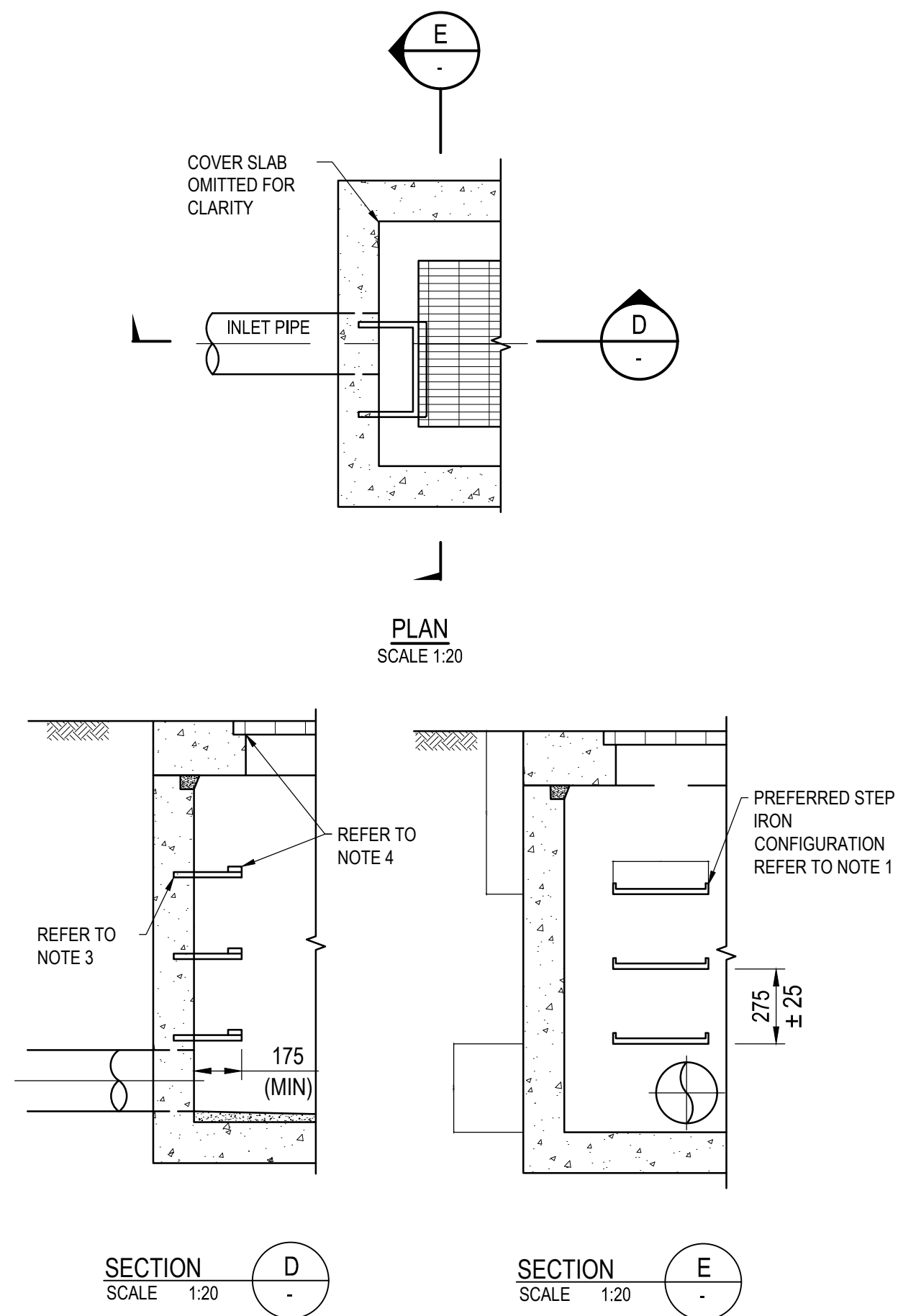
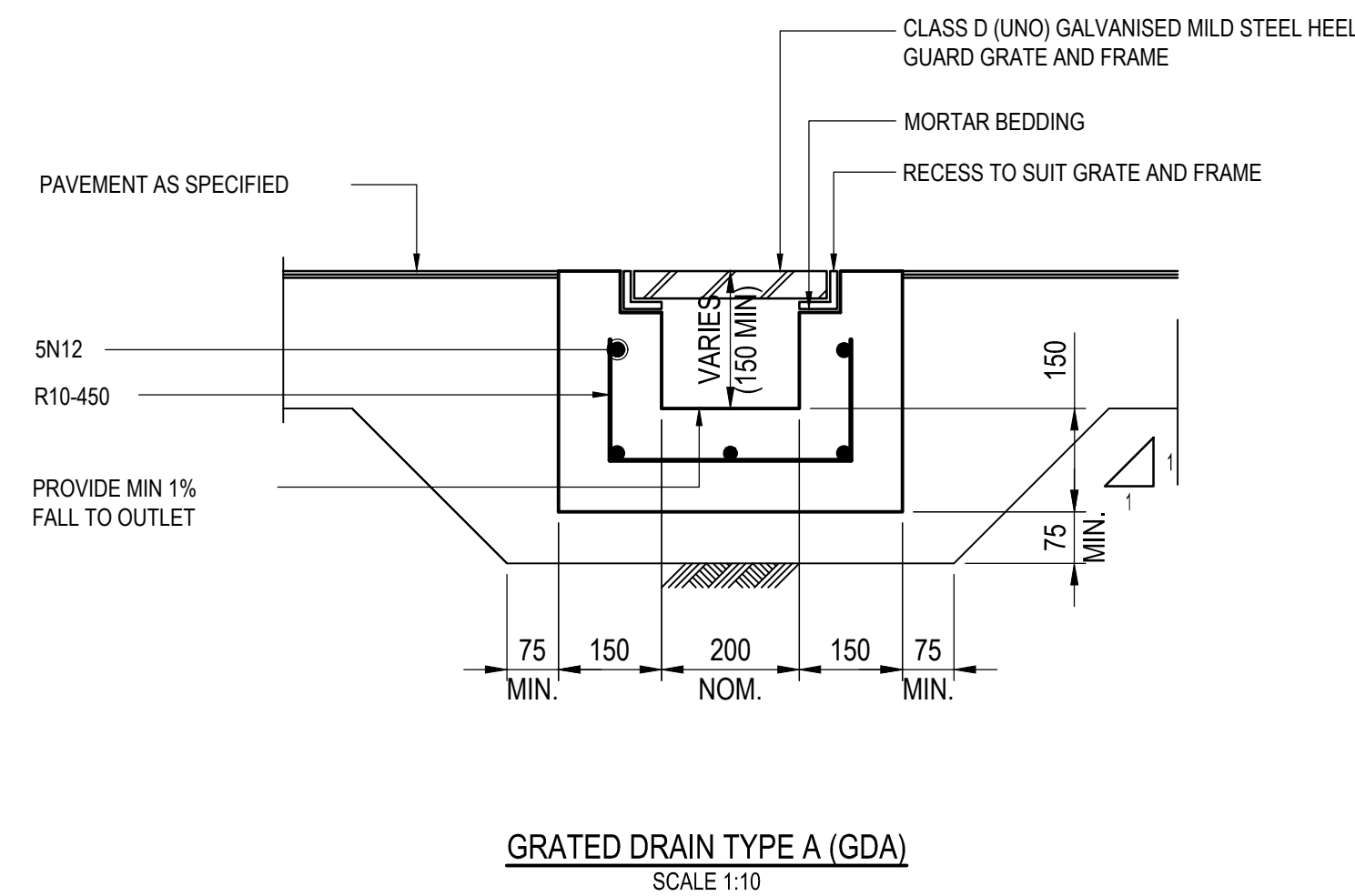
