

# Concept Structural Design Report

New Wee Waa High School

105-107 Mitchell St

WEE WAA, NSW 2388



Source Google Earth

Prepared for:

NSW Department of Education & School Infrastructure NSW

October 2021

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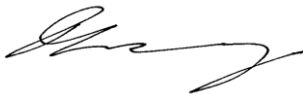
## Document Control & Revision Register

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## APPENDICIES

Appendix A – Structural Concept Plan

## 1.0 INTRODUCTION

### 1.1 Site & Project Description

Students and staff were evacuated from the current Wee Waa High School site due to ongoing health issues in late 2020. Students are currently collocated within the town's primary school in an overcrowded site. A Ministerial announcement made on 3 June 2021 committed to the construction of a new High School at Wee Waa on existing Department of Education owned land and adjacent Crown land as an urgent priority. The site is located on Mitchell Street/Kamliaroi Highway and is legally described as Lot 1 DP577294, Lot 2 DP550633 and Lots 124-125 DP757125.

This report accompanies a State Significant Development Application which seeks consent for the construction of a new high school. The school will service 200 students with potential to grow to a total capacity of 300 students, subject to further funding and service need, and 61 staff. The new proposed new high school consists of a two-storey building, an Indigenous learning centre, sporting fields and associated civil and utilities works. For a detailed project description refer to the EIS prepared by Ethos Urban.



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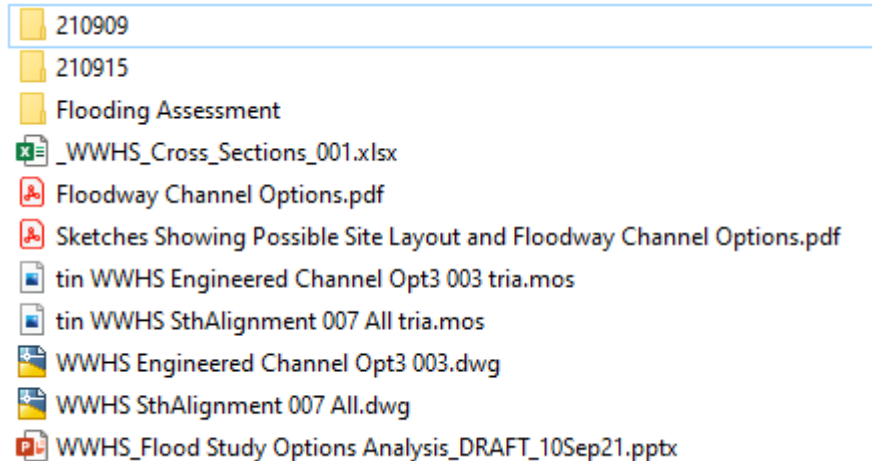
### 1.2 Scope

This Concept Structural Design Report has been prepared in response to the SEARs report (application number SSD-21854025) specifically for the requirement for a Structural Report.

## 2.0 CONSULTANTS DOCUMENTATION

### 2.1 Flood Study

The Flood Study documentation produced by Lyall & Associates were made available on the SharePoint. A list of the available drawings has been depicted below for reference.



### 2.2 Architectural drawings

The Architectural drawings produced by SHAC were made available on the SharePoint folder. A list of the available drawings has been depicted below for reference.



