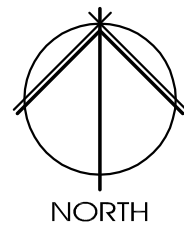
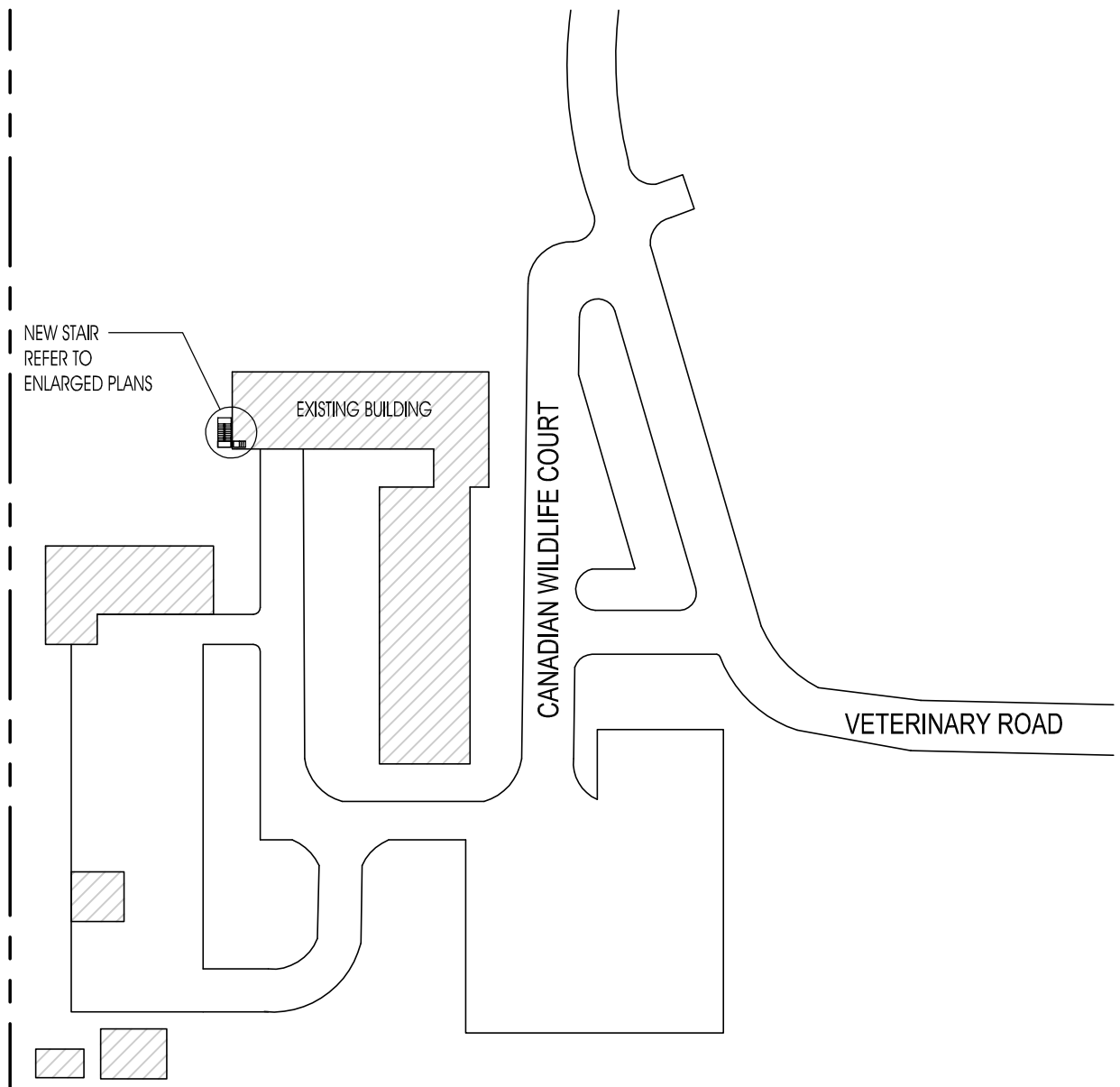


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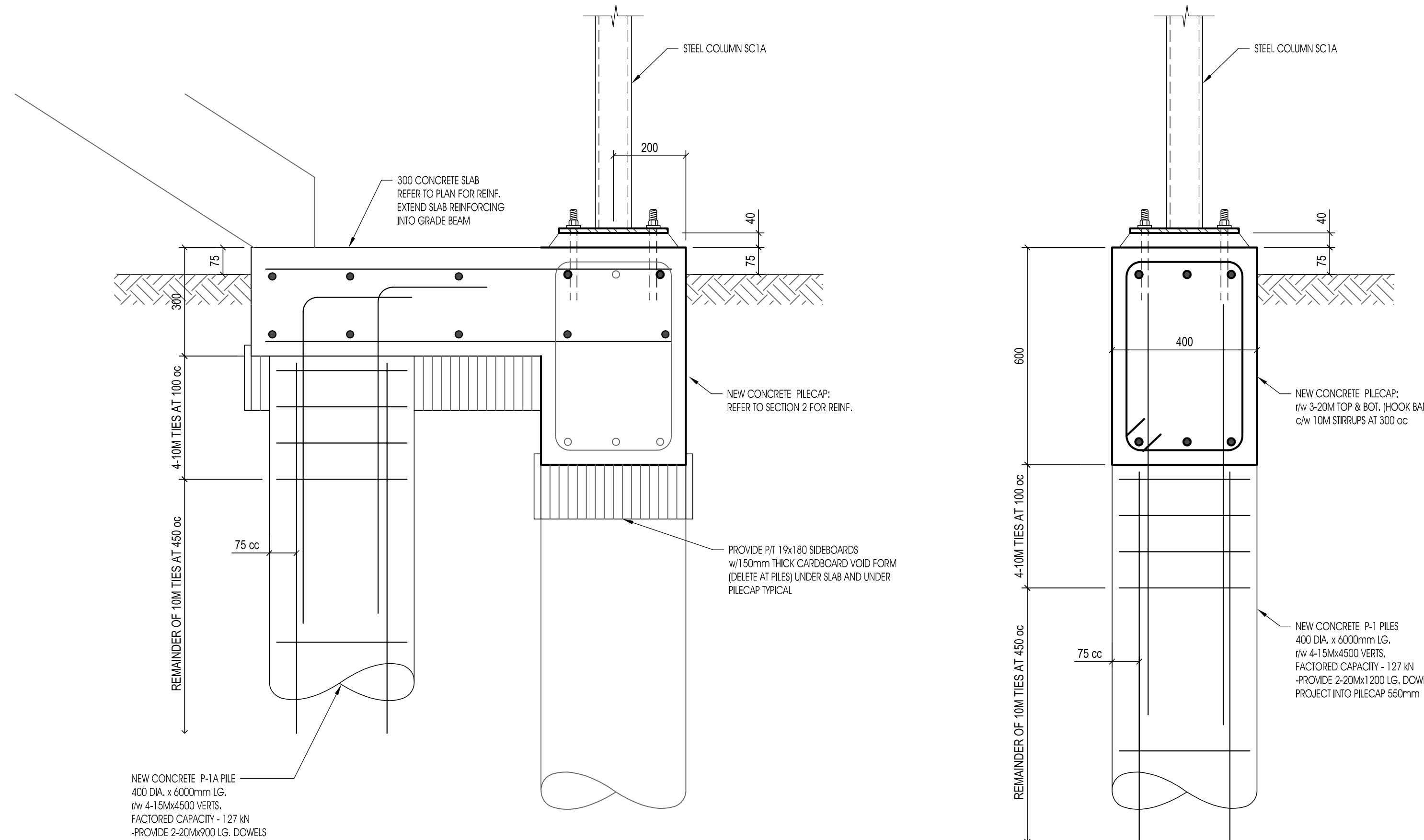
KEYPLAN
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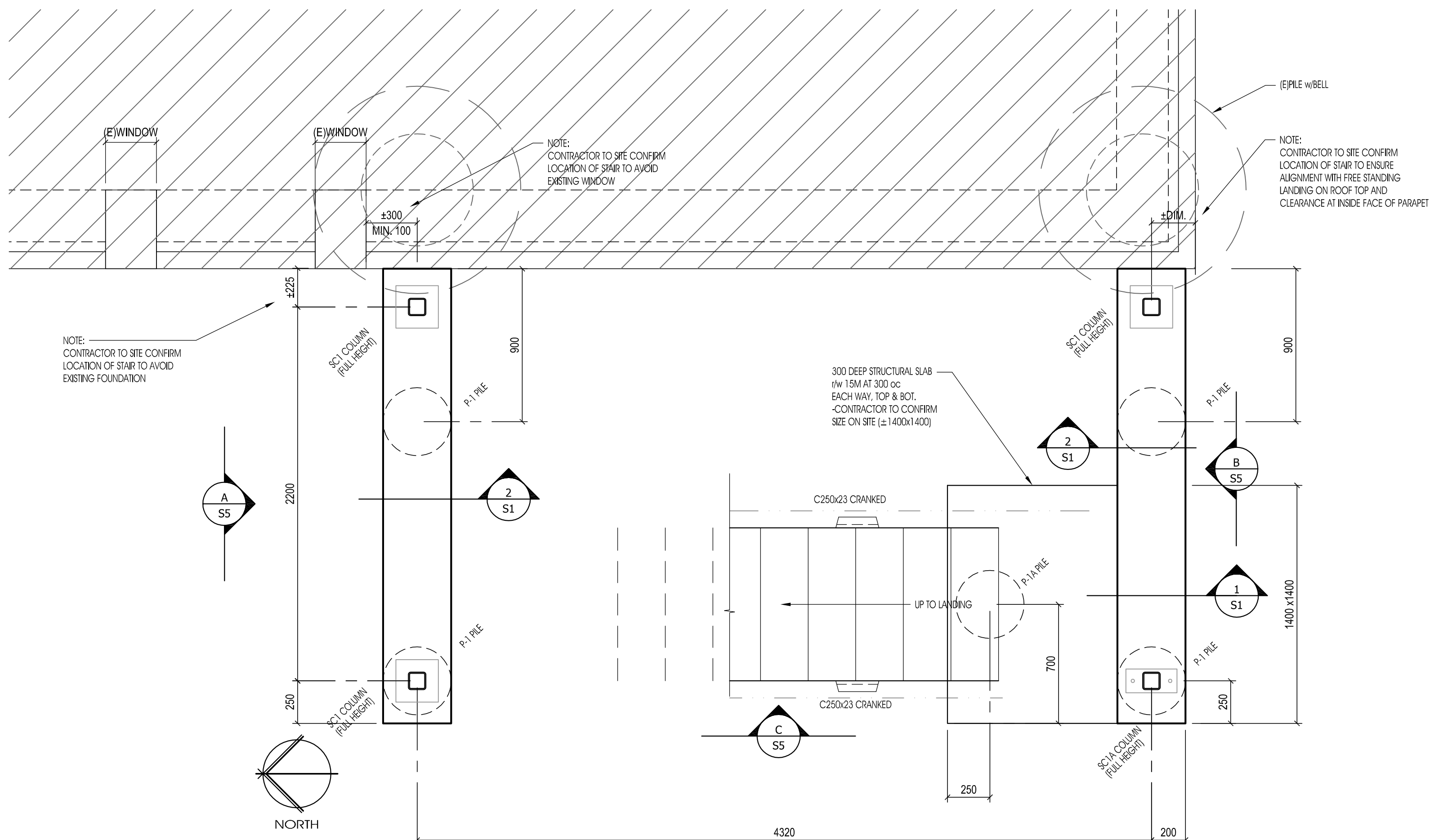
ROBB ■ KULLMAN ENGINEERING LLP 3022 LOUISE STREET SASKATOON, SASKATCHEWAN S7J 3L8 T: 306.477.0655 F: 306.477.1995 E: rk-eng@robb-kullman.com	ASSOCIATION OF PROFESSIONAL ENGINEERS & GEOSCIENTISTS OF SASKATCHEWAN CERT. OF AUTHORIZATION NUMBER C1422		PRAIRIE & NORTHERN WILDLIFE RESEARCH CENTRE (PNWRC) KEYPLAN 115 PERIMETER ROAD, SASKATOON, SK	
	DISCIPLINE STRUCTURAL	SK. REG. No. .		

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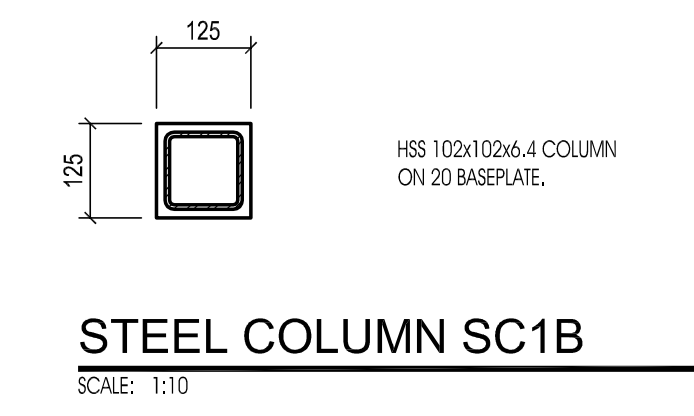


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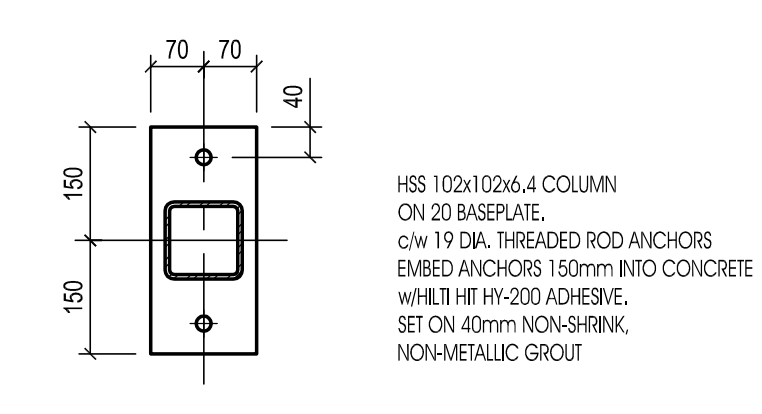
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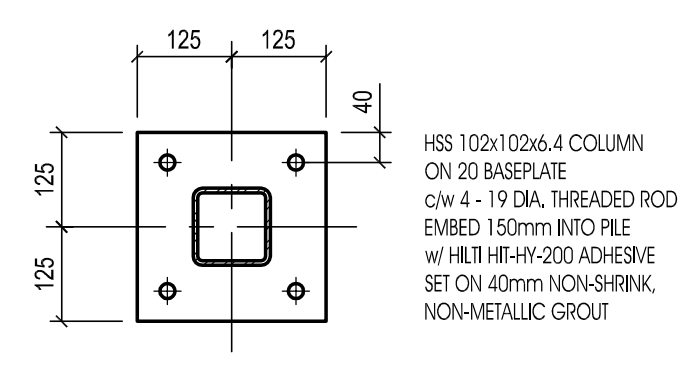
1 PLAN OF STAIR AT FOUNDATION
SCALE: 1:20



STEEL COLUMN SC1B
SCALE: 1:10



STEEL COLUMN SC1A
SCALE: 1:10



STEEL COLUMN SC1
SCALE: 1:10

SPECIFICATION

GENERAL

- Protect and safeguard existing buildings, equipment and services which may be affected by this work. Report any unforeseen conditions to the owner before proceeding.
- All dimensions to existing to be verified on site.
- Structural Design conforms to the most current edition of the following codes and standards.
 - National Building Code of Canada, 2015.
 - Structural Commentaries (NBC of Canada).
 - CAN/CSA-S16-14, Limit States Design for Steel Structures
 - CSA-A23.3-14, Design of Concrete Structures
- Design Loads:
 - Specified Dead Load: 0.5 kPa
 - Specified Live Load: 4.8 kPa

CLIMATIC DESIGN DATA

- Snow Loading: $S_s=1.7kPa$, $S_w=0.1kPa$
- Wind Loading: $q/50=0.43kPa$

CONCRETE PILES

- All piles are to be centered within 50mm of location shown on plan and shall not be out of plumb by more than 2% of pile length.
- Protect and safeguard existing buildings and services which may be affected by this work.
- Consolidate top 3m of all piles with mechanical vibrator.
- Piles have been designed based on the following skin friction values:

Depth Below Grade	Ultimate Skin Friction
0-2m	NIL
2-4m	50 kPa
4-7m	75 kPa
BELOW 7m	120 kPa

HELICAL SCREW PILES (ALTERNATE)

- All piles to be centered within 50mm of location shown on plan and shall not be out of plumb by more than 2% of pile length.
- Design, supply and install piles based on loads indicated on drawings including all required splices, concrete fill, dowels and pile caps as indicated on drawings.
- Helical screw pile shall be designed and sealed by a qualified Professional Engineer, registered in Saskatchewan, to safely support loads identified on the drawings.
- Pile design shall be based on bearing on helix and skin friction on the screw pile shaft. Designs based on torque are not acceptable.
- Modify and restore existing grades as required to obtain access.
- Provide suitable enclosure and fire protection around piles during completion of splices. All to be subject to the approval of site representative.
- Cut off piles squarely at elevations indicated and cast pile caps.
- Clear-up all debris from this work. Make good any damage to existing structures or services.
- Take one set of 3 test cylinders for each day concrete is cast and test in accordance with CSA-A 23.2-19.
- Steel Piles shall conform to the latest issue of ASTM Specification A552 (F_y= 241 MPa minimum).
- All piles to be hot dipped galvanized with a minimum zinc coating of 2 ounces/sq. foot to CAN/CSA G164-M92.
- Touch up site welds with galvanized primer.
- Welding electrodes to CSA W48 Series. Welding in accordance with CSA W59-13.
- Reinforcing Steel: new material conforming to CSA G30.18-14, Grade 400 MPa. Submit shop drawings for review prior to fabrication.
- Co-operate with the Owner and schedule work to accommodate required removal/relocation of existing equipment in a manner which is compatible with continued operation of the existing facility.
- Prior to commencement of piling, submit to the Consultant details of equipment to be used in installation of piles.
- Ensure inside of pile is free of foreign matter.
- Fill installed pipe with concrete using methods which will limit free fall and prevent segregation.
- Set dowels in accordance with details indicated on drawing. Secure until concrete is set.
- All concrete to be supplied and placed in accordance with CSA Standard A23.1-19.
- Remove all debris from the work and provide compacted backfill around new piles to match existing grades.
- Provide 3 typed copies of piling records including details of equipment use in installation, pile lengths and installation torque for each pile.

CONCRETE

- Supply, place, cure, finish and test all concrete in accordance with CSA-A23.1-19 and CSA-A23.2-19 with the following specific requirements:

Location	f _c (MPa)	Cement	Max Aggr. Size	Slump	Air Entrainment	Exposure Class
Piles & Pile Caps	32	HS	19mm	75mm	4 to 7%	S-2
Exterior Slab	32	HS	19mm	75mm	5 to 8%	C-2
- Take one set of 3 test cylinders for each day concrete is cast and test in accordance with CSA-A23.2-19.
- When outside air temperature drops below +5 degrees C or can reasonably be expected to do so, provide effective means of keeping all concrete temperatures above +10 degrees C for at least 3 days.

REINFORCING STEEL

- Reinforcing steel to be deformed bars of new billet steel conforming to CSA Standard G30.18-09 Grade 400.
- Place reinforcement in accordance with the plans and the requirements of the National Building Code and with the following cover on reinforcing:
 - Concrete deposited directly against soil: 75mm
 - Concrete formed against soil: 40mm
 - Structural slab on hardboard: 20mm top & bottom
- Extend grade beam reinforcing around corners or use corner bars.
- Slab reinforcement to be chaired on concrete brick sufficient in size and number to prevent displacement of reinforcing by workmen and equipment during placement of concrete. Lifting of reinforcement during placement of concrete is not acceptable.

DRILLED IN CONCRETE ANCHOR BOLTS

- Perform all work in accordance with manufacturer instructions.
- Drilled-in cartridge injected adhesive anchors shall be installed by a contractor with at least three (3) years of experience performing similar installations.
- Contractor shall complete a thorough installation training program with the manufacturer or manufacturer's representative prior to installing anchors.
- Carbon steel threaded rods shall conform to ASTM A193 type B7.
- Clean all holes to remove loose material and drilling dust prior to installation of adhesive. Remove water from drilled holes in such a manner as to achieve a surface dry condition.
- Do not disturb or load anchors before manufacturer specified cure time has elapsed.
- Observe manufacturer recommendations with respect to installation temperatures.
- Anchor shall not be torque tested unless otherwise directed by the Engineer.
- Remove and replace misplaced or malfunctioning anchors. Fill empty anchor holes and patch failed anchor locations with high-strength non-shrink, non-metallic grout. Anchors that fail to meet proof load or installation torque requirements shall be regarded as malfunctioning.

STRUCTURAL STEEL

- Wide Flanged and HSS Sections shall conform to CAN/CSA G40.20/G40.21 - Grade 350W.
- Channel Sections and Plate shall conform to CAN/CSA G40.20/G40.21 - Grade 300W.
- Anchor bolts shall conform to ASTM A307.
- Welding of structural steel to conform to CSA W59 - 13 and CSA W47.1-09, and shall be completed by a fabricator certified to Division 1 or 2.
- Fabrication, erection and connection design of structural steel shall conform to CSA S16-09.
- Galvanize all metal fabrications after fabrication. Touch up site welds with galvanized primer. All structural steel to be hot dipped galvanized with a minimum zinc coating of 2 ounces/sq. foot to CAN/CSA G164-M92.

NOTES:

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ROBB KULLMAN ENGINEERING LLP
NUMBER **C1422**
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PERMISSION TO CONSULT HELD BY: ROBB KULLMAN
SASK. REG. NO.: 9281

ROBB KULLMAN ENGINEERING LLP
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PROJECT

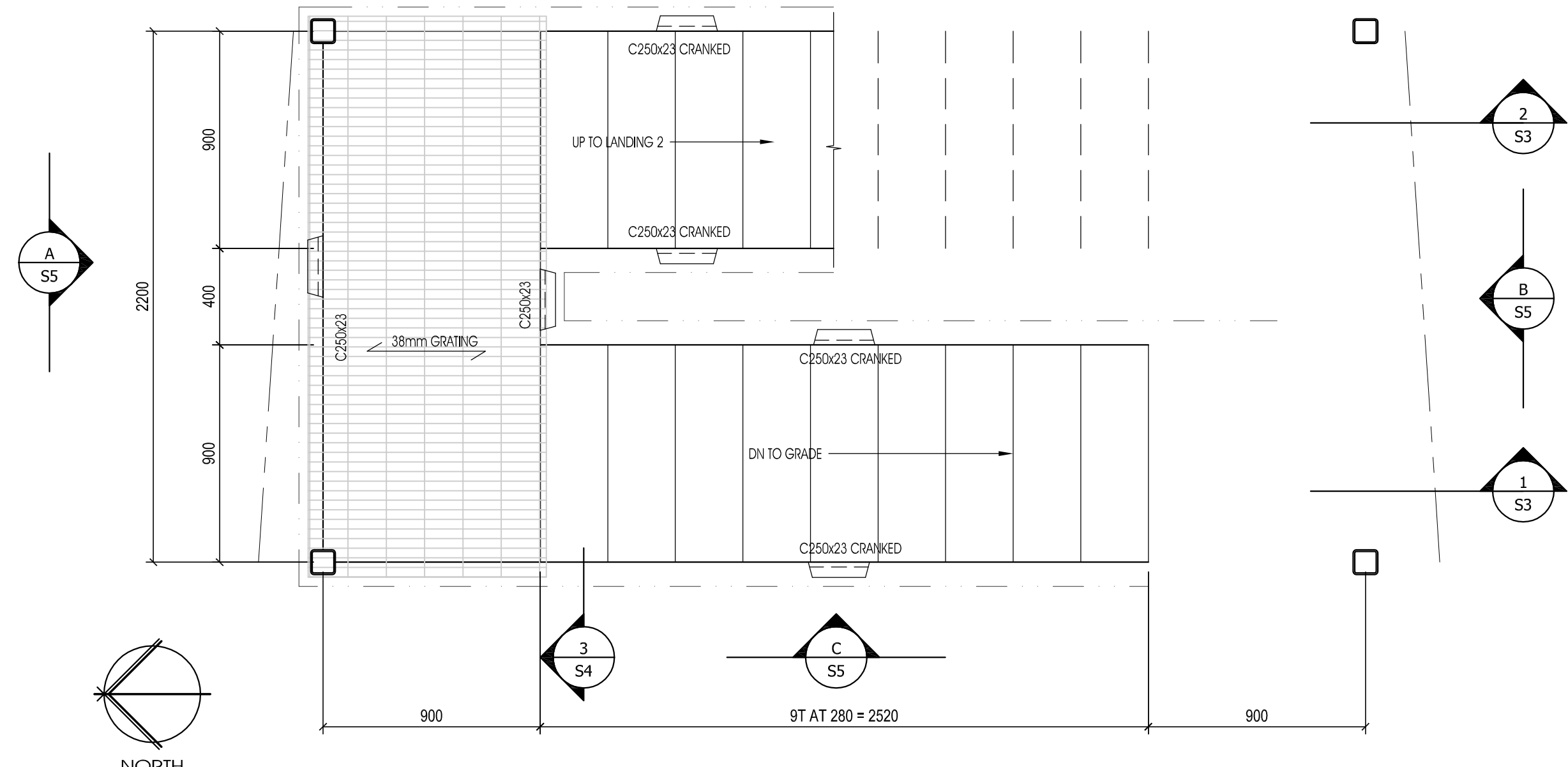
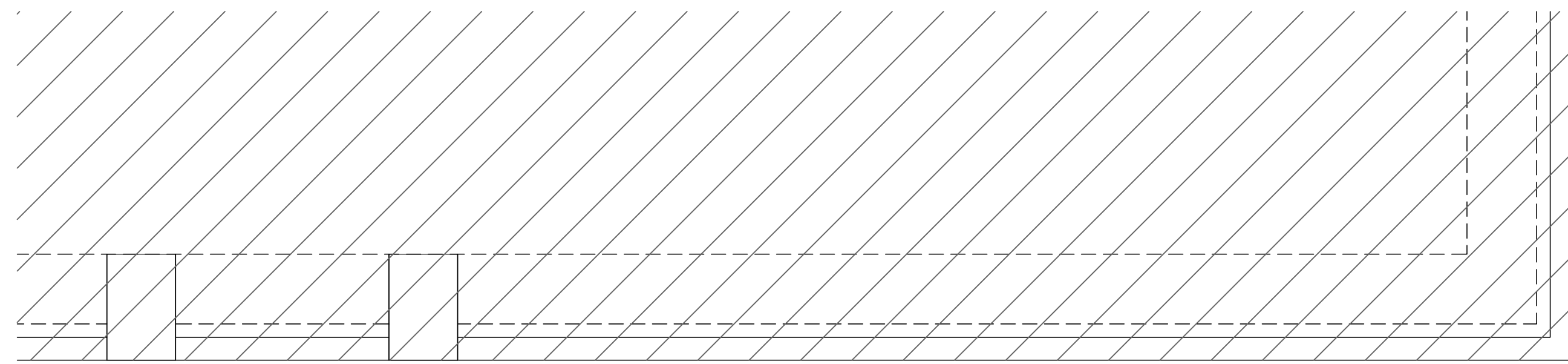
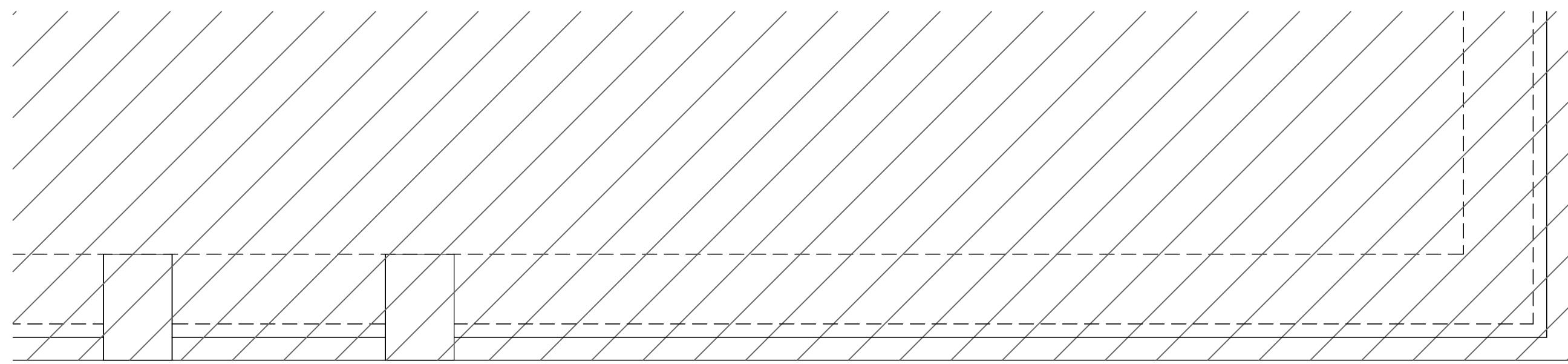
PRAIRIE & NORTHERN WILDLIFE RESEARCH CENTRE NEW EXTERIOR STAIR
115 PERIMETER ROAD
SASKATOON, SK

DRAWING NAME

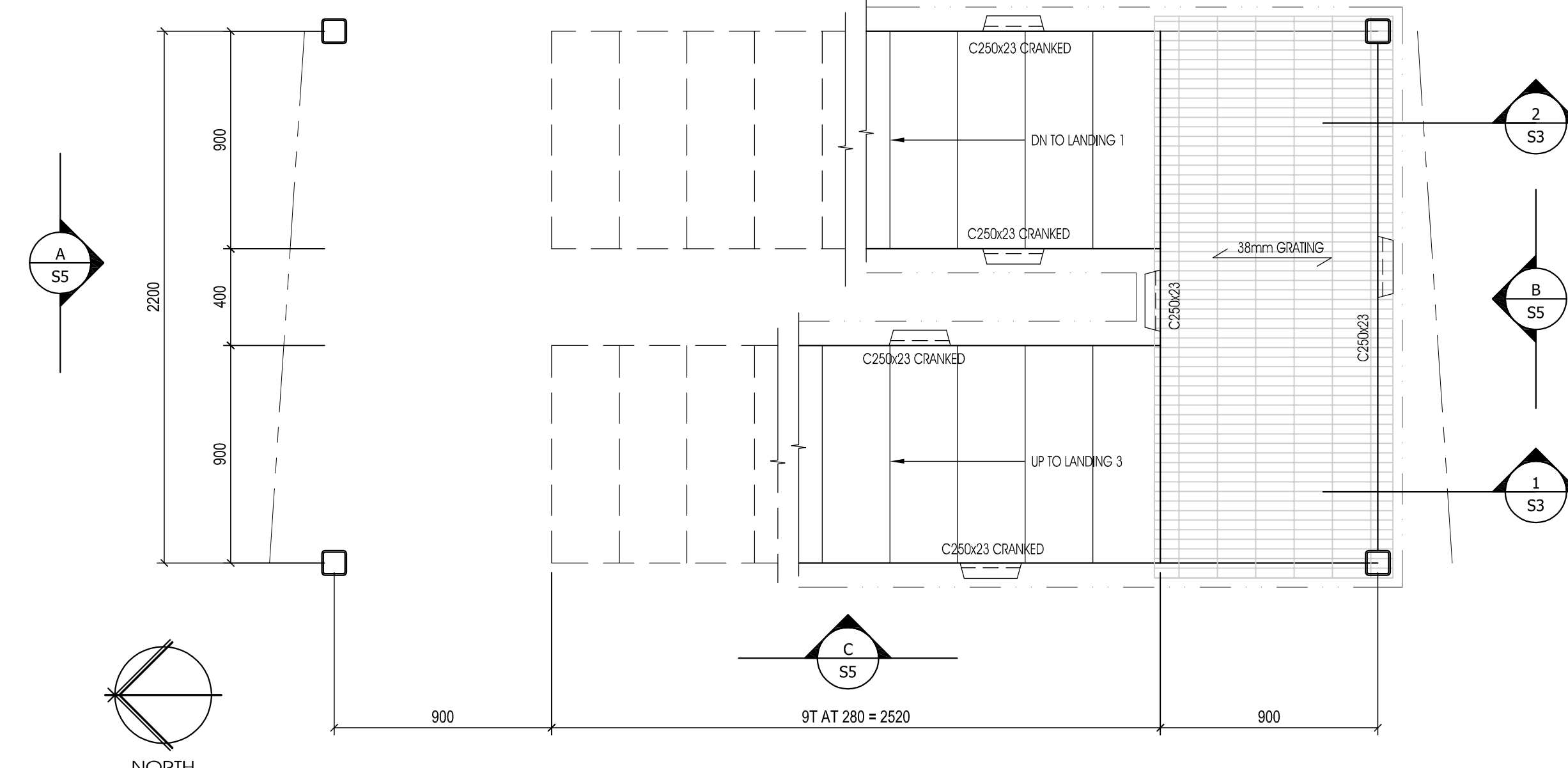
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DATE : SEPT. 2021
FILE : 21-715
CHECKED : FAC

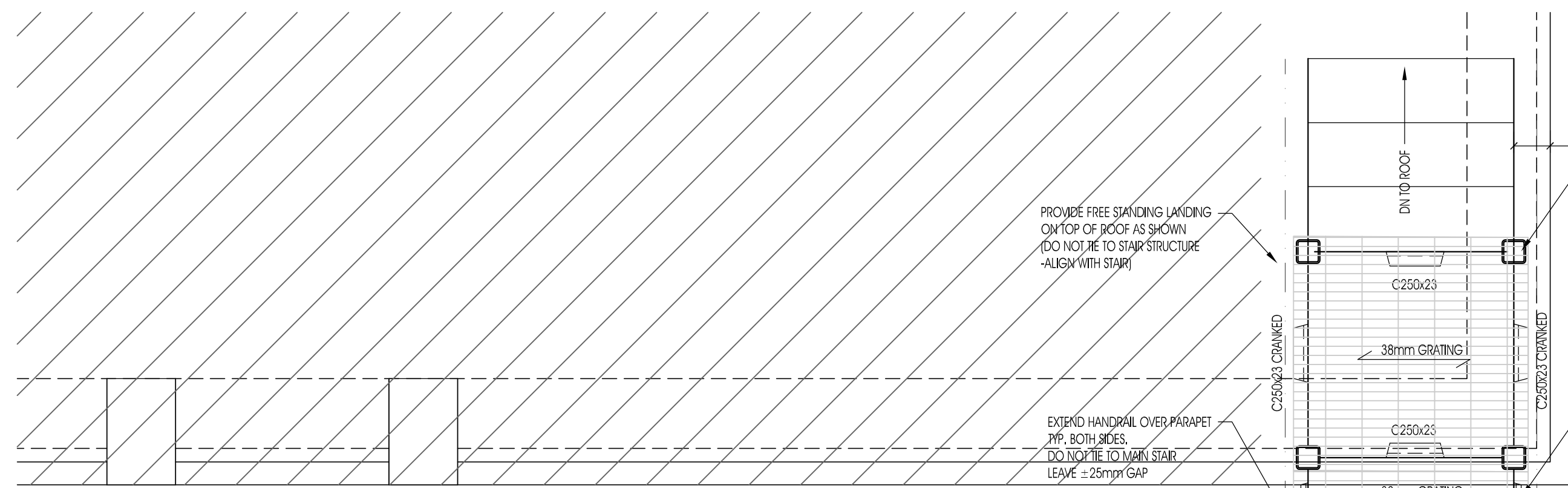
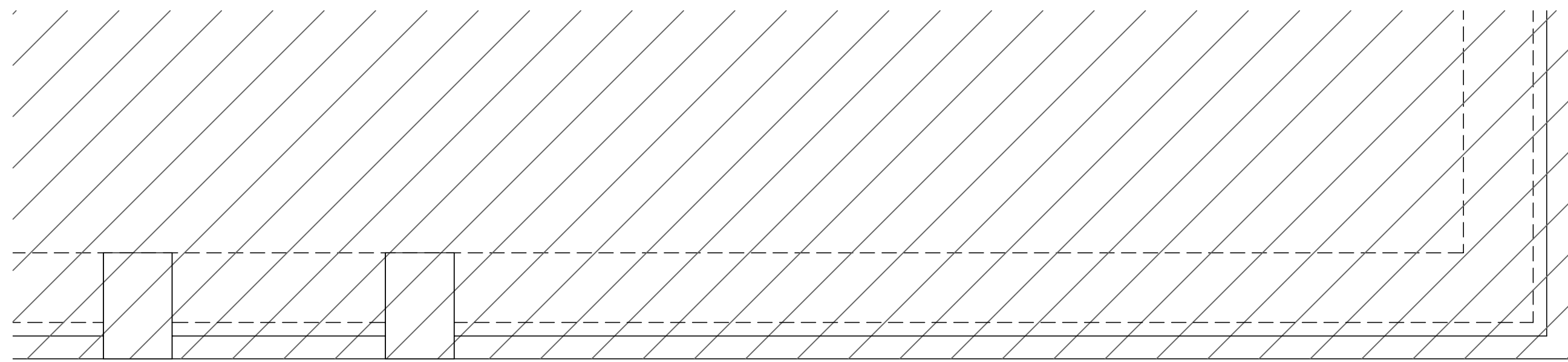
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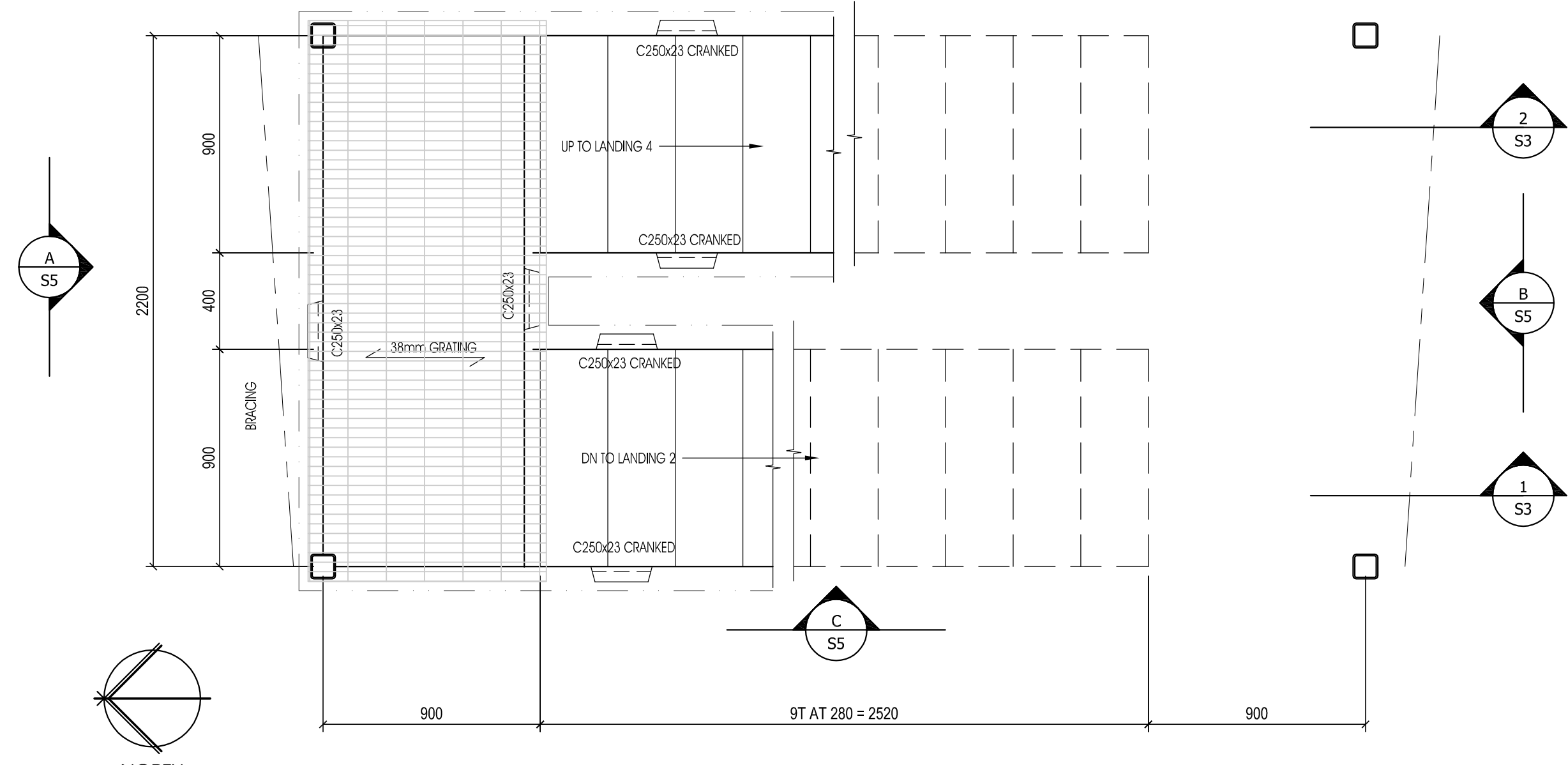
1 PLAN OF STAIR AT LANDING #1
SCALE: 1:20



2 PLAN OF STAIR AT LANDING #2
SCALE: 1:20



4 PLAN OF STAIR AT LANDING #4
SCALE: 1:20



3 PLAN OF STAIR AT LANDING #3
SCALE: 1:20

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PROJECT
PRAIRIE & NORTHERN WILDLIFE RESEARCH CENTRE NEW EXTERIOR STAIR
115 PERIMETER ROAD
SASKATOON, SK

DRAWING NAME
PLAN OF STAIRS AT LANDINGS #1-4

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S2

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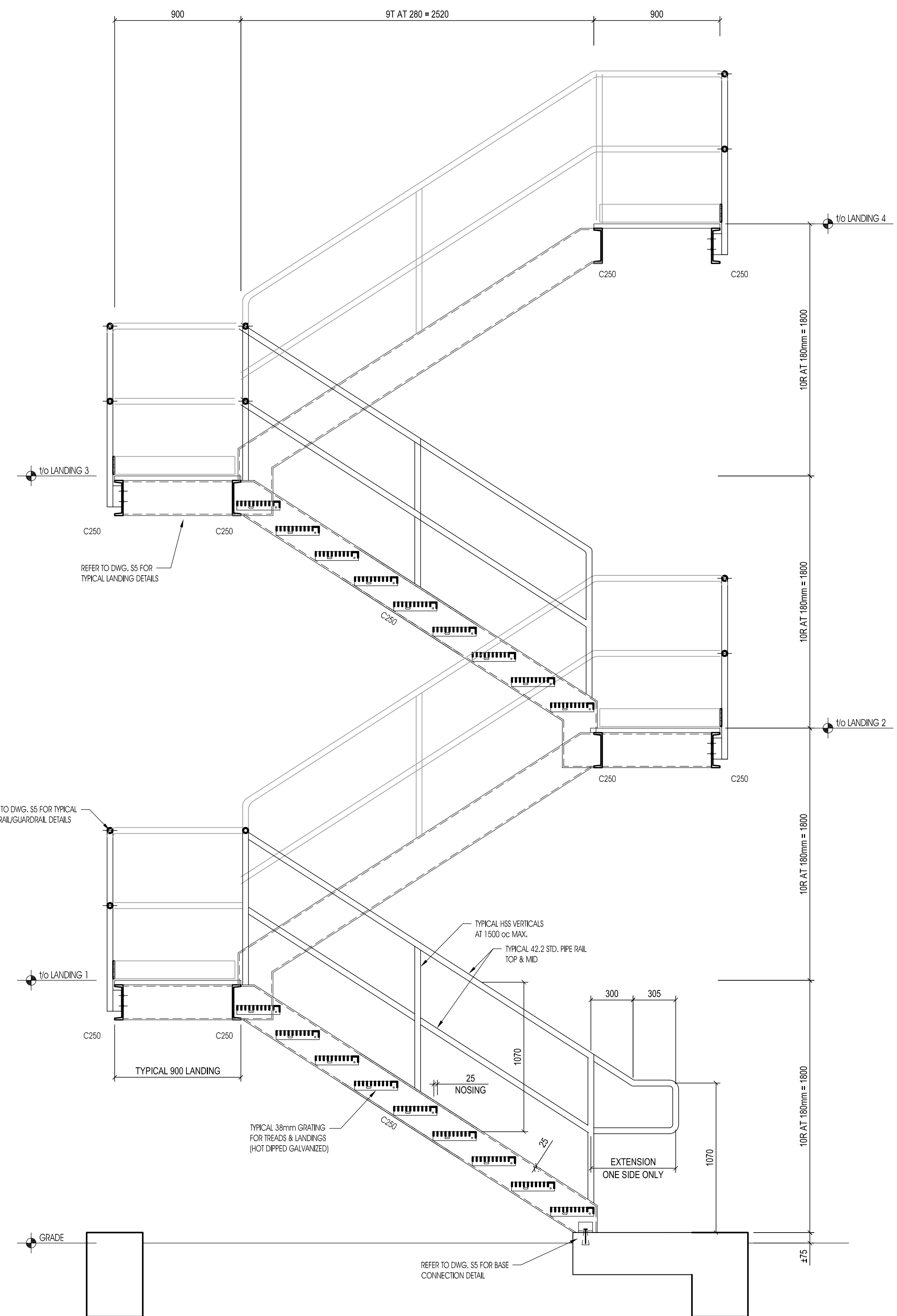


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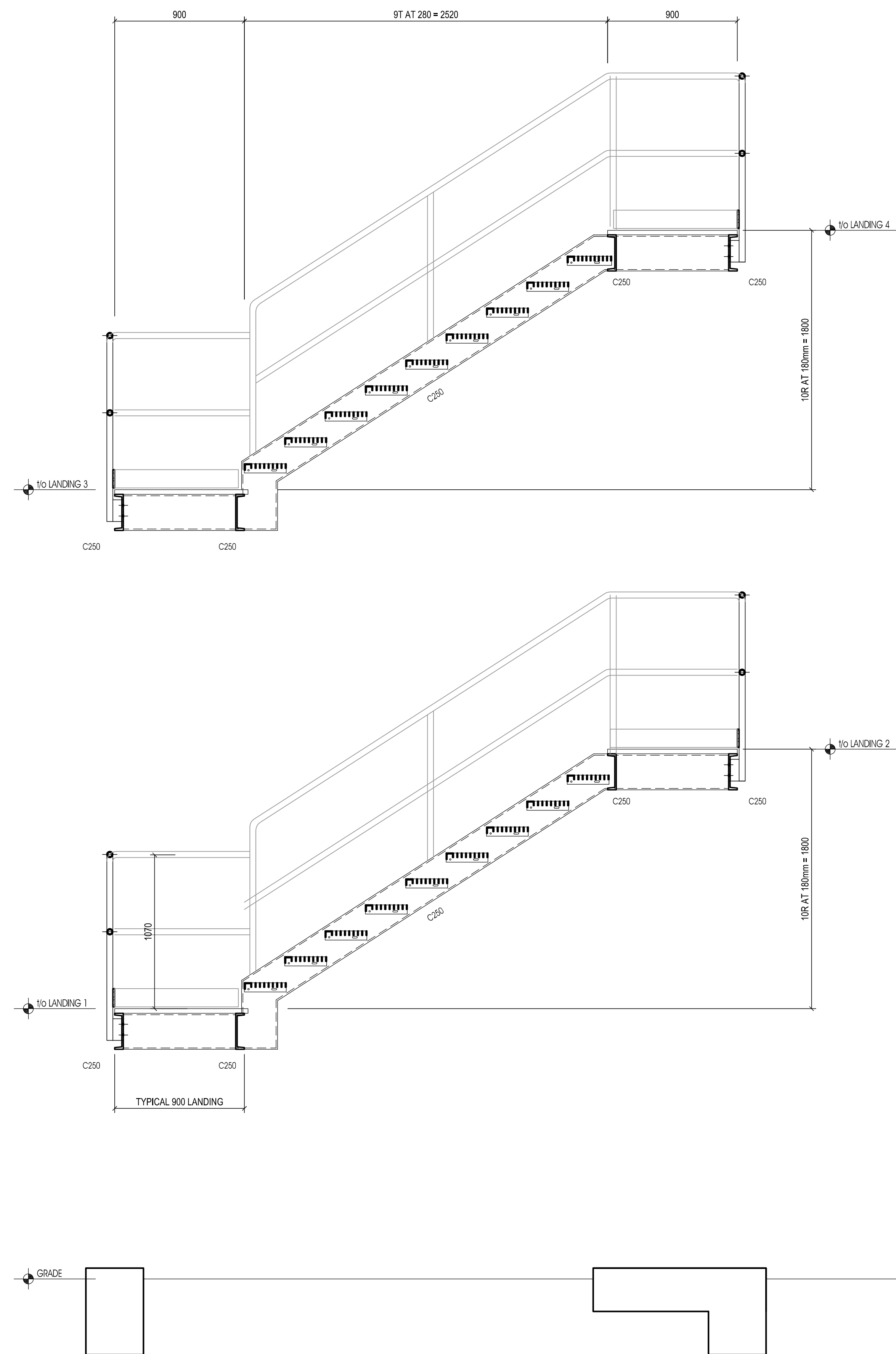
PROJECT
PRAIRIE & NORTHERN WILDLIFE RESEARCH CENTRE
NEW EXTERIOR STAIR
 115 PERIMETER ROAD
 SASKATOON, SK

DRAWING NAME
STAIR SECTIONS

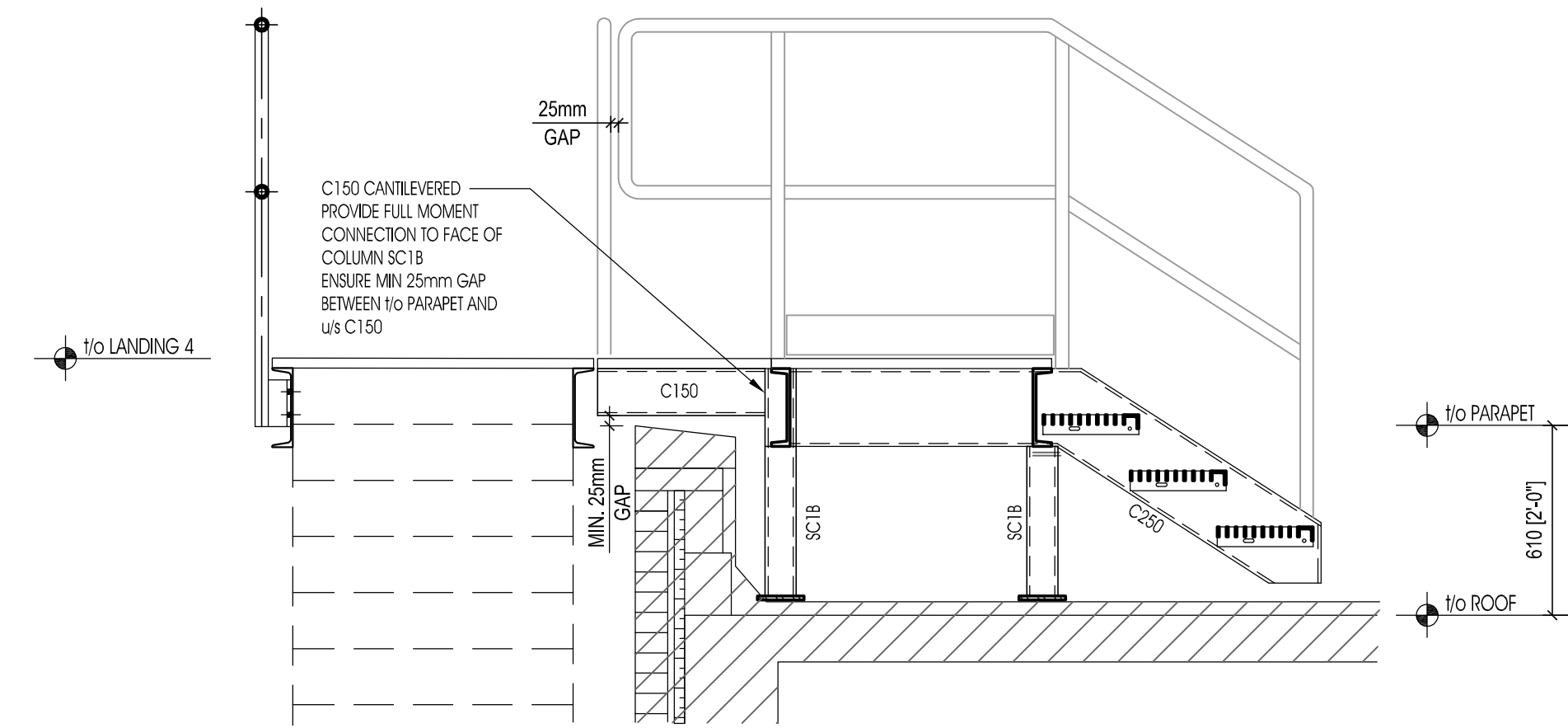
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 FILE : 21-715
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S3