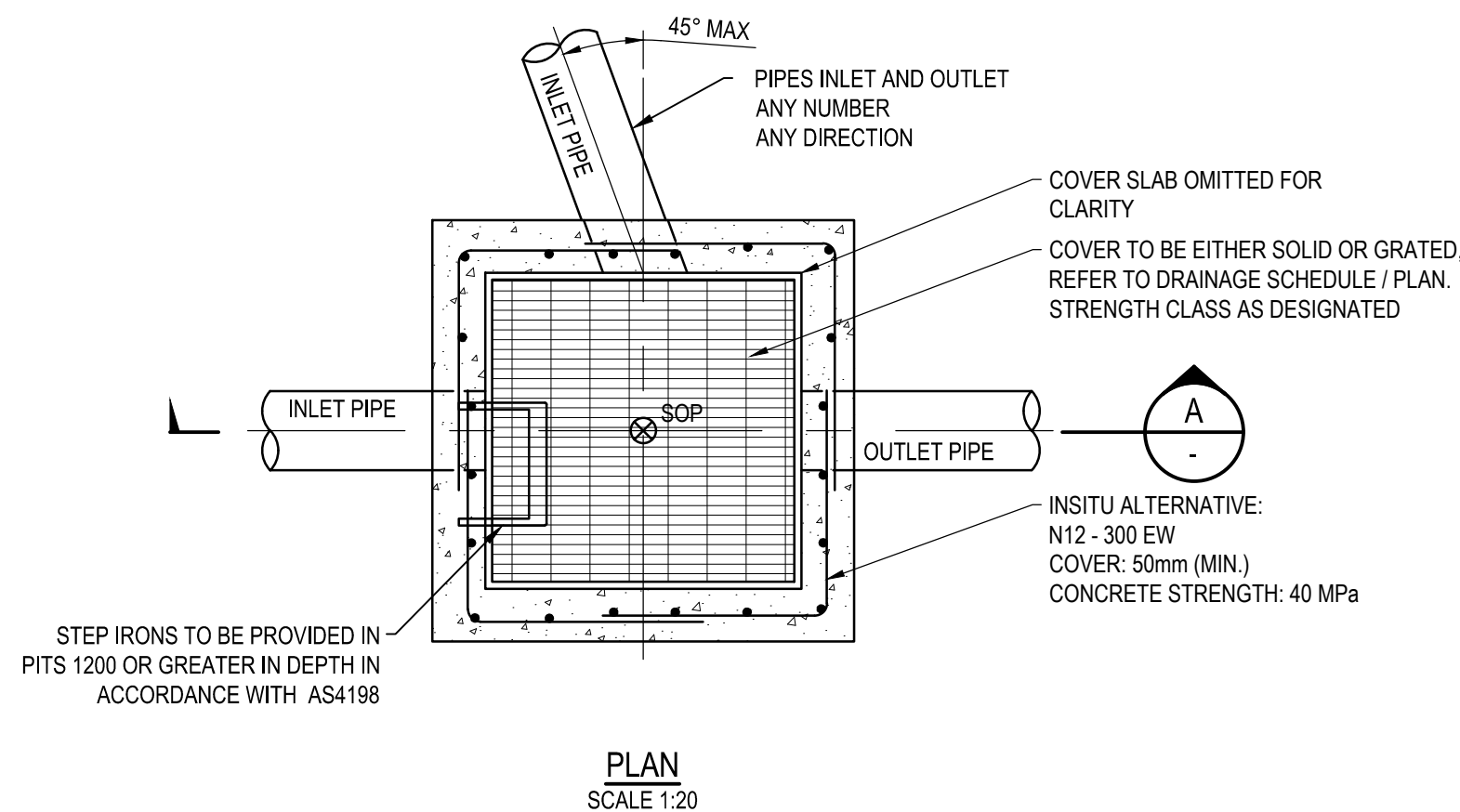
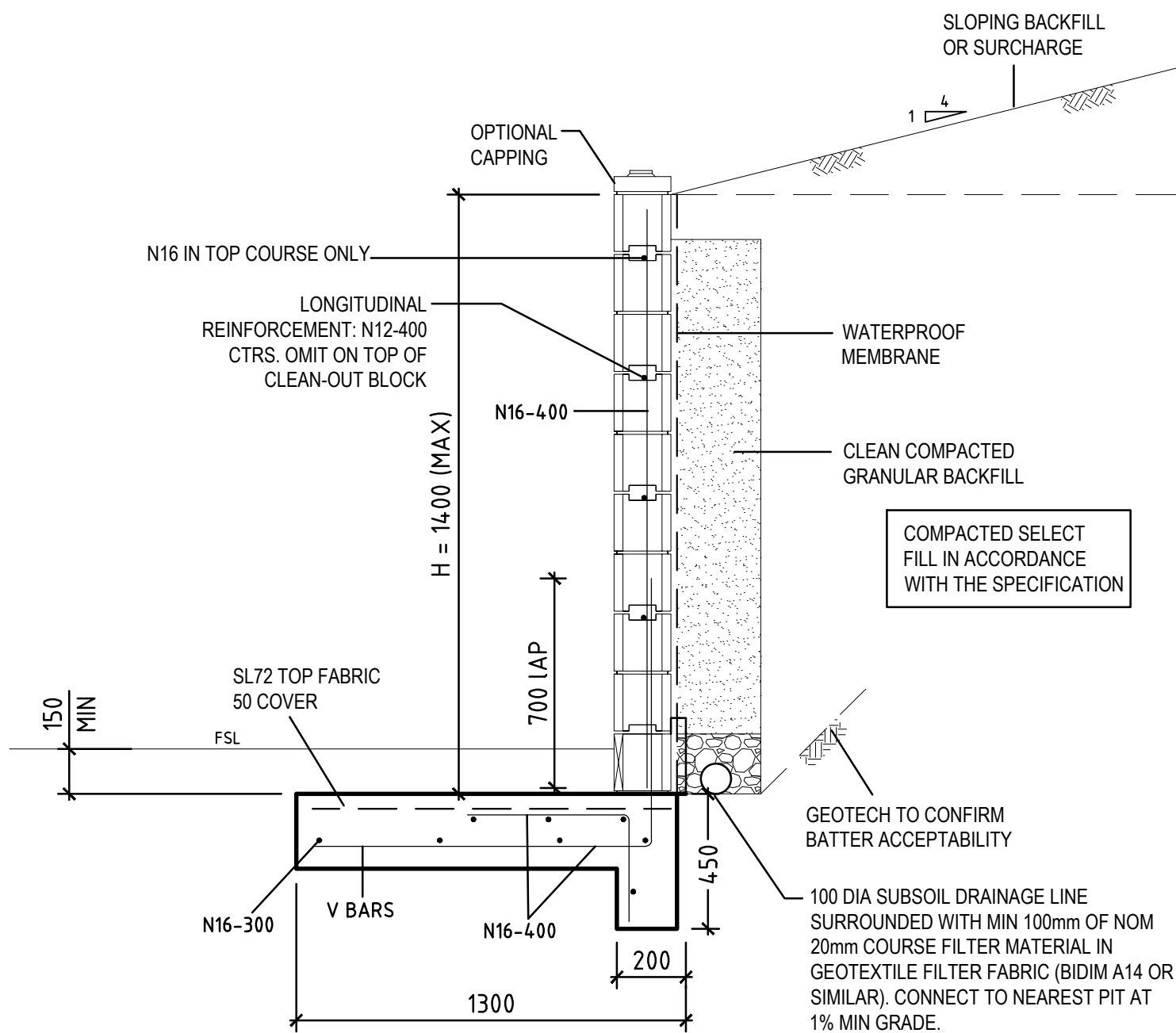