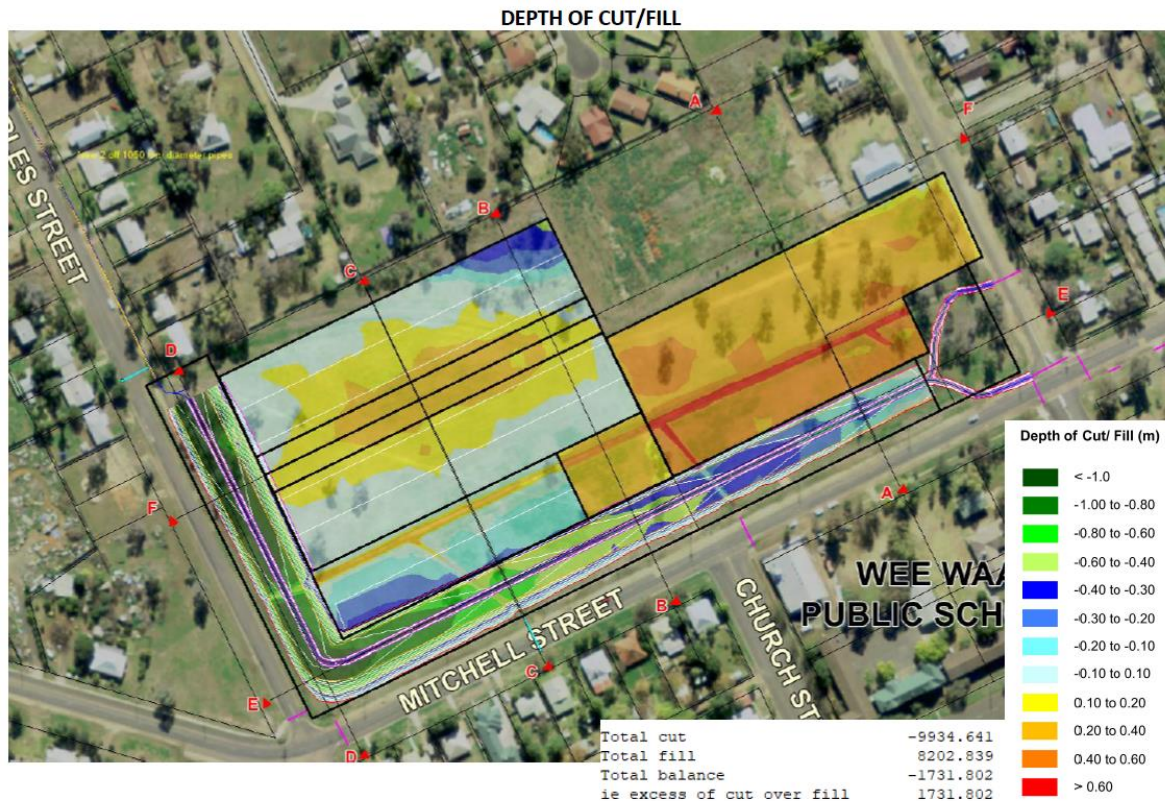
### 2.3 Geotechnical Report

The geotechnical report was made available on the SharePoint folder. The original report was undertaken by Barnson Pty Ltd reference 35754-GR02\_A. A second report will be provided by Pacific Geotec Pty Ltd reference number PG-6504 Dated October 2021.

## 3.0 STRUCTURAL CONCEPT REPORT

### 3.1 Flood Study & Proposed Earthworks

Lyall & Associates have completed various design options for Flood Mitigation. It has been advised that The Southern Chancel alignment will be option adopted and will require significant earthworks to re profile the site. The indicative cut/fill extract has been inserted below. Earthworks shall be carried out in accordance with the civil and geotechnical documentation.