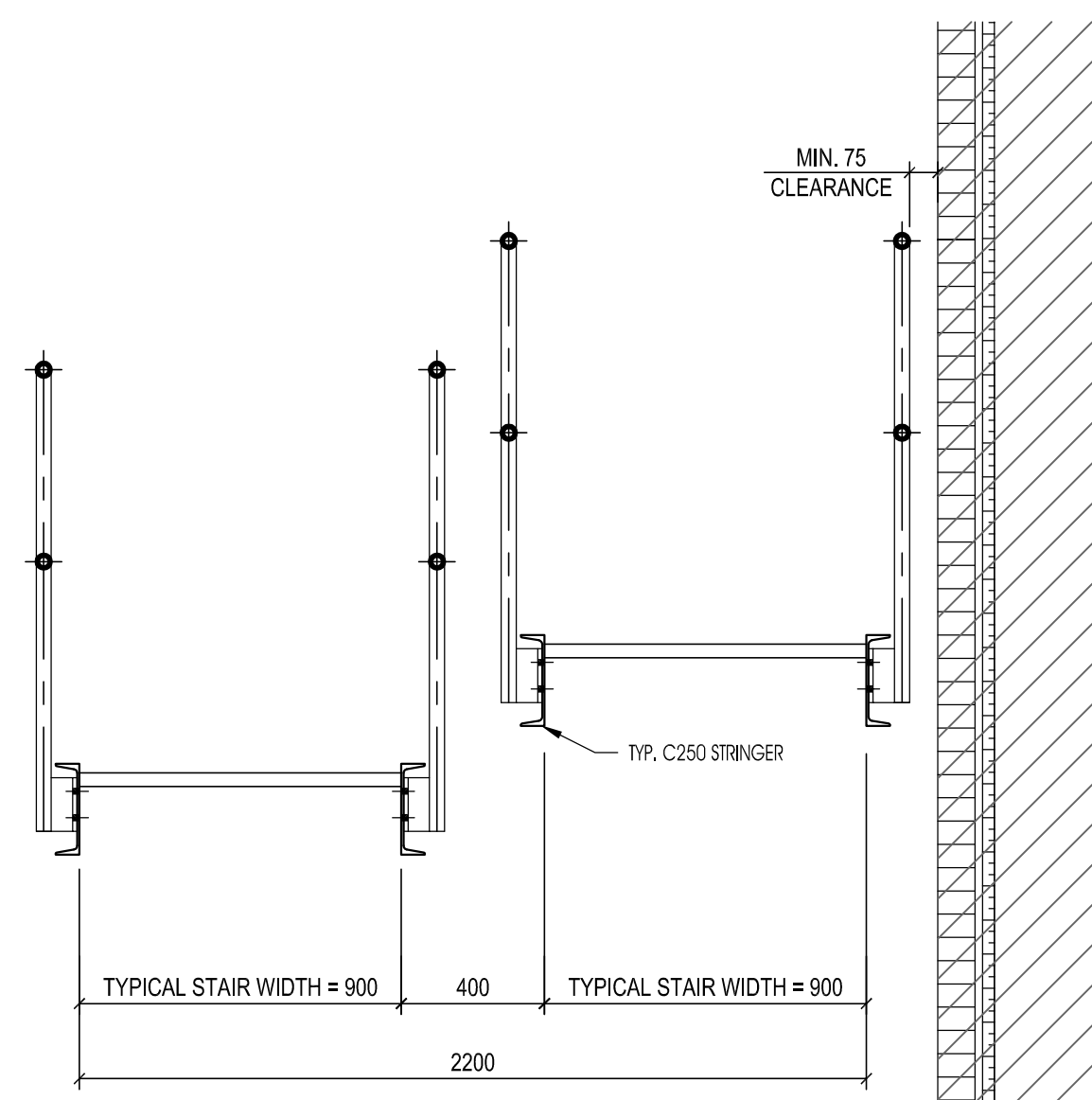
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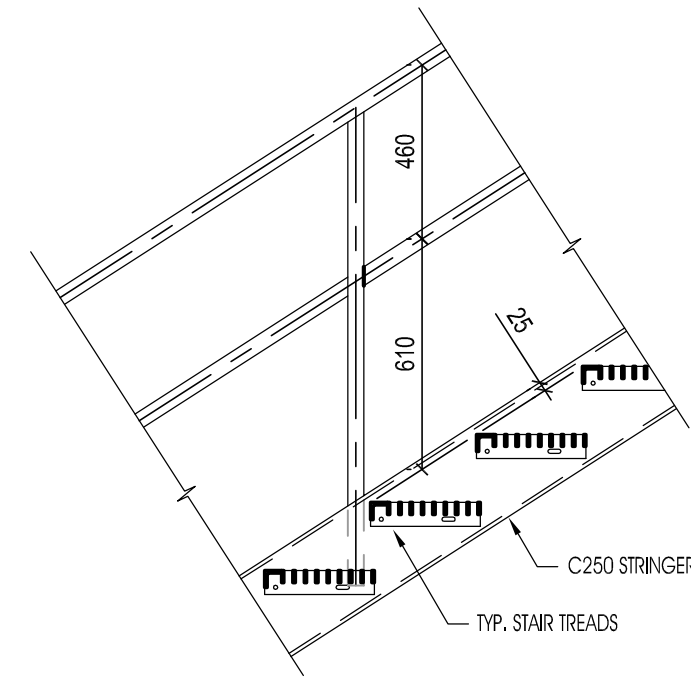
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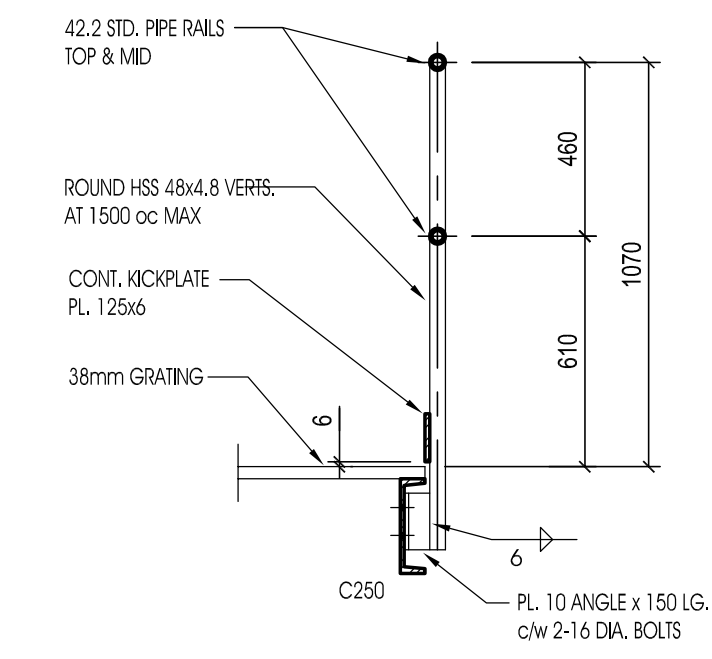
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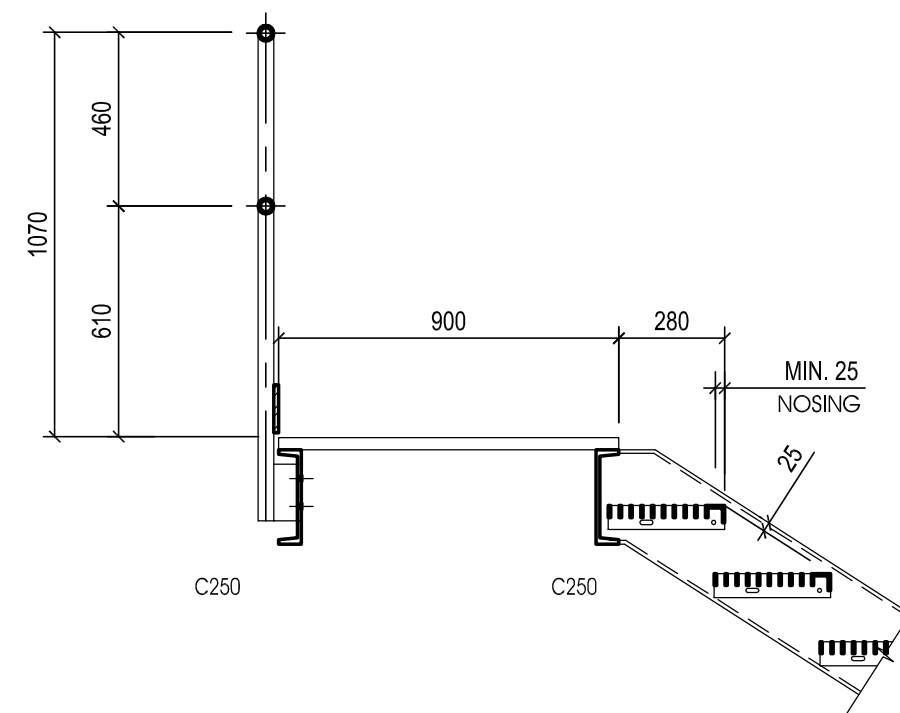
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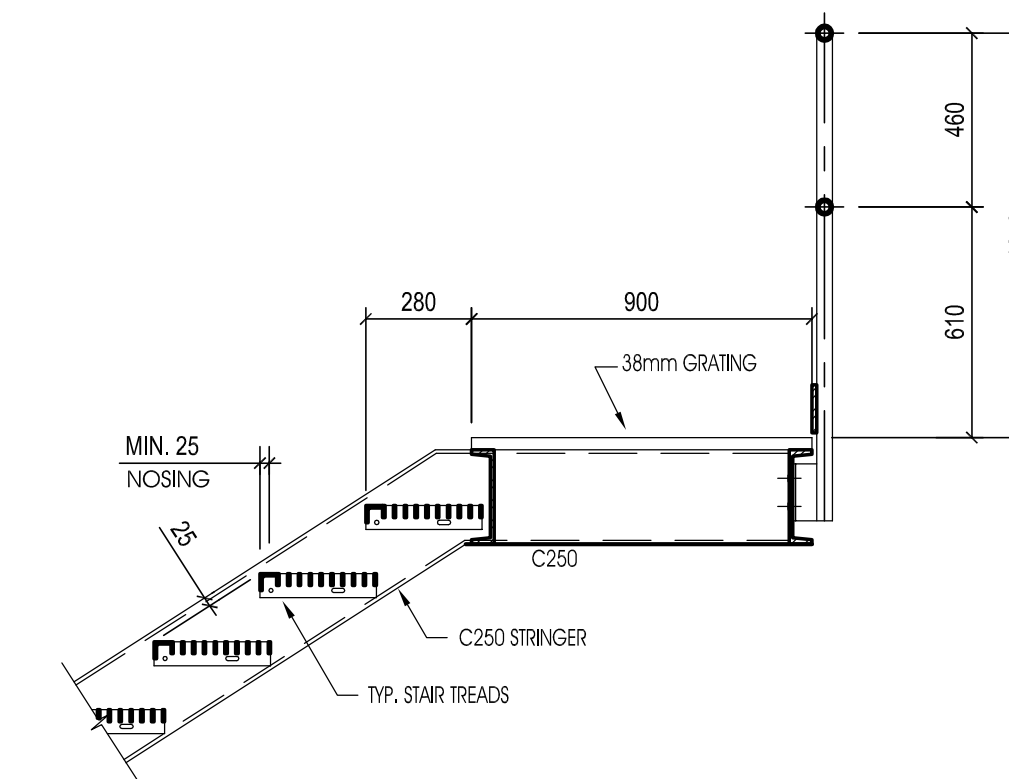
TYP. HANDRAIL/GUARDRAIL ELEVATION AT STRINGER
SCALE: 1:20



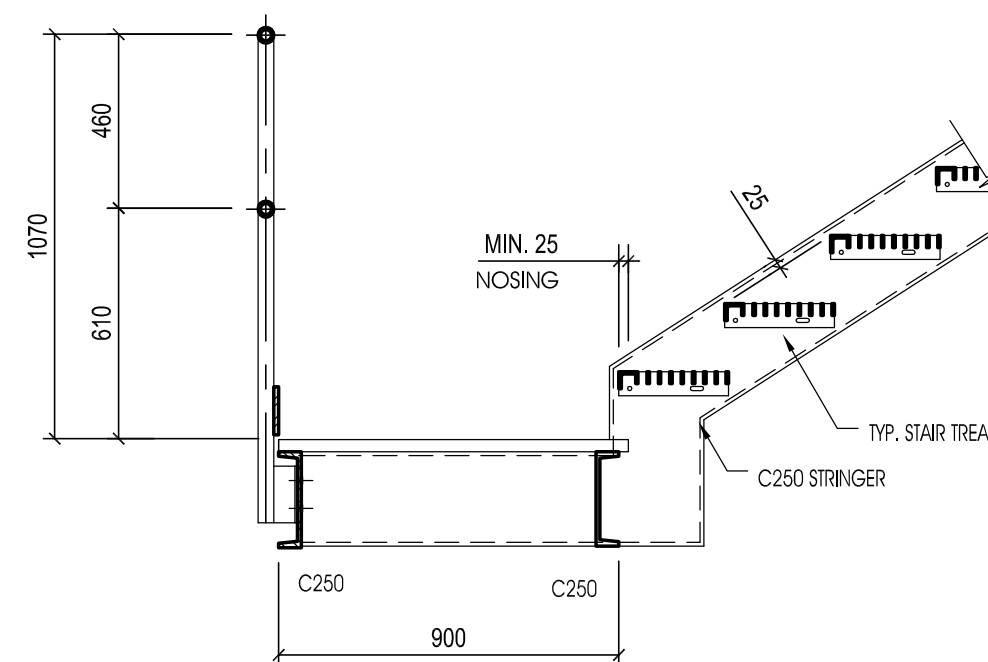
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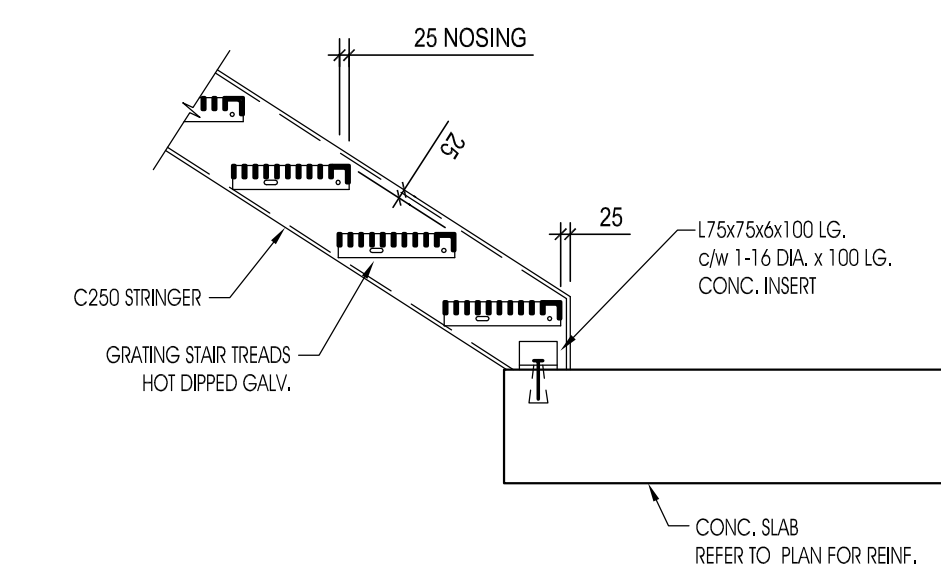
STAIR DESCENDING FROM LANDING AT CHANNEL
SCALE: 1:20



STAIR DESCENDING FROM LANDING AT CHANNEL
SCALE: 1:20



STAIR ASCENDING FROM LANDING AT CHANNEL
SCALE: 1:20



TYP. STRINGER CONNECTION AT BASE
SCALE: 1:20

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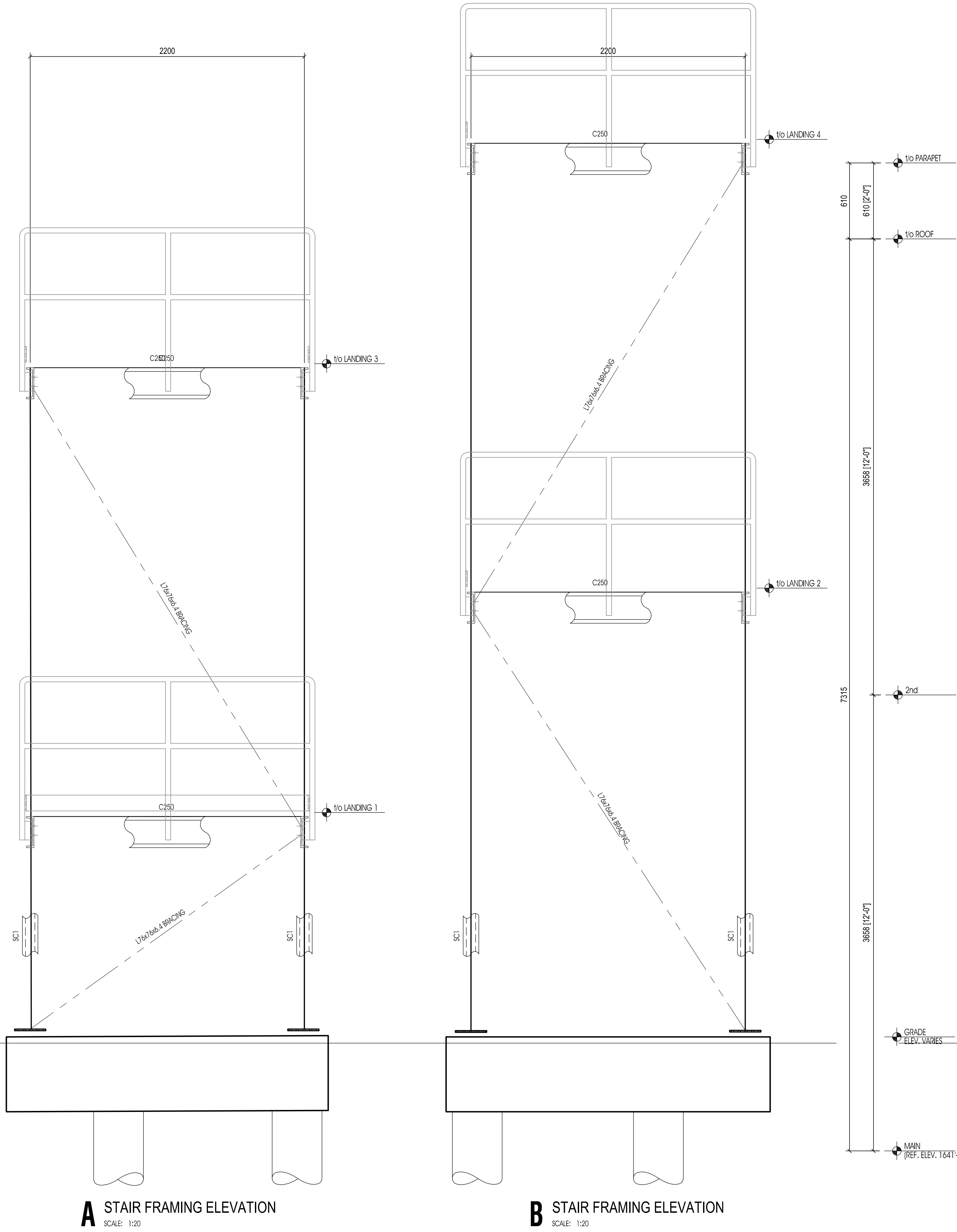
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PROJECT
PRAIRIE & NORTHERN WILDLIFE RESEARCH CENTRE NEW EXTERIOR STAIR
115 PERIMETER ROAD
SASKATOON, SK

DRAWING NAME
STAIR DETAILS

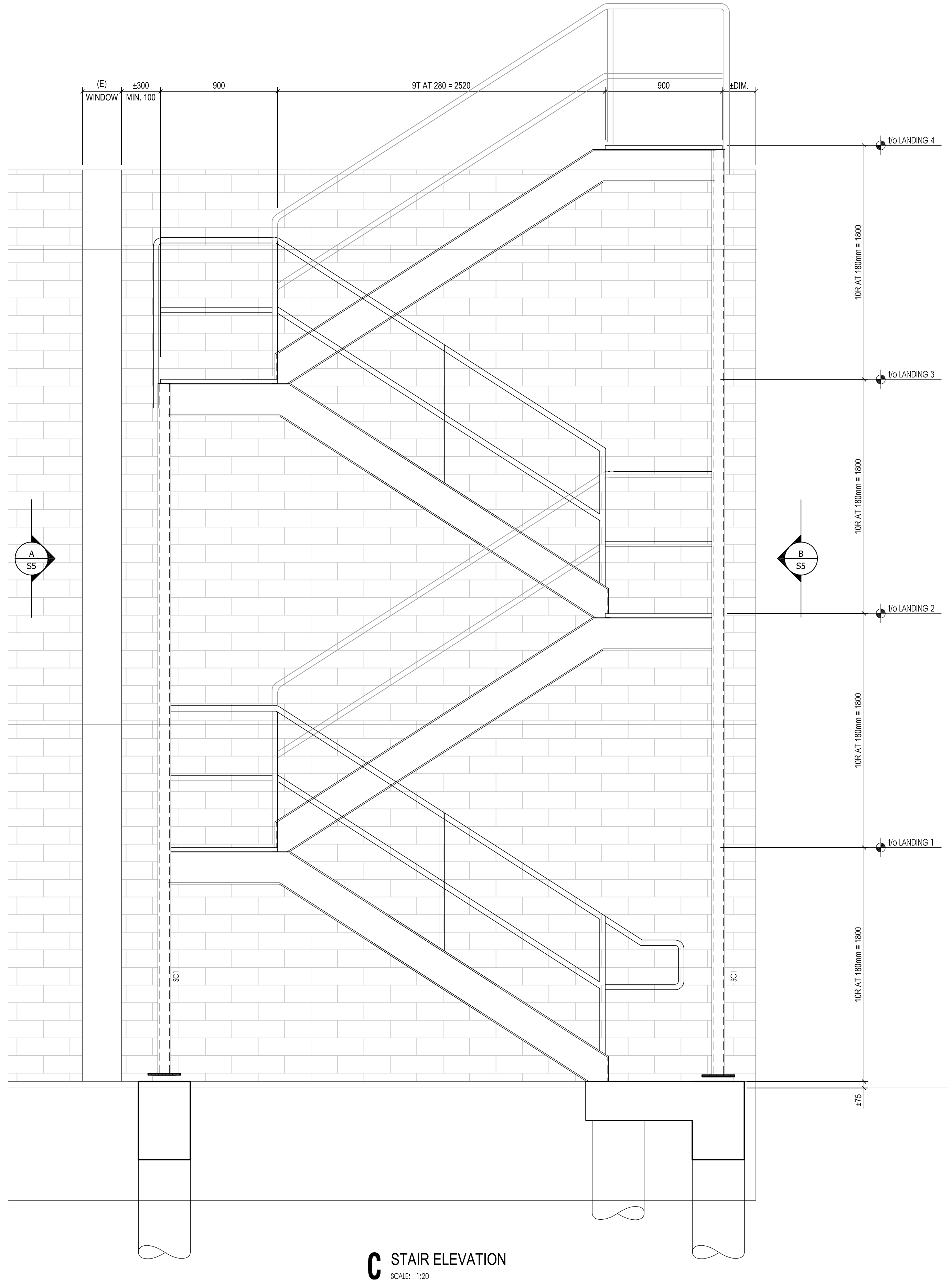
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FILE : 21-715
CHECKED : FAC
DRAWING
S4

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A STAIR FRAMING ELEVATION
SCALE: 1:20

B STAIR FRAMING ELEVATION
SCALE: 1:20



C STAIR ELEVATION
SCALE: 1:20

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PROJECT
PRAIRIE & NORTHERN WILDLIFE RESEARCH CENTRE NEW EXTERIOR STAIR
 115 PERIMETER ROAD
 SASKATOON, SK

DRAWING NAME
STAIR ELEVATIONS

DRAWN : SJC
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 DRAWING
S5