TYPICAL DRAINAGE PIT COVERS

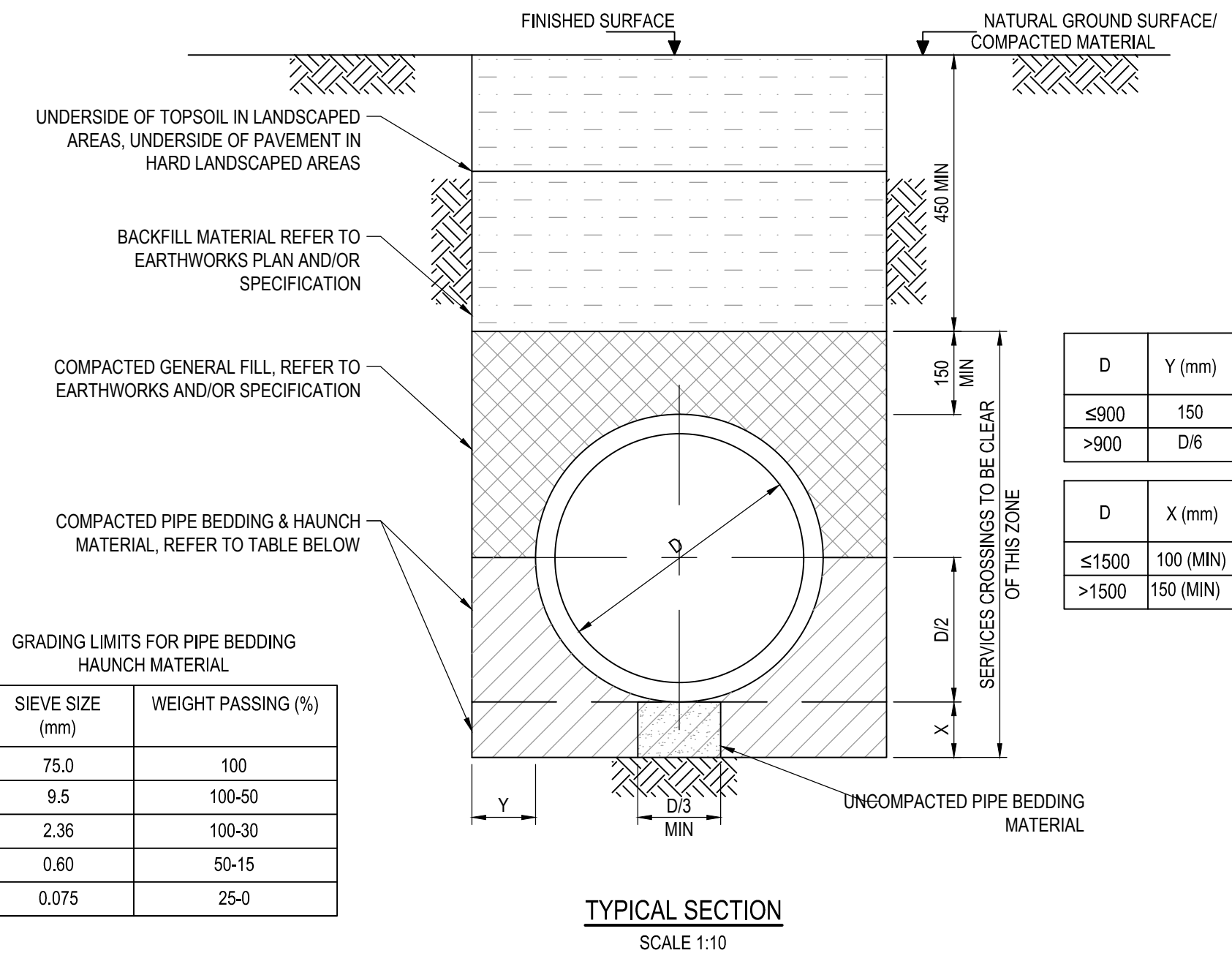
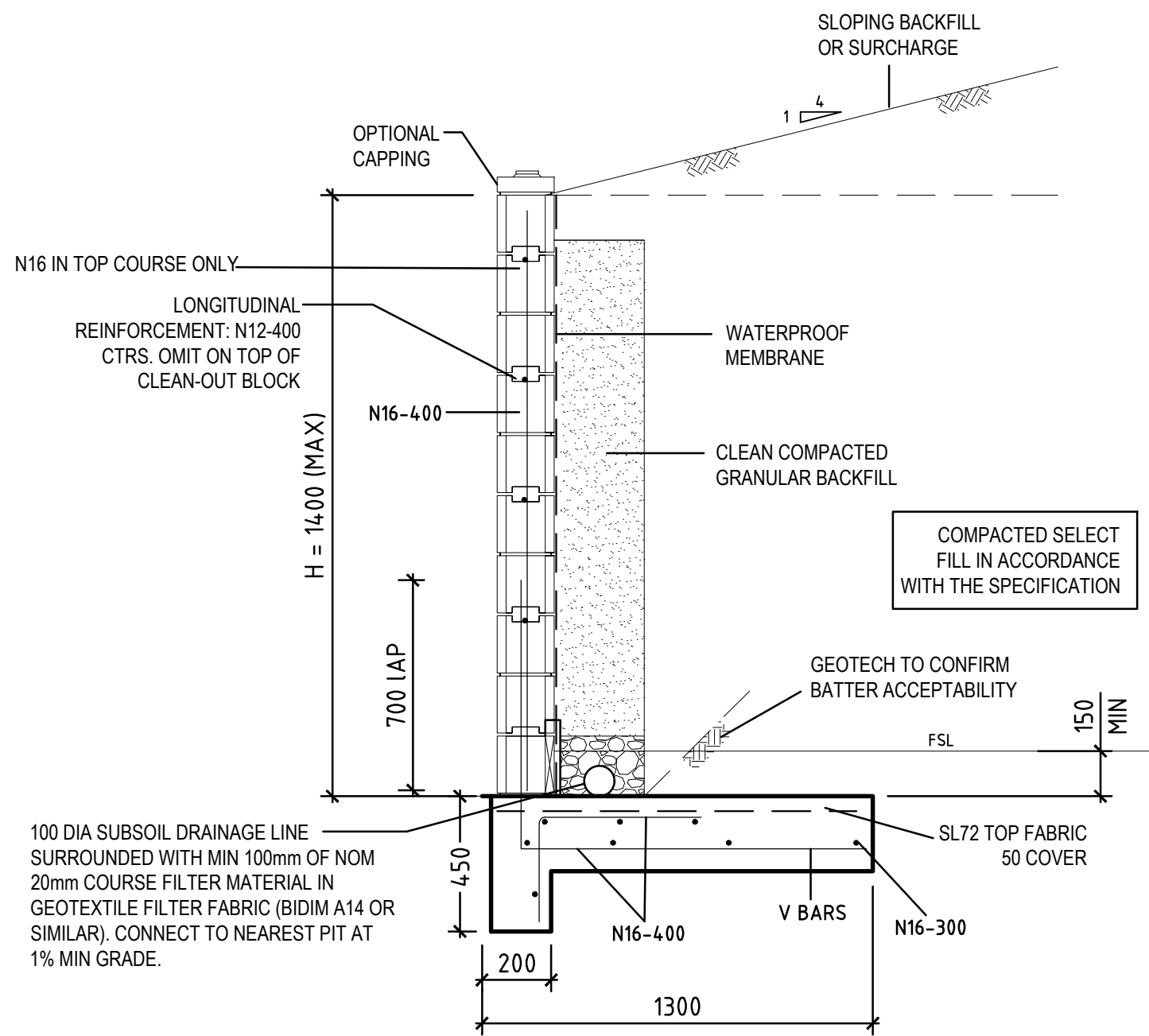


STANDARD STEP IRON DETAILS



BLOCK RETAINING WALL (MAX 1400 HIGH)

SCALE 1:20



TYPE HS1 PIPE BACKFILL DETAIL

SIEVE SIZE (mm)	WEIGHT PASSING (%)
75.0	100
9.5	100-50
2.36	100-30
0.60	50-15
0.075	25-0

TYPE	MIN STD COMPACTION
COHESIVE	50%*1
COHESIONLESS	85%*2

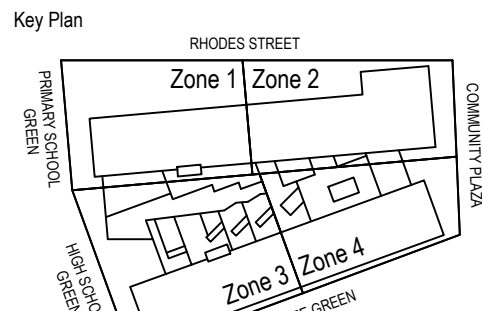
*1 IN ACCORDANCE WITH AS3725-2007

- NOTES FOR PITS:**
- HOLES BROKEN/FORMED IN PRE-CAST PITS FOR THE INSERTION OF PIPES SHALL BE MADE WATERTIGHT AND REINSTATED WITH A STIFF MORTAR (3 CEMENT:1 FINE AGGREGATE) OR EPOXY BASED SEALANT.
 - IF PIT DEPTH IS GREATER THAN 1500mm BUT LESS THAN 3000mm, INSITU REINFORCEMENT IS N16-150 EW.
 - WIDTH OF PIT WALL TO BE EXTENDED ACCORDINGLY TO ACCOMMODATE TWIN PIPES. INSITU REINFORCEMENT TO SUIT ACCORDINGLY.

- NOTES FOR BENCHING:**
- MASS CONCRETE BENCHING WITHIN PITS MUST BE FORMED SO AS TO CONVEY WATER FROM INLET(S) TO OUTLET.
 - BENCHING SHOULD BE ACHIEVE MINIMUM CROSS FALLS WITHIN PITS AS REQUIRED BY ENSTRUCT'S PIT DETAILS AND AUSTRALIAN STANDARDS.
 - NO WATER STAND IN PITS WHEN BENCHING IS COMPLETE.

- NOTES FOR STEP IRONS:**
- STEP IRONS TO AS1657 AND EN13101 ARRANGED IN A SINGLE WIDTH TREAD FORMATION (MIN LENGTH 350mm) OR A SINGLE COLUMN, DOUBLE WIDTH TREAD (MIN LENGTH 150mm) STAGGERED DOUBLE COLUMN.
 - STEP IRONS TO BE INDUSTRIAL STEP. SURE-STEP OR SIMILAR APPROVED. MINIMUM THICKNESS OF TREAD 20mm WITH UPSTAND HEIGHT 20mm AT EACH END OF THE TREAD TO PREVENT LATERAL SLIP.
 - STEPS TO BE CHEMICALLY/PHYSICALLY ANCHORED INTO THE PIT WALLS IN ACCORDANCE WITH THE STEP IRON MANUFACTURER'S DETAILS.
 - STEP IRONS TO BE LOCATED SO AS TO BE READY ACCESSIBLE FROM THE COVER. WHERE INTERNAL PIT SIZE EXCEEDS 1200x1200 THE COVER SLAB, FRAME & COVER POSITION SHOULD BE LOCALLY DISPLACED TO SUIT ACCESS TO THE STEP IRONS. REFER TO ENGINEER FOR CLARIFICATION IF REQUIRED.

Recent revision history	Notes
# Status Description Date	Copyright © Woods Bagot 2018
01 Status 50% SD ISSUE 13/07/18	All Rights Reserved
02 Status 80% SD ISSUE 31/08/18	No material may be reproduced without prior permission
03 FOR COSTING 25/03/19	
04 SSDA ISSUE 15/05/19	Contractor must verify all dimensions on site before commencing work or preparing shop drawings.
05 DRAFT 90% SD 29/05/19	
06 SD ISSUE 14/06/19	Do not scale drawings.
07 50% ISSUE 01/06/20	
08 75% ISSUE 08/07/20	
09 FOR CROWN CERTIFICATE 23/07/20	



Contractor



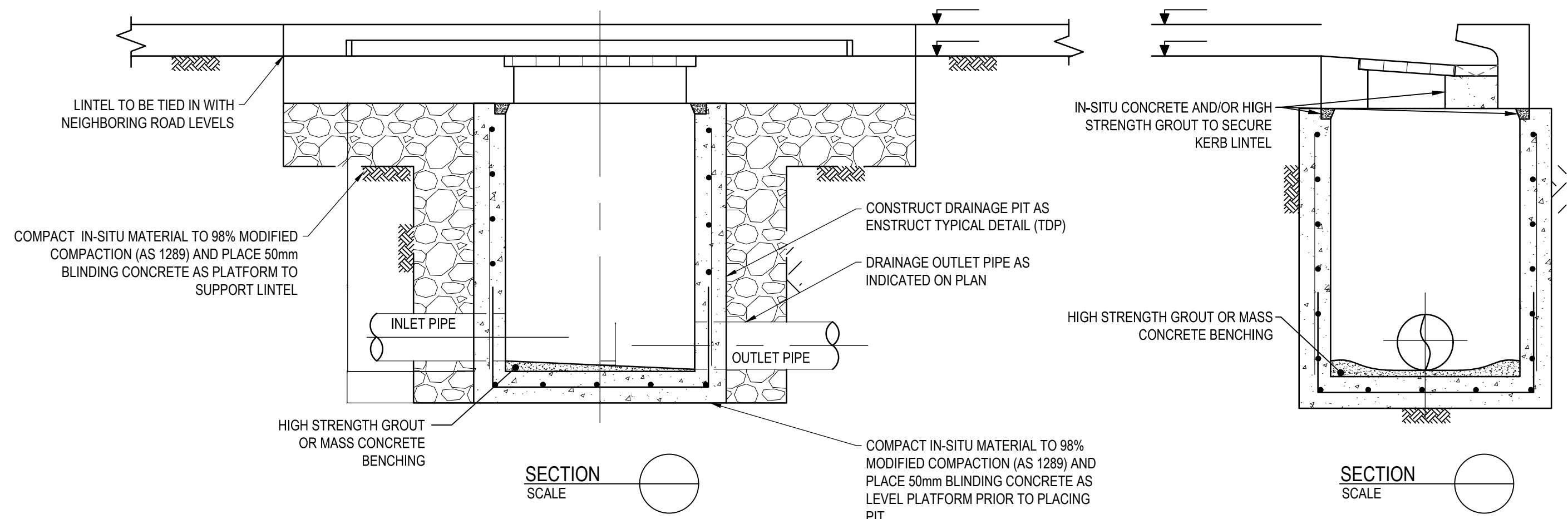
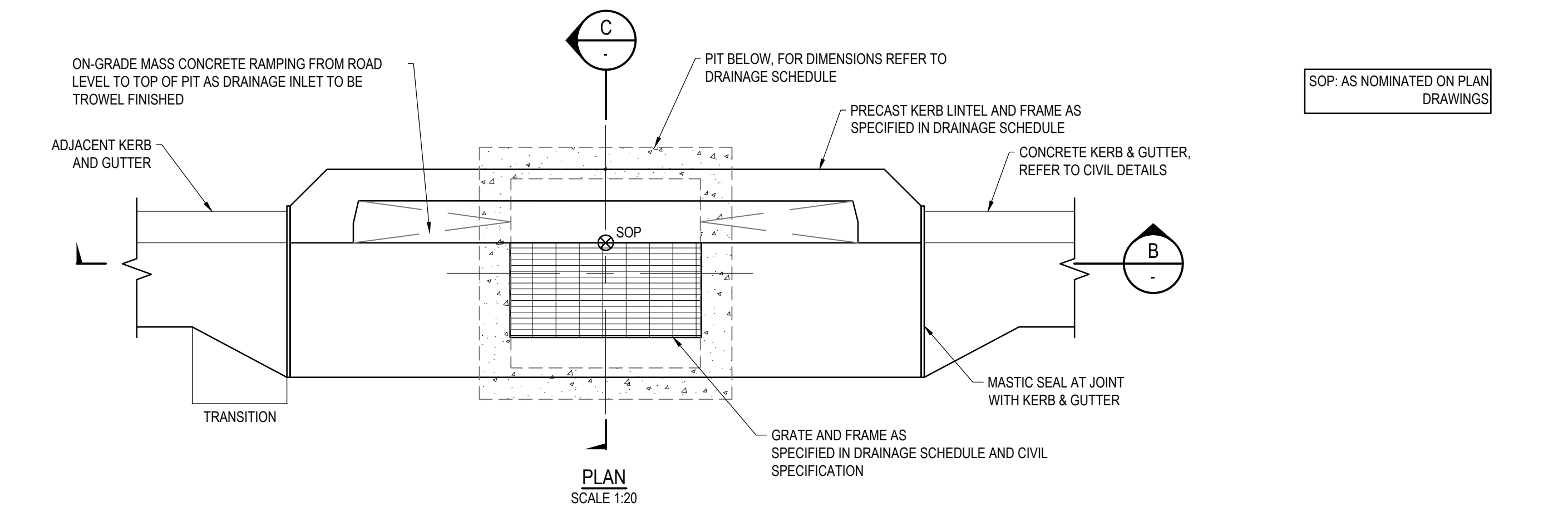
Project
MEADOWBANK EDUCATION AND
EMPLOYMENT PRECINCT
SCHOOLS PROJECT



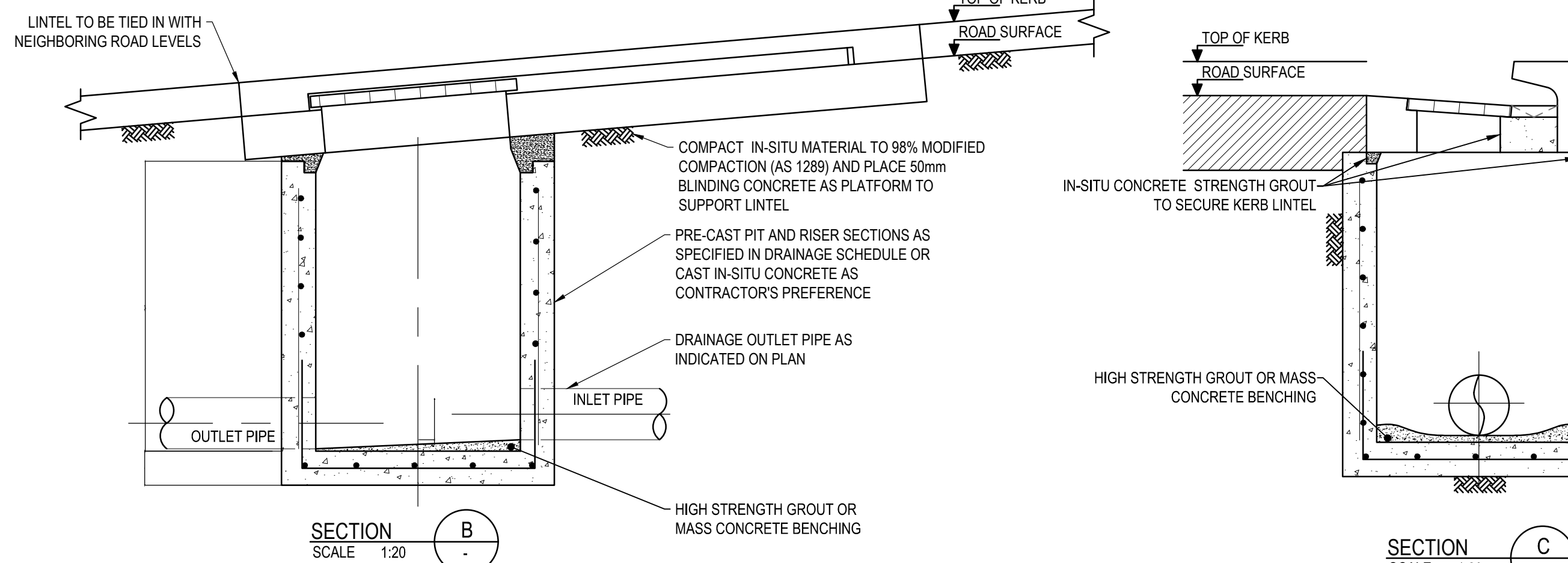
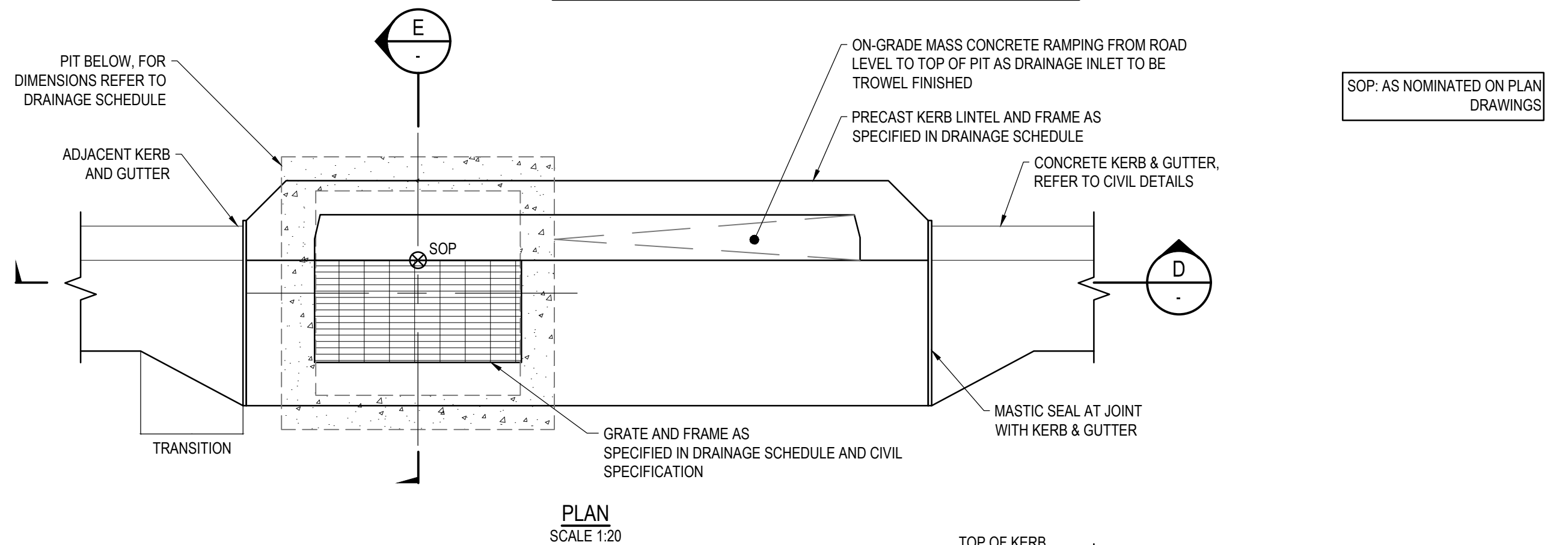
Issuer
enstruct
enstruct group pty ltd
Level 4, 2 Glen Street, Milsom's Point NSW 2061
Telephone (02) 8904 1444
http://www.enstruct.com.au

Project number
5645
Checked MD
Approved PR
Size check 25mm
Sheet size A1
Scale NOTED

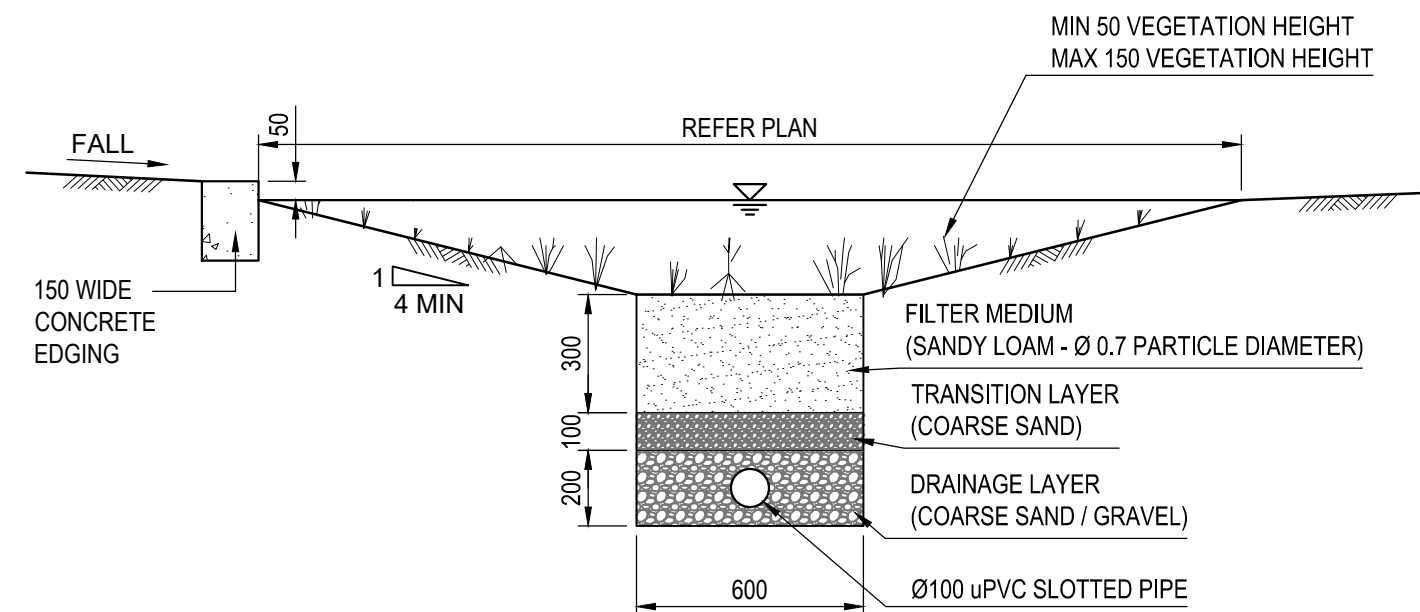
Sheet title
**STORMWATER DETAILS -
SHEET 2**
Sheet number
MSP-EN-CV-00852
Status
FOR CROWN CERTIFICATE
Revision
09



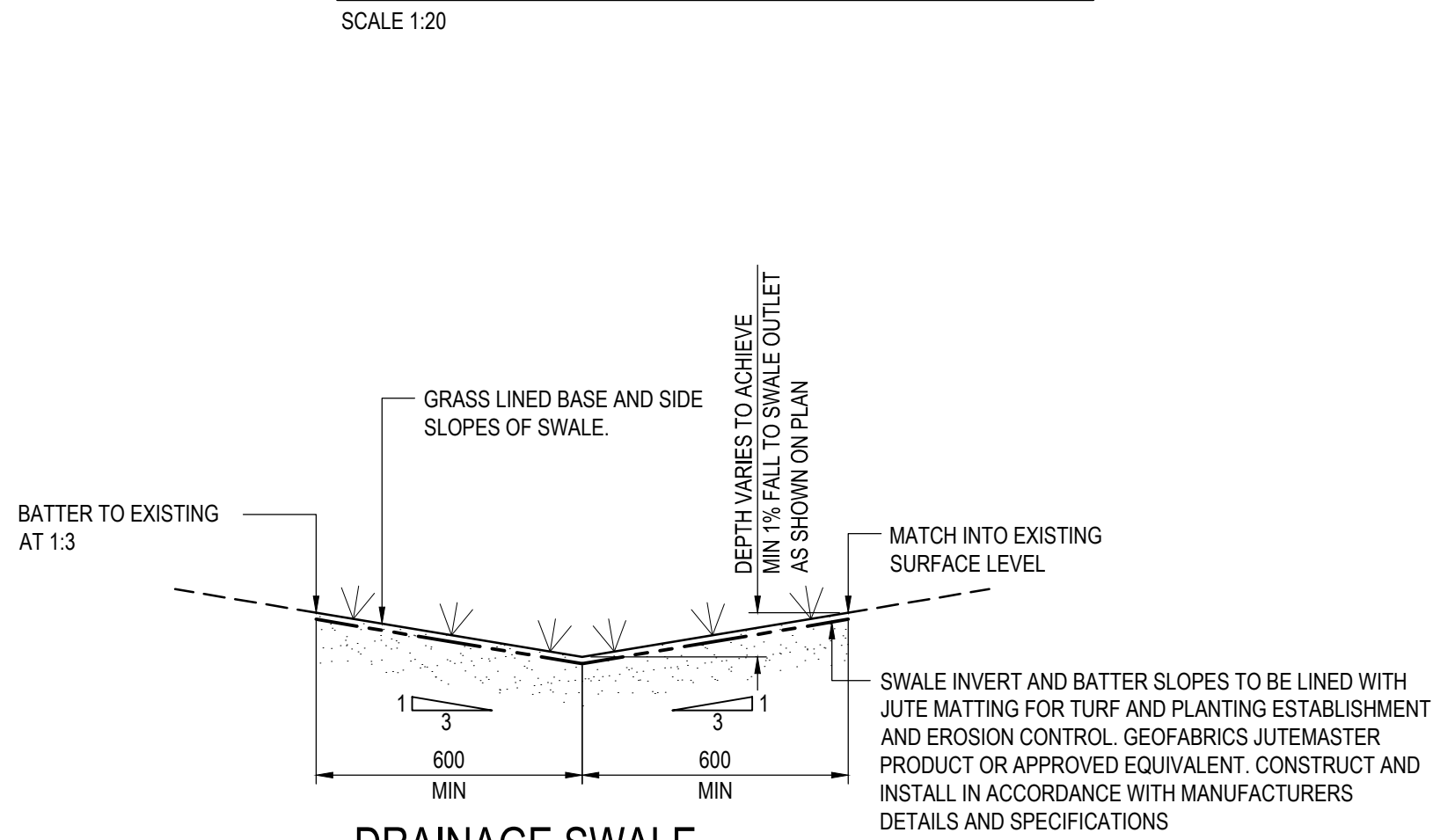
TYPICAL SAG KERB INLET DETAIL [KIP(S)]



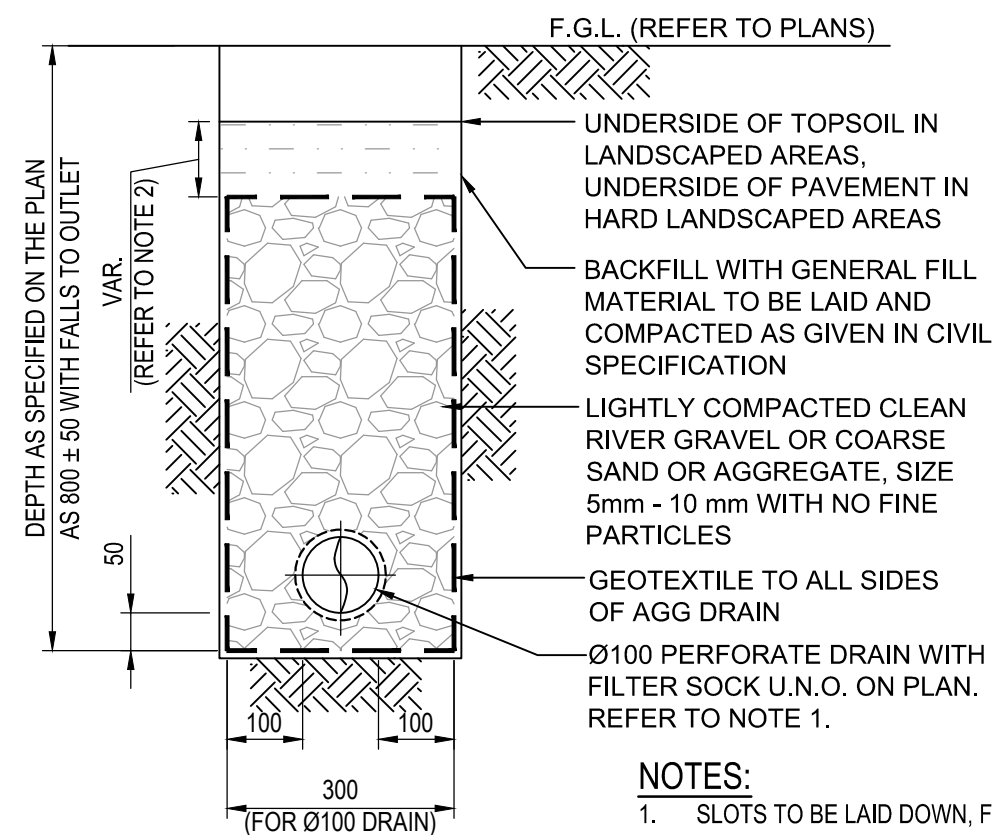
TYPICAL ON-GRADE KERB INLET DETAIL [KIP(OG)]



TYPICAL BIO-RETENTION SWALE DETAIL



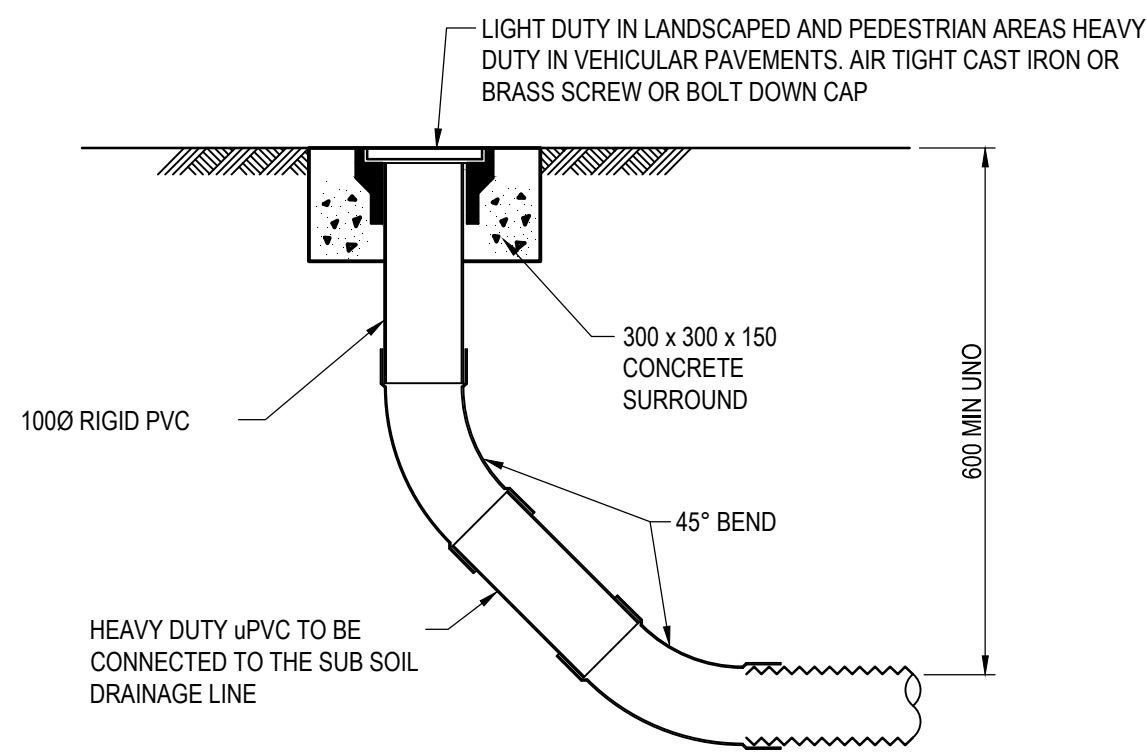
DRAINAGE SWALE



SUBSOIL DRAIN DETAIL

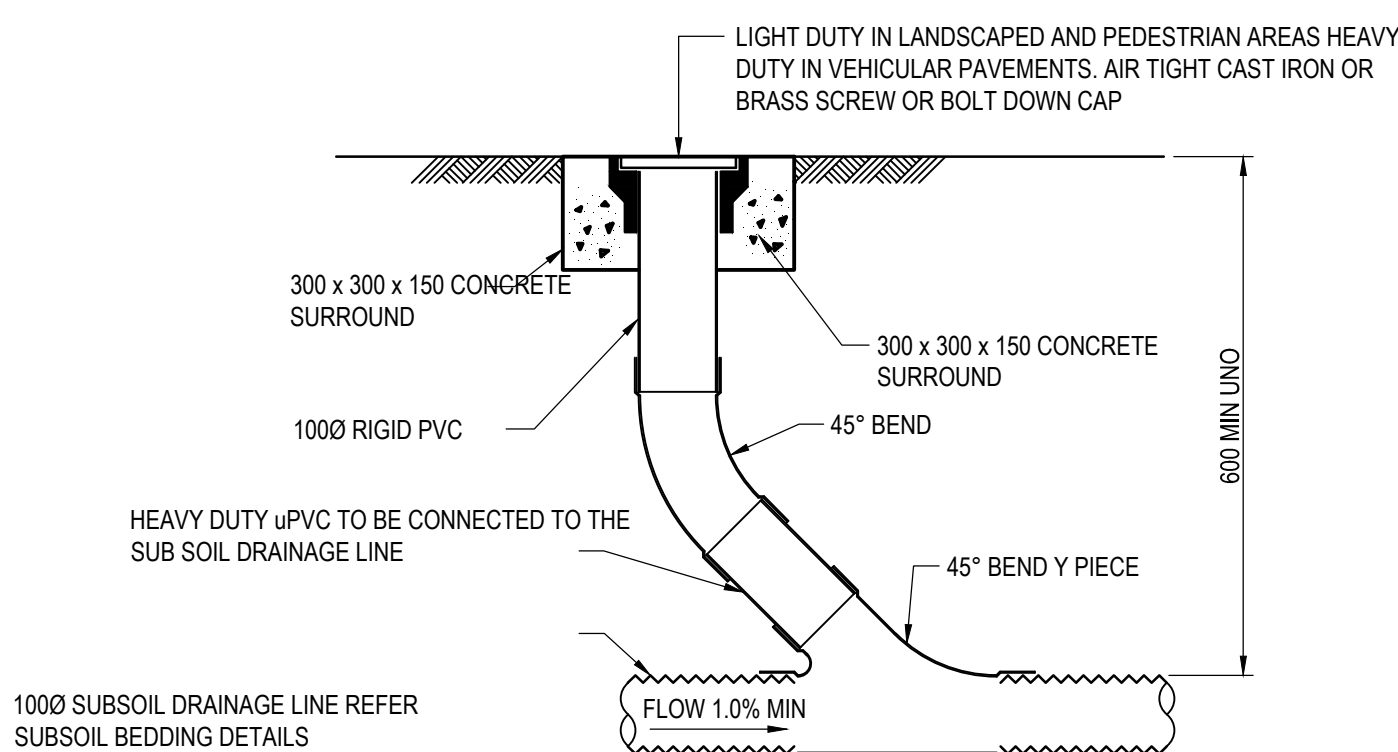
SCALE 1:10

- NOTES:**
1. SLOTS TO BE LAID DOWN, FILTER AS GIVEN IN DRAINAGE SPECIFICATION.
 2. FOR LANDSCAPING AREAS, CLEAN AGGREGATE AND GEOTEXTILE TO BE BROUGHT UP TO UNDERSIDE OF TOPSOIL OR AS OTHERWISE INDICATED ON LANDSCAPE ARCHITECT'S DETAILS. IN THE EVENT OF UNCERTAINTY, CONTRACTOR TO REFER TO LANDSCAPE ARCHITECT. FOR PAVED AREAS, CHANNELS AND SLABS MINIMUM DEPTH OF MATERIAL IS 150mm COMPACTED FILL.



FLUSHING POINT (FP)

SCALE 1: 10
NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED

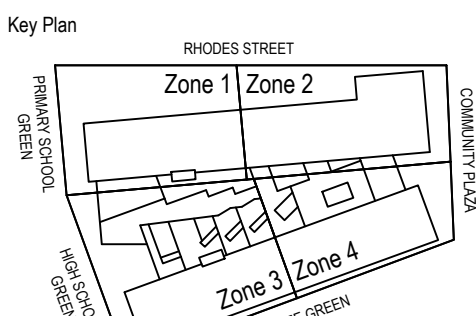


INTERMEDIATE RISER (IR)

SCALE 1: 10
NOTE: SLOTTED RIGID PVC PIPE AND FITTINGS MAY BE USED

Recent revision history			
#	Status	Description	Date
01		50% SD ISSUE	13/07/18
02		80% SD ISSUE	31/08/18
03		FOR COSTING	25/03/19
04		SSDA ISSUE	15/05/19
05		DRAFT 90% SD	29/05/19
06		SD ISSUE	14/06/19
07		50% ISSUE	01/06/20
08		75% ISSUE	08/07/20
09		FOR CROWN CERTIFICATE 23/07/20	

Notes
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Contractor must verify all dimensions on site before commencing work or preparing shop drawings.
Do not scale drawings.



Contractor



Project
MEADOWBANK EDUCATION AND EMPLOYMENT PRECINCT SCHOOLS PROJECT

Client
NSW Education School Infrastructure

Issuer
enstruct
enstruct group pty ltd
Level 4, 2 Glen Street, Milsons Point NSW 2061
Telephone (02) 8904 1444
http://www.enstruct.com.au

Project number
5645
Checked
TAH
Approved
TAH
Size check
25mm
Sheet size
A1
Scale
NOTED

Sheet title
STORMWATER DETAILS - SHEET 3
Sheet number
MSP-EN-CV-00853
Revision
09
Status
FOR CROWN CERTIFICATE

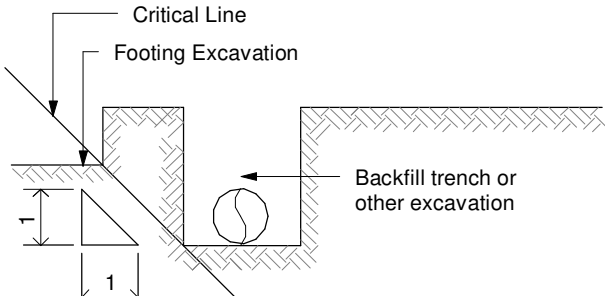
GENERAL		
1.	Structural drawings to be read in conjunction with the structural specification and all documents produced by all other consultants.	
2.	The contractor shall obtain a copy of the enstruct Safety in Design report and adhere to the recommendations of that report.	
3.	When considering discrepancies between drawings, notes and specifications, the drawings shall take precedence over the notes and specifications and the notes shall take precedence over the specifications.	
4.	Refer to the architectural documents for all setting out dimensions. Any discrepancies shall be reported to the architect.	
5.	The documents describe the as completed structure. The contractor shall be responsible for the stability of the structure during erection. No part of the structure is to be overstressed during construction. The contractor shall provide a proposed construction sequence prior to the commencement of works. A submission of a proposed method of construction by the contractor and acceptance by the engineer does not absolve the contractor from accepting full responsibility for the submitted document. If required by the engineer, the contractor shall submit calculations justifying the adequacy of the structure to carry the loads from construction procedures.	
6.	The engineer shall be given the opportunity to inspect all structural works prior to their concealment. 48 hours notice for inspection shall be provided. The contractor remains responsible for the works notwithstanding any inspection by the engineer.	
7.	All workmanship and material shall be in accordance with the current Australian Standards and Codes of Practice.	
8.	Any variation to the structure, as described in the documents, shall be via a written request, copied to the architect, and work related to the variation shall not proceed prior to the receipt of written approval.	
9.	Any changes to the structural drawings required by the contractor including but not limited to changes to the building services, architectural design or detailing will be charged at the applicable hourly rate.	
10.	Should the contractor require the engineer to provide advice on temporary works, buildability, construction sequencing, temporary loading on alternate materials, applicable hourly rate charges will apply.	
11.	The engineer will provide periodic site attendance to confirm the design intent shown on the drawings is being carried out on site (excluding floor plates).	
12.	It is the contractor's responsibility to carry out a pre-pour inspection of reinforcement and confirm in writing that the reinforcement is installed in accordance with the drawings prior to the engineers inspection. Rectification work required to be carried out by the engineer where the contractors works are defective will be charged at the applicable hourly rate.	
13.	Full services design including fully dimensioned shop drawings showing all service penetrations or holes is required prior to pouring concrete. Any request for approval to core hole will be charged at the applicable hourly rate.	
14.	All Precast elements are to be designed and detailed by the precast supplier.	
15.	All dimensions are expressed in millimetres. All levels are expressed in metres.	
16.	No contract work is to commence until formal approval is received from the relevant authorities.	
17.	Drawing status noted on the drawings must be FOR CONSTRUCTION before being used for permanent works.	
18.	The structural drawings do not show all relevant fixings, cleats, openings, etc. necessary for the completion of the works, including work by other trades.	
19.	The tender price must allow for all details necessary for the completion of the works, whether shown on the drawings or not.	
20.	All loading applied to the structure during construction requiring assessment by the engineer, whether shown on the drawings or not, shall be liable for charging by the engineer at current hourly rates. Submission of items for approval must be made a minimum of 7 working days before incorporation in the works.	
21.	Design of all formwork and falsework shall remain the responsibility of the contractor and shall comply with the relevant Australian Standards.	
22.	Finish to formed and unformed surfaces shall be described by the architect and in accordance with AS 3610.	
23.	The use of proprietary products shall be in strict accordance with manufacturer's recommendations and instructions and is subject to engineer's approval where relevant.	
24.	All materials and workmanship shall be in accordance with Australian standards and codes of practice except where varied by the specification and/or drawings. The applicable Standards shall be the referenced Standards current at commencement of construction. These Standards for this project shall be determined by reference to the document history on the Standards Australia website. This determination of applicable Standards shall be carried out during the Tender period and any queries relating to the appropriate Standard shall be raised with Enstruct during this period.	
25.	Works shall be carried out in accordance with all Work cover requirements and the Work Health and Safety Act and the Work Health and Safety regulation.	
26.	Structure has not been designed to be water retaining. All waterproofing is the responsibility of the Architect and the Contractor.	
27.	The structural engineer is not responsible for the design of bracing as per NCC requirements for non-structural elements	

LOADING		
1.	All loadings have been assessed in accordance with AS1170.0 and the National Construction Code of Australia (NCC)	
2.	Refer to loading diagrams for the structural components designed for.	
3.	The design wind criteria to AS1170.2 are as follows: Design Life: 50 years Region: A2 Importance Level: 3 Terrain Category: 3	
4.	The design earthquake criteria to AS1170.4 are as follows: Importance Level: 3 Probability Factor, kp: 1.3 Hazard Factor, Z: 0.08 Site Subsoil Class: Cc Earthquake Design Category (EDC): III	
5.	Do not place or store building materials on concrete members without the contract administrator's approval.	

ELECTROLYSIS		
1.	Refer to power earth electrolysis report No. 4413REP010101 Revision 0 Dated 8/7/20 for electrolysis requirements for the project.	
2.	Provide electrical connections and reinforcement welds/ties to achieve electrical continuity of reinforcement in accordance with the electrolysis report.	
3.	Refer to acnex correspondence RobPlz-Gcor-000965 for additional electrical connections required where movement joints exist between slab-on-grade and footings/columns.	
4.	Electrolysis requirements are designed by others and are not to reduce the durability of the structure	

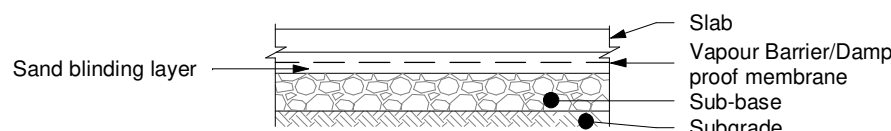
FOUNDATIONS

1. The contractor shall obtain a copy of the site geotechnical report and adhere to the recommendations of that report.
2. All foundation works shall be inspected and approved by the geotechnical engineer. The contractor shall allow for these costs in the tender.
3. Refer to the site geotechnical report for allowable bearing pressures and founding levels. The contractor shall report founding levels to the engineer prior to pouring footings.
4. No excavation shall fall within the zone of influence of any adjacent foundation without prior approval.



The diagram illustrates a cross-section of a foundation. A 'Critical Line' is shown as a diagonal line extending from the top left corner of the footing. Below the footing is a 'Footing Excavation'. To the right of the footing is a 'Backfill trench or other excavation'. The 'Subgrade' is indicated by a horizontal line at the bottom. A dimension 'd' is shown for the depth of the footing excavation.

5. Subgrade:
 - a. Natural Subgrade shall be proof-rolled with a roller of 80 kN minimum static weight, (minimum 610 passes), unless otherwise stated in the site geotechnical report, to detect soft or loose areas. Such areas should be treated in accordance with the geotechnical engineer's recommendation.
 - b. All proof rolling should be completed in the presence of an experienced geotechnical engineer or geotechnician. Where soft or heaving zones are identified they should be excavated down to a sound base and replaced with engineered fill as described below.
 - c. Where fill is placed against slopes, such as the backfilling of temporary batters associated with the realignment of the stormwater system, benches should be formed in the batter slopes. This will allow the fill to be compacted as described below in **Engineered Fill**.
 - d. Unless otherwise specified the subgrade below base courses for slabs shall be suitable density material compacted to 100% std as determined by test AS 1289.5.1.1 or 70% minimum index for cohesionless soils.
6. Sub-base: Unless otherwise specified
 - a. Base shall be approved well graded slag aggregate or crushed rock (maximum size of 40mm)spread and compacted to 98% mod as determined by test AS 1289.5.2.1 or 80% minimum density index for cohesionless soils.



The diagram shows a cross-section of an industrial slab and pavement. From top to bottom, the layers are: 'Slab', 'Vapour Barrier/Damp proof membrane', 'Sub-base', and 'Subgrade'. A 'Sand binding layer' is shown on the left side, adjacent to the subgrade. A dimension 'd' is shown for the thickness of the slab.

Industrial slab and pavements

7.	Cohesive (Loamey and Clayey) Soils: a. Underside of footings to be a minimum of 600mm below natural ground level. b. Excavate to firm ground and maintain the excavation in a dry condition Remove any soft ground as directed by the geotechnical engineer. c. Where over-excavation in soft ground is required, filling to the correct level shall be with concrete of $f_c = 15$ MPa. d. Blinding of 50mm concrete ($f_c = 15$ MPa) to be placed in footing excavations as soon as the foundations have been inspected by the geotechnical engineer.	
8.	Non-Cohesive (Sandy) Soils: a. Compaction under footings and slabs to be measured using a penetrometer in accordance with AS 1269 F3.2 or AS 1269 F3.3. Compaction under footings and slabs to be 10 blowe per 300mm measured from 150mm to 750mm deep. Results to be submitted to the geotechnical engineer. b. Penetrometer testing to be carried out as follows:Under pad footings : One per ten square metres or one per pad. Under strip footings : One per five metre length. Under slabs : One per twenty square metres.	

FORMWORK		
1.	The contractor shall be fully responsible for the design of all formwork, unless a product is specified on the drawings as being the responsibility of the engineer e.g. a profiled steel decking acting compositely with the concrete, such as Bondtek, Condek or Kinglor.	
2.	All formwork shall be designed in accordance with AS 3600 and AS 3610.	
3.	Formwork shall remain in place undisturbed for the following minimum periods: a. Slab edges - 2 days b. Beams and slabs - 7 days c. Backrops to beams and slabs - 28 days	
4.	In multi-level construction, the contractor shall take into account the age of the floors previously cast, necessary to support the weight of the wet concrete along with any applied load due to be placed on the freshly cast concrete, before the slab achieves sufficient strength to contribute to carry load. A minimum concrete strength of 32 MPa is required before the slab can contribute to carry load.	
5.	The contractor shall submit for review by the engineer, full details of the propping system proposed to be used. This shall include the weight of the formwork system to be used and any heavy loading such as reinforcement bundles or bins to be placed on the slab. Review by the engineer does not diminish the contractors full responsibility for the design of the formwork system. Details submitted shall indicate the means by which formwork is to be raised to the required position and transported across the freshly cast slab, including the weight of equipment proposed to be used for that purpose.	
6.	The contractor shall be liable for the engineers costs associated with assessing the impact of any construction loading on the structure, including inspection of works required by the engineer arising from the review. These costs will be charged at current hourly rates.	
7.	All exposed formed edges shall have 20mm x 20mm timber fillets or chamfers added to formed or cast edges, unless noted on the architectural drawings. a. All drip grooves required as noted on the architectural drawings shall be constructed with reinforcement adjusted to ensure correct minimum cover is maintained across the drip groove. Refer to concrete notes for cover requirements.	

CONCRETE		
1.	All works to be in accordance with AS 3600, AS 3610 and the specification.	
2.	Beam dimensions on the documents indicate the depth first, width second. Normal downturn beam depth includes slab thickness. Upstand beam depth includes slab depth.	
3.	Dimensions for all concrete elements do not include thickness of applied finishes.	
4.	Refer to drawings for notes on cambers.	
5.	Construction joints, where not indicated on the drawings, shall be approved by the engineer.	
6.	Remove all formwork, to engineer's approval, prior to the construction of masonry above.	
7.	Concrete shall conform to the following unless noted otherwise: a. Cement : Type SL to AS 3972 b. Ready-mixed concrete : AS 1379 c. Concrete aggregates : AS 2758.1 d. Slump: 80mm e. Maximum aggregate size: 20mm f. Maximum drying shrinkage strain (to AS 1012 Part 13) less than 650 microstrain at 56 days. g. Strength Grades: S32, S40 or S50 as shown on the drawings. h. Refer to drawings for notes on curing.	
8.	All concrete is to be properly cured using an approved method within 2 hours of finishing. Curing shall be continuous for 7 days by one of the following methods: a. Ponding with water or continuous spraying with water b. Use of continuous absorptive cover, such as hessian, kept continuously wet c. Coating with an approved curing compound compatible with any applied finish d. Use of an approved impervious covering to the whole of the surface of the concrete, securely kept in position to prevent passage of air between the concrete and the covering. The covering is to remain undisturbed in place for the duration of the curing period.	
9.	If plastic shrinkage of the concrete is observed due to rapid drying shrinkage or other conditions, apply a single spray coat of aliphatic alcohol evaporation retardant after the initial rough screed, while the concrete is still wet (Masterkure 111 GF-Conform by Master Builders or approved equivalent).	
10.	Any cast in elements, such as conduits and piping, not indicated on the structural drawings, are to be approved by the engineer. Where pipes and conduits are cast in slabs and walls, these are to be placed in the mid third depth of the member in between the layers of reinforcement. Where conduits are to be cast in slabs on ground and there is only one layer of reinforcement, the minimum gap between the conduit and the reinforcement is to be 50mm.	
11.	Formwork for all external corners of exposed concrete shall incorporate a 20 by 20 fillet, unless noted otherwise.	
12.	Unless noted otherwise, the characteristic strength and clear cover to the reinforcement, including fitments shall be as follows	

ELEMENT	EXTERNAL	INTERNAL
	Grade (MPa)	Grade (MPa)
Blinding and mass concrete	N25	N25
Footings	S40	S40
Slabs and beams	S40	S40
Columns	S50	S50
Stairs	S40	S40
Retaining walls	S40	S40
Non-Non-load bearing precast walls	S40	S40

ELEMENT	EXPOSURE CONDITION			
	CