Mulgrave School - East and West Additions

Amendment to Development Permit 16-001 & Proposed Re-zoning and Development Permit for the Mulgrave Campus Southlands

October 26th, 2018

CORNERSTONE architecture + SURF ARCHITECTURE

Letter from Original DP Submission

MULGRAVE SCHOOL

September 24, 2018

District of West Vancouver
750-17th Street
West Vancouver, BC
V7V 3T3

Attention: Michelle McGuire, MCIP
Manager of Current Planning and Urban Design | District of West Vancouver

Dear Michelle,

RE: Mulgrave Phase II Addition DP amendment and re-zoning of the lands on the south of the school site.

Thank you to you and your team for the support in preparing for the formal submission of the DP amendment and re-zoning package which is hereby enclosed. As discussed, much of the approved DP remains intact and we are excited that the amendments to the East Wing will allow us to more comprehensively improve and integrate all the facilities at the east end of the school site and improve the facilities for community use of the current play field. The rezoning of the land owned by the school will allow us to in time (and with the proper permits) to complete a smaller training field and overflow parking for school and community events.

As you know the West Wing part of the DP is almost complete and we will be holding an opening ceremony at 4.30pm on 20th December which we hope that you or someone from your team will be able to attend.

Kind regards,

John Wray
Head of School

c.c.
Harry Wierenga, Chair, Mulgrave Board of Directors
John Pao, Chair Building and Grounds Committee
Simon Richards, Cornerstone Architecture
Mark Koropecky, Surf Architecture

2330 Cypress Bowl Lane, West Vancouver, BC V7S 3H9
P 604.922.3223 | F 604.922.3328 | mulgrave.com

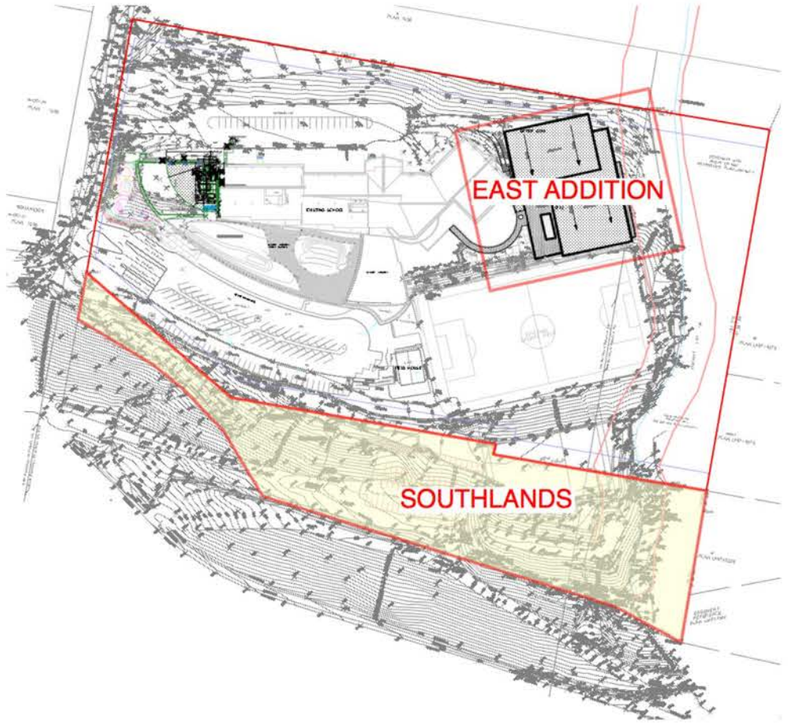
CORNERSTONE architecture + SURF ARCHITECTURE

PREFACE

This submission documents two Mulgrave School development initiatives.

The first concerns amending the development permit for the East Addition to the main school building. This project will develop the senior athletics centre and complete the Mulgrave School's phased development concept.

The second concerns the Mulgrave campus southlands – specifically, to rezone this land parcel to the same (PA-1) zone as the rest of the site and to put in place a development permit for the proposed uses comprising a second sports paly field and a permanent ancillary parking lot.



EAST ADDITION

On July 25, 2016 Council approved Development Permit 16-001 for Mulgrave School's West and East Additions*. Construction commenced on the West Addition in June 2017 and completion is expected by December 2018.

The construction of the East Addition is intended to commence in May 2019 to take advantage of the construction window offered by the school calendar. The current Development Permit contemplates that the last remaining "temporary building" would be retained and dealt with at a later date. Mulgrave School has since decided that, in the interest of facilitating construction and minimizing disruption to the school and its neighbours, the temporary building is better removed and replaced by a permanent structure, and therefore, forms part of the East Addition construction program.

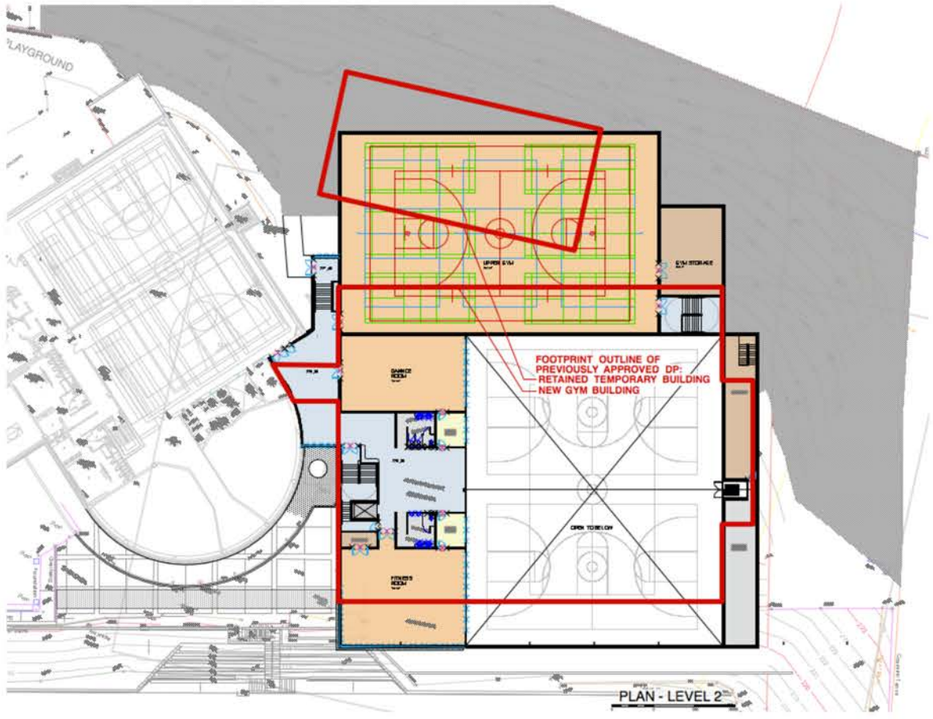
Based on this decision, proposed amendments to Development Permit 16-001 are reflected in this document. The document maintains the organization and content of the approved DP save for the specific design changes pertaining to the East Addition. The table of contents denotes those pages that have been modified.

In summary, the proposed design changes to the East Addition comprise the following:

- The design for the proposed new main gym is almost identical in plan to the previous, but the building has been moved 4877mm (16 feet) southward
- With the building closer to the Field it is both desirable and feasible to add a partial lower storey at field level (that is mostly underground)
- The existing temporary building (mini-gym) is to be removed, and using the vacated site footprint, a new Upper Gym development is proposed
- The amended design unifies the architectural treatment of both gym structures, as well as the landscape and technical systems

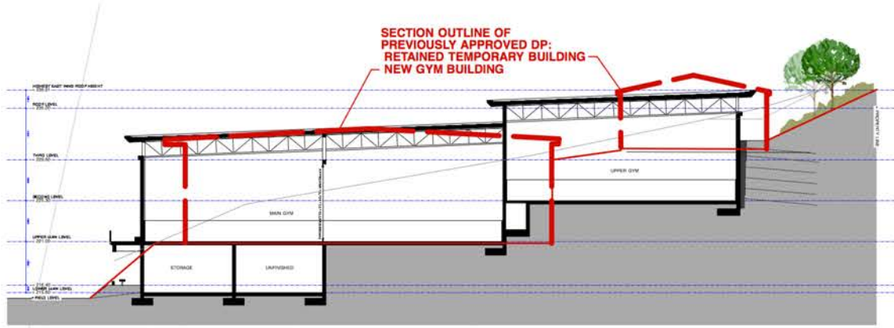
In addition to the functional benefits, we feel that the amended design results in a more attractive overall development and has no adverse consequences for the neighbours. The figures opposite show:

- the Level 2 Plan for the amended design on which the outline has been superimposed in red of the approved DP East Addition footprint with the retained temporary building – illustrating that the campus development footprint is somewhat increased (from 25.36% to 26.17%) but with no difference to the horizontal view angle presented by the East Addition to neighbours on the slope above



- the amended North South Building Section on which the section outline has been superimposed in red of the approved DP East Addition with the temporary building retained – illustrating that the south part of the roof, over the Main Gym, now a mono-slope, is at virtually the same height as the approved DP; the proposed new Upper Gym roof is somewhat lower than the existing temporary building; both are well below the vertical view angle to the water available to the neighbours on the slope above and the differential effect between the approved and amended DP is insignificant (and marginally positive)
  Note: the roof surface treatment remains as per the approved DP; this is a granular-faced roof membrane that will not cause glare

* Cornerstone Architecture, in association with SURF Architecture, is the Architect for the current project. This DP Amendment document incorporates material originally prepared and submitted by CEI. This document also incorporates the minor amendment to the original submission (Cornerstone+SURF, December 2016).



NORTH-SOUTH SECTION

SOUTHLANDS

The Mulgrave Southlands is a plot of land located along the southern border of the school campus and is currently zoned RS8 (Residential Single Family). The Development Permit and Rezoning Application that was submitted on February 22, 2018 is intended to change overall zoning designation to PA-1 (Public Assembly 1 – School and ancillary uses). The specifically proposed uses for the land south of the main playing field in the southeast corner of the site are for a new junior artificial turf playing field and an over-flow parking lot that is accessed by a connecting road from Cypress Bowl Lane.

By way of background, the school is currently utilizing this land as a temporary vehicular parking area for the construction workers who are building the new West Addition to the school. At the commencement of construction, Mulgrave was not aware that the zoning of this portion of their land does not permit vehicular parking. Upon notification from the District of West Vancouver, the school promptly made efforts to rectify the current situation through the District of West Vancouver rezoning process.

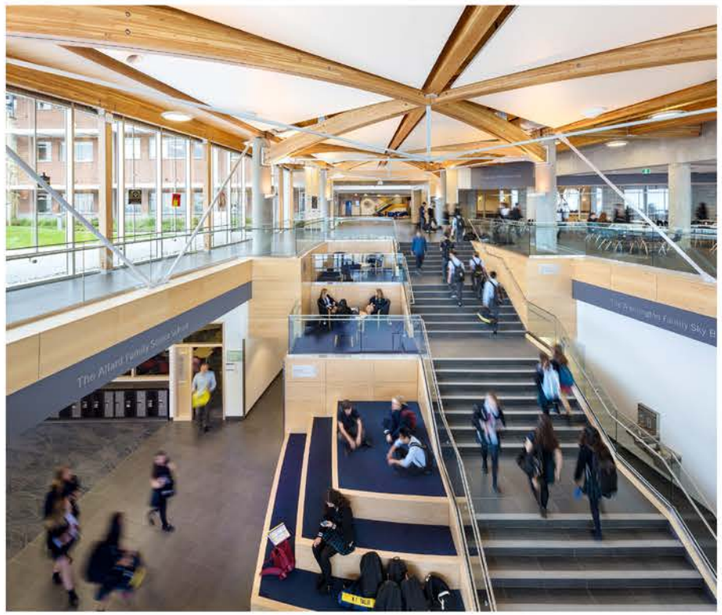
In section 3.0 of this document, the Landscape drawings illustrate the proposed design for the entire campus including the southlands. Appendix B provides a summary of the background, as well as summaries of both the rezoning and development permit application documents that have been submitted.

Table of Contents

Note:

● Denotes New Page
▲ Denotes Updated Page

1.0 Introduction



"Inspiring Excellence in Education and Life"

From its humble beginnings in 1993, Mulgrave School opened its West Vancouver Campus in 2001 followed by the addition of its Early Learning Centre in 2010. During 2011, Mulgrave School endeavored to anticipate its future facilities requirements through the development of its 2020 Vision Plan. In the process, it retained the services of CEI Architecture and Cornerstone Planning Group to assist in the development of a Long Term Facilities and Campus Plan Vision and as a result, created the Mulgrave School Campus Plan (2035) (attached on page 5). After the recent completion of its new Senior School Addition in 2015, Mulgrave School is now poised to move into its next phase of development to ensure that the School remains at the forefront of 21st Century Learning.

The Campus Plan identifies the facilities required to expand and enhance the School's known program requirements and now the realized Senior School Addition will be followed by the West (Junior/Middle School) Addition and East (Athletics) Addition. It also includes other facilities that might be added in future years. The additional lands that Mulgrave has purchased immediately south of the school are also included in the Mulgrave Campus Plan.

Phase 1, the Senior School Addition, was completed in 2015 as the focus of the School's initial expansion program. As part of the preparation of the 2035 Campus Plan, Davies Geotechnical Inc. prepared a Geotechnical Review and Slope Stability Review for the land located south and east of the existing school (refer to Appendix A).

Pedestrian traffic within the Campus is accommodated with sidewalks and walkways. A future circuit trail will also be constructed to encompass the site. Also, as part of the construction of the Junior/Middle School Addition, the access road to the north parking lot will be modified to include a marked pedestrian crossing to better accommodate the pedestrian trail connecting the Chippendale Road trail head with the residential development to be located immediately west of Mulgrave School. As no pedestrian traffic arrives, or is expected to arrive, on foot from Cypress Bowl Road, no offsite pedestrian improvements are contemplated.

Mulgrave School is now embarking on its second major Capital Campaign by engaging the support of the School's Community. While Mulgrave School's success in moving forward with these expansion plans will be dependent on its fundraising success within the School Community, it is not dependent on increasing the school population. In fact, Mulgrave School has committed "not to significantly increase the school population after building these new facilities, that each division of the school will continue to have a base in an area of the school and that the campus will retain its small community and family feel." A minor increase in the ELC student population is projected (see page 10) to open opportunities for advancing children directly into the Mulgrave Junior School.

Mulgrave School has also committed to sustainable development practices and embracing the community at large through the sharing of its specialized facilities. In 2001 it entered into a Community Use Agreement with the District of West Vancouver and continues to work with the District to meet new and mutually beneficial objectives. Mulgrave School has identified a number of Sustainable Initiatives (see page 6) that it will endeavor to include during further design development of this project. They include initiatives to enhance the sustainable performance of the project, with a focus on reducing energy demands.

Design Rationale

General Overview

The 2020 Vision Plan establishes an overall program of academic spaces that enhance the school's learning environment and dovetails with the physical layout of the existing facilities.

The addition of new space to the school results in the need to reconfigure a portion of the existing programmed spaces. A few of the classrooms have been re-assigned to group Junior and Middle School students within zones of the school that then tie into adjacent proposed facilities. The existing Early Learning Centre adjacent to the new turf field will be used as field house changing rooms on the lower floor and a Teachers' Professional Development Centre on the upper floor.

The table on page 10 summarizes the Mulgrave Student Body population. Apart from a minor increase to the enrolment of children in the Early Learning Centre, the school is maintaining the student population as it currently stands at a three classroom per academic year model.

The Phase 2 Development Permit Application concentrates on two areas of the site. An addition to the west end of the existing original "red brick school house" will house the new Early Learning Centre, expanded Art and Design Technology Studios, as well as a consolidated pod of Junior School learning spaces.

A proposed Athletics addition is to be located east of the existing Performing Arts "drum", which is the curved exterior wall adjacent to the new Cafeteria. The new stand-alone structure is intended to replace the existing Lower Gym and will house an expanded competition Gymnasium, Dance and Fitness Studios along with support spaces such as Departmental Offices, Change Rooms and Storage Rooms.

The East Addition will be linked to the existing school to provide internal connections at the Upper Main Level and Level 2. The Upper Main Level connection will be achieved by modifying the arrangement of Music Practice Rooms within the Music Department to provide circulation space. The Level 2 connection will be provided through the southeast exit doors of the existing Main Gym.

West Addition

The proposed three storey addition totals approximately 2,500 square metres. The Early Learning Centre (ELC) is located at the Lower Main Floor Level and is accessed through the west entrance of the recently constructed Senior School. The connection will be provided through the north wall of the locker alcove and through the foundation wall, which was designed to allow for this tie-in.

The heart of the four classroom ELC is the Multi-Purpose Room. This space is oval in plan to create a warm, rich environment for the children outside of their classrooms. The ELC population will have two classrooms of 16 three-year-old children each, and two classrooms of 24 four-year-old children each, for a total enrolment of 80 children. 388 sq m of devoted interior space for the children will exceed the Health Authority's mandate of 3.7 metres squared per child by over 90 sq m.

The outdoor area for the children has been carefully considered. The design by PMG Landscape Architects, with direct input from educators and staff, creates a stimulating outdoor environment replete with varying levels of activity and play. Following the Health Authority's guidelines, the space has been divided in two, allowing two user groups to be outside concurrently. The separating fence was designed to be as unobtrusive as possible, allowing visual access to both sides. Approximately 35% of the space has been given specific programming while 65% remains unprogrammed. A curving tricycle path connects both spaces while individual circuits are possible on each side independently. The curvilinear forms and natural play elements of logs, boulders, sand and water give reference to the ELC's location amidst the spectacular natural landscape of the North shore mountains. Opportunities for outdoor learning have been provided in semicircular seating areas on both sides. The exterior play and learning space meets the requirement for seven square metres per child and includes the provision for a possible future covered area for additional sun protected and all-season use.

Linkage between the proposed addition and the west end of the existing school, as well as access to all levels of each, is provided through a new atrium that contains an exit/connector stair and elevator. In the new West Addition, at the next level above the ELC located on the Upper Main Level of the School, are the Art and Design Tech Studios. These studios have direct access to the exterior along the west wall and direct access onto the existing multi-programmed green roof located to the south over the new Senior School.

Level 2 of the West Addition houses five Middle School classrooms, two small study rooms and a learning commons. This level has direct access to grade at the north where an existing children's play structure will be relocated. Above this level is the roof for the West Addition. It is designed as an outdoor learning and play environment for the Junior School and has a covered area of over 380 sq m. This rooftop amenity has a direct, level connection to the top floor of the existing school where Kindergarten through Grade 3 classrooms will be located.

The Level 3 rooftop amenity space has been designed to have approximately 20% programmed space, leaving the remaining 80% unprogrammed and available for free play. Mirroring the curving lines of the school and the organic forms of the ELC below, the ground plane of the Level 3 rooftop amenity has curving lines forming a circuitous path which separates the space into active and passive 'pods'. A cord climbing structure and vertical maze elements incorporate the overhanging roof's columns into their design, efficiently and creatively integrating the play environment with the architecture of the school.

Outdoor learning opportunities have been incorporated formally in the amphitheatre with views to the south and west and informally in the semicircular boulders located beneath the cover of the overhanging roof. Soft landscape elements have been included in raised planters providing green anchors of native and drought tolerant shrubs at the two ends of the sweeping curved roof edge.

The existing main buildings on the site provide the parameters for setting the massing for the West Addition. The massing along the southwest face of the West Addition is a smooth progression of the curve, which is scribed in the school campus by the Senior School Addition. The north elevation of the West Addition is set parallel to the original school.

The south and west elevations of the West Addition are a combination of an aluminum framed curtain wall system set within an insulated wall assembly. This wall assembly is finished at the exterior with red brick, matching the brick material used in the main body of the existing school building. Along the south and west walls, the brick willl match the profile of the curved walls below, as shown on the floor plan. The north wall of the West Addition will also be finished in this red brick. The large punched windows along this elevation continue the rhythm of the window openings along the north elevation of the existing school.

To the north of the West Addition, it is intended to relocate the existing children's play structure currently located at the west end of the school. Because of the site grading and programmed use of roof space, each level on the West Addition has access to exterior learning and play space.

East Addition

The new physical education wing will replace both the existing lower gym and the upper auxiliary gym in order to provide enhanced programmed space. With direct access from the Upper Main Floor level and from the main sports field, the new facility will serve as the core of the school's athletics curriculum.

For the most part, this new addition is considered a stand-alone structure. The physical connection is limited to a two-storey vestibule, which also provides exits at both levels. This vestibule has been designed to maintain a circulation and visual connection between the north and south sides of the site. On the north side, the upper vestibule ties into the existing walkway along the northeast corner of the existing school. On the south side, the main vestibule level opens onto the existing terrace/walkway looking over the fields.

The vestibule and its core vertical circulation also connects to the partial lower level that in turn, opens directly onto the fields. The East Addition comprises a new main dividable double Competition Gym as well as an Upper Gym; these are supported by adjacent storage and central change room and team room facilities. Additional upper level facilities include a Gym Viewing Lounge, a Dance Studio and a Fitness Studio that overlooks the fields. The lower level contains storage and service space as well team and change rooms that facilitate the operation of the field.

The overall massing reflects the two main gym volumes. These are terraced into the rising topography and covered with stepped mono-sloped roof forms. The south elevation, visible over the field, has two components – the eastern part is the logical expression of the main gym volume, capped by the roof overhang over a clerestory window and the lower solid wall plane. The smaller western part reflects the interior functions – the Fitness Studio over the main Gym Entrance Lobby. The treatment here uses a significant percentage of glazing with a commonality to Mulgrave's new main entry lobby. The solid wall areas are clad in an insulated metal panel system coloured to match the buff tan of the West Addition as approved in the current development permit. These measures are in keeping with the intent that both the West and East Additions form a cohesive group of additions to the original red brick schoolhouse.

Consistency with Official Community Plan Policies

Our design team has carefully reviewed the relevant municipal documents to ensure that the new East and West additions to Mulgrave School not only recognizes but reinforces the community building principles stated for future development in the neighborhood and region.

Fundamental Community Building Principles

- Creating a strong community
- Establishing a sensitivity and connection to the natural environment and mountain qualities
- Encouraging a diverse community
- Focusing on environmental and economic sustainability

The sense of place that is stated as a priority for any future development will be influenced by the Mulgrave School Site, which will integrate not only these governing design principles, but the infrastructure and amenities which will serve and connect the larger North Shore community.

The existing school site is located in the Rodgers Creek Area Development Plan (March 7, 2008) and within the larger Upper Lands area described in Policy Section 7 of the Official Community Plan. There are several objectives outlined within this policy that the project is particular sympathetic towards including;

- Design of a built environment that takes into account environmental considerations and complements natural characteristics of the landscape, including building layouts, building types, roads and play areas.
- Provision of a diversity of home, lifestyle and recreation choices
- Creation of future neighborhoods that offer a range of amenities and services, including major parks, schools, trail systems and some commercial lands for locally convenient commercial services that have a sense of identity and that provide varied housing to meet resident needs.

As stated elsewhere in our design rationale and sustainability summary, the design solution strives to improve upon the existing community amenity by minimizing its environmental impact while maximizing its sustainability potential. The site planning and building configuration recognize the topographic constraints and environmental sensitivities of the site while celebrating the natural heritage of the region and how it relates to the District of West Vancouver and to Greater Vancouver as a whole.

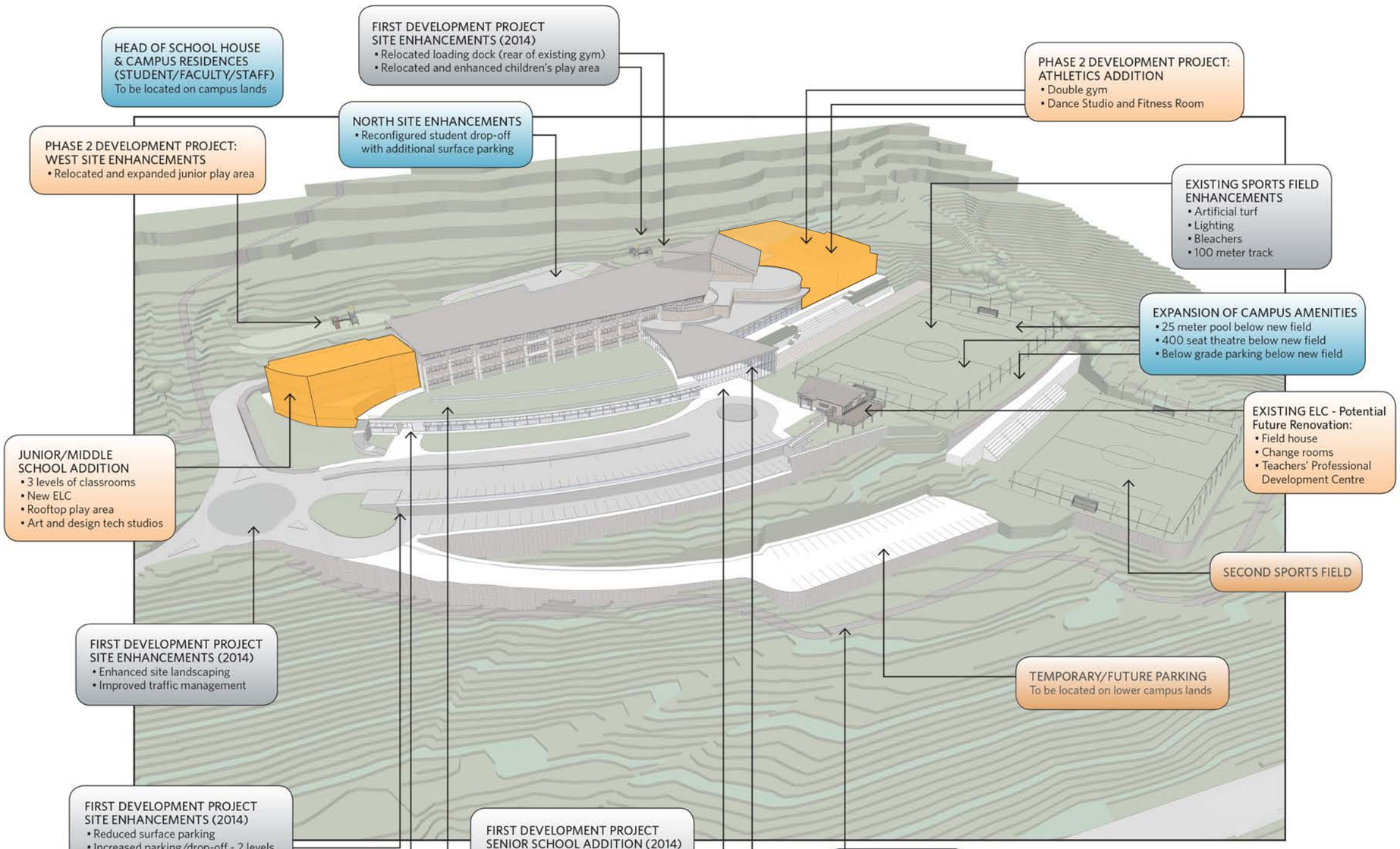
Policy Highlights

- ***Existing Neighbourhoods*** - preserve and enhance character
- ***Future Neighbourhoods*** - base development on environmental considerations; use creeks to form open space framework, encourage a variety of housing
- ***Limited Use and Recreation Area*** - protect the natural environment; separate study for privately owned lands
- CA ***Clyde Avenue Area*** - allow mix of commercial and residential use
- HB ***Horseshoe Bay*** - promote seaside village character
- ED ***Evelyn Drive Area*** - study area for possible multi-family housing
- LC ***Lower Caulfield Heritage Conservation Area*** - protect heritage character
- 1200' ***1200' Elevation*** - upper limit of development; plan provides for community discussion of possible benefits of development above 1200' in exchange for public acquisition of lands with outstanding community benefit or environmental assets
- A ***Ambleside*** - enhance as Town Centre
- DV ***Dundarave Village*** - build upon local village character
- ***BC Rail*** - work to achieve pedestrian and cycling connections
- PR ***Park Royal*** - enhance role as gateway to West Vancouver
- S ***Public School*** - maximize community use
- P ***Private School*** - recognize role in the community
- S ***Potential Future School Site*** - provide for school site acquisition in the Upper Lands at no public cost
- CC ***Civic Centre*** - integrate recreation and community services
- ***Argyle Avenue*** - Create plan and review waterfront acquisition policy
- GCC ***Gleneagles Community Centre*** - neighbourhood focused recreation
- ***Future Road*** - 1000' Connector provides east/west route in Upper Lands
- ***Community Parks*** - provide parks and open spaces that meet a range of community needs
- P ***Future Parks*** - acquire sites for three major community parks
- ***Foreshore*** - protect the shoreline; provide for public access

Mulgrave School Campus Plan (2035)

LEGEND

- COMPLETE
- PROPOSED
- FUTURE



Sustainability Initiatives

Our approach strives to reduce environmental site impacts by maximizing water efficiency, optimizing energy performance, and enhancing indoor air quality while integrating several other innovative sustainable design strategies. These efforts are all aligned with Mulgrave School's mission statement that states a belief that a global perspective and environmental and social responsibility are central to become true world citizens.

The design solution will integrate innovative practices, materials and techniques to ensure that building systems, technologies, components and finishes all optimize the sustainability and overall quality of the two new additions to Mulgrave School. These include;

Sustainable Site Initiatives

- Passive design features include aligning the addition along a predominantly east-west axis to help mitigate solar gain while maximizing daylighting and views.
- Leveraging the building as a thermal mass to equalize the heating and cooling cycles throughout the course of a day.
- Accessing the temperate regional environment by naturally ventilating with unconditioned outdoor air for free cooling.
- For stormwater management, the intent is to use the existing retention system in order to maintain the current level of net zero contribution to the municipal storm system.
- Mitigating the heat island effect of roof elements through the use of appropriately specific roof membranes and accessible roof areas.
- Encouraging carpooling and bicycle riding through a sustainable transportation program.

Energy Initiatives

- Employ a high performance envelope that judiciously employs glazing limited to 40% of the exterior walls.
- Placement of exterior and interior glazing to maximize the use of natural daylighting.
- Alongside this high performance envelope, the mechanical and electrical systems will be designed to improve the overall energy performance of the building by reducing energy consumption and associated costs while providing long term operational efficiencies, reduced maintenance and retrofitting costs and overall improved user comfort.
- Highly efficient air source heat pump distribution system which will provide maximum zoned control and efficiency. Heat recovery will then be achieved by equipping exhausts with energy recovery coils.
- Lighting design will focus on efficiency and automation to promote conservation throughout the life cycle of the facilities. By incorporating lower lighting densities and utilizing occupancy and daylight sensors, the energy consumption will be reduced.

Water Initiatives

- Respect the surrounding terrain and manage the significant stormwater runoff from both within and around the site.
- Stormwater management strategy will mitigate runoff volume and improve water quality.
- This irrigation strategy will be supported by the selection of regionally appropriate, drought resistant plant species.
- Highly efficient plumbing fixtures will also be specified throughout the new additions to significantly reduce potable water usage.

Material Initiatives

- The project will make use of materials selected for durability, functionality, aesthetics and their contribution to a smaller environmental footprint.
- Regional materials, with high recycled content, will be selected wherever possible.
- The use of wood will be emphasized in interior finishes to contribute to a warmer, more productive learning environment.
- Expand the Reduce/Recycle/Reuse program currently implemented throughout the school.

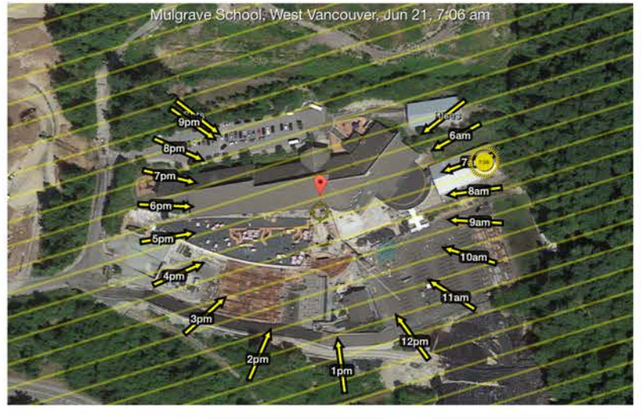
Indoor Environmental Quality

- Passive ventilation strategy utilizes the natural flow of air and stack effect to minimize the impact of the mechanical system.
- Specify only base building and interior finishes that conform to low VOC limits to ensure quality indoor air.
- Control sources of indoor chemical pollution, both from within the building as sources of maintenance and cleaning requirements, but also ingress from outdoor sources.
- Maximize daylighting throughout the floor plate while complying with thermal comfort standards to provide as optimal an academic environment as possible.

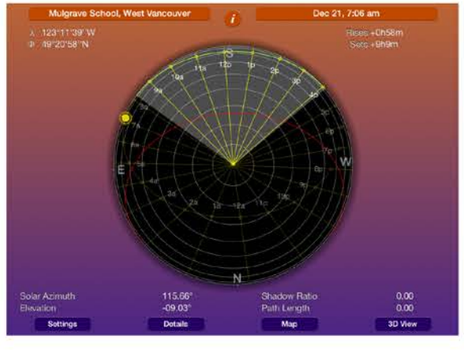
Integrated Design Opportunities		Description
ID.1	Passive design to improve building performance	Using design decisions that affect form and function to help thermal performance, weather protection, indoor air quality, and utility use. • Limit glazing to 40% of exterior area. • Utilize sun shading or high performance glazing for south facing windows. • Use the structure as a thermal mass.
ID.2	Passive ventilation	Using the natural flow of air to create cycle in fresh air without the use of mechanical equipment. • External shading and large operable windows will be reviewed.
ID.3	Materials selection	When choosing the materials, consideration will be given to: • local sources. • recycled and renewable content. • life cycle performance and ability to recycle. • durability. • low VOC emissions.
ID.4	Native vegetation	The use of hardy local plants that don't require phosphorous. Also a teaching opportunity: natural habitats vs. invasive species, bioregions, microclimates.
ID.5	Manual and automatically operable windows	Provide classrooms with manually operable windows.
ID.6	High efficiency boiler	The cost of high efficiency gas fired boilers has been dropping, making this option affordable and sensible.
ID.7	Light dimming and switching	Intensity of lighting controlled with consideration on the amount of natural light in the space. Occupancy sensors used for turning lights on and off.
ID.8	Free cooling from HVAC economizers	Integrating the Heating and Ventilating system so it can pump 100% unconditioned outdoor air into the interior space when outdoor temperature is less than the indoor temperature.
ID.9	Stormwater retention and reuse for irrigation	Utilize the existing retention system in order to maintain the current level of net zero contribution to the municipal storm system.
ID.10	Daylighting into spaces	Bring natural light into spaces that are not located on an exterior wall by means of interior glazed wall and/or potentially light tubes.
ID.11	Heat recovery from air exhausts	Classrooms, electrical room, mechanical room, and elevator machine room exhausts may be equipped with an energy recovery coil to recapture lost heat.
ID.12	Air source heat pumps	Utilize hybrid air source heat pumps in HVAC systems. (Considered to be a better alternate to ground source heat pumps for this project.)
ID.13	Potential Living Green Wall	Use growing medium to act as a partition, air purifier and sculpture in the interior west atrium.

Location and Context Plan

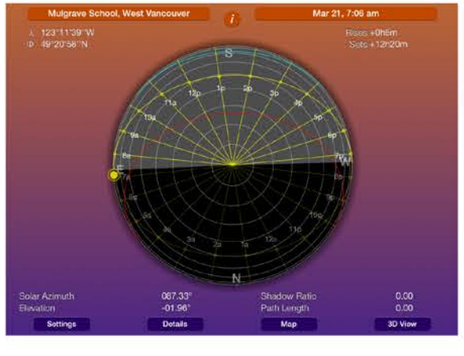
Sun Path Diagrams



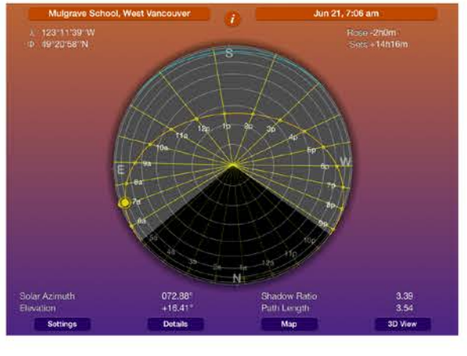
DECEMBER



MARCH



JUNE



Project Data and Statistics

Permitted Uses			
Accessory buildings, structures and uses		(Upper Gym)	
Child Care		(Early Learning Centre)	
Combined School		(Grades K-12)	
Site Zoning	PA-1 & R8		
Site Area			
Plan EPP30215	55,162.40m2		
Total Site Area	55,192.40m2	5.52 ha	13.64 acres

Setbacks	REQUIRED	PROVIDED
South (front)	9.1m	44.0m
East (side)	by geological setback*	56.0m
West (side)	3.0 m	16.0m
North (rear)	9.1m	9.1m

Floor Area		**Existing**	**Proposed**
Existing			
Main Building			
	Lower Main	2,908.0	2,908.0
	Upper Main	4,919.4	4,919.4
	Level 2	3,633.5	3,633.5
	Level 3	2,981.8	2,981.8
Total Main Building		14,442.7	14,442.7
Upper Gym Building		487.8	0.0
Lower Gym Building		811.4	0.0
ELC Building*		492.4	0.0
Field House (*conversion)		0.0	492.4
Existing Campus Total		**16,234.4**	**14,935.1**
Proposed			
West Addition			
	Lower Main		816.0
	Upper Main		785.0
	Level 2		791.0
	Level 3		71.0
Total West Addition			**2,463.0**
East Addition			
	Lower Main		1,029.0
	Upper Main		2,150.0
	Level 2		1,970.0
Total East Addition			**5,149.0**
Proposed Campus Total			**22,547.1**

Site Coverage	**Existing**	**Proposed**
Existing School	10395.64	10395.64
Upper Gym	796	0
Future Field House	204	204
Lower Gym(to be demolished)	811.42	0
West Addition		816
East Addition		3027
Total Area	**12207**	**14,442.64**
Coverage Permitted	**40%**	**40%**
Coverage Proposed	**22%**	**26.17%**

Building Height	**Existing**	**Proposed**
	24.8m**	**24.8m**
Number of Storeys	4	4
Floor and Ceiling Levels		
Top of Roof	241.20m	
Level 3 Ceiling	232.60m	
Level 3	229.60m	
Level 2 Ceiling	228.30m	
Level 2	225.30m	
New Upper Gym Ceiling		236.91m
Upper Main Level Ceiling	224.00m	
Upper Main Level	221.00m	
Lower Main Level Ceiling	219.60m	
Lower Main Level	216.40m	
Covered Parking Level	212.60m	
Finished Site Grades		
Corner A	221.00	
Corner B	231.06	
Corner C	221.10	
Corner D	216.36	

Wall to Window Ratio	**Window Area**	**Total Wall Area**	**Percent**
West Additon			
Lower Main	71.8m2	466.82m2	15%
Upper Main	175.7m2	450.53m2	38%
Level 2	145.4m2	488.22m2	29%
Level 3	84.3m2	152.87m2	55%
Total	**477m2**	**1558m2**	**30%**
East Addition			
Lower Main	5.0m2	842.9m2	0.6%
Upper Main	49.3m2	853.6m2	5.8%
Level 2	200.2m2	2647.0m2	7.6%
Total	**254.5m2**	**4343.5m2**	**5.9%**

Off-Street Parking

***Number of parking stalls required 99

Distribution of Parking Stalls	Total	Regular	Small	Accessible
North Parking Lot	29	28		1
South Parking Lot	42	41		1
Covered Parking Area	156	103	52	1
Total Provided	**227**	**172**	**52**	**3**
School Bus Loading Spaces required		3		
Provided		3		

Mulgrave School Campus Statistics - May 2015	**Current**	**Projected Increase**	**Total**
Number of ELC Students	75	5	80
Number of Junior School Students	421	0	421
Number of Middle School Students	189	0	189
Number of Senior School Students	225	0	225
Total Number of Students	**910**	**5**	**915**
Number of Teaching Staff	105	0	105
Number of Admin. Staff	38	0	38
Total Number of Staff	**143**	**0**	**143**
Number of Part Time Support Staff	10	0	10
Number of Part Time Volunteers	25	0	25
Total Support/Volunteers	**35**	**0**	**35**
Total School Population	**1088**	**5**	**1093**
Number of Staff Parking	120	0	120
Number of Student Parking	20-45	0	20-45
Visitor Parking	32		
ELC Parking	20		

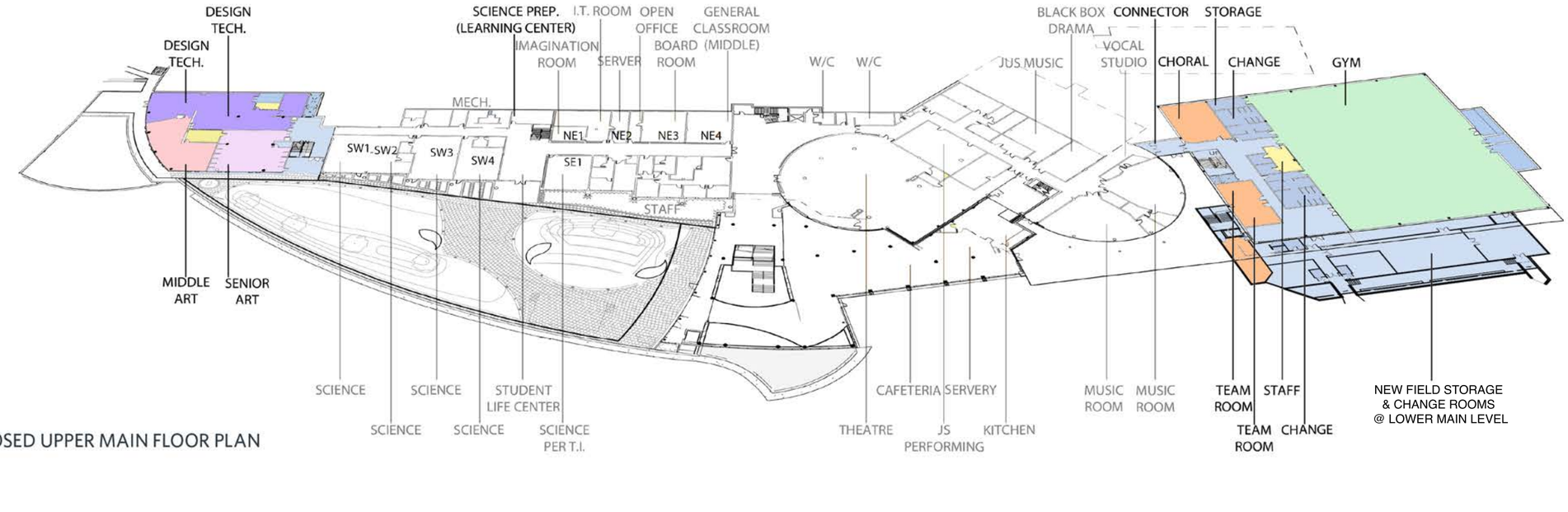
Daily Deliveries:	2 long base 10 ton trucks (Coca Cola, Sysco) 4 short base 4 ton delivery trucks 8 delivery vans/cars
Three times per week:	Garbage pick-up
Once per week:	Organic recycling pick-up
Bi-weekly:	Paper/Cardboard recycling pick-up
Special Events:	Misc. delivery vans/cars (December, May, June)

Note: Deliveries include food, drinks, books, papers, furniture, cleaning products, school supplies, and rentals, Deliveries are restricted between 7:30 - 9:00 am and 2:00 pm - 4:00 pm.
Majority of small deliveries occur between 9:00 am - 2:00 pm.
The larger deliver trucksusually arrive between 12:00 am -2:00 pm.
Garbage/recycling pick-up generally occurs between 10:00 am - 2:00 pm.

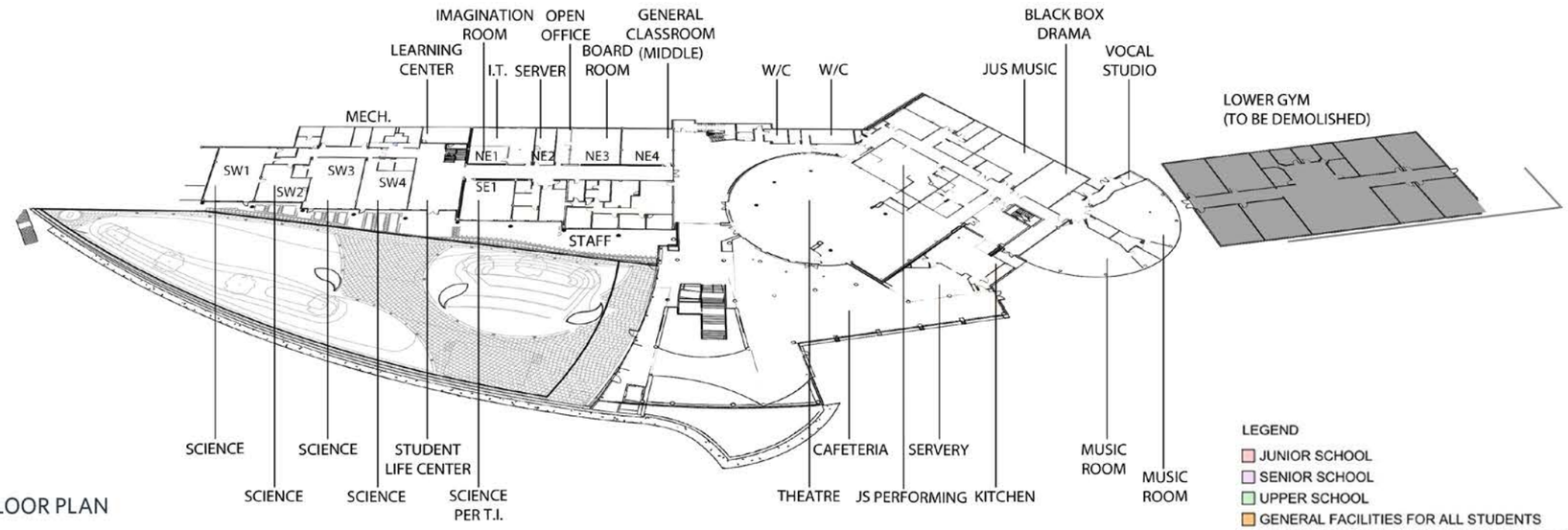
Start/end times junior school	8:15am / 3:15 pm
Start/end times middle school	8:30am / 3:30 pm
Start/end times senior school	8:30am / 3:30 pm

NOTES
*The geological setback varies yet exceeded the minimum side yard setback per 560.07 (1) and (2)
**The existing building was approved with 4 storeys
***Requirement per section 560.1 (3) is 1.25 spaces / classroom + 1 per 10 students in grades 11 and 12.
The total requirement is based on 150 students and 59 permanent classrooms

Mulgrave School Classroom Rearrangement By Floor

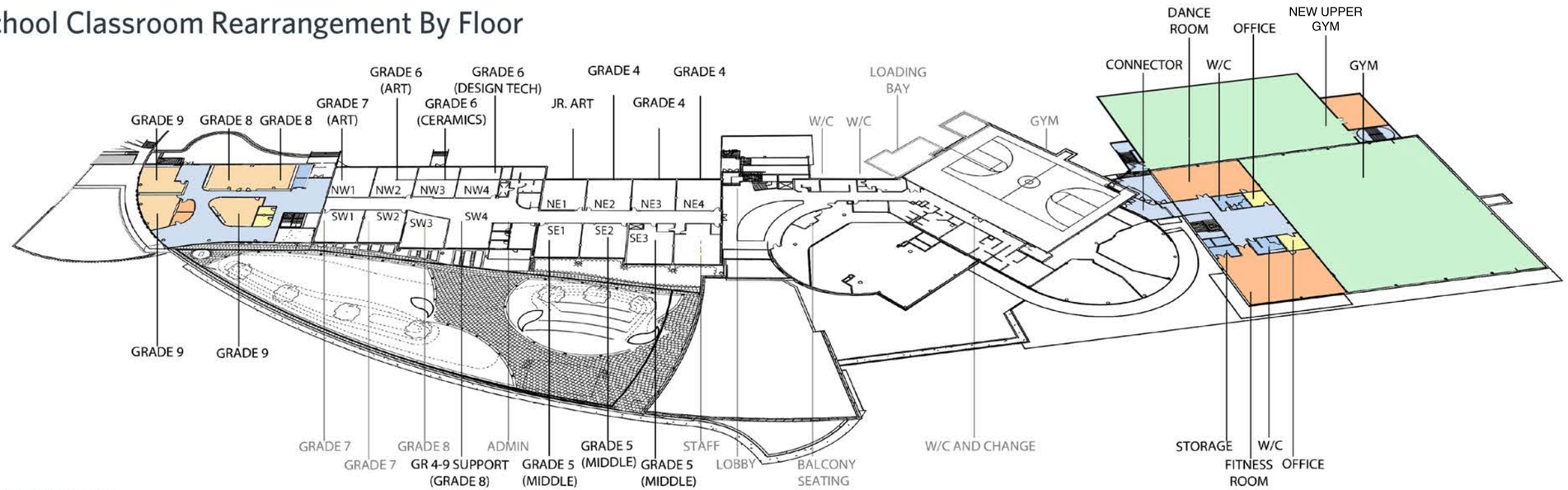


PROPOSED UPPER MAIN FLOOR PLAN

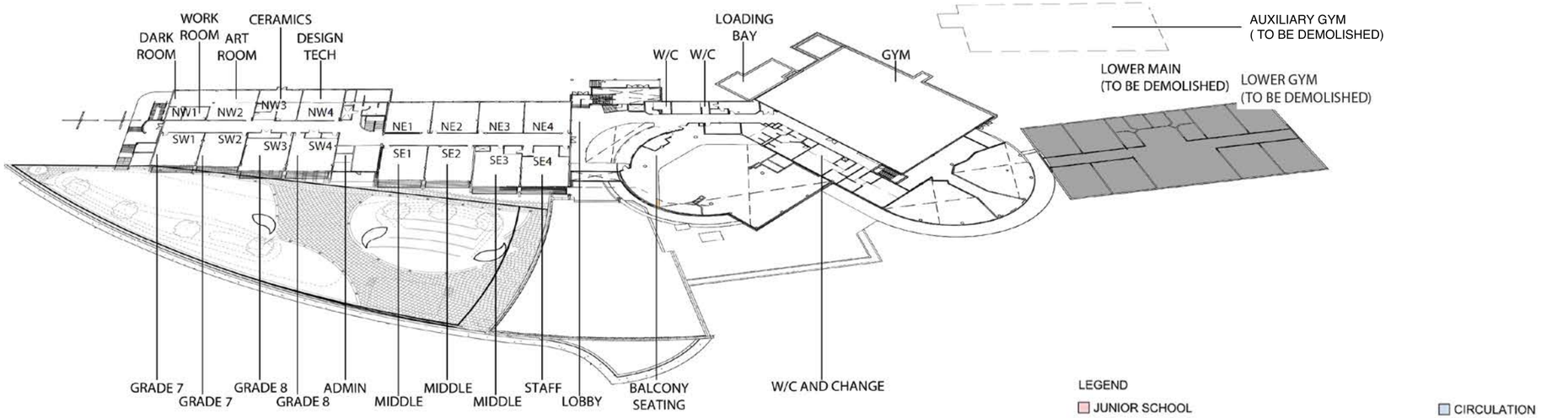


EXISTING UPPER MAIN FLOOR PLAN

Mulgrave School Classroom Rearrangement By Floor

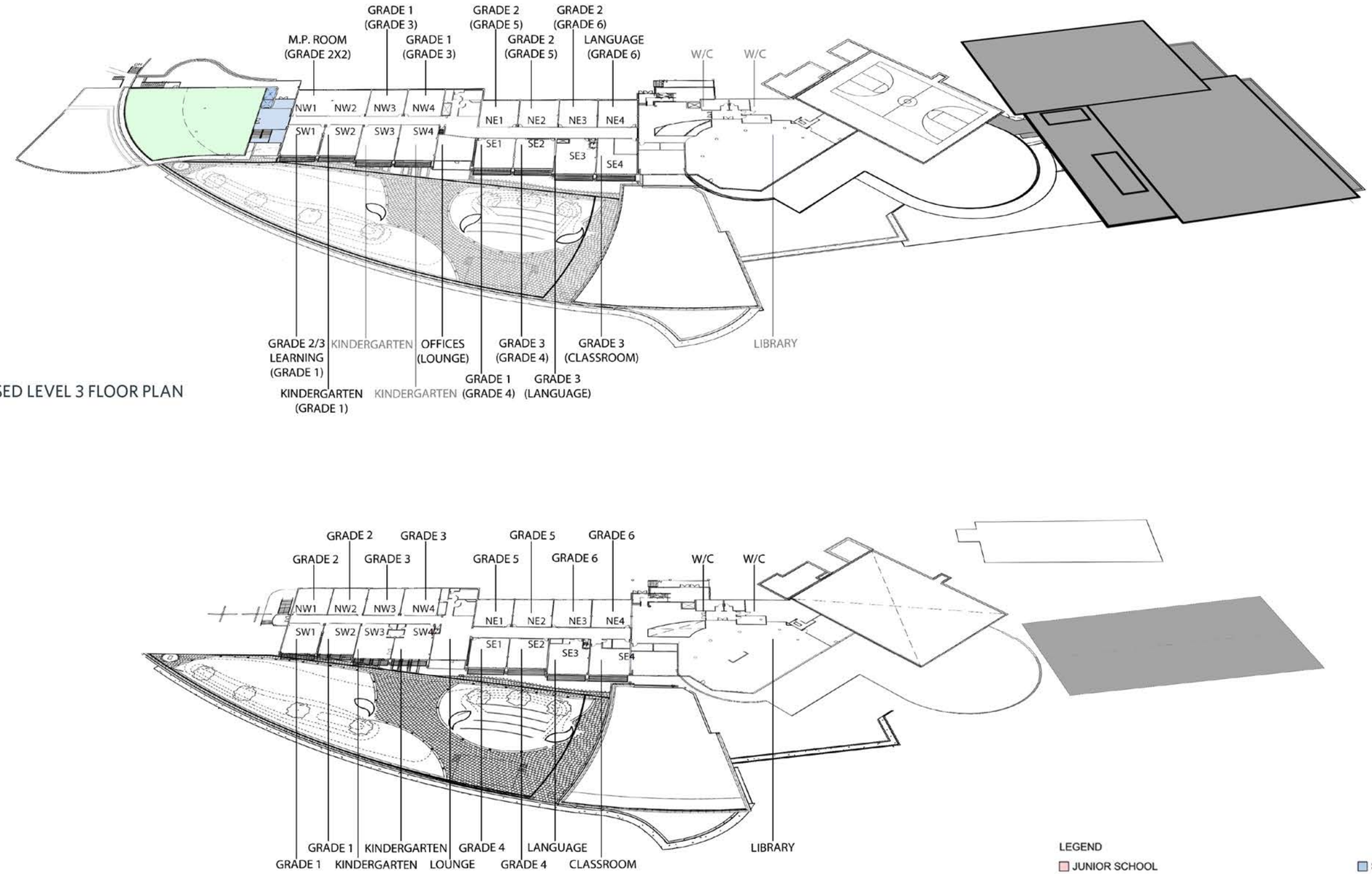


PROPOSED LEVEL 2 FLOOR PLAN



EXISTING LEVEL 2 FLOOR PLAN

Mulgrave School Classroom Rearrangement By Floor



PROPOSED LEVEL 3 FLOOR PLAN

EXISTING LEVEL 3 FLOOR PLAN

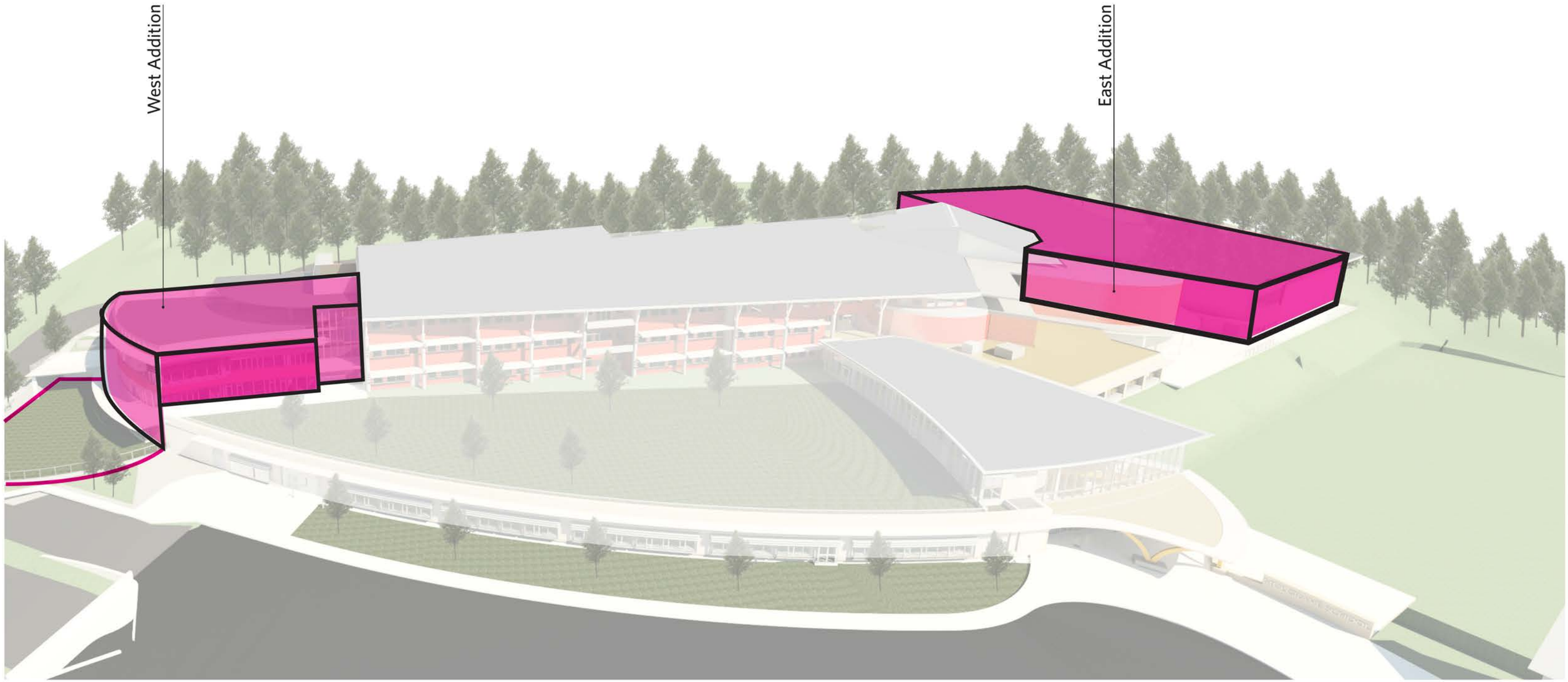
LEGEND

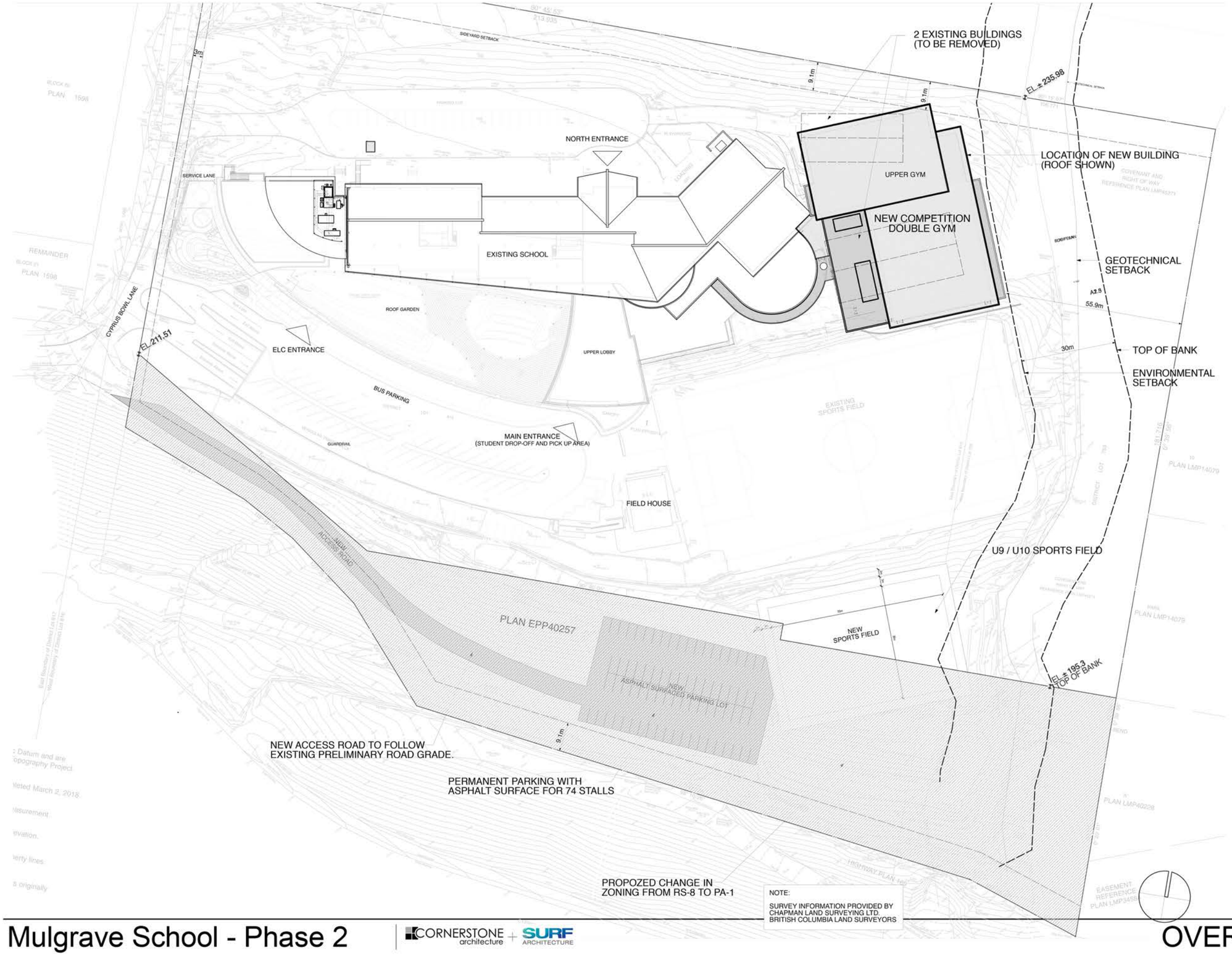
- JUNIOR SCHOOL
- GENERAL FACILITIES FOR ALL STUDENTS
- ENHANCED SUPPORT FOR TEACHERS AND STAFF
- CIRCULATION
- SERVICE SPACES
- OUTDOOR
- OUTDOOR CIRC

3.0 Drawings

Existing

Proposed

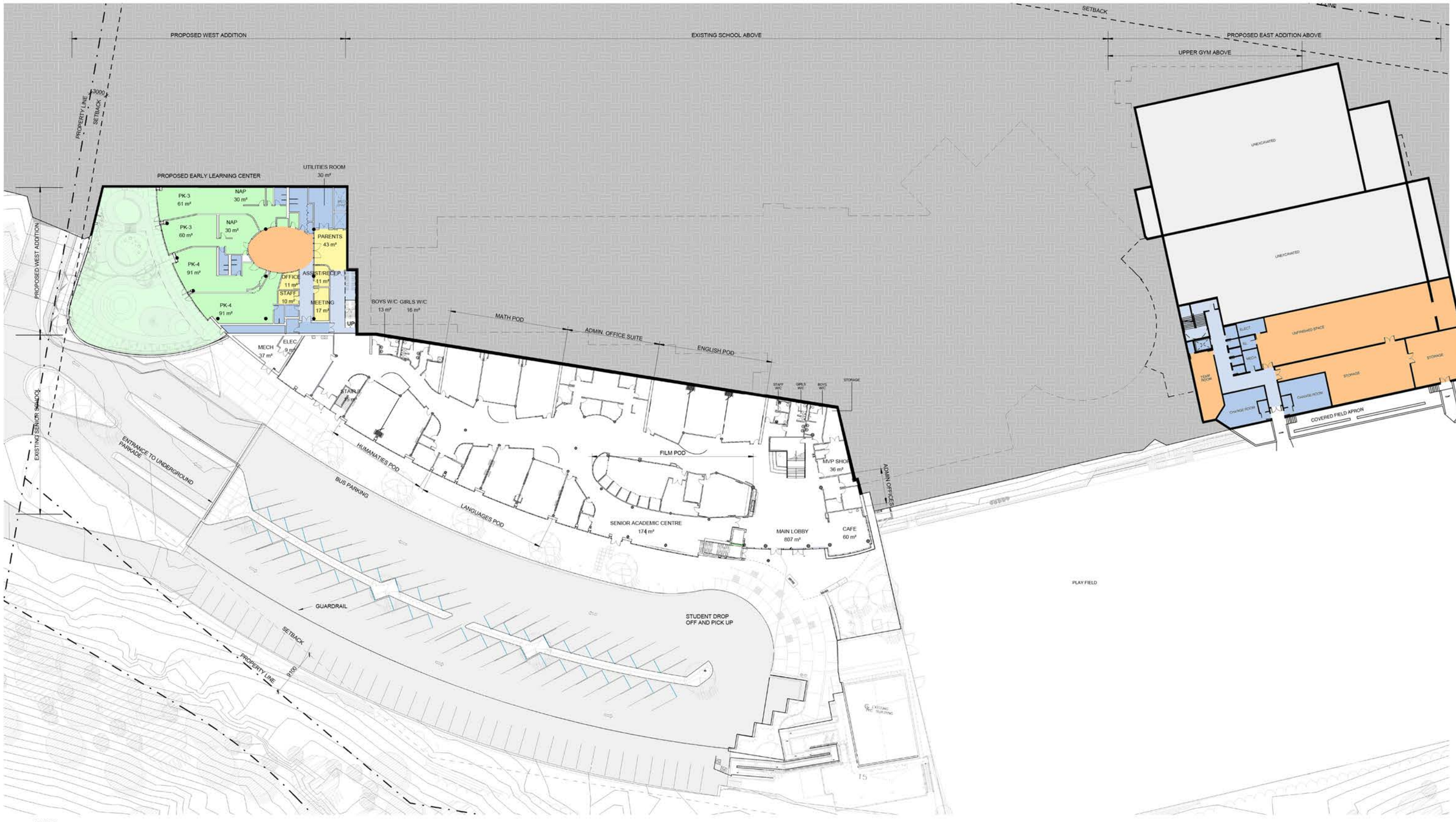




Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

OVERALL-SITE

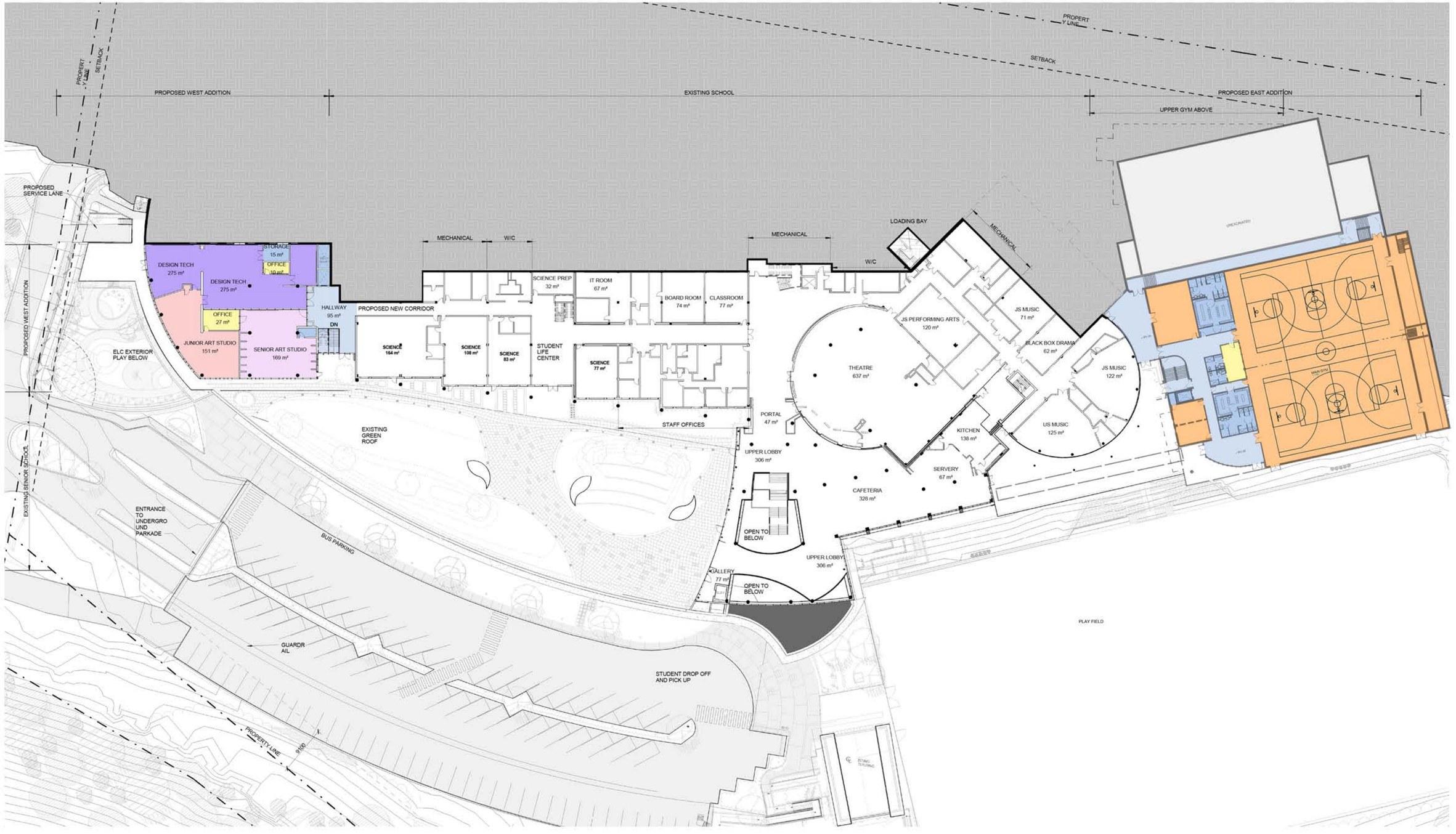


LEGEND

- ELC/ CHILDCARE
- GENERAL FACILITIES FOR ALL STUDENTS
- ENHANCED SUPPORT FOR TEACHERS AND STAFF
- CIRCULATION
- SERVICE SPACES
- OUTDOOR

Mulgrave School - Phase 2 | CORNERSTONE architecture + SURF ARCHITECTURE

OVERALL-LOWER LEVEL PLAN



LEGEND

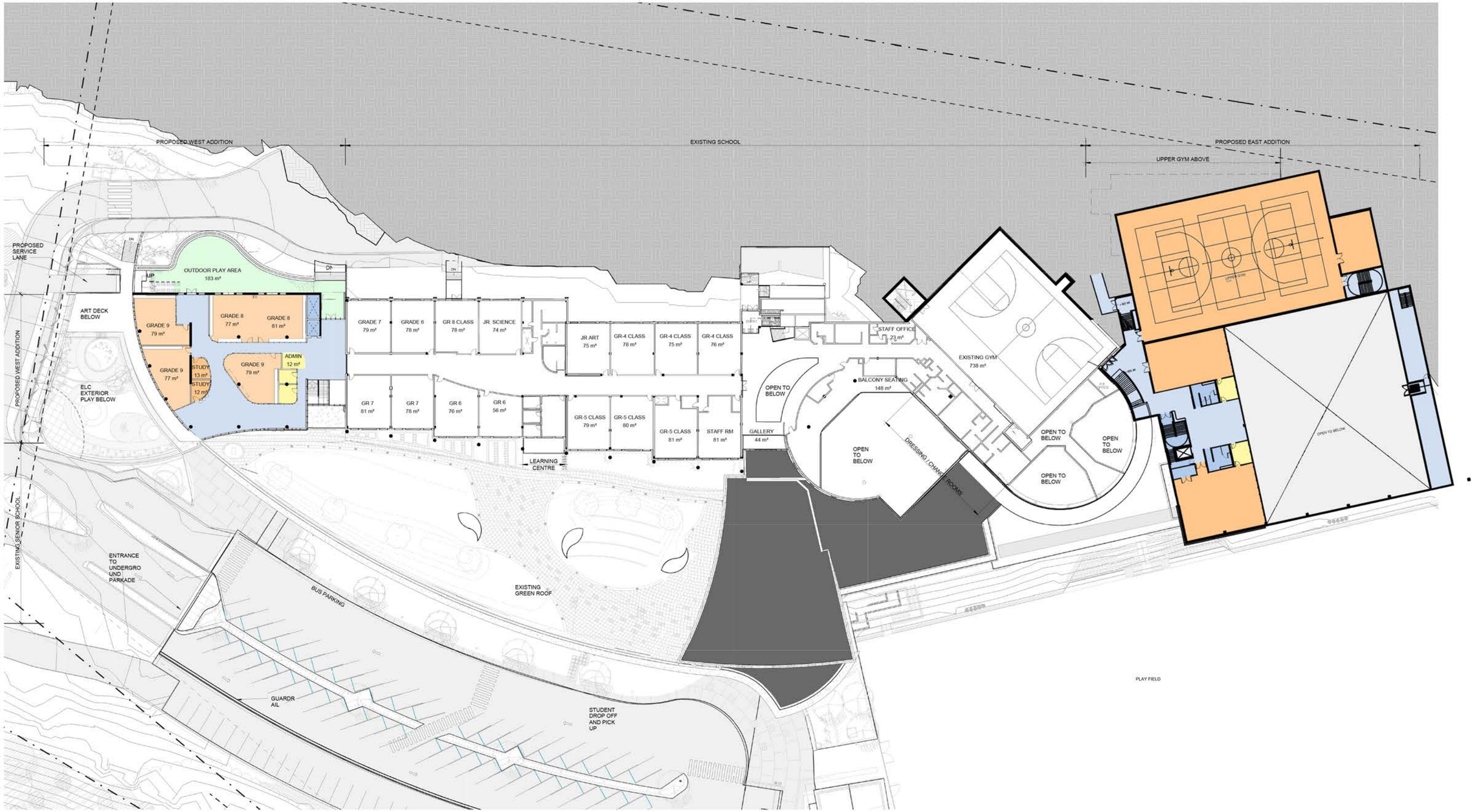
- JUNIOR SCHOOL
- SENIOR SCHOOL
- GENERAL FACILITIES FOR ALL STUDENTS
- ENHANCED SUPPORT FOR TEACHERS AND STAFF
- COMMUNITY ROOMS AND MVP SHOP
- CIRCULATION
- SERVICE SPACES

Scale 1: 300

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

OVERALL - UPPER LEVEL PLAN



LEGEND

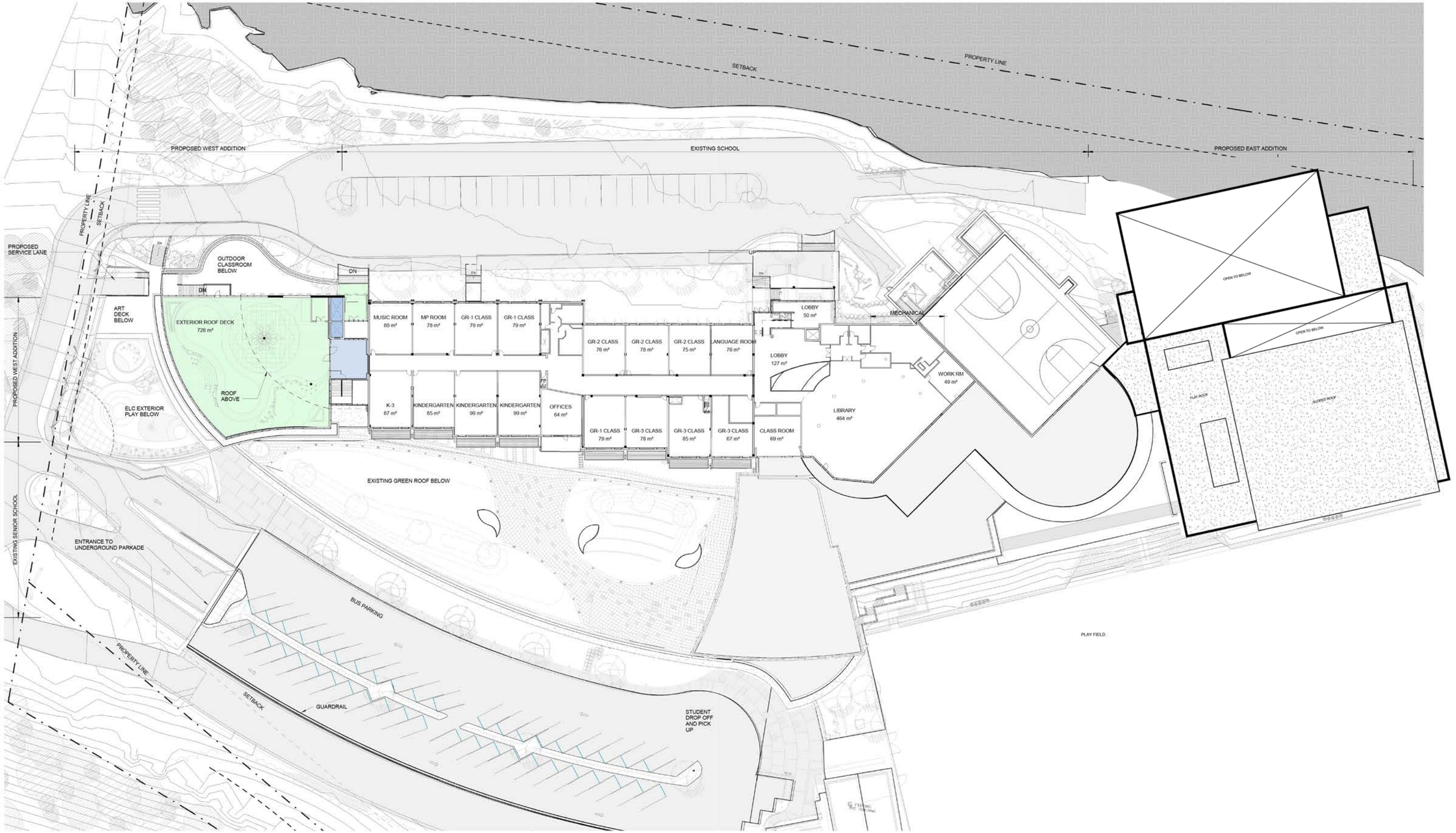
- MIDDLE SCHOOL
- GENERAL FACILITIES FOR ALL STUDENTS
- ENHANCED SUPPORT FOR TEACHERS AND STAFF
- CIRCULATION
- SERVICE SPACES
- OUTDOOR
- OUTDOOR CIRC

0 3 6 15
Scale 1: 300

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

OVERALL - LEVEL 2 PLAN



LEGEND
- CIRCULATION
- SERVICE SPACES
- OUTDOOR
- OUTDOOR CIRC

0 3 6 15
Scale 1: 300

Mulgrave School - Phase 2

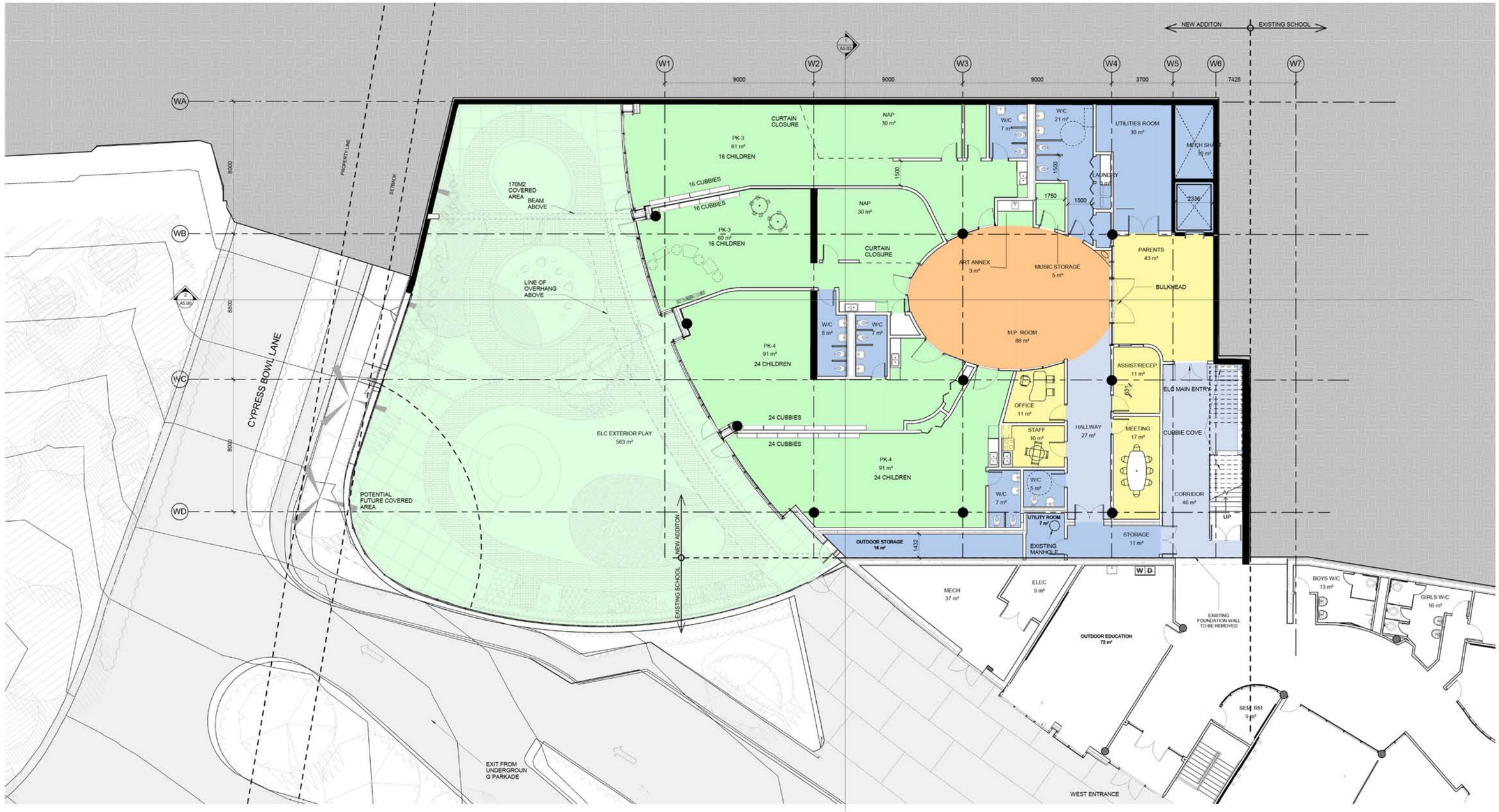
CORNERSTONE architecture + SURF ARCHITECTURE

OVERALL - LEVEL 3 PLAN

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

OVERALL - LEVEL ROOF PLAN



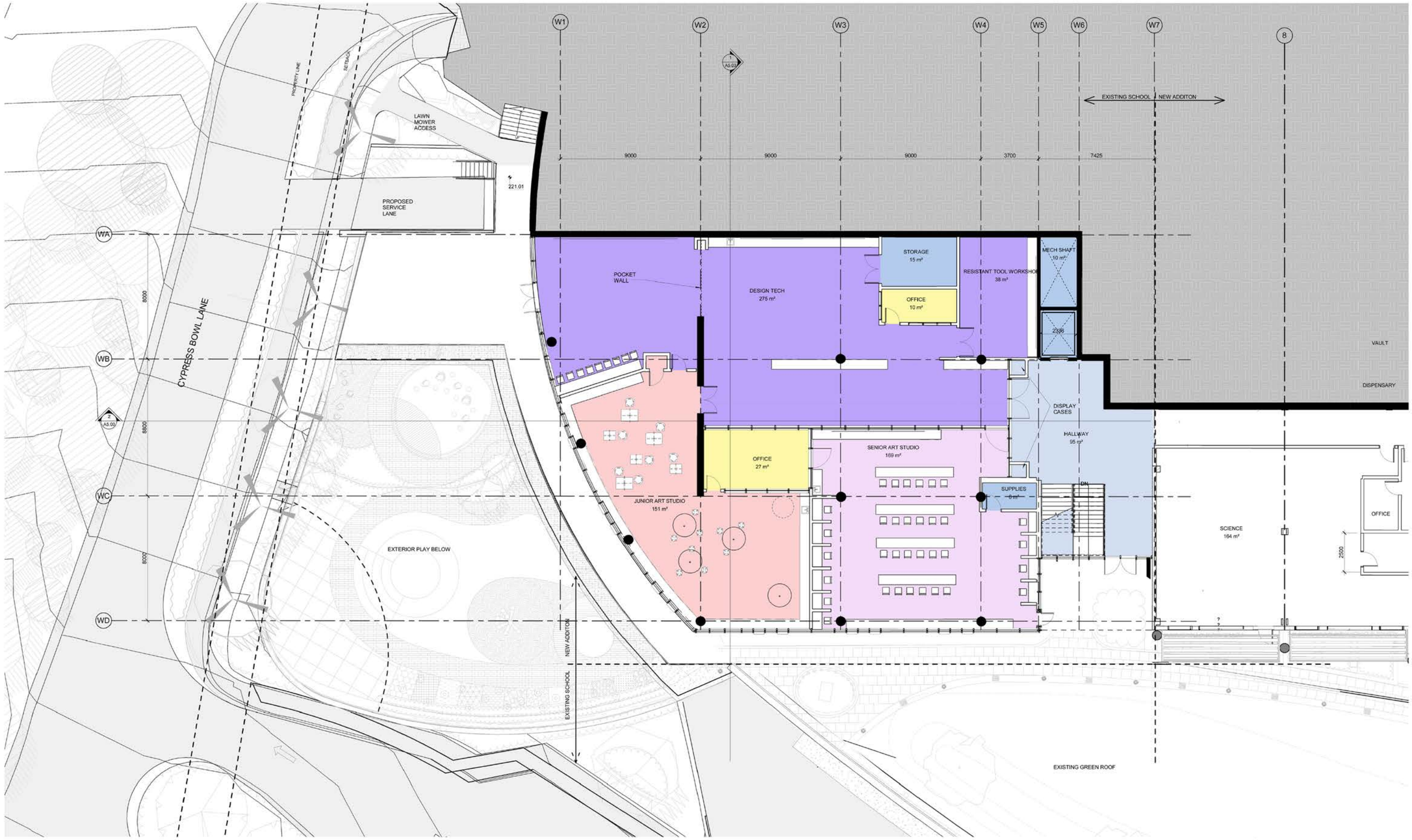
1 LOWER MAIN PLAN
A2.05 SCALE: 1 : 100

Scale 1: 200

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

WEST ADDITION - LOWER MAIN FLOOR PLAN



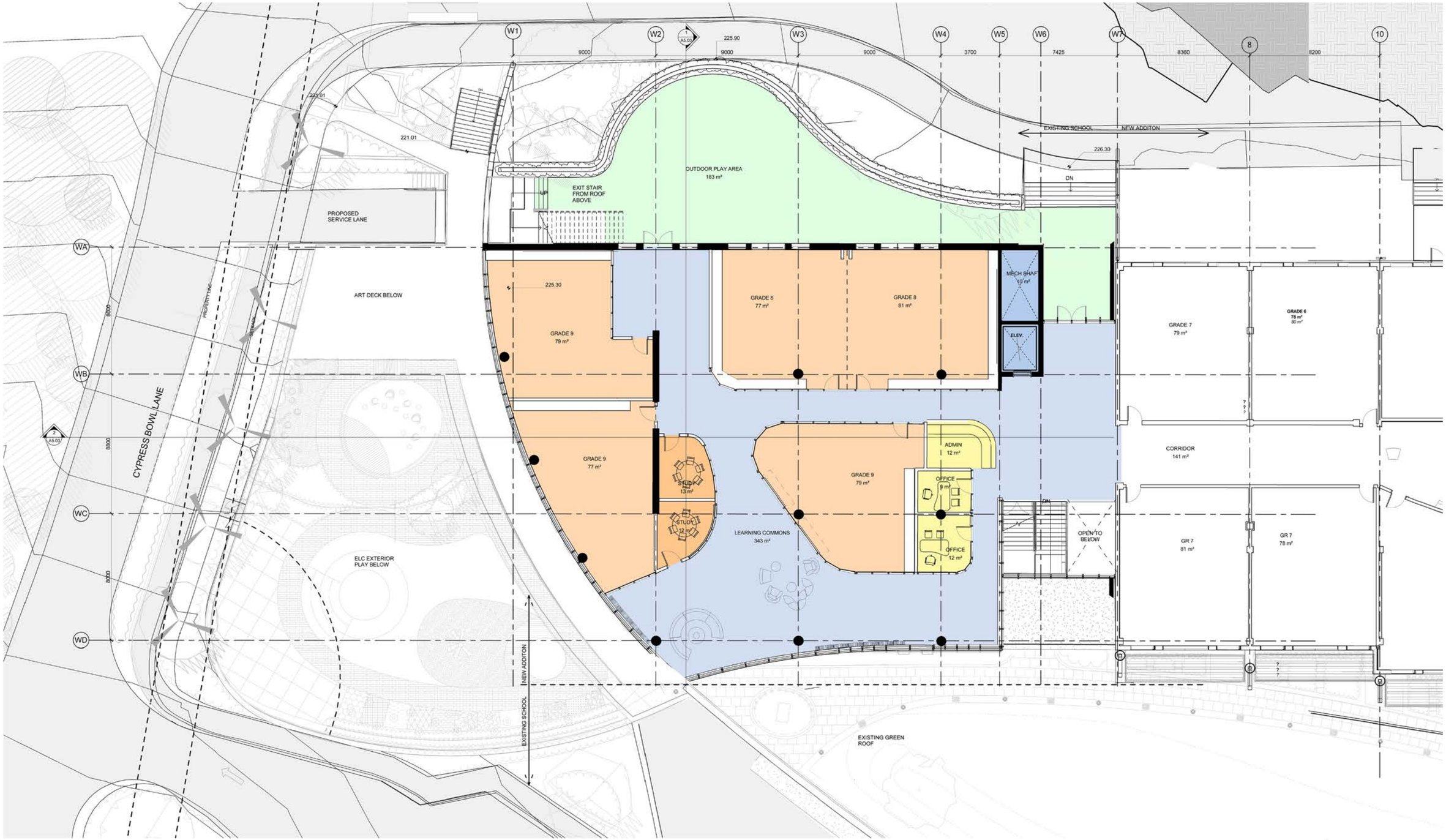
1 UPPER MAIN PLAN
A2.06 SCALE: 1:100

Scale 1: 200

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

WEST ADDITION - UPPER MAIN FLOOR PLAN



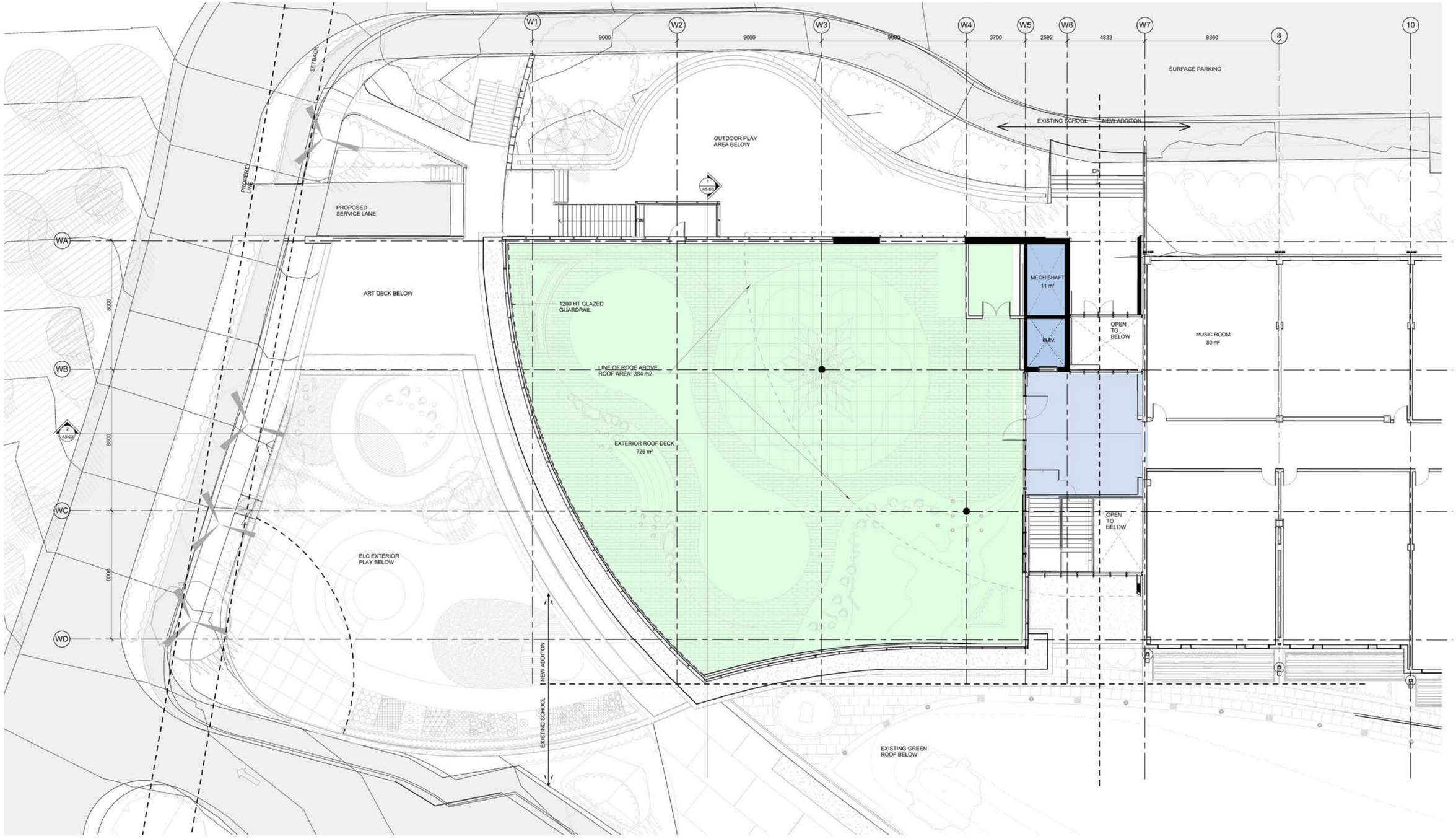
1 Level 2-West Addition-DD
A2.07 SCALE: 1 : 100

0 2 4 10
Scale 1: 200

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

WEST ADDITION - LEVEL 2 FLOOR PLAN



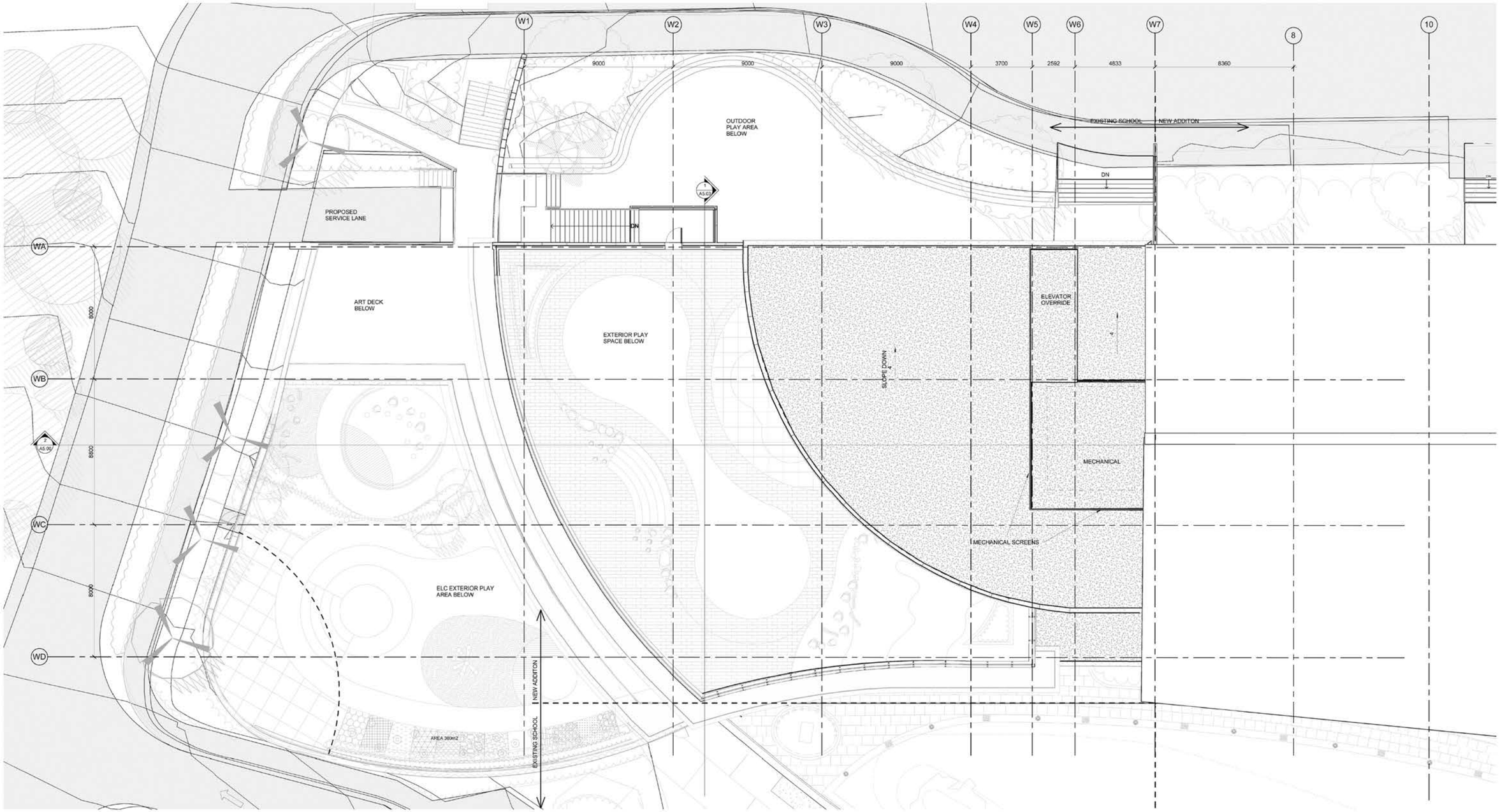
1 A2.08 Level 3-West Addition-DD
SCALE: 1 : 100

Scale 1: 300

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

WEST ADDITION - LEVEL 3 FLOOR PLAN



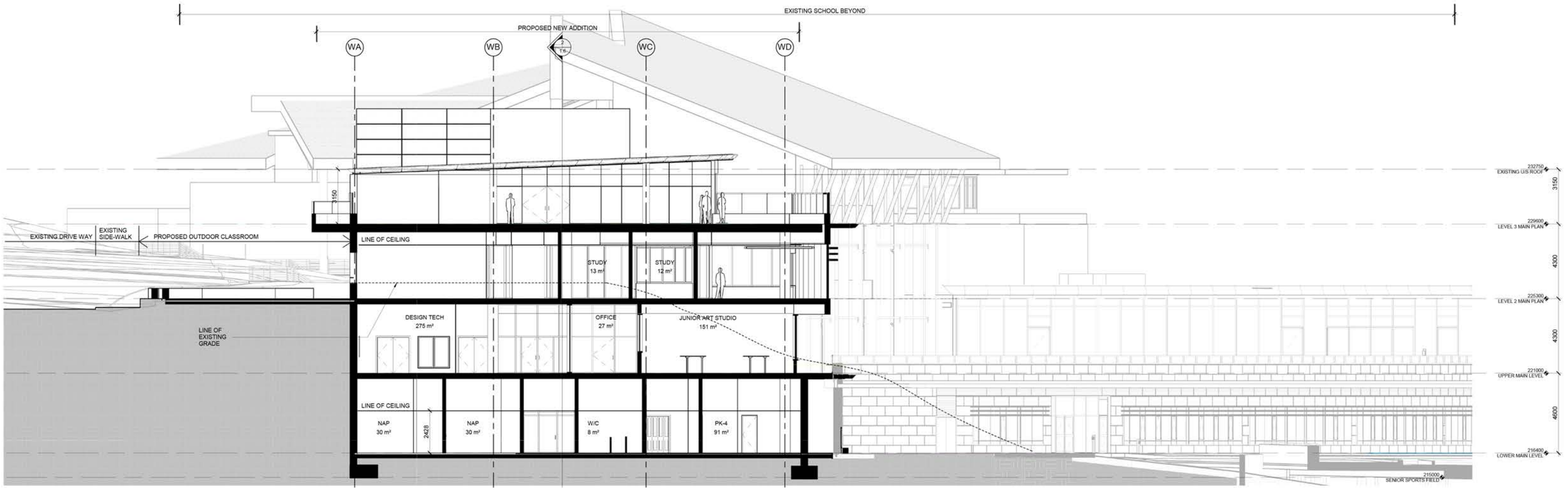
1 A2.09 Roof Level-West Addition-DD
SCALE: 1 : 100

Scale 1: 300

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

WEST ADDITION - ROOF PLAN

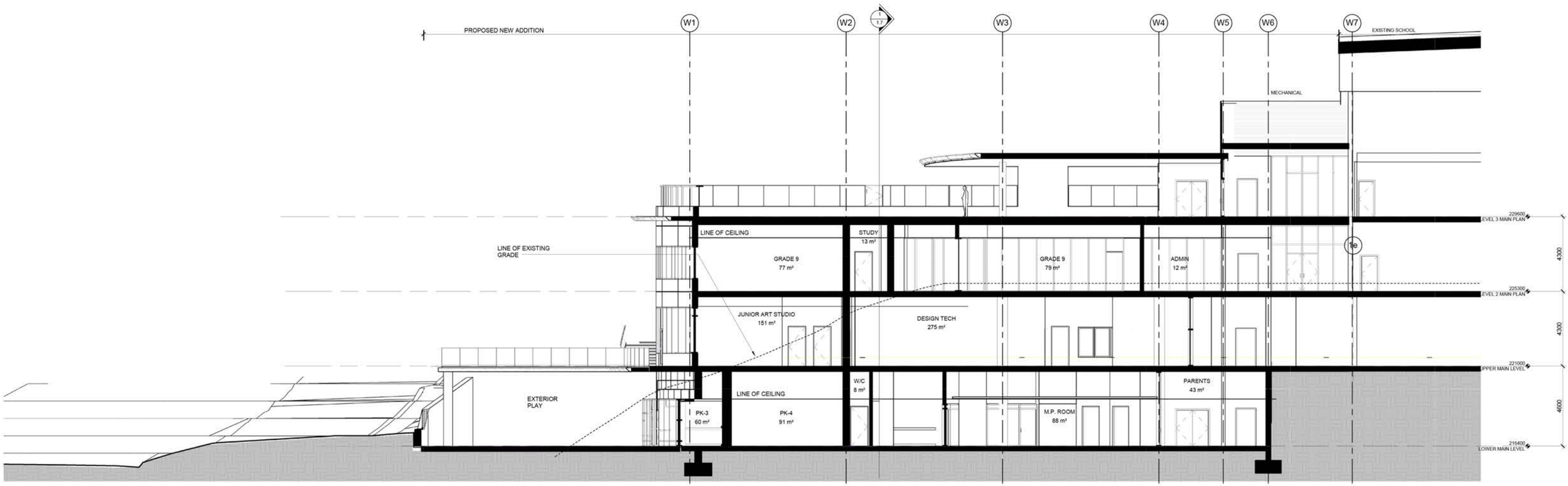


1 | 1.7 WEST SECTION NS
SCALE: 1 : 100
0 2 4 10
Scale 1: 200

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

WEST ADDITION CROSS SECTION



2 WEST SECTION EW
1.6 SCALE: 1 : 100

0 1 2 5
Scale 1: 100

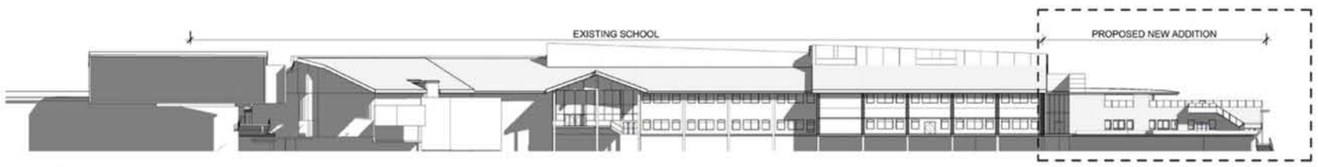
Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

WEST ADDITION LONGITUDINAL SECTION

1 Elevation 1 - a
A4.00 SCALE: 1 : 100

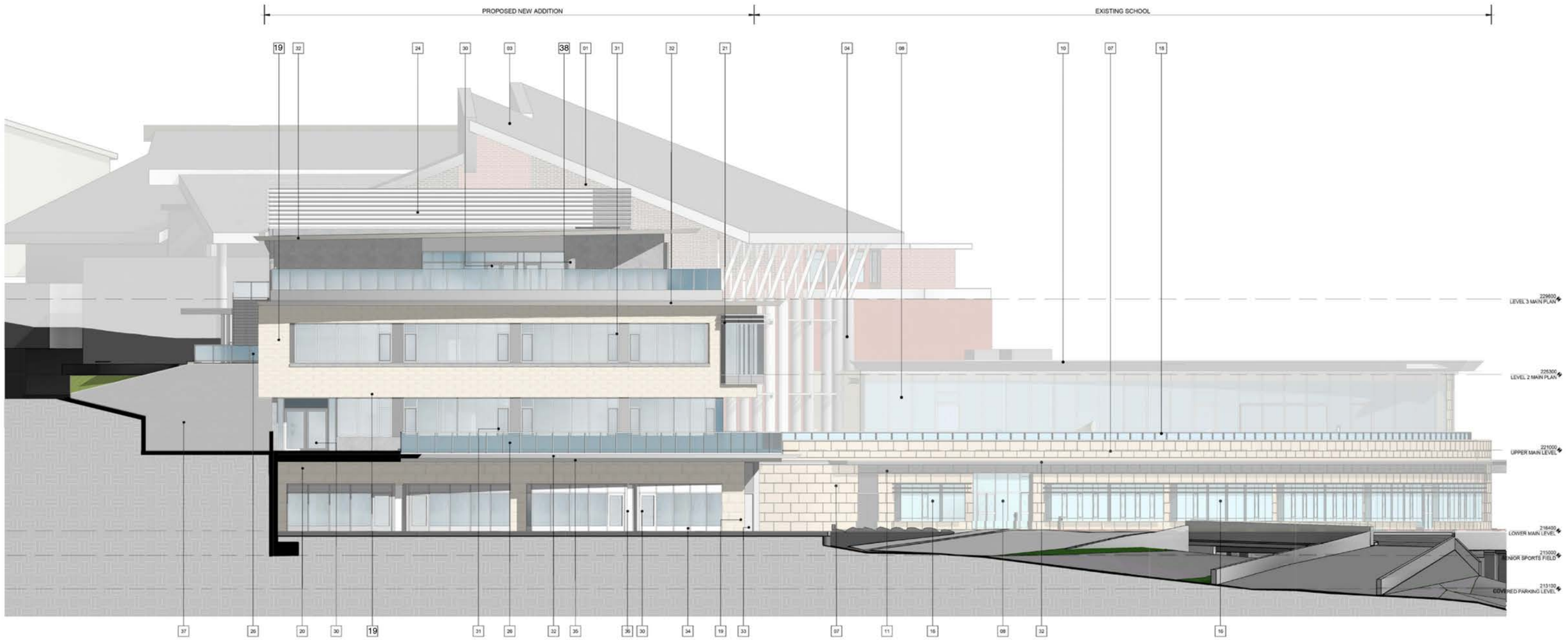
0 1 2 5
Scale 1: 100



2 W NORTH ELEVATION KEYPLAN
A4.00 SCALE: 1 : 500

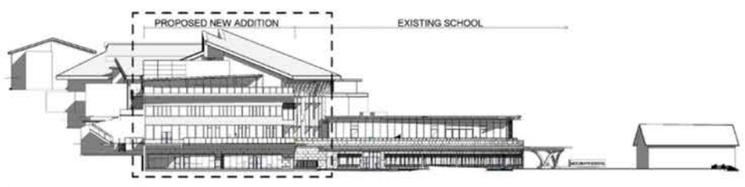
MATERIALS LEGEND

01	EXISTING BRICK	11	EXISTING METAL LOUVRE	21	SUNSHADE	31	CAPTURED CURTAIN WALL OPERABLE UNITS
02	EXISTING FIBER CEMENT PANELS	12	EXSISTING PAINTED STEEL FASCIA	22	CURTAIN WALL GLAZING W/ VERTICAL CAPS	32	PAINTED CONCRETE CANOPY
03	EXISTING ROOF	13	PREFINISHED ALUMINUM FASCIA	23	4 SIDED CAPTURED CURTAIN WALL GLAZING	33	PAINTED METAL DOOR
04	EXISTING CONCRETE COLUMN	14	EXISTING GLAZED ENTRANCE DOOR	24	LOUVRED MECHANICAL SCREEN	34	GLAZED STOREFRONT BAY W/ COLOURED ACCENT PANELS
05	EXISTING CONCRETE MASONRY UNITS	15	EXPOSED ARCHITECTURAL CONCRETE	25	2 PLY SBS MEMBRANE ROOFING - COLOUR LIGHT GREY	35	CONCRETE BEAM
06	EXISTING ALUMINUM FRAMED WINDOWS	16	EXISTING BOX WINDOW C/W HORIZONTAL SUNSHADES	26	GLAZED GUARDRAIL IN ALUMINUM FRAME	36	ALUMINUM PANELS
07	EXISITING STONE CLADDING	17	EXISTING METAL PANEL	27	METAL ACCENT PANELS	37	CONCRETE RETAINING WALL
08	EXISTING CURTAINWALL GLAZING	18	EXISTING GLAZED GUARDRAIL	28	METAL CLADDING	38	EXPOSED CONCRETE COLUMN
09	EXISTING HORIZONTAL SUNSHADE	19	STONE CLADDING	29	PUNCHED ALUMINUM FRAME WINDOWS	39	INSULATED SANDWICH PANEL SANDCOLOR FINISH
10	EXISTING PREFINISHED ALUMINUM FASCIA	20	BRICK CLADDING	30	GLAZED ENTRANCE DOOR W/ ALUMINUM FRAME	40	INSULATED SANDWICH PANEL SILVER FINISH
						41	GLAZED CANOPY



1 A4.01 West-West Addition-WK
SCALE 1 : 100

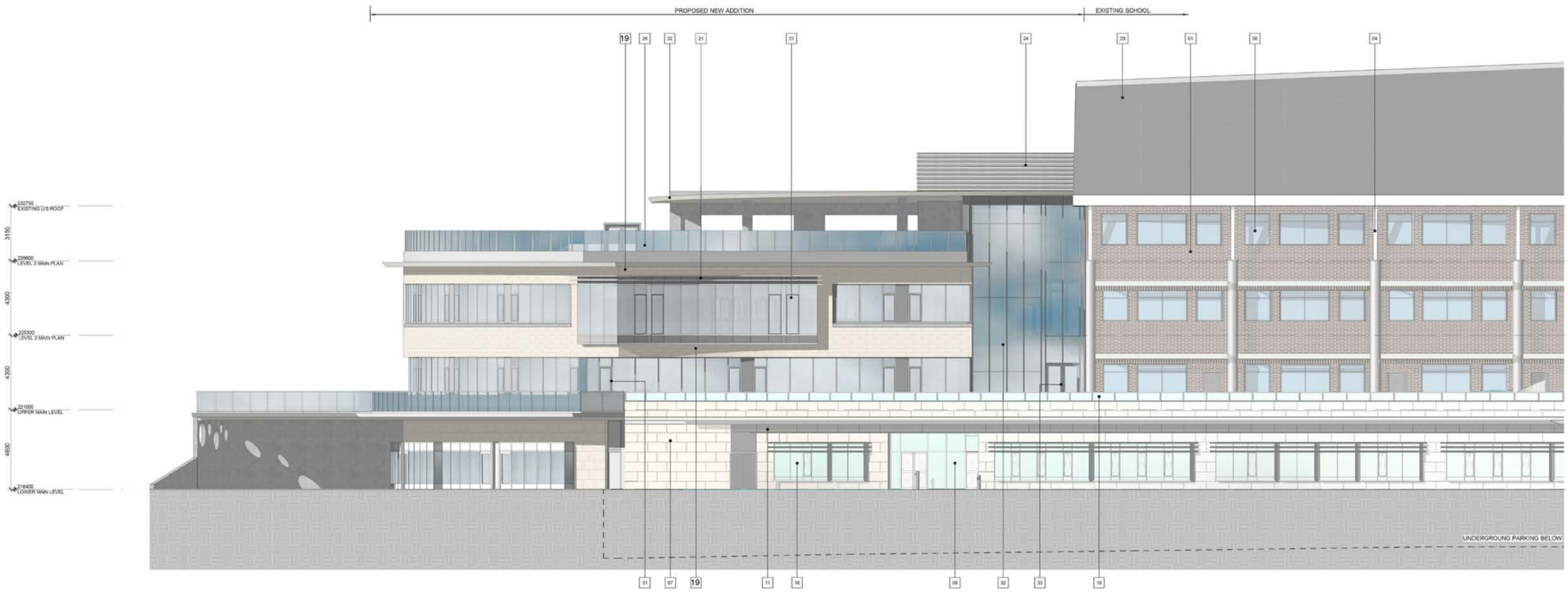
0 1 2 5
Scale 1: 100



2 A4.01 W WEST ELEVATION KEY PLAN
SCALE 1 : 500

MATERIALS LEGEND

01	EXISTING BRICK	11	EXISTING METAL LOUVRE	21	SUNSHADE	31	CAPTURED CURTAIN WALL OPERABLE UNITS
02	EXISTING FIBER CEMENT PANELS	12	EXSISTING PAINTED STEEL FASCIA	22	CURTAIN WALL GLAZING W/ VERTICAL CAPS	32	PAINTED CONCRETE CANOPY
03	EXISTING ROOF	13	PREFINISHED ALUMINUM FASCIA	23	4 SIDED CAPTURED CURTAIN WALL GLAZING	33	PAINTED METAL DOOR
04	EXISTING CONCRETE COLUMN	14	EXISTING GLAZED ENTRANCE DOOR	24	LOUVRED MECHANICAL SCREEN	34	GLAZED STOREFRONT BAY W/ COLOURED ACCENT PANELS
05	EXISTING CONCRETE MASONRY UNITS	15	EXPOSED ARCHITECTURAL CONCRETE	25	2 PLY SBS MEMBRANE ROOFING - COLOUR LIGHT GREY	35	CONCRETE BEAM
06	EXISTING ALUMINUM FRAMED WINDOWS	16	EXISTING BOX WINDOW C/W HORIZONTAL SUNSHADES	26	GLAZED GUARDRAIL IN ALUMINUM FRAME	36	ALUMINUM PANELS
07	EXISITING STONE CLADDING	17	EXISTING METAL PANEL	27	METAL ACCENT PANELS	37	CONCRETE RETAINING WALL
08	EXISTING CURTAINWALL GLAZING	18	EXISTING GLAZED GUARDRAIL	28	METAL CLADDING	38	EXPOSED CONCRETE COLUMN
09	EXISTING HORIZONTAL SUNSHADE	19	STONE CLADDING	29	PUNCHED ALUMINUM FRAME WINDOWS	39	INSULATED SANDWICH PANEL SANDCOLOR FINISH
10	EXISTING PREFINISHED ALUMINUM FASCIA	20	BRICK CLADDING	30	GLAZED ENTRANCE DOOR W/ ALUMINUM FRAME	40	INSULATED SANDWICH PANEL SILVER FINISH



1 South-West Addition-WK
A4.02 SCALE: 1 : 100

0 1 2 5
Scale 1: 100

2 W SOUTH ELEVATION KEYPLAN
A4.02 SCALE: 1 : 500

MATERIALS LEGEND

01	EXISTING BRICK	11	EXISTING METAL LOUVRE	21	SUNSHADE	31	CAPTURED CURTAIN WALL OPERABLE UNITS
02	EXISTING FIBER CEMENT PANELS	12	EXISTING PAINTED STEEL FASCIA	22	CURTAIN WALL GLAZING W/ VERTICAL CAPS	32	PAINTED CONCRETE CANOPY
03	EXISTING ROOF	13	PREFINISHED ALUMINUM FASCIA	23	4 SIDED CAPTURED CURTAIN WALL GLAZING	33	PAINTED METAL DOOR
04	EXISTING CONCRETE COLUMN	14	EXISTING GLAZED ENTRANCE DOOR	24	LOUVRED MECHANICAL SCREEN	34	GLAZED STOREFRONT BAY W/ COLOURED ACCENT PANELS
05	EXISTING CONCRETE MASONRY UNITS	15	EXPOSED ARCHITECTURAL CONCRETE	25	2 PLY SBS MEMBRANE ROOFING - COLOUR LIGHT GREY	35	CONCRETE BEAM
06	EXISTING ALUMINUM FRAMED WINDOWS	16	EXISTING BOX WINDOW C/W HORIZONTAL SUNSHADES	26	GLAZED GUARDRAIL IN ALUMINUM FRAME	36	ALUMINUM PANELS
07	EXISITING STONE CLADDING	17	EXISTING METAL PANEL	27	METAL ACCENT PANELS	37	CONCRETE RETAINING WALL
08	EXISTING CURTAINWALL GLAZING	18	EXISTING GLAZED GUARDRAIL	28	METAL CLADDING	38	EXPOSED CONCRETE COLUMN
09	EXISTING HORIZONTAL SUNSHADE	19	STONE CLADDING	29	PUNCHED ALUMINUM FRAME WINDOWS	39	INSULATED SANDWICH PANEL SAND/COLOR FINISH
10	EXISTING PREFINISHED ALUMINUM FASCIA	20	BRICK CLADDING	30	GLAZED ENTRANCE DOOR W/ ALUMINUM FRAME	40	INSULATED SANDWICH PANEL SILVER FINISH

UNEXCAVATED

ELECT.

EL.

MECH.

UNFINISHED SPACE

STORAGE

STORAGE

TEAM ROOM

+216.4

CHANGE ROOM

CHANGE ROOM

COVERED FIELD APRON

RAMP

RAMP

Toe of Bank

Retaining Wall

0 2.0 4.0 6.0 8.0 10.0 M

ED

EE

EF

EG

EH

EI

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

EAST ADDITION - LOWER MAIN PLAN

CHOIR ROOM 88M2

CHANGE ROOM 75 m²

STAFF ROOM 24M2

CHANGE ROOM 68 m²

TEAM ROOM 47M2

MAIN GYM 1175M2

RETRACTABLE BLEACHERS

GYM STORAGE 67M2

RETRACTABLE BLEACHERS

GYM STORAGE 67M2

+ 221.00

+ 221.00

ACCESS & VIEWING TERRACE

Toe of Bank

0 2.0 4.0 6.0 8.0 10.0 M

GENERAL STORAGE 1079

MUSIC ROOM 1114

MUSIC EQUIPMENT 1106

TUTORIAL 1108

OFFICE 1112

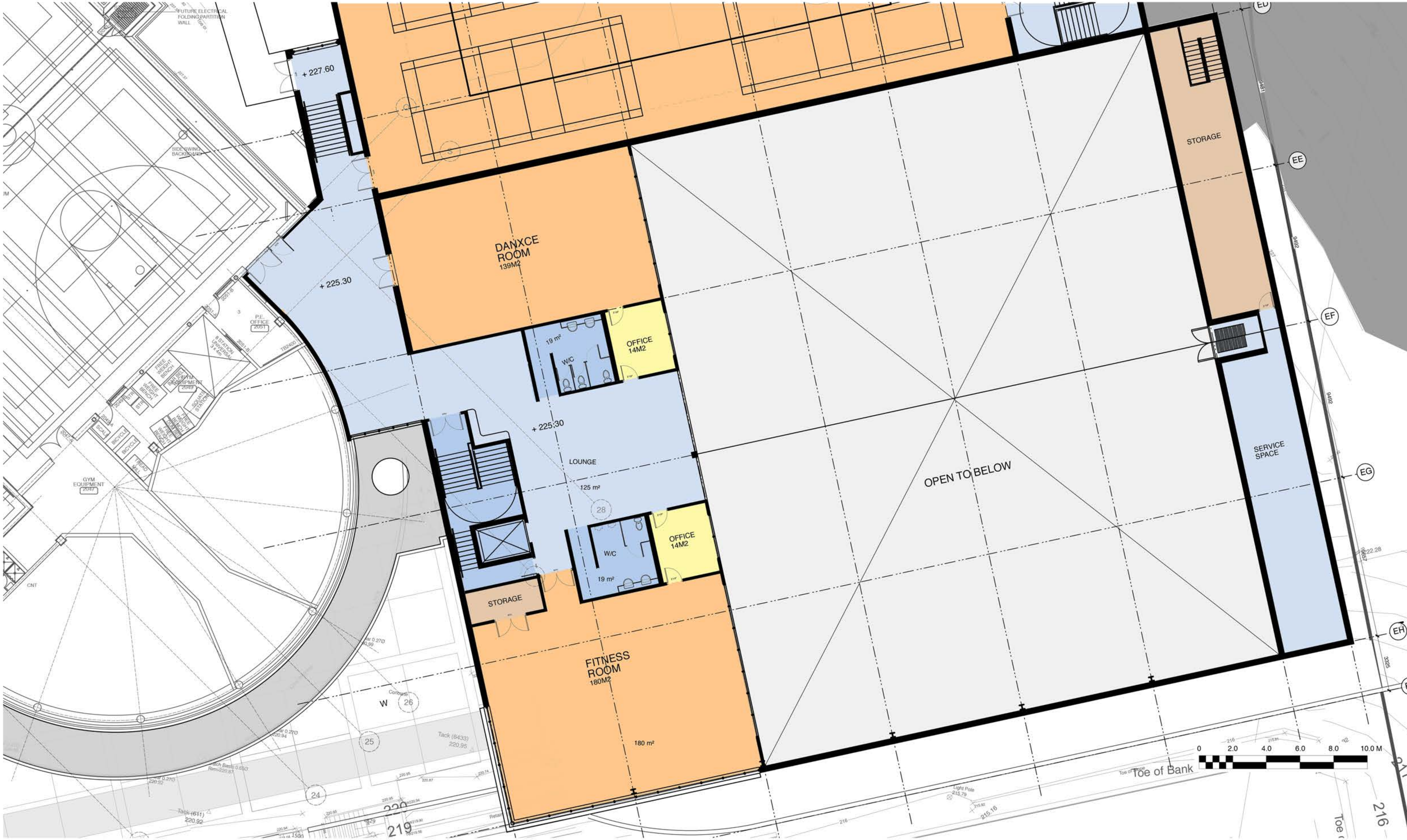
MUSIC ROOM 1109

OFFICE 1110

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

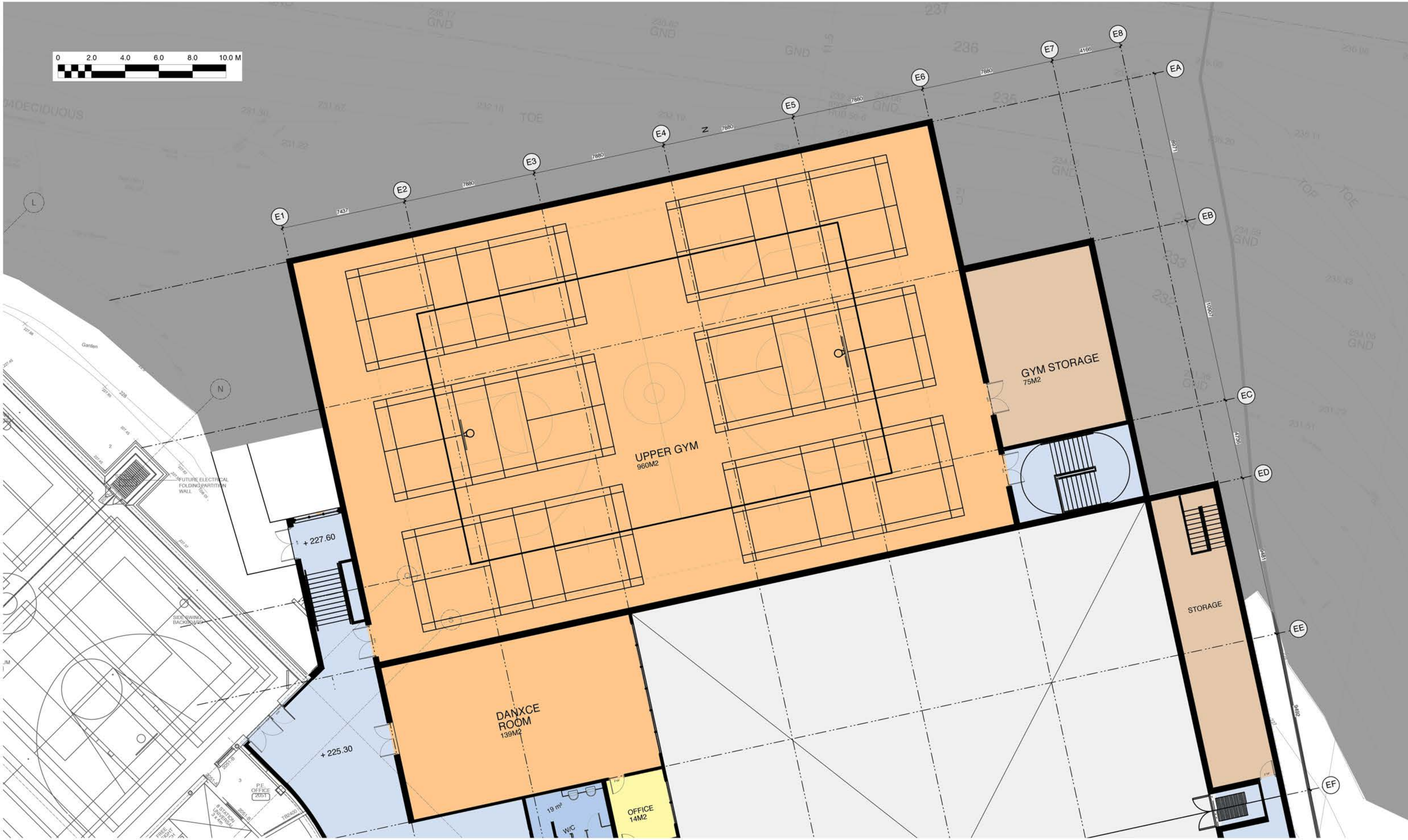
EAST ADDITION - UPPER MAIN PLAN



Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

EAST ADDITION - LEVEL 2 - SOUTH



Mulgrave School - Phase 2

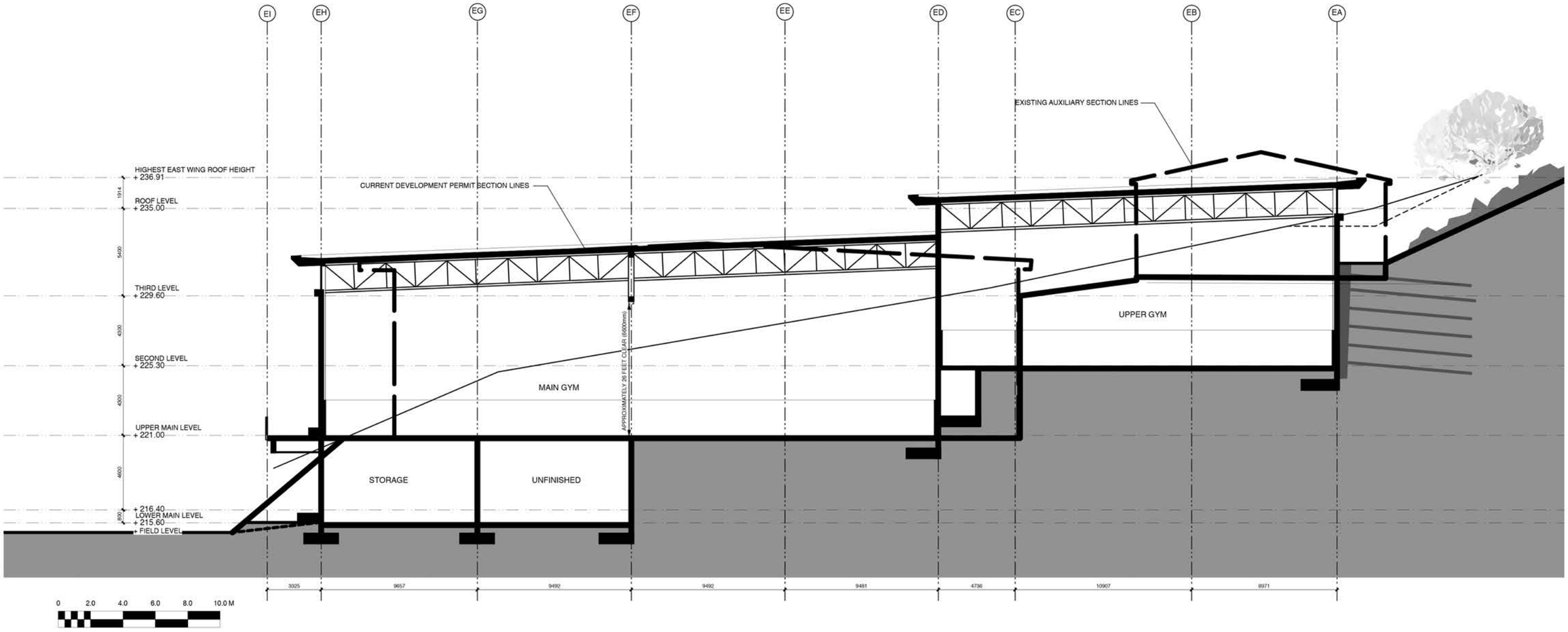
CORNERSTONE architecture + SURF ARCHITECTURE

EAST ADDITION - LOWER MAIN PLAN - NORTH

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

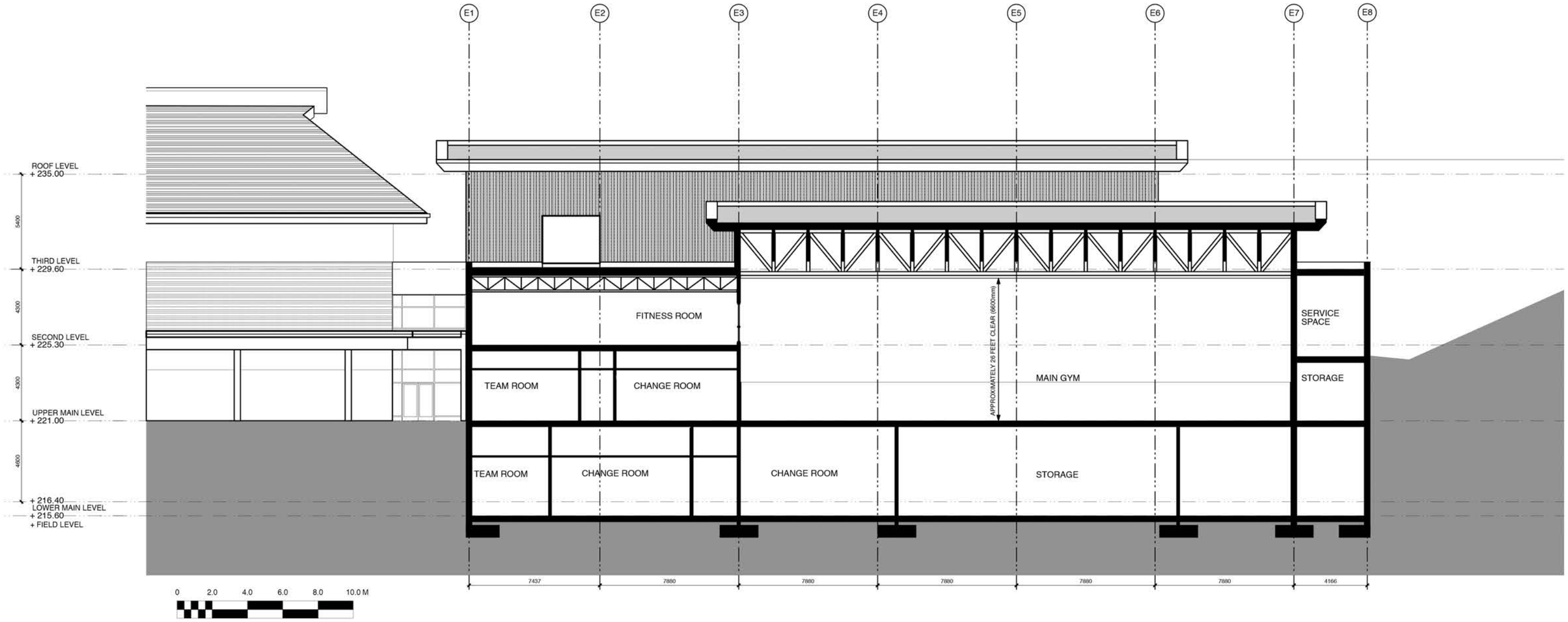
EAST ADDITION - ROOF PLAN



Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

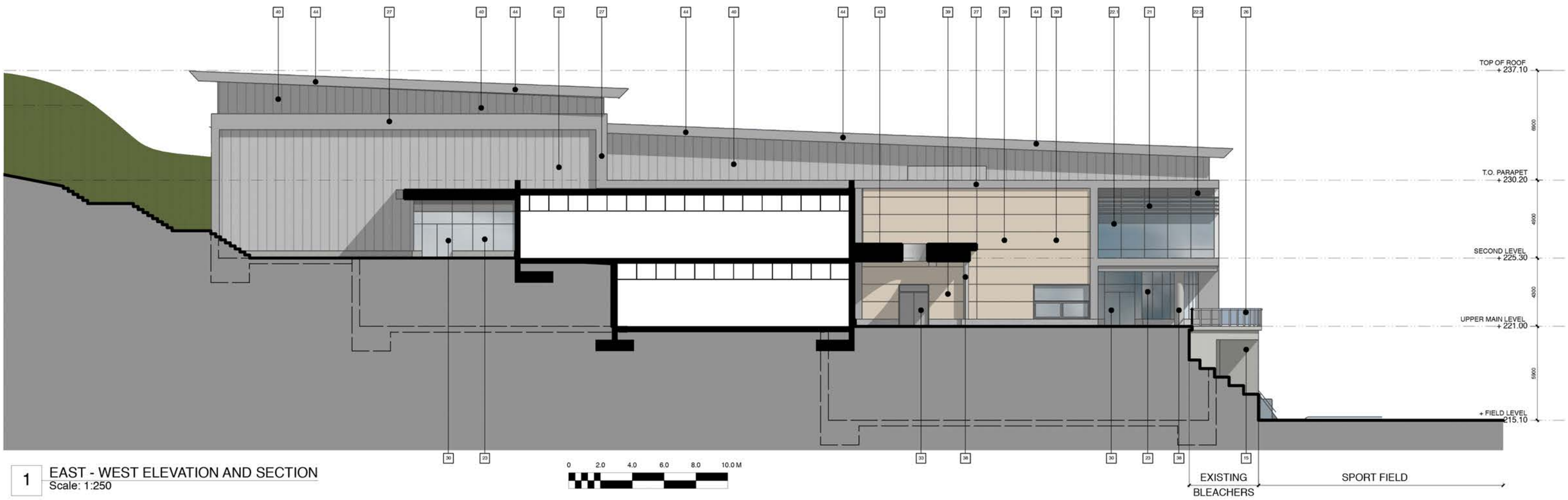
EAST ADDITION - CROSS SECTION



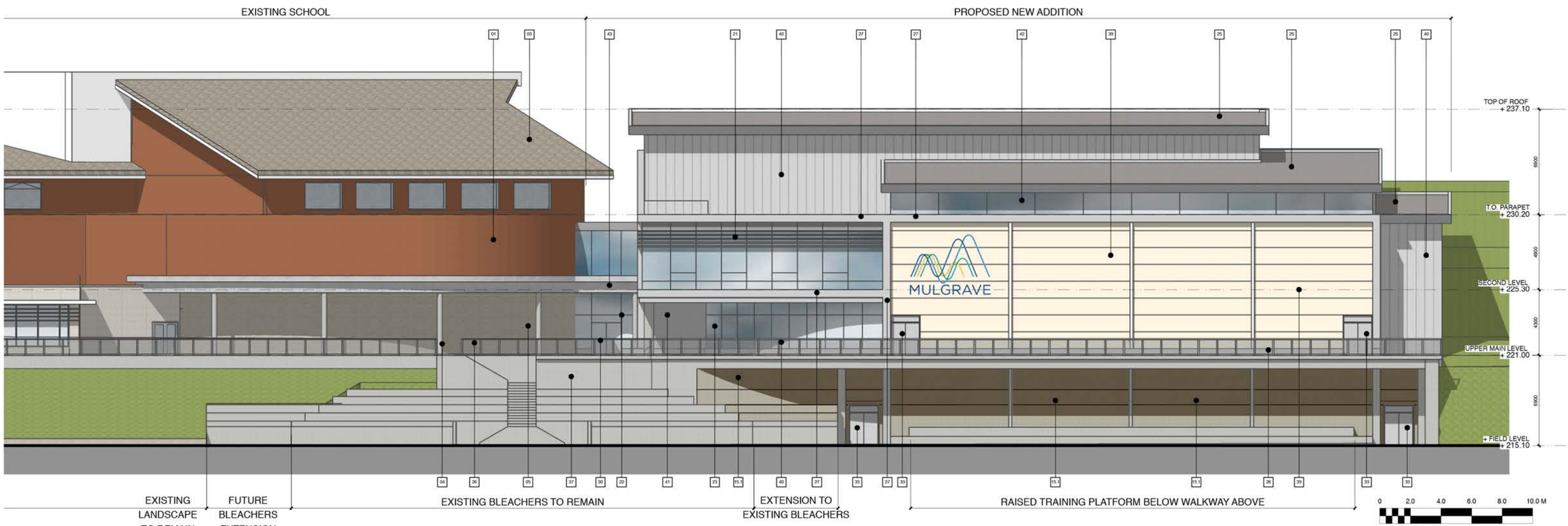
Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

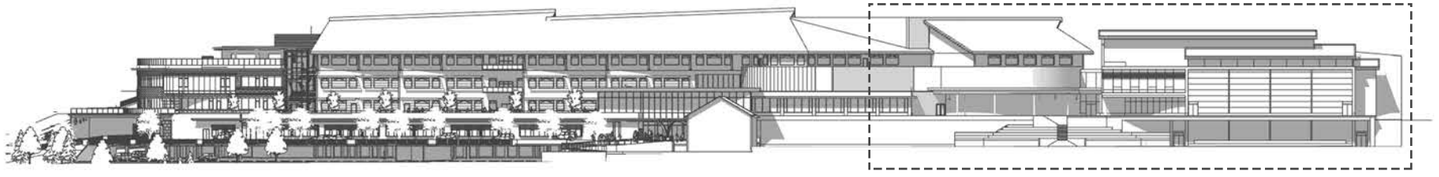
EAST ADDITION - LONGITUDINAL SECTION



1 EAST - WEST ELEVATION AND SECTION
Scale: 1:250



1 EAST - SOUTH ELEVATION
Scale: 1:250



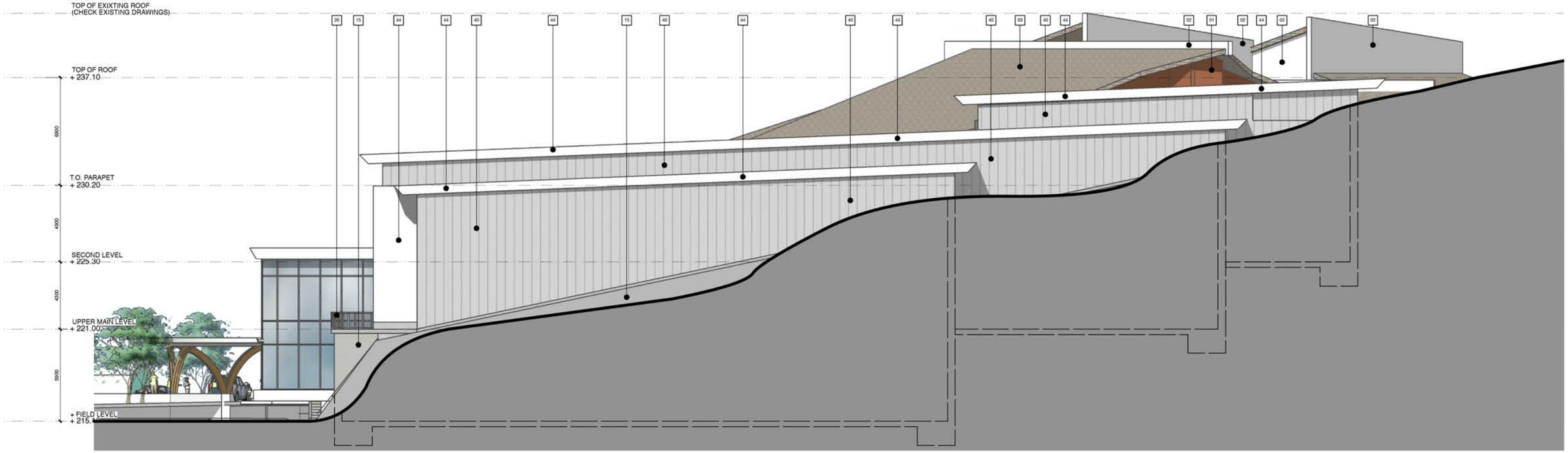
2 EAST - SOUTH ELEVATION KEYPLAN
Scale: 1:250

MATERIALS LEGEND

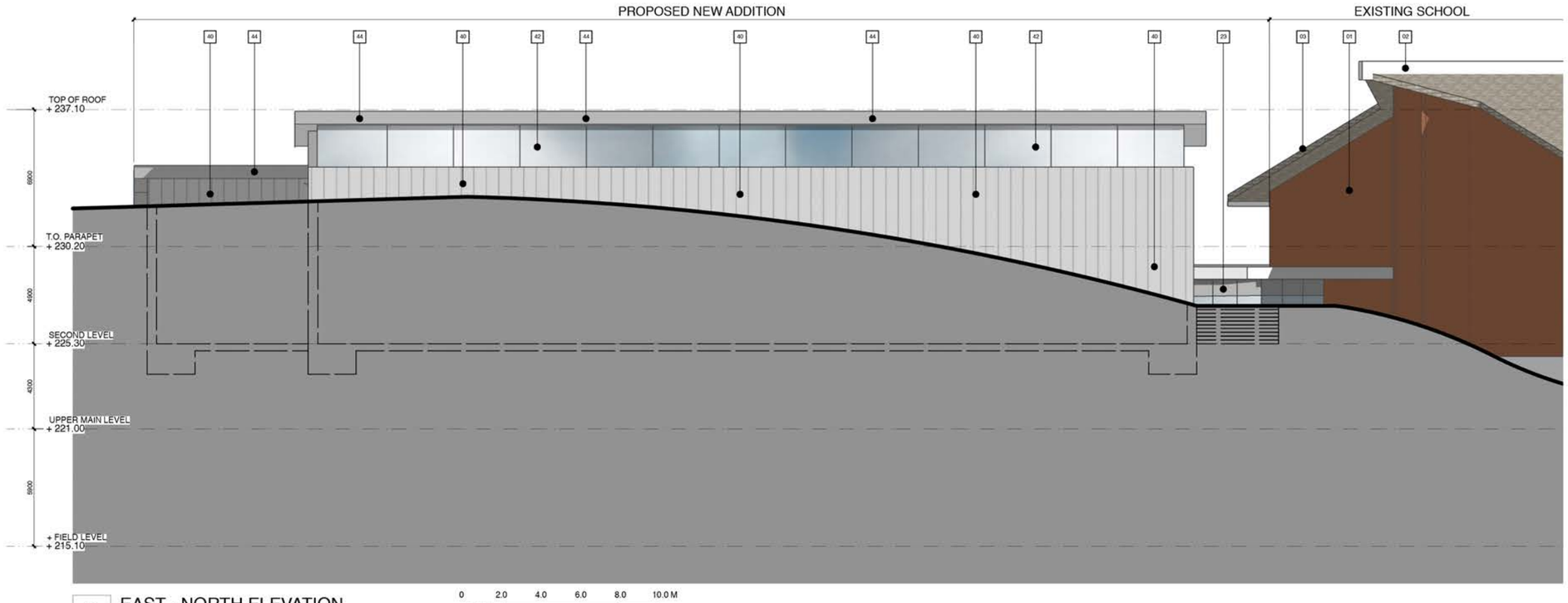
01	EXISTING BRICK	11	EXISTING METAL LOUVRE	20	PAINTED CAST IN PLACE CONCRETE	30	GLAZED ENTRANCE DOOR W/ALUMINUM FRAME	40	INSULATED SANDWICH PANEL SILVER FINISH (VERTICAL)
02	EXISTING FIBER CEMENT PANELS	12	EXISTING PAINTED STEEL FASCIA	21	SUNSHADE	31	CAPTURED CURTAIN WALL OPERABLE UNITS	41	GROUND FACED CMU (BUFF COLOR)
03	EXISTING ROOF	13	PREFINISHED ALUMINUM FASCIA	22	CURAIN WALL GLAZING W/VERTICAL CAPS	32	PAINTED CONCRETE CANOPY	42	CLERESTORY GLAZING IN ALUMINUM FRAME
04	EXISTING CONCRETE COLUMN	14	EXISTING GLAZED ENTRANCE DOOR	23	4 SIDED CAPTURED CURTAIN WALL GLAZING	33	PAINTED METAL DOOR	43	NEW EXTENSION TO CONCRETE CANOPY
05	EXISTING CONCRETE MASONRY UNITS	15	EXPOSED ARCHITECTURAL CONCRETE	24	LOUVRED MECHANICAL SCREEN	34	GLAZED STOREFRONT BAY W/COLORED ACCENT PANELS	44	PAINTED FIBRE CEMENT PANELS COLOR LIGHT GRAY
06	EXISTING ALUMINUM FRAMED WINDOWS	15.1	EXPOSED ARCHITECTURAL CONCRETE PAINTED COLOR TAN	25	2 PLY SBS MEMBRANE ROOFING COLOR LIGHT GRAY	35	CONCRETE BEAM	22.1	S.S.G. CURTAIN WALL GLAZING
07	EXISTING STONE CLADDING	16	EXISTING BOX WINDOW C/W HORIZONTAL SUNSHADES	26	GLAZED GUARDRAIL IN ALUMINUM FRAME	36	ALUMINUM PANELS	22.2	OPAQUE SPANDREL GLAZING
08	EXISTING CURTAINWALL GLAZING	17	EXISTING METAL PANEL	27	METAL ACCENT PANELS	37	CONCRETE RETAINING WALL		
09	EXISTING HORIZONTAL SUNSHADE	18	EXISTING GLAZED GUARDRAIL	28	METAL CLADDING	38	EXPOSED CONCRETE COLUMN		
10	EXISTING PREFINISHED ALUMINUM FASCIA	19	STONE CLADDING	29	PUNCHED ALUMINUM FRAME WINDOWS	39	INSULATED SANDWICH PANEL SANDCOLOR FINISH (HORIZONTAL)		

Mulgrave School - Phase 2 | CORNERSTONE architecture + SURF ARCHITECTURE

EAST ADDITION SOUTH ELEVATION



1 EAST - EAST ELEVATION
Scale: 1:250



2 EAST - NORTH ELEVATION
Scale: 1:250

0 2.0 4.0 6.0 8.0 10.0 M

MATERIALS LEGEND

01	EXISTING BRICK	24	LOUVRED MECHANICAL SCREEN
02	EXISTING FIBER CEMENT PANELS	25	2 PLY SBS MEMBRANE ROOFING COLOR LIGHT GRAY
03	EXISTING ROOF	26	GLAZED GUARDRAIL IN ALUMINUM FRAME
04	EXISTING CONCRETE COLUMN	27	METAL ACCENT PANELS
05	EXISTING CONCRETE MASONRY UNITS	28	METAL CLADDING
06	EXISTING ALUMINUM FRAMED WINDOWS	29	PUNCHED ALUMINUM FRAME WINDOWS
07	EXISTING STONE CLADDING	30	GLAZED ENTRANCE DOOR W/ALUMINUM FRAME
08	EXISTING CURTAINWALL GLAZING	31	CAPTURED CURTAIN WALL OPERABLE UNITS
09	EXISTING HORIZONTAL SUNSHADE	32	PAINTED CONCRETE CANOPY
10	EXISTING PREFINISHED ALUMINUM FASCIA	33	PAINTED METAL DOOR
11	EXISTING METAL LOUVRE	34	GLAZED STOREFRONT BAY W/COLORED ACCENT PANELS
12	EXISTING PAINTED STEEL FASCIA	35	CONCRETE BEAM
13	PREFINISHED ALUMINUM FASCIA	36	ALUMINUM PANELS
14	EXISTING GLAZED ENTRANCE DOOR	37	CONCRETE RETAINING WALL
15	EXPOSED ARCHITECTURAL CONCRETE	38	EXPOSED CONCRETE COLUMN
16	EXISTING BOX WINDOW C/W HORIZONTAL SUNSHADES	39	INSULATED SANDWICH PANEL SANDCOLOR FINISH (HORIZONTAL)
17	EXISTING METAL PANEL	40	INSULATED SANDWICH PANEL SILVER FINISH (VERTICAL)
18	EXISTING GLAZED GUARDRAIL	41	GROUND FACED CMU (BUFF COLOR)
19	STONE CLADDING	42	CLERESTORY GLAZING IN ALUMINUM FRAME
20	PAINTED CAST IN PLACE CONCRETE	43	NEW EXTENSION TO CONCRETE CANOPY
21	SUNSHADE	44	PAINTED FIBRE CEMENT PANELS COLOR LIGHT GRAY
22	CURAIN WALL GLAZING W/VERTICAL CAPS	22.1	S.S.G. CURTAIN WALL GLAZING
23	4 SIDED CAPTURED CURTAIN WALL GLAZING	22.2	OPAQUE SPANDREL GLAZING

Mulgrave School - Phase 2

CORNERSTONE architecture + SURF ARCHITECTURE

EAST ADDITION EAST AND NORTH ELEVATIONS

pmg LANDSCAPE ARCHITECTS
Suite C100 - 4185 Still Creek Drive
Burnaby, British Columbia, V5C 6G9
p: 604 294-0011 ; f: 604 294-0022

SEAL:

NO.	DATE	REVISION DESCRIPTION	DR.
7	18.JUL.22	ISSUED FOR DP AMENDMENT - EAST GYM	CW
6	18.MAY.24	ISSUED FOR LSI04	CW
5	18.MAY.10	ISSUED FOR LANDSCAPE SITE INSTRUCTION	CW
4	17.JUN.20	ISSUED FOR CONSTRUCTION	CW
3	17.MAR.31	ISSUED FOR TENDER	CW
2	17.JAN.20	ISSUED FOR BP	CW
1	16.DEC.20	REV. PER NEW SPACE REQUIREMENTS	CW

CLIENT:

PROJECT:

MULGRAVE SCHOOL

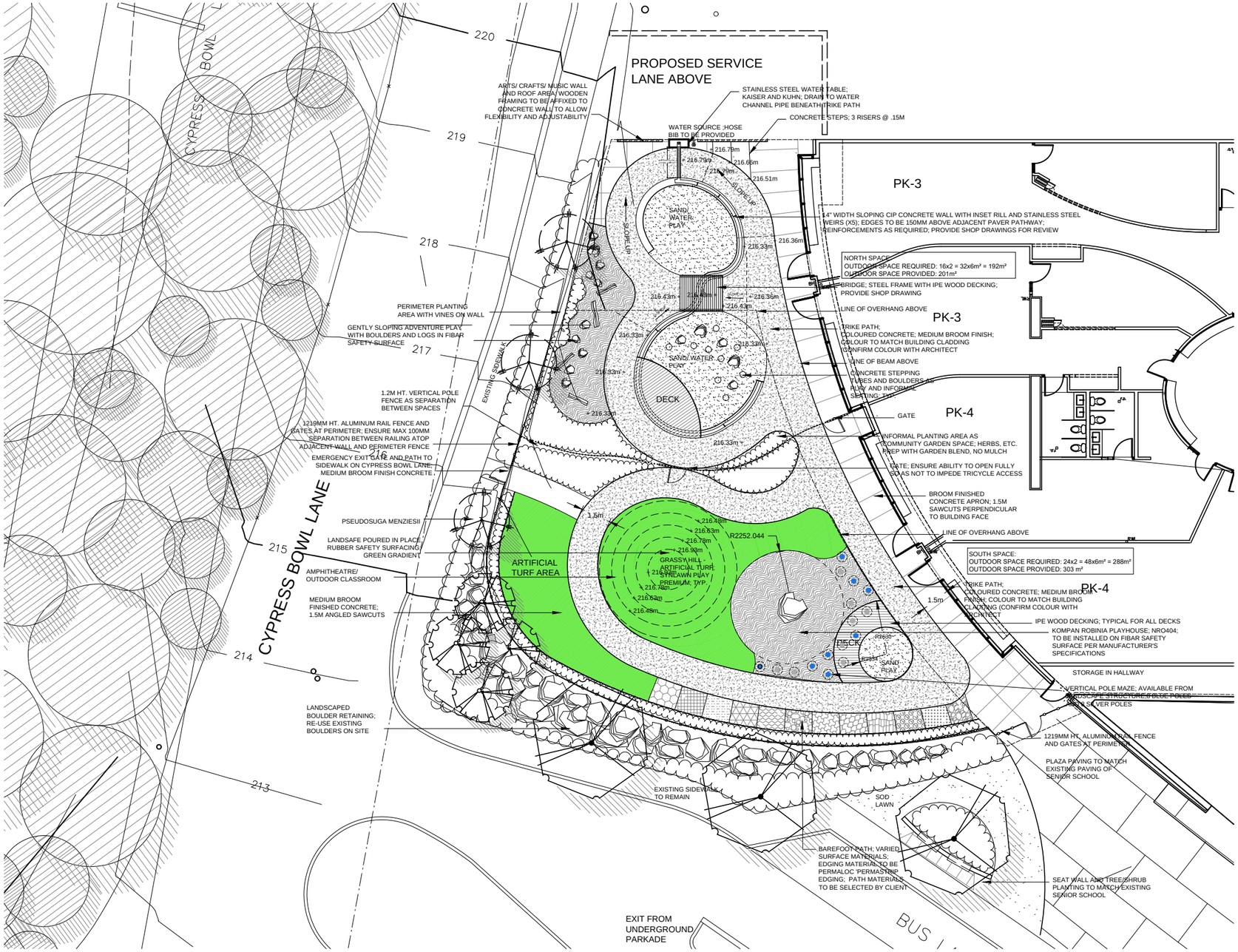
CYPRESS BOWL LANE
WEST VANCOUVER

DRAWING TITLE:

LANDSCAPE PLAN - RENDERED

DATE:	15.NOV.18	DRAWING NUMBER:
SCALE:	1:100	**L0**
DRAWN:	CW	
DESIGN:	CW	
CHK'D:	PCM	**OF 5**

PMG PROJECT NUMBER: **15-148**



TREE SCHEDULE

PMG PROJECT NUMBER: 9x-xxx

KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANTED SIZE / REMARKS
	4	ACER CIRCINATUM	VINE MAPLE	2.5M HT; B&B; 3 STEM CLUMP
	3	ACER RUBRUM 'KARPICK'	COLUMNAR KARPICK MAPLE	7CM CAL; 2M STD; B&B
	3	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	3M HT; B&B

NOTES: * PLANT SIZES IN THIS LIST ARE SPECIFIED ACCORDING TO THE CANADIAN LANDSCAPE STANDARD, LATEST EDITION. CONTAINER SIZES SPECIFIED AS PER CNLA STANDARDS. BOTH PLANT SIZE AND CONTAINER SIZE ARE THE MINIMUM ACCEPTABLE SIZES. * REFER TO SPECIFICATIONS FOR DEFINED CONTAINER MEASUREMENTS AND OTHER PLANT MATERIAL REQUIREMENTS. * SEARCH AND REVIEW: MAKE PLANT MATERIAL AVAILABLE FOR OPTIONAL REVIEW BY LANDSCAPE ARCHITECT AT SOURCE OF SUPPLY. AREA OF SEARCH TO INCLUDE LOWER MAINLAND AND FRASER VALLEY. * SUBSTITUTIONS: OBTAIN WRITTEN APPROVAL FROM THE LANDSCAPE ARCHITECT PRIOR TO MAKING ANY SUBSTITUTIONS TO THE SPECIFIED MATERIAL. UNAPPROVED SUBSTITUTIONS WILL BE REJECTED. ALLOW A MINIMUM OF FIVE DAYS PRIOR TO DELIVERY FOR REQUEST TO SUBSTITUTE. SUBSTITUTIONS ARE SUBJECT TO CANADIAN LANDSCAPE STANDARD - DEFINITION OF CONDITIONS OF AVAILABILITY. ALL LANDSCAPE MATERIAL AND WORKMANSHIP MUST MEET OR EXCEED CANADIAN LANDSCAPE STANDARD'S LATEST EDITION. ALL PLANT MATERIAL MUST BE PROVIDED FROM CERTIFIED DISEASE FREE NURSERY

ADVENTURE PLAY - NATURAL PLAY ELEMENTS - LOGS AND BOULDERS

MUSIC WALL

SLOPING TRIKE PATH

BAREFOOT PATH

pmg LANDSCAPE ARCHITECTS
Suite C100 - 4185 Still Creek Drive
Burnaby, British Columbia, V5C 6G9
p: 604 294-0011 ; f: 604 294-0022

SEAL:

NO.	DATE	REVISION DESCRIPTION	DR.
7	18.JUL.22	ISSUED FOR DP AMENDMENT - EAST GYM	CW
6	18.MAY.24	ISSUED FOR LSI04	CW
5	18.MAY.10	ISSUED FOR LANDSCAPE SITE INSTRUCTION	CW
4	17.JUN.20	ISSUED FOR CONSTRUCTION	CW
3	17.MAR.31	ISSUED FOR TENDER	CW
2	17.JAN.20	ISSUED FOR BP	CW
1	16.DEC.20	REV. PER NEW SPACE REQUIREMENTS	CW

CLIENT:

PROJECT:

MULGRAVE SCHOOL

CYPRESS BOWL LANE
WEST VANCOUVER

DRAWING TITLE:

LANDSCAPE PLAN - ELC

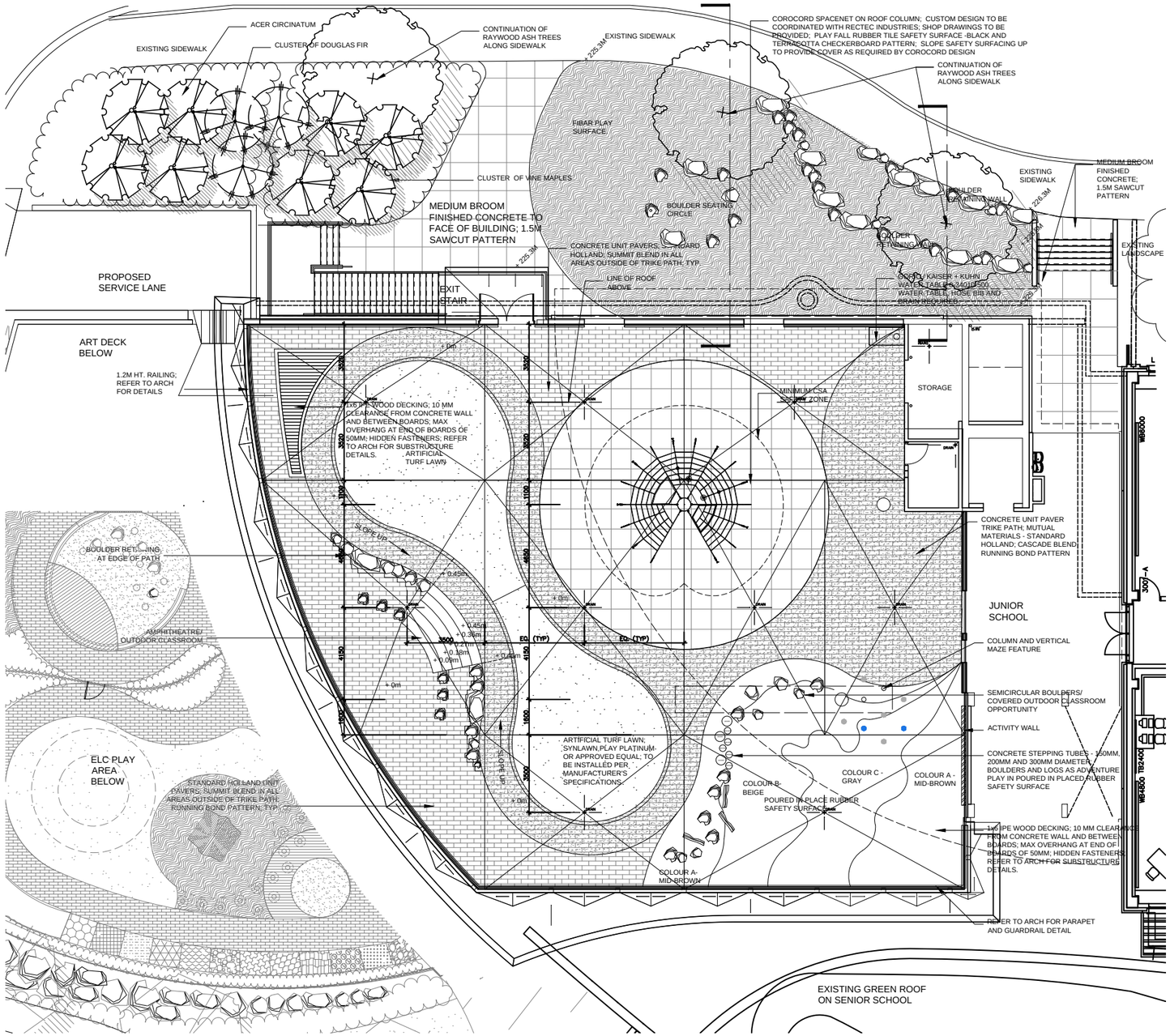
DATE: 15.NOV.18
SCALE: 1:100
DRAWN: CW
DESIGN: CW
CHK'D: PCM

DRAWING NUMBER: **L1**

OF 5

PMG PROJECT NUMBER: **15-148**

15148-7DPAMEND.ZIP



TREE SCHEDULE

PMG PROJECT NUMBER: 15-148

KEY	QTY	BOTANICAL NAME	COMMON NAME	PLANTED SIZE / REMARKS
TREE				
	8	ACER CIRCINATUM	VINE MAPLE	2.5M HT; B&B; 3 STEM CLUMP
	3	FRAXINUS OXYCARPA 'RAYWOOD'	RAYWOOD ASH	6CM CAL; 1.8M STD; B&B
	3	PSEUDOTSUGA MENZIESII	DOUGLAS FIR	3M HT; B&B

NOTES: * PLANT SIZES IN THIS LIST ARE SPECIFIED ACCORDING TO THE CANADIAN LANDSCAPE STANDARD, LATEST EDITION. CONTAINER SIZES SPECIFIED AS PER CNLA STANDARDS. BOTH PLANT SIZE AND CONTAINER SIZE ARE THE MINIMUM ACCEPTABLE SIZES. * REFER TO SPECIFICATIONS FOR DEFINED CONTAINER MEASUREMENTS AND OTHER PLANT MATERIAL REQUIREMENTS. * SEARCH AND REVIEW: MAKE PLANT MATERIAL AVAILABLE FOR OPTIONAL REVIEW BY LANDSCAPE ARCHITECT AT SOURCE OF SUPPLY. AREA OF SEARCH TO INCLUDE LOWER MAINLAND AND FRASER VALLEY. * SUBSTITUTIONS: OBTAIN WRITTEN APPROVAL FROM THE LANDSCAPE ARCHITECT PRIOR TO MAKING ANY SUBSTITUTIONS TO THE SPECIFIED MATERIAL. UNAPPROVED SUBSTITUTIONS WILL BE REJECTED. ALLOW A MINIMUM OF FIVE DAYS PRIOR TO DELIVERY FOR REQUEST TO SUBSTITUTE. SUBSTITUTIONS ARE SUBJECT TO CANADIAN LANDSCAPE STANDARD - DEFINITION OF CONDITIONS OF AVAILABILITY. ALL LANDSCAPE MATERIAL AND WORKMANSHIP MUST MEET OR EXCEED CANADIAN LANDSCAPE STANDARD'S LATEST EDITION. ALL PLANT MATERIAL MUST BE PROVIDED FROM CERTIFIED DISEASE FREE NURSERY

pmg LANDSCAPE ARCHITECTS
Suite C100 - 4185 Still Creek Drive
Burnaby, British Columbia, V5C 6G9
p: 604 294-0011 ; f: 604 294-0022

SEAL:

NO.	DATE	REVISION DESCRIPTION	DR.
7	18.JUL.22	ISSUED FOR DP AMENDMENT - EAST GYM	CW
6	18.MAY.24	ISSUED FOR LSI04	CW
5	18.MAY.10	ISSUED FOR LANDSCAPE SITE INSTRUCTION	CW
4	17.JUN.20	ISSUED FOR CONSTRUCTION	CW
3	17.MAR.31	ISSUED FOR TENDER	CW
2	17.JAN.20	ISSUED FOR BP	CW
1	16.DEC.20	REV. PER NEW SPACE REQUIREMENTS	CW

CLIENT:

PROJECT:

MULGRAVE SCHOOL

CYPRESS BOWL LANE
WEST VANCOUVER

DRAWING TITLE:

LANDSCAPE PLAN - JUNIOR SCHOOL

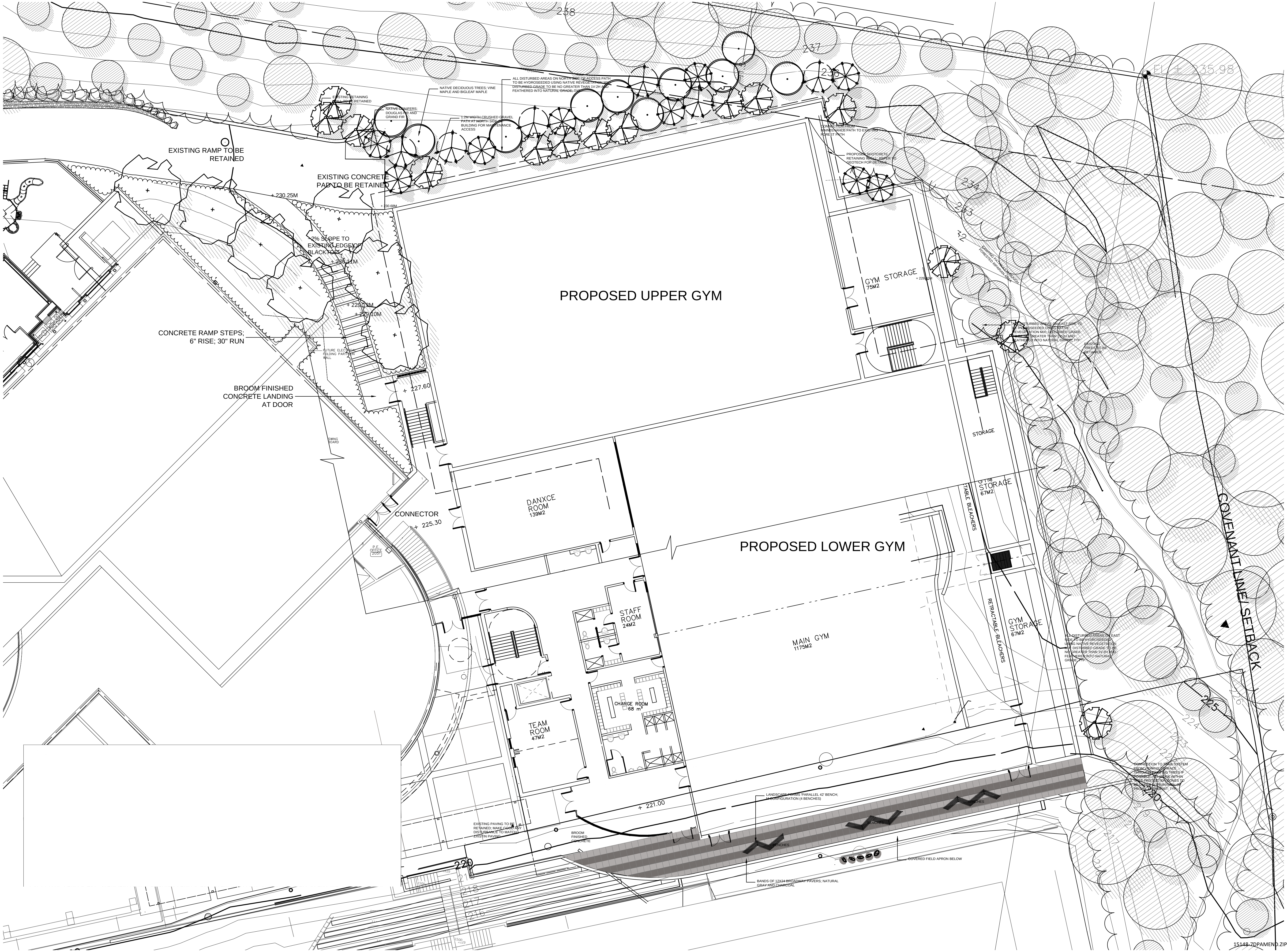
DATE: 15.NOV.18
SCALE: 1:100
DRAWN: CW
DESIGN: CW
CHK'D: PCM

DRAWING NUMBER: **L2**

OF 5

PMG PROJECT NUMBER: **15-148**

15148-7DPAMEND.ZIP



pmg LANDSCAPE ARCHITECTS
Suite C100 - 4185 Still Creek Drive
Burnaby, British Columbia, V5C 6G9
p: 604 294-0011 ; f: 604 294-0022

SEAL:

NO.	DATE	REVISION DESCRIPTION	DR.
7	18.JUL.22	ISSUED FOR DP AMENDMENT - EAST GYM	CW
6	18.MAY.24	ISSUED FOR LSI04	CW
5	18.MAY.10	ISSUED FOR LANDSCAPE SITE INSTRUCTION	CW
4	17.JUN.20	ISSUED FOR CONSTRUCTION	CW
3	17.MAR.31	ISSUED FOR TENDER	CW
2	17.JAN.20	ISSUED FOR BP	CW
1	16.DEC.20	REV. PER NEW SPACE REQUIREMENTS	CW

CLIENT:

PROJECT:

MULGRAVE SCHOOL

CYPRESS BOWL LANE
WEST VANCOUVER

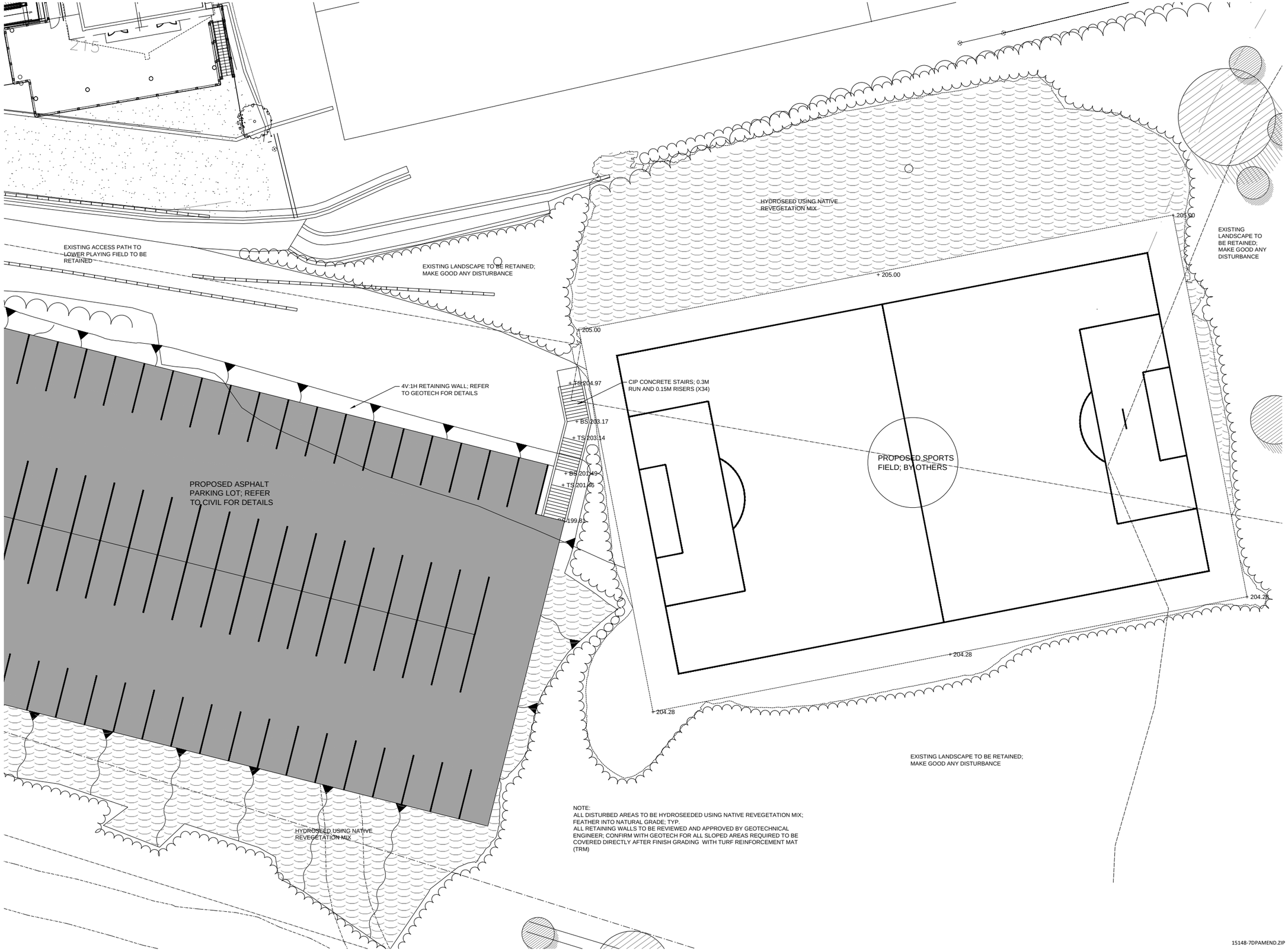
DRAWING TITLE:

LANDSCAPE PLAN - EAST END GYM

DATE: 15.NOV.18
SCALE: 1:100
DRAWN: CW
DESIGN: CW
CHK'D: PCM

DRAWING NUMBER:
L3
OF 5

PMG PROJECT NUMBER: **15-148**



NOTE:
ALL DISTURBED AREAS TO BE HYDROSEEDED USING NATIVE REVEGETATION MIX; FEATHER INTO NATURAL GRADE; TYP.
ALL RETAINING WALLS TO BE REVIEWED AND APPROVED BY GEOTECHNICAL ENGINEER; CONFIRM WITH GEOTECH FOR ALL SLOPED AREAS REQUIRED TO BE COVERED DIRECTLY AFTER FINISH GRADING WITH TURF REINFORCEMENT MAT (TRM)

15148-7DPAMEND.ZIP

pmg LANDSCAPE ARCHITECTS
Suite C100 - 4185 Still Creek Drive
Burnaby, British Columbia, V5C 6G9
p: 604 294-0011 ; f: 604 294-0022

SEAL:

NO.	DATE	REVISION DESCRIPTION	DR.
7	18.JUL.22	ISSUED FOR DP AMENDMENT - EAST GYM	CW
6	18.MAY.24	ISSUED FOR LSI04	CW
5	18.MAY.10	ISSUED FOR LANDSCAPE SITE INSTRUCTION	CW
4	17.JUN.20	ISSUED FOR CONSTRUCTION	CW
3	17.MAR.31	ISSUED FOR TENDER	CW
2	17.JAN.20	ISSUED FOR BP	CW
1	16.DEC.20	REV. PER NEW SPACE REQUIREMENTS	CW

CLIENT:

PROJECT:

MULGRAVE SCHOOL

CYPRESS BOWL LANE
WEST VANCOUVER

DRAWING TITLE:

LANDSCAPE PLAN - SOUTHLAND

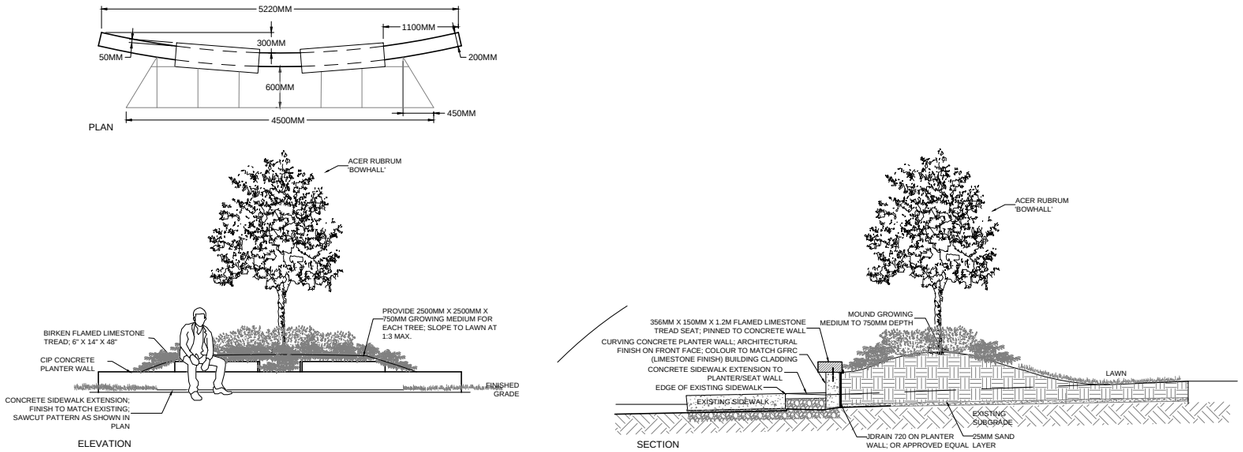
DATE:	15.NOV.18
SCALE:	1:100
DRAWN:	CW
DESIGN:	CW
CHK'D:	PCM

DRAWING NUMBER:

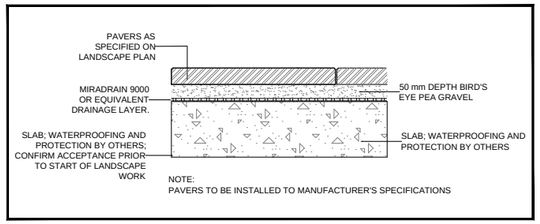
L4

OF 5

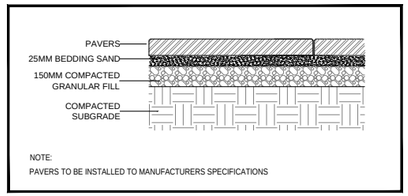
PMG PROJECT NUMBER: **15-148**



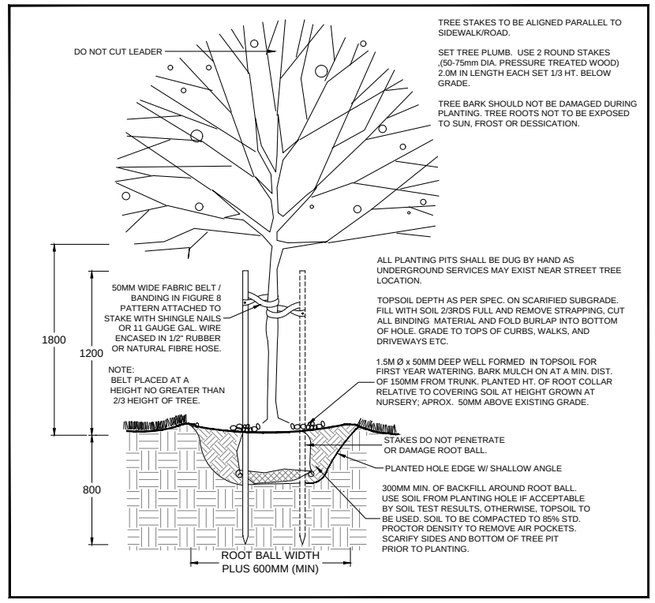
1 SEAT WALL
1:40



2 PAVERS ON SLAB
1:10



3 PAVERS ON GRADE
1:10



4 TYPICAL DECIDUOUS TREE DETAIL
NTS

LANDSCAPE FORMS 'PARALLEL 42' BENCH; ANGLED CONFIGURATION TO REFERENCE MULGRAVE 'M'; IPE SLATS

PROPOSED TREES


ACER CIRCINATUM - VINE MAPLE


ACERMACROPHYLLUM - BIGLEAF MAPLE


PSEUDOTSUGA MENZIESII


ABIES GRANDIS

PROPOSED SHRUBS


VACCINIUM OVATUM


VACCINIUM CORYMBOSUM


MAHONIA AQUIFOLIUM

PROPOSED GRASSES


CALAMAGROSTIS ACUTIFLORA 'KARL FOERSTER'


DESCHAMPSIA CESPITOSA


STIPA TENNUISIMA


HELICTOTRICHON SEMPERVIRENS

PROPOSED GROUNDCOVERS


ARCTOSTAPHYLOS UVA-URSI


POLYSTICHUM MUNITUM


FRAGARIA VIRGINIANA


CORNUS CANADENSIS

pmg LANDSCAPE ARCHITECTS
Suite C100 - 4185 Still Creek Drive
Burnaby, British Columbia, V5C 6G9
p: 604 294-0011 ; f: 604 294-0022

SEAL:

NO.	DATE	REVISION DESCRIPTION	DR.
7	18.JUL.22	ISSUED FOR DP AMENDMENT - EAST GYM	CW
6	18.MAY.24	ISSUED FOR LSID4	CW
5	18.MAY.10	ISSUED FOR LANDSCAPE SITE INSTRUCTION	CW
4	17.JUN.20	ISSUED FOR CONSTRUCTION	CW
3	17.MAR.31	ISSUED FOR TENDER	CW
2	17.JAN.20	ISSUED FOR BP	CW
1	16.DEC.20	REV. PER NEW SPACE REQUIREMENTS	CW

CLIENT:

PROJECT:

MULGRAVE SCHOOL

CYPRESS BOWL LANE
WEST VANCOUVER

DRAWING TITLE:

LANDSCAPE DETAILS

DATE: 15.NOV.18
SCALE: 1:100
DRAWN: CW
DESIGN: CW
CHK'D: PCM

DRAWING NUMBER: **L5** OF 5

15148-7DPAMEND.ZIP

PMG PROJECT NUMBER: **15-148**

Appendices

APPENDIX A1 - TOPOGRAPHIC SURVEY OVERALL CAMPUS
APPENDIX A2 - TOPOGRAPHIC SURVEY SOUTHLANDS

COMPOSITE PLAN OF PART OF LOT 1 OF PLAN EPP30215 AND LOT 1 OF PLAN EPP40257 BOTH OF DISTRICT LOTS 793 AND 816

GROUP 1, NEW WESTMINSTER DISTRICT

LOT 1 – P.I.D. 029-077-842 (PLAN EPP30215)

LOT 1 – P.I.D. 029-308-461 (PLAN EPP40257)

SCALE = 1:750

-10 0 25 50 75

ALL DISTANCES IN METERS

Notes:

Lot 1–Plan EPP30215

This title may be affected by permits under part 26 of the Local Government Act, see BB3007581 and BB793514, and by part 26 of the Municipal Act, see BP104051.
This lot is subject to:
- *Two (2) Statutory Rights of Way, (BL116382) in favour of B.C. Hydro, and (BL116383) in favour of B.C. Tel.*
- *Two (2) Covenants BP56201, BP65881, both in favour of the Corporation of the District of West Vancouver.*
- *Restrictive Covenant (BN303747).*

Lot 1–Plan EPP40257

This lot is subject to:
- *Two (2) Under Surface and Other EXC and REC, see (CA3550438) and (BB4064659), both in favour of the Crown in Right of B.C., Inter Alia.*
- *Covenant (CA3645126), in favour of the Crown in Right of B.C.*
- *Restrictive Covenant (BB1951118).*

Elevations are to Geodetic Datum and are derived from the Chairlift Topography Project.

This Document is not valid unless originally signed & sealed.

Certified Correct according to Plans EPP30215 and EPP40257:

September 29, 2015.

British Columbia Land Surveyors
#107-100 Park Royal South
WEST VANCOUVER, B.C.
V7T 1A2 604-926-7311
FAX 604-926-6923
EMAIL sandy@chapmansurvey.com

06 FB:2302(33) JOB:08-168 FILE:2785C DRAWN BY: RB
COMP: Q:\Eagle\2785C\08168-MULGRAVE\MS2785C-MULGRAVE-08168-T02.dwg

COMPOSITE PLAN OF PART OF LOT 1 OF PLAN EPP30215 AND LOT 1 OF PLAN EPP40257 BOTH OF DISTRICT LOTS 793 AND 816

GROUP 1, NEW WESTMINSTER DISTRICT

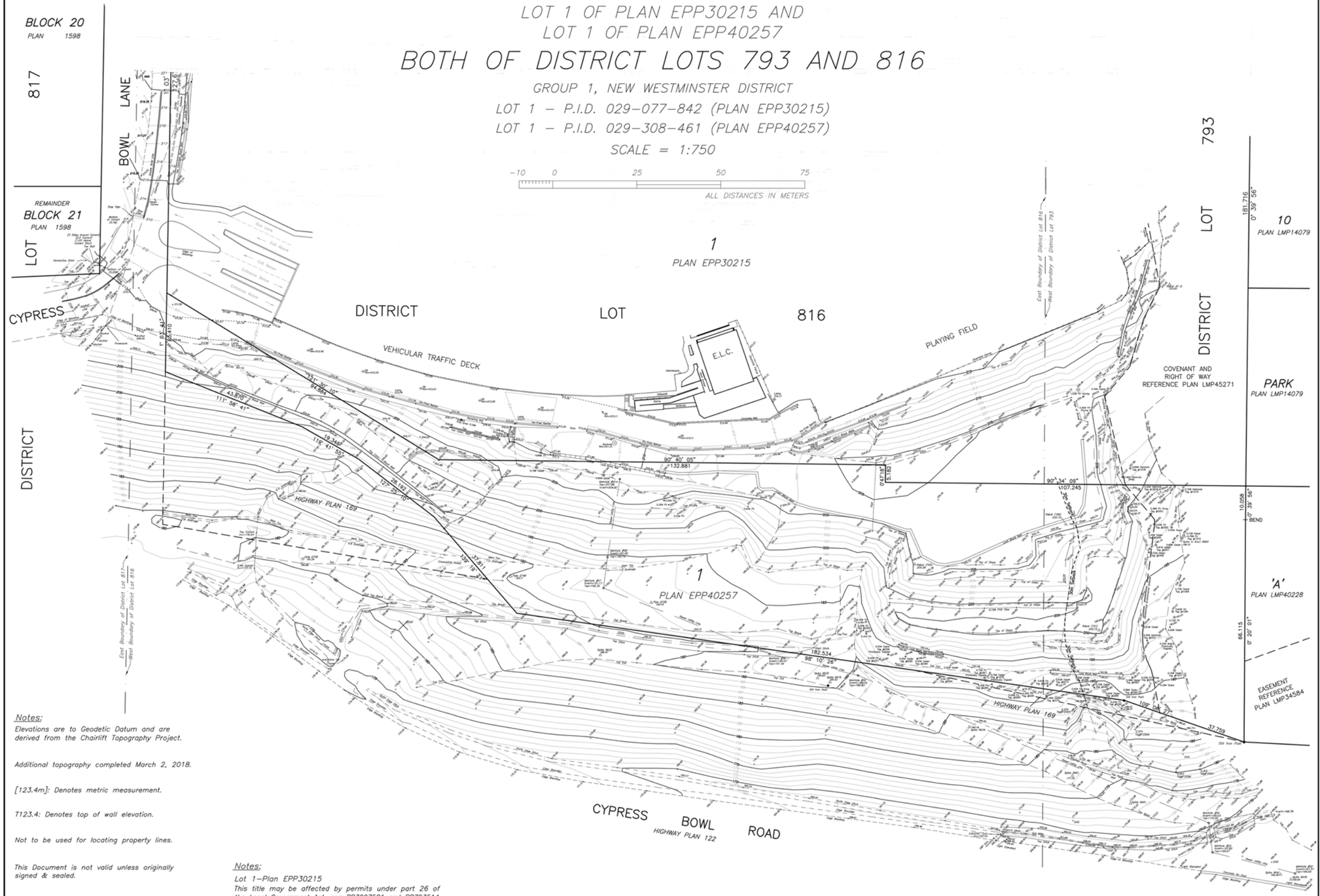
LOT 1 – P.I.D. 029–077–842 (PLAN EPP30215)

LOT 1 – P.I.D. 029–308–461 (PLAN EPP40257)

SCALE = 1:750

–10 0 25 50 75

ALL DISTANCES IN METERS



Notes:

Elevations are to Geodetic Datum and are derived from the Chairlift Topography Project.

Additional topography completed March 2, 2018.

[123.4m]: Denotes metric measurement.

T123.4: Denotes top of wall elevation.

Not to be used for locating property lines.

This Document is not valid unless originally signed & sealed.

Certified Correct according to Plans EPP30215 and EPP40257:

_ _ _ _ _ _ _ _ _ _ _ _ _ _ _, B.C.L.S.
Harry E. Hickman
this 12th day of March, 2018.

Notes:

Lot 1–Plan EPP30215
This title may be affected by permits under part 26 of the Local Government Act, see BB3007581 and BB793514, and by part 26 of the Municipal Act, see BP104051.
This lot is subject to:
–Two (2) Statutory Rights of Way, (BL116382) in favour of B.C. Hydro, and (BL116383) in favour of B.C. Tel.
–Two (2) Covenants BP56201, BP65881, both in favour of the Corporation of the District of West Vancouver.
–Restrictive Covenant (BN303747).

Lot 1–Plan EPP40257
This lot is subject to:
–Two (2) Under Surface and Other EXC and REC, see (CA3550438) and (BB4064659), both in favour of the Crown in Right of B.C., Inter Alia.
–Covenant (CA3645126), in favour of the Crown in Right of B.C.
–Restrictive Covenant (BB1951118).

British Columbia Land Surveyors
#107–100 Park Royal South
WEST VANCOUVER, B.C.
V7T 1A2 604–926–7311
FAX 604–926–6923
EMAIL sandy@chapmansurvey.com

G6 FB:2374(14) JOB:18–021 FILE:2785C DRAWN BY: KS
COMP: Q:\Eagle\2785C\18021–MULGRAVE\MS2785C–MULGRAVE–18021–T03.dwg

APPENDIX B:

SUMMARY OF SOUTHLANDS REZONING AND DEVELOPMENT PERMIT APPLICATIONS

The Mulgrave Southlands is a plot of land located along the southern border of the school campus and is currently zoned RS8 (Residential Single Family). The Development Permit and Rezoning Application that was submitted on February 22, 2018 is intended to address overall zoning designation and particularly proposed uses for the land south of the main playing field in the southeast corner of the site. By way of background, the school is currently utilizing this land as a temporary vehicular parking area for the construction workers who are building the new West Addition to the school. At the commencement of construction, Mulgrave was not aware that the zoning of this portion of their land does not permit vehicular parking. Upon notification from the District of West Vancouver, the school promptly made efforts to rectify the current situation through the District of West Vancouver rezoning process.

Mulgrave is proposing to rezone the RS8 Zone (Residential Single Family) portion of land (Mulgrave Southlands) located along their south property line to PA-1 (Public Assembly 1 – School and ancillary uses). The school understands that this change of use would then match the remainder of the site and would likely have the Planning Department's support throughout the rezoning process.

The use of the Southlands portion of the Mulgrave School Campus is proposed as follows:

a. Temporary use as vehicular parking until the end of construction of the West Addition
b. Permanent use of the land as ancillary uses for the school comprising the following
   - Sports field
   - Vehicular parking
   - Access road to the vehicular parking lot

The area which is currently used for temporary vehicular parking will change to a U9 U10 Play field. In addition, a permanent vehicular parking lot will be relocated south of the current ELC Building (refer to Field House on the Campus Master Plan). The parking lot would be accessed by a paved road along the south property line. It should be noted that the preliminary grading for the road was done during the first phase of construction 20 years ago.

APPLICATION DOCUMENTS

The following application documentation was submitted for the Development Permit / Rezoning Application on February 22nd 2018:

1. Development Permit / Zoning Application:

- DoWV Development Application Form Schedule "A"
- DoWV Application Checklist
- Cheque for fees
- DoWV Confirmation of Appointment Form signed by Mulgrave
- Mulgrave School Confirmation of Appointment Letter
- Certificate of Title
- Site Survey
- Location and Context Plan
- Project Data and Development Statistics
- Site Plan
- Visual Analysis
- Environmental Reports

SUPPORTING DOCUMENTS

The following supporting documentation was submitted for the Development Permit / Rezoning Application on February 28th 2018 as part of a letter addressed to the District of West Vancouver Planning Department. Not all the submitted documents are reproduced in this report, however in order to convey a complete summary, the italicized items are included in this Development Permit Amendment Booklet as Appendices:

1. Information provided on the Existing Works which will be retained until the construction of permanent, ancillary school facilities:

a. Information on previously existing conditions

- *Reproduced below:* Aerial Photo of the Mulgrave School Campus
- Soil Stockpile Area drawing prepared by Creus Engineering and circulated to DoWV Engineering for approval June 12th 2013.
- Civil Drawing D-3 prepared by Creus Engineering and reviewed on site with DoWV Engineering, June 2013.

b. Details and description of the works undertaken

- Civil Drawing GRAD 4 dated 2016 – 09 – 28 by Creus Engineering and reviewed on site with DoWV Engineering, fall, 2016.
- *Reproduced below:* Architectural Site Plan AR1.1 of current conditions prepared by Cornerstone architecture + SURF Architecture Associated Architects
- *Reproduced below:* Letter prepared by Geopacific, geotechnical engineer certifying the stability of the Works

c. *Included as part of The Environmental Assessment Dated April 13th 2018*: Written analysis by Sartori Environmental on the current site conditions

d. *Included as part of The Environmental Assessment Dated April 13th 2018:* Review by Sartori Environmental of erosion and sedimentation control measures which may be required for the existing Works

2. Information provided on the Temporary Works which are proposed prior to the construction of permanent, ancillary school facilities

- *Reproduced below:* Architectural Site Plan AR1.2 of the temporary parking layout prepared by Cornerstone architecture + SURF Architecture Associated Architects
- Civil Drawing R-3 of the proposed temporary parking layout prepared by Creus Engineering
- Civil Drawing showing the proposed drainage system for Temporary and Permanent Works
- Civil Drawing ESC showing the Erosion and Sedimentation Control requirements required during the construction of the temporary parking layout prepared by Creus Engineering
- Civil Drawing TMP showing the Traffic Management Plan during the construction of the temporary parking layout prepared by Creus Engineering
- Image of 3D Site Grading Model prepared by Creus Engineering for the temporary parking lot to be replaced by a future play field.
- *Included as part of The Environmental Assessment Dated April 13th 2018:* Review of the temporary works site plan by Sartori for compliance to UL8 guidelines

3. Information provided on the Permanent Works which are proposed for the ancillary school facilities

- Architectural Site Plan AR1.3 prepared by Cornerstone architecture + SURF Architecture *Associated Architects (This documents has been superseded by the architectural site plan forming part of this DP Amendment)*
- Civil Drawing Key-2 of the proposed Southlands Access and Playfield prepared by Creus Engineering
- Civil Drawing R-2 of the proposed Permanent Parking Lot prepared by Creus Engineering
- *Included as part of The Environmental Assessment Dated April 13th 2018:* Review of the proposed site plan by Sartori Environmental for compliance to UL8 guidelines

4. Updated Site Topographic Survey

- *Reproduced below:* Current Topographic Survey prepared by Chapman Surveyors that includes the current terrain south of the main playing field, and the existing drainage works.

APPENDIX C - ENVIRONMENTAL REVIEW

MEMORANDUM

DATE: June 27, 2013

TO: David Lord – Project Manager

FROM: Alex Sartori, SES

RE: Mulgrave School – Erosion and Sediment Control Plan Review

Sartori Environmental Services (SES) has conducted a review of potential environmental issues, associated with the proposed Mulgrave School works, including the Creus Engineering Ltd. Sediment and Erosion Control Plan.

SES has the following comments regarding the proposed stockpiling of material within the properties to the south:

- Under the BC *Wildlife Act*, it is illegal to molest or destroy active bird nests not on current provincial exclusion lists. Concurrently, North American migratory birds are managed by the Canadian Wildlife Service (CWS) branch of Environment Canada (EC) under the Migratory Birds Convention Act. The CWS-recommended songbird nesting survey window for the proposed works area falls between March 15 and July 31. If clearing of the stockpile area coincides with the March 15 to July 31st window, pre-clearing surveys to identify active nests, and species, if present should be conducted. In the event that an active nest not listed in provincial exclusion lists is discovered, a 15m buffer radius from the nest will be flagged in field, and no clearing work or machinery operation will be conducted within the radius until the nest is no longer active;
- The boundaries of the construction/clearing area will be clearly marked to ensure works do not extend into the riparian area of Rodgers Creek. Only the area within these boundaries will be disturbed;
- All contractor employees and sub-contractors should be briefed on the limits of construction and the locations of the marked Environmentally Sensitive Areas during orientation prior to their first day on site;
- Ditch blocks should be installed within the perimeter ditching of the stockpiled material to provide for settling of silt laden runoff;
- Ensure site inspections occur regularly during the fall/winter period; and,
- Ensure that hydro seeding of slopes occur as soon as possible to ensure that there is sufficient growth prior to the fall rainy season.

Alex Sartori, RP.Bio

106 - 185 Forester St. North Vancouver, BC V7H 0A6 **T.** 604-987-5588 **F.** 604-987-7740 **E.** alex@sartorienv.com
www.sartorienv.com

Environmental Development Permit

April 13, 2018

Marie Maddatu
Environmental Protection Officer
District of West Vancouver
750 – 17th St.
West Vancouver, B.C. V7V 3T3

Re: 2850 Wentworth Avenue – PID: 029-308-461

Dear Marie,

Sartori Environmental Inc (SEI) has been retained by the owners of 2850 Wentworth Avenue (the "Subject Property"; Figure 1) to assess the environmental implications of existing temporary and proposed permanent construction works on the Subject Property. The Subject Property is located in the Future Neighbourhood's Development Permit Area (Policy UL8) and zoned Residential Single Family Zone 8 ("RS8 Zone"). The objective of this environmental development permit report (EDP) is to address requirements outlined in the District of West Vancouver (DWV) letter of December 19, 2017 and to conduct an environmental assessment of the Subject Property for future development and rezoning from RS8 Zone to PA1 Public Assembly Zone 1 (Schools).

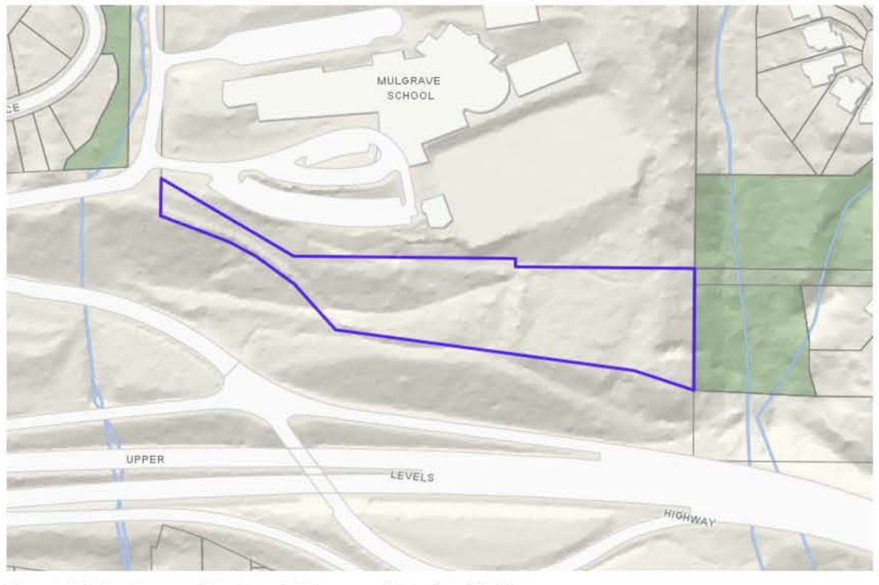


Figure 1. Subject Property (WestMap 2017; accessed March 1, 2018).

Temporary works currently constructed over the Subject Property consist of vehicle access and a parking area (the "Temporary Works"). Permanent construction works currently proposed for the Subject Property will consist of a

CORNERSTONE architecture + SURF ARCHITECTURE

playing field for Mulgrave School. SEI has assessed the existing and proposed development compliance with the UL8 Guidelines based on pre-construction conditions of the Subject Property defined herein, existing site conditions (e.g. Temporary Works), and proposed permanent works. The EDP is organized into the following sections: regulatory conditions and approach, site conditions (pre-existing and existing), proposed permanent development, environmental protection recommendations, and an evaluation of compliance to DWV Guidelines (including UL8 Guidelines).

1. Regulatory Conditions and Approach

As part of this environmental assessment the environmental regulatory framework guiding present and future development of the Subject Property was reviewed. A summary of each of the pertinent environmental regulatory policy guidelines and bylaws are summarized within this section. The approach of this environmental assessment is as follows: to assess the environmental conditions of the Subject Property (pre-existing and existing) and the proposed future Subject Property development in the context of the environmental regulations guiding development in DWV. Where appropriate, SEI has identified environmental recommendations for the Subject Property to ensure Temporary Works and proposed future development meet the intent of the DWV environmental regulations for development.

UL8 Policy Guidelines

Lands are designated under policy UL8 due to special conditions such as difficult terrain, sensitive environmental conditions, numerous watercourses, and the need to coordinate the provision of various public services and facilities, including road and transit. This assessment will identify impacts of development on the site as they relate to sensitive environmental conditions (including watercourses) and provide recommendations regarding how the site's natural features will be protected. Site conditions relating to difficult terrain and the provision of public services and facilities (including road and transit) are not assessed in this report. The assessment consists of the identification of natural features to be retained and protected, recommendations for site development to minimize disturbance, and plans for site restoration of disturbed areas.

Watercourse Protection Bylaw 4364, 2005/ Creeks Bylaw No. 3013, 1982

The DWV Watercourse Protection Bylaw 4364, 2005 applies to all public or privately-owned land and identifies requirements for ensuring that watercourses are protected during development works; whereby, no obstruction, impedance or fouling of a watercourse system is permitted. This bylaw requires that construction projects follow an erosion and sediment control (ESC) process. This assessment identifies ESC measures and/or requirements, where appropriate, for Temporary and Proposed works.

The Creeks Bylaw No. 3013, 1982 regulates development adjacent to streamside protection areas; whereby, creek fouling is not permitted, and construction, removal or deposition of materials within a streamside protection area requires permission from the District. The Subject Property streamside protection area is defined as 30-m from top of watercourse bank under current zoning (Future Neighbourhood's Development Permit Area Policy UL8). This assessment delineates streamside protection setbacks for the Subject Property, identifies development that will interface with the streamside setbacks (existing Temporary or permanent Proposed works), and prescribes streamside protection measures for those works, where appropriate.

Interim Tree Bylaw No. 4892, 2016

The Interim Tree Bylaw regulates the cutting of trees on privately owned land. Under this bylaw trees identified for protection include any tree species located within 15-m of watercourse top of bank, species 75 cm in diameter or larger, or Arbutus and Garry oak trees 20 cm in diameter or larger, measured 1.4 meters from the ground. Any tree removal proposed as part of subject property development must be in adherence of the Interim Tree

Protection Bylaw and will require the retention of appropriate tree cutting permits and a certified arborist to provide a tree assessment.

2. Site Conditions and Works

The Subject Property is located north of the Upper Levels Highway westbound exit 8 turnoff. It is bordered by Chelsea Close Park along its east property line, Mulgrave School along its north property line, and highway right-of-way to the south and west. A tributary to Pipe Creek is located west of the Subject Property and Rodgers Creek is located east of the subject property. Both watercourses are located off-property and flow in a southerly direction. The Subject Property is accessed from Cypress Bowl Lane from the west.

2.1 Pre-Existing Conditions

SEI was unable to determine pre-existing conditions of the Subject Property in the field prior to the installation of the Temporary Works (driveway and parking area). The pre-existing site conditions defined herein are based on available records and consist of: Chapman Land Surveying subject property 2015 survey, District of West Vancouver 2016 Orthophotos, 2016 Orthophotos collected on behalf of the applicant, review of drawing 12124 D-3 and 16502 R-3 from Creus Engineering Ltd and discussions with Creus Engineering Ltd. SEI is of the understanding that works associated with clearing, fill placement, and associated site drainage works along the east side of the Subject Property were completed prior to the Temporary Works installation and represent pre-existing site conditions. The attached Drawing 1 shows pre-existing site conditions of the Subject Property based on 2015 land survey and 2016 orthophoto of the Subject Property.

Pre-existing site conditions consisted of a gravel access road east off-of Cypress Bowl Lane that extends east through the Subject Property and abuts the fill placement area (Road-1). A second road extends onto the Subject Property from Mulgrave School (Road-2). Road-2 is gravel and extends eastwards parallel to the north property line; the Road-2 and its associated structures are located entirely outside of the 30-m riparian setback of Rodgers Creek. Within the Subject Property Road 2 is delineated by lock blocks. Within the fill placement area there is a sediment pond located within the 30-m setback from top of bank of Rodgers Creek. Outflows from the sediment pond were directed westward away from the riparian area through a gravel-lined ditch for discharge along the west side of the fill slope.

Pre-existing site vegetation assessment is limited to review of 2016 DWV orthophotos and is of limited resolution. West of the fill placement area vegetation consists of mixed forest dominated by deciduous trees and low-lying shrubs. East of the fill placement location vegetation consists of second-growth conifer dominated forest associated with Rodgers Creek riparian habitat. Environmental features assessed as part of this EDP for the Subject Property are described below. The fill slope area shows minor recruitment of vegetation; however, appears to be primarily exposed surface fill material.

Rodgers Creek

Rodgers Creek is located east of the Subject Property. Rodgers Creek right top of bank and 30-m riparian setback is located through the east side of the Subject Property. The right bank of Rodgers Creek is steeply sloped and is approximately 40 m from the high water mark of Rodgers Creek. Rodgers Creek (Watershed Code: 900-072300) is a 3.18 km long stream with a stream order of one and stream magnitude of one (MoE HabitatWizard accessed: February 27, 2018). Fish presence documented in Rodgers Creek includes Chum salmon (*Oncorhynchus keta*) and coho salmon (*O. kisutch*) observed near its confluence with Burrard Inlet approximately 1.6 km downstream from the Subject Property. There are two documented barriers to fish movement located downstream of the Subject

Property that are anticipated to limit fish access to upstream habitat. Based on historical fish salvages in the vicinity, no fish presence was observed upstream of Highway 1.

Tributary to Pipe Creek

A tributary to Pipe Creek is located west of the Subject Property. The 30-m riparian setback from top of bank for the tributary to Pipe Creek does not encroach within the Subject Property. Subject Property stormwater drainage along the westernmost sections of the property may discharge into the tributary to Pipe Creek off-property. Riparian setbacks of this watercourse do not extend into the Subject Property boundaries.

Drainage-1

Drainage-1 is located at the northeast corner of the Subject Property and functions to convey site drainage from the Subject Property to Rodgers Creek. Drainage-1 collects stormwater runoff from installed storm infrastructure, underneath of the fill material location, and conveys flow within an approximately 45 m long ditch due east prior to discharging into Rodgers Creek. Pre-existing conditions of Drainage-1 were not completed by SEI.

2.2 Existing Conditions

SEI visited the Subject Property on February 19, 2018 and March 21, 2018. During the site visit SEI conducted field reconnaissance of the entire Subject Property to identify/confirm sensitive environmental features on site and confirm the extent of the existing Temporary Works. Drawing 2 shows the 2018 survey of the Subject Property, including the Temporary Works, and delineates watercourse protection setbacks. With the exception of the Temporary Parking Lot footprint, the remainder of the Subject Property existing conditions remain unchanged from site conditions described in Section 1.1.

A portion of the Temporary Works, associated with the temporary parking lot, encroaches within the 30-m riparian setback of Rodgers Creek (~ 326 m^2). The entire Temporary Works footprint is located over surfaces associated with pre-existing earthworks excavation and grading. The Temporary Parking Lot and associated approach road ("Road-2"; enters the Subject Property along its north property boundary) consist of gravel surfaces. The closest structure associated with the Temporary Parking lot is located 19.6 m from Rodgers Creek top of bank. Sections of the Temporary Works fill slope, including slopes adjacent to the Rodgers Creek riparian setback, are exposed and SEI identified active erosion. Within Rodgers Creek streamside protection setback area remnant ESC structures (silt fence) were observed.

Drainage-1 flows discharge from a headwall structure at the base of the east side of the fill slope and conveys stormwater from the Subject Property to Rodgers Creek. At the time of assessment, Drainage-1 was dry. Exposed and deteriorating geotextile fabric was observed within the upstream 30-m of Drainage-1 and substrates largely consisted of cobble and gravels. The bankfull width of the channel is approximately one meter in length and the channel gradient is steep (>25%). Large woody debris was observed throughout the channel. It is anticipated that Drainage-1 flows intermittently throughout the year.

Open-channel stormwater conveyances observed on the Subject Property included: Drainage-1, Storm-1, Storm-2, and Storm-3. Storm-1 conveys stormwater flows from the upslope property through a pipe that outlets to the fill slope and discharges into a west-flowing ditch-line along the southern property perimeter. Storm-2 is a road ditch that collects flow seepage along the upslope side of Road-1 in the center of the Subject Property and flows in a westerly direction off the Subject Property. Storm-3 is a shallow ditch located at the upslope side along the western extent of Road-1. These open-channel conveyances were created by historical development and function primarily as flow conveyance corridors for stormwater from upslope lands and roadways.

Native species identified on and adjacent to the Subject Property include but are not limited to the following species:

- Trailing blackberry (*Rubus ursinus*)
- Salmonberry (*Rubus spectabilis*)
- Bigleaf Maples (*Acer macrophyllum*)
- Red alder (*Alnus rubra*)
- Salal (*Gaultherion shallon*)
- Clover sp. (*Trifolium sp*.)
- Sword fern (*Polystichum munitum*)
- Western red cedar (*Thuja plicata*)
- Douglas Fir (*Pseudotsuga menziesii*)
- Western hemlock (*Tsuga heterophylla*)
- Bracken fern (*Pteridium aquilinum*)

Conifer dominated stands are located within the riparian setback from Rodgers Creek and along the southeast boundary of the Subject Property. West of the fill slope the forest stand becomes dominated by deciduous trees predominantly red alder (*Alnus rubra*). Wildlife trees are present throughout the riparian corridor adjacent to Rodgers Creek and provide suitable habitat to a variety of resident wildlife. The placement of fill material within and adjacent to the 30-m riparian setback of Rodgers Creek has created edge habitat between site development and riparian habitat. The edge habitat boundary has the potential to promote the recruitment of invasive species to the development site and adjacent riparian areas. Non-native and invasive species observed on and adjacent to the Subject Property include the following:

- English Ivy (*Hedera helix)*
- Yellow Archangel (*Lamium galeobdolon*)
- Butterfly Bush (*Buddleja davidii*)
- Scotch Broom (*Cytisus scoparius*)
- Common burdock (*Arctium minus*)
- Broadleaf dock (*Rumex obtusifolius*)
- Himalayan Blackberry (*Rubus armeniacus*

2.3 Proposed Development

Proposed development on the Subject Property consists of the conversion of the Temporary Parking lot area into a permanent playing field for Mulgrave School. The footprint of the permanent playing field will be over the same footprint extents of the existing Temporary Parking lot (See Drawing 3). The closest structure associated with the permanent playing field is located 19.6 m from Rodgers Creek top of bank. The permanent playing field surfaces/structures will consist of artificial turf surface, lighting for the playing field and parking lot areas, and edging around the field area consisting of hard surfaced material (paving stone or concrete). All proposed future structures within the 30-m riparian setback will be over existing fill placement areas. Playing field installation equipment, materials, and machinery will access the works area from the existing access Road-2 south from Mulgrave School. Minor fill placement works will be required; however, all fill placement is located entirely outside of the 30-m setback from Rodgers Creek top of bank. No equipment or machinery use from within 15-m of Rodgers Creek top of bank will be required to install the permanent playing field.

3. Environmental Recommendations

The following environmental recommendations are provided for the Subject Property to ensure that existing site conditions and proposed future works are in accordance with the District of West Vancouver UL8 Guidelines and environmental protection bylaws.

3.1 Recommendations for Existing Site Conditions:

- Install permanent riparian protection fencing within the Rodgers Creek streamside protection setback as specified in Drawing 3 to deter human encroachment.
- Plant/seed all exposed fill-slope areas in Spring 2018 with a suitable invasive species free seed mix or native riparian suitable plant species (April – June) to prevent erosion along these slopes and prevent the establishment of invasive vegetation to these areas.
- Remove all non-functional ESC measures located within the Rodgers Creek Streamside Protection setback area and dispose of at an appropriate disposal facility.
- Remove invasive species that have established along the edge habitat created within the Rodgers Creek streamside protection setback area (Drawing 3).
- Implement native riparian planting as per Drawing 3 to offset that portion of the Temporary Parking lot footprint located within the 30-m riparian setback and to provide additional vegetative buffer between edge and riparian habitat.

3.2 Recommendations for Proposed Site Works:

- All future development works should be conducted based on a stormwater management plan developed by a qualified Engineer for the Subject Property.
- Retain a certified arborist to conduct an arborist report of tree health and provide appropriate recommendations for trees located within the streamside protection area of Rodgers Creek prior to any tree removal. All tree removal must be conducted under a DWV tree removal permit and in accordance with recommendations from a certified arborist.
- The applicant should retain a certified arborist to conduct a Hazard Tree assessment of those trees within the Rodgers Creek streamside protection area that pose a safety risk to human safety or infrastructure.

<u>Construction Mitigation Measures - Erosion and Sediment Control</u>

Due to the proximity of proposed works to Rodgers Creek, Drainage-1, and the steep slope gradients of the site, an Erosion and Sediment Control (ESC) Plan should be developed for maintenance of ambient water quality during the proposed work activities. Information pertaining to location and details of silt fencing, site drainage management and treatment, access/egress route armouring, catch basin protection, tree protection, and dewatering should be included, as appropriate. It is anticipated that the proposed works will not require extensive earthworks or concrete works – in the event these works are required additional ESC mitigation measures should be implemented. At a minimum, the following ESC measures should be implemented during the proposed works:

- Machinery access and truck loading should be limited to prepared rock/gravel access and/or existing paved driveway areas only.
- If significant trucking is expected, sweeping should be conducted on affected areas of Cypress Bowl Lane to recover any fines tracked onto the road.
- Catch basin protection (silt sacks) should be installed on adjacent catch basins and maintained regularly to ensure proper functioning.
- All import material must be clean, inert, and free of contamination.

Prior to issuance of a building permit by the DWV, the owner and/or developer will be required to engage an appropriately qualified ESC supervisor to monitor compliance with the approved ESC Plan as well as requirements of the DWV Watercourse Protection Bylaw 4364, 2005. As a requirement, ESC inspections are set based on the following schedule:

- Biweekly inspections **1 June – 30 September** (dry season),
- Weekly inspections **1 October – 31 May** (wet season), and

- As required during or immediately following precipitation events exceeding **20 mm within 24 hours**.

It is the responsibility of the owner and/or developer to contact their ESC supervisor prior to commencing earthworks, construction, or any other activities of ground disturbance. It is recommended that a preconstruction meeting be held to ensure that the contractors are aware of the ESC requirements.

4. Conclusions

SEI assessed the Subject Property to review the impacts of existing development associated with a Temporary Parking Lot and proposed permanent playing field partially located within a 30-m setback of Rodgers Creek right top of bank and 15-m of Drainage-1. Upon review of habitat impacts associated with existing and proposed development at 2850 Wentworth Avenue, West Vancouver, BC, it is the opinion of SEI that existing and proposed works pose no significant risk of Serious Harm to Commercial, Recreational, or Aboriginal (CRA) fisheries as defined by Sec. 35(1) of the Canada *Fisheries Act* provided that best management practices are implemented as described herein. The following is a summary of Temporary and proposed works as they relate to the Subject Property watercourse setbacks.

- **The existing and proposed development is situated on pre-existing fill placement areas with no new structures proposed within the 15-m setback of watercourse top of bank of Rodgers Creek. Within the 30-m setback of Rodgers Creek, the replanted riparian area (365 m^2) will be greater than the area impacted by structures within the 30-m setback (325 m^2).**
- **The closest structure to Rodgers Creek top of bank associated with the existing Temporary Parking lot and the proposed permanent playing field is located 19.6 m from watercourse top of bank of Rodgers Creek and 8-m from top of bank of Drainage-1.**
- **No new buildings, structures, or impervious/semi-impervious surfaces are proposed within the 19.6-m of Rodgers Creek top of bank or within 8-m of the Drainage-1 headwall structure.**
- **The implementation of the Riparian Planting Plan will serve to increase the buffering capacity of the riparian area to the watercourse, prevent invasive species encroachment, and provide additional habitat for local flora and fauna suited to native riparian conditions.**
- **The implementation of the Riparian Planting Plan surface stabilization planting/seeding will function to mitigate erosion and the potential for invasive species recruitment to fill slope exposed surfaces within the Rodgers Creek 30-m setback from top of bank.**

Please contact the undersigned if you require any additional information or clarification of the above.

Sincerely,

Sartori Environmental Inc

Sarah Wyness, R.P.Bio.

(3) Attachments

- Drawing 1: Pre-Existing Conditions
- Drawing 2: Existing Conditions
- Drawing 3: Proposed Works

5. Photodocumentation

Photo 1. Road-2 approach onto the Subject Property from Mulgrave School; gravel surfaced (2018.03.21).

Photo 2. Temporary Works consisting of Temporary Parking lot; gravel surfaced (2018.03.21).

Photo 3. Drainage-1 from the Subject Property; looking downstream (2018.03.21).

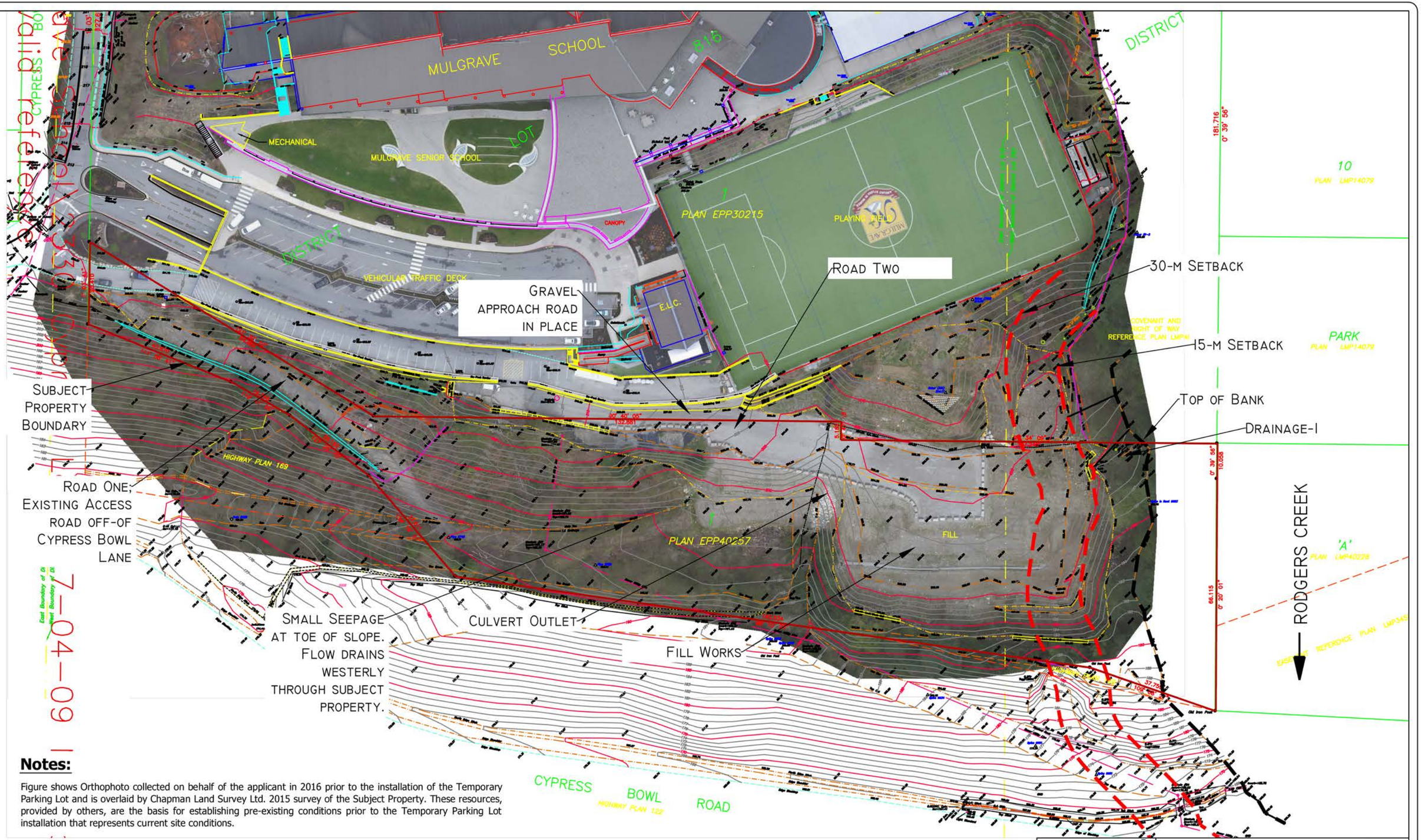
Photo 4. Riparian habitat adjacent to Rodgers Creek right bank above top of bank (2018.03.21).

Photo 5. Invasive species recruitment within Rodgers Creek 30-m setback; Himalayan Blackberry. Remnant ESC measures identified and non-functional (2018.03.21).

Photo 6. Exposed fill slope adjacent to and within the 30-m setback from Rodgers Creek top of bank; rilling soil erosion identified (2017.06.01).

Photo 7. Looking at existing dwelling located within the 15-m setback; includes paver driveway and surfaces and garage (2018.03.21).

Photo 8. Typical vegetation within the western portion of the Subject Property (2018.03.21).



Notes:

Figure shows Orthophoto collected on behalf of the applicant in 2016 prior to the installation of the Temporary Parking Lot and is overlaid by Chapman Land Survey Ltd. 2015 survey of the Subject Property. These resources, provided by others, are the basis for establishing pre-existing conditions prior to the Temporary Parking Lot installation that represents current site conditions.

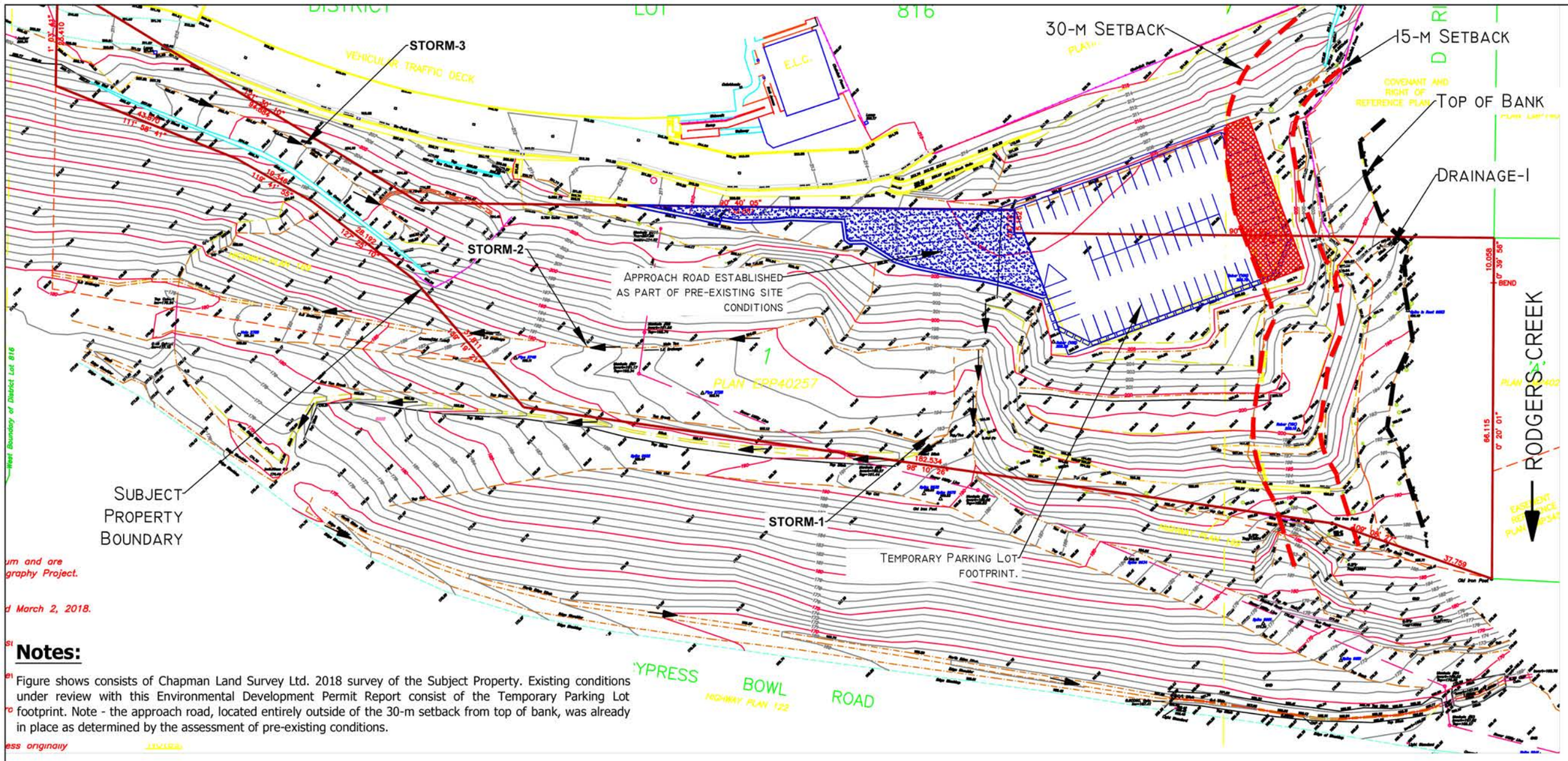
— — — TOP OF BANK

— — — DWV SETBACKS

sartori environmental

2350 WENTWORTH AVENUE PRE-EXISTING CONDITIONS

DATE 2018-04-11	DRAWING I: PRE-EXISTING CONDITIONS	REV 00
DRAWN BY S.W.	SCALE 1:1000	



Notes:

Figure shows consists of Chapman Land Survey Ltd. 2018 survey of the Subject Property. Existing conditions under review with this Environmental Development Permit Report consist of the Temporary Parking Lot footprint. Note - the approach road, located entirely outside of the 30-m setback from top of bank, was already in place as determined by the assessment of pre-existing conditions.

DIRECTION OF WATERCOURSE/ DRAINAGE FLOWS

TEMPORARY WORKS

FOOTPRINT WITHIN 30-M SETBACK 326 M²

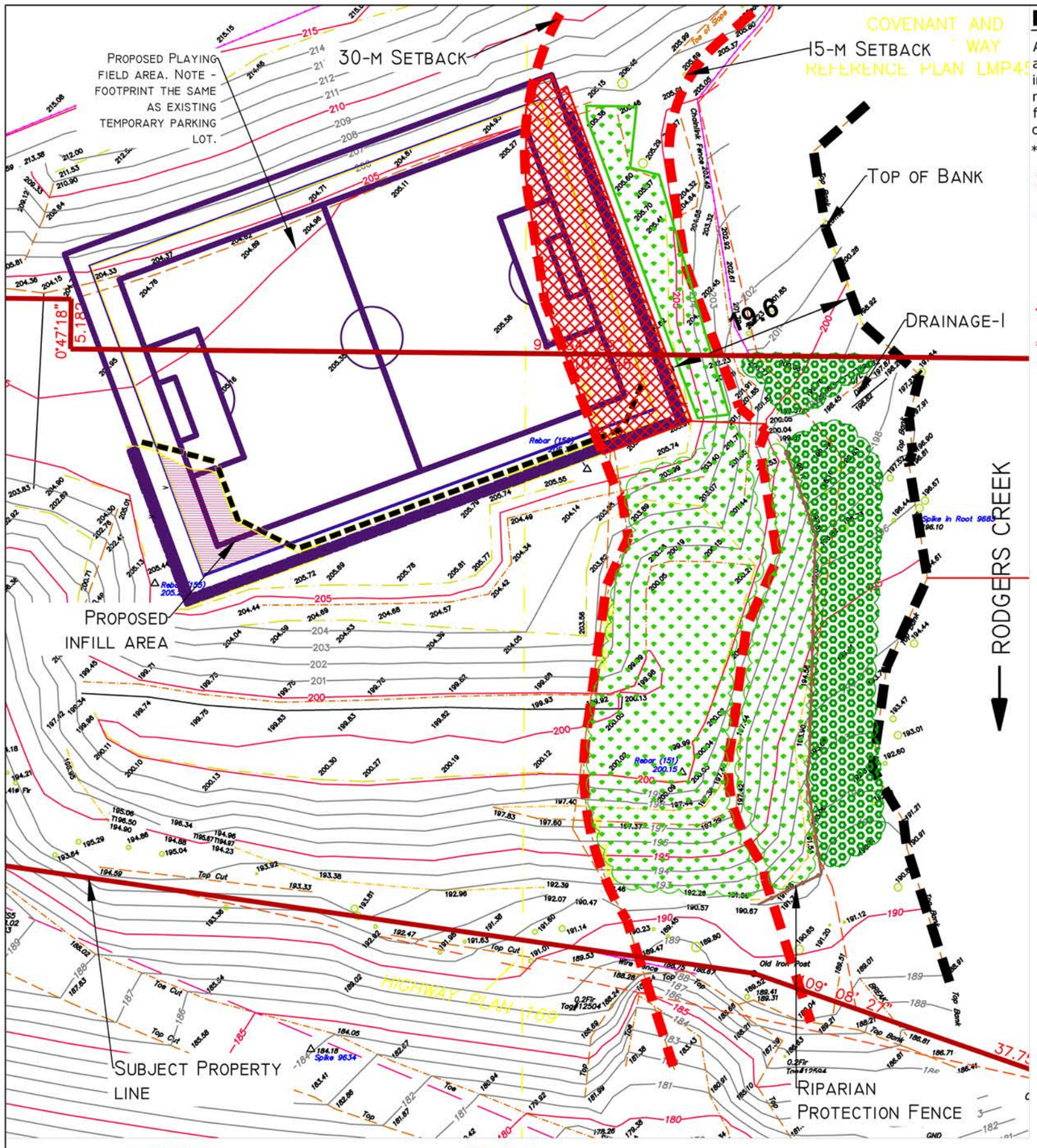
TOP OF BANK

DWV SETBACKS

sartori environmental

2350 WENTWORTH AVENUE
EXISTING CONDITIONS

DATE 2018-04-11	DRAWING 2: EXISTING CONDITIONS	REV 00
DRAWN BY S.W.	SCALE 1:1000	



Riparian Planting Plan

Approximately **365 m²** of planting is proposed at an average density of 1 plant per **1.5 m²** within identified riparian planting areas to accommodate for the existing and proposed works on the subject property, provide a protective vegetative buffer between land use on the subject property and the adjacent watercourse and to increase the overall biological productivity of the watercourses riparian zone. Plant species have been selected with consideration to plant community, competitive nature, shade tolerance, growth rates and rate of spread. Efforts should be taken to retain existing native vegetation in-place or by careful storage and transplant. The following planting list is recommended (if species substitutions are desired due to reasons of aesthetics or plant stock availability, Sartori Environmental Inc should be contacted at 604.987.5588 to consider the approval):

Note Nurseries should be contacted as early as possible as larger specimens may need to be special ordered.

Coniferous Trees
(3.0 - 5.0m Spacing from other coniferous trees, and purchased at a minimum height of 2.0m, unless otherwise specified)

Western Redcedar Thuja plicata
Western Hemlock Tsuga heterophylla
Doulgas Fir Pseudotsuga menziesii

TOTAL - 25*

* coniferous trees must be purchased at a height of at least 2.0 m

Deciduous Trees
(1.5 - 3.0m spacing from other deciduous and coniferous trees, and purchased at a minimum height of 1.2m, unless otherwise specified)

Western Flowering Dogwood Cornus nuttalli
Red Alder Alnus rubra
Bitter Cherry Prunus emarginata
Cascara Rhamnus purshiana

TOTAL - 40**
** deciduous trees must be purchased at a height of at least 1.2m.

Shrubs
(0.25 - 1.0m spacing from other vegetation and purchased in minimum #1 or one gallon containers)

Salmonberry Rubus spectabilis
Baldhip Rose Rosa gymnocarpa
Red-osier Dogwood Cornus stolonifera
Red Elderberry Sambucus racemosa
Red Huckleberry Vaccinium parvifolium
Pacific ninebark Physocarpus capitatus
Western Swordfern Polystichum munitum
Deer Fern Blechnum spicant
Salal Gaultheria shallon

TOTAL - 185

Purchasing, Site Preparation and Planting

Botanical names should be referenced when purchasing to ensure accuracy and all specimens should be of guaranteed nursery stock. Purchased stock should be tagged with species name, and tags should be left on after planting for the purpose of planting confirmation. Nursery stock should be a minimum of two years old at purchase to ensure developed root systems and increase the likelihood of survival. Once plant stock is received onsite, specimens should be stored in a cool, shady location and watered regularly. Note: healthy native riparian vegetation existing currently on-site may be counted to achieve the prescribed planting densities herein.

Planting should be undertaken during the fall (Sep - Oct) or spring (Mar - Apr) for maximized probability of survival. Prior to planting, it should be ensured that adequate soil structure and nutrient content exist through appropriate storage of existing onsite material or import of organic growing medium. If growing medium is to be retained from onsite, consideration should be given to organic stockpile depth (no greater than 1.0m) and length of storage time (ideally less than 1 month) to maintain nutrient cycling, microbial activity and viability of native seed stock. Once placed, factors affecting soil compaction (i.e. traffic, machine movement, material storage) should also be considered. If material import is required for growing medium, it should be inert and certfied free of invasive or noxious weed species. Holes should be dug 2-3 times larger that the size of the roots and soil should be non-compacted. Root ball untangling, pruning, splitting and burlap sack removal should be done in a means suitable to allowing the newly planted roots to spread and avoid root girdling. If in doubt, supplier planting prescriptions should be consulted. Regular watering and/or fertilizer application may also be required to ensure adequate recruitment.

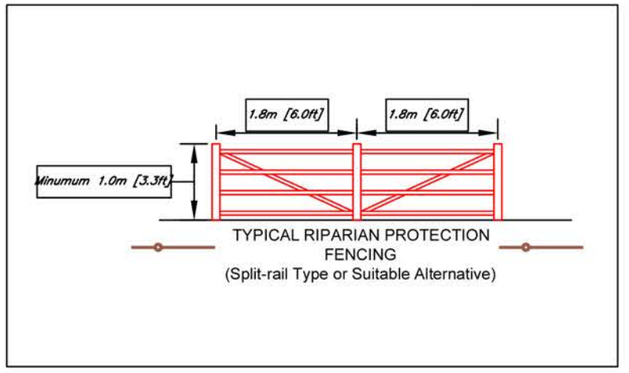
The following plant spacings are included as a guideline, and clustering of plants around preferred microsites (e.g., woody debris, large trees, wetted depressions on dry sites, drier mounds on wet sites, etc.) is preferred to a standard grid formation. **Coniferous Trees** should be 2.0m (Min) height and planted 3.0 - 5.0m away from other coniferous trees. **Deciduous Trees** should be 1.2m (Min) height and planted 1.5 - 3.0m away from other coniferous and deciduous trees. **Shrubs** should be purchased in minimum 1 gallon pots and planted 0.25 - 1.0m away from other vegetation.

All acquired plant materials shall be healthy, with well developed root systems and top growth, and shall be free of disease, insect infestation and the following defects at all times: broken tops, torn roots and abrasions of bark on trunk and branches; dried out root systems; prematurely opened or damaged buds; dry, loose or broken ball of earth; evidence of heating, moulding, or freezing damage; thin, poor root or top systems, and abnormal leaf colour.

Invasive and Non-native Species

All invasive plant species and non-native landscaped vegetation located within the identified riparian planting polygon and surface stabilization polygons should be removed (with their root structures) to the extent practicable. Invasive plant species located along fence lines, stairs, retaining walls, deck edges or steep slopes where machine access is restricted, or where vegetation may be integral to existing structural components or slope stability, should be removed by hand. Invasive species located in riparian areas where machine access is available may be managed through other mechanical means (e.g., us of a small-rubber tracked machine). Extensive species-specific information exists regarding the removal and control of invasive species, and if required, Sartori Environmental Inc can provide further direction during the landscaping/vegetation maintenance phase of the proposed works to ensure adequate removal and disposal. At minimum, invasive species present within the ToB to 30-m setback should be removed including all root structures and local topsoil strata, and disposed of in an appropriate manner. During the site assessment, the following invasive species were observed within the 30 m riparian setback:

- Himalayan Blackberry (Rubus discolor)
- English Ivy (Hedera helix)
- Butterfly Bush (Buddleja davidii)
- Scotch Broom (Cytisus scoparius)
- Common burdock (Arctium minus)
- Broadleaf dock (Rumex obtusifolius)
- Yellow archangel (Lamium galeobdolon)



TYPICAL RIPARIAN PROTECTION FENCING
(Split-rail Type or Suitable Alternative)

sartori environmental

2350 WENTWORTH AVENUE
PROPOSED SITE PLAN
HABITAT BALANCE

DATE 2018-04-11	DRAWING 3: PROPOSED WORKS	REV 00
DRAWN BY S.W.	SCALE 1:500	

APPENDIX D - SLOPE STABILITY REVIEW

DAVIES GEOTECHNICAL INC.

MULGRAVE SCHOOL

SLOPE STABILITY REVIEW
EVALUATION OF SETBACKS FOR FUTURE DEVELOPMENT

PROJECT No: I092
DATE: Feb 15, 2012

TABLE OF CONTENTS

ATTACHMENTS

1.0 INTRODUCTION

In response to your request, Davies Geotechnical Inc. has completed a landslide assessment for the slopes located on the east side of the existing Mulgrave School property located in West Vancouver, B.C. The objective of this work was to provide a plan showing the safe limits for future development or re-development of the property.

This work was carried out in compliance with the task force report titled "Guidelines for Legislated Landslide Assessments for Proposed Residential Developments in BC", published by APEGBC in May 2010 .

2.0 SITE DESCRIPTION

The Mulgrave School property is located north of Highway # 1 in West Vancouver and is accessed from the Cypress Bowl exit. The property is bounded to the west by Rodgers Creek – Trib N, and the east by Rodgers Creek.

Grades within the property slope down from north to south. A series of near horizontal benches exist within this sloping property that form platforms for the existing school building, auxiliary buildings, play fields and parking areas. A number of modular block retaining walls were observed within the property.

3.0 SUBSURFACE CONDITIONS

3.1 Site Geology

Review of Geologic Survey of Canada Map 1486 A indicates that the site is located within an area underlain at relatively shallow depth by very dense glacially deposited soils and bedrock. Our experience with numerous projects in close proximity to the school site indicated that the thickness of overburden soils overlying these dense glacially deposited soils ranges within 1 meter to 2 meters, with occasional increases in thickness to 3 meters at low lying depressions or in-filled channels.

The overburden soils generally consist of a mixture of silt and sand with little to some gravel. These soils are generally in a loose to medium dense state.

The underlying glacially deposited soils, while somewhat variable in nature, generally consisting of a well graded mixture of silt, sand, and clay with some gravel and boulders. These soils are very dense and relatively impermeable.

3.2 Observed Soil Conditions

Davies Geotechnical Inc. completed a traverse through the Rodgers Creek gully area on February 8, 2012. During this reconnaissance, we observed and noted the soil profile and soil conditions at locations where they had been exposed. In general, the depth to the very dense till-like soils was 1 meter or less at these soil exposures.

3.3 Groundwater

Groundwater levels typically fluctuate seasonally. During the summer months when there is little or no precipitation, water levels within the soils can be very deep. During the winter months and after long periods of sustained precipitation, a perched water layer develops at the top of the low permeability till-like soil. Typically, during this time the till-like soils are found to be fully saturated.

4.0 SLOPE STABILITY ANALYSES – EXISTING SLOPES

4.1 Methodology

The assessment of the risk of slope failure can be expressed as a factor of safety against slope failure. This factor of safety is represented by the ratio of the force or moment resisting slope failure divided by the force or moment driving slope failure. It is generally accepted by the engineering community that a factor of safety in excess of 1.5 represents a condition of very low risk of slope failure.

Davies Geotechnical Inc. completed analysis of the existing slopes on the east side of the property utilizing limit equilibrium methods of analysis to assess the factor of safety of these slopes. The Morgenstern and Price procedures were adopted as they are considered a rigorous method of analysis and consider force equilibrium and moment equilibrium.

4.2 Input Parameters

4.2.1 Slope Geometry

The geometry of the slopes adjacent to Mulgrave School was modelled using the topographic information provided by Webster Engineering. This information included a site plan with topographic contours, as well as, five cross sections through the east side of the Mulgrave School property and the west bank of the Rodgers Creek gully. The site plan attached to this report illustrates the orientation and location of the cross sections considered in this study. Figures 2 and 3 provide the geometry of the five cross sections considered in our stability analyses.

Due to the limited access to the study area, a site specific investigation of soil conditions was not practical. Therefore, assumptions were made by Davies Geotechnical Inc. with respect to the thickness of individual soil layers, based upon previous experience in the area.

4.2.2 Soil Parameters

The input parameters relating to the soil properties, such as unit weight and shear strength, were estimated based upon visual classification, reported text book values, and experience. These parameters are listed in Table 1.

Table 1: Soil Parameters Used for Stability Analysis

Soil or Rock	Unit Weight (kN/ m^3)	Friction Angle (degrees)	Cohesion (kPa)
Overburden	18	33	5
Till-Like	21.5	39	50

4.2.3 Water Levels

Groundwater levels are expected to fluctuate seasonally and with precipitation. We anticipate based upon our experience in the area that the worst case condition with respect to water levels and their impact upon slope stability will be the "winter" condition where a perched water table develops at the top of the relatively impermeable till-like soils.

4.2.4 Surcharge Loads

The stability analysis carried out by Davies Geotechnical Inc. did not consider the impact of surcharge loading near the slope crest.

5.0 ACCEPTANCE CRITERIA REGARDING SLOPE HAZARDS

To our knowledge, the District of West Vancouver has not officially adopted specific criteria for the safety of soil slopes. Davies Geotechnical Inc. has completed numerous landslide assessments and has adopted safety criteria that were recently adopted by The District of North Vancouver. These criteria are summarized in Table 2.

Table 2: Acceptance Criteria

Development Type	Static	Seismic
Existing Development	greater than 1.3	greater than 1.0 or slope displacement less than 0.15m
New or Proposed Development	greater than 1.5	greater than 1.0 or slope displacement less than 0.15m

6.0 SLOPE STABILITY ANALYSIS RESULTS

The slope stability analysis was carried out for Sections 1 to 5 utilizing the input parameters summarized within the previous sections of this report. The purpose of this analysis was to determine, at each cross section, the location beyond which the factor of safety exceeded the acceptance criteria. This location is termed the "geotechnical setback" and is illustrated on Figure 1 attached to this report. The location of this safe setback line was found to vary in location depending upon the depth and steepness of the Rodgers Creek ravine.

The results of the analysis also indicated factors of safety lower than the acceptance criteria exist for shallow slip surfaces parallel with the ravine slopes. In view of the steepness of portions of the ravine and the potential for erosion and down cutting at the toe of the slope, it is likely that small shallow slope failures will occur on these existing slopes.

7.0 RECOMMENDATIONS REGARDING FUTURE DEVELOPMENT

In order to satisfy the requirements of the provincial legislation with respect to landslide safety, it is recommended that all future development on the Mulgrave School property remain on the west side of the geotechnical setback line.

Grades between the top of bank and the geotechnical setback line should remain unchanged.

The geotechnical set back line provided within this study did not consider the impact of surcharge loading. Therefore in the event that an increase in the grades within closed proximity to this setback is considered or in the event that it is proposed to construct a building or structure, a site-specific review of slope stability and foundation design should be completed by the geotechnical engineer. Structures or grade increases located beyond a line extending at 2.5 horizontal to 1 vertical from the base of the Rodgers Creek ravine to the current grade level will likely not require a site-specific assessment in terms of impact upon the stability of the Rodgers Creek ravine.

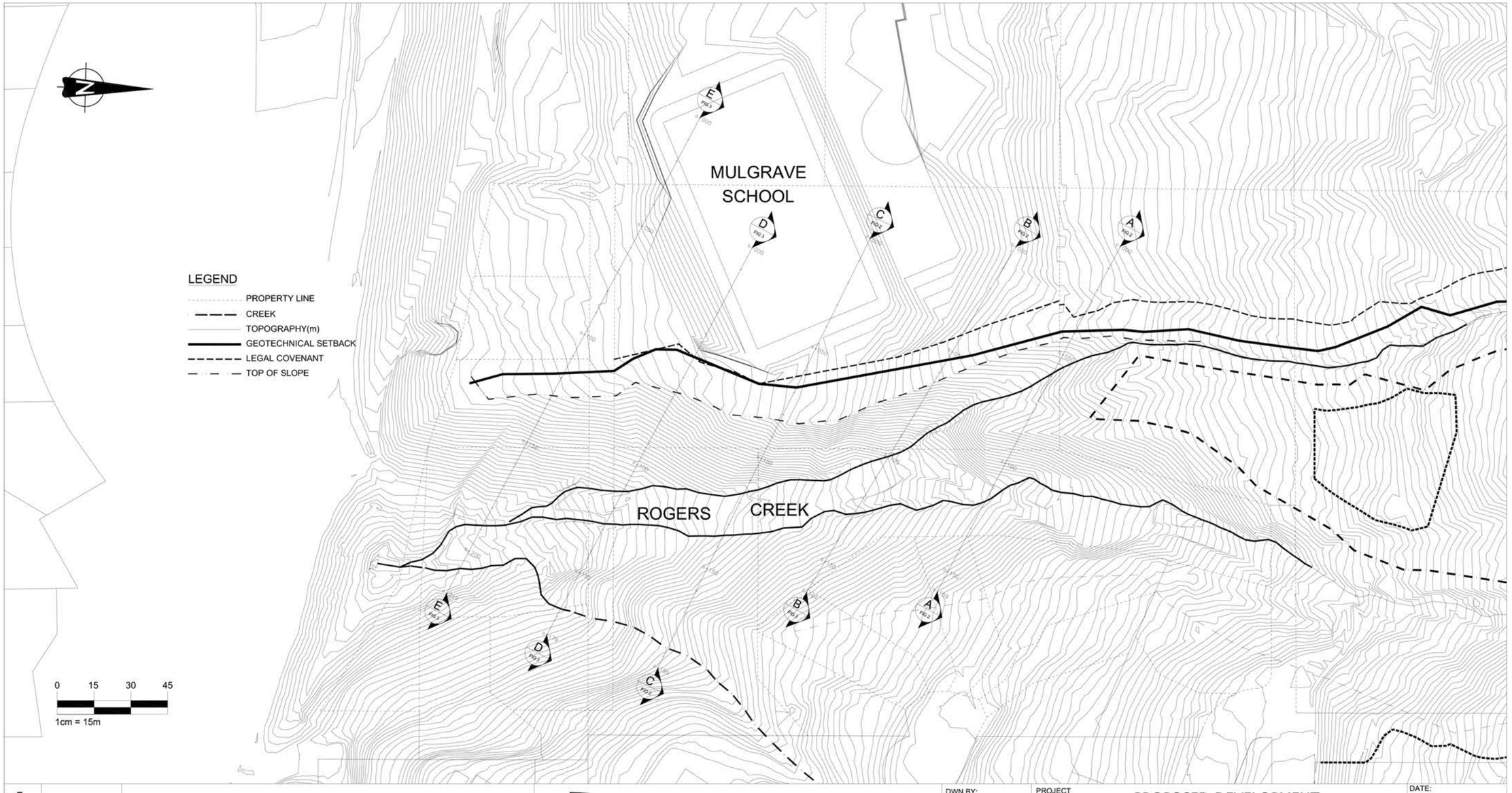
Site drainage and stormwater systems should be designed to minimize surface water flow towards the Rodgers Creek ravine.

8.0 CLOSURE

We trust that the information presented within this report meets your requirements. If you have any questions please do not hesitate to contact the undersigned at 604-395-2300.

Yours truly,

DAVIES GEOTECHNICAL INC.
Paul A. Davies, P. Eng.



REV.	DATE	REVISION
E		
D		
C		
B		
A		

DGI

Davies Geotechnical Inc.
#2 - 1520 Cliveden Avenue, Delta, B.C. V3M 6J8
Tel 604-395-2300 Fax. 604-395-2301

Client
MULGRAVE SCHOOL

DWN BY: KL
CHK'D BY: PD
APP. PD
SCALE 1:1500

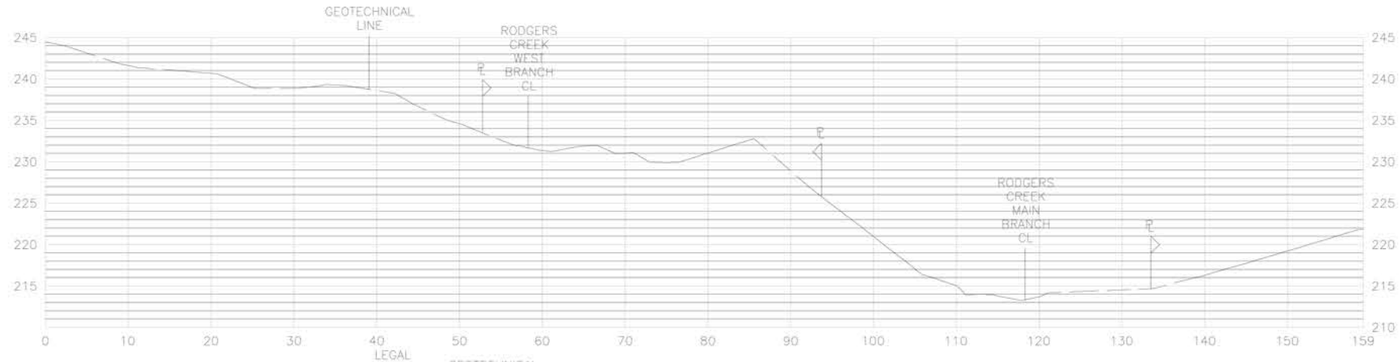
PROJECT
PROPOSED DEVELOPMENT
WEST VANCOUVER, BC

TITLE
SITE PLAN

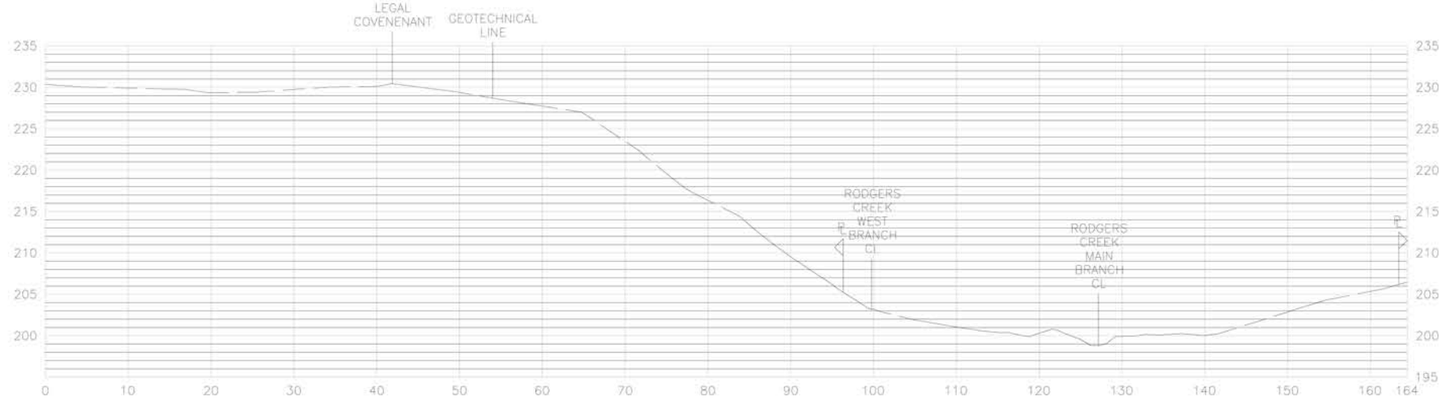
DATE: February 2012
PROJECT NO: I092
REV. NO.: A
FIGURE No. FIGURE 1

CORNERSTONE architecture + SURF ARCHITECTURE

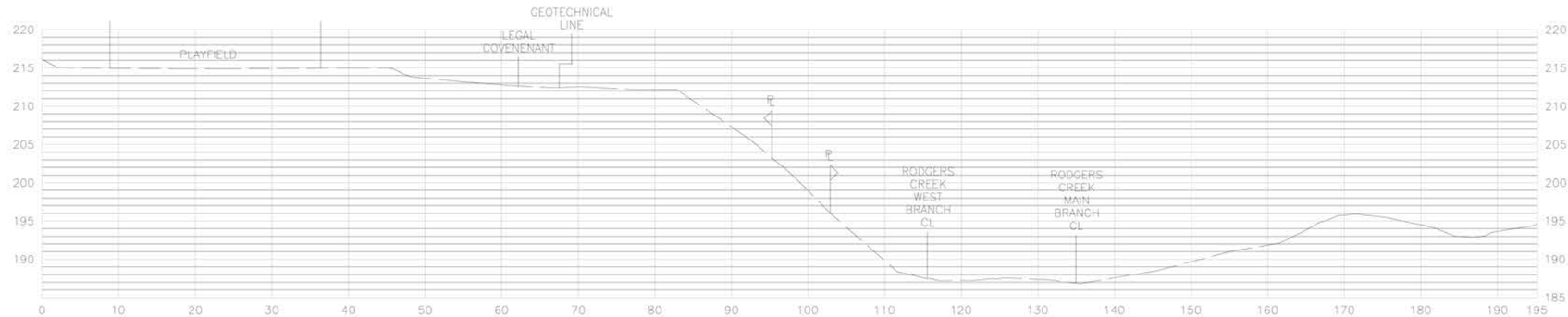
CROSS SECTION A Fig 2



CROSS SECTION B Fig 2



CROSS SECTION C Fig 2



REV.	DATE	REVISION
E		
D		
C		
B		
A		

DGI

Davies Geotechnical Inc.

#2 - 1520 Cliveden Avenue, Delta, B.C. V3M 6J8

Tel 604-395-2300 Fax. 604-395-2301

Client

MULGRAVE SCHOOL

DWN BY:	KL
CHK'D BY:	PD
APP.	PD
SCALE	AS SHOWN

PROJECT

PROPOSED DEVELOPMENT
WEST VANCOUVER, BC

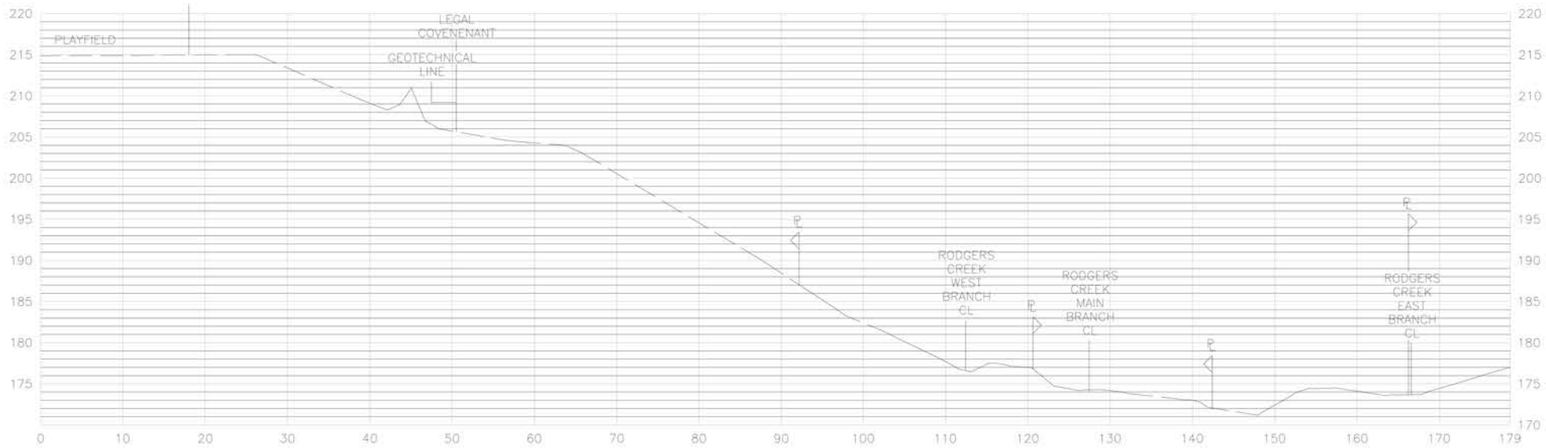
TITLE

SECTIONS A-C

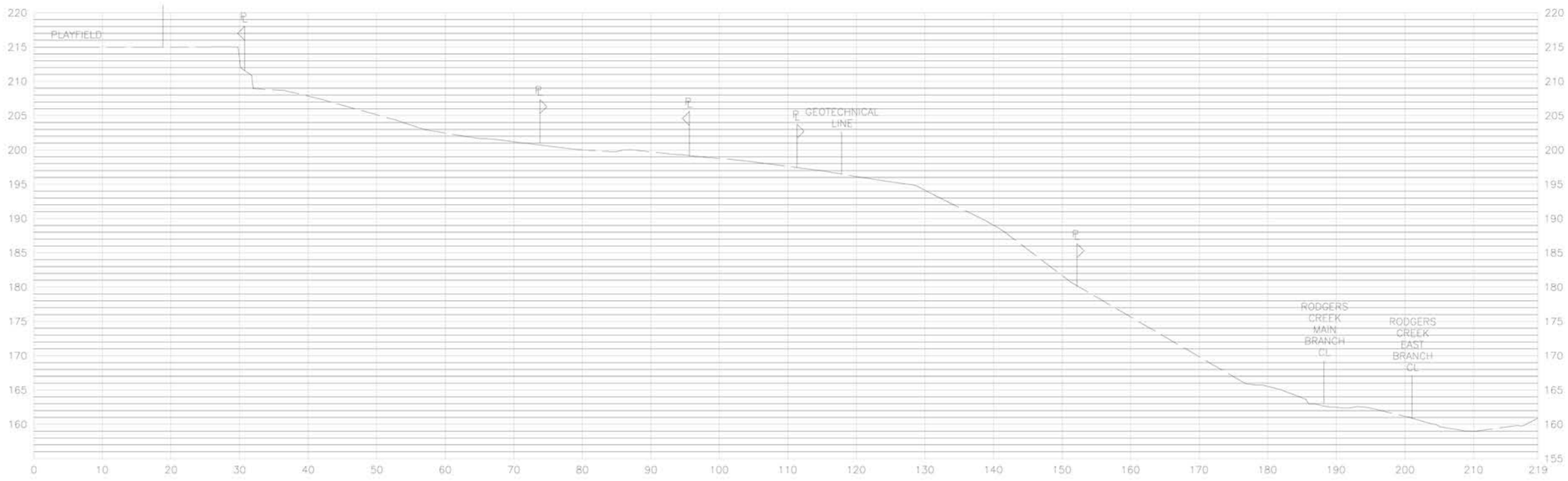
DATE:	February 2012
PROJECT NO:	I092
REV. NO.:	A
FIGURE No.	FIGURE 2

CORNERSTONE architecture + SURF ARCHITECTURE

CROSS SECTION D
Fig 3



CROSS SECTION E
Fig 3



REV.	DATE	REVISION
E		
D		
C		
B		
A		

DGI

Davies Geotechnical Inc.
#2 - 1520 Cliveden Avenue, Delta, B.C. V3M 6J8
Tel 604-395-2300 Fax. 604-395-2301

Client
MULGRAVE SCHOOL

DWN BY: KL
CHK'D BY: PD
APP. PD
SCALE AS SHOWN

PROJECT
PROPOSED DEVELOPMENT
WEST VANCOUVER, BC

TITLE
SECTIONS D-E

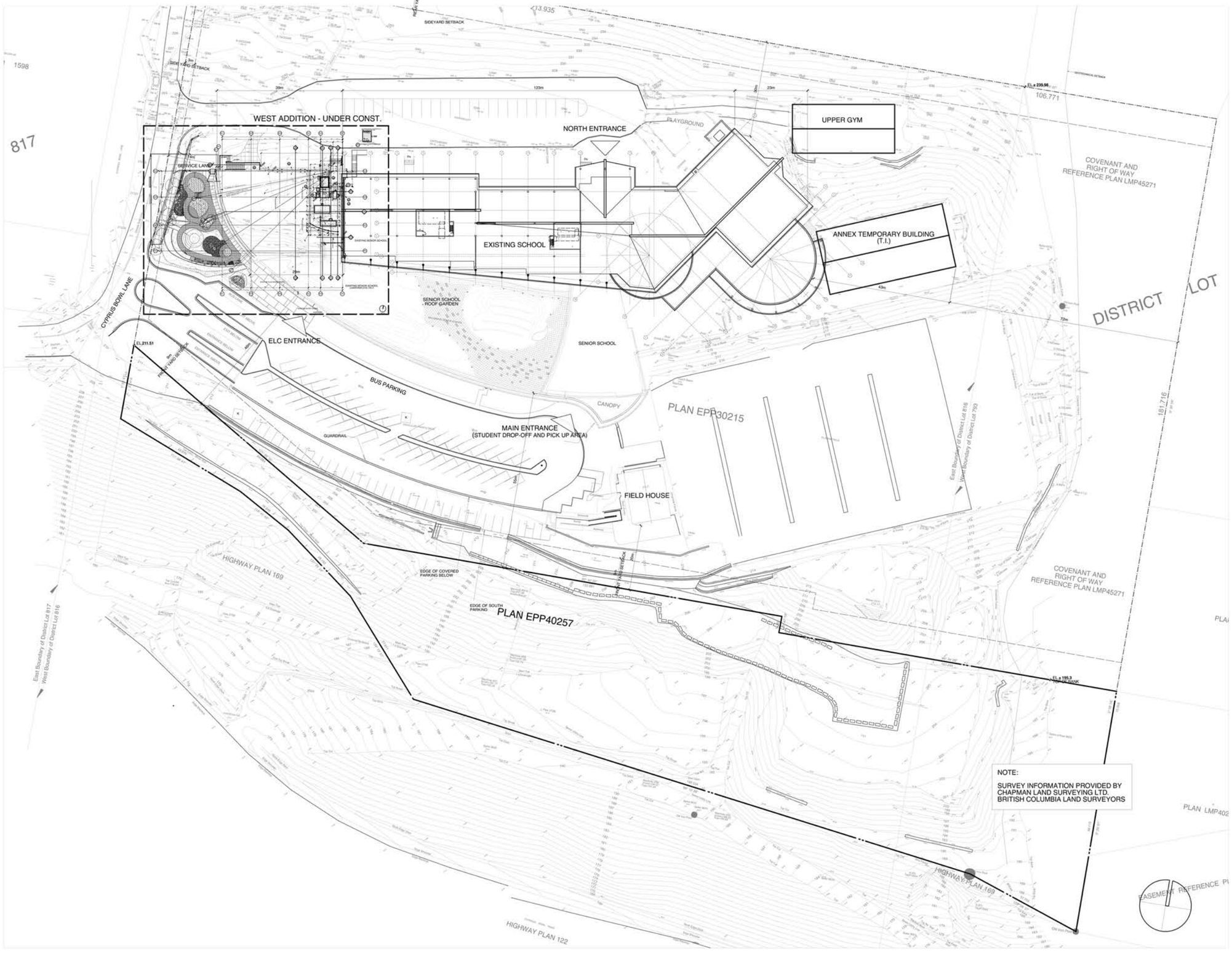
DATE: February 2012
PROJECT NO: 1092
REV. NO.: A
FIGURE No. FIGURE 3

CORNERSTONE architecture + SURF ARCHITECTURE

APPENDIX E - AERIAL PHOTO OF MULGRAVE CAMPUS

CORNERSTONE architecture + SURF ARCHITECTURE

APPENDIX F - ARCHITECTURAL SITE PLANS
AR1.1
AR1.2



CORNERSTONE architecture
+
SURF ARCHITECTURE

Associated Architects

408 - 611 Alexander Street
Vancouver, British Columbia
Canada, V6A 1E1

www.cornerarch.com
(604) 253 8800

www.surfarchitecture.com
(604) 562 2442

7. ISSUED FOR CONSTRUCTION 17/06/20
6. ISSUED FOR POST-TENDER ADDENDUM 2 17/06/06
4. ISSUED FOR TENDER 17/03/31
3. ISSUED FOR 85% REVIEW 17/03/17
2. ISSUED FOR BUILDING PERMIT 17/01/19
1. ISSUED FOR 30% REVIEW 16/11/15

REVISION / ISSUE DATE:

PROJECT:

MULGRAVE SCHOOL
WEST ADDITION

2330 Cypress Bowl Lane,
West Vancouver, BC

DRAWING:

EXISTING CONDITIONS

SEAL:

SCALE 1:500 (unless noted otherwise)

PLOT DATE DEC 12, 2017

PROJECT NO. 1623

DRAWING NO. AR1.1

PRINTED FROM FILE: 1623 MULGRAVE A2.1-4 PLANS.vwx
24x36

CORNERSTONE architecture
+
SURF ARCHITECTURE

Associated Architects

408 - 811 Alexander Street
Vancouver, British Columbia
Canada, V6A 1E1

www.cornerarch.com
(604) 253 8800

www.surfarchitecture.com
(604) 562 2442

7. ISSUED FOR CONSTRUCTION 17/06/20
6. ISSUED FOR POST-TENDER ADDENDUM 2 17/06/06
4. ISSUED FOR TENDER 17/03/31
3. ISSUED FOR 85% REVIEW 17/03/17
2. ISSUED FOR BUILDING PERMIT 17/01/19
1. ISSUED FOR 30% REVIEW 16/11/15

REVISION / ISSUE DATE:

PROJECT:

MULGRAVE SCHOOL
WEST ADDITION

2330 Cypress Bowl Lane,
West Vancouver, BC

DRAWING:

TEMPORARY PARKING LOT

SEAL:

SCALE 1:500 (unless noted otherwise)

PLOT DATE DEC 12, 2017

PROJECT NO. 1623

DRAWING NO. AR1.2

PRINTED FROM FILE: 1623 MULGRAVE A2.1-4 PLANS.vwx
24x36

APPENDIX G - GEOTECHNICAL LETTER CERTIFYING STABILITY OF THE WORKS

GeoPacific Consultants Ltd.
#215 – 1200 West 73rd Avenue, Vancouver, BC, V6P 6G5
Phone (604) 439-0922 / Fax (604) 439-9189

Mulgrave Senior School
2330 Cypress Bowl Lane
West Vancouver, BC
V7S 3H9
c/o David Lord

June 27, 2013
File: 10357

Attention: Mr. David Lord

Re: Geotechnical Review of Proposed Soil Stockpiles, Mulgrave School, West Vancouver, BC

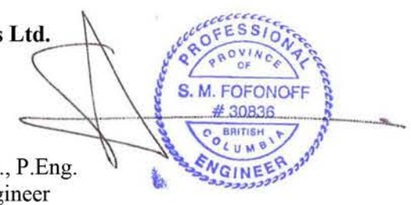
We understand that it is intended to stockpile excavated materials derived from the proposed excavation at Mulgrave Senior School in West Vancouver to the south of the existing playfield. The location and configuration of the stockpile is shown on the drawings prepared by Creus Engineering Ltd., dated June 25, 2013.

The proposed stockpile is to be up to 9 m high and comprised of a lower bench fill and an upper fill. The fill required for the lower bench is to be placed over natural soil deposits at depths ranging from 1.5 to 5 m. The drawings indicate side slopes of 1.5H to 1V. The upper fill is to be set back from the top edge of the lower bench by about 5 m.

GeoPacific is in general agreement with the proposed fill and stockpile plan provided our recommendations adhered to. These recommendations should be considered preliminary and should be reviewed once the fill area has been prepared and in light of the actual materials being encountered in the excavation. We understand that the materials within the lower bench may be left in place to form part of a future field.

1. The fill placement area should be stripped of all organics and topsoil prior to placement of fill materials.
2. Any sloping portions of the fill area should be levelled such that all fill is being placed on a level surface.
3. The materials are expected to contain varying amounts of silt and therefore will likely be sensitive to water; therefore, materials should be placed and compacted in place as required to achieve a level of compaction equivalent to 95% of their Standard Proctor dry density.
4. Side slopes of 1.5H:1V are considered OK for temporary fill conditions provided the materials are compacted in place and cut back to achieve the desired slopes. However, some minor sloughing of the soil stockpile should be expected.
5. If it is decided that the stockpile will left permanently, the side slopes should be hydro-seeded and protected with a 2 year erosion control mat and/or regarded to 2H:1V or flatter.

For:
GeoPacific Consultants Ltd.



Steven Fofonoff, M.Eng., P.Eng.
Senior Geotechnical Engineer

APPENDIX H - CIVIL ENGINEER'S LETTER REGARDING IMPACT OF THE DEVELOPMENT ON SITE SERVICES

CREUS Engineering Ltd
200 – 901 W 16TH ST NORTH VANCOUVER, BC V7P 1R2
P: 604-987-9070 F: 604-987-9071 www.creus.ca
Civil Engineers & Project Managers

August 27th 2018 File No. 16503

District of West Vancouver
750 17th Street
West Vancouver, BC
V7V 3T3

RE: EAST ADDITION – MULGRAVE SCHOOL CIVIL SERVICES

Mulgrave School is planning an East Side Addition to the current school and has requested that Creus Engineering review the impacts to the existing onsite civil infrastructure and the storm water management.

The location of the addition is east of the existing gymnasium where the current metal school building currently exists. There are no services under the proposed building at this location, only some catch basins which will be relocated as required. There are water, sanitary & storm mains located just to the west of the site and these can be utilized to service the new east addition if required.

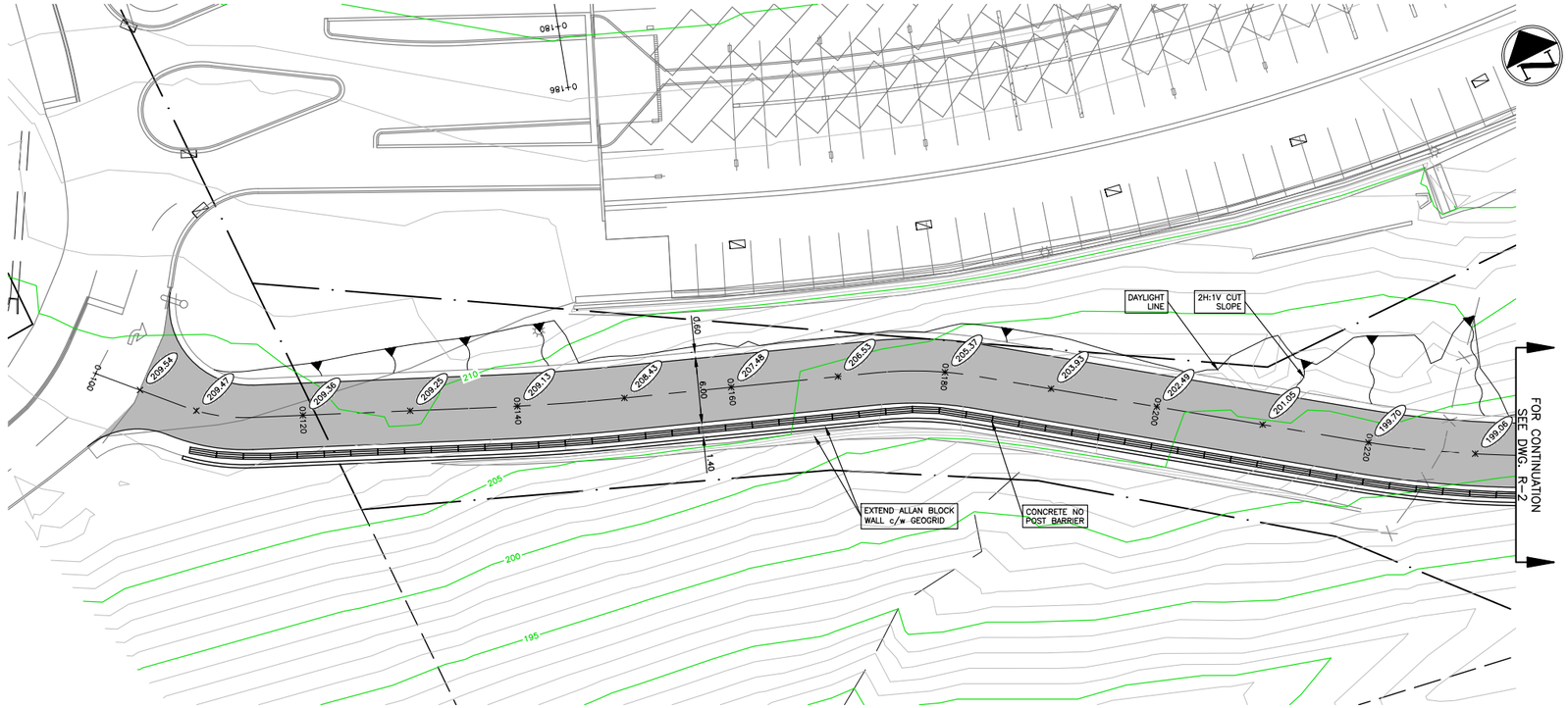
The overall storm water management for the school utilizes the existing playfield for detention / infiltration and there is significant storage in the playfield to address the District of West Vancouver's storm water management requirements. The SMP could also utilize permeable paving, green roofs and the reconstructed bioswale to further enhance the smp system. A flow control structure existing at the playfield which limits the release rate of storm water from the site. The smp was reviewed in 2012 as part of the Senior School and has been functioning as intended. The proposed additional building will be installed over existing hardscaped area. Per DWV standards all building and hardscape areas have a runoff coefficient of 0.95, resulting in no increase in the overall impermeability of the subject site from existing to proposed conditions. As such, there will be no increase in the storm water rate or runoff from the site; the current storm water management system will be sufficient to serve the existing site and the new additional building.

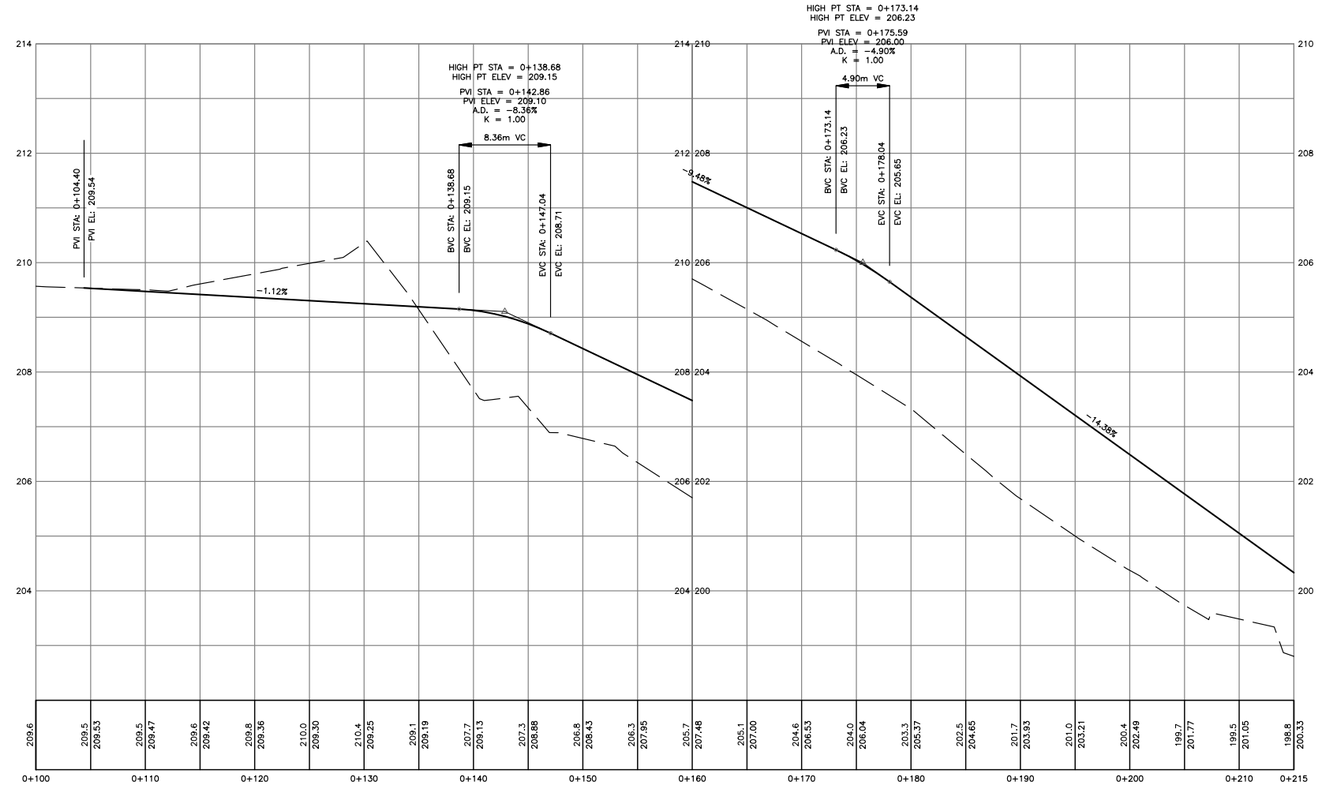
If you have any questions or require any further information, please do not hesitate to contact us.

CREUS Engineering Ltd.

Fred Ciambrelli, P.Eng.

APPENDIX I - CIVIL ENGINEER'S DRAWINGS



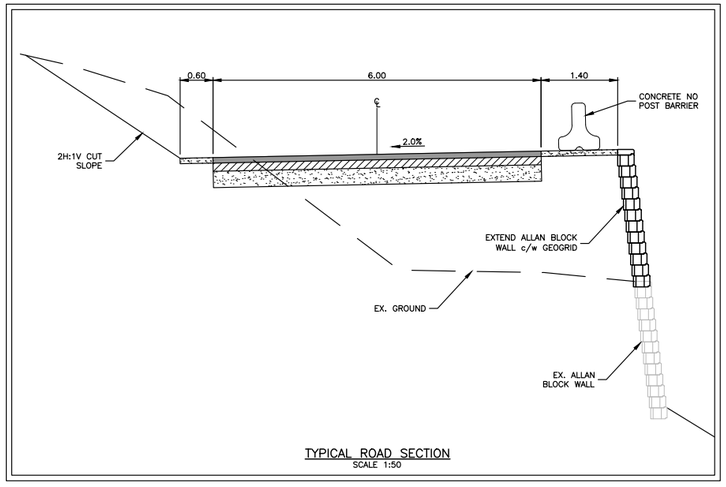


SEE DRAWING X-X-X FOR GENERAL NOTES
SEE DRAWING X-X-X FOR ROADWORKS NOTES
SEE DRAWING X-X-X FOR WATERWORKS NOTES
SEE DRAWING X-X-X FOR STORM & SANITARY NOTES

CONTRACTOR TO VERIFY & LOCATE EXISTING MAINS & SERVICE CONNECTIONS & NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING CONSTRUCTION

ROADWORKS NOTES

1. ALL ROADWORKS CONSTRUCTION AND METHODS MUST BE IN ACCORDANCE WITH MASTER MUNICIPAL CONSTRUCTION DOCUMENTS (MMCD).
2. PAVING CAN ONLY PROCEED IN THE PRESENCE OF THE ENGINEER OR DESIGNATED INSPECTORS.
3. CONTRACTOR TO SUBMIT SEIVE TEST AND SOURCE DATA FOR AGGREGATES AND MIX DESIGN FOR ASPHALT AT BEGINNING OF CONTRACT FOR REVIEW AND APPROVAL.
4. ALL LOOSE AND ORGANIC MATERIAL TO BE EXCAVATED FROM ROADWAY, ALL SUBGRADES TO BE COMPACTED TO 95% MODIFIED PROCTOR DENSITY. SUBGRADE TO BE INSPECTED BY ENGINEER PRIOR TO PLACEMENT OF GRAVEL SUBBASE. ANY WATER SOFTENED SUBGRADE SOIL SHALL BE OVEREXCAVATED AND THE GRADE RESTORED WITH GRANULAR SOILS COMPACTED TO 95% MODIFIED PROCTOR DENSITY.
5. THE BASE AND SUBBASE MATERIALS SHALL BE PROPERLY PLACED AND COMPACTED TO A MINIMUM OF 95% OF MODIFIED PROCTOR DRY DENSITY (ASTM D1557).
6. THE CONTRACTOR WILL GIVE ENGINEER THEN D.W.V. 48 HOURS NOTICE PRIOR TO SUBGRADE PROOF ROLL, BASE COMPACTION AND PAVING.
7. THE CONTRACTOR MUST NOTIFY ENGINEER 48 HOURS PRIOR TO STARTING CONSTRUCTION TO ESTABLISH AN INSPECTION SCHEDULE.
8. A PORTION OF THE CONTRACT DOCUMENTS IS INCLUDED BY REFERENCE. COPIES OF THESE DOCUMENTS HAVE BEEN REFERENCED IN THE TENDER PACKAGE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT CURRENT RELEVANT COPIES OF ALL DRAWINGS AND CONTRACT DOCUMENTS ARE FORWARDED TO SURVEYORS, TESTING AGENCIES, SUBCONTRACTORS, SUPERINTENDENTS, ESTIMATORS, PROJECT MANAGERS, SITE STAFF AND ANY OTHER RELEVANT PARTIES. CONTRACTOR CONFIRMS THEY HAVE REVIEWED SAME PRIOR TO SUBMITTING TENDER.
8. ALL CUTS IN EXISTING ASPHALT REQUIRED FOR CONSTRUCTION SHALL BE VERTICAL, FULL DEPTH, WITH A DIAMOND SAW AND REPLACED TO FULL / DESIGN DEPTH WITH MINIMUM 80mm ASPHALT CONCRETE FOR MAIN ROADS AND 65mm ASPHALT CONCRETE FOR LANES, AFTER BACKFILL AND COMPACTION. ALL PAVEMENTS, BOULEVARDS, DRIVEWAYS, FENCES, ETC. ARE TO BE RESTORED TO THE SATISFACTION AND APPROVAL OF THE CITY WHEN NO IMPROVEMENT IS PROPOSED UNDER THIS CONTRACT.
9. TOP LIFT OF ASPHALT TO BE MINIMUM 40 mm OR AS NOTED.
10. ALL PAVEMENTS, BOULEVARDS, DRIVEWAYS, FENCES, ETC. ARE TO BE RESTORED TO ORIGINAL CONDITION WHEN NO IMPROVEMENT IS PROPOSED UNDER THIS CONTRACT. CONTRACTOR TO ROUGHGRADE THE BOULEVARDS AT THE SAME TIME AS ROAD GRADING.
11. CHANGES IN GRADE TO BE FORMED WITH SMOOTH CURVES.
12. COVERS FOR INSPECTION CHAMBERS AND VALVE RISERS IN DRIVEWAYS SHALL BE SUITABLE FOR TRAVELED AREAS
13. ALL MANHOLE LIDS, VALVE COVERS, CATCHBASIN RIMS AND LIDS OF OTHER STRUCTURES TO BE SET AT FIRST LIFT ROAD ELEVATIONS AND RAISED WHEN FINAL LIFT INSTALLED.
14. ENSURE ALL NEW PAVEMENT WORKS ARE KEYED INTO EXISTING ASPHALT AS PER MMCD STANDARD.



TYPICAL ROAD SECTION
SCALE 1:50

NOT FOR CONSTRUCTION

CREUS Engineering
Civil Engineers & Project Managers
SUITE 200-901 16TH ST WEST, NORTH VANCOUVER BC, V7P1R2
PH: 604-987-9070 WEBSITE: www.creus.ca

SITE MAP

DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE			
EASMENT			
WATERMAIN			
SANITARY			
STORM			
HYDRO			
TEL			
STREETLIGHT			
GAS			

	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT			
GATE VALVE			
AIR VALVE			
REDUCER			
INSPECTION CHAMBER			
CATCHBASIN (STD/SI)			
CAP			
MANHOLE			
POWER POLE			
STREETLIGHT			

approved

client
MULGRAVE SCHOOL

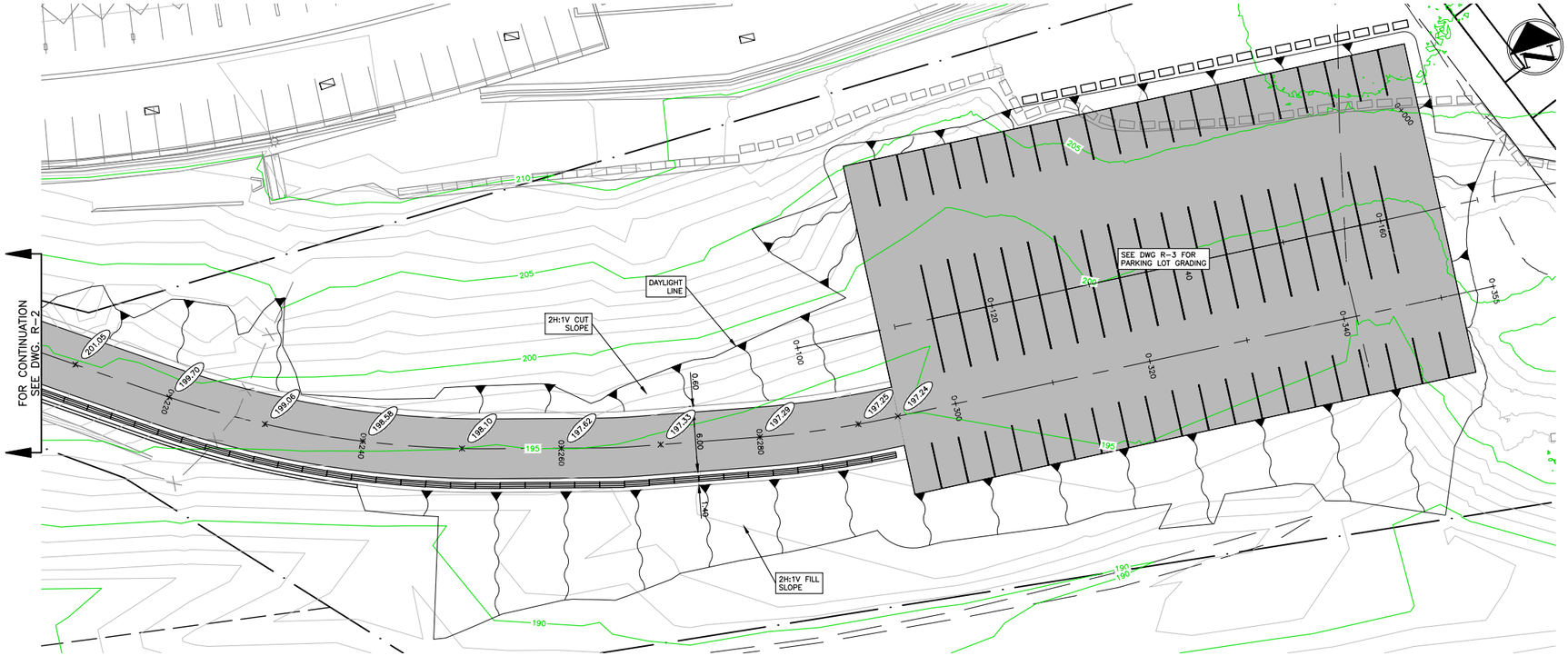
project
MULGRAVE SCHOOL
SOUTHLANDS
WEST VANCOUVER, BC

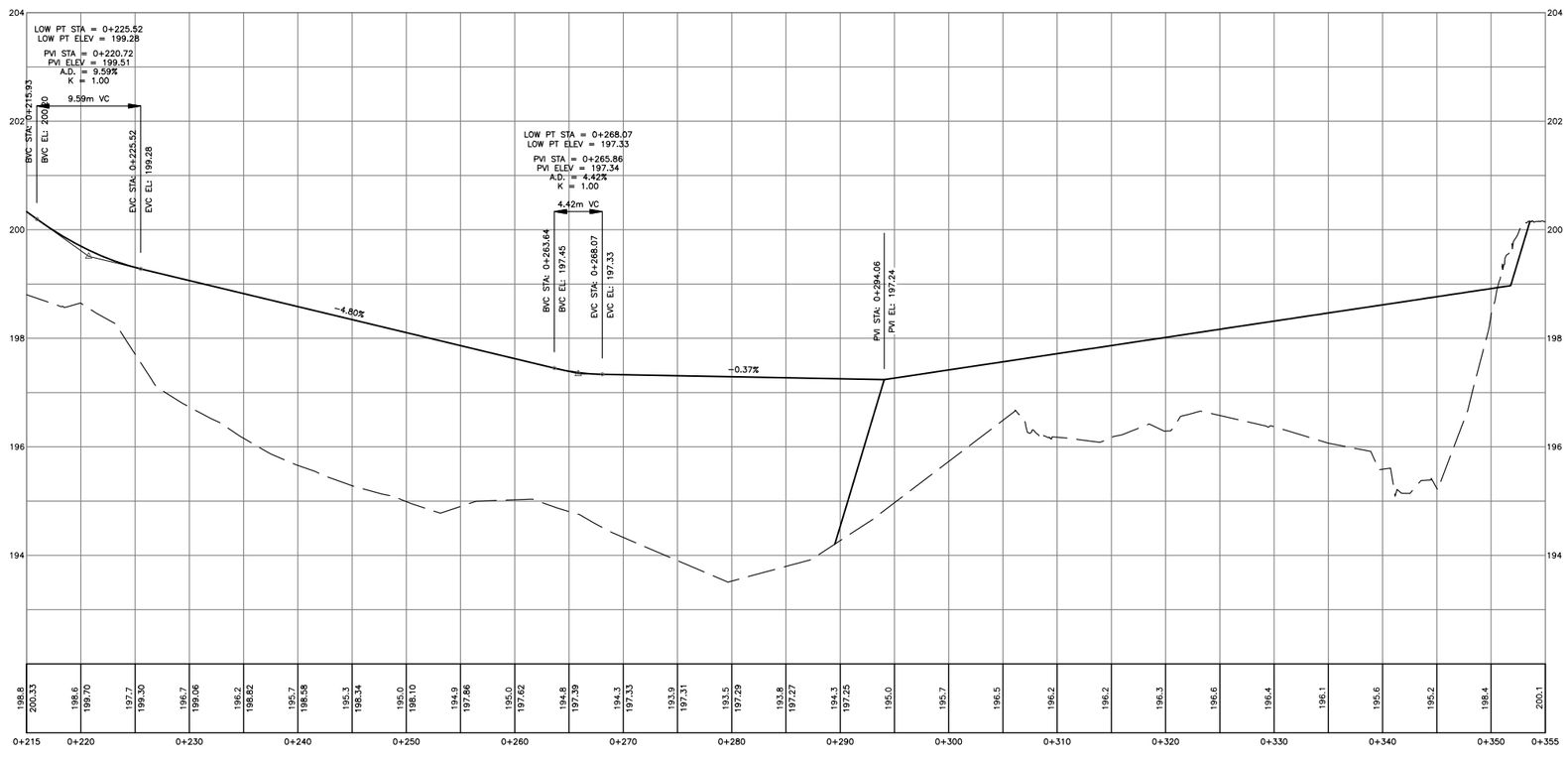
title
ROADWORKS
PLAN & PROFILE (0+100 - 0+215)

no.	(y/m/d)	revision	chk'd

current rev. #

engineer of record: FMC	scales: hor: 1:250 vert: 1:50
designed by: FMC	file no.: 16502
drawn by: AFG	drawing no.: R-1
date: 2016-09-28	





SEE DRAWING X–X–X FOR GENERAL NOTES
SEE DRAWING X–X–X FOR ROADWORKS NOTES
SEE DRAWING X–X–X FOR WATERWORKS NOTES
SEE DRAWING X–X–X FOR STORM & SANITARY NOTES

CONTRACTOR TO VERIFY & LOCATE EXISTING MAINS & SERVICE CONNECTIONS & NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING CONSTRUCTION

NOT FOR CONSTRUCTION

CREUS Engineering
Civil Engineers & Project Managers
SUITE 200-901 16TH ST WEST, NORTH VANCOUVER BC, V7P1R2
PH: 604-987-9070 WEBSITE: www.creus.ca

DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE			
EASMENT			
WATERMAIN			
SANITARY			
STORM			
HYDRO			
TEL			
STREETLIGHT			
GAS			

	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT			
GATE VALVE			
AIR VALVE			
REDUCER			
INSPECTION CHAMBER			
CATCHBASIN (ST/SS)	ST / SS	ST / SS	ST / SS
CAP			
MANHOLE	ST SS	ST SS	ST SS
POWER POLE			
STREETLIGHT			

approved

client
MULGRAVE SCHOOL

project
MULGRAVE SCHOOL
SOUTHLANDS
WEST VANCOUVER, BC

title
ROADWORKS
PLAN & PROFILE (0+215 - 0+335)

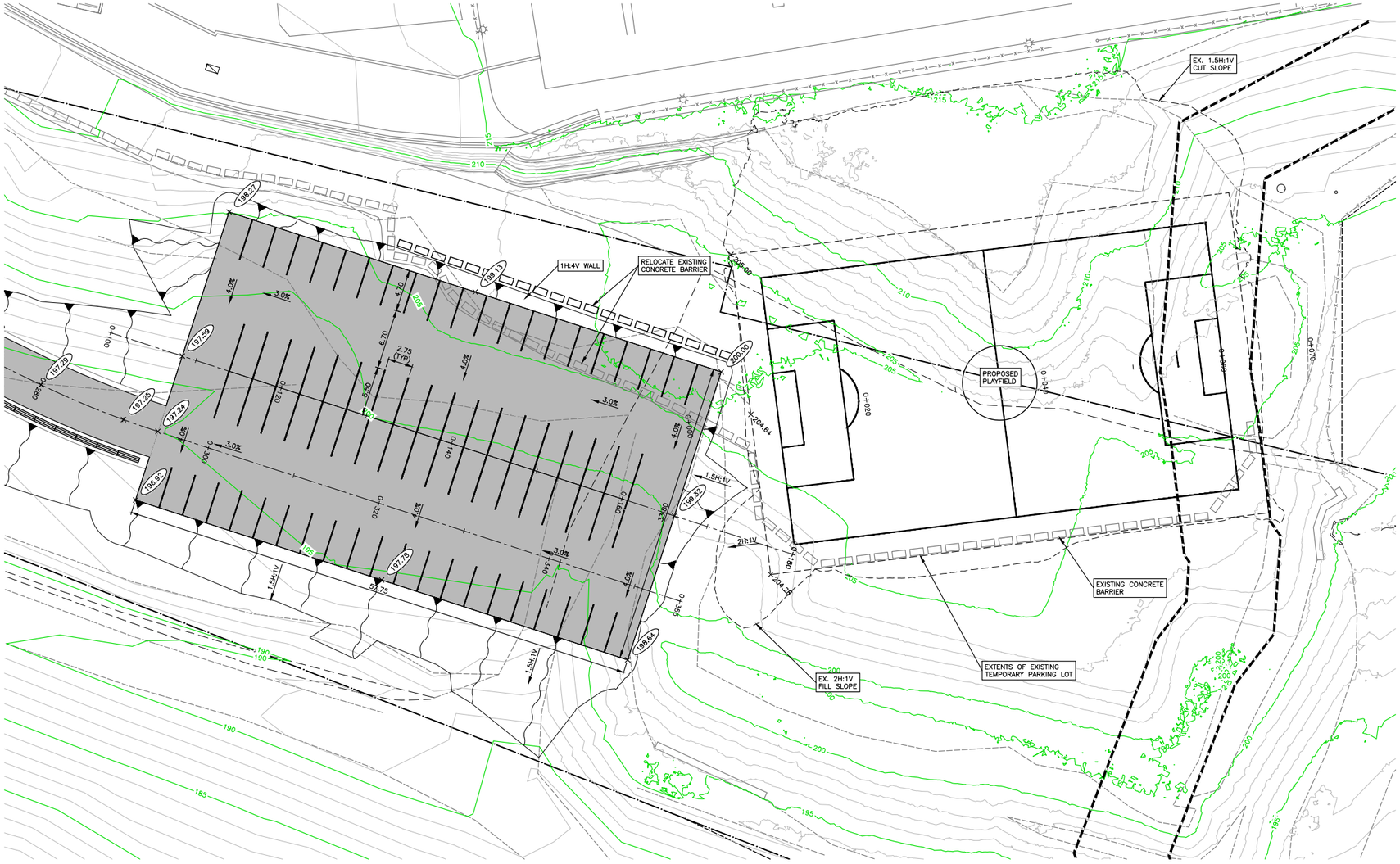
no.	(y/m/d)	revision	chk'd

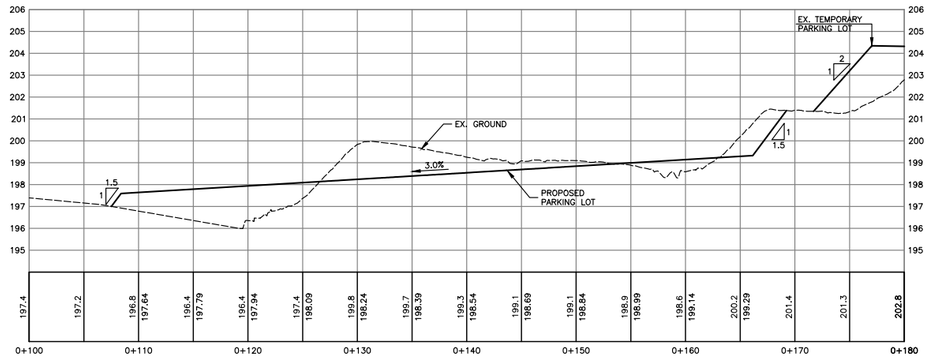
current rev. #

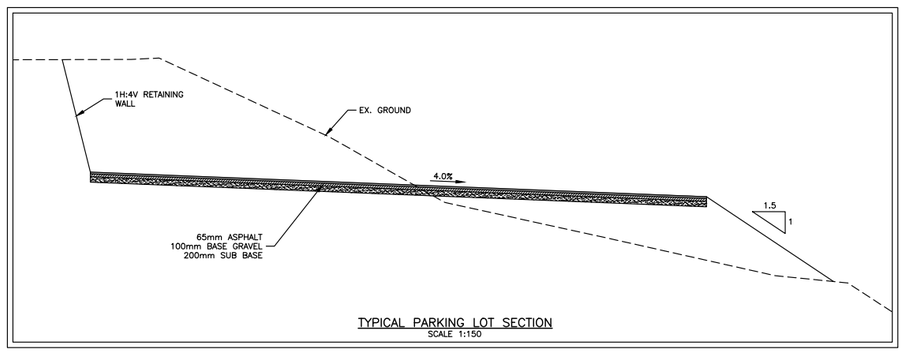
engineer of record: FMC	scales: hor: 1:250 vert: 1:50
designed by: FMC	file no.: 16502
drawn by: AFG	drawing no.: R-2
date: 2016-09-28	

SEE DRAWING X–X–X FOR GENERAL NOTES
SEE DRAWING X–X–X FOR ROADWORKS NOTES
SEE DRAWING X–X–X FOR WATERWORKS NOTES
SEE DRAWING X–X–X FOR STORM & SANITARY NOTES

CONTRACTOR TO VERIFY & LOCATE EXISTING MAINS & SERVICE CONNECTIONS & NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO BEGINNING CONSTRUCTION







TYPICAL PARKING LOT SECTION
SCALE 1:150

NOT FOR CONSTRUCTION

CREUS Engineering

Civil Engineers & Project Managers
SUITE 200-901 16TH ST WEST, NORTH VANCOUVER BC, V7P1R2
PH: 604-987-9070 WEBSITE: www.creus.ca

DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE			
EASMENT			
WATERMAIN			
SANITARY			
STORM			
HYDRO			
TEL			
STREETLIGHT			
GAS			

	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT			
GATE VALVE			
AIR VALVE			
REDUCER			
INSPECTION CHAMBER			
CATCHBASIN (STD/SI)			
CAP			
MANHOLE			
POWER POLE			
STREETLIGHT			

approved

client
MULGRAVE SCHOOL

project
MULGRAVE SCHOOL
SOUTHLANDS
WEST VANCOUVER, BC

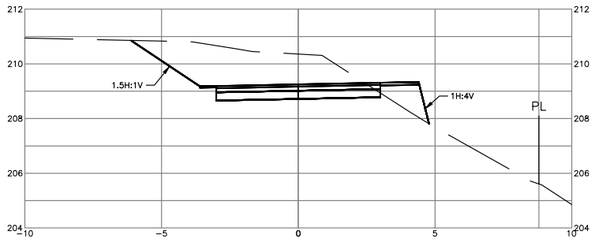
title
STOCKPILE REMOVALS AND TEMPORARY PARKING LOT

no.	(y/m/d)	revision	chk'd

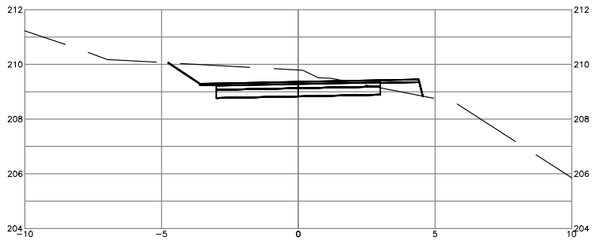
current rev. #

engineer of record: FMC	scales: hor: 1:250 vert:
designed by: AFG	file no.: 16502
drawn by: AFG	drawing no.: R-3
date: 2016-09-28	

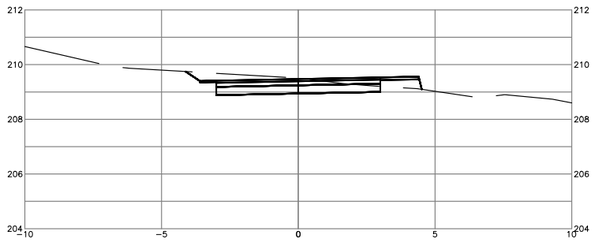
0+130



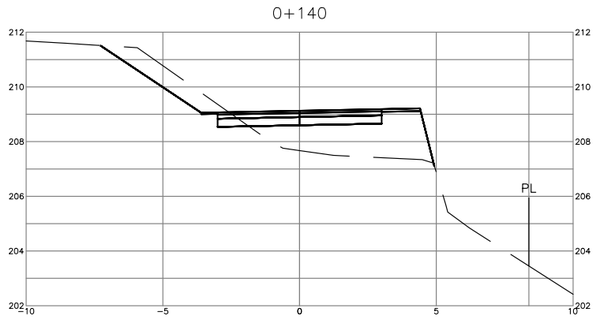
0+120



0+110



0+140



NOT FOR CONSTRUCTION

CREUS
Engineering
Civil Engineers & Project Managers
#610 EAST TOWER - 221 ESPLANADE WEST, NORTH VANCOUVER BC, V7M3J3
PH: 604-987-9070 WEBSITE: www.creus.ca

DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE			
EASEMENT			
WATERMAIN			
SANITARY			
STORM			
HYDRO			
TEL			
STREETLIGHT			
GAS			

	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT			
GATE VALVE			
AIR VALVE			
REDUCER			
INSPECTION CHAMBER			
CATCHBASIN (STD/SI)			
CAP			
MANHOLE			
POWER POLE			
STREETLIGHT			

approved

client
MULGRAVE SCHOOL

project
MULGRAVE SCHOOL
SOUTHLANDS
WEST VANCOUVER, BC

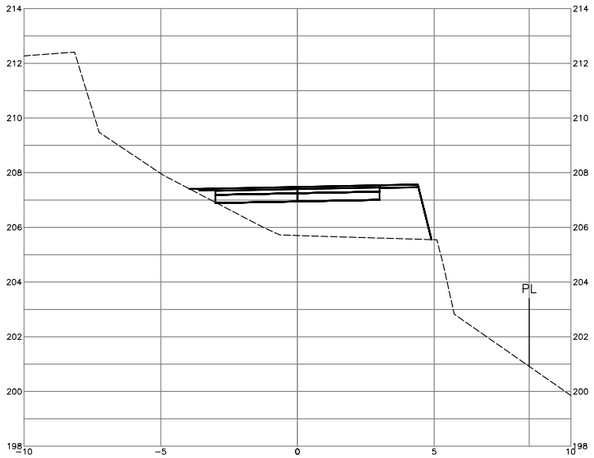
title
CROSS SECTIONS
STA. 0+110 - 0+140

no.	(y/m/d)	revision	chk'd

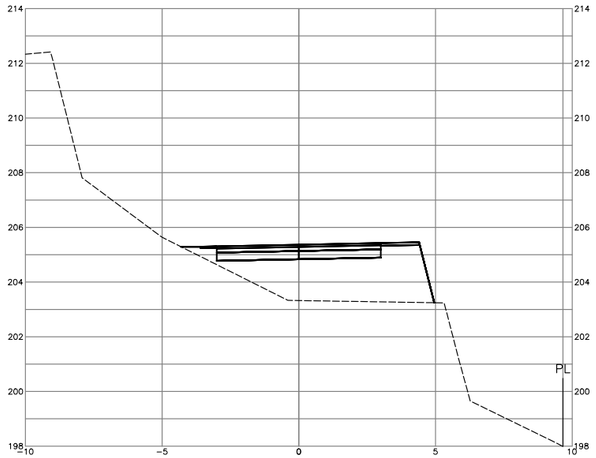
current rev. #

engineer of record: FMC	scales: hor: 1:100 vert:
designed by: AFG	file no.: 16502
drawn by: AFG	drawing no.: XS-1
date: 2016-09-28	

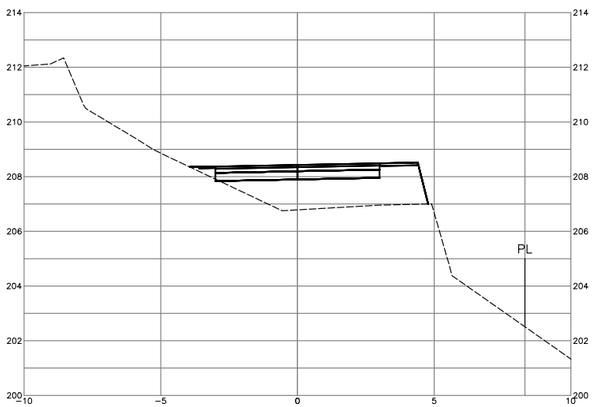
0+160



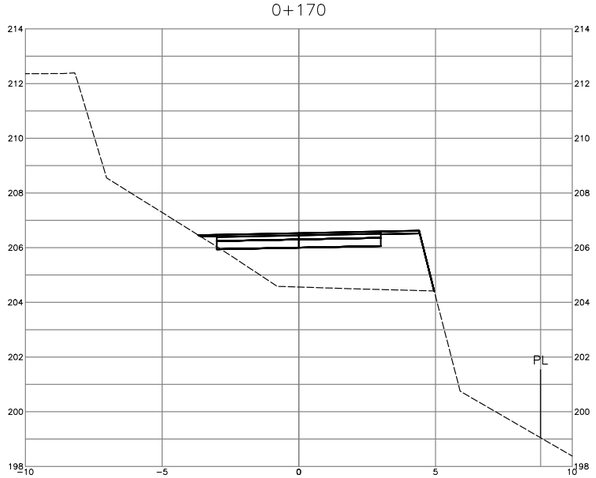
0+180



0+150



0+170



NOT FOR CONSTRUCTION

DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE			
EASEMENT			
WATERMAIN			
SANITARY			
STORM			
HYDRO			
TEL			
STREETLIGHT			
GAS			

	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT			
GATE VALVE			
AIR VALVE			
REDUCER			
INSPECTION CHAMBER			
CATCHBASIN (STD/SI)			
CAP			
MANHOLE			
POWER POLE			
STREETLIGHT			

approved

client
MULGRAVE SCHOOL

project
MULGRAVE SCHOOL
SOUTHLANDS
WEST VANCOUVER, BC

title
CROSS SECTIONS
STA. 0+150 - 0+180

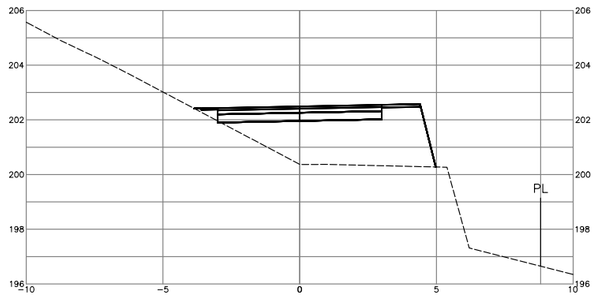
no.	(y/m/d)	revision	chk'd

current rev. #

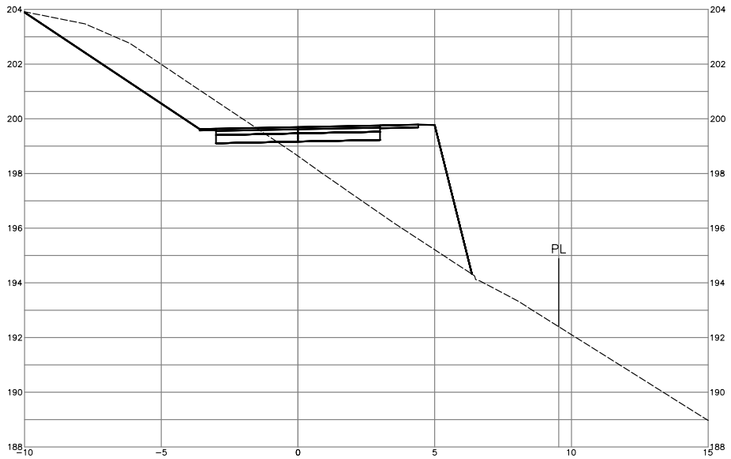
engineer of record: FMC
scales: hor: 1:100 vert:
designed by: AFG
file no.: 16502
drawn by: AFG
drawing no.: XS-2
date: 2016-09-28

CREUS Engineering
Civil Engineers & Project Managers
#610 EAST TOWER - 221 ESPLANADE WEST, NORTH VANCOUVER BC, V7M3J3
PH: 604-987-9070 WEBSITE: www.creus.ca

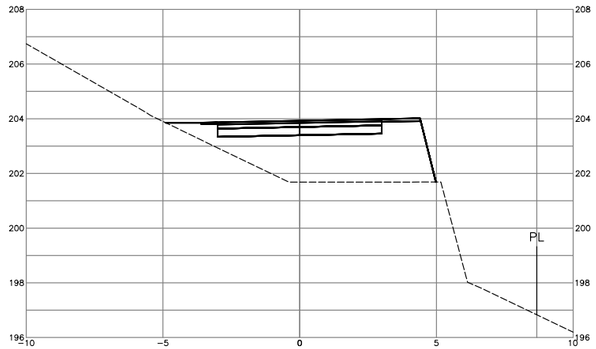
0+200



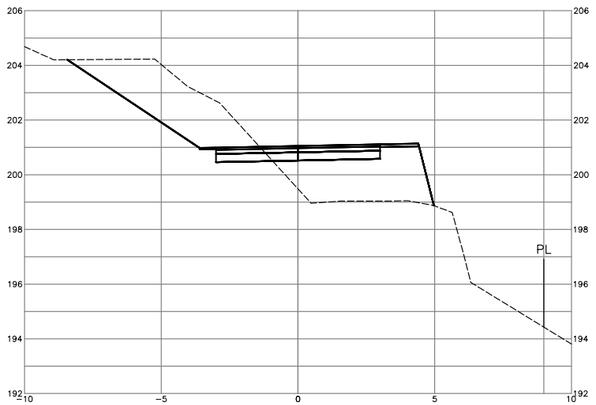
0+220



0+190



0+210



NOT FOR CONSTRUCTION

CREUS
Engineering
Civil Engineers & Project Managers
#610 EAST TOWER - 221 ESPLANADE WEST, NORTH VANCOUVER BC, V7M3J3
PH: 604-987-9070 WEBSITE: www.creus.ca

DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE			
EASEMENT			
WATERMAIN			
SANITARY			
STORM			
HYDRO			
TEL			
STREETLIGHT			
GAS			

	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT			
GATE VALVE			
AIR VALVE			
REDUCER			
INSPECTION CHAMBER			
CATCHBASIN (STD/SI)			
CAP			
MANHOLE			
POWER POLE			
STREETLIGHT			

approved

client
MULGRAVE SCHOOL

project
MULGRAVE SCHOOL
SOUTHLANDS
WEST VANCOUVER, BC

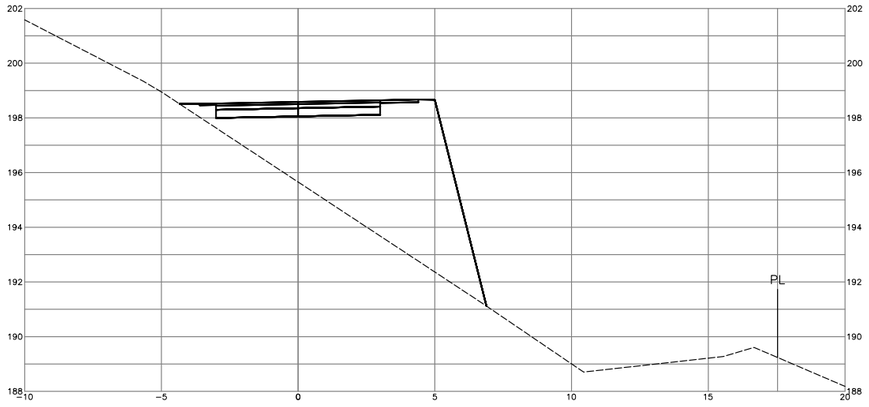
title
CROSS SECTIONS
STA. 0+190 - 0+220

no.	(y/m/d)	revision	chk'd

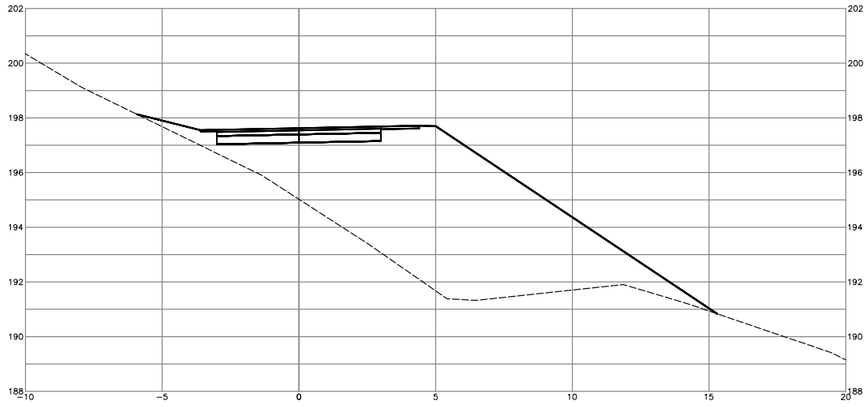
current rev. #

engineer of record: FMC	scales: hor: 1:100 vert:
designed by: AFG	file no.: 16502
drawn by: AFG	drawing no.: XS-3
date: 2016-09-28	

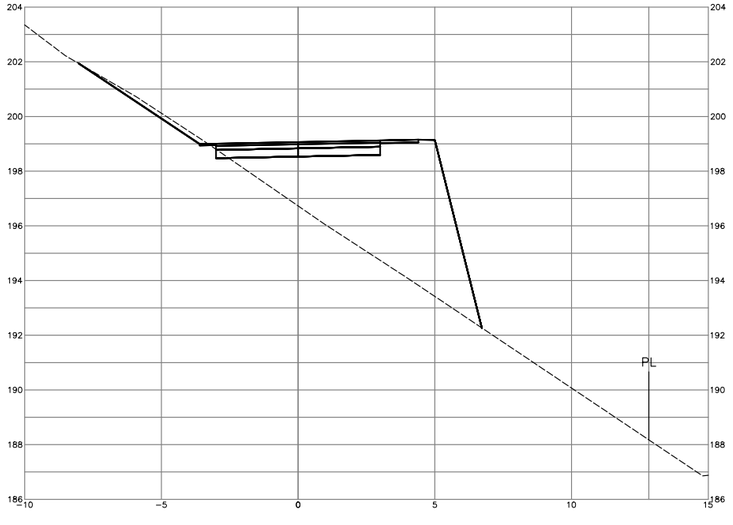
0+240



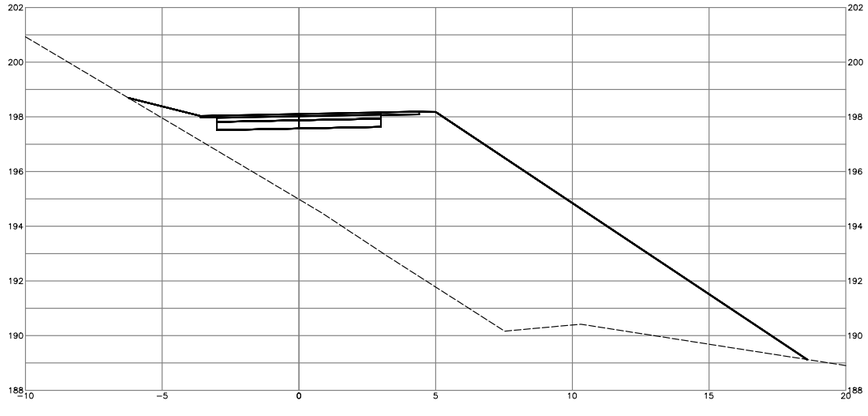
0+260



0+230



0+250



NOT FOR CONSTRUCTION

CREUS
Engineering
Civil Engineers & Project Managers
#610 EAST TOWER - 221 ESPLANADE WEST, NORTH VANCOUVER BC, V7M3J3
PH: 604-987-9070 WEBSITE: www.creus.ca

DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE			
EASEMENT			
WATERMAIN			
SANITARY			
STORM			
HYDRO			
TEL			
STREETLIGHT			
GAS			

	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT			
GATE VALVE			
AIR VALVE			
REDUCER			
INSPECTION CHAMBER			
CATCHBASIN (STD/SI)			
CAP			
MANHOLE			
POWER POLE			
STREETLIGHT			

approved

client
MULGRAVE SCHOOL

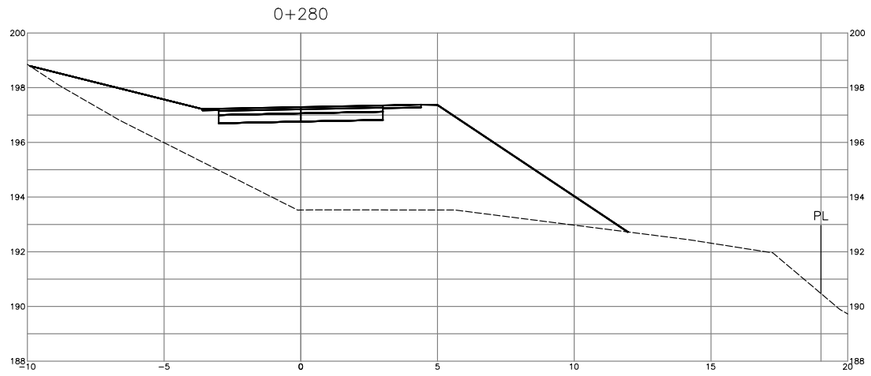
project
MULGRAVE SCHOOL
SOUTHLANDS
WEST VANCOUVER, BC

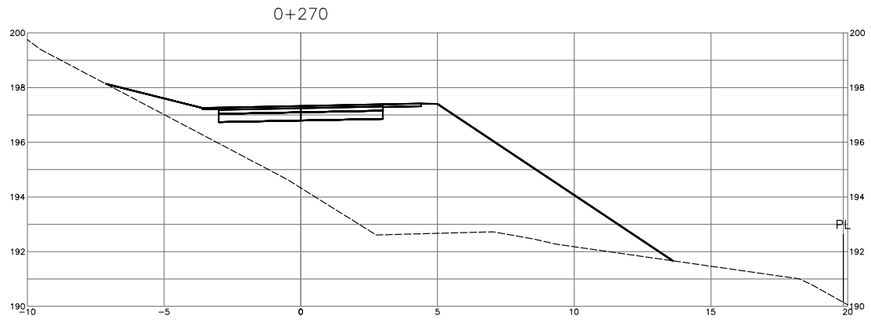
title
CROSS SECTIONS
STA. 0+230 - 0+260

no.	(y/m/d)	revision	chk'd

current rev. #

engineer of record: FMC	scales: hor: 1:100 vert:
designed by: AFG	file no.: 16502
drawn by: AFG	drawing no.: XS-4
date: 2016-09-28	





NOT FOR CONSTRUCTION

CREUS
Engineering
Civil Engineers & Project Managers
#610 EAST TOWER - 221 ESPLANADE WEST, NORTH VANCOUVER BC, V7M3J3
PH: 604-987-9070 WEBSITE: www.creus.ca

DRAWING LEGEND

	EXISTING	PROP.	TO BE REMOVED
LEGAL LINE			
EASEMENT			
WATERMAIN			
SANITARY			
STORM			
HYDRO			
TEL			
STREETLIGHT			
GAS			

	EXISTING	PROP.	TO BE REMOVED
FIRE HYDRANT			
GATE VALVE			
AIR VALVE			
REDUCER			
INSPECTION CHAMBER			
CATCHBASIN (STD/SI)			
CAP			
MANHOLE			
POWER POLE			
STREETLIGHT			

approved

client
MULGRAVE SCHOOL

project
MULGRAVE SCHOOL
SOUTHLANDS
WEST VANCOUVER, BC

title
CROSS SECTIONS
STA. 0+270 - 0+280

no.	(y/m/d)	revision	chk'd

current rev. #

engineer of record: FMC	scales: hor: 1:100 vert:
designed by: AFG	file no.: 16502
drawn by: AFG	drawing no.: XS-5
date: 2016-09-28	

MULGRAVE

CORNERSTONE architecture + SURF ARCHITECTURE