Eisenhower Elementary School

Schematic Design Submittal

May 6, 2009

Boulder Valley School District

SLATERPAULL ARCHITECTS

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Please note, for security reasons floor plans have been removed from this document.

EXECUTIVE SUMMARY

The Schematic Design Report for the Eisenhower Elementary School Renovation and Addition project includes project narratives, drawings, and project information such as meeting minutes and design progress drawings.

A Design Advisory Team (DAT) was formed consisting of Eisenhower staff and parents. During the first DAT meetings, the needs and desires of the staff and parents were compared to the Educational Facilities Master Plan prepared by the District. Several floor plan options were presented and it was decided by the DAT to proceed with a plan that included a large addition for a new Instructional Media Center (IMC) and a small addition for Kindergarten. It was decided that the old Library would be renovated into Special Education and Small Group rooms. The existing Administration area would be renovated and a secure vestibule would be created.

Eisenhower Elementary School is located on a small parcel of land with few areas for expansion. It was decided to put the large IMC addition on the Northwest corner of the existing building. The new addition will be an opportunity to give the school a new look from Eisenhower Drive. The kindergarten addition will be completely under the existing overhang and connect directly to the existing kindergarten rooms.

We are pleased to submit this document and are very excited about the opportunities this project presents. We would like to thank all of those who participated to this point.

DESIGN TEAM

The project design team includes the firms and individuals identified below:

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- Rob Price – Project Manager
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DESIGN ADVISORY TEAM

The following individuals took part in the Design Advisory Team (DAT) process:

Lindsay Donaldson	Boulder Valley School District Project Manager
Dr. Charles Serns	Eisenhower Principal
Linda Chambers	Eisenhower Staff
Toni Estoque	Eisenhower Staff
Margaret Moore	Eisenhower Staff
Terry Neitenbach	Eisenhower Staff
Candace Uvalle	Eisenhower Staff
Jennifer Hanson	Boulder Valley School District Admin. Intern
Rebekah Hartman	Eisenhower Parent
Tracy Sinner	Eisenhower Parent
Rob Price	FCI Constructors
Adele Willson	SLATERPAULL Architects
Ted Hagan	SLATERPAULL Architects

NARRATIVES

ARCHITECTURAL

Existing Building History and Assessment

The original building was constructed in 1970. A music room addition was constructed in 1977, a computer room was added in 1984, the computer room was expanded in 1990, and the gymnasium and gym storage were expanded in 1999 to bring the building to its current size of about 53,600 square feet. The special education area was remodeled in 1987 and 1988 and the classroom areas were remodeled in 1991, 1992, and 1995. In 1992 the majority of the lighting in the building was replaced and in 1996 lighting controls (occupancy sensors) were added. The HVAC controls were replaced in 1993, replacement of HVAC units took place in 1999, and the boiler was replaced in 2003. The roof was replaced in 1996. Staff toilets were remodeled for accessibility in 1999. The bus loop drive was also added in 1999.

The building was assessed by the District and the existing spaces in the building were compared to the current District Educational Specifications. It was found that the building lacked adequate space for: special education, kindergarten, small group instruction, staff offices, and storage.

The building does not currently have a fire sprinkler system. A new fire sprinkler system will be installed throughout the entire building. The sprinklers will also need to protect the space above the ceiling since there are combustible materials in the plenum. The exterior overhang will require a dry sprinkler system to protect the existing exposed combustible materials.

The existing fascia on the overhang is in poor condition and severely deteriorated in several areas. It appears that a combination of age, moisture, and birds have caused the damage. Although not identified in the facilities master plan, the DAT group feels that this issue needs to addressed as part of this project. Prefinished metal siding products and stucco will be priced by the contractor to replace the existing fascia.

Addition Summary

Instructional Media Center: The IMC addition includes a large open area, an office/workroom, a storage room for audio/visual items, and a computer lab. It was decided by the DAT that the Video Production Studio required by the Educations Specifications could be part of the computer lab. It was also decided by the DAT that the resource room required by the Educational Specifications could be part of the open space. The addition will also include the addition of accessible toilets. A new storage room for music will also be included in the addition. The addition will also include a fire riser room for the new fire sprinkler system. The addition will also include a new gym storage room that will be accessed from the exterior.

Kindergarten: The kindergarten addition will include a teacher workroom/storage room and a coat room. This will allow the teacher desks and other items to be removed from the existing large middle room. The coat room will have cubbies for the East classroom. Refer to the remodel summary below for additional work in the kindergarten area.

Remodel Summary

Administrative Office Area: The current Administration area is undersized. By taking the adjacent classroom to the West and expanding into a portion of the existing lobby, additional administration area can be achieved without adding onto the building. A new staff lounge and conference room will be built in the old classroom space. The existing administration area will be reconfigured into 3 offices, a workroom, a small conference room and a clinic. The existing staff toilets will be expanded in size

and upgraded for accessibility. The new reception area will expand into the existing lobby and a new entry vestibule will be created to improve security and energy efficiency.

Special Education and Small Group Instruction: The current special education program is undersized and does not have the spaces required by the Ed Spec. The program does not have a changing room and currently must use an adjacent gang toilet. Small group instructional space is also lacking throughout the building. The existing IMC space will be remodeled into special education program spaces and small group instructional spaces. Existing rooms surrounding the IMC will be re-used to save costs - the existing spaces will require minimal remodeling. A staff workroom will also be added as part of the remodel of the existing IMC space. A portion of the hallway along the East wall of the existing IMC space will be expanded for a coat area.

Kindergarten: The current East classroom is undersized – it will be expanded to be of similar size to the West classroom. The existing coat areas will be remodeled into storage rooms for the classrooms. New cubbies will be provided for the West classroom in the new hallway created by the IMC addition.

Sustainability Goals

The most sustainable aspect of this project is the re-use of the existing building.

The construction waste from demolition activities should be recycled where possible. Wood framing, gypsum board, metal frames, glass, ceiling tiles, and carpeting are a few items that could be recycled. New construction waste should also be recycled.

New materials will have recycled content and will be low VOC emitting where possible. Metal framing, wall tile, floor tile, gypsum board, steel and aluminum frames, glass, ceiling tiles, casework, and carpeting are items that could be specified with recycled content. Casework, paint, furniture, and carpeting are items that could be specified as low VOC emitting.

Energy efficient lighting and mechanical systems will be utilized for this project. The use of controls to turn off lights and reduce mechanical demand when rooms are unoccupied will also be utilized. Low water consumption plumbing fixtures will also be utilized. Please refer to the mechanical and electrical sections for additional information.

Daylighting to the interior of the building will be accomplished through solar tubes. Solar tubes will be added to the interior hallways at the special education remodel and the hallway at the IMC addition.

The new exterior walls and roof will be well insulated to provide a high performing exterior envelope for the addition. The glazing will also be high performance glazing.

CIVIL

Earthwork

Description of Work: Work in this section includes the site preparation for two building additions. Site preparation and regrading will be required around the northwest portion of the building to accommodate the building addition there.

Subgrade preparation will be required for the additions at the northwest and north ends of the building and for new flatwork/paving. An updated soil study is currently being conducted for this site and will explain the requirements for subgrade preparation in more detail. The subgrade preparation requirements will need to be confirmed with the geotechnical engineer.

It is expected that imported fill will be required for the new additions. A detailed earthwork analysis has not been completed at this time. Analysis will be completed after current topography has been established.

Coordination Issues: Phasing of the demolition and site construction will need to be coordinated with the school, the School District, and the contractor. Site grading decisions will be coordinated with the project architect, landscape architect and with the geotechnical and structural consultants involved in the pavement and building foundation subgrade. Stormwater management and erosion control plans will be required for the site. Water quality best management practices will be utilized to the greatest extent possible.

Flexible Asphalt Paving

Description of Work/Products: This section covers the asphaltic concrete paving for the repairs to the bus loop area and new play surface areas. Pavement markings for parking and roadways are also included in this section. A 2-inch mill and overlay is expected at the existing bus loop and ±2-inch asphalt will be used in the new play surface, depending on the recommendations of the geotechnical engineer. There may be some amount of subgrade preparation required for the play surface and bus loop after the pavement design is established.

Coordination Issues: Pavement recommendations by the geotechnical engineer have not been provided at this time.

Emergency site access during construction will need to be coordinated with the fire department. Faculty and other vehicle site access during construction will need to be coordinated with the school, the school district and the contractor.

Rigid Concrete Paving

Description of Work/Products: This section includes the concrete for sidewalks, and curb and gutter with jointing and reinforcement as needed. 6-inch pavement sections for service areas, walks and pavement areas that receive vehicle traffic is anticipated. Some minor walks may require less depth. All public curb, gutter and crosspans will be constructed according to City of Boulder standard details. All concrete paving will have a 4000-psi mix with Type II cement and Fibermesh reinforcement.

Coordination Issues: Paving amenities such as patterned or colored concrete will be detailed by the landscape architect. Handicap ramps are required at accessible entry routes.

Site Water Lines

Description of Work: There is an existing public water main to the west of the site. It is assumed at this time that the existing water tap meters will adequately provide for the increased demand resulting from the proposed improvements. There appears to be a separate water meter for irrigation. This information will be verified with the Boulder utility department.

Based on initial discussions with the fire department and the decision by the design team to sprinkle the building, a new four inch fire line will be required. No new service lines are anticipated.

Coordination Issues: Additional coordination with the Boulder Fire Department is required to approve the emergency access.

The domestic service connection and meter capacities will require coordination with the mechanical engineer. Upsizing of the water meters and coordination with the City of Boulder may be necessary with the addition of new fixtures. This will also require additional site waterline work. Irrigation facilities, as designed by the landscape architect, will be connected to a separate utility meter when practical. Water pressures of the existing hydrants have not been obtained at this time. Private flow tests and water system modeling may be required.

Sanitary Sewer Systems

Description of Work: There is an existing public sanitary sewer main on the west side of the site. The number and locations of the existing service connections to public mains has not yet been determined. It is assumed at this time the existing sanitary sewer service(s) will provide sufficient service for the proposed build out conditions. Future calculations by the mechanical engineer may determine that a larger sanitary service, or an additional service to the City main, may be required to serve the school. In this event additional site sanitary work will be required and will be coordinated in future submittals.

Coordination Issues: The building sanitary sewer service will require coordination with the mechanical engineer. If an additional sanitary service or an upsize of the existing service is necessary, coordination with the City will be required.

Storm Drainage Utilities

Description of Work: The site has an existing storm drain network to convey parking lot and some roof runoff to the existing City network. The City network flows to South Boulder Creek to the east of the site. The size, condition and alignment of the storm pipes will be determined with the forthcoming site survey. It is assumed that roof runoff from the building additions will need to connect to the existing storm drain network.

At this time it is assumed that no stormwater detention will be required with the project. If it is determined that these improvements are necessary, additional drainage work will be required. A State stormwater management plan and stormwater enhancement facilities may be required if the disturbed site area is greater than one acre.

The floodplain mapping indicates that the site is not located within the 100 year floodplain.

Most runoff, including all roof drains if feasible, will be directed to drainage piping and connect to storm sewer piping around the building, and will carry runoff water to the existing City storm water system.

Coordination Issues: The roof downspout piping and foundation drainage (if called for) will require coordination with the design team. Ponding occurs in the bus loop and will need to be conveyed either to the street, if allowed by the City, or to the onsite storm system. Regrading and paving of the bus loop is anticipated. Coordination with the architect is required for the final location and sizing of any detention or water quality basins, if required. A new storm outfall to the City network may be required if the existing outfall pipe is in poor condition and/or undersized.

LANDSCAPE

Vehicle and Pedestrian Circulation:

The school building is located on the southwestern portion of the site. The parking lot on the south portion of the site along with the parent drop off will remain. The bus drop-off is located on Eisenhower, west of the school building.

A new 10' sidewalk from Eisenhower will connect to the addition while an 8' sidewalk will continue north of the addition and provide access to the north side of the building and play areas.

Athletic Elements:

The north portion of the site contains sports fields for the following activities: multi-use field, soccer, and softball. The sports fields will not be affected by the improvements.

The northwest play area includes existing play elements, swings, and a 4 on one basketball hoop. The pea gravel surfacing will be removed and replaced with an 18" depth of engineered wood fiber (EWF) to make the play pit accessible (approx. 8,500 sq. ft). A concrete walk with a poured-in-place landing adjacent to the swings will provide ADA access. The sand in the sand play will be replaced and filled to capacity. The 4 on one basketball hoop will be relocated to the asphalt pad by the 4-square area and its concrete base will be removed. New 8" wide x 24" deep curb wall will surround the play area to control EWF migration and a new underdrain will be installed to properly drain the play pit. A new landscape bed will separate the concrete walk north of the school and the play area and control access into and out of the play area.

The northeast play area includes existing play elements, swings, slide, and climbing dome. The pea gravel surfacing will be removed and replaced with an 18" depth of engineered wood fiber (EWF) to make the play pit accessible (approx. 10,000 sq. ft.). The blue slide will be removed along with the climbing dome. The swings where the new asphalt pad will be installed will be relocated to the space vacated by the climbing dome. New 8" wide x 24" deep curb wall will surround the play area to control EWF migration and a new underdrain will be installed to properly drain the play pit. A new landscape bed will separate the concrete walk north of the school and the play area.

South of the northeast play pit is an asphalt play pad with current uses of basketball, four-square, and hopscotch. The pad slopes at approximately 5%. The eastern portion of the asphalt will be demolished because of its condition and slope. New asphalt will be poured in its place and extend east to the edge of the existing play area. 2 new basketball hoops will be installed in this pad. The 4-square areas will be re-striped out of the pathway of the existing walk access across the asphalt.

Additional concrete walks to play pieces in the remaining play pits will provide ADA access to play structures. A pour-in-place landing will be installed adjacent to the large play structure to the north. In addition, the balance beam will be removed. Existing fencing as shown in the site/landscape plan will be removed.

Landscape/Site Elements:

There are several healthy, mature trees located throughout the school's campus. Where possible and when appropriate, these trees should be preserved and protected through the construction process. The site will be sodded in areas disturbed by construction. If a 5' wide non-irrigated zone is not required by geotech to ensure adequate site drainage around the building, then this 5' zone will remain free of trees, shrubs, and ground cover. Shade trees will be used around the affected areas to provide shade for pedestrians, faculty, parents, and students. A mixture of evergreen, shade, and ornamental trees are used. Ornamental grasses will be used along with shrubs and perennials to create year-round landscape interest.

A new concrete pan will run along the eastern edge of play areas adjacent to the turf play field to improve drainage in this area.

General site rehabilitation will be involved in all areas directly impacted by construction of the building addition. These include play areas, irrigation, and landscaping.

Irrigation System

New irrigation mainline, heads and laterals will be installed in the large turf field east of the school as shown on the plan. New irrigation mainline and laterals will be installed in the three sod areas on the west side of the site as shown on the plans. All areas of irrigation disturbed by construction will be replaced and repaired back to pre-existing condition. Irrigation as-builts will be required from the district before the beginning of design development.

STRUCTURAL

Design Codes, Loads and Criteria

Design of structural elements and systems shall be based on the requirements of the 2006 International Building Code and all applicable local amendments to the Code.

Design of structural elements and systems shall be based on the requirements of the following materials codes:

Concrete:	Building Code Requirements for Reinforced Concrete (ACI 318) and Specifications for Structural Concrete for Building (ACI 301)
Masonry:	Building Code Requirements for Masonry Structures (ACI 530)
Structural Steel:	AISC Manual of Steel Construction, 13th Edition

Structural elements and systems shall be designed for the following uniform live loads or loading criteria:

Roof (snow):	30 psf (plus drifting)
Interior classroom floors:	40 psf
Other floors:	100 psf
Wind:	110 mph (3-second gust), exposure B
Seismic:	Design Category B

An updated soils report has not yet been prepared for the project. Foundation system recommendations are based on review of the structural construction documents for the original school building prepared in 1970, the Music Addition prepared in 1977 and an addition at the west end prepared in 1999.

Foundation System

The original school building and the subsequent additions were all founded on a stem wall on conventional spread footings. It is likely that the new additions will also be founded on this system. Exterior nonbearing steel stud walls and brick veneer and the steel columns located in those stud walls will be supported by a 12" wide concrete stem wall. A continuous 2'-0 wide by 12"deep footing will support the stem wall. Footings will be founded a minimum of 3"-0 below adjacent grade for frost protection. No brick ledge is anticipated at the exterior edge of the stem wall.

A firewall must be constructed where the additions attach to the existing buildings except at the Kindergarten addition. A similar foundation system with stem wall on footings will be required to support this masonry or shaft wall fire protection wall. The new foundation will be directly adjacent to the existing foundation wall and footing.

Interior steel building columns shall be supported on isolated footings with the top of footing located 8" below the top of slab elevation. Footing size will be determined after the new soils report is prepared. Assume 4'-0 x 4'-0 x 1'-0 at interior footings.

Interior Floor Slab

Interior floors shall be 4" polypropylene fiber reinforced, concrete slab-on-grade over a 4" thick layer of free-draining gravel. Slabs shall have saw cut or formed control joints spaced at 12'-0± in each direction. A vapor barrier shall be installed below the gravel layer in areas with moisture sensitive finished floor coverings.

Building Columns

Exterior/perimeter steel building columns supporting roof beams shall be HSS4x4x¼, hidden in adjacent wall framing, and continuous between foundation below and roof framing above.

Interior steel building columns supporting steel roof beams shall be HSS4x4x¼, hidden in adjacent wall framing, and continuous between drilled piers below and roof framing above.

Primer paint is only required on steel elements permanently exposed to view.

Roof Framing System

Roof surfaces shall slope ¼" per foot (minimum) or as noted on the architectural drawings from high points/lines to roof drains at low points/lines.

Deck shall be 1½" deep x 20 gage wide rib, painted, steel deck spanning between exterior/perimeter steel beams and interior roof joists. Deck shall be welded to supporting framing elements below and shall be interconnected with screwed side lap connections.

Open-web, steel, K-series roof joists shall be spaced @ 5'-0" and shall span between exterior/perimeter steel beams. Joists at the IMC addition will span approximately 34' from the exterior wall to the masonry firewall or a steel column and beam line adjacent to a shaft wall firewall. Joists will be 24" deep and will be designed to accommodate future lightweight solar panel installations. Steel beams will be used in place of joists below mechanical units on the roof. 6" thick maximum concrete pads may be required below these units by the Mechanical Engineer.

Exterior/perimeter beams spanning between 15 and 20 feet at the IMC addition shall be W14x22. The addition is L-shaped and the joists will change framing direction at the bend in the L. This will require an interior steel beam. An interior column will also be required to limit the beam reaction at the corner of the existing building. The beam will be a W16x31.

The Kindergarten Addition will be built entirely below the existing space truss roof of the existing building. The exterior walls will extend up to the existing roof deck so no additional roof structure will be required at this addition. A slip joint will likely be required at the tops of these walls. A small mechanical unit will be located on the existing roof above this addition and may require some reinforcement of the existing roof structure.

Lateral Load Resisting System

The building's lateral load resisting system shall be HSS5x5x¼ diagonal configured braces installed between steel gusset plates connected to building columns. The IMC addition shall have a total of four braces with two located in the direction of each major axis of the addition. This may require locating an additional column and footing to coordinate with brace location. The Kindergarten addition will be braced using diagonal metal strap bracing welded to the steel studs.

Primer paint is only required on structural steel brace and frame elements exposed to view.

Exterior/Perimeter Non-Load Bearing Curtain Walls

Exterior/perimeter walls shall be framed using 6" x 1 5/8" flange x 18 gage light-gage steel cee studs spaced @ 16" continuous between foundations and roof elements or parapets, with continuous 18 gage top and bottom tracks. Provide multiple interconnected studs at opening jambs, heads, and sills. Parapet heights have not been defined at this stage.

Steel loose lintel L7x4x3/8 (long leg vertical) shall support masonry veneer over openings in walls and shall bear on veneer at jambs.

Masonry veneer shall be connected to cee stud back-up with two piece, adjustable veneer ties connected in 16" x 16" pattern.

MECHANICAL

Scope of Work for Existing Heating, Ventilating and Air Conditioning Systems:

Central Heating Plant: Two (2) forced draft gas fired cast iron boilers each with a rated input of 2,210,000 BTUH and a rated output capacity of 1,790,100 BTUH. Each boiler includes a boiler circulation pump. The main building heating water circulating pumps are two (2) base mounted pumps. The boilers appear to be designed to operate on a 20 degree delta T.

The existing boilers appear to be to have the capacity to meet the needs of the existing building as well as the proposed addition rooftop air handling unit with the systems as described above. As design of the building and systems proceed further investigation and review of the existing systems will be completed to insure that additional boiler capacity is not required.

Hydronic Piping Systems: The heating water system is installed overhead above the ceiling. The hydronic piping system serves the multi-zone HVAC units serving the building, as well as terminal units such as cabinet unit heaters.

Air Handling Systems: A majority of the spaces within the building are served from multi-zone air handling systems located in a penthouse on the roof. The building is served by four (4) multi-zone air handling units. These systems utilize rooftop air handling units to serve ductwork located above the ceiling. Outside air for each space is provided through the rooftop air handling units and associated distribution system. Each of the four (4) multi-zone units utilizes a DX cooling coil with remote condensing unit which is located on the roof adjacent to the mechanical penthouse. The hot water heating coils utilize three way control valves, and pumped hot water coils.

The music room addition is served by an small gas fired furnace with DX cooling coil. The unit is located within a storage closet located adjacent to the music room. Outside air for this unit is provided by an outside air duct connection to the unit which extends up through the roof. Modifications to the outside and flues will be required to accommodate the new addition adjacent to the music room. Outside air may be taken from the roof and the flues to the roof as well away from outside air intake.

Temperature Control Systems: Many of the areas served by the original pneumatic control system have been converted to DDC controls, although per District preferences the larger valves and damper actuators remain pneumatic with DDC controllers. Westover Controls is the approved manufacturer and installer of the districts DDC controls

New Building Addition and Renovated Areas

IMC Addition: A new IMC and associated support spaces are planned for the north-west corner of the building. These spaces will include approximately 3500 square feet of addition.

A new multi-zone air handling system will be designed to serve this space. The new unit will be roof mounted above the new addition. The new unit will utilize DX cooling coils and hot water heating coils. The hot water heating coils will be 3-way valves with a coil circulation pump.

New ductwork will be specified to serve the new areas. The zone distribution shall be evaluated and individual zones for the multi-zone system shall be determined based on exposure and utilization.

Air distribution for the spaces shall be by ceiling mounted louver faced diffusers. Return air shall incorporate a return air plenum.

All new ductwork shall be sheet metal and insulated with 1-1/2" acoustical duct liner. Duct liner insulation shall comply with the 2006 IMC.

Kindergarten Office/Coat Addition

A new Kindergarten office and coat room addition will be served by the existing unit located in this area. A duct/ zone extension will be added to serve the office area and a unit heater added to the coat room to maintain adequate temperature in the vestibule area.

Administration Renovation

The existing administration area will be renovated to accommodate the needs of the facility. The existing space is currently served by the roof mounted multi-zone unit which serves the south-west corner of the building.

The existing multi-zone system shall be re-configured to accommodate the new space layout. The existing duct system shall be utilized wherever possible. Where modifications to the existing duct system are necessary to achieve thermal comfort, or to accommodate the new space layout, a new duct distribution system shall be specified.

All new ductwork shall be sheet metal and insulated with 1-1/2" acoustical duct liner. Duct liner insulation shall comply with the 2006 IMC.

Air distribution for the spaces shall be by ceiling mounted louver faced diffusers. Return air shall incorporate a return air plenum.

The existing multi-zone ventilation capacity will be evaluated, and adjustments will be specified to ensure the renovated areas meet the ventilation rates required by current codes.

ILC/Office Renovation

The existing ILC area will be renovated to accommodate the new office spaces. The existing space is currently served by the roof mounted multi-zone unit which serves the east side of the building.

The existing multi-zone system shall be re-configured to accommodate the new space layout. The existing duct system shall be utilized wherever possible. Where modifications to the existing duct system are necessary to achieve thermal comfort, or to accommodate the new space layout, a new duct distribution system shall be specified.

All new ductwork shall be sheet metal and insulated with 1-1/2" acoustical duct liner. Duct liner insulation shall comply with the 2006 IMC.

Air distribution for the spaces shall be by ceiling mounted louver faced diffusers. Return air shall incorporate a return air plenum.

The existing multi-zone ventilation capacity will be evaluated, and adjustments will be specified to ensure the renovated areas meet the ventilation rates required by current codes.

Miscellaneous Scope Items

The existing rooftop unit air intakes experience infiltration of snow. This causes the rooftop units to leak at their intake plenums. These systems will be evaluated for remediation. Providing an open duct work extension on to of the return air opening and a ductwork baffle connected to the outside air louver should help resolve this melting snow/ roof leak issue.

The return air system in the Special Education room is noisy. This system will be evaluated to determine if the system can be modified to remediate the noise issue. Modifications will be specified as required.

The existing building is experiencing pressurization issues. The building is becoming over-pressurized and causing the entry doors to remain open. This becomes a security issue for the school. The existing building relief air path consists of roof mounted relief air hoods. These hoods will be evaluated to determine a method to eliminate the over pressurization. The hoods will be evaluated to determine if a motorized damper can be implemented, or if the hoods require replacement with new roof mounted exhaust fans. Corrective measures will be specified.

Energy Efficient Design

Under the current scope of work energy efficient design measures will be employed for the new systems. Due to the request by the District to maintain a multi-zone air handling system, significant energy conservation measures such as incorporating variable frequency drives, variable air volume systems, and similar design strategies are not available. Efforts during design will be made to accommodate actual design conditions, to eliminate the possibility of over-sizing equipment.

XCEL Energy has completed an Energy Assessment of the facility and made recommendations. This assessment has been reviewed for recommendations which can be implemented for this project.

At this time only one of the recommendations presented by Xcel energy do not appear to apply to this project. A recommendation has been made to provide energy efficient rooftop units. The new addition units will be specified as energy efficient units. The existing units in place will not be changed.

Design under this project will include energy efficient rooftop units and associated condensing units meeting a minimum design SEER of 13 @ ARI conditions. Additionally, for motors which are larger than 3/4 hp and 3-phase voltages will be specified as premium efficiency.

Additional design considerations regarding ductwork and piping insulation will also be included.

Design Criteria:

Weather Data Outside:

- Cooling: 93° F dry bulb, 59° F wet bulb.
- Heating: -10° F

Weather Data Inside:

- Occupied Spaces:
  - Cooling: 75° F
  - Heating: 72° F
- Unoccupied Spaces:
  - Cooling: No Cooling
  - Heating: 65° F

Occupancy and Ventilation per IMC chapter 4, Table 403.3.

- Classrooms: 50 people per 1000 square feet, 15 CFM per person.
- Offices: 7 people per 1000 square feet, 20 CFM per person.
- Library: 20 people per 1000 square feet, 15 CFM per person.

Reference Data

- Boulder Valley School District Technical Specifications.
- International Mechanical Code, 2006 Edition.
- International Building Code, 2006 Edition.
- International Energy Conservation Code, 2006 Edition.
- ASHRAE
  - Current edition of the handbooks
  - Standard 62-2004 “Ventilation for Acceptable Indoor Air Quality”

  - Standard 90-2004 "Energy Standards for Buildings Except Low Rise Residential Buildings"

- SMACNA.
- ASME.
- NFPA.
- Americans with Disabilities Act Accessibility Guidelines.

Program Compliance Statement

The HVAC systems for the facility will be designed to agree with and compliment the overall building program.

Code Analysis

2006 International Mechanical Code (IMC) section 403.1 Mechanical Ventilation: Ventilation rates calculated based on Table 403.3. The tables require ventilation rates to be calculated based on occupants per 1000 square feet.

IMC Section 606, Smoke Detectors: Smoke detectors shall be provided in the return air duct for all air systems over 2,000 cfm.

IECC Section 504, Pipe Insulation: Pipe insulation thickness specified for application on new piping systems will comply with the requirements of this section.

IECC: All new equipment shall comply with applicable sections.

PLUMBING

New Building Addition and Renovated Areas

IMC Addition: A new IMC and associated support spaces are planned for the north-west corner of the building. These spaces will include approximately 3500 square feet of addition.

As part of this addition, new women's and men's toilet rooms will be added. New plumbing fixtures will be specified for the spaces. The plumbing fixtures specified will follow district standards, and match the existing plumbing fixture types.

Lavatories for public usage will be specified with new thermostatic mixing valves in compliance with the IPC. New flush valve fixtures will be battery operated automatic type and lavatory faucets will be specified as manual type per the BVSD Technical Guidelines.

A new waste line to the sewer main in the street based on preliminary review of the existing drawings to allow the new plumbing fixtures, sink in the IMC and floor drain for the fire service entry room. Coordination with the civil engineer for size and location will be determined as the design progresses.

Kindergarten Renovation

New sinks in casework will be specified to replace existing sinks. The plumbing fixtures specified will follow district standards.

Lavatories for public usage will be specified with new thermostatic mixing valves in compliance with the IPC.

Administration Renovation

The renovation of the administration area includes the renovation of the existing staff toilet rooms as well as the addition of a new staff lounge and complete remodel of the existing clinic toilet. The new lounge will include a new two compartment kitchen type sink, garbage disposal connection, dishwasher connection, and ice maker box connection to accommodate typical utilization of a teacher's lounge.

ILC/Office Renovation

The existing plumbing fixtures currently serving this area will be removed as required for the new floor plan.

This area does not include any new toilet or plumbing requirements.

The special education classrooms within the building will have sinks and changing rooms added to them. New sinks and associated changing room showers will be specified for these areas.

Miscellaneous Scope Items

The existing water service entry within the boiler room does not currently contain a backflow preventer. This condition does not currently comply with current codes. A new backflow preventer will be specified to correct this condition.

Fire Sprinkler

The existing building is not currently sprinkled. New fire sprinklers throughout the existing building as well as the new addition areas will be specified. The fire sprinkler system will be based upon a performance specification with fire sprinkler system layout and design by the fire sprinkler contractor.

To accommodate the new fire sprinkler system a new fire service entry will be specified. Due to existing conditions the new fire sprinkler entry will be located in the new addition area of the building.

A majority of the existing building structure is wood construction. The building also has a large overhang around a majority of the perimeter. The overhang will require the addition of fire sprinklers. Due to this area being exposed to freezing temperatures, a dry pipe sprinkler system will be specified for these areas. The existing portions of the wood structure within the building will include sprinklers to protect the area above the ceiling.

General Plumbing Design Criteria

The existing domestic water heating system will be evaluated to ensure they are of adequate size to accommodate the new addition as well as the renovated areas. The existing domestic cold water system is also assumed to be of adequate size to accommodate these additions and renovations. The existing hot water and cold water systems will be extended to include the new plumbing requirements. The existing hot water circulation system will be utilized to provide the necessary hot water circulation to the remote fixtures.

New sanitary sewer and vent piping will be specified for the new toilet spaces. Where available existing sanitary sewer piping below the floor of existing toilet facilities will be utilized for the new toilet facilities. Where new toilet facilities or plumbing fixtures are necessary new sanitary sewer piping will be extended below the floor to the nearest main sewer line. New vent piping will be specified.

All new domestic hot and cold water will be specified as Type L copper. New piping will also include the code required pipe insulation. Pipe insulation shall be fiberglass pipe insulation. The new sanitary sewer piping will be specified as cast iron, and new vent piping will be specified as schedule 40 steel.

Design Criteria and Reference Data:

- Boulder Valley School District Technical Guidelines.
- International Plumbing Code, 2006 Edition
- International Fuel Gas Code, 2006 Edition
- International Energy Code, 2006 Edition
- International Fire Code, 2006 Edition
- National Fuel Gas Code, NFPA 54, 1999 Edition.
- Colorado Department of Health
- Americans with Disabilities Act Accessibility Guidelines
- Xcel Energy
- ASHRAE
- ASPE

Program Compliance Statement:

Plumbing systems for the facility will be designed to agree with and compliment the overall building program.

Code Analysis

IPC Section 608: Backflow prevention devices will be provided throughout the building to prevent contamination from nonpotable sources (kitchen equipment).

IPC Section 904: Sanitary Vent terminals shall be positioned a minimum of 20'-0" from any outside air intake location.

IFGC Section 401: Natural gas distribution will be designed in accordance with this code and NFPA 54.

IECC Section 504: Pipe insulation thickness specified for application on new piping systems will comply with the requirements of this section.

IECC Section 804: Plumbing equipment efficiencies shall meet the requirements outlined in the international Energy Code. Domestic hot water circulation systems will be designed to allow for automatic or manual control activation.

ELECTRICAL

Overall Scope of Project

The scope of Electrical systems work for Eisenhower Elementary School is to provide additional fire alarm devices, emergency exit egress lighting and exit signs per code; provide a new intercom and paging system; replace existing 277/480V and 120/208V switchboards; add surge protection to the existing service; relocate existing fire alarm control panel based on new design layout; provide electrical receptacles and tele/data junction boxes to addition/remodel areas per Boulder Valley School District (BVSD) technical specifications; and provide lighting fixtures and lighting controls in the addition/remodel areas.

Power Systems

Upgrade the existing 1600 ampere, 480 volt, 3-phase Square D, QMB switchboard with a new switchboard that can house additional spares. The existing switchboard appears to be in good shape, but it has only one 100 ampere spare bucket remaining. The addition will need to utilize this remaining bucket for the IMC area and it does not appear that we can add any spare switches. The current peak demand on the electrical service, according to Xcel Energy, is 217 amperes. This means although the electrical service meets BVSD's recommendation of 25% capacity on electrical services, the switchboard will not meet the recommendation of 25% spares for future growth. The existing panel circuitry will be reconnected.

Upgrade the existing 400 ampere, 208 volt, 3-phase Square D switchboard currently containing one 100 ampere spare bucket with a new switchboard that can house additional spares. This is also based on meeting BVSD's recommendation of 25% capacity for future growth. The existing panel circuitry will be reconnected.

New 1600 ampere surge protection device in new 480 volt switchboard.

Upgrade existing 12-circuit panels "PPA" and "PPB", 24-circuit panel "PPC", and 30-circuit panels "LPA" and "KPA" to new 42-circuit panels and reconnect existing branch circuitry.

New 42-circuit 100 ampere, 480 volt, 3-phase panel, new 30 kVA unistrut mounted transformer and new 42-circuit 125 ampere, 208 volt, 3-phase panel to replace the existing 24-circuit panel "LPC/F". This configuration will accommodate the power needs of the new IMC addition. The panel and transformer locations will be determined in the design development process.

New receptacles throughout addition/remodel areas based on BVSD's technical specifications. The remodel areas will utilize existing receptacles and branch circuitry where possible.

New electrical connections and controls as required for mechanical systems in addition/remodel areas.

Lighting Systems

New exterior egress lighting fixtures throughout building per code requirements. Exact locations will be based on the path of egress outlined in the design development process. Currently, 28 locations have been noted based on the existing building footprint.

New T8 parabolic fluorescent light fixtures throughout addition/remodel areas based on the new design layout. Where possible, the existing branch circuitry and junction boxes will be incorporated in the design.

New exit signage and interior emergency lighting per code requirements throughout addition/remodel areas. Exact locations will be based on the path of egress outlined in the design development process. Approximately 4 additional exit signs are needed in the existing area of the building.

New ceiling-mounted district standard occupancy sensors will be added in the addition areas and relocated in the remodel areas. Currently no new occupancy sensors are required in the existing

portion of the building. Override wall switches will be provided per IECC 2006 lighting compliance requirements.

Alternate: Based on Xcel's energy assessment dated 4/6/09, there is a possible $2,000 rebate with a 2-year payback for replacing the gym's existing HID fixtures with new high-bay T8 fluorescent fixtures, replacing any remaining incandescent fixtures to new compact fluorescent fixtures and removing the two T8 fluorescent fixtures at each skylight throughout the building. Xcel has noted an approximate project cost of $4,000 with an annual energy savings $1,300 or 13,000 kWh.

Alternate: Based on Xcel's energy assessment dated 4/6/09, there is a possible $1,700 rebate with a 9-year payback for upgrading the existing classroom and office 32 watt, T8 fluorescent lighting to new 28 watt, Super T8 fluorescent fixtures with low-ballast factor ballasts. Xcel has noted an approximate project cost of $27,000 with an annual energy savings $2,700 or 27,000 kWh.

Fire Alarm Systems

Relocate existing fire alarm control panel and map to new building entrance. Extend and reconnect existing fire alarm IDC's/NAC's to new panel location.

New wall mounted fire alarm pull station near exit doors per code requirements and tied into existing fire alarm control system in the addition/remodel areas as well as approximately 3 devices in the existing areas.

New fire alarm horn/strobes per code requirements and tied into existing fire alarm control system in the addition/remodel areas.

New fire/smoke dampers and duct detectors per mechanical plans in the addition/remodel areas.

Special Systems

Relocate existing clock control system and public address control system based in new administrative area layout. Extend and reconnect branch circuitry. Location of systems will be determined during the design development process.

New telephone/data communication outlet junction box and a 3/4" conduit with pull string and end bushings to above accessible ceiling per BVSD technical specifications in the addition/remodel areas.

New intercom and paging system throughout building per BVSD's technical specifications. Disconnect and remove conduit for existing call buttons. The existing public address speakers in the clock/speaker combination boxes and hallway single boxes are to remain.

New ceiling/wall mounted motion detectors to match existing building standard and tied into existing motion detection system in the addition/remodel areas.

New wall mounted clocks tied into existing clock system in the addition/remodel areas.

New security access junction box and conduit based on BVSD security requirements at new main administrative entrance.

Alternate: During the existing site survey, it was noted that many of the clocks throughout the building were either not synchronized, stand alone battery units or covered up by construction paper. MEP suggests upgrading the existing clock system per BVSD's technical specifications.

Code Analysis

The following list summarizes the Codes and Standards that will be incorporated into the design of Eisenhower Elementary School:

A. 2006 International Building Code (IBC)

B. 2006 International Fire Code (IFC)

C. 2008 NFPA 70 National Electrical Code (NEC)

D. 2007 NFPA 72 National Fire Alarm Code

E. 2004 ASHRAE/IESNA Standard 90.1

F. 2003 Americans with Disabilities Act Accessibility Standard (ICC/ANSI A117.1)

G. 2006 International Energy Conservation Code (IECC)

General building information:

Building Occupancy: Group A-1 or 2, Assembly occupancy with 1,000 or more (Division A-1) or less than 1,000 (Division A-2) occupant load with a legitimate stage. Since the assembly area is part of a Group E occupancy, the Group E code has precedence.

Group E-1, Educational through 12th grade for 50 or more persons.

Specific requirements that affect the electrical systems design are listed below based on the IBC and ADA.

2006 IBC Group A: Fire Alarm Systems: As required by IFC for Group A, Divisions 1 or 2 listed. 2006 IFC 907.2.1.1 Fire Alarm System: Only Audible and Visual notification horn/visuals are required. If the occupancy is greater than 1000 people, a pre-recorded message is required instead of horns.

2006 IBC Group E: Fire Alarm Systems: An automatic sprinkler or detection system required. IFC 907.2.3 requires a manual fire alarm system. IFC requires an exterior alarm signaling device at the fire department connection.

2006 IBC 903.4.2 Alarms: An approved audible sprinkler flow alarm shall be provided on the exterior of the building in an approved location. An approved audible sprinkler flow alarm to alert the occupants shall be provided in the interior of the building in a normally occupied location. Actuation of the alarm shall be as set forth in IBC Standard 9-1.

2006 IBC 907.9: Alarms: Alarm systems shall include both audible and visible alarms in public and common use areas, toilet rooms, hallways, and in lobbies.

2006 IBC 1006: Means of egress illumination: The means of egress shall be illuminated at any time the building is occupied to a level of not less than one footcandle at floor level.

2006 IBC 1006.3: Egress illumination shall normally be provided by building premises wiring. Upon failure of normal power, power shall be automatically transferred to an alternate source (Batteries or on-site generator).

2006 IBC 1011.1: Means of egress identification: The path of exit travel to and within exits in a building shall be identified by exit signs conforming to the requirements of Section 1011.1. Exit signs shall be readily visible from any direction of approach. Exit signs shall be located as necessary to clearly indicate the direction of egress travel. No point shall be more than 100 feet from the nearest visible sign.

2006 IBC 1011.2: Exit signs shall be internally or externally illuminated. Specific criteria apply.

2006 IBC 1011.5.3: Power source. All exit signs shall be illuminated at all times. To ensure continued illumination for a duration of not less than 1.5 hours in case of primary power loss, the exit

sign shall also be connected to an emergency electrical system provided from storage batteries, unit equipment, or on-site generator set, and the system shall be installed in accordance with the Electrical Code.

2008 NEC 700-12: Current supply shall be such that in the event of failure of the normal supply to, or within the building, exit signs illumination will be available within the time required for the application, but shall not exceed 10 seconds. Batteries or an emergency generator are allowable forms of power. Batteries shall have suitable rating and capacity to supply and maintain the total load for a period of 1-1/2 hours minimum, without the voltage applied to the load falling below 87-1/2 percent of normal.

Electrical Systems IBC: Electrical systems shall be installed per the Electrical Code, NFPA 70 (Electrical system will be designed and installed as per the 2008 National Electric Code).

S L A T E R P A U L L
A R C H I T E C T S

EISENHOWER ELEMENTARY SCHOOL

RENOVATION AND ADDITION PROJECT
DESIGN SCHEDULE

May 5, 2009

Date	Task
March thru May, 2009	• Design Advisory Team Meetings
Week of April 27, 2009	• Meet with Building Department
May 6, 2009	• Issue Schematic Design Package
May 6-19, 2009	• Review SD Package
May 19, 2009	• Review FCI SD Cost Estimates with DAT
June 30, 2009	• Issue Design Development Package
Week of July 6, 2009	• Review DD Package
July 31, 2009	• FCI to Deliver DD Estimates
September 25, 2009	• Issue Final Review Set
Week of Sept. 28, 2009	• Review meeting
October 16, 2009	• Issue for Bidding / Construction Permit
November 13, 2009	• Subcontractor bids due to FCI
November 20, 2009	• GMP's due to BVSD from FCI
November 27, 2009	• Permit from State
Week of Dec. 1, 2009	• Start Construction
August, 2010	• Receive T.C.O. from State • Owner begins move in

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DRAWING INDEX

Site/Landscape Plan

Overall Floor Plan

Code Review Plan

Demolition Plan – Area A

Demolition Plan – Area B

Floor Plan - Area A

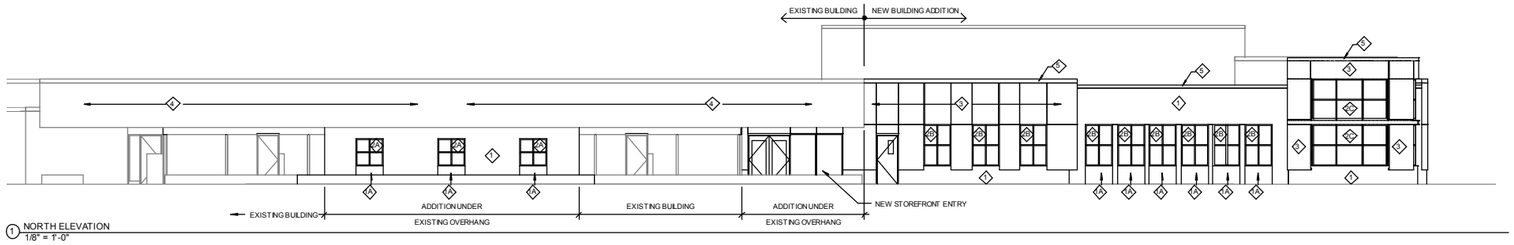
Floor Plan - Area B

Finish/Ceiling Plan – Area A

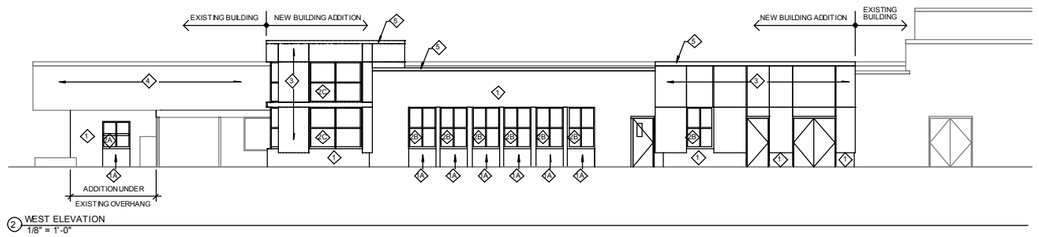
Finish/Ceiling Plan – Area B

Building Elevations/Perspectives

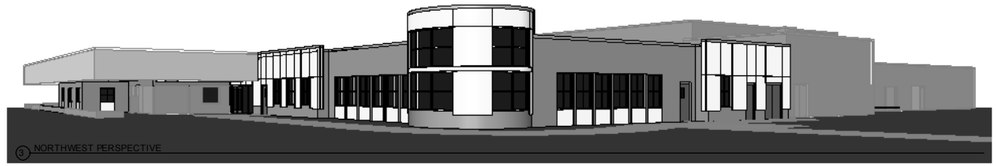
(11x17 drawings included with this report – full size drawings available upon request)



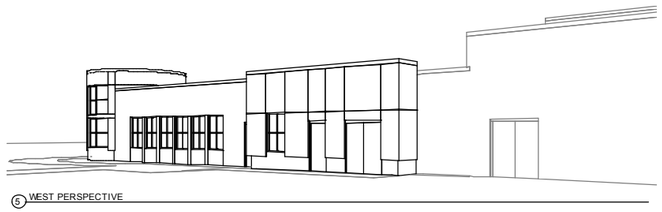
1 NORTH ELEVATION
1/8" = 1'-0"



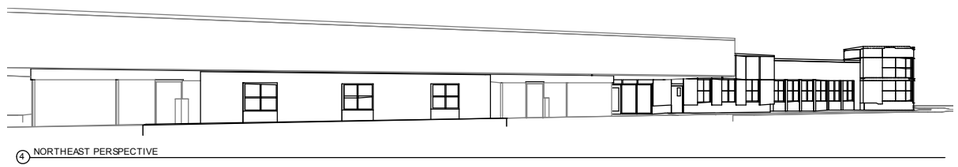
2 WEST ELEVATION
1/8" = 1'-0"



3 NORTHWEST PERSPECTIVE



5 WEST PERSPECTIVE



4 NORTHEAST PERSPECTIVE

KEY NOTES

1. FACE BRICK - FIELD COLOR.
2. FACE BRICK - ACCENT COLOR - RECESS 1".
3. 4'x4' ALUMINUM WINDOW W/ INSULATING GLAZING.
4. 4'x6' ALUMINUM WINDOW W/ INSULATING GLAZING.
5. SEGMENTED ALUMINUM WINDOWS W/ INSULATING GLAZING - SEGMENTS APPROX. 4'x6'.
6. STUCCO WALL PANEL.
   ALTERNATE: METAL WALL PANEL.
7. ALTERNATE: REMOVE AGGREGATE FINISH AND DAMAGED PLYWOOD PANELS - INSTALL NEW PLYWOOD AS NEEDED AND APPLY NEW STUCCO FINISH TO ENTIRE FASCIA.

   ALTERNATE: REMOVE DAMAGED PLYWOOD PANELS AND EXISTING METAL COPING. INSTALL NEW METAL PANELS, METAL COPING AND TRIMAS REQUIRED.

   NOTE: REFER TO FLOOR PLANS FOR EXTENT OF OVERHANG.
8. PREFINISHED METAL COPING.

EXTERIOR ELEVATIONS / PERSPECTIVES

A-211

Eisenhower Elementary School

1220 Eisenhower
Boulder, CO 80303

6 MAY 2009

0' 4' 8' 16' 32'

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