Extract from WWHS Cut Fill Strategy

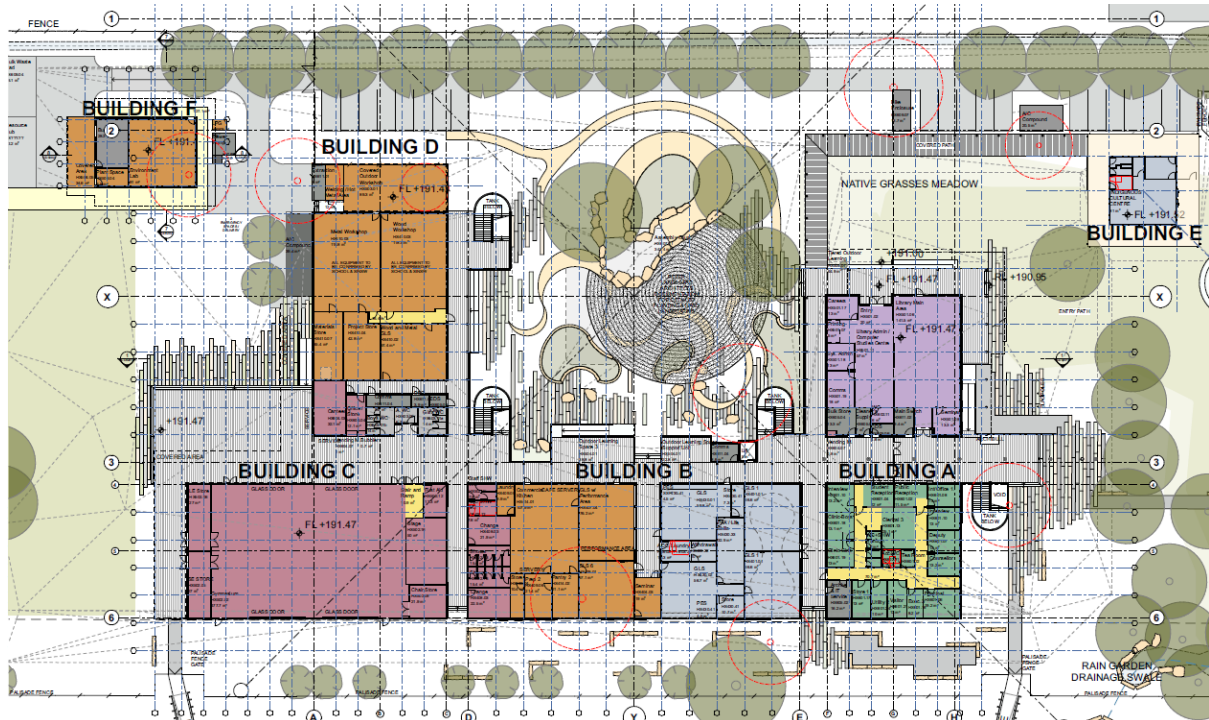
### 3.2 Geotechnical

The original geotechnical report by Barnson Pty Ltd states the site currently consists of extremely reactive clays with an equivalent soil classification E-D with reactivity in the order of 125mm (in accordance with AS2870). Due to the presence of trees, it has been deemed to be classified as a class P. Prior to earthworks commencing on the site, it was recommended that the top 500mm of soil be stripped and stored for landscaping purposes. The site fill is then to be completed in a controlled manner to level 2 certification in accordance with the civil levels and the geotechnical requirements.

The revised geotechnical report and advice from Pacific Geotec Pty Ltd is to reduce the proposed stripping of the site from 500mm down to approximately 200-300mm and remove the topsoil component only, proof roll and commence earthworks. The fill is then to be completed in a controlled manner and supervised by Pacific Geotec to be classed as certified fill. This reduces the volume of bulk earthworks and imported fill considerably as well as handling and stockpiling.

### 3.3 Building structures

The new school is made up of 6 buildings as depicted below. Buildings A to D share a common ground floor level and linked together via open corridors and hallways. Buildings A, B and D are two story buildings. Building C is a double height sports hall. Building E and F are separated from the main buildings and are single level structures. It has been advised that all buildings will require 500 free board above flood level and therefore will be elevated above the site earthworks from approximately 700mm to 1000mm.



Extract from architectural Ground Floor drawing

#### 3.3.1 Building A, Building B, Building C & Building D

All four buildings (A,B,C & D and linking walkways) share a common ground floor level. The concept structure for these buildings will be as follows:

The foundations will consist of steel screw piles to a minimum of 4m below the surface level and will support the elevated ground floor which will be elevated with a 500 freeboard above the flood level. The ground floor structure will consist of either a concrete suspended slab (with a permanent formwork system) or structural steel with modular infill floor framing such as CLT cassettes. The wall framing and upper floor will be steel framed and braced with the CLT system. Roof trusses for the upper roof.

Building C is the double height hall and expected to be a steel portal style structure with steel purlins and roof sheeting

### **3.3.2 Building E & Building F**

Building E and F are single level isolated buildings separated from the main structure. The concept structure for these buildings will be as follows:

The foundations will consist of steel screw piles to a minimum of 4m below the surface level and will support the elevated ground floor which will be elevated with a 500 freeboard above the flood level. The ground floor structure will consist of either a concrete suspended slab (with a permanent formwork system) or structural steel with modular infill floor framing such as CLT cassettes. The wall framing will consist of braced timber framing with roof trusses.

### **3.3.3 External walkways (on ground) and pavements**

For all external covered walkway structures there are two possible structural options available.

Option 1 is a more conservative method which is less susceptible to surface movement, this is to provide a pile assisted footings beams and slabs on ground cast over collapsible void former to limit potential surface movement. Piles will need to be founded below 4m moisture change level. The structure over will be structural steel frames and steel roof sheeting.

Option 2 is a more cost-effective method however is more susceptible to surface movement this is via articulated dowelled/jointed slabs on ground with modular overlapping roof structure which has tolerance to articulate independently. Column and wall structure above the ground slab will be structural steel frames and steel roof sheeting.

All slab pavements are to be poured on a geotechnically approved subgrade (refer geotechnical report) and well articulates with sawn and dowelled joints to allow for potential surface movements. All joints are to be adequately sealed to prevent water ingress dampening and damaging the subgrade

### **3.3.4 Connections to buildings**

Ramps from slabs on ground to the raised building structures will require specific detailing to allow for potential surface movements. This will be designed as a hinged relieving slab to allow for varying surface movements.

## **4.0 Conclusion**

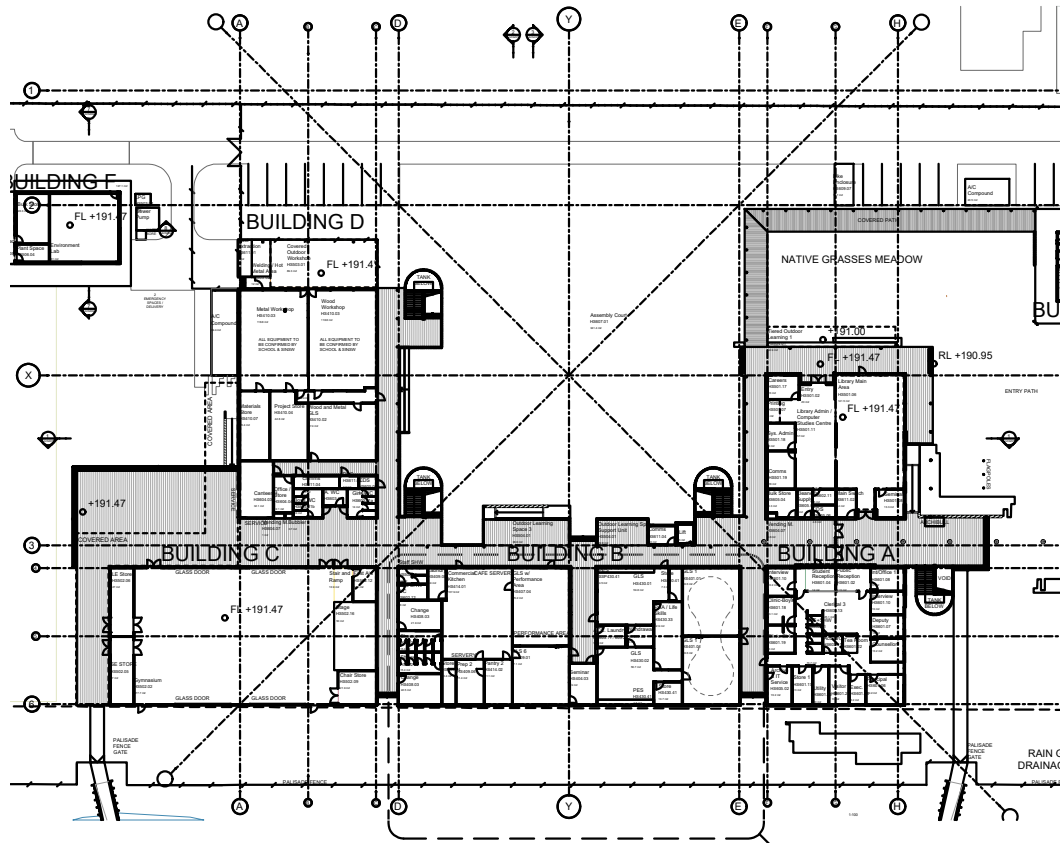
The new Wee Waa High school development consists of many challenges with regards to flooding, upgrades to stormwater drainage, very poor soil conditions.

Section 3 in this report summarises the proposed concept to relieve the above concerns.

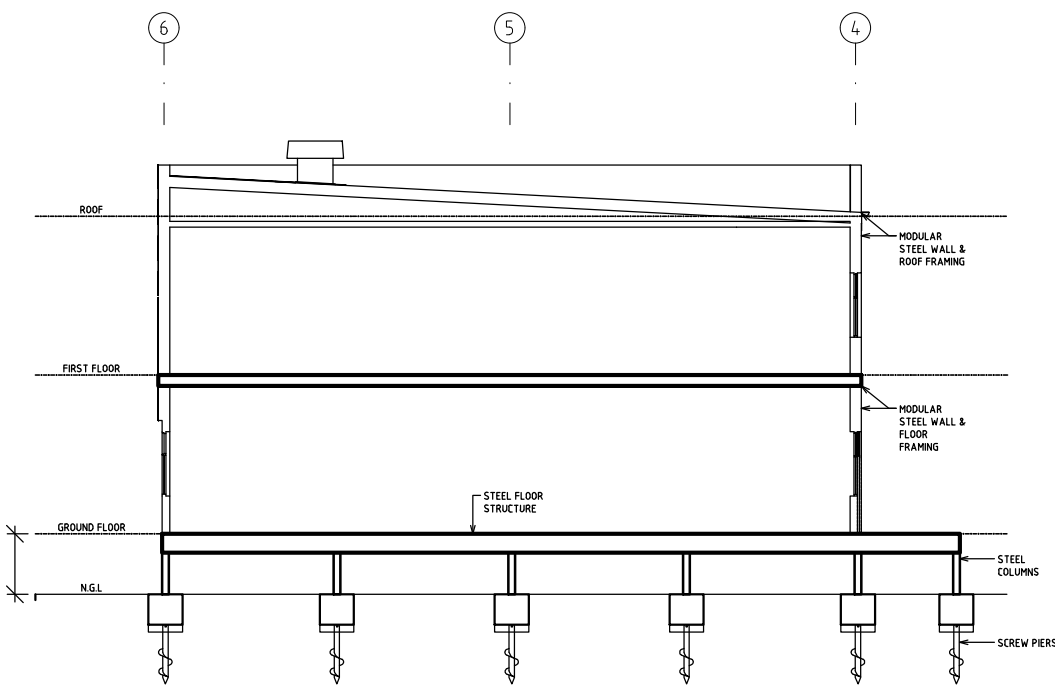
- The revised geotechnical advice will provide a considerable saving in bulk earthworks volumes.
- Due to the soil reactivity and flood levels the buildings will need to be piled and elevated to 500mm above the flood level.
- Two options for the covered walkways are proposed for consideration.

In conclusion, with the above concerns being addressed, also along with the proposed structural concept, we consider this approach to be structurally sound.

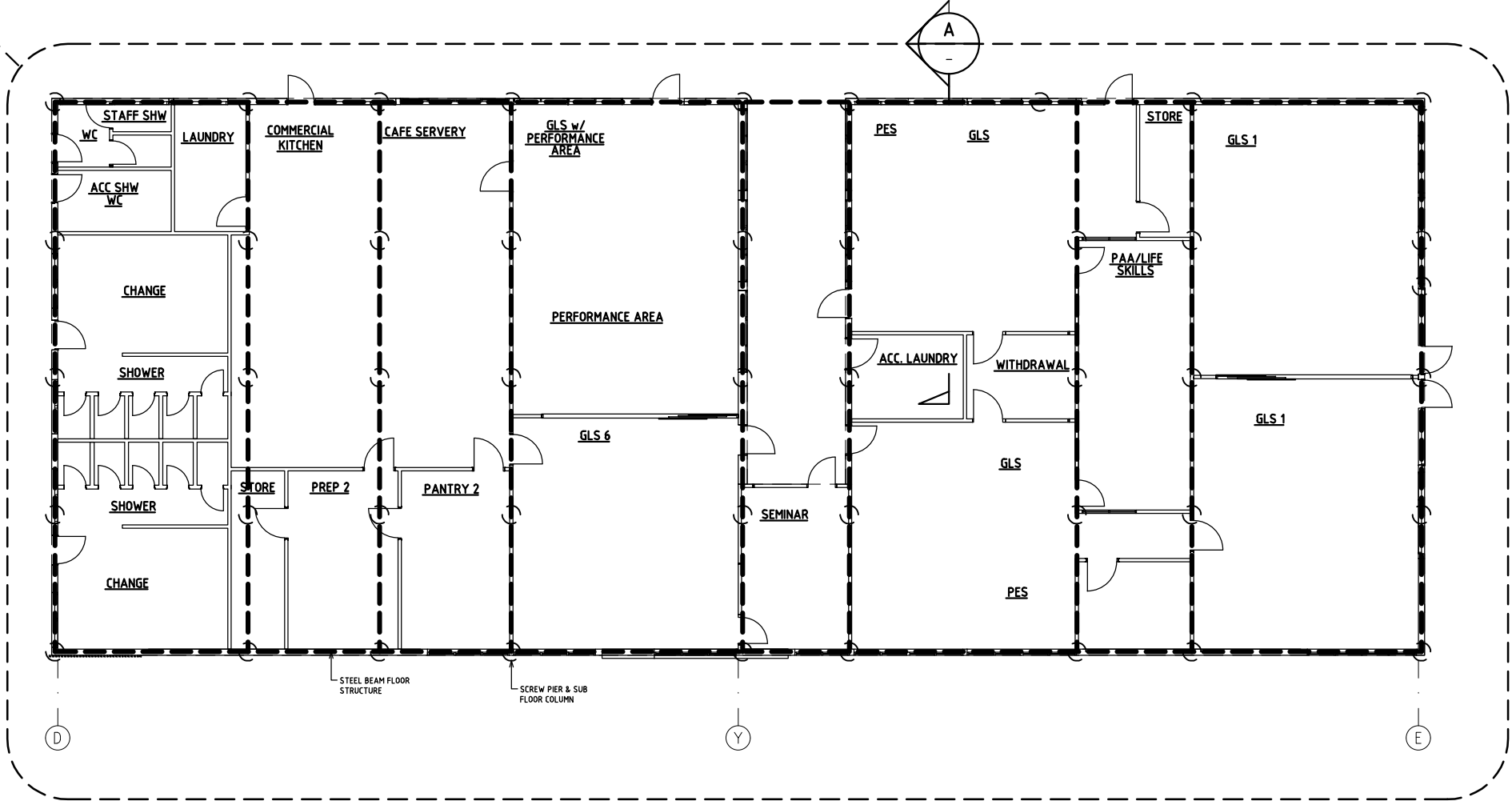
## **Appendix A – Structural Concept Plan**



GROUND FLOOR SITE PLAN  
SCALE 1:500



SECTION A  
SCALE 1:100



INSET CONCEPT STRUCTURAL PLAN  
SCALE 1:100