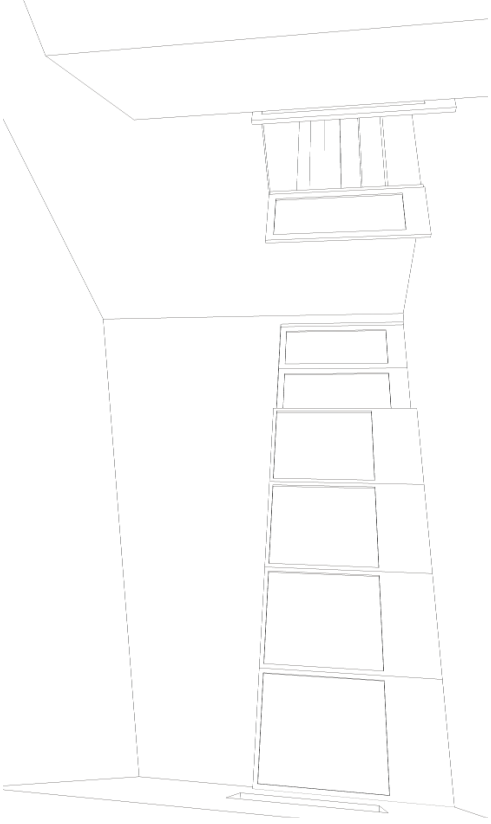
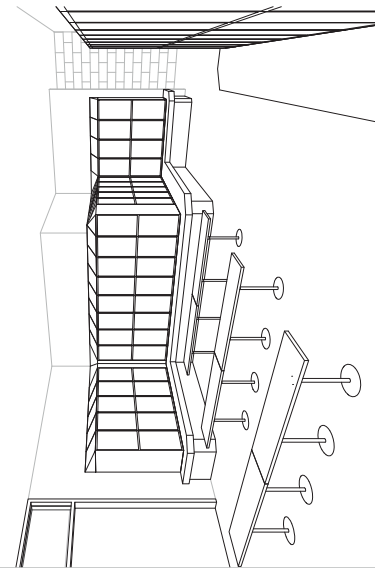


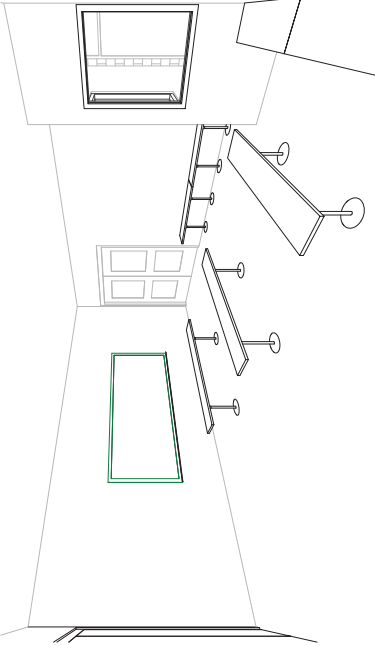
NEW AUX GYM LOBBY



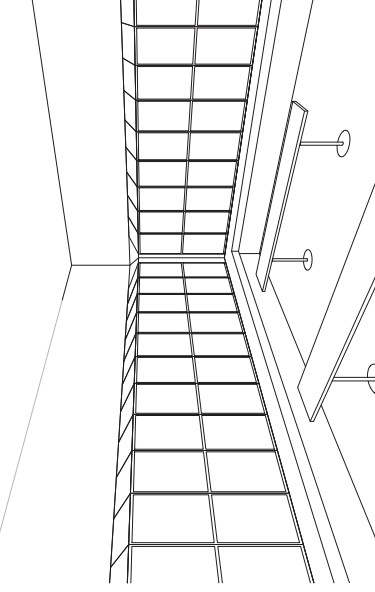
NEW AUX GYM LOBBY



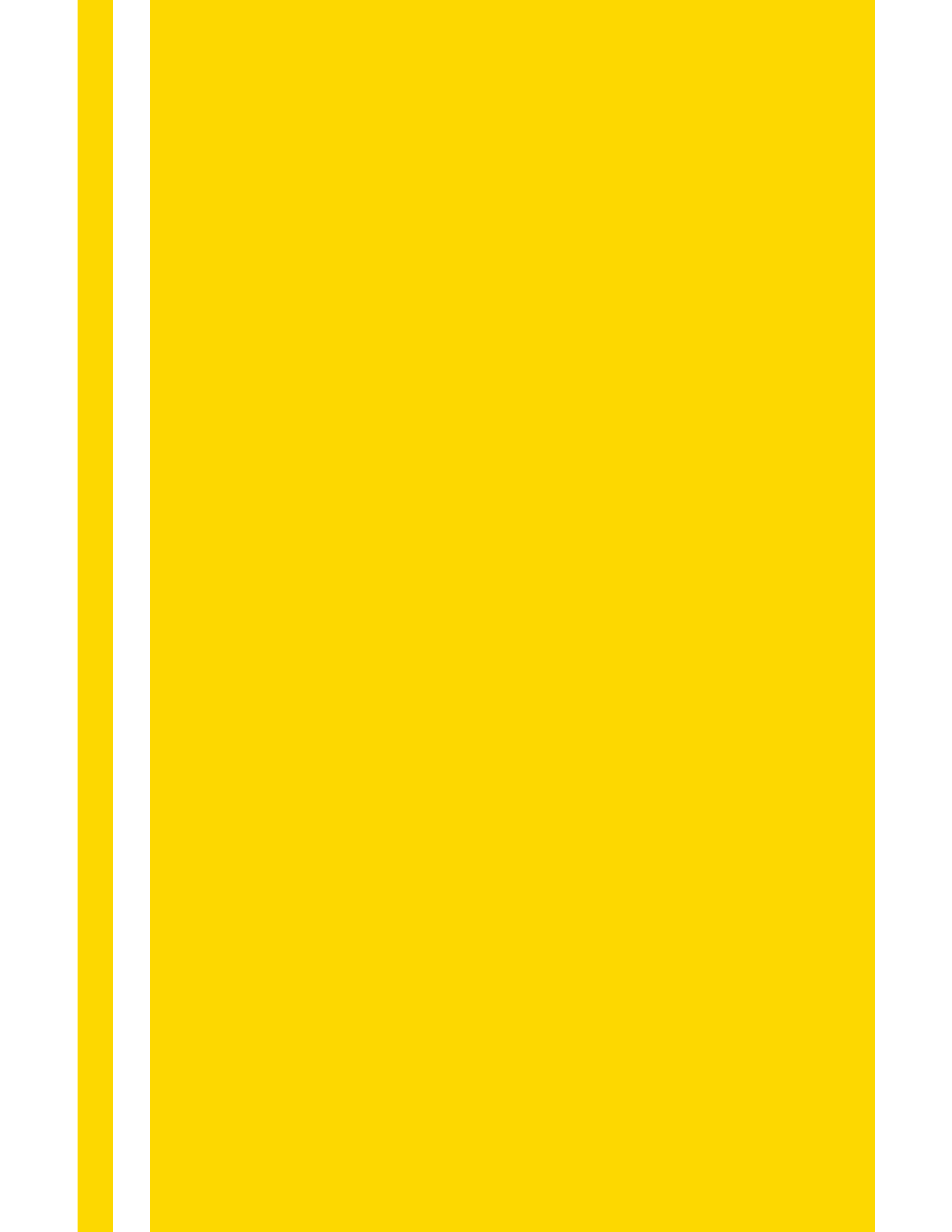
GIRLS' HOME TEAM ROOM 1



GIRLS' HOME TEAM ROOM 2



GIRLS' VISITING TEAM ROOM



# CODE ANALYSIS 03.0

CODE ANALYSIS NARRATIVE 03.1

EGRESS & SPRINKLERS 03.2  
PROPOSED SPRINKLER SYSTEM EXTENTS  
AREA ANALYSIS  
EGRESS

OCCUPANT LOAD & ENERGY 03.3  
PLUMBING FIXTURE CALCULATIONS

# CODE ANALYSIS

## ALLOWABLE AREA AND ALLOWABLE STORIES

### Existing Building

1. Two existing buildings, separated by 2 hour fire wall
  - a. E = 17,664 sf per story = Gymnasium and locker rooms (2 stories total)
  - b. D = 6,451 sf per story = South classroom building (1 story)
  - c. E+D = 24,115 sf (2 stories)
2. Existing frontage – Area increase allowed per 506.2?
  - a. E = 278' frontage and 726' total perimeter = 38% of frontage, minus 25% = 13% allowable area increase.
    1. 9500 sf + 13% = 10,735sf
    2. NOT compliant. 10,735sf allowable < 17,663 sf designed
  - b. D = falls within allowable area, so no frontage increase calculation done.
    1. Area B is compliant for allowable building area.
  - c. E+D (24,115 sf) = 527' frontage and 663' total perimeter = 79% of frontage, minus 25% = 54% area increase
    - i. 9,500 sf + 54% = 14,630 sf allowable area
      1. NOT compliant. 14,630sf allowable < 24,115 sf designed
      2. If we took away courtyard, that would make it even less compliant.
    3. Sprinkler Area Increase per 506.3. To bring gymnasium building up to code, a sprinkler system must be installed.
- a. A = 200% increase [for multi-story buildings]
  - i. 9,500 sf + 200% = 28,500 sf
    1. This would make building compliant, even without frontage increase, therefore no frontage is required and we can remove current frontage.
    2. Note: This would also make the building compliant as a 2 story building per 504.2, whereas now 2 stories are not allowed per Type 5B, E occupancy, unsprinklered.

### New Construction Only

- Allowable Area = 9,500 sf + 300% (single story building) = 38,000sf allowable area. Acceptable.

**New Construction Combined with Existing (newly sprinklered) Gymnasium building, to avoid Fire Wall. Retain existing 2 hour separation from South Classroom Building D.**

- **Allowable Area = 9,500 sf + 200% (two story building @ existing gym) + zero frontage increase = 28,500 sf allowable area**
- **Keep existing addition below 10,834 sf (28,500sf – 17,664sf). Current design is at 10,160 sf, so compliant if not including alternative lobby space.**

## PEDESTRIAN WALKWAYS & CANOPIES

The pedestrian walkway shall not contribute to the building area per 3104.1.

The pedestrian walkway shall be of noncombustible construction per 3104.3 unless both buildings that it connects are of combustible construction.

Walkways shall be separated from the interior of the building by not less than 2-hour fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 711, or both. This protection shall extend vertically from a point 10 feet above the walkway roof surface or the connected building roof line, whichever is lower, and horizontally 10 feet from each side of the pedestrian walkway.

**Exception:** The walls separating the pedestrian walkway from a connected building and the openings within the 10-foot horizontal extension of the protected walls beyond the walkway are not required to have a fire-resistance rating by this section where the following conditions exist:

The distance between the connected buildings is more than 10 feet and both sidewalls of the pedestrian walkway are not less than 50 percent open with the open area uniformly distributed to prevent the accumulation of smoke and toxic gases.

**Canopy Definition** = a permanent structure or architectural projection of rigid construction over which a covering is attached that provides weather protection, identity or decoration, and shall be structurally independent or supported by attachment to a building on one end and by not less than one stanchion on the other end.

Canopies shall be constructed of a rigid framework with an approved covering that meets the fire propagation performance criteria of NFPA 701 or has a flame spread index not greater than 25 when tested in accordance with ASTM E 84 or UL 723.

## REQUIRED PLUMBING FIXTURES:

Addition only (see chart)

## BUILDING ENVELOPE REQUIREMENTS:

Roofs, insulation entirely above deck = R-20 continuous insulation, minimum

Walls, Above Grade = Mass = R-11.4 continuous insulation, minimum

Walls, Above Grade = Wood framed = R-21, minimum

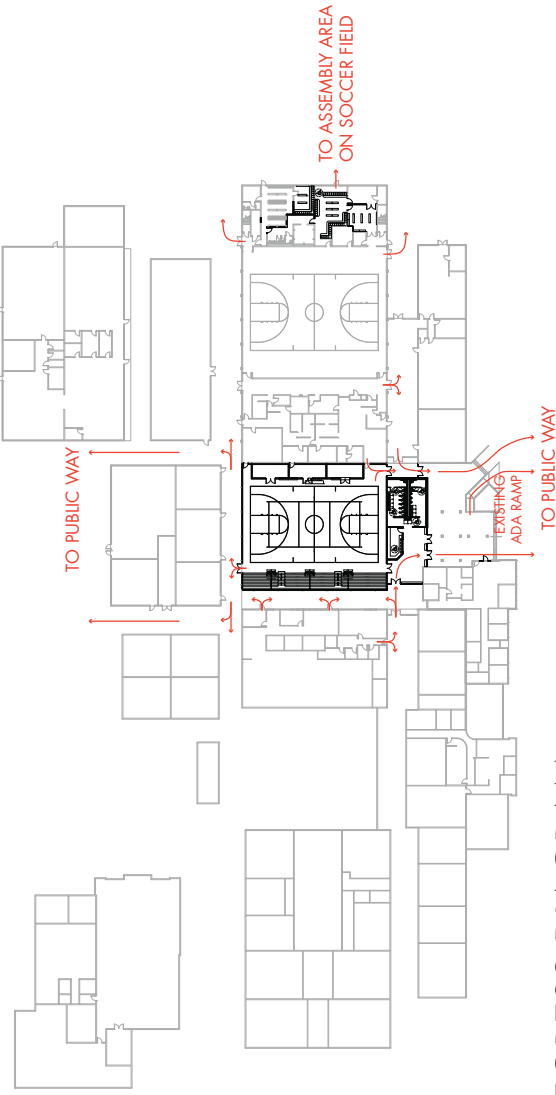
Walls, Below Grade = R-7.5 continuous insulation, minimum

Slab-on-Grade Floors = NR

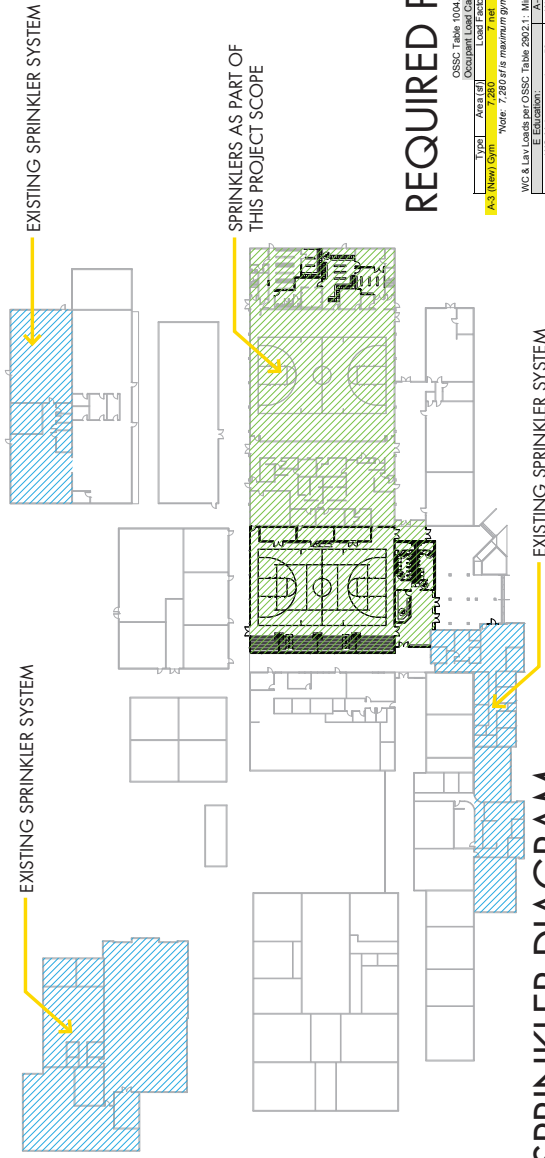
Opaque Doors = Swinging = U-0.70 maximum

Storefront with Metal Framing = U-0.45 maximum

Entrance Door = U-0.80 maximum



EGRESS DIAGRAM



REQUIRED PLUMBING FIXTURE CALCULATIONS

| Code  | Area (sf) | Occupant Load Calculations | WC (1,000) | Per Code | WC (1,000) | Per Code | WC (1,000) | Per Code | WC (1,000) | Per Code | WC (1,000) | Per Code | WC (1,000) | Per Code |
|---|-----------|----------------------------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|
| A-3 (New) Gym   | 7,280     | 274                        | 1          | 1,000    | 600        | 1        | 1,000      | 600      | 1          | 1,000    | 600        | 1        | 1,000      | 600      |
| <p>OSCC Table 1004.1.2<br/>           Occupant Load Calculations (See below)<br/>           Water Closets (Toilet &amp; Urinal)<br/>           WC (1,000)    1 per 125    1 per 125    1 per 125    1 per 125    1 per 125    1 per 125    1 per 125    1 per 125    1 per 125    1 per 125    1 per 125    1 per 125    1 per 125    1 per 125</p> <p>WC &amp; Lav Leads per OSCC Table 2002.1: Minimum Number of Required Plumbing Fixtures<br/>           Note: 7,280 is a maximum gym size prior to going to 9 women's WC. Current (SD) gym size is 7,098 sf.</p> |           |                            |            |          |            |          |            |          |            |          |            |          |            |          |

| Code        | Area (sf) | Occupant Load Calculations | WC (1,000) | Per Code | WC (1,000) | Per Code | WC (1,000) | Per Code | WC (1,000) | Per Code | WC (1,000) | Per Code | WC (1,000) | Per Code |
|-------------|-----------|----------------------------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|------------|----------|
| S-2 Storage | 2,600     | 100                        | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      |
| WC Male     |           |                            | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      |
| WC Female   |           |                            | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      |
| Lav Male    |           |                            | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      |
| Lav Female  |           |                            | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      | 1          | 100      |

SPRINKLER DIAGRAM



# MATERIALITY

04.0

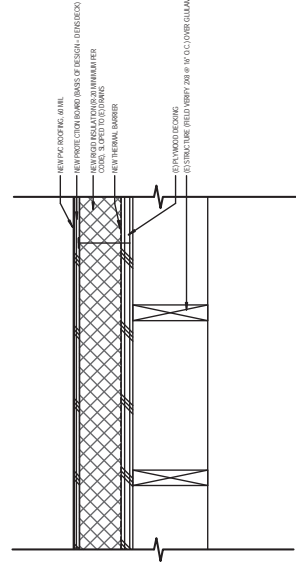
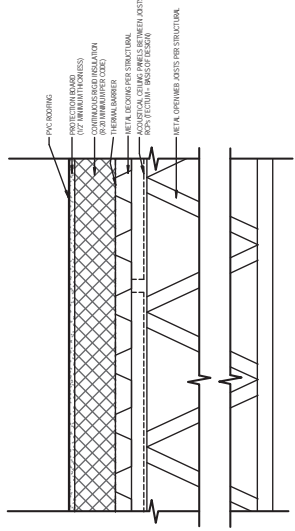
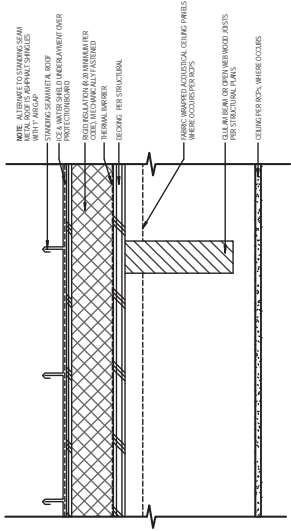
**EXTERIOR MATERIALS**  
ASSEMBLY TYPES  
NEW GYMNASIUM CLADDING

04.1

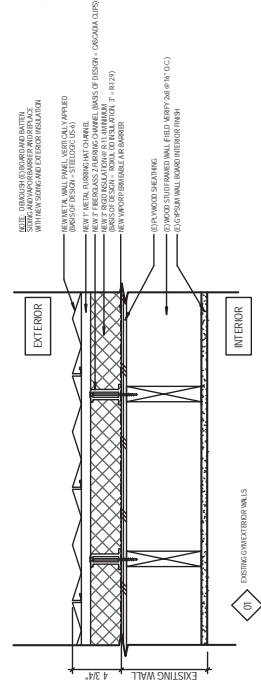
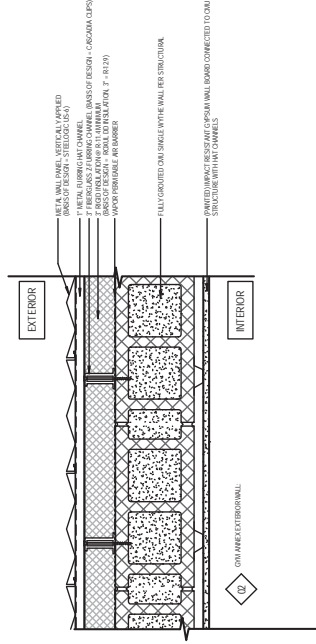
**INTERIOR MATERIALS**  
GIRLS' LOCKER ROOM IMPROVEMENTS  
NEW AUX GYM & LOBBY

04.2

# EXTERIOR MATERIALS



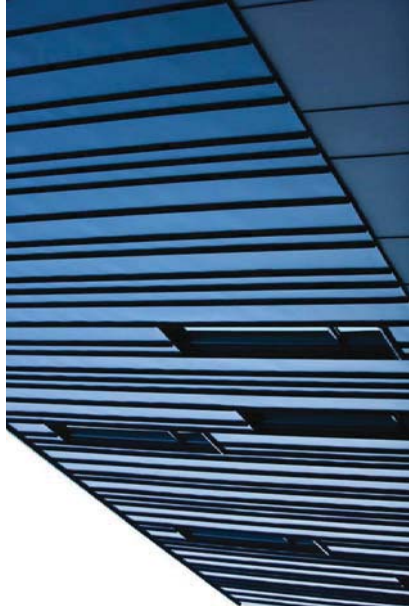
**ROOF TYPES  
(SECTION VIEW)**

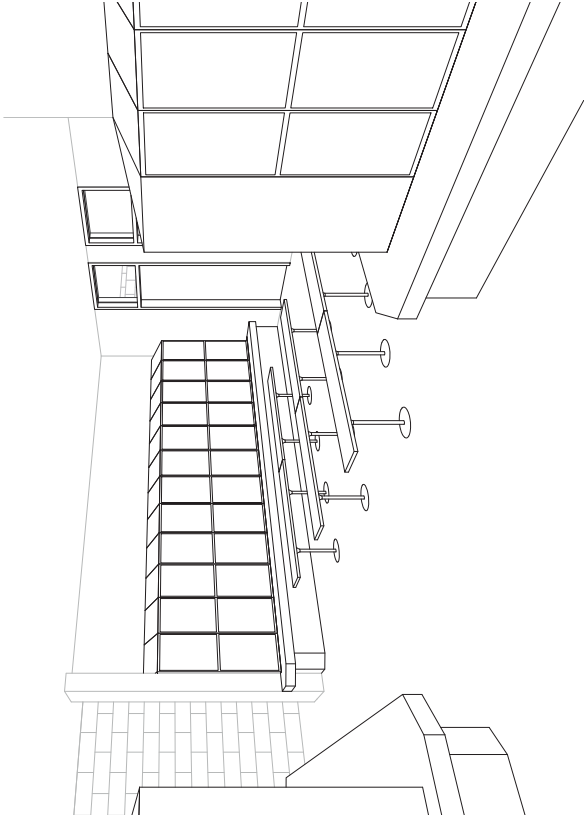


**EXTERIOR WALL TYPES  
(PLAN VIEW)**

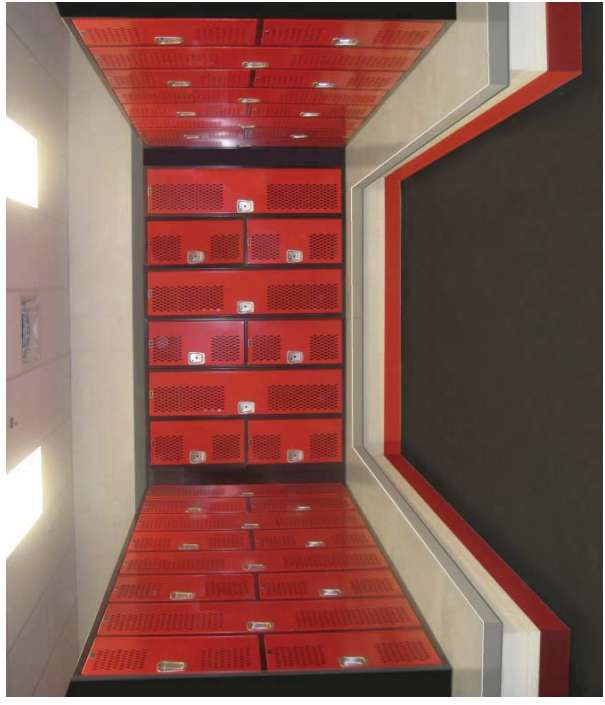


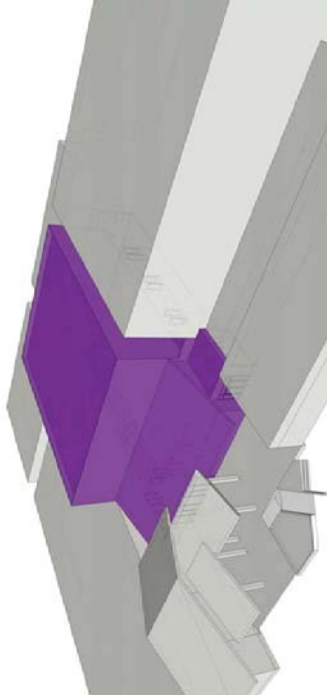
EXTERIOR MATERIALS



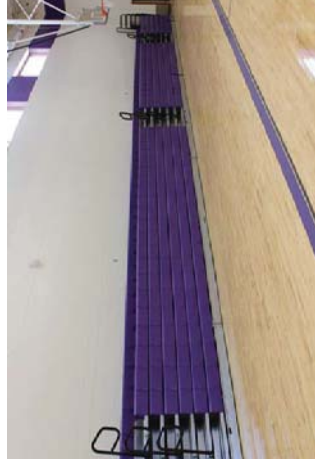
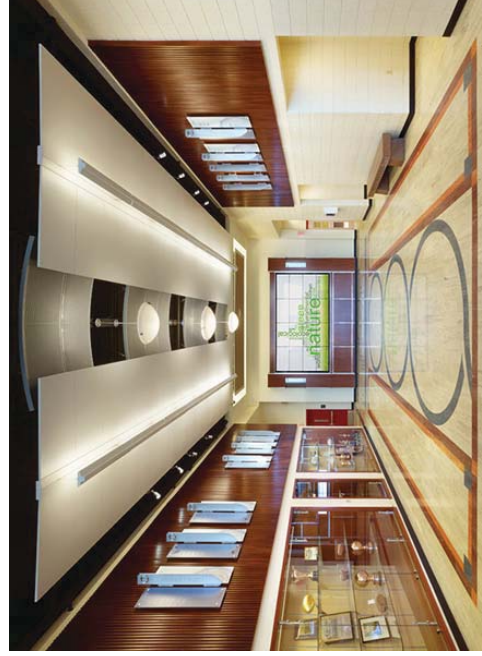
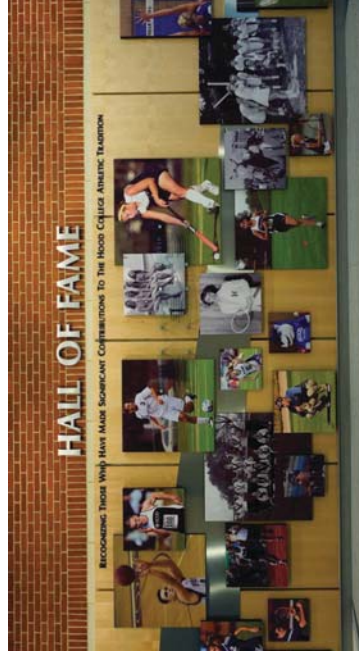


INTERIOR MATERIALS - GIRLS' RENOVATED TEAM LOCKER ROOMS





## INTERIOR MATERIALS - NEW AUX GYM & ENTRY LOBBY



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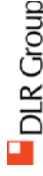
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ELMIRA HIGH SCHOOL

Fern Ridge School District





# TEAM NARRATIVES 05.0

CIVIL 05.1

STRUCTURAL 05.2

ELECTRICAL 05.3

MECHANICAL 05.4

# CIVIL NARRATIVE

## Existing Conditions

The existing site is an open courtyard area that is surrounded by a gym to the east, weight room to the north, classrooms to the west, and a covered entrance to the south. The School District desires to keep the covered entrance and flatwork to the south.

The existing topography at the Elmira High School site ranges in elevation from approximately 408 feet to 410 feet. The Finish Floors of all of the building surrounding the courtyard is 410.8 +/-.

## Site Soils

Per the Geotechnical Site Investigation and Recommendations dated August 28, 2014, by K&A Engineering, site soils are characterized as consisting of 2 to 4-feet of highly variable soils (organics, loose fills, construction debris) over native gravelly silty and clayey soils. Groundwater was not consistently found at depths up to 23 feet.

## Site Improvements

The proposed project includes demolishing the courtyard to the west of the existing gym and constructing a new auxiliary gym, storage area, entrance lobby and rest rooms. These site improvements will require utility demolition, rerouting, and new utility connections.

(See the Electrical Narrative for the power, data, and telephone demolition, re-routing, and proposed improvements.)

## Access and Site Paving

To the south of the proposed project are a driveway and two parking lots. The project scope includes repair of the existing asphalt near the lobby entrance and improved drainage. The existing stairways connecting the driveway to the proposed improvements will remain. Proposed pavement sections will be 3 inches of asphalt over 10 inches of base, over a paving fabric.

## Site Utilities

### Domestic Water and Fire Protection:

Elmira High School is currently served by a well and pump house to the south. There is a 4-inch water line running from the well and pump house to the north which serves the high school.

The domestic water system is regulated by the Oregon Health Authority Drinking Water Services, and their involvement early in the design phase may be necessary. Also, coordination with the architect, mechanical engineer, and plumbing designer will be critical to determine demand on the proposed system. It is anticipated a domestic water service is readily available in one of the adjacent buildings, and a new domestic service is not anticipated at this time.

Some of the existing buildings have fire sprinkler service, while a number do not. There is an existing fire pump system and a 25,000 gallon tank located to the west of the high school which provides flow to two existing hydrants and sprinkler service to the school. The new buildings will have fire sprinkler service. In order to meet current fire code, additional fire tank storage volume may be required. The fire system will be designed per NFPA standards. A meeting with the local fire marshal is highly recommended at this point.

## Site Utilities (cont'd)

### Sanitary Sewer

The high school school is served by a several septic tanks, recirculating gravel filter system, and leachfield system under the football field. The new auxiliary gym will be on top of an existing sewer line which runs west-to-east and presumably serves the western side of the high school complex. Approximately 100 feet of sewer line will either need to be rerouted or completely replaced within the footprint of the auxiliary gym. It is prudent to pothole the existing sewer line immediately to determine the depth and size of the pipe.

### Storm Drainage

Currently, the site generally drains easterly via an underground storm drain system towards the football field. It is anticipated this flow pattern will be maintained with the new site development. The ultimate discharge point for the flow from most of the high school site is the Territorial Highway ODOT right of way. To alleviate downstream flooding concerns that currently exist and will be further exacerbated by constructing over pervious areas in the courtyard, storm water detention will be required somewhere on the high school campus.

The new auxiliary gym will displace two catch basins and approximately 270 feet of storm drain pipe. The downspouts from the new buildings will connect to the existing underground storm network. Drainage at and around the new buildings will likely be captured by trench drains or small, pedestrian friendly area drains.

### Steam Line

The site topographic map shows two 1-1/4-inch metal pipes assumed to be abandoned steam lines along the northwest corner of the courtyard. These lines will likely be within the building footprint and will need to be cut off and removed. Steam lines are known to contain asbestos, and the removal of the facilities may require asbestos abatement procedures prior to or during construction.

## STRUCTURAL NARRATIVE

The new additions to Elmira High School will consist of a new auxiliary gymnasium and a new entrance lobby. Both additions will be seismically isolated from the existing building. There will also be some renovations to the team room as well as some selected seismic strengthening.

The Gymnasium addition will be one story and constructed of 12" CMU bearing walls which will also act as the shear walls for the building. The roof framing will consist of steel open web joists at approximately 8 feet on center supporting a 3" acoustic metal roof deck. The foundations will consist of concrete continuous footings under the CMU walls and isolated spread footings under any columns. The floor will be a 5" thick reinforced slab on grade, which will be recessed as required for the gymnasium flooring. The existing covered walkways to the north and west of the new gymnasium will be removed during construction for access. The walkways will then be rebuilt after the gymnasium is in place, utilizing existing footings where possible. The walkways will likely consist of steel columns with a wood framed roof. A seismic joint will need to be located between the gymnasium and the walkways.

At the new entrance lobby, the existing covered walkway and canopy will be removed. Structural modifications to the existing building on the east and west sides of the new addition are expected to be minimal. The new addition will consist of a wood framed roof supported on a combination of steel columns and wood walls. The foundation will consist of concrete continuous footings with stem walls under the bearing walls and isolated spread footings at the columns. The floor will be a 5" thick reinforced slab on grade. A seismic joint will need to be located at the east and west sides of the addition next to the existing building, while the north side will be tied into the new auxiliary gymnasium.

The top 2 to 4 feet of the site soils consist of highly variable soils. Therefore, the geotechnical report notes that footings likely will have to be excavated to a depth of 3 to 4 feet and then filled partially with select granular fill. The slab on grade will also have to be supported on a minimum of 18" of select granular fill.

The renovation at the team room will consist of removing bearing walls and replacing them with posts and beams. As long as the posts land on existing bearing wall footings no additional foundation work is expected.

Seismic strengthening will consist of adding anchorage from the roof diaphragms to the top of the existing CMU walls. The new anchors will consist of steel plates and straps with epoxy bolts into the CMU walls and lag screws to the roof framing. At locations where the walls are parallel to the roof framing, additional blocking and strapping will be added to the underside of the roof.

# ELECTRICAL NARRATIVE

## CODES, STANDARDS, AND REGULATIONS

The following codes are applicable to this project:

1. National Electrical Code (NEC) – 2014
2. International Building Code (IBC) - 2012
3. International Fire Code (IFC) – 2012
4. International Mechanical Code (IMC) – 2012
5. International Plumbing Code (IPC) – 2012
6. Oregon Energy Efficiency Specialty Code (OEESC) – 2014
7. Oregon Electrical Specialty Code (OESC) – 2011

Latest editions publications from the following standards organizations will be used as design guidelines for the project:

1. National Fire Protection Association (NFPA)
2. Illuminating Engineering Society of North America (IES)
3. Building Industry Consulting Service International (BICSI)
4. Americans with Disabilities Act (ADA)
5. National Electrical Manufacturer's Association (NEMA)
6. Electrical Industries Alliance (EIA)
7. Telecommunications Industry Association (TIA)

The project will be designed to conform to the Oregon Energy Trust requirements and Americans with Disabilities Act and Architectural Guidelines (ADAAG).

## POWER DISTRIBUTION

A new 100A, 208Y/120V panelboard will be provided for the new gymnasium and surrounding spaces. This panel will be designed to accommodate the electrical loads for general purpose receptacles, mechanical loads and special equipment for the space. If possible, new 277V and 480V loads will be accommodated by existing Panel J located in the nearby West Locker Rooms.

All interior electrical conductors will be stranded copper, #12 minimum, (#14 for control) Type THHN/THWN-600V. Ground conductor shall be provided in all feeders, branch and lighting circuits' raceways.

## POWER

Receptacles will be spaced throughout the new gym to accommodate potential needs for cleaning, general use, and use during events. Additional power will be provided for all specialty systems such as scoreboard raising/lowering, scoreboard, bleachers, and audio-visual equipment.

## LIGHTING

Interior lighting will be primarily 3500K LED fixtures with electronic 0-10V dimming drivers. Lighting levels will vary and will be based on the recommendations of Illuminating Engineering Society. Lighting power densities and controls will comply with the Oregon Energy Efficiency Specialty Code.

The gymnasium will be designed to an average of 35 footcandles. Locker rooms will be designed to 20 footcandles. Corridor, storage and utility spaces will be designed to an average of 10 footcandles.

Due to the lack of a permanent on-site generator, emergency egress lighting will be provided primarily by battery powered supplemental lighting units. These fixtures will provide a 1 ft path in all egress locations.

## LIGHTING (cont'd)

The basis of design for lighting controls will be the Wattstopper DIM system. It will consist of distributed digital relay/dimming module located in the gym and locker room spaces, which will power and dim the light fixtures. Switches and sensors will be connected via Cat 5 cabling. Spaces with daylight access will utilize photocells to automatically dim fixtures. This will ensure that distraction is not caused by lights turning on and off. All spaces will be controlled by occupancy sensors.

## FIRE ALARM

All fire alarm devices will be of the intelligent, addressable type. Devices will include manual pull stations, strobes, and speaker/strobes.

The current existing main fire alarm control panel (FACP) for the school is a Siemens MXL panel, which is capable of supporting addressable devices. However, the system is currently in the process of being phased out of manufacture. In addition, the system does not support voice evacuation, which is required by code due to the occupant capacity of the gymnasium. It is recommended that the FACP is replaced with a newer Siemens XLSV system. All existing devices within the school are compatible with the XLSV system, meaning that only the actual FACP will need to be replaced. Upgrading the FACP now will provide a benefit to any future renovations of the school in terms of ensuring device compatibility.

## SPECIAL SYSTEMS

**Phone / Data communication System:** A full coverage Wi-Fi system shall be provided in the building via WAPs located throughout and in all classrooms and corridors and common areas. Each WAP location will have (2) Category 6A data drops brought to them. A VoIP phone system will be rolled out across the school, which may require the installation of additional data drops in each space.

Note that the addition of a potentially large number of data drops across the school will require a verification of the current capacity of the existing racks in the MDF and IDF closets. Additional switches may be required, and in the event that there is no additional rack space, additional racks may be required. Depending on the layout of the closet, this could require relocation of existing racks and systems to accommodate any required additions.

**Intercom / Paging / Clock & Bell system:** Additional clocks and intercom stations will be provided in the new construction areas. All devices provided and installed will be compatible with the existing Telecor PA system.

**Classrooms and Instructional Spaces Audio Video System:** Each classroom and instructional space shall be equipped with audio video systems that will consist of a wall mounted ultra-short throw LCD projector connected to the teacher workstation, sound amplification system, and either ceiling mounted or wall mounted speakers as applicable in the space. An Ethernet connection shall be provided for each projector enabling it to be used for visual paging or online video streaming from a remote location in the future. The basis of design will be the Quiktron TruLink amplifier and speakers, utilizing Quiktron RapidRun cabling for the connection between the teacher's station and the projector.

**Access Control and Intrusion Detection System:** IP-based access control and intrusion detection system shall be provided. All doors to be equipped with access control shall be coordinated with owner. All exterior doors are currently planned to be equipped with access control system and electronic locking hardware. Key pads and card readers will be located near the main entry doors. Magnetic contacts will be provided on all exterior doors and shall be double pole double throw type so they can be shared amongst access control and intrusion detection systems. Access control system shall have provisions for complete emergency lockdown via hardwired panic pushbutton or systematic lockdown from a control workstation. A badge printing/programming station shall be provided at the security desk or office. Main control panels for the systems shall be located in the MDF room.

**CCTV Camera Surveillance System:** A complete IP based CCTV video surveillance system shall be provided. The scope and coverage areas will be discussed in future phases.

**System Integration:** An integrated software platform will be considered for integration of access controls and security cameras. All of these systems shall be web based and accessible from a remote network connection.



# MECHANICAL NARRATIVE

## **CODES**

The following codes are applicable to this project:

- 2014 Oregon Mechanical Specialty Code, based on 2012 IMC, adopted July 1, 2014
- 2011 Oregon Plumbing Specialty Code, based on 2009 UPC
- 2014 Oregon Energy Efficiency Specialty Code, based on 2012 OEESC, adopted July 1, 2014

## **HVAC**

### **NEW GYM AREA**

The proposed HVAC systems are comprised of roof mounted packaged heating and ventilation systems that satisfy 2014 OEESC. The existing heating hot water system will be utilized as a source of heat. Areas with high levels of outside air ventilation requirements will be provided with heat recovery. No active air conditioning will be provided. High volume, low speed (HVLS) ceiling fans will be used to maximize comfort levels during traditional cooling seasons. One unit will be provided for the Gym area and another unit will be provided for the Lobby and Restroom area. Air will be delivered with a standard overhead air distribution system.

### **LOCKER ROOM AREA**

The existing mechanical system will be reconfigured, and exhaust fans, as needed to meet the requirements of the new demising plan.

## **CONTROLS**

### **NEW GYM AREA**

Controls for the New Gym mechanical equipment will feature direct digital controls which will tie into the existing campus control system.

### **LOCKER ROOM AREA**

The existing controls will be reconfigured as needed to meet the requirements of the new demising plan.

## **FIRE PROTECTION**

### **NEW GYM AREA**

The New Gym will be provided throughout with an automatic sprinkler fire protection system. Areas subject to freezing will be provided with dry-type sprinkler heads or dry-pipe distribution system. All other areas will be served by a wet-pipe distribution system. Performance based design specifications will be issued as part of Contract Documents, with final design provided by the installing contractor. All aspects of the fire protections system will be in accordance with NFPA 13 and will comply with the requirements of local and State Fire Marshals.

## **FIRE PROTECTION (cont'd)**

### **LOCKER ROOM AREA**

The Locker Room Area does not currently have an automatic sprinkler fire protection system. Discussions are underway with the Fire Marshal to determine if this area, as well as other portions of the school, will be required to be retrofitted with an automatic sprinkler fire protection system.

## **PLUMBING**

### **NEW GYM AREA & LOCKER ROOM AREA**

#### **Domestic Water**

The existing domestic water system will be extended to the meet the demand of the new and/or relocated fixtures.

#### **Domestic Hot Water**

The existing domestic hot water system will be extended to the meet the demand of the new and/or relocated fixtures. A re-circulating system will be utilized to maintain water temperatures in the piping.

#### **Domestic Water Piping:**

Domestic water piping will be copper.

#### **Domestic Waste and Vent:**

All waste and vent pipe will be hub-less cast iron and copper for durability and noise reduction.

#### **Plumbing Fixtures and Water Conservation:**

In support of reducing potable water, the proposed design will include recent advances in plumbing fixture technology. Manual controls will be used for plumbing fixtures - neither IR flush valves or nor IR faucets will be used. The following are proposed:

- All lavatories will have aerators which limit flow to 0.5 gpm. (Code maximum is 2.0 gpm).
- All water closets will have manual dual flush flushometers which allow the user to select between 1.1 gallons per flush or 1.6 gallons per flush.
- All urinals will be low flow requiring only one-half gallon of water per flush and will utilize manual flush valves.
- All electric water chillers will have manual operation and bottle fillers.