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900 Student (5-9) Core Middle School

Design Development Short Report

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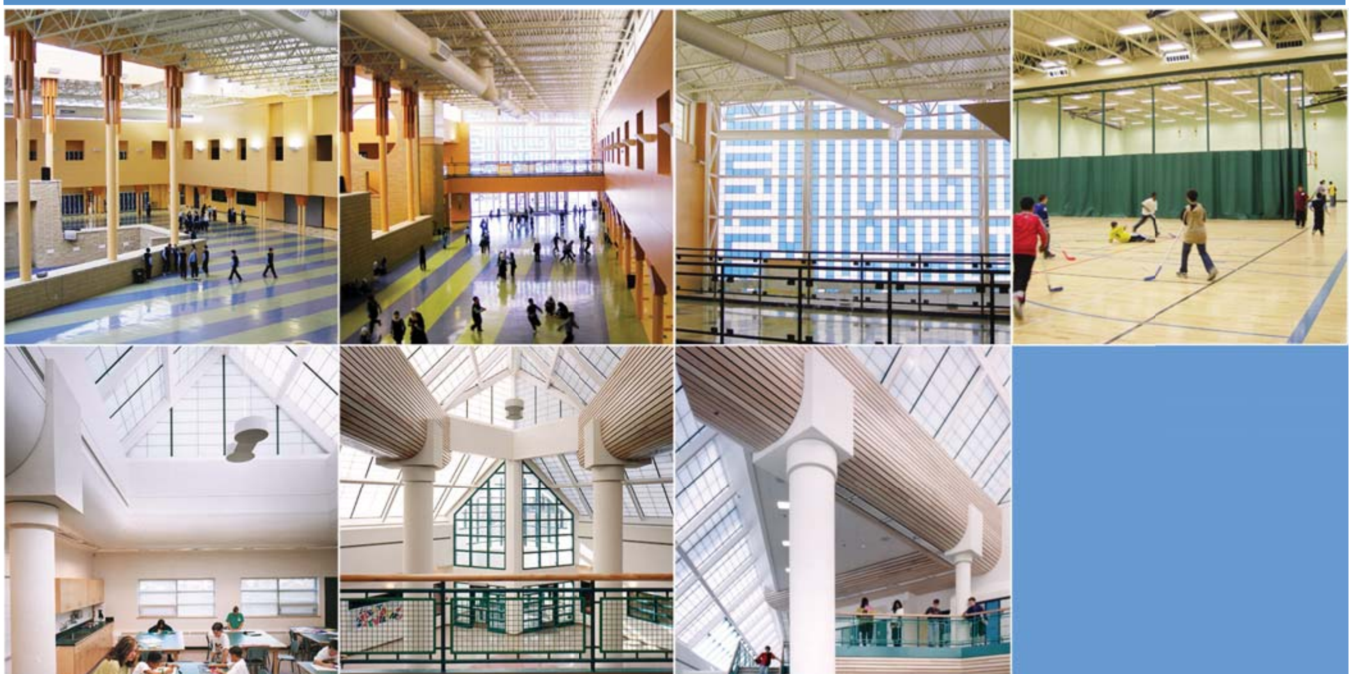

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PROJECT PARTICIPANTS

Steering Committee	**Organization**
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Project Team

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CONCEPT OPTION IMAGES

1.0 CONTEXT AND FRAMEWORK FOR FACILITY DEVELOPMENT

The most important factor in the design concept of the Grade 5-9 (900 student) Core Middle School is to support the appropriate education of children and ensure their well being, both inside and outside the facility.

As part of our design process, Barr Ryder Architects & Interior Designers established the following philosophical goals as the basis by which our design has evolved.

- Meet all programmatic and educational requirements.
- Develop Core Middle School with modular classrooms providing equivalent facilities to a permanent school of identical capacity.
- Develop a central core orientation area with simple circulation systems and establish clear lines of visibility and orientation for maximization of supervision and security.
- Develop a sense of entry at an appropriate student scale.
- Maximize community access to the gymnasium and other core areas designated for community after hours use.
- Develop flexible learning and interactive spaces for students, teachers and the community.
- Create ability for facility to be separated into wings for appropriate separation of programs as deemed appropriate for the size of the school and age classifications.
- Make provision for variation of design options of components within the core to suit individual school board requirements.
- Establish simple and cost effective building systems, structural, mechanical and electrical systems within the Alberta Infrastructure guidelines, including the incorporation of the *****"PERSIST" wall system.
- Incorporation of sustainable design systems into the building concept as deemed practical including the maximization of natural lighting and views.
- Meet all development guidelines including AI design ration guidelines and Alberta Education funding allowances.

*Pressure Equalized Rain Screen Insulated Structure Technique

2.0 PROJECT GOALS AND OBJECTIVES

The overall planning goal for the standardization of the Grade 5-9 (900 student) Core Middle School design focused on several key areas:

- Flexible use of space.
- Facilities that enhance learning.
- Simple and effective structure and systems to ensure “best value” for money.
- Safe and accessible environment for learning.
- Incorporation of the modular classrooms into the school.
- The maximization of community access to community use facilities (i.e. gymnasium).
- A design that reflects responsible stewardship.

3.0 DESIGN DEVELOPMENT

3.1 Program and Area Summary

Total Target Area for the Grade 5-9 (900 student) Core Middle School:

• Core Area	6,337 m^2
• Modular Classrooms	1,600 m^2
Total Build-out Gross Area	7,937 m^2

.1 Site

Based on a generic site concept, the following fundamental site development guidelines have been established:

.1 The orientation of the building should be towards the street:

- Identifiable presence in the community.
- Ease of front entry identification and orientation.
- Clear site lines and visibility for security.

.2 Student access should be from the main road.

- Student safety and site security is paramount.

.3 Student drop off areas for both cars and buses should be directly off the main road.

- Separate drop off areas to be identified for both buses and cars.
- There should be limited opportunity for pedestrian traffic to conflict with vehicular traffic.

.4 Student drop off areas to be separated from parking area.

.5 Student playground areas should be oriented to the rear of the school.

.6 It is also essential to the development of the site that the orientation of the facility enhances the sense that this new building is part of the community and the community was welcome.

.8 Staff and visitor parking areas to be located away from congested student drop off areas, but adjacent to the school. This location on the site allows for ease of access for staff to the parking areas and the school.

.2 Building

The initial prototype Core Middle School is to be designed based on a total occupancy of 900 students. Based on information provided by Alberta Infrastructure, the total allowable gross area for the Core Middle School including relocatables was not to exceed 7,937 m².

The programmed areas as provided by Alberta Infrastructure outlines that to accommodate Grade 5-9 (900 student) Core Middle School is to include:

- sixteen modular relocatable classrooms;
- four science classrooms;
- six ancillary classrooms;
- a gymnasium and gym storage;
- a library;
- three information service areas;
- three CTS lab/classrooms;
- an administration area;
- washrooms, and;
- a variety of service and support areas.

A detailed area breakdown for the school is included in **Appendix A**.

All the programmatic, educational and accessibility requirements are to be met in the design of the Core Middle School. Based on several workshops with representatives of up to three school divisions and Alberta Infrastructure some realistic modifications were implemented into the facility to more reflect the actual programmatic needs of this facility. On the recommendation of educators, significant revisions to the school program for the 900 student Core Middle School include the provision of the addition of break out areas and a small gymnasium room. Flexibility is key to the development of this core school concept. Operable walls between classroom and gathering areas utilized as lunch areas were part of the concept's evolution. The modified Area Analysis for the 900 Core Middle School is included in the Appendix B. All of the revisions to the programs have essentially been added without the addition of any area to the total gross floor area.

Based on fundamental philosophical goals established for this project the design of the core school is oriented around a central orientation/gathering/focal area. The administration area, gymnasium, ECS suite and library were located off of the central gathering/orientation space for functional access, security and clarity of orientation within the facility.

It is essential that the administration suite be visually and physically accessible as one immediately enters the school. The centrality of the atrium area and relationship to the core orientation/gathering node not only establishes a sense of welcome, but also reinforces a sense of security and control within the facility. The proposed split wing concept for the school, radiating from the core orientation/gathering node, reinforces a high degree of visual and secured access throughout the school.

The gymnasium is oriented on the main entry axis of the school adjacent to the central gathering/orientation node. In the development of a community school, it was established that the gymnasium needs to be easily accessible from the main entry and is a major focus for the school and the community.

It was also established early in the analysis of the programmatic requirements for the school, that a second multipurpose room gymnasium area was required to meet the physical education needs of the 900 students. The second gymnasium has been located adjacent to the main gymnasium for ease of access and centralization of programs.

After hours sports programs and community gatherings are also desired uses for the gymnasium, so central accessibility is critical. It is important in the development of a community school that clear lock off points are established to isolate the gymnasiums for after hours usage. The full sized gymnasium intended to be a two-station gymnasium complete with a retractable divider curtain and can facilitate full competitive basketball and volleyball courts, cross-court basketball, volleyball and badminton courts. The smaller multi-purpose gymnasium will accommodate activities oriented to the younger students at the school and may also accommodate less active activities, i.e. scouts, martial arts, theatre, brownies, etc.

The focus for the second floor is a central gathering/orientation node. The permanent core areas radiate from the core node allowing for clear lines of security and control. Three means of access to the second floor have been provided with exit stairs located at each end of the core wings and a convenience stair located in the central gathering/orientation node. The second floor is intended to be securely separated from the main floor during after hours operation.

The two permanent main floor wings of the Core Middle School support pods of modular relocatable classrooms. The wings house the various core areas demanded by the programmatic requirements outlined in the School Infrastructure Manual and as adjusted by the individual school divisions. The final allocation of modular relocatables will be established based on the population base at each location. Because of the simple groupings of each modular pod, the number and wing location of the classrooms can be modified as the student demographics change.

Acoustic treatment should be provided and incorporated throughout this facility. All spaces will have to be designed to achieve and maintain the minimum acoustic standards a prescribed in the Alberta Infrastructure Design and Construction Standards and Guidelines for School Facilities.

The modified area analysis for this 900 capacity core school is included in **Appendix A.**

.3 Building Scale and Details

As this School is a Grade Five to Grade Nine (5–9) Middle School and two storeys, the design team felt it was essential that the new Core Middle School presented a scale that was appropriate to the age group and the community. A two storey school requires careful delineation of elements and materials to ensure one is not faced with overpowering facades and scale especially for smaller students. Our concept for the treatment of the school was to split materials or colours between floors, maintain a single storey entry element and introduce shading elements that would not only break the massiveness of the façade, but also contribute to our LEED® program requirements. The significance of the entry and orientation/gathering node is reinforced by a two storey space.

Light and views also play a significant role in the development of this facility. All teaching and occupied spaces will receive appropriate levels of natural lighting. Exterior windows would be operable for access to fresh air.

.4 Exterior Elevations Concept

For the design of the Core Middle School, it was felt important that the School reflect a sophisticated level of scaling that would address the three divisions of students in addition to community usage. Colors and materials as mentioned would be used to break the scale of the school, reflect a neighborhood scale, conform to any architectural controls, and personify durability and longevity. A lower scale entrance element not only protects the entry area, but also reduces the scale of the two storey façade. In our building concept, continuous glazing at the edges of the entrance courtyard frame the entrance to the school and are intended to act as a beacon to the community. At night these glazed elements are intended to be way finders and a focus for the community.

As a minimum, durable masonry materials should be utilized for the first 2.2 meters of the school and alternate approved products can be incorporated into the upper façade of the facility to assist sealing.

Masonry is to extend from the floor level to 3m to ensure exterior durability for the school. A combination of Hardiboard panels and pre-finished metal siding is to be incorporated into the school to unify the modular classrooms and break the mass of the school.

4.0 LEED® OVERVIEW

At the onset of the project, it was established by Alberta Infrastructure and Transportation that the standard core elementary schools be designed to target sufficient LEED® points so that once a project site is identified, LEED® Silver under LEED® Canada – New Construction, V1, is attainable.

4.1 Current Project Standing

The LEED® scorecard currently indicates a LEED® Silver standing at 39. This assessment reflects only the content incorporated into the Design Development Report and the credits that appear well within reach assuming current initiatives are completed. Items discussed as potentially viable for this project but which cannot be confirmed from information in the Design Development Report are itemized under the *"may be or ?"* column. There are currently 10 credits in this column. A full LEED® checklist has been provided in **Appendix D**.

5.0 STRUCTURAL

5.1 Design Criteria

The structural design will be in accordance with the following codes and standards:

- Alberta Building Code 2006
- National Building Code 2005
- Structural Steel Design CAN/CSA-S16-01
- Reinforced Concrete Design CAN/CSA-A23.1 / A23.2 / A23.3
- Engineering Masonry Design CSA-S304.1

5.2 Foundation System

A geotechnical investigation must be completed for the proposed site to determine the foundation type; however, foundations will either be a foundation wall on footing system or a grade beam on pile system. If concentrations of soluble sulphates are present in the soils, Portland Cement Type 50 will be utilized for all foundation concrete.

5.3 Main Floor

Pending final geotechnical recommendations, a reinforced cast-in-place concrete floor on grade will be provided for the main floor.

The floor will consist of 130 mm reinforced concrete slab unless noted otherwise in the soils report, resting on compacted 150 mm clean well-graded granular base over native soils below.

Cast-in-place concrete structural supported floors will be provided for all exterior concrete stoops at doorways and any other areas, which may be designated as "sensitive to movement".

5.4 Second Floor

The floor system for the second floor will consist of 100 mm thick reinforced concrete topping acting compositely with 38 mm steel decking, supported by open web steel joists, beams and columns.

Utilization of steel deck and joists becomes feasible and economically viable due to multiple units, where the repetitive use of standard components manufactured in a factory may be fully utilized.

This system has excellent structural rigidity and at the same time provides fire resistance, sound control, durability, low maintenance and rapid construction, thus eliminating any unwanted construction waiting periods.

5.5 Roof System

The roof structure over the new schools will consist of a combination of steel deck supported by steel joists, beams, and steel trusses. Acoustic steel deck will be utilized over the Gymnasiums.

5.6 Wall System

Steel beams supported by a series of steel columns will be utilized to support the roof loads mainly along the perimeter and corridor walls.

6.0 MECHANICAL

6.1 Design Criteria

The mechanical design will comply with the current *Alberta Building Code* (2006) Model National Energy Code for Buildings (1997), and all applicable Provincial and Municipal Codes. Good quality mechanical systems will be used throughout the project. ASHRAE will be used as a guide to establish criteria for heating and ventilation system design.

System design will reflect a prudent blend of life cycle cost considerations including capital costs, utility consumption costs, and simple straightforward systems that can be understood and operated in an effective manner. Consideration will be given to providing accessibility for maintenance. Canadian products will be specified wherever possible to facilitate easy replacement of parts.

6.2 Fire Protection and Life Safety

All systems shall satisfy the latest building code and NFPA requirements. The building will be fully sprinkled to NFPA 13 regardless of combustibility. In general, protection levels will be to Light Hazard with Ordinary Group 1 and Group 2 Occupancies, unless otherwise directed by the 'Authority having jurisdiction.' The sprinkler system will be a wet pipe quick response system. Dry heads will be provided for locations where potential freeze conditions are possible, such as vestibules. The sprinkler system will be extended from the core school into the modular classrooms. Recessed sprinkler heads will be installed in all ceiling areas and wire guards will be provided over the sprinkler heads in the gymnasium. Grooved fittings are allowed only in fire protection systems. Extinguishers will be distributed in recessed cabinets, consistent with *Alberta Building Code* (2006) requirements.

6.3 Site Service Utilities

New storm and sanitary services are to be provided based on the generic site plan. Lines will be connected to the municipal utilities, and the site will be subject to local Guideline requirements. Storm water ponding may be required in the new green space adjacent to the new facility for storm water retention, if mandated by local Municipal requirements.

A new gas service will be provided, as required, to suit the building loads and future modular portable classroom loads.

6.4 Plumbing Systems

All new plumbing systems are to be of the latest design and of the highest degree of water consumption efficiency. Ultra low flow urinals and low flush toilets will be utilized as a sustainable design measure as a further water conservation measure. An emergency eyewash station with a tempered water supply will be provided within the infirmary. CTS rooms will have an oversized sink with an interceptor. Non-freeze hose bibs will be provided around the building for cleaning only.

Domestic hot water for the facility is to be provided by the high efficiency water heaters installed in the mechanical room. A small, domestic hot water recirculation pump will be provided to ensure the availability of hot water throughout the facility. All domestic hot, cold, and recirculation piping will be thermally insulated for energy conservation. Domestic hot, cold, and recirculation piping will be extended to all fixtures. Domestic water piping, sanitary drainage piping and natural gas piping will be extended from the core school to serve the modular classrooms. Type L copper pipe will be installed for the cold water system. Type K copper pipe will be installed for the hot water and recirculation systems. Grooved fittings will not be installed in the domestic water system.

A system of sanitary drains and venting will collect sanitary waste and transfer effluent to the municipal sewer system. The primary connection point will be a sanitary manhole in the municipal services.

Storm water will ultimately be directed to a municipal storm water system. Consideration is being given to a storm water retention system. Storm water may be collected by a system of roof drains and catch basins.

6.5 Heating Systems

The heating system for the building will be a combination of perimeter baseboard heating and/or passive radiant heating panels suspended from the structure. These perimeter elements will be a two-pipe reverse return heating water piping system. The perimeter panels will be controlled in concert with the air system functions for the building. The orientation of the heating system will be as follows:

- Two hot water high efficiency heating boilers will be situated in the mechanical room. One exchanger will be provided for the air system glycol heating loop.
- The respective heating loops, hydronic circulating pumps, expansion tanks, and accessories will be installed locally in the mechanical room.
- A network of insulated reversed return hot water supply and return lines running to heating risers and mains will distribute heating water to the facility.
- Radiant panels will be zoned on an exposure basis. Each zone will be controlled by thermostats and 2-way control valves and where appropriate, individual room control.
- Entrance unit heaters will be ceiling or wall mounted in vestibules and entryways to allow for the offsetting of infiltration at the door entrances.
- The proposed system will provide the occupants with a high level of thermal comfort with a passive and quiet delivery of radiant energy to the building structure. This system will afford the appropriate level of zoning and controls to suit space requirements.
- Boiler plant will be controlled via a dedicated boiler controller and interface with the BMS.
- Butterfly valves will not be installed in the heating system.
- Schedule 40 steel pipe will be installed for the heating system.
- Grooved fittings will not be installed in the heating system.

6.6 Ventilation Systems

The main building ventilation systems will consist of two indoor air systems situated in the mechanical room and mezzanine. The classroom and office area systems will be designed with the premise of providing displacement ventilation at reduced air change rates, and with higher proportions of outdoor air so that fan energy consumption and duct sizes can be reduced. The gymnasium system will utilize duct mounted diffusers and will draw return/exhaust through the washroom/change rooms. All systems will be equipped with a return fan, isolation dampers, filter bank, glycol heating coil supplied from the heat exchangers, wet media humidifier, enthalpy wheel or heat pipe, and a draw-through supply fan. All components will be selected for a life expectancy of 30 years based on ASHRAE standards.

Ventilation to the classroom areas will be 100% outdoor air, displacement ventilation system to supplement the operable windows in the building. This distribution system would supply air around the perimeter of each floor to afford the minimum ventilation supplied to the spaces. *Alberta Building Code* (2006) requirements establish the minimum level of mechanical ventilation. True laminar displacement relies on thermal stratification to effectively pump out all contaminants. Hence, on a continual basis, a slow flow of 100% outside air continually passes occupants on a continual base without drafts or dead spots. The air flow supplied to the classroom areas will not decrease the comfort levels, as schools will not be occupied during the summer months. Alternative strategies include opening the windows, drawing the blinds closed during days of higher temperatures, and allowing fresh air to circulate through the building. Ventilation to the office and administration areas will be mixed ventilation through the use of coils to increase the temperature and provide the required increased air flow with re-circulated air. Free cooling is accomplished by opening the windows to provide natural ventilation.

All air systems will utilize heat recovery systems on the facility exhaust air streams to improve operating efficiency and serve to preheat the outdoor air for the new building ventilation systems. Air systems will be equipped with a variable temperature with space temperature feedback to reset the discharge air temperature. Air systems will be designed to use 100% outdoor air and provide free cooling when outdoor conditions permit.

Wet media humidifiers will be utilized to provide humidification during the winter months in the classroom/office and gymnasium air systems. Humidifiers will be mounted in the mechanical rooms or air systems.

Air system filtration on all units shall be two stage and meet MERV 13 for LEED® compliance and air quality control.

All outdoor air and exhaust air dampers shall be insulated and utilize motorized dampers.

6.7 Exhaust Systems

The exhaust system for the washrooms in the building consists of a network of exhaust ductwork connected to the primary exhaust fans. The washroom exhaust air will not be combined with other exhaust/return air, other than at the inlet to the fan. The exhaust requirement will be in compliance with the *Alberta Building Code* (2006). Exhaust systems will also be provided for the photocopier and lunch/kitchenette areas, as well as for specific science classrooms.

Representative areas that will be equipped with ducted exhaust systems to fans are as follows:

- Science labs.
- Washrooms, change rooms and janitor rooms will be exhausted at the rate of 2 CFM/ft2, as required by Code.
- Storage areas will be exhausted at the rate of 4 ACH.
- Servery areas will be exhausted as dictated by the exhaust hood design.

Fume hoods, kiln exhaust hoods, and dust collectors will be provided for Science Rooms, Art Rooms and CTS/Wood Shop. Non-recirculating dust collectors will be installed and that provision for make-up air will be provided. Overhead exhaust hood will be designed for the stoves and exhausted to the outside.

6.8 Humidification Systems

Humidity control will be provided for the core building. It has been suggested that a minimum amount of humidity control be provided using a wet media humidifier in the air systems to maintain a minimum of 15% humidity in the building during the winter months. This is a more energy efficient and resource limiting system for humidification and free cooling. The relative humidity will be variable, dependent on outside air conditions above 5°C. Humidity will be added only to the up air systems, not to the individual rooms. A water softener will be provided where the supply water requires pretreatment to meet the needs of the wet media humidifier.

6.9 Controls

The control system shall be BACnet compliant DDC energy management control system. The proposed system of room temperature control is simplistic and affords a reasonable level of temperature control. It is recommended that this system be DDC based, flexible to function, and expandable.

6.10 Executive Summary

The proposed development of the facility is driven by an optimal balance of comfort and efficiency. The intent is to provide a sustainable and environmentally conscience system design for the facility. Therefore, the following highlights are considered:

- Improvements to plumbing facilities and fixtures to improve water use efficiency and functionality.
- Improvements to heating systems for control and heat distribution management to ensure blanket coverage or exterior zones.
- Addition of mechanical cooling systems in the form of unitary systems where supplemental cooling is required.
- Addition of heat recovery systems to reduce outdoor air heating loads.
- Ventilation systems improvements to ensure low level displacement ventilation air is accurately and unobtrusively delivered to occupied spaces that can be further enhanced by the use of operable windows.
- Improvements to life safety systems to meet the minimum Code requirements.
- Addition of minimal humidification control for occupant comfort in the building.
- Using wet media humidifier to provide evaporative cooling during summer season.

7.0 ELECTRICAL

7.1 Introduction

This report is based on the Alberta Infrastructure Standards for Core Elementary School Facilities and the current edition of the *Alberta Building Code* (2006), Canadian Electrical Code, and all Provincial and Municipal Codes. The electrical design shall include fixtures to minimize and control energy consumption consistent with LEED® performance criteria.

7.2 Power Service and Distribution

Service will be provided underground from a utility company network to a pad mounted transformer located adjacent to the building. From this transformer, an underground 347/600V, three phase, four wire secondary power services will be provided to the electrical distribution center located in the main electrical room. A new 600 amp 347/600V, 3 ø, 4 wire service will be complete with a:

- 600 amp three pole main breaker.
- TVSS unit.
- Utility current transformer section/utility meter.
- Integrated digital meter.
- Moulded case thermal/magnetic breakers for the control of branch circuit panels.

The exact service size is to be confirmed during detail design. The branch circuit panels will be located throughout the school to serve the various areas of load concentration most effectively. Power, data, security, sound, and fire alarm provisions will be provided for in the corridor serving the modular classrooms.

7.3 Telephone Service and Distribution

An underground telephone service (100 mm conduit) from TELUS facilities off site will be provided, located in the same trench as the power service. This service will terminate in the computer networking room. An additional 100 mm conduit will be provided for the supernet cable. A cable tray system will be provided through the school to serve outlets in offices and classrooms. The tray will extend down the corridor serving the modular classrooms.

7.4 Duplex Receptacles

Duplex receptacles will be provided throughout all areas of the school for staff convenience and ease of facility operation. Special consideration will be given to the following areas: science rooms, music and arts room, CTS, and auxiliary spaces to ensure that sufficient duplex receptacles are provided to meet the special requirements of those areas. The exact location and quantity of duplex receptacles in all areas will be determined by equipment layouts.

7.5 Car Park Receptacle

Car park receptacles will be provided in the parking lot. Receptacles will be mounted in pre-manufactured posts that can be readily removed for maintenance and/or replacement. These receptacles will be controlled from the mechanical BMCS system. The control strategy of the receptacles shall be based on external temperatures with a cyclic operation.

7.6 Lighting

Fluorescent lighting will be the primary source of illumination throughout the school. LED and compact fluorescent lighting will be used in selected areas for display and feature lighting for architectural elements or as a means of changing the aesthetics of an area. The primary light fixtures will be a 1,220 mm pendant direct/indirect linear fluorescent and a 610 mm by 1220 mm, with a recessed refractor lensed fluorescent luminaire for the school. Energy efficient T5 and T8 lamps and electronic ballast will be used in order to reduce energy consumption. Gymnasium luminaires will be surface mounted. The luminaires will be equipped with energy efficient T5/HO lamps and electronic ballast. All lighting in classrooms and offices will be controlled using low voltage switching. Corridors and gathering areas will be centrally controlled using low voltage switching. Multi-level control will be provided in all classrooms to allow illumination levels vary with changing tasks. Mutli-level control in classrooms shall consist of one switch for the row adjacent to the whiteboard and one switch for the entire room. Daylight sensors will be provided for fluorescent lighting controllability and will adjust the level of light automatically with the amount of natural light within each classroom (using the switch row approach).

Exterior site lighting will be provided at exits, pedestrian walkways, and throughout parking areas. Site lighting will be designed to the illumination levels set forth by the Illuminating Engineering Society of North America. All exterior lighting will be Dark Sky compliant. Site lighting fixtures will be controlled through the use of photoelectric cells with override using the BMCS system. Low use entrances will be illuminated with incandescent fixtures that c/w motion sensor and daylight control. Selected light fixtures within corridors will be controlled from the security key pad to turn lights on during non-operational school hours to allow for personal travel.

Occupancy sensors will be utilized in storage, washrooms, and service rooms. Daylight sensors will be incorporated to reduce illumination levels in high ceiling areas, taking into account the natural light level. The lighting will be designed to achieve less than 1 watt/ft^2 of lighting power density.

7.7 Exit Lights

Exit lights will be provided throughout the school and will be LED type.

7.8 Emergency Lighting

Emergency power battery packs and remote heads utilizing self-test technology will be provided throughout the school in accordance with the requirements of the *Alberta Building Code* (2006). Emergency lighting shall include all hardware, wiring, programming and testing.

7.9 Fire Alarm and Smoke Detection System

A fire alarm and smoke detection system, utilizing current addressable technology with horn strobes and isolation modules will be provided. The location of all devices will be as per the current *Alberta Building Code* (2006). The Fire alarm and smoke detection system shall include all hardware, wiring, programming and testing.

7.10 Intrusion Detection System

An intrusion detection system and access control will be provided, consisting of an entry key pad at the main entry to the school as well as motion sensors in the vestibules and corridors. This system will be zoned to allow for community functions. The system shall be supplied with an auto dialer for connection to an outside monitoring facility. An electric locking system will be provided for all exterior doors and doors indicated in the architectural door schedule. Electric locking system shall be compliment with the Alberta Building Code and not limit egress under a fire alarm, power failure or other panic condition.

7.11 Sound and Intercommunication System

A telephone and intercom system will be provided consisting of a digital PABX type exchange, complete with auto attendant, voice mail and homework hot line features. Administrative handsets will be provided in the office and library and individual handsets in each classroom. The system will allow communication between all handsets and selective directing of incoming and outgoing telephone calls. Handsets will be accessible through the paging system. A paging system will be provided complete with amplifier and zone control to permit paging via telephone-intercom handset into classroom and various zones within the school. All corridors and instructional areas will be provided with overhead speakers. Bus loading area, building perimeter and playground areas will be covered by exterior speakers. A central programmable time clock for classroom signals will be provided and interfaced with the paging system. An independent sound reinforcement system will be provided for the gymnasium

7.12 Cable Television System

An underground television service (100 mm conduit) from an off site facility, will be provided for and will run in the same trench as the telephone and supernet services. A television distribution system will be provided throughout the school. The RG6-FT4 cable will be routed through the cable tray to wall outlet locations. Classrooms, project centres, breakout, conference rooms, library, staff lounge, and the gymnasium will be furnished with television outlets. The cable television system shall include hardware, wiring, programming and testing.

7.13 Computer Provisions

Computer outlets will be allocated in all instructional space throughout the school, complete with cable tray distribution in the corridor ceiling space. Category 6 cabling with 8P8C connectors will be provided. Eight computer ports will be provided for in each instructional space. Two computer outlets will also be provided for at the teacher station. One at the front of each classroom for smart board use and another in the classroom ceiling for projector use. The core school will have provision for wireless transmitters.

7.14 Clocks

Wireless analogue GPS clocks will be utilized in the classrooms and hallways. Wireless 12” diameter classroom clocks with built in antennas and transmitter/receiver will be provided in instructional and administration areas. The 15” diameter GPS clock in the gymnasium will require a wire guard.

7.15 Energy Conservation Features

In an effort to minimize and control energy consumption and provide a sustainable, efficient, and functional system for the facility that is consistent with LEED® criteria, it is proposed that the following special features be incorporated into the electrical systems of the school:

- Energy efficient lamps and ballasts.
- Multi-level local lighting controllability.
- BMCS control of car park receptacle operation.
- Use of fluorescent T8 and T5 technology.
- Occupancy sensor control of lighting in all washrooms and daylight control of corridors.

Appendices

Appendix A – AI's Area Analysis/ Modified Area Analysis

		No.	Required Area (m^2)	Total (m^2)	Proposed Area (m^2)
1.0	**INSTRUCTIONAL AREA**				
.1	Classrooms	5	80	400	388
.2	Science Lab/Classroom	4	120	480	474
.3	Ancillary				
	• Small	4	90	360	316
	• Large	2	130	260	250
.4	Information Services	3	115	345	318
.5	Gymnasium	1	815	815	798
.6	Gymnasium Storage	1	82	82	78
.7	Library	1	360	360	338
	Subtotal (Instructional Area)			3102	2960
2.0	**NON-INSTRUCTIONAL AREA**				
.1	Administration	1	632	632	640
	• Principal's Office	1	15	18	
	• Vice Principal's Office	1	12	14	
	• Administration	3	40	22	
	• General Administration	1	70	100	
	• Conference	1 – 2	50	33	
	• Counselling	3 – 4	50	29	
	• Staff Lounge	1 – 2	65	57	
	• Staff Work	1 – 3	80	78	
	• Washrooms (Male)	1	8	4.7	
	• Washrooms (Female)	1	12	4.7	
	• Infirmary	1 – 2	40	21	
	• Kitchen	1	30	38	
	• Mechanical	1	160	221	
.2	Physical Education/Change	1	160	160	84
.3	Storage Area	1	159	159	152
.4	Washrooms	1	108	108	194

.5	Wiring Network	1	40	40	36
.6	Circulation Wall Area Flexible Space	1	1536	1536	1706
Subtotal (Non-Instructional Area)				2635	2812

3.0 CAREER AND TECHNOLOGY STUDIES

.1	CTS	3	200	600	565
Subtotal (Career and Technology Studies)				600	565
Subtotal (Core School)				**6337**	**6337**

4.0 MODULAR CLASSROOMS

.1	Modular Classrooms	16	100	1600	1600
Subtotal (Modular Classrooms)				1600	1600
TOTAL (Combined Areas)				**7937**	**7937**

Appendix B – Architectural Drawings

SITE INFORMATION

Building Area =6,337 SQ.M
Site Area =19,420.09 SQ.M
Site Coverage =32%

Overall Future Built Out
Building Area =7,937 SQ.M
Site Coverage =40.8 %

BUILDING CLASSIFICATION

GROUP A,DIVISION 2, UP TO 6 STOREYS, ANY AREA, SPRINKLERED

1) A building classified as Group A, Division 2, that is not limited in building area, is permitted to conform to Sentence (2) provided:
a) except as permitted by Sentences 3.2.2.7(1) and 3.2.2.18(2), the building is sprinkled throughout,and
b) it is not more than 6 storeys in building height

2) Except as permitted by Article 3.2.2.16.,the building referred to in Sentence (1) shall be of non-combustible constuction, and
a) floor assemblies shall be fire separations with a fire-resistance rating not less than 1 hour
b) mezzanines shall have a fire-resistance rating not less than 1 hour, and
c) loadbearing walls , columns and arches shall have a fire-resistance rating not less tahn required for the supported assembly.

BUILDING FIRE SAFETY
3.2.2.27. GROUP A, DIVISION 2, UP TO 2 STOREYS, SPRINKLERED

1) A building classified as Group A, Division 2 is permitted to be of combustible construction or non-combustible construction, used singly or in combination, provided
a) except as permitted by Sentences 3.2.2.7.(1) and 3.2.2.18(2), the building is sprinkled throughout,
b) it is not more than 2 storeys in building height, and
c) it has a building area not more than
i) 2400m2 if 1 storey in building height with no basement
ii) 1200m2 if 1 storey building height or
iii) 600m2 if 2 storeys in building height.

LANDSCAPE REQUIREMENTS (City of Calgary)

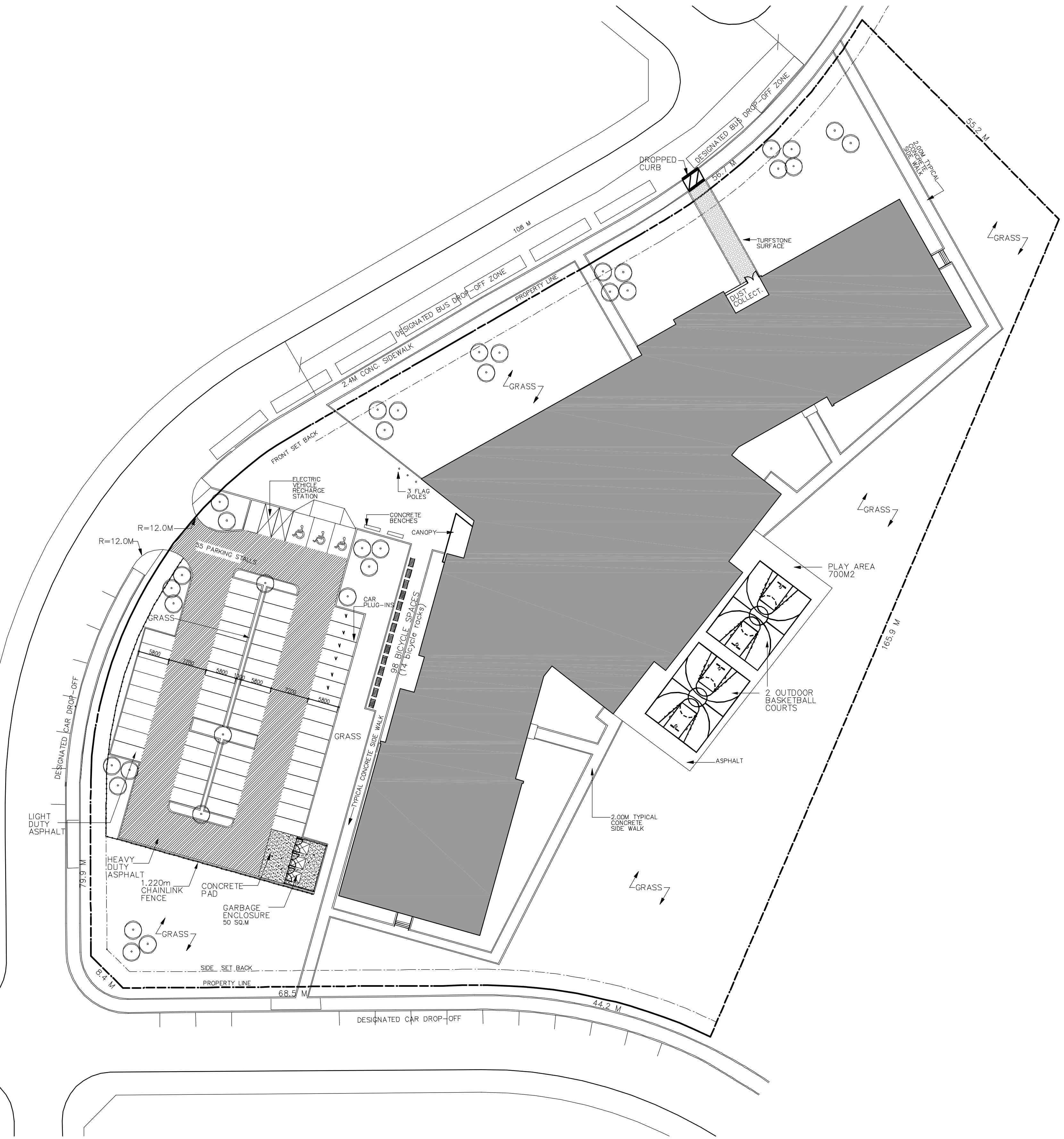
Setback Area: 1071M2
Minimum Required Trees:19
Trees Provided: 34

Exact number of trees will change based on individual site requirements

PARKING CALCULATION (City of Calgary)

Parking Stalls Required	
Junior High	
Grade 5 to 6=1 stall per 15 students	
350 Students	= 24 Parking Stalls
Grade 7 to 9=1 stall per 18 students	
550 Students	=31 Parking Stalls
Total	=55 Parking Stalls
Bicycle Parking Required	
900 Students x 10%	= 90 Bicycle Spaces Required
# Employees x3%	= 2 Bicycle Spaces Required
	=98 Bicycle Spaces Provided
On Site Drop Off	
2.5 Stalls per 100 Students=23Required	= 23 Spaces Provided
Refuse Area	= 3 Bins Required (50 Sq. M.)

NOTE:
Setbacks based on City of Calgary requirements to be determined on a site by site basis.



900 STUDENT CORE-MIDDLE SCHOOL

SITE PLAN

SCALE NTS
DATE NOV.05,2008

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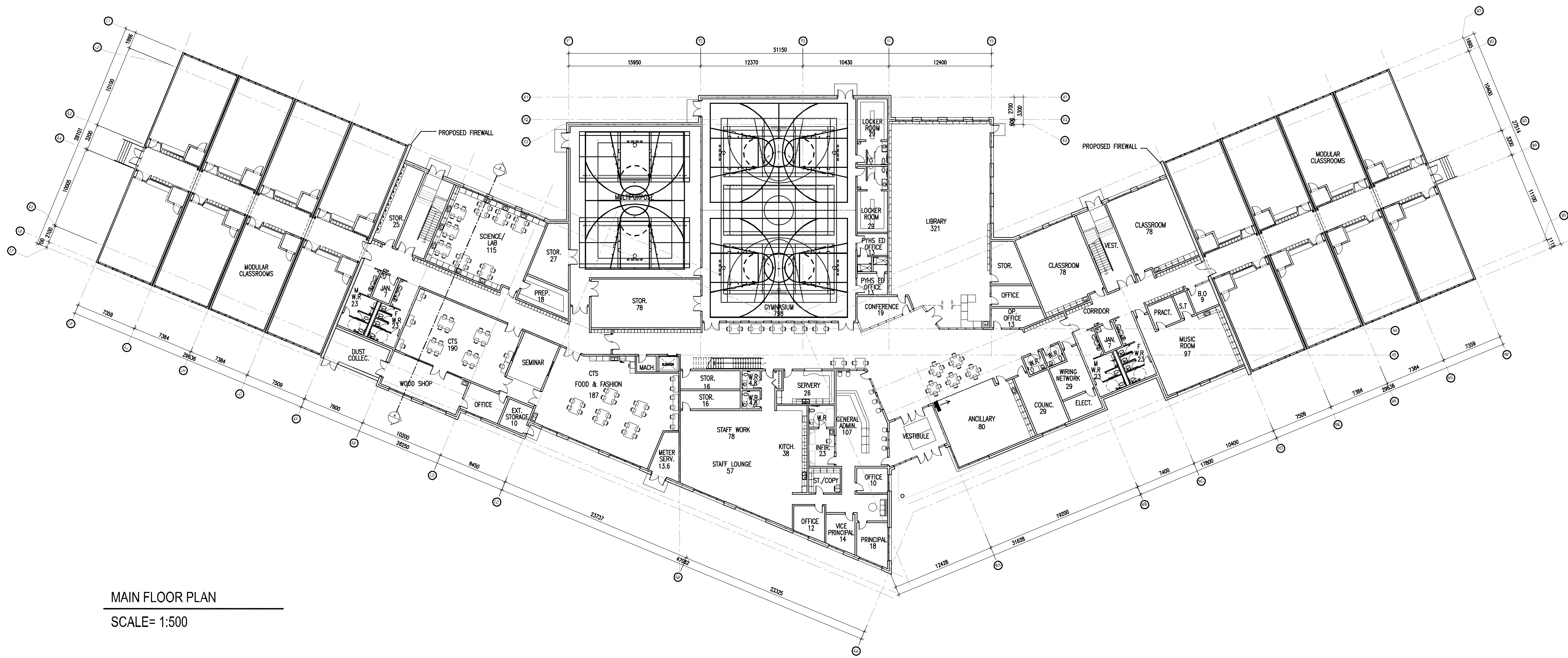

MAIN FLOOR PLAN

SCALE= 1:500

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900 STUDENT CORE-MIDDLE SCHOOL

MAIN FLOOR

SCALE	1:500
DATE	NOV.05,2008

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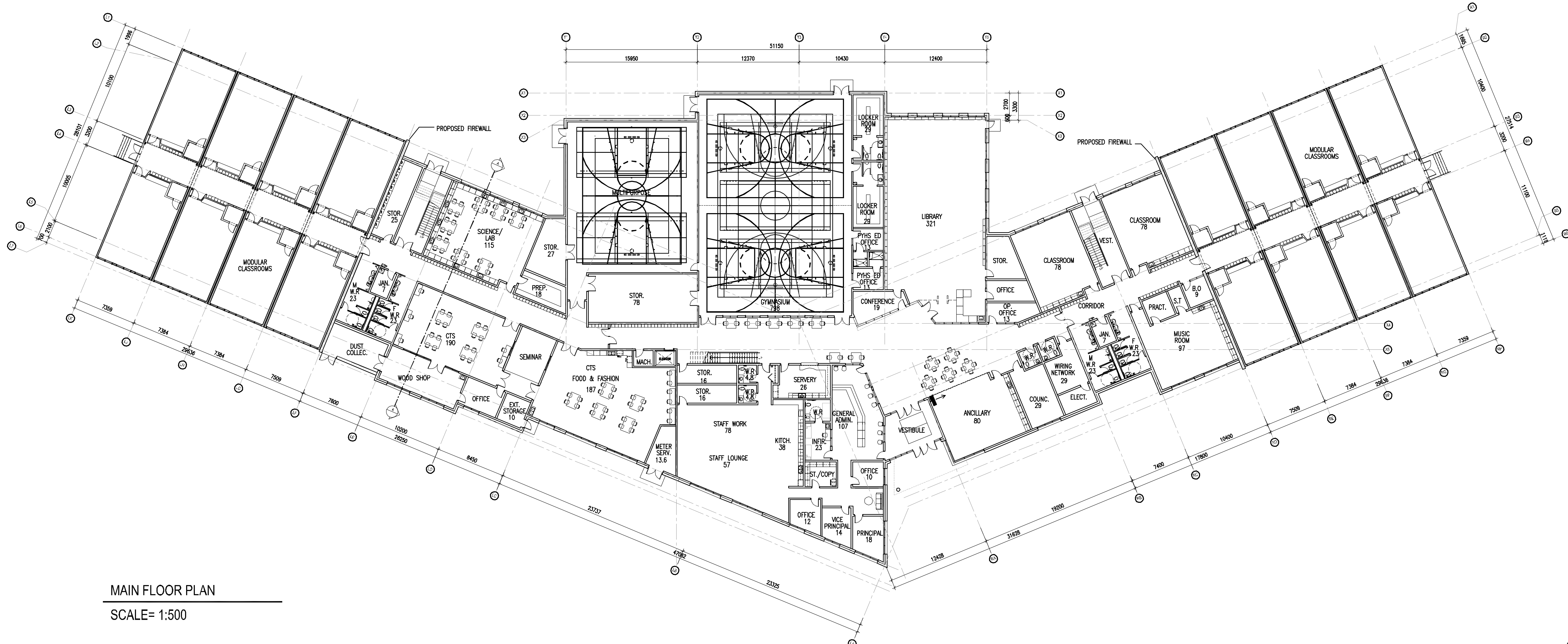

900 STUDENT CORE-MIDDLE SCHOOL

MAIN FLOOR

SCALE 1:500

DATE NOV.05,2008

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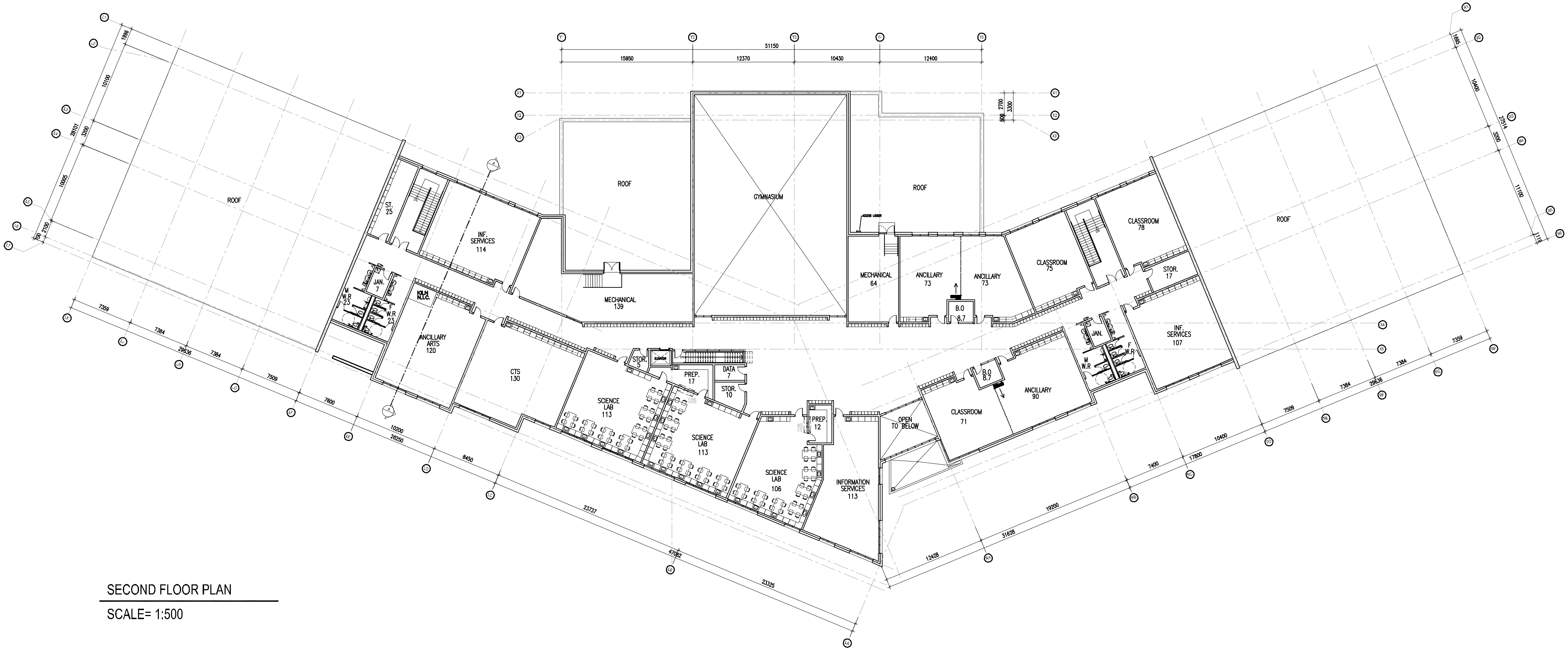

SECOND FLOOR PLAN

SCALE= 1:500

900 STUDENT CORE-MIDDLE SCHOOL

SECOND FLOOR

SCALE 1:500

DATE NOV.05,2008

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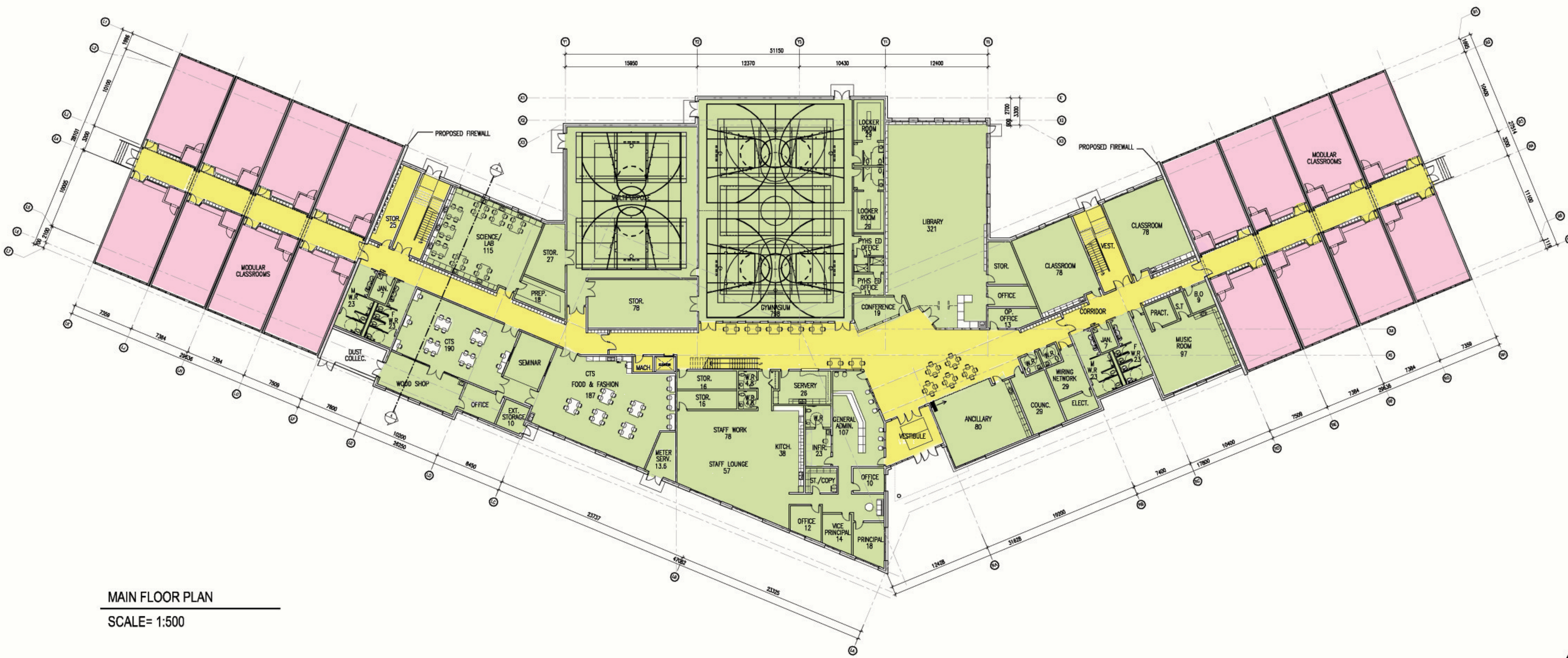

MAIN FLOOR PLAN

SCALE= 1:500

900 STUDENT CORE-MIDDLE SCHOOL

MAIN FLOOR

SCALE 1:500

DATE NOV.05,2008

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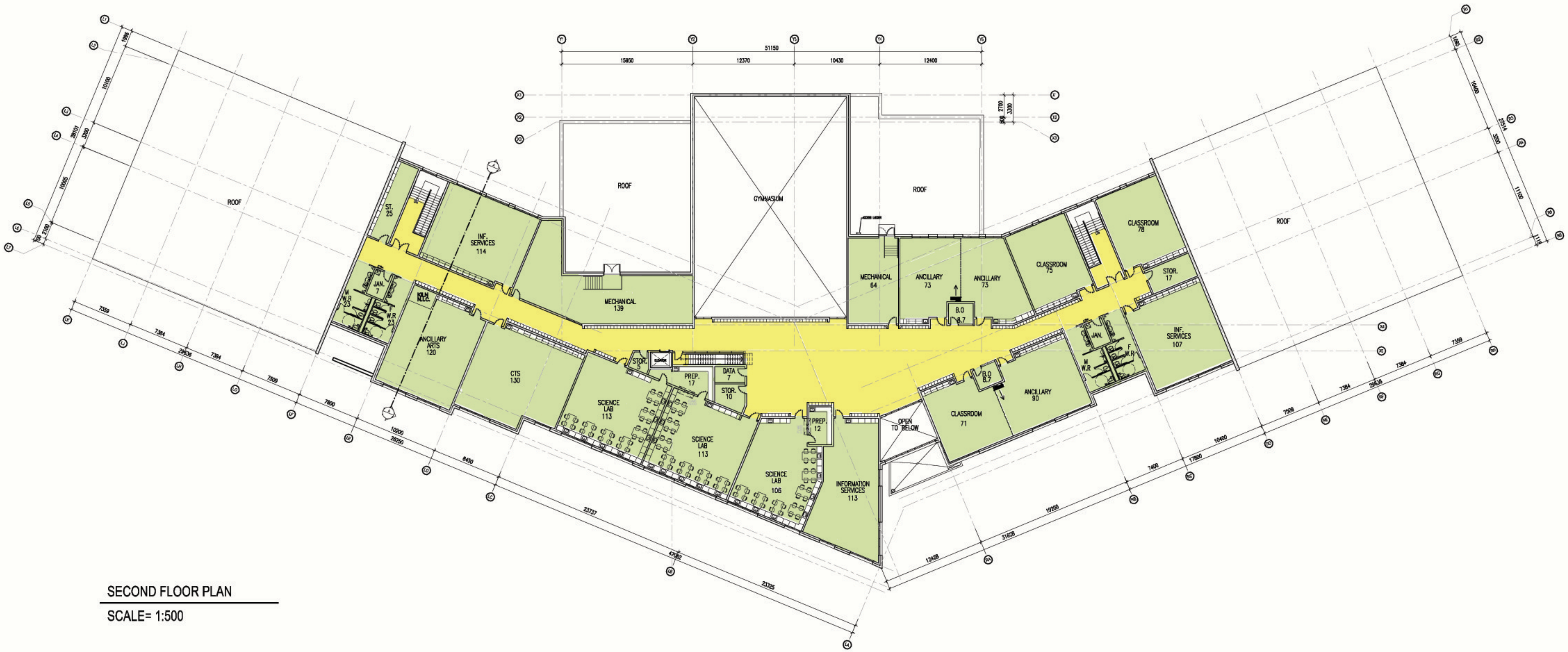

SECOND FLOOR PLAN

SCALE= 1:500

900 STUDENT CORE-MIDDLE SCHOOL

SECOND FLOOR

SCALE 1:500

DATE NOV.05,2008

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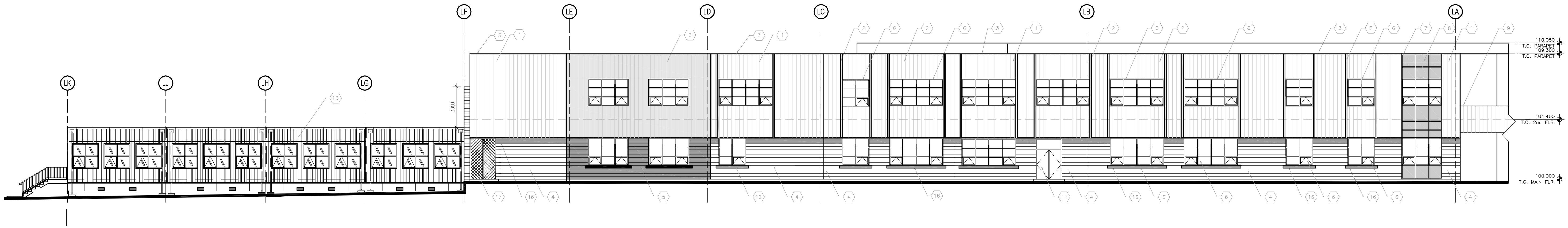
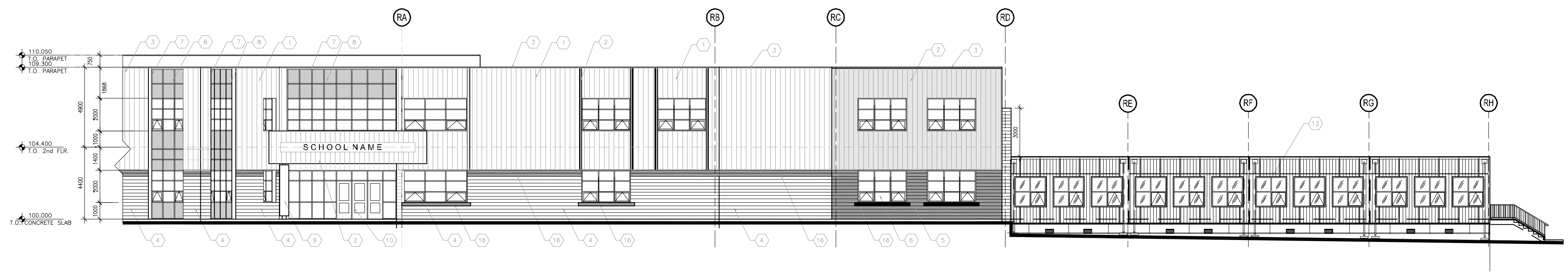


FRONT ELEVATION

SCALE=1:300

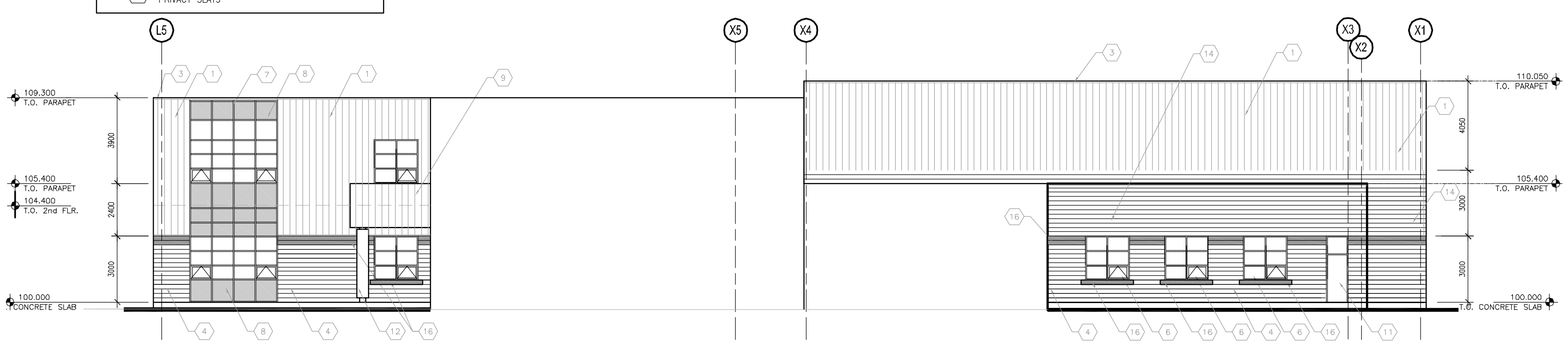
KEYNOTES: THIS SHEET ONLY

1. PREFINISHED METAL SIDING COLOUR ONE
2. PREFINISHED METAL SIDING COLOUR TWO
3. PREFINISHED METAL FLASHING
4. SPLIT FACE CONCRETE BLOCK VENEER COLOUR ONE
5. SPLIT FACE CONCRETE BLOCK COLOUR TWO
6. DOUBLE GLAZED, THERMALLY BROKEN ANODIZED ALUMINUM CURTAIN WALL EXTERIOR WINDOW U VALUE= 5.91 W/M2 R VALUE=1.47 (based on Ashrae HOF 2001)
7. PREFINISHED ALUMINUM CURTAIN WALL FRAMING
8. GLASS SPANDREL PANEL
9. PREFINISHED METAL SIDING – COLOUR THREE
10. PREFINISHED ALUMINUM ENTRANCE IN CURTAIN WALL FRAMING SYSTEM U VALUE= 5.91 W/M2 R VALUE=1.47 (based on Ashrae HOF 2001)
11. INSULATED HOLLOW METAL DOOR IN PRESSED STEEL FRAME – PAINTED
12. PAINTED STEEL PIPE COLUMN
13. MODULAR CLASSROOMS
14. PREFINISHED CONCRETE MANSORY SMOOTH BALL WALL TO 6000 ABOVE MAIN FLOOR ELEVATION
15. PREFINISHED METAL RWL
16. SMOOTH FACE CONCRETE BLOCK COLOUR TWO
17. CHAINLINK C/W VERTICAL PRIVACY SLATS



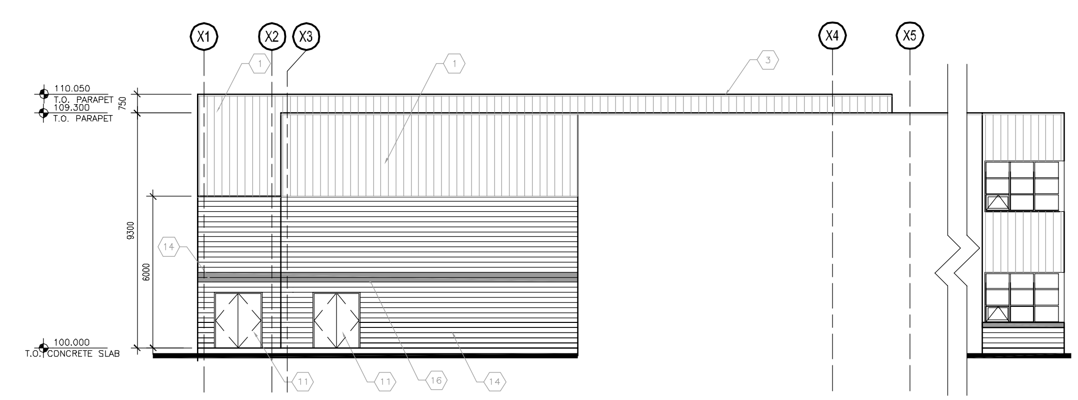
FRONT ELEVATION

SCALE=1:300



RIGHT- SIDE ELEVATION

SCALE=1:300



LEFT- SIDE ELEVATION

SCALE=1:300

900 STUDENT CORE-MIDDLE SCHOOL

ELEVATIONS

SCALE 1:300

DATE NOV.05,2008

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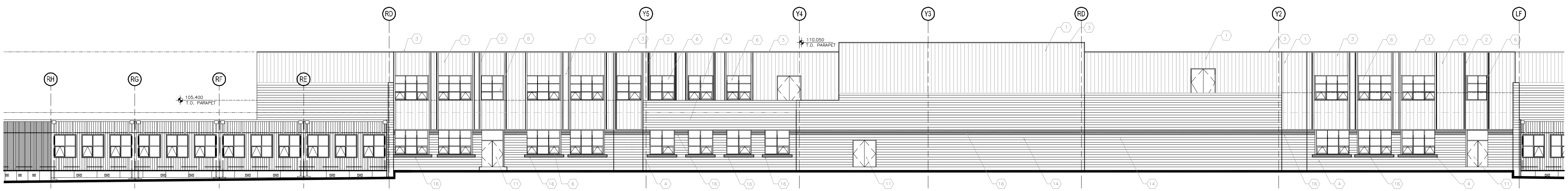
KEYNOTES: THIS SHEET ONLY

1. PREFINISHED METAL SIDING COLOUR ONE
2. PREFINISHED METAL SIDING COLOUR TWO
3. PREFINISHED METAL FLASHING
4. SPLIT FACE CONCRETE BLOCK VENEER COLOUR ONE
5. SPLIT FACE CONCRETE BLOCK COLOUR TWO
6. DOUBLE GLAZED, THERMALLY BROKEN ANODIZED ALUMINUM CURTAIN WALL EXTERIOR WINDOW
   U VALUE= 5.91 W/M2
   R VALUE=1.47
   (based on Ashrae HOF 2001)
7. PREFINISHED ALUMINUM CURTAIN WALL FRAMING
8. GLASS SPANDREL PANEL
9. PREFINISHED METAL SIDING – COLOUR THREE
10. PREFINISHED ALUMINUM ENTRANCE IN CURTAIN WALL FRAMING SYSTEM
    U VALUE= 5.91 W/M2
    R VALUE=1.47
    (based on Ashrae HOF 2001)
11. INSULATED HOLLOW METAL DOOR IN PRESSED STEEL FRAME – PAINTED
12. PAINTED STEEL PIPE COLUMN
13. MODULAR CLASSROOMS
14. PREFINISHED CONCRETE MANSORY SMOOTH BALL WALL TO 6000 ABOVE MAIN FLOOR ELEVATION
15. PREFINISHED METAL RWL
16. SMOOTH FACE CONCRETE BLOCK COLOUR TWO
17. CHAINLINK C/W VERTICAL PRIVACY SLATS



REAR ELEVATION

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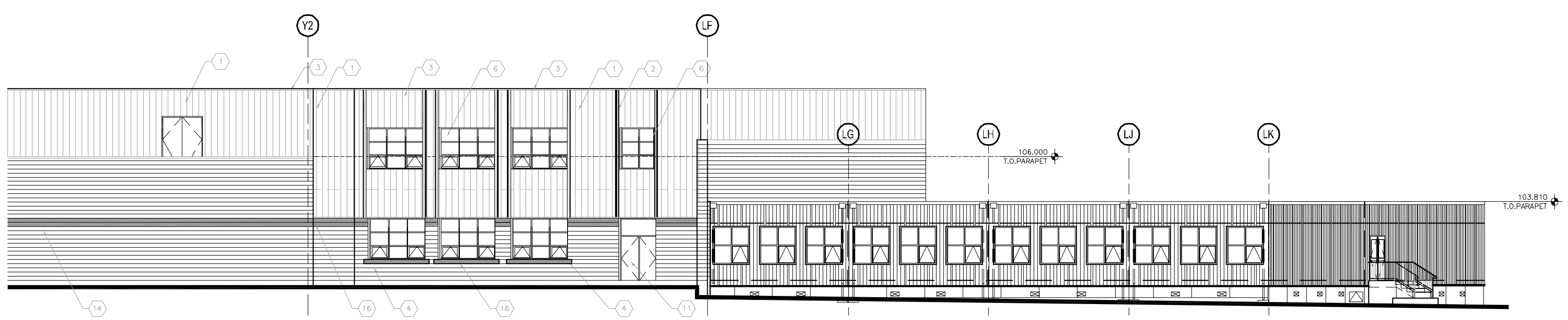

REAR ELEVATION

SCALE=1:300

900 STUDENT CORE-MIDDLE SCHOOL

ELEVATIONS

SCALE 1:300

DATE NOV.05,2008

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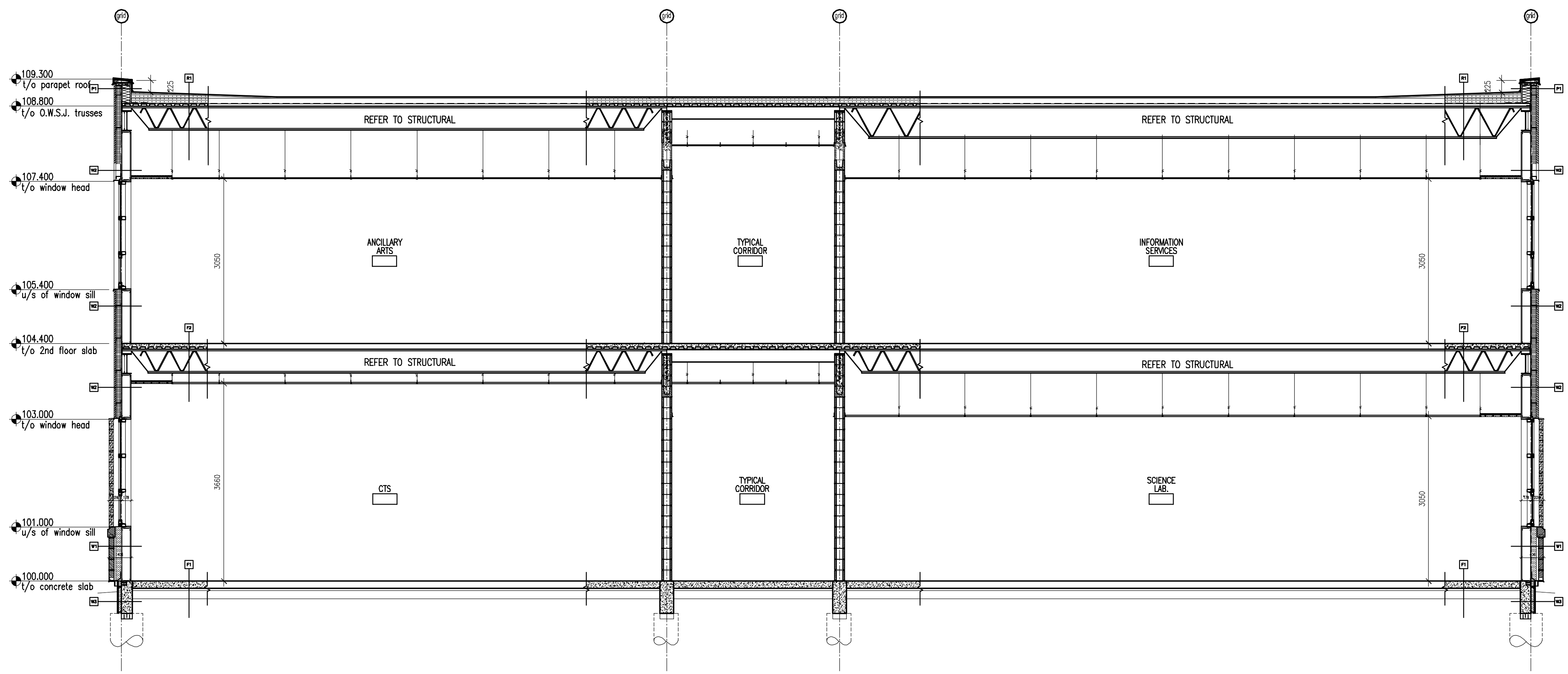
A302



A BUILDING SECTION

SCALE= 1:100

900 STUDENT CORE-MIDDLE SCHOOL

BUILDING SECTION

SCALE 1:100

DATE NOV.05,2008

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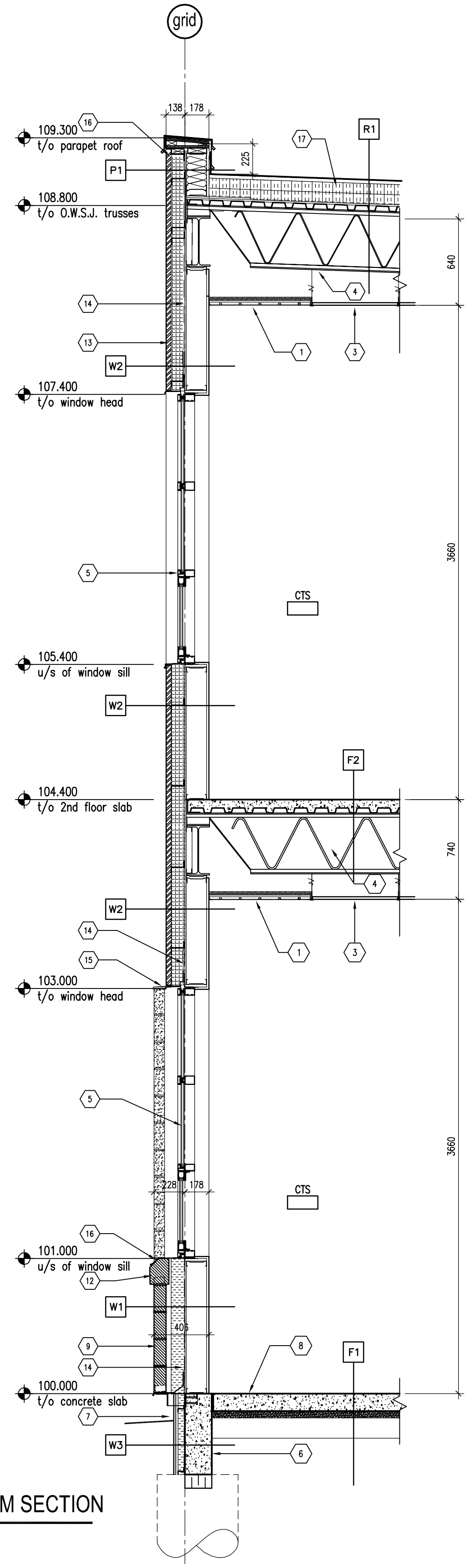
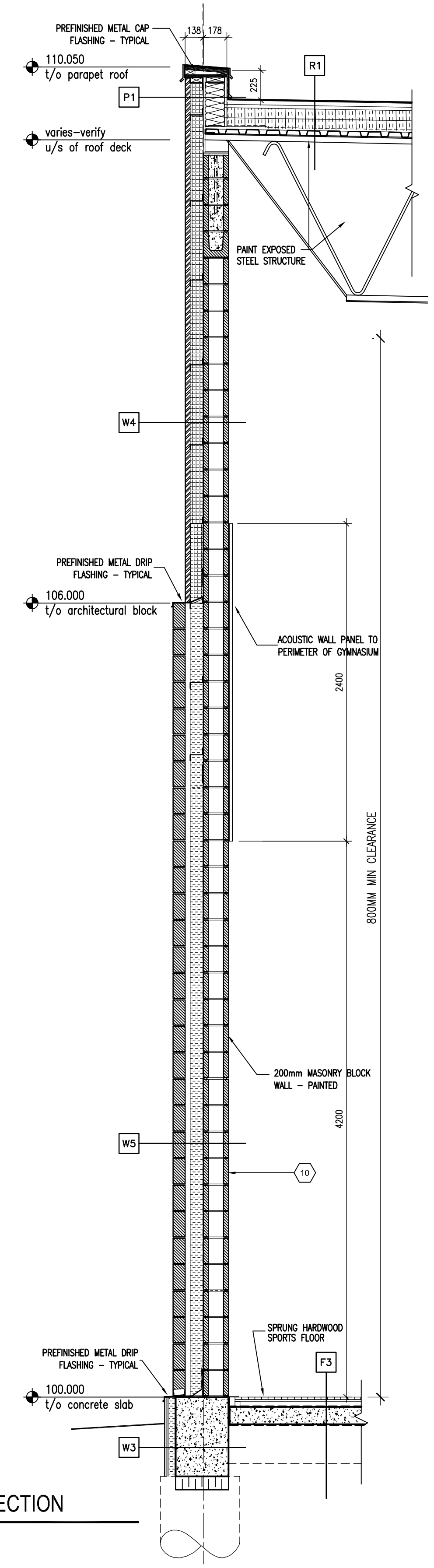
A401



TYPICAL CLASSROOM SECTION

SCALE= 1:50



GYMNASIUM SECTION

SCALE= 1:50

KEYNOTES THIS SHEET ONLY:

1. SUSPENDED RADIANT PANEL
2. STEEL STUDS DEFLECTION TRACK
3. SUSPENDED ACOUSTIC TILE CEILING
4. ROOF STRUCTURE SEE STRUCTURAL DRAWINGS
5. DOUBLE GLAZED THERMALLY BROKEN CLEAR ANODIZED ALUMINUM CURTAIN WALL FRAME WINDOW W/OPERABLE AWNING UNIT
6. CONCRETE GRADE BEAM ON CONCRETE PILES (TBO)
7. 16mm CEMENT BOARD ON 50mm Z-BARS, 50mm RIGID INSULATION, AIR/VAPOUR BARRIER TO FACE OF GRADE BEAM
8. FLOOR STRUCTURE SEE STRUCTURAL DRAWINGS
9. 90mm CONCRETE BLOCK VENEER
10. 190mm CONCRETE BLOCK
11. R20 INSULATION (REFER TO SECTION)
12. 140 mm CONCRETE CHAMFER BLOCK SILL
13. PREFINISHED METAL CLADDING
14. AIR/VAPOUR BARRIER
15. PREFINISHED METAL FLASHING
16. PREFINISHED METAL CAP FLASHING c/w COUNTER FLASHING
17. ROOFING MEMBRANE ON FIBREBOARD POSITIVE SLOPE INSULATION

ROOF TYPE:

R1 **ROOF TYPE: R1**
SBS TWO PLY ROOF
MEMBRANE ON
25mm ASPHALT IMPREGNATED
FIBREBOARD PROTECTIVE INSULATION
POSITIVE SLOPED RIGID INSULATION
(REQUIRED FOR BACK SLOPES ONLY)
R30/RSI=5.28 RIGID INSULATION
VAPOUR BARRIER MEMBRANE
13mm DENS DECK GYPSUM BOARD
38mm STEEL ROOF DECK ON
STEEL STRUCTURE SLOPED TO DRAIN
(REFER TO STRUCTURAL)

WALL TYPES:

W1 **WALL TYPE: W1**
90mm ARCHITECTURAL BLOCK VENEER
38mm AIR SPACE
R20/RSI=3.4 100mm STYROFOAM INSULATION
AIR/VAPOUR BARRIER MEMBRANE
13mm EXTERIOR GRADE GYPSUM BOARD
150mm STEEL STUDS @400mm O.C.
16mm IMPACT RESISTANT GYPSUM BOARD

W2 **WALL TYPE: W2**
PREFINISHED METAL CLADDING (ALLOW MIN. 19mm PROFILE)
100mm GALVANIZED GIRTS @600mm O.C.
R20/100mm ROXUL SEMI-RIGID
MINERAL FIBRE INSULATION
AIR/VAPOUR BARRIER MEMBRANE
13mm EXTERIOR GRADE GYPSUM BOARD
150mm STEEL STUDS @400mm O.C.
16mm IMPACT RESISTANT GYPSUM BOARD

W3 **WALL TYPE: W3**
CEMENT PARGING
16mm CEMENT BOARD
50mm GALVANIZED 'Z' BARS
50mm RIGID INSULATION
(REFER TO STRUCTURAL)

W4 **WALL TYPE: W4**
PREFINISHED METAL CLADDING
100mm GALVANIZED GIRTS @600mm O.C.
R20/100mm ROXUL SEMI-RIGID
MINERAL FIBRE INSULATION
AIR/VAPOUR BARRIER MEMBRANE
190mm SMOOTH FACE CONCRETE BLOCK
(PAINTED - EXPOSED BLOCK)

W5 **WALL TYPE: W5**
90mm ARCHITECTURAL BLOCK VENEER
38mm AIR SPACE
R20/RSI=3.4 100mm STYROFOAM INSULATION
AIR/VAPOUR BARRIER MEMBRANE
190mm SMOOTH FACE CONCRETE BLOCK
(PAINTED-EXPOSED BLOCK)

FLOOR TYPES:

F1 **FLOOR TYPE: F1**
130mm REINFORCED CONCRETE
FLOOR SLAB (EXACT THICKNESS
TO BE CONFIRMED BY STRUCTURAL
ENGINEER ON A PER SITE BASIS)
6mil. POLY VAPOUR BARRIER
50mm SAND UNDERBED
150mm MIN. FULLY COMPACTED
GRANULAR FILL

F2 **FLOOR TYPE: F2**
100mm CONCRETE TOPPING ON
38mm STEEL DECK ON
STEEL STRUCTURE, REFER TO
STRUCTURAL
(RATED FOR 1.0 HOUR WHERE NOTED)

F3 **FLOOR TYPE: F3**
19mm STRIP HARDWOOD FLOORING ON
2 LAYERS 13mm PLYWOOD SHEATHING ON
CONTINUOUS WOOD SLEEPERS WITH
BIO PADS @ 300mm O.C.
POLY VAPOUR BARRIER /
GROUND SHEET ON
REINFORCED CONCRETE FLOOR SLAB
ON GRADE, REFER TO STRUCTURAL
COMPACTED SUBBASE
(SUBSTRUCTURE PREPARED PER
RECOMMENDATIONS CONTAINED IN
GEOTECHNICAL ENGINEER'S REPORT

PARAPET ROOF TYPES:

P1 **PARAPET TYPE: P1**
38mm PREFINISHED METAL CLADDING
100mm GALVANIZED GIRTS @600mm O.C.
R20/100mm ROXUL SEMI-RIGID
MINERAL FIBRE INSULATION
AIR/VAPOUR BARRIER MEMBRANE
13mm EXTERIOR GRADE GYPSUM BOARD
150mm STEEL STUDS @400mm O.C.
(FILL VOID WITH BATT INSULATION)
16mm EXTERIOR GRADE PLYWOOD
AIR/VAPOUR BARRIER MEMBRANE
CARRY SBS TWO PLY ROOF MEMBRANE
MEMBRANE ROOFING FROM ROOF
TO TOP OF WOOD COPING
COUNTERFLASHING WITH
PREFINISHED METAL COPING FLASHING
(MIN. 2% SLOPE TO DRAIN)

BARR RYDER

900 STUDENT CORE-MIDDLE SCHOOL

WALL SECTIONS

SCALE 1:100

DATE NOV.05,2008

Alberta Infrastructure

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Appendix C – Design Ratios

Project Identification

Project Name:	Standard Middle-Core School – 900 Capacity	Building Type:	School
Location:	Base Case – Edmonton	Project Start Date:	N/A
School Board:	N/A	Completion Date:	N/A
Architect:	BARR RYDER ARCHITECTS	Market Condition:	
Constructor:		Geographic Location Factor:	Edmonton Base Rate

DESCRIPTION OF BUILDING

2 Storey. Fnd Drilled Conc. Piles, Grade Beams and Concrete Slab on Grade dependent on Soil conditions. Structural Metal Frame, Loadbearing Mansory Wall at Gymnasium, Ext wall Cladding 3.0 m Ht Masonry Facing, Upper Walls above 3.0 m Prefinished Metal Cladding, Double glz thermally broke Curtain Wall Exterior Windows and Entry, 2 Ply SBS Roof, Int. Partitions Mansory, Steel Stud/Gypsum Board. Floors VCT (Carpet Library/Admin) Wood @ Gym, Ceilings Acoustic Tile/GB, Walls Pt/Ceramic Tile Washrooms, Millwork

Building Area and Volume

	Core	Built-out
Gross Floor Area:	6337m2	7937m2
Net Floor Area:	5735m2	7261m2
Volume:	32003m3	38115m3
Exterior Cladding:	2015m2	2534m2
Roof Area:	3748m2	5348m2
No. of stories above grade:	2No	2No.
Modular Classrooms Built Out:	N/A	16No.

Outline Specification

A10 Foundation:
Piles with grade beams and pile caps for isolated columns, 130 slab on grade based on soils condition in area

B10 Superstructure:
Structural steel frame, steel beam interior structure, steel deck second floor system. Loadbearing mansory at gymnasium

B20 Exterior Enclosure:
Wall Cladding is 3.0m of masonry veneer, Fascia, upper walls prefinished metal cladding, Alum Double glz thermally broken windows, Curtain Wall At Entry.

B30 Roofing: 2 Ply modified SBS roofing

C10 Interior Construction:
Concrete block partitions impact resistant to areas requiring durability, GB/SS partitions

C30 Interior Finishes:
Vinyl composite tile flooring, ceramic tile @ washrooms, carpet Library, admin and staff lounge, wood floor in gym, ceilings are a combination of painted drywall and acoustic tile, wall finish are predominantly paint, ceramic wall tiles at showers, urinals and mop sink.

D30 Mechanical:
System utilizes interior air handling units and boilers, c/w perimeter radiant ceiling panels utilized for heating. Mechanical system is controlled using digital controls.

Ratios

	Core	Built-out
Net Floor Area/GFA:	.90:1	.91:1
Exterior Cladding Area/GFA:	.31:1	.31:1
Window Area/GFA:	.07:1	.08:1
Roof Area/GFA:	.59:1	.67:1

Capacities

Percentage exterior wall glazed:	19%
Soil characteristics:	
Density plumbing fixtures:	
Heating capacities:	
Cooling capacities:	
Ventilation Capacities:	
Lighting intensity:	

Floor Area (by type)

No.	Type	Core	Built-out
	Ancillary Classrooms/CTS	1079m2	N/A
	Permanent Core Classrooms	1216m2	N/A
	Gymnasium	798m2	N/A

Project Identification				
D 40 Fire Protection: Building is to be sprinklered.		Library Administration/Staff Storage Mech/Elect/Maintenance Circulation	321m2 417m2 152m2 221m2 1092m2	N/A N/A N/A N/A N/A
D50 Electrical: Main Service size to be confirmed during detail design. Service will be provided underground from a utility company network to a pad mounted transformer located adjacent to the building. From this transformer, an underground 347/600V three phase, four wire secondary power service will be provided to the electrical distribution center located in the main electrical room.				
Capital Cost of Permanent Core per m^2 (April 2007$)		Other Modular Classrooms Built out	1041m2 N/A	N/A 1600m2
	Gross Floor Area		6337	7937

Appendix D – LEED® Checklist

LEED Canada-NC 1.0 Project Checklist
Alberta Infrastructure Core G5-9 Middle School - 900 Capacity

Yes	? Probable	? Possible	No				Next Steps/Action Items:	Target Date:	Resp:
4	3	0	7	**Sustainable Sites**		14 Points			
Y				Prereq 1	**Erosion & Sedimentation Control**				
	?			Credit 1	**Site Selection**		Verify if site can achieve LEED criteria.		PRIME
			X	Credit 2	**Development Density**				
			X	Credit 3	**Redevelopment of Contaminated Site**				
	?			Credit 4.1	**Alternative Transportation**, Public Transportation Access		To be determined on a per site basis		PRIME/AI
Y				Credit 4.2	**Alternative Transportation**, Bicycle Storage & Changing Rooms		Ensure provision of showers for staff is acceptable to school boards (5% of FTE staff (not students) 1 shower per eight people).		PRIME/AI
Y				Credit 4.3	**Alternative Transportation**, Alternative Fuel Vehicles		Review provision of Stalls allocated for electric or Hybrid cars with designated power outlets.		School Board
Y				Credit 4.4	**Alternative Transportation**, Parking Capacity		Do not provide more parking than required by code.		PRIME/AI
			X	Credit 5.1	**Reduced Site Disturbance**, Protect or Restore Open Space				
			X	Credit 5.2	**Reduced Site Disturbance**, Development Footprint				PRIME/AI
			X	Credit 6.1	**Stormwater Management**, Rate and Quantity				Cons. Eng
			X	Credit 6.2	**Stormwater Management**, Treatment				Cons. Eng
			X	Credit 7.1	**Heat Island Effect**, Non-Roof				School Board or ASP
	?			Credit 7.2	**Heat Island Effect**, Roof		PVC roofs can achieve this LEED credit, SBS membranes can be used if suplimented with 18% of the roof having a higher reflectivity/Emissivity		School Board or ASP
Y				Credit 8	**Light Pollution Reduction**		Design lighting to meet LEED requirements.		Cons. Eng
Yes		?	No						
4	0	0	1	**Water Efficiency**		5 Points			
Y				Credit 1.1	**Water Efficient Landscaping**, Reduce by 50%		No irrigation to be provided in schools		PRIME
Y				Credit 1.2	**Water Efficient Landscaping**, No Potable Use or No Irrigation		No irrigation to be provided in schools		PRIME
			X	Credit 2	**Innovative Wastewater Technologies**				
Y				Credit 3.1	**Water Use Reduction**, 20% Reduction		Use ultra low flow urinals and low flow toilets to achieve this credit		Cons. Eng
Y				Credit 3.2	**Water Use Reduction**, 30% Reduction		Use ultra low flow urinals and low flow toilets to achieve this credit		Cons. Eng
Yes		?	No						
8	1	7	0	**Energy & Atmosphere**		17 Points			
Y				Prereq 1	**Fundamental Building Systems Commissioning**				AI
Y				Prereq 2	**Minimum Energy Performance**		Design building to achieve minimum of 6 EAc1 points and evaluate additional energy savings using a preliminary criteria of a 10 year simple payback. Conduct energy modeling as part of conceptual/schematic design.		Cons. Eng
Y				Prereq 3	**CFC Reduction in HVAC&R Equipment**		Design HVAC & fire protection without CFCs		Cons. Eng

Yes	?	No		Credit	Title	Points	Notes	Responsibility
6	0	4		Credit 1	**Optimize Energy Performance**		Design building to achieve minimum of 6 EAc1 points and evaluate additional energy savings using a preliminary criteria of a 10 year simple payback. Conduct energy modeling as part of conceptual/schematic design.	Cons. Eng
		?		Credit 2.1	**Renewable Energy**, 5%			Cons. Eng
		?		Credit 2.2	**Renewable Energy**, 10%			
		?		Credit 2.3	**Renewable Energy**, 20%			
Y				Credit 3	**Best Practice Commissioning**		Ensure AI are prepared to sign off on this. AI is currently doing most of the requirements of this credit	AI
Y				Credit 4	**Ozone Protection**		Design HVAC & fire protection without HCFCs	Cons. Eng
	?			Credit 5	**Measurement & Verification**		Use AI DDC standards to achieve LEED M&V requirements	Cons. Eng
				Credit 6	**Green Power**		School Boards may already be buying green power in order to achieve this credit. To be reviewed on a per site basis	School Board or ASP

Yes		?	No			
6	1	2	5	**Materials & Resources**		14 Points

Yes	?	No		Credit	Title	Points	Notes	Responsibility
Y				Prereq 1	**Storage & Collection of Recyclables**		Provide recycling areas as per LEED Reference Guide	PRIME
			X	Credit 1.1	**Building Reuse:** Maintain 75% of Existing Walls, Floors, and Roof			
			X	Credit 1.2	**Building Reuse:** Maintain 95% of Existing Walls, Floors, and Roof			
			X	Credit 1.3	**Building Reuse:** Maintain 50% of Interior Non-Structural Elements			
Y				Credit 2.1	**Construction Waste Management:** Divert 50% from Landfill		Divert 50% of Construction Waste from landfill	PRIME
Y				Credit 2.2	**Construction Waste Management:** Divert 75% from Landfill		Divert 75% of Construction Waste from landfill	PRIME
			X	Credit 3.1	**Resource Reuse:** 5%			
			X	Credit 3.2	**Resource Reuse:** 10%			
Y				Credit 4.1	**Recycled Content:** 7.5% (post-consumer + ½ post-industrial)		Analyze the most costly building materials in the project to determine if they can meet the 22.5% threshold for recycled materials and achieve this point and an ID point.	PRIME
Y				Credit 4.2	**Recycled Content:** 15% (post-consumer + ½ post-industrial)		Analyze the most costly building materials in the project to determine if they can meet the 22.5% threshold for recycled materials and achieve this point and an ID point.	PRIME
Y				Credit 5.1	**Regional Materials:** 10% Extracted and Manufactured Regionally		Analyze the most costly building materials in the project to determine if they can meet the 30% threshold for regional materials and achieve this point and an ID point.	PRIME
Y				Credit 5.2	**Regional Materials:** 20% Extracted and Manufactured Regionally		Analyze the most costly building materials in the project to determine if they can meet the 30% threshold for regional materials and achieve this point and an ID point.	PRIME
		?		Credit 6	**Rapidly Renewable Materials**		Hard to achieve but is doable	School Board or ASP
		?		Credit 7	**Certified Wood**		Confirm if 50% of wood in the project could ecomonically be certified wood	PRIME
	?			Credit 8	**Durable Building**		Complete the LEED documentation spreadsheets and specify Quality Assurance requirements.	PRIME

Yes		?	No			
14	1	0	0	**Indoor Environmental Quality**		15 Points

Yes	?	No		Credit	Title	Points	Notes	Responsibility
Y				Prereq 1	**Minimum IAQ Performance**	Required	Design ventilation to meet ASHRAE 62.1-2004	Cons. Eng
Y				Prereq 2	**Environmental Tobacco Smoke (ETS) Control**	Required	Ensure building is non-smoking	PRIME/AI
y				Credit 1	**Carbon Dioxide (CO_2) Monitoring**	1	Include CO2 sensors to control ventilation (i.e. vary ventilation to rooms based on CO2).	Cons. Eng
Y				Credit 2	**Ventilation Effectiveness**	1	Ensure ventilation effectiveness is achieved by delivering ventilation air at a low level.	Cons. Eng
Y				Credit 3.1	**Construction IAQ Management Plan:** During Construction	1	Incorporate the SMACNA and other requirements of this credit into the specification.	PRIME & Cons. Eng

Yes	?	?	No	Credit	Title	Points	Action	Responsibility
Y				Credit 3.2	**Construction IAQ Management Plan:** Testing Before Occupancy	1	Specify either IAQ testing or building flush out in the specifications.	PRIME & Cons. Eng
Y				Credit 4.1	**Low-Emitting Materials:** Adhesives & Sealants	1	Specify low emitting adhesives & sealants in documents	PRIME & Cons. Eng
Y				Credit 4.2	**Low-Emitting Materials:** Paints and Coating	1	Specify low emitting paints & coatings in documents	PRIME
Y				Credit 4.3	**Low-Emitting Materials:** Carpet	1	Specify low emitting carpets in documents	PRIME
Y				Credit 4.4	**Low-Emitting Materials:** Composite Wood and Laminate Adhesives	1	Specify low emitting composite wood in documents	PRIME
Y				Credit 5	**Indoor Chemical & Pollutant Source Control**	1	Incorporate entrance way grills, MERV 13 filters & storage of hazardous material into the design.	PRIME & Cons. Eng
Y				Credit 6.1	**Controllability of Systems:** Perimeter Spaces	1	Incorporate lighting control & operable windows in design	PRIME & Cons. Eng
Y				Credit 6.2	**Controllability of Systems:** Non-Perimeter Spaces	1	Incorporate lighting & ventilation control windows in design	Cons. Eng
Y				Credit 7.1	**Thermal Comfort:** Compliance	1	Design envelope and HVAC to meet ASHRAE Std. 55	PRIME & Cons. Eng
Y				Credit 7.2	**Thermal Comfort:** Monitoring	1	Utiliize AI DDC standards to achieve LEED ASHRAE Std. 55 monitoring requirements.	Cons. Eng
Y				Credit 8.1	**Daylight & Views:** Daylight 75% of Spaces	1	Ensure 75% of regularly occupied spaces are day lit	PRIME
	?			Credit 8.2	**Daylight & Views:** Views 90% of Spaces	1	Ensure 90% of regularly occupied spaces have views.	PRIME

Yes		?	No			
3	2	0	0	**Innovation & Design Process**	**5** Points	
Y				Credit 1.1	**Innovation in Design**	1	Incorporate requirements to use the building as a demonstration project (ex. signage, M&V readouts, window to see equipment, website, etc.)	PRIME
	?			Credit 1.2	**Innovation in Design**	1	Contract documents to require 95% waste diversion to achieve an ID credit.	PRIME
	?			Credit 1.3	**Innovation in Design**	1	Analyze whether MRc5 (regional materials) can reach 30% or MRc4 (recycled materials) can reach 22.5% to achieve an ID point.	PRIME
Y				Credit 1.4	**Innovation in Design**	1	Use ultra low flow urinals and low flow toilets to achieve this credit	Cons. Eng
Y				Credit 2	**LEED® Accredited Professional**	1	Determine who will be the designated LEED AP on the project team.	PRIME

Yes		?	No		
39	8	9	13	**Project Totals (pre-certification estimates)**	**70** Points

Certified 26-32 points **Silver** 33-38 points **Gold** 39-51 points **Platinum** 52-70 points

ID1 Innovation Credits achieved on other projects

1 Commiting to use the project as a demonstration project
2 Commitment to green cleaning products
3 100% green power
4 On site composting facility
5 Low emitting materials - furniture
6 Exceptional Water Use Reduction
7 Exceptional CWM (i.e. >95%)
8 Exceptional recycled materials (i.e. >22.5%)
9 Exception regional materials (i.e. >30%)
etc.

AI	Alberta Infrastructure
PRIME	Prime Consultant
Cons. Eng	Consulting Engineer
School Board	School Board
ASP	Alberta Schools Proponent