIMED	TEAM MEMBER RESPONSIBLE	DESIGN REVIEW REQUIREMENTS	READY FOR REVIEW	CONSTRUCTION REVIEW REQUIREMENTS	READY FOR REVIEW	CONSTRUCTION AUDIT REQUIREMENT
LEADERSHIP, EDUCATION, AND INNOVATION (2 prerequisites; 11 possible points)										
1. Leadership (2)										
	LEI1.0	Integrated Design	Req	Req		T	A			
	LEI1.1	District Level Commitment	1	1		T	A			
	LEI1.2	School Master Plan	1	1		T	A			
2. Schools As Learning Tools (1)										
	LEI2.0	Educational Display	Req	Req		T		CD		A
	LEI2.1	Demonstration Areas & Staff Training	1	1		T		CD		T
3. Innovation (8)										
	LEI3.1	Innovation	1-4	3		T	A			A
	LEI3.2	Design for Adaptability, Durability and Disassembly	2	2		T	A	CD		A
	LEI3.3	School Garden	1	1		T	A	CD		T
	LEI3.4	Plug Load Reduction	1	1		T	A	CD		T
SUSTAINABLE SITES (3 prerequisites; 19 possible points)										
1. Site Selection (8)										
	SS1.0	Site Selection and Evaluation	Req	Req		T	A			
	SS1.1	Environmentally Sensitive Land	1-2	-		T	A	CD		
	SS1.2	Central Location	3	3		T	A			
	SS1.3	Joint-Use of Facilities	1	1		T		CD		T
	SS1.4	Joint-Use of Parks	1	1		T	A			
	SS1.5	Reduced Footprint	1	1		T		CD		
2. Transportation (4)										
	SS2.1	Public Transportation	2	-		T	A			
	SS2.2	Human Powered Transportation	1	1		T		CD		T
	SS2.3	Parking Minimization	1	1		T		CD		T
3. Stormwater Management (2)										
	SS3.0A	Construction Site Runoff Control	Req	Req		T	A	CD		T
	SS3.0B	Limit Stormwater Runoff	Req	Req		T	A	CD		T
	SS3.1	Treat Stormwater Runoff	1	1		T		CD		T
	SS3.2	Protect and Reuse Topsoil	1	1		T	A			T
4. Outdoor Surfaces & Spaces (4)										
	SS4.1	Reduce Heat Islands - Landscaping	2	2		T		CD		T
	SS4.2	Reduce Heat Islands - Cool Roofs	1	1		T		CD		T
	SS4.3	Microclimates	1	-		T		CD		T
	SS5.1	Light Pollution Reduction	1	1		T		CD		T
WATER (2 prerequisite; 11 possible points)										
1. Outdoor Systems (4)										
	WE1.0	Water Use Budget and Exterior Water Use Reduction	Req	Req		T	A	CD		
	WE1.1	Superior Reduction in Potable Water Use for Non-Recreational Landscaping Areas	1	1		T				
	WE1.2	Reduce Potable Water for Recreational Area Landscaping	2	2		T		CD		T
	WE1.3	Irrigation System Testing and Training	1	1		T	A	CD		T
2. Indoor Systems (4)										
	WE2.0	Minimum Reduction in Indoor Potable Water Use	Req	Req		T		CD		T
	WE2.1	Reduce Indoor Potable Water Use	1-2	1						
	WE2.2	Reduce Sewage Conveyance from Toilets and Urinals	2	2		T		CD		T
3. Water Efficiency (3)										
	WE3.1	Water Management System	1 or 3	1		T	A	CD		T

ENERGY (3 prerequisites; 34 possible points; minimum 2 points required)										
1. Energy Efficiency (25)										
	EE1.0A	Minimum Energy Performance	Req	Req		T	A			
	EE1.0B	Minimum Flex Energy	Req	Req		T	A	CD		
	EE1.1	Superior Energy Performance	1-20	11						
	EE1.2	Flex Energy - Solar Ready	1	1		T		CD		T
	EE1.3	Natural Ventilation & Energy Conservation Interlocks	1-2	2		T		CD		T
	EE1.4	Energy Management Systems	1-2	2		T	A	CD		T
2. Alternate Energy Sources (7)										
	EE2.1	On-site Renewable Energy	1-7	-		T	A	CD		T
3. Commissioning & Training (2)										
	EE3.0	Comprehensive Commissioning	Req	Req		T	A	CD		T
	EE3.1	Additional Commissioning	1-2	2		T				
CLIMATE (6 possible points)										
1. Emission Reduction (6)										
	CL1.1	Climate Change Action	1	1		T	A			
	CL1.2	Grid Neutral / Zero Net Energy	2-5	-						
MATERIALS & WASTE MANAGEMENT (2 prerequisite; 19 possible points)										
1. Recycling (0)										
	ME1.0	Storage and Collection of Recyclables	Req	Req		T		CD		T
2. Construction Waste Management (2)										
	ME2.0	Minimum Construction Site Waste Management	Req	Req		T		CD		T
	ME2.1	Construction Site Waste Management	1-2	1						
3. Building Reuse (2)										
	ME3.1	Building Reuse	1-2	-		T		CD		T
4. Sustainable Materials - Single Attribute (9)										
	ME4.1	Recycled Content	1	1		T		CD		T
	ME4.2	Rapidly Renewable and Organically Grown Materials	1-2	1		T		CD		T
	ME4.3	Sustainable Wood	1-2	1		T		CD		T
	ME4.4	Salvaged Materials	1-2	-		T		CD		T
	ME4.5	Regional Materials	1-2	1		T		CD		T
5. Sustainable Materials - Multi Attribute (2)										
	ME5.1	Environmentally Preferable Products	1-2	1		T		CD		T
6. Sustainable Materials - LCIA (4)										
	ME6.1	Environmental Performance Reporting	1-6	2		T		CD		T
INDOOR ENVIRONMENTAL QUALITY (4 prerequisites; 26 possible points)										
1. Lighting and Daylighting (8)										
	EQ1.1	Daylighting	1-6	4		T	A	CD		T
	EQ1.2	View Windows	1	1		T		CD		T
	EQ1.3	Electric Lighting	1	1		T	A	CD		T
2. Indoor Air Quality & Thermal Comfort (14)										
	EQ2.0A	Minimum HVAC and Construction IEQ Requirements	Req	Req		T	A	CD		T
	EQ2.0B	ASHRAE 55 Thermal Comfort Code Compliance	Req	Req		T	A	CD		
	EQ2.0C	Minimum Low Emitting Materials Requirements	Req	Req		T		CD		T
	EQ2.1	Enhanced Filtration	1-2	2		T		CD		T
	EQ2.2	Low-Emitting Materials	1-4	4		T		CD		T
	EQ2.3	Ducted Returns	1	-		T		CD		T
	EQ2.4	Thermal Displacement Ventilation	2	2		T		CD		T
	EQ2.5	Controllability of Systems	1	1		T		CD		T
	EQ2.6	Chemical, Pollutant and Exposure Control	1-3	2		T		CD		T
	EQ2.7	Mercury Reduction	1	1		T	A	CD		
3. Acoustics (4)										
	EQ3.0	Minimum Acoustical Performance	Req	Req		T	A	CD		
	EQ3.1	Improved Acoustical Performance	1-4	3		T		CD		T
TOTAL 70										

CODE ANALYSIS

APPLICABLE CODES

Effective January 1, 2009 - All Public School Construction projects shall be approved only under the following codes:

International Building Code - 2006 Edition, Third Printing: March 2007 (Copyright 2006 by International Code Council, Inc. - Washington, D.C.)

International Fire Code - 2006 Edition, Third Printing: April 2007 (Copyright 2006 by International Code Council, Inc. - Washington, D.C.), including Appendices B and C.

International Mechanical Code - 2006 Edition, Second Printing: December 2007 (Copyright 2006 by International Code Council, Inc. - Washington, D.C.)

International Energy Conservation Code - 2006 Edition, First Printing: January 2007 (Copyright 2006 by International Code Council, Inc. - Washington, D.C.)

http://dfs.state.co.us/Schools/School_FAQ.htm

International Fuel Gas Code (IFGC) 2006 Edition
National Electrical Code, 2008 Edition
Appendix Chapter 29, IBC, 2006 Edition for plumbing fixture counts

Applicable Standards
Accessibility Standards per Chapter 11, IBC 2003 Edition
Accessibility Standards per ANSI A117.1, 2003 Edition

SALIDA ELEMENTARY SCHOOL SALIDA, COLORADO

PRIMARY PROJECT DATA:

The scope of this project includes a 54,353 square foot new elementary school in Salida, Colorado. The school will have 18 classrooms, which includes an art room, a music room, a computer room, and program classrooms. The school will have a media center, cafeteria/commons with kitchen, gymnasium, and administrative offices.

General Building Information:

Total New Building Area:	54,353 GSF
• First floor area:	38,355 GSF*
• Second floor:	14,798 GSF
	*(Includes Add-Alternate Kindergarten Classroom)

Building height: Two stories, 30 feet.

Construction Type: Type II B

Occupancy Type: Group E, A-2 (Cafeteria) & A-3 (Gymnasium)

Fire Protection: Fully-sprinkled.

USE AND OCCUPANCY CLASSIFICATION (CHAPTER 3) & SECTION 508

Section 302.1 General. A room or space that is intended to be occupied at different times for different purposes shall comply with all of the requirements that are applicable to each of the purposes for which the room or space will be occupied.

Section 305.1 Educational Group E. Educational Group E occupancies shall include educational use of structures or buildings or parts thereof by six or more persons through the 12th grade. The use of a building for education, supervision or personal care for more than 5 children older than 2 ½ years of age shall be classified as E Occupancy.

Section 508.2, Table 508.2 Incidental Uses.
The following spaces are considered incidental to the main occupancy and require a smoke partition*: Storage Rooms and Laundry rooms over 100 SF.

***Section 508.2.2.1. Construction.**
Where Table 508.2 permits an automatic fire-extinguishing system without a fire barrier, the incidental use area shall be separated from the remainder of the building by construction capable of resisting the passage of smoke. The partitions shall extend from the floor to the underside of the fire-resistance-rated floor/ceiling assembly or fire-resistance-rated roof/ceiling assembly above or to the underside of the floor or roof sheathing, or sub deck above. Doors shall be self- or automatic closing upon detection of smoke in accordance with Section 715.4.7.3. Doors shall not have air transfer openings and shall not be undercut in excess of the clearance permitted in accordance with NFPA 80.

Section 508.3. Mixed Occupancies. Each portion of a building shall be individually classified in accordance with Section 302.1. Where a building contains more than one occupancy group, the building or portion thereof shall comply with Sections 508.3.1, 508.3.2, 508.3.3 or a combination of these sections.

Section 508.3.2., Table 508.3.3 Nonseparated occupancies.
Occupancies A & E = No separation required. (In Assembly occupancies, the commercial kitchens need not be separated from the restaurant seating areas that they serve.)

SPECIAL USE AND OCCUPANCY (CHAPTER 4)

Section 410.3 Stages and Platforms. The music room doubles as a platform for school performances. The raised area does not have overhead curtains, drops or scenery. Per 410.4, platform construction can be constructed from fire retardant treated wood for Type II construction if the platform is no more than 30 inches above the main floor and not more than one third the room floor areas. If the space under the platform is used for storage or anything other than wiring and plumbing, construction shall be not less than one hour fire resistant.

GENERAL BUILDING HEIGHTS AND AREAS (CHAPTER 5)

Table 503 & Section 504 Building Height
Allowable height for Type II-B construction with E occupancy, A-2 occupancy & A-3 occupancy is 2 stories, maximum 55 feet.

In addition to an allowable increase for floor area, its allowable height increases by one story and an additional 20 feet (Section 504.2).

Table 503 & Sections 504, 505, 506 Allowable Floor Area
Maximum allowable floor area for Type II-B construction with E occupancy is 14,500 square feet per floor (Table 503).

Maximum allowable floor area for Type II-B construction with A-2 or A-3 occupancy is 9,500 square feet per floor (Table 503).

Maximum Allowable Area Increase:
The new school is allowed both a frontage increase (where a building has more than 25% of its perimeter on a public way or open space having a minimum width of 20 feet) and an automatic sprinkler system increase, realized to increase the allowable area as follows:

Frontage Increase Formula. $I_f = 100(F/P - 0.25)W/30$ where:

I_f = Area increase due to frontage
 F = Building perimeter fronting a min. 20' wide public way or open space = 100%
 P = Perimeter of entire building = 100%
 W = Min. width of public way or open space

$I_f = 100((1642/1642) - 0.25)(25/25)$
 $I_f = 100(1 - 0.25)(1) = .75$

Allowable Area Increase Formula. $A_a = A_t + (A_t I_f / 100) + (A_t I_s / 100)$ where:

A_a = Allowable area per floor (SF)
 A_t = Allowable area per floor per Table 503
 I_f = Area increase due to frontage (75%)
 I_s = Area increase due to sprinkler protection (200%)

New Group E = Actual 42,388 SF; Allowable = 14,500 SF

$A_a = 14,500 + (14,500)(75)/100 + (14,500)(200)/100 =$
 $A_a = 14,500 + 10,875 + 29,000 = 54,375$ sf
 $A_a = 54,375$ max SF per floor

New Group A-2 Cafeteria = 2,480 SF < 9,500 SF allowable

New A-3 Gymnasium = 4,982 SF < 9,500 SF allowable

New A-3 Media Center = 2,405 SF < 9,500 SF allowable

TYPES OF CONSTRUCTION (CHAPTER 6)

Type II is construction in which the building elements listed in Table 601 are of noncombustible materials.

Table 601. Using a Type II B construction type the fire-resistant rating requirements for building elements are as follows:

Structural frame: 0 hours
Bearing walls - exterior: 0 hours
Bearing walls - interior: 0 hours
Nonbearing walls - interior: 0 hours
Floor construction: 0 hours
Roof construction: 0 hours

Table 602. Using a Type II B construction type the fire-resistant rating requirements for exterior walls based on fire separation distance.

Group A & E Occupancy: $X < 5 = 1$ hour, $5 \leq X < 10 = 1$ hour, $10 \leq X < 30 = 0$ hours, $X \geq 30 = 0$ hours

Section 603.1. Combustible materials shall be permitted in buildings of Type II construction in the following applications:

- Fire retardant treated wood - non bearing partitions where the required FR rating is 2 hrs or less, non-bearing exterior walls where no fire rating is required, and roof construction, including girders, trusses, framing and decking and as permitted in Table 601. (In Type II – Table 601 has 0 hr rating.)
- Foam plastics in accordance with Chapter 26.
- Roof coverings that have A,B, and C classifications.
- Heavy timber as permitted by Note d to Table 601 and Sections 602.4.7 and 1406.3

Refer to Section 603 for other permitted construction.

FIRE-RESISTANT-RATED CONSTRUCTION (CHAPTER 7)

Section 704 Exterior Walls. Projections shall be constructed of noncombustible materials except as allowed for balconies, porches, decks, exterior stairways not used as required exits, and pickets and rails or similar guard devices no more than 42 inches in height (Section 1406.3, Exceptions 1 & 2).

Exterior walls shall be fire resistant rated per Tables 601 and 602 (in this case 0 Hours). Walls that have a fire separation greater than 5 feet shall be rated for exposure to fire from the inside. Walls that have a fire resistance rating less than 5 feet shall be rated for exposure to fire from both sides.

Section 704.8 Allowable area of openings. The maximum area of unprotected or protected openings permitted in an exterior wall in any story shall not exceed the values set forth in Table 704.8.

In buildings equipped with an automatic sprinkler system in accordance with 903.3.1.1, the maximum allowable area of unprotected openings for A & E occupancy shall be the same as the tabulated limitations for protected openings which for distances 30 feet or greater is unlimited. (Sec. 704.8.1)

In occupancies other than Group H, unlimited unprotected openings are permitted in the exterior walls of the first story above grade facing a street that have a fire separation distance of greater than 15 feet or facing an unoccupied space. The unoccupied space shall be on the same lot or dedicated for public use, shall not be less than 30 feet in width and shall have access from a street by a posted fire lane in accordance with the International Fire Code (Section 704.8.2).

Parapets at exterior walls are not required where the exterior wall is not required to be rated which in A & E occupancy, Type II B is where the fire separation distance greater than 10 feet or provided the roof is constructed entirely of noncombustible materials (Section 704.11, Exception 1 and 3).

Section 707 Shaft Enclosures. Openings through a floor/ceiling assembly shall be protected by a shaft enclosure complying with Section 707.

Exceptions:

3. A shaft enclosure is not required for penetrations by pipe tube, wire, cable and vents protected in accordance with 712.4.

11. A shaft enclosure shall not be required for floor openings created by unenclosed stairs or ramps in accordance with Exception 8 or 9 in Section 1020.1

Section 710 Smoke Partitions. Smoke partitions shall extend from the top of the foundation or floor below to the underside of the floor or roof sheathing, deck or slab above or to the underside of the ceiling above where the ceiling membrane is constructed to limit the transfer of smoke (710.4).

The space around a duct penetrating a smoke partition shall be filled with an approved material to limit the free passage of smoke (710.7).

Section 717 Concealed Spaces. Draft stops are not required in concealed roof spaces in buildings equipped throughout with an automatic sprinkler system (Exception to Section 717.4.3).

INTERIOR FINISHES (CHAPTER 8)

Table 803.5, interior wall and ceiling finish requirements for:

Group A-2 & A-3 occupancy / sprinklered.
 Vertical exit or exit passageways: Class B
 Exit access corridors: Class B
 Rooms and enclosed spaces: Class C

Group E occupancy / sprinklered.
 Vertical exit or exit passageways: Class B
 Exit access corridors: Class C
 Rooms and enclosed spaces: Class C

FIRE PROTECTION SYSTEMS (CHAPTER 9)

Section 903 Automatic sprinkler system. Where fire areas in A-2 occupancy buildings with an occupant load of 100 or more, an Automatic Fire-Extinguishing system is required. (903.2.1.2.2)

Where fire areas in A-3 occupancy building with an occupant load of 300 or more, an Automatic Fire-Extinguishing system is required. (903.2.1.3.2)

Where fire areas in E occupancy buildings are greater than 20,000 square feet, an Automatic Fire-Extinguishing System is required as well as throughout every portion of educational buildings below the level of discharge unless every classroom below the level of discharge has a least one exit door at ground level. Such systems shall be electronically supervised, signaled and alarmed (Section 903.2.2).

Section 906 Portable fire extinguishers. Portable fire extinguishers will be provided per International Fire Code and Fire Marshall Requirements (Section 906). Per IFC Section 906 requirements fire extinguishers shall be provided with no more than a 75 foot travel distance from any point in the building.

Section 907 Fire alarm and detection systems. An approved fire alarm system (manual, automatic, or manual and automatic) shall be provided in new buildings in accordance with Sections 907.2.0 through 907.2.23 and provide occupant notification in accordance with Section 907.9, unless other requirements are provided by another section of this code.

Where automatic sprinkler protection is provided and connected to the building alarm system, automatic heat detection shall not be required (Section 907.2).

A manual fire alarm system shall be installed in Group A occupancies having an occupant load of 300 or more. However, manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system and the alarm notification appliances will activate upon sprinkler water flow (Section 907.2.1).

A manual fire alarm system shall be installed in Group E occupancies. When automatic sprinkler systems or smoke detectors are installed, such systems or detectors shall be connected to the building fire alarm system. However, manual fire alarm boxes shall not be required in Group E occupancies where the building is equipped throughout with an approved automatic sprinkler system, the notification appliances will activate on sprinkler water flow and manual activation is provided from a normally occupied location (Section 907.2.3 & Section 907.2.3.3).

MEANS OF EGRESS (CHAPTER 10)

Section 1004 Occupant Load.	
First Floor Occupant Load (4 round school)	615
<u>Second Floor Occupant Load (4 round school)</u>	<u>315</u>
Total Daytime Occupant Load (4 round school)	930

Section 1005.1 Egress width. Stairways shall use a factor of 0.2, other egress components shall use a factor of 0.15 for determining the minimum required egress width. Table 1005.1.

Section 1007 Accessible means of egress. An accessible means of egress will be provided from accessible spaces and two accessible means of egress will be provided from spaces requiring more than one means of egress. (Section 1007.1)

Each accessible means of egress shall be continuous to a public way. (Section 1007.2)

Open exit stairways as permitted by Section 1020.1 are permitted to be considered part of an accessible means of egress: Interior egress stairways serving only the first and second stories of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 are not required to be enclosed, provided at least two means of egress are provided from both floors served by the unenclosed stairways. Such interconnected stories shall not be open to other stories. Unenclosed exit stairways, shall be remotely located as required in Section 1015.2 (1020.1.9).

The area of refuge is not required at open stairways that are permitted by Section 1020.1 in buildings that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 (Section 1007.3, Exception 2). Every required area of refuge shall be accessible from the space it serves by an accessible means of egress. The maximum travel distance from any accessible space to an area of refuge shall not exceed 250 feet for Group A & E occupancies with an automatic sprinkler system (1007.6).

The clear width of 48 inches between handrails and the area of refuge is not required at exit stairways in buildings that are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2. (Section 1007.3, Exception 3).

CODE ANALYSIS

Section 1008 Doors. Minimum clear width of exit doors shall be 32" (Section 1008.1.1).

Door shall swing in the direction of travel when serving an occupant load of 50 or more (Section 1008.1.2). Each door in a means of egress in Group A or E occupancy buildings having an occupant load of 50 or more shall not latch or lock unless it is part of the door's panic or fire exit hardware (Section 1008.1.9).

Section 1014 Exit Access. Egress from a room or space shall not pass through adjoining or intervening room or areas, except where such adjoining rooms or areas are accessory to the area served. Egress shall not pass through storage rooms, closets or similar spaces. (Sec. 1014.2).

In Group A or E occupancies, common path of egress travel shall not exceed 75 feet (Section 1014.3)

Section 1015 Exit Access Doorways. Two exits from any space shall be provided when:

- The maximum occupancy load exceeds 50 in Group A or E occupancies (Table 1015.1);
- The common path of travel exceeds 75 feet;
- Boiler or furnace room areas exceed 500 SF and any fuel-fired equipment exceeds 400,000 Btu input capacity (Section 1015.3).

Section 1016 Exit Access Travel Distance. In Group A or E occupancies with sprinklers, the maximum travel distance to an exit entrance is 250 feet. (Table 1016.1).

Section 1017 Corridors. Corridors in Group A or E occupancy buildings protected throughout by an approved sprinkler system and serving an occupant load greater than 30 are not required to be fire resistance rated. (Table 1017.1).

Corridors in Group E occupancies serving an occupant load of 100 or more shall be minimum 72 inches wide (Section 1017.2, Exception 4).

Where more than one exit or exit access doorway is required, the exit access shall be arranged such that there are no dead ends in corridors more than 20 feet in length (Section 1017.3).

Corridors shall not serve as supply, return, exhaust, relief, or ventilation air ducts (Sec. 1017.4). Use of space between the corridor ceiling and the floor or roof structure above as a return air plenum is permitted for one or more of the following conditions: 1. The corridor is not required to be of fire-resistance-rated construction (1017.4.1 Exception 1).

Rated corridors shall be continuous from point of entry to an exit and may not be interrupted by intervening rooms unless such foyers, lobbies or reception rooms/areas are constructed as required for corridors (Exception to Section 1017.5).

Section 1019 Number of Exits. The minimum number of exits for an occupant load of 1 to 500 shall be 2 and from 500-1000 shall be 3. (Table 1019.1).

Exits shall be continuous from the point of entry to the exit discharge (Section 1019.3).

Section 1020 Vertical exit enclosures. Group E occupancy, interior egress stairways serving only the first and second stories of a building equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 are not required to be enclosed, provided at least two means of egress are provided from both floor served by the unenclosed stairways. (Section 1020.1, Exception 9)

ACCESSIBILITY (CHAPTER 11)

Section 1101.2 Design. Buildings and facilities shall be designed and constructed to be accessible in accordance with this code and ICC A117.1

Section 1103.1 Where required. Sites, buildings, structures, facilities, elements and spaces, temporary or permanent, shall be accessible to persons with physical disabilities.

Section 1104.4 Multilevel buildings and facilities. At least one accessible route shall connect each accessible level, including mezzanines, in multilevel buildings.

Section 1105.1 Public Entrances. At least 60 percent of all public entrances shall be accessible.

Section 1109.2 Toilet and bathing facilities. Toilet rooms and bathing facilities shall be accessible. Accessible signage shall meet the requirements of Section 1110.

INTERIOR ENVIRONMENT (CHAPTER 12)

Ventilation shall meet the requirements of Section 1203.

Temperature control shall meet the requirements of Section 1204.

Lighting shall meet the requirements of Section 1205.

Sound transmission shall meet the requirements of Section 1207.

Surrounding materials shall meet the requirements of Section 1210.

ROOF ASSEMBLIES (CHAPTER 15)

Section 1505 Fire Classification. Roofs on Type II-B construction shall have a minimum of Class C roofing (Table 1505.1).

PLUMBING SYSTEMS (CHAPTER 29)

Toilet fixture counts calculated for Columbine Elementary School.

First Floor Occupant Load (4 round school)	615
Second Floor Occupant Load (4 round school)	315
Total Education Occupant Load (4 round school)	930
Gymnasium (Standing)	500 (capped max)
Music Room	52
Cafeteria (Seating layout)	160
Media	30
Total Assembly Occupant Load	844

Table 2902.1 requirements for E occupancy group:

- Water closets: 1 per 50
- Lavatories: 1 per 50
- Drinking fountains: 1 per 100

Required total fixture count E occupancy (Daytime Use):

- 465 males = (10) water closets, (10) lavatories.
- 465 female = (10) water closets, (10) lavatories.
- (10) drinking fountains.

Provided total fixture count E occupancy (Daytime Use):

- Male = (9) water closets, (7) lavatories.
- Female = (10) water closets, (8) lavatories.
- Unisex = (11) water closets, (11) lavatories.
- (4) drinking fountains plus bubbler at each classroom sink for total of 25

For After-Hours use, the occupant load is capped at 500, and only the center block of restrooms adjacent to the Gym and Commons will be available for public use. In the event that there is a function with more, additional Unisex (Staff) restrooms on the first floor will be made available for public use to meet additional occupant load.

Required total fixture count A-3 occupancy (After-Hours Use):

- 250 males = (2) water closets, (2) lavatories.
- 250 female = (4) water closets, (2) lavatories.
- (1) drinking fountain.

Provided total fixture count A-3 occupancy (After-Hours Use):

- Male = (3) water closets, (2) lavatories.
- Female = (4) water closets, (2) lavatories.
- (2) drinking fountains.

SCOPING / SPECIFICATION CHECKLIST



Date: March 22, 2013
Name: Schematic Design Scoping Checklist
Project No: 1290.00
Project: Salida Elementary School
Project Phase: Schematic Design

Scoping Checklist:

A scoping checklist is a tool that helps the entire Design and Pre-Construction team to communicate and verify that all of the known scope for the project is identified by the Design Team such that the Pre-Construction (estimating) Team can ensure that the SD pricing is as complete as possible and that scope is not forgotten. It also allows the Design Development outline specification effort to proceed in a timelier manner as we begin the next Design Phase.

A - SUBSTRUCTURE

A10 - FOUNDATIONS

<input checked="" type="checkbox"/>	A1010	STANDARD FOUNDATIONS	
<input checked="" type="checkbox"/>	A1010.01	Wall Foundations	
<input checked="" type="checkbox"/>		Continuous Footings	
<input checked="" type="checkbox"/>		Foundation Walls	
<input checked="" type="checkbox"/>	A1010.02	Column Foundations	
<input checked="" type="checkbox"/>		Spread Footings	
<input type="checkbox"/>		Cast-in-place Concrete Pile Caps	
<input type="checkbox"/>		Cast-in-place Concrete Piers	
<input type="checkbox"/>	A1020	SPECIAL FOUNDATIONS	
<input type="checkbox"/>	A1020.01	Driven Piles Composite Piles	
<input type="checkbox"/>	A1020.02	Bored/Augured Piles	
<input type="checkbox"/>	A1020.03	Underpinning	
<input type="checkbox"/>	A1020.04	Dewatering	
<input type="checkbox"/>	A1020.05	Raft Foundations	
<input type="checkbox"/>	A1020.06	Cofferdams	
<input type="checkbox"/>	A1020.07	Grade Beams	
<input checked="" type="checkbox"/>	A1030	SLAB ON GRADE	
<input checked="" type="checkbox"/>	A1030.01	Standard Slabs on Grade	
<input type="checkbox"/>	A1030.02	Structural Slabs on Grade	
<input type="checkbox"/>	A1030.03	Inclined Slabs on Grade	
<input type="checkbox"/>	A1030.04	Trenches	
<input checked="" type="checkbox"/>	A1030.05	Pits and Bases	
<input type="checkbox"/>	A1030.06	Subdrainage Systems	
<input type="checkbox"/>	A1030.07	Perimeter Insulation	
<input type="checkbox"/>	A1030.08	Other Slabs on Grade	

PROJECT SCOPING

A20 - BASEMENT CONSTRUCTION

B - SUPERSTRUCTURE

B10 - SUPERSTRUCTURE

<input type="checkbox"/>	B1010	FLOOR CONSTRUCTION	
<input checked="" type="checkbox"/>	B1010.01	Floor Structural Frame	
<input checked="" type="checkbox"/>		Columns Supporting Floors	
<input checked="" type="checkbox"/>		Floor Girders and Beams	
<input type="checkbox"/>		Floor Trusses	
<input checked="" type="checkbox"/>		Floor Joists	
<input type="checkbox"/>		Expansion Control	
<input type="checkbox"/>	B1010.02	Structural Interior Walls Supporting Floors	
<input checked="" type="checkbox"/>	B1010.03	Floor Decks, Slabs and Toppings	
<input type="checkbox"/>	B1010.04	Balcony Floor Construction	
<input type="checkbox"/>	B1010.05	Mezzanine Construction	
<input type="checkbox"/>	B1010.06	Ramps	
<input type="checkbox"/>	B1010.07	Exterior Stairs	
<input type="checkbox"/>	B1010.08	Vapor Retarders, Air Barriers and Insulation	
<input type="checkbox"/>		Vapor Retarders	
<input type="checkbox"/>		Air Barriers	
<input type="checkbox"/>		Building Insulation	
<input type="checkbox"/>	B1010.09	Floor Construction Fireproofing	
<input type="checkbox"/>	B1010.10	Floor Construction Firestopping	
<input type="checkbox"/>	B1010.11	Other Floor Construction	
<input checked="" type="checkbox"/>	B1020	ROOF CONSTRUCTION	
<input checked="" type="checkbox"/>	B1020.01	Roof Structural Frame	
<input checked="" type="checkbox"/>		Columns Supporting Roofs	
<input checked="" type="checkbox"/>		Roof Girders and Beams	
<input type="checkbox"/>		Roof Trusses	
<input checked="" type="checkbox"/>		Roof Joists	
<input type="checkbox"/>		Expansion Control	
<input checked="" type="checkbox"/>	B1020.02	Structural Interior Walls Supporting Roofs	
<input checked="" type="checkbox"/>	B1020.03	Roof Decks, Slabs, and Sheathing	
<input type="checkbox"/>	B1020.04	Canopies	
<input type="checkbox"/>	B1020.05	Vapor Retarders, Air Barriers and Insulation	

PROJECT SCOPING

<input checked="" type="checkbox"/>		Vapor Retarders	sub-slab
<input type="checkbox"/>		Air Barriers	
<input checked="" type="checkbox"/>		Building Insulation	Spray applied on backside of thermax sheathing- see narrative Also rigid beneath heated slabs-on-grade, per mech narrative
<input type="checkbox"/>	B1020.06	Roof Construction Fireproofing	
<input type="checkbox"/>	B1020.07	Roof Construction Firestopping	
<input type="checkbox"/>	B1020.08	Other Roof Construction	

B20 - EXTERIOR ENCLOSURE

<input checked="" type="checkbox"/>	B2010	EXTERIOR WALLS	
<input checked="" type="checkbox"/>	B2010.01	Exterior Wall Exterior Skin	
<input checked="" type="checkbox"/>		Precast Concrete	Sills at brick veneer below windows
<input checked="" type="checkbox"/>		Masonry Units	Brick Veneer
<input checked="" type="checkbox"/>		Stone Assemblies	Stone Veneer
<input type="checkbox"/>		Simulated Masonry	
<input type="checkbox"/>		EIFS	
<input checked="" type="checkbox"/>		Siding Panels	Pre-finished SM Siding panels
<input type="checkbox"/>		Faced Panels	
<input type="checkbox"/>		Portland Cement Plaster	
<input type="checkbox"/>		Expansion Control	
<input checked="" type="checkbox"/>		Water Repellents	
<input checked="" type="checkbox"/>		Joint Sealers	
<input checked="" type="checkbox"/>		High Performance Coatings	
<input checked="" type="checkbox"/>		Paints	
<input checked="" type="checkbox"/>	B2010.02	Exterior Wall Construction	
<input type="checkbox"/>		Cast-in-place Concrete	
<input type="checkbox"/>		Precast Concrete	
<input checked="" type="checkbox"/>		Masonry Units	CMU at bearing walls
<input type="checkbox"/>		Load-bearing Metal Studs	
<input checked="" type="checkbox"/>		Wood Framing	Glulams
<input type="checkbox"/>		Expansion Control	
<input checked="" type="checkbox"/>	B2010.03	Vapor Retarder, Air Barriers and Insulation	
<input checked="" type="checkbox"/>		Vapor Barriers	
<input type="checkbox"/>		Air Barriers	
<input checked="" type="checkbox"/>		Building Insulation	perimeter and below first floor SOG (radiant slab)
<input type="checkbox"/>	B2010.04	Exterior Wall Interior Skin	

PROJECT SCOPING

<input checked="" type="checkbox"/>	B2010.05	Parapets	
<input checked="" type="checkbox"/>	B2010.06	Exterior Louvers, Grilles and Screens	
<input checked="" type="checkbox"/>	B2010.07	Exterior Protection Devices for Openings	
<input type="checkbox"/>	B2010.08	Exterior Balcony Walls and Railings	
<input checked="" type="checkbox"/>	B2010.09	Exterior Soffits	
<input type="checkbox"/>	B2010.10	Other Exterior Walls	
<input checked="" type="checkbox"/>	B2020	EXTERIOR WINDOWS	
<input checked="" type="checkbox"/>	B2010.01	Exterior Standard Windows	
<input checked="" type="checkbox"/>	B2010.02	Storefronts	
<input checked="" type="checkbox"/>	B2010.03	Glazed Curtainwall	
<input type="checkbox"/>	B2010.04	Other Exterior Windows	
<input checked="" type="checkbox"/>	B2030	EXTERIOR DOORS	
<input checked="" type="checkbox"/>	B2030.01	Exterior Entrance Doors	
<input checked="" type="checkbox"/>	B2030.02	Exterior Utility Doors	
<input checked="" type="checkbox"/>	B2030.03	Glazed Curtain Wall	
<input type="checkbox"/>	B2030.04	Large Exterior Special Doors	
<input type="checkbox"/>	B2030.05	Exterior Gates	
<input type="checkbox"/>	B2030.06	Other Exterior Doors	

B30 - ROOFING

<input checked="" type="checkbox"/>	B3010	ROOF COVERINGS	
<input type="checkbox"/>	B3010.01	Deck Vapor Retarder and Insulation	
<input type="checkbox"/>		Lightweight Insulating Concrete	
<input type="checkbox"/>		Vapor Retarders	
<input checked="" type="checkbox"/>		Roof and Deck Insulation	5" Polyiso- (2) layers 2 1/2" w/ staggered joints
<input type="checkbox"/>	B3010.02	Shingles and Roofing Tiles	
<input type="checkbox"/>	B3010.03	Manufactured Roofing	
<input checked="" type="checkbox"/>	B3010.04	Membrane Roofing	White Duro-last or TPO, 60 mil
<input type="checkbox"/>	B3010.05	Traffic Coatings	
<input type="checkbox"/>	B3010.06	Horizontal Waterproofing	
<input checked="" type="checkbox"/>	B3010.07	Sheet Metal Roofing	Standing Seam over LMC, Main Lobby and Commons
<input checked="" type="checkbox"/>	B3010.08	Flashing and Sheet Metal	
<input checked="" type="checkbox"/>		Sheet Metal Flashing and Trim	
<input checked="" type="checkbox"/>		Metal Gutters and Downspouts	
<input checked="" type="checkbox"/>		Joint Sealers	
<input checked="" type="checkbox"/>	B3010.09	Roof Specialties and Accessories	Walkway pads to all roof mech units/ (2) roof hatches
<input type="checkbox"/>		Manufactured Roof Specialties	

PROJECT SCOPING

<input checked="" type="checkbox"/>		Roof Accessories	
<input type="checkbox"/>	B3010.10	Manufactured Exterior Specialties	
<input type="checkbox"/>	B3020	ROOF OPENINGS	
<input checked="" type="checkbox"/>	B3020.01	Skylights	
<input checked="" type="checkbox"/>		Unit Skylights	Solatubes at Gym
<input type="checkbox"/>		Metal Framed Skylight	
<input type="checkbox"/>	B3020.02	Other Roof Openings	

C - INTERIORS

C10 - INTERIOR CONSTRUCTION

<input checked="" type="checkbox"/>	C1010	PARTITIONS	
<input checked="" type="checkbox"/>	C1010.01	Interior Fixed Partitions	
<input type="checkbox"/>	C1010.02	Interior Demountable Partitions	
<input checked="" type="checkbox"/>	C1010.03	Interior Operable Partitions Folding Panel Partitions	STC 55 or better at (2) locations- Music and Commons
<input checked="" type="checkbox"/>	C1010.04	Interior Balustrades, and Screens, Interior Railings	
<input checked="" type="checkbox"/>	C1010.05	Interior Windows	
<input type="checkbox"/>	C1010.06	Interior Glazed Partitions and Storefront	
<input type="checkbox"/>	C1010.07	Interior Partition Firestopping	
<input type="checkbox"/>	C1010.08	Other Partitions	
<input checked="" type="checkbox"/>	C1020	INTERIOR DOORS	
<input checked="" type="checkbox"/>	C1020.01	Interior Swinging Doors	
<input type="checkbox"/>	C1020.02	Interior Entrance Doors	
<input type="checkbox"/>	C1020.03	Interior Fire Doors	
<input type="checkbox"/>	C1020.04	Interior Sliding and Folding Doors	
<input type="checkbox"/>	C1020.05	Interior Large Doors	
<input type="checkbox"/>	C1020.06	Interior Gates	
<input type="checkbox"/>	C1020.07	Other Interior Doors	
<input checked="" type="checkbox"/>	C1030	FITTINGS	
<input checked="" type="checkbox"/>	C1030.01	Visual Display Boards	
<input checked="" type="checkbox"/>	C1030.02	Fabricated Compartments and Cubicles	
<input checked="" type="checkbox"/>	C1030.03	Interior Louvers and Vents	
<input type="checkbox"/>	C1030.04	Service Walls	
<input type="checkbox"/>	C1030.05	Wall and Corner Guards	
<input checked="" type="checkbox"/>	C1030.06	Handrails	
<input type="checkbox"/>	C1030.07	Fireplace and Stoves	

PROJECT SCOPING

<input checked="" type="checkbox"/>	C1030.08	Interior Identifying Devices	
<input type="checkbox"/>	C1030.09	Pedestrian Control Devices	
<input type="checkbox"/>	C1030.10	Lockers	
<input type="checkbox"/>	C1030.11	Postal Boxes and Chutes	
<input checked="" type="checkbox"/>	C1030.12	Storage Shelving	Custodial closets/ Resource Room(s)
<input type="checkbox"/>	C1030.13	Telephone Specialties	
<input checked="" type="checkbox"/>	C1030.14	Toilet, Bath and Laundry Accessories	
<input type="checkbox"/>	C1030.15	Scales	
<input checked="" type="checkbox"/>	C1030.16	Wardrobe and Closet Specialties	and/ or millwork
<input type="checkbox"/>	C1030.17	Other Fittings	

C20 - STAIRS

<input checked="" type="checkbox"/>	C2010	STAIR CONSTRUCTION	
<input type="checkbox"/>	C2010.01	Cast in Place Concrete Stairs	
<input type="checkbox"/>	C2010.02	Precast Concrete Stairs	
<input checked="" type="checkbox"/>	C2010.03	Metal Stair Construction	
<input type="checkbox"/>	C2010.04	Wood Stair Construction	
<input type="checkbox"/>	C2010.05	Other Stair Construction	
<input checked="" type="checkbox"/>	C2020	STAIR FINISHES	
<input checked="" type="checkbox"/>	C2020.01	Tile Stair Finishes	Tile treads at main (center) stair in Lobby
<input type="checkbox"/>	C2020.02	Terrazzo Stair Finishes	
<input type="checkbox"/>	C2020.03	Stone Stair Finishes	
<input type="checkbox"/>	C2020.04	Unit Masonry Stair Finishes	
<input type="checkbox"/>	C2020.05	Resilient Stair Finishes	
<input type="checkbox"/>	C2020.06	Carpet Stair Finishes	
<input type="checkbox"/>	C2020.07	Stair Treatment	
<input checked="" type="checkbox"/>	C2020.08	Stair Railings and Balustrades	
<input type="checkbox"/>	C2020.09	Stair Soffits	
<input type="checkbox"/>	C2020.10	Stair Painting	
<input checked="" type="checkbox"/>	C2020.11	Other Stair Finishes	Sealed concrete filled pans at west stair

C30 - INTERIOR FINISHES

<input checked="" type="checkbox"/>	C3010	WALL FINISHES	
<input type="checkbox"/>	C3010.01	Concrete Wall Finishes	
<input type="checkbox"/>	C3010.02	Wall Paneling	
<input type="checkbox"/>	C3010.03	Plaster Wall Finishes	
<input checked="" type="checkbox"/>	C3010.04	Gypsum Board Wall Finishes	

PROJECT SCOPING

<input type="checkbox"/>	C3010.05	Veneer Plaster Finishes	
<input checked="" type="checkbox"/>	C3010.06	Tile Wall Finishes	Restrooms
<input type="checkbox"/>	C3010.07	Terrazzo Wall Finishes	
<input type="checkbox"/>	C3010.08	Stone Wall Finishes	
<input checked="" type="checkbox"/>	C3010.09	Acoustical Wall Treatment	Music room, and possibly Gym and Commons
<input type="checkbox"/>	C3010.10	Wall Carpet	
<input checked="" type="checkbox"/>	C3010.11	Interior Wall Painting	
<input checked="" type="checkbox"/>	C3010.12	Wall Coverings	Self-healing tackable vinyl wallcoverings in classrooms and hallways (select locations)
<input type="checkbox"/>	C3010.13	Wall Trim and Decoration	
<input type="checkbox"/>	C3010.14	Other Wall Finishes	
<input checked="" type="checkbox"/>	C3020	FLOOR FINISHES	
<input checked="" type="checkbox"/>	C3020.01	Concrete Floor Finishes	
<input checked="" type="checkbox"/>	C3020.02	Tile Floor Finishes	Restrooms
<input type="checkbox"/>	C3020.03	Terrazzo Floor Finishes	
<input type="checkbox"/>	C3020.04	Wood Flooring	
<input type="checkbox"/>	C3020.05	Stone Flooring	
<input type="checkbox"/>	C3020.06	Unit Masonry Flooring	
<input checked="" type="checkbox"/>	C3020.07	Resilient Flooring	poured floor in Gym
<input checked="" type="checkbox"/>	C3020.08	Carpet Flooring	
<input type="checkbox"/>	C3020.09	Access Flooring	
<input type="checkbox"/>	C3020.10	Floor Treatment	
<input type="checkbox"/>	C3020.11	Floor Painting	
<input type="checkbox"/>	C3020.12	Floor Toppings	
<input type="checkbox"/>	C3020.13	Traffic Coating	
<input type="checkbox"/>	C3020.14	Other Floor Finishes	
<input checked="" type="checkbox"/>	C3030	CEILING FINISHES	
<input type="checkbox"/>	C3030.01	Concrete Ceiling Finishes	
<input type="checkbox"/>	C3030.02	Ceiling Paneling	
<input type="checkbox"/>	C3030.03	Plaster Ceiling Finishes	
<input checked="" type="checkbox"/>	C3030.04	Gypsum Board Ceiling Finishes	
<input type="checkbox"/>	C3030.05	Veneer Plaster Finishes	
<input checked="" type="checkbox"/>	C3030.06	Acoustical Ceiling Treatment	
<input checked="" type="checkbox"/>	C3030.07	Interior Ceiling Painting	
<input checked="" type="checkbox"/>	C3030.08	Ceiling Trim and Decoration	
<input type="checkbox"/>	C3030.09	Other Ceiling Finishes	

PROJECT SCOPING

D - SERVICES

D10 - CONVEYING

<input checked="" type="checkbox"/>	D1010	ELEVATORS	
<input checked="" type="checkbox"/>	D1010.01	Elevators	
<input type="checkbox"/>	D1010.02	Lifts	
<input type="checkbox"/>	D1020	ESCALATORS AND MOVING WALKS	
<input type="checkbox"/>	D1020.01	Escalators	
<input type="checkbox"/>	D1020.02	Moving Walks	
<input type="checkbox"/>	D1090	OTHER CONVEYING SYSTEMS	
<input type="checkbox"/>	D1090.01	Dumbwaiters	
<input type="checkbox"/>	D1090.02	Cranes	
<input type="checkbox"/>	D1090.03	Hoists	
<input type="checkbox"/>	D1090.04	Conveyors	
<input type="checkbox"/>	D1090.05	Turntables	
<input type="checkbox"/>	D1090.06	Baggage Conveying and Dispensing	
<input type="checkbox"/>	D1090.07	Operable Scaffolding	
<input type="checkbox"/>	D1090.08	Transportation Systems	

D20 - PLUMBING

<input checked="" type="checkbox"/>	D2010	PLUMBING FIXTURES	
<input checked="" type="checkbox"/>	D2010.01	Water Closets	
<input checked="" type="checkbox"/>	D2010.02	Urinals	
<input checked="" type="checkbox"/>	D2010.03	Lavatories	
<input checked="" type="checkbox"/>	D2010.04	Sinks	
<input type="checkbox"/>	D2010.05	Showers	
<input type="checkbox"/>	D2010.06	Bathtubs	
<input type="checkbox"/>	D2010.07	Basins	
<input checked="" type="checkbox"/>	D2010.08	Drinking Fountains/Coolers	
<input type="checkbox"/>	D2010.09	Other Plumbing Fixtures	
<input checked="" type="checkbox"/>	D2020	DOMESTIC WATER DISTRIBUTION	
<input type="checkbox"/>	D2020.01	Water Supply Piping System	
<input type="checkbox"/>	D2020.02	Water Supply Equipment	
<input type="checkbox"/>	D2020.03	Water Supply Insulation	
<input checked="" type="checkbox"/>	D2030	SANITARY WASTE	
<input type="checkbox"/>	D2030.01	Waste and Vent Piping	

PROJECT SCOPING

<input type="checkbox"/>	D2030.02	Waste Piping Specialties	
<input type="checkbox"/>	D2030.03	Waste Piping Equipment	
<input type="checkbox"/>	D2030.04	Waste Piping Insulation	
<input checked="" type="checkbox"/>	D2040	RAIN WATER DRAINAGE	
<input type="checkbox"/>	D2040.01	Rain Water Drainage Piping Systems	
<input type="checkbox"/>	D2030.02	Rain Water Drainage Specialties	
<input type="checkbox"/>	D2030.03	Rain Water Drainage Insulation	
<input checked="" type="checkbox"/>	D2090	OTHER PLUMBING SYSTEMS	
<input type="checkbox"/>	D2090.01	Compressed Air Systems	
<input type="checkbox"/>	D2030.02	Deionized Water Systems	
<input type="checkbox"/>	D2030.03	Distilled Water Systems	
<input type="checkbox"/>	D2030.04	Fuel Oil Systems	
<input type="checkbox"/>	D2030.05	Gasoline Dispensing Systems	
<input type="checkbox"/>	D2030.06	Helium Gas Systems	
<input type="checkbox"/>	D2030.07	Liquified Petroleum Gas System	
<input type="checkbox"/>	D2030.08	Lubricating Oil System	
<input checked="" type="checkbox"/>	D2030.09	Natural Gas System	
<input type="checkbox"/>	D2030.10	Oxygen Gas System	
<input type="checkbox"/>	D2030.11	Reverse Osmosis Systems	
<input type="checkbox"/>	D2030.12	Vacuum Systems	
<input type="checkbox"/>	D2030.13	Acid Waste Systems	
<input type="checkbox"/>	D2030.14	Pool and Fountain Equipment	

D30 - HVAC

<input type="checkbox"/>	D3010	ENERGY SUPPLY	
<input type="checkbox"/>	D3010.01	Oil Supply Systems	
<input checked="" type="checkbox"/>	D3010.02	Gas Supply Systems	
<input type="checkbox"/>	D3010.03	Coal Supply Systems	
<input checked="" type="checkbox"/>	D3010.04	Steam, Hot and Chilled Water Supply System	
<input type="checkbox"/>	D3010.05	Solar and Wind Energy Equipment	
<input type="checkbox"/>	D3010.06	Other Energy Supply Systems	
<input checked="" type="checkbox"/>	D3020	HEAT GENERATION	
<input type="checkbox"/>	D3020.01	Steam Boilers	
<input checked="" type="checkbox"/>	D3020.02	Hot Water Boilers	
<input type="checkbox"/>	D3020.03	Furnaces	
<input type="checkbox"/>	D3020.04	Fuel-Fired Heaters	
<input type="checkbox"/>	D3020.05	Auxiliary Equipment	

PROJECT SCOPING

<input type="checkbox"/>	D3020.06	Other Heat Generation Systems	
<input checked="" type="checkbox"/>	D3030	REFRIGERATION	
<input type="checkbox"/>	D3030.01	Absorption Water Chillers	
<input type="checkbox"/>	D3030.02	Centrifugal Water Chillers	
<input type="checkbox"/>	D3030.03	Reciprocating Water Chillers	
<input type="checkbox"/>	D3030.04	Rotary-Screw Water Chillers	
<input type="checkbox"/>	D3030.05	Cooling Towers	
<input checked="" type="checkbox"/>	D3030.06	Refrigerant Compressors and Condensers	
<input type="checkbox"/>	D3030.07	Heat Pumps	
<input type="checkbox"/>	D3030.08	Other Refrigeration System	
<input type="checkbox"/>	D3040	HVAC DISTRIBUTION	
<input checked="" type="checkbox"/>	D3040.01	Air Distribution Systems	
<input type="checkbox"/>		Air Handling Units	
<input type="checkbox"/>		Fans	
<input type="checkbox"/>		Air Cleaning Devices	
<input type="checkbox"/>		Ducts	
<input type="checkbox"/>		Duct Accessories	
<input type="checkbox"/>		Air Terminal Units	
<input type="checkbox"/>		Air Outlets and Inlets	
<input type="checkbox"/>	D3040.02	Steam Distribution Systems	
<input checked="" type="checkbox"/>	D3040.03	Hydronic Distribution Systems	
<input type="checkbox"/>	D3040.04	Special Exhaust Systems	
<input type="checkbox"/>	D3040.05	Other HVAC Distribution Systems	
<input checked="" type="checkbox"/>	D3050	TERMINAL AND PACKAGED UNITS	
<input type="checkbox"/>	D3050.01	Unitary Air Conditioning Equipment	
<input type="checkbox"/>		Computer Rooms AC	
<input type="checkbox"/>		Packaged Rooftop AC	
<input type="checkbox"/>		Packaged Terminal AC	
<input type="checkbox"/>		Unit AC	
<input type="checkbox"/>	D3050.02	Air Coils	
<input type="checkbox"/>	D3050.03	Humidifiers	
<input type="checkbox"/>	D3050.04	Dehumidifiers	
<input checked="" type="checkbox"/>	D3050.05	Terminal Heat Transfer Units	
<input type="checkbox"/>		Convectors	
<input type="checkbox"/>		Fan Coil	
<input type="checkbox"/>		Finned Tube Radiation	
<input type="checkbox"/>		Induction Units	

PROJECT SCOPING

<input type="checkbox"/>		Infrared Heaters	
<input type="checkbox"/>		Unit Heaters	
<input type="checkbox"/>		Unit Ventilators	
<input checked="" type="checkbox"/>	D3050.05	Energy Recovery Units	
<input type="checkbox"/>	D3050.06	Other Terminal and Packaged Units	
<input checked="" type="checkbox"/>	D3060	HVAC INSTRUMENTATION CONTROLS	
<input type="checkbox"/>	D3060.01	Energy Management and Conservation Systems	
<input type="checkbox"/>	D3060.02	HVAC Instrumentation and Controls	
<input type="checkbox"/>	D3060.03	HVAC Sequence of Operations	
<input type="checkbox"/>	D3060.04	Gas Purging Systems	
<input type="checkbox"/>	D3060.05	Other HVAC Instrumentation and Controls	
<input checked="" type="checkbox"/>	D3070	TESTING, ADJUSTING, AND BALANCING	
<input type="checkbox"/>	D3070.01	Piping Systems Testing, Adjusting and Balancing	
<input type="checkbox"/>	D3070.02	Air Systems Testing, Adjusting and Balancing	
<input checked="" type="checkbox"/>	D40 - FIRE PROTECTION		
<input type="checkbox"/>	D4010	SPRINKLERS	
<input checked="" type="checkbox"/>	D4010.01	Wet-Pipe Fire Sprinkler Systems	
<input type="checkbox"/>	D4010.02	Dry-Pipe Fire Sprinkler Systems	
<input type="checkbox"/>	D4010.03	Combination Dry-Pipe and Pre-Action Fire Sprinkler Systems	
<input type="checkbox"/>	D4010.04	Deluge Fire Sprinkler Systems	
<input type="checkbox"/>	D4020	STANDPIPES	
<input type="checkbox"/>	D4020.01	Fire Protection Standpipe System	
<input type="checkbox"/>	D4030	FIRE PROTECTION SPECIALTIES	
<input type="checkbox"/>	D4030.01	Fire Extinguisher, Cabinets and Accessories	
<input type="checkbox"/>	D4030.02	Fire Blankets and Cabinets	
<input type="checkbox"/>	D4030.03	Wheeled Fire Extinguisher Units	
<input type="checkbox"/>	D4090	OTHER FIRE PROTECTION SYSTEMS	
<input type="checkbox"/>	D4090.01	Foam Extinguishing Systems	
<input type="checkbox"/>	D4090.02	Carbon Dioxide Fire Extinguishing System	
<input type="checkbox"/>	D4090.03	Clean Agent Extinguishing Systems	
<input type="checkbox"/>	D4090.04	Dry Chemical Fire Extinguishing Systems	
<input checked="" type="checkbox"/>	D50 - ELECTRICAL		
<input checked="" type="checkbox"/>	D5010	ELECTRICAL SERVICE AND DISTRIBUTION	
<input checked="" type="checkbox"/>	D5010.01	Main Electrical Transformers	
<input checked="" type="checkbox"/>	D5010.02	Secondary Electrical Transformers	
<input checked="" type="checkbox"/>	D5010.03	Main Electrical Switchboards	

PROJECT SCOPING

<input checked="" type="checkbox"/>	D5010.04	Interior Electrical Distribution Transformers	
<input checked="" type="checkbox"/>	D5010.05	Electrical Branch Circuit Panelboards	
<input checked="" type="checkbox"/>	D5010.06	Enclosed Electrical Circuit Breakers	
<input type="checkbox"/>	D5010.07	Motor Control Centers	
<input checked="" type="checkbox"/>	D5020	LIGHTING AND BRANCH WIRING	
<input checked="" type="checkbox"/>	D5020.01	Electrical Branch Wiring	
<input checked="" type="checkbox"/>	D5020.02	Interior Lighting	
<input checked="" type="checkbox"/>	D5020.03	Exterior Building Lighting	
<input checked="" type="checkbox"/>	D5030	COMMUNICATION AND SECURITY	
<input checked="" type="checkbox"/>	D5030.01	Detection and Fire Alarm	
<input checked="" type="checkbox"/>	D5030.02	Security Access and Surveillance	
<input checked="" type="checkbox"/>	D5030.03	Clock and Program Systems	
<input checked="" type="checkbox"/>	D5030.04	Voice and Data Systems	
<input checked="" type="checkbox"/>	D5030.05	Public Address and Music Systems	
<input checked="" type="checkbox"/>	D5030.06	Television Systems	
<input type="checkbox"/>	D5030.07	Other Communications and Security Systems	
<input type="checkbox"/>	D5090	OTHER ELECTRICAL SYSTEMS	
<input type="checkbox"/>	D5090.01	Uninterrupted Power Supply Systems	
<input type="checkbox"/>	D5090.02	Packaged Engine Generator Systems	
<input type="checkbox"/>	D5090.03	Battery Power Systems	
<input type="checkbox"/>	D5090.04	Cathodic Protection	
<input type="checkbox"/>	D5090.05	Electromagnetic Shielding System	
<input type="checkbox"/>	D5090.06	Lightning Protection Systems	
<input type="checkbox"/>	D5090.07	Unit Power Conditioners	
<input type="checkbox"/>	D5090.08	Power Generation Systems	

E - EQUIPMENT & FURNISHINGS

E10 - EQUIPMENT

<input type="checkbox"/>	E1010	COMMERCIAL EQUIPMENT	
<input type="checkbox"/>	E1010.01	Security and Vault Equipment	
<input type="checkbox"/>	E1010.02	Teller and Service Equipment	
<input type="checkbox"/>	E1010.03	Registration Equipment	
<input type="checkbox"/>	E1010.04	Checkroom Equipment	
<input type="checkbox"/>	E1010.05	Mercantile Equipment	
<input type="checkbox"/>	E1010.06	Commercial Laundry and Dry Cleaning Equipment	
<input type="checkbox"/>	E1010.07	Vending Equipment	
<input checked="" type="checkbox"/>	E1010.08	Office Equipment	
<input type="checkbox"/>	E1020	INSTITUTIONAL EQUIPMENT	
<input type="checkbox"/>	E1020.01	Ecclesiastical Equipment	
<input checked="" type="checkbox"/>	E1020.02	Library Equipment	High Density storage system for LMC
<input type="checkbox"/>	E1020.03	Theatre and Stage Equipment	

PROJECT SCOPING

<input type="checkbox"/>	E1020.04	Instrumental Equipment	
<input checked="" type="checkbox"/>	E1020.05	Audiovisual Equipment	
<input type="checkbox"/>	E1020.06	Detention Equipment	
<input type="checkbox"/>	E1020.07	Laboratory Equipment	
<input type="checkbox"/>	E1020.08	Medical Equipment	
<input type="checkbox"/>	E1020.09	Mortuary Equipment	
<input type="checkbox"/>	E1030	VEHICULAR EQUIPMENT	
<input type="checkbox"/>	E1030.01	Vehicle Service Equipment	
<input type="checkbox"/>	E1030.02	Parking Control Equipment	
<input type="checkbox"/>	E1030.03	Loading Dock Equipment	
<input type="checkbox"/>	E1090	OTHER EQUIPMENT	
<input type="checkbox"/>	E1090.01	Maintenance Equipment	
<input type="checkbox"/>	E1090.02	Solid Waste Handling Equipment	
<input checked="" type="checkbox"/>	E1090.03	Food Service Equipment	Kitchen
<input type="checkbox"/>	E1090.04	Residential Equipment	
<input type="checkbox"/>	E1090.05	Unit Kitchens	
<input type="checkbox"/>	E1090.06	Darkroom Equipment	
<input checked="" type="checkbox"/>	E1090.07	Athletic, Recreation and Therapeutic Equipment	Gym equipment
<input type="checkbox"/>	E1090.08	Planetarium Equipment	
<input type="checkbox"/>	E1090.09	Observatory Equipment	
<input type="checkbox"/>	E1090.10	Agricultural Equipment	

E20 - FURNISHINGS

F - SPECIAL CONSTRUCTION & DEMOLITION

F10 - SPECIAL CONSTRUCTION

F20 - SELECTIVE BUILDING DEMOLITION

<input checked="" type="checkbox"/>	F2010	BUILDING ELEMENTS DEMOLITION	
<input type="checkbox"/>	F2010.01	Minor Demolition for Remodeling	
<input checked="" type="checkbox"/>	F2010.02	Selective Structural Demolition	Selective salvage at (E) Longfellow ES- glulams and decking, plus...?
<input checked="" type="checkbox"/>	F2020	HAZARDOUS COMPONENTS ABATEMENT	
<input type="checkbox"/>	F2020.01	Hazardous Abatement	asbestos- scope to be determined by RLH

G - BUILDING SITEWORK

G10 - SITE PREPARATION

<input type="checkbox"/>	G1010	SITE CLEARING	
<input type="checkbox"/>	G1010.01	Sod Stripping	

PROJECT SCOPING

<input checked="" type="checkbox"/>	G1010.02	Clearing and Grubbing	
<input type="checkbox"/>	G1010.03	Shrub and Tree Removal and Trimming	
<input checked="" type="checkbox"/>	G1010.04	Stripping and Stockpiling of Soil	
<input type="checkbox"/>	G1020	SITE DEMOLITION AND RELOCATIONS	
<input type="checkbox"/>	G1020.01	Integrated Assemblies	
<input checked="" type="checkbox"/>	G1020.02	Site Elements Demolition	
<input type="checkbox"/>	G1020.03	Structure Moving	
<input checked="" type="checkbox"/>	G1020.04	Utility Relocation	
<input type="checkbox"/>	G1030	SITE EARTHWORK	
<input checked="" type="checkbox"/>	F1030.01	Grading	
<input checked="" type="checkbox"/>	F1030.02	Excavating, Backfilling and Compacting	
<input checked="" type="checkbox"/>	F1030.03	Soil Stabilization	
<input checked="" type="checkbox"/>	F1030.04	Slope Protection and Erosion Control	
<input type="checkbox"/>	F1030.05	Earth Dams	
<input type="checkbox"/>	G1040	HAZARDOUS WASTE REMEDIATION	

G20 - SITE IMPROVEMENTS

<input checked="" type="checkbox"/>	G2010	ROADWAYS	
<input checked="" type="checkbox"/>	G2010.01	Roadway Base Courses	
<input checked="" type="checkbox"/>	G2010.02	Flexible Roadway Pavement	
<input type="checkbox"/>	G2010.03	Roadway Unit Pavers	
<input checked="" type="checkbox"/>	G2010.04	Rigid Roadway Pavement	
<input checked="" type="checkbox"/>	G2010.05	Roadway Curbs and Gutters	
<input checked="" type="checkbox"/>	G2010.06	Roadway Appurtenances	
<input checked="" type="checkbox"/>	G2020	PARKING LOTS	
<input checked="" type="checkbox"/>	G2020.01	Parking Lot Base Courses	
<input checked="" type="checkbox"/>	G2020.02	Flexible Parking Lot Pavement	
<input type="checkbox"/>	G2020.03	Parking Lot Unit Pavers	
<input checked="" type="checkbox"/>	G2020.04	Rigid Parking Lot Pavement	
<input checked="" type="checkbox"/>	G2020.05	Parking Lot Curbs and Gutters	
<input checked="" type="checkbox"/>	G2020.06	Parking Lot Appurtenances	
<input type="checkbox"/>	G2020.07	Parking Booths and Equipment	
<input checked="" type="checkbox"/>	G2030	PEDESTRIAN PAVING	
<input checked="" type="checkbox"/>	G2030.01	Pedestrian Pavement Base Courses	
<input checked="" type="checkbox"/>	G2030.02	Flexible Pedestrian Pavement	Asphalt in play court area
<input type="checkbox"/>	G2030.03	Pedestrian Unit Pavers	
<input checked="" type="checkbox"/>	G2030.04	Rigid Pedestrian Pavement	All internal walks, and perimeter sidewalks to be CIP concrete
<input checked="" type="checkbox"/>	G2030.05	Pedestrian Pavement Curbs and Gutters	
<input checked="" type="checkbox"/>	G2030.06	Exterior Steps and Ramps	Stairs and ramp for access to slide on hill
<input type="checkbox"/>	G2040	SITE DEVELOPMENT	
<input type="checkbox"/>	G2040.01	Fountains	Hand pump and sluices
<input type="checkbox"/>	G2040.02	Fences and Gates	5' chainlink fence around perimeter of site, 4' fence around KG playground

PROJECT SCOPING

<input type="checkbox"/>	G2040.03	Athletic and Recreational Surfaces	Irrigated sod all-purpose play field
<input type="checkbox"/>	G2040.04	Athletic and Recreational Equipment	Natural play equipment - wood logs, stepping 'stones', manufactured play equipment in two play pits, and swing sets
<input type="checkbox"/>	G2040.05	Site and Street Furnishings	Trash receptacles at main entrances, bike racks, cast in place concrete seat walls at main entry plaza
<input type="checkbox"/>	G2040.06	Exterior Signs	
<input type="checkbox"/>	G2040.07	Footbridges and Underpasses	Trex foot bridges over drainage swale
<input type="checkbox"/>	G2040.08	Flagpoles	2 flagpoles at main entry plaza
<input type="checkbox"/>	G2040.09	Covers and Shelters	2 small prefabricated storage sheds: 1 for garden tools and supplies 1 for storage of KG trikes
<input type="checkbox"/>	G2040.10	Site Equipment	EWf safety surface in the play pits, Trex deck, recycled plastic timbers for raised garden beds
<input type="checkbox"/>	G2040.11	Retaining Walls	Cast in place concrete play pit curbs and handicap ramps, quarried stone amphitheater
<input type="checkbox"/>	G2050	LANDSCAPING	
<input checked="" type="checkbox"/>	G2050.01	Irrigation Systems	'Smart' system with ET controller and rain sensor, all planted areas on the south side of the school to be fully irrigated including the raised garden beds.
<input type="checkbox"/>	G2050.02	Shrub and Tree Transplanting	
<input checked="" type="checkbox"/>	G2050.03	Soil Preparation	4 CU YDS class I compost per 1,000 SF in tilled topsoil. Fertilizer as recommended in the soils report.
<input checked="" type="checkbox"/>	G2050.04	Lawns and Grasses	Sod in play areas and all purpose play field, seed around east, west and north side of the building
<input checked="" type="checkbox"/>	G2050.05	Trees, Plants and Ground Covers	See plan
<input checked="" type="checkbox"/>	G2050.06	Plant Maintenance	30 days from date of substantial completion
<input type="checkbox"/>	G2050.07	Planting Accessories	Boulders, cobble, crusher fines walks, tree stakes and accessories, wood mulch in planting beds, roll-top steel edging

G30 - SITE CIVIL/MECHANICAL UTILITIES

<input type="checkbox"/>	G3010	WATER SUPPLY	
<input type="checkbox"/>	G3010.01	Water Wells	
<input checked="" type="checkbox"/>	G3010.02	Site Domestic Water Distribution	
<input type="checkbox"/>	G3010.03	Site Fire Protection Water Distribution	
<input type="checkbox"/>	G3020	SANITARY SEWER	
<input checked="" type="checkbox"/>	G3020.01	Sanitary Sewage Collection	
<input type="checkbox"/>	G3020.02	Septic Systems	
<input type="checkbox"/>	G3020.03	Sanitary Sewage Equipment	
<input type="checkbox"/>	G3020.04	Sewage Ponds	
<input type="checkbox"/>	G3030	STORM SEWER	
<input checked="" type="checkbox"/>	G3030.01	Storm Water Collection	
<input checked="" type="checkbox"/>	G3030.02	Storm Water Equipment	
<input checked="" type="checkbox"/>	G3030.03	Storm Water Ponds and Reservoirs	
<input type="checkbox"/>	G3040	HEATING DISTRIBUTION	
<input type="checkbox"/>	G3040.01	Site Steam Distribution	
<input type="checkbox"/>	G3040.02	Site Hot Water Distribution	

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<input type="checkbox"/>	G3050	COOLING DISTRIBUTION	
<input type="checkbox"/>	G3050.01	Chilled Water Distribution	
<input type="checkbox"/>	G3060	FUEL DISTRIBUTION	
<input checked="" type="checkbox"/>	G3060.01	Gas Distribution	
<input type="checkbox"/>	G3060.02	Oil Distribution	
<input type="checkbox"/>	G3060.03	Other Fuel Distribution Systems	
<input type="checkbox"/>	G3060.04	Fuel Storage Tanks	
<input type="checkbox"/>	G3060.05	Fuel Dispensing Equipment	
<input type="checkbox"/>	G3090	OTHER SITE MECHANICAL UTILITIES	
<input type="checkbox"/>	G3090.01	Industrial Waste System	
<input type="checkbox"/>	G3090.02	Petroleum Oil and Lubricants Distribution	

G40 - SITE ELECTRICAL UTILITIES

<input checked="" type="checkbox"/>	G4010	ELECTRICAL DISTRIBUTION	
<input type="checkbox"/>	G4010.01	Electrical Substations	
<input checked="" type="checkbox"/>	G4010.02	Electrical Power Distribution Lines	
<input checked="" type="checkbox"/>	G4010.03	Electrical Power Distribution Equipment	
<input checked="" type="checkbox"/>	G4020	SITE LIGHTING	
<input type="checkbox"/>	G4020.01	Area Lighting	
<input type="checkbox"/>	G4020.02	Feature Lighting	
<input checked="" type="checkbox"/>	G4020.03	Building Illumination	
<input checked="" type="checkbox"/>	G4020.04	Landscape Lighting	
<input type="checkbox"/>	G4020.05	Other Site Lighting	
<input type="checkbox"/>	G4030	SITE COMMUNICATIONS AND SECURITY	
<input type="checkbox"/>	G4030.01	Site Detection and Alarm	
<input type="checkbox"/>	G4030.02	Site Voice and Data	
<input type="checkbox"/>	G4030.03	Site Communications Reception	
<input type="checkbox"/>	G4030.04	Other Site Communications and Security	
<input type="checkbox"/>	G4090	OTHER SITE ELECTRICAL UTILITIES	
<input type="checkbox"/>	G4090.01	Cathodic Protection	

G90 - OTHER SITE CONSTRUCTION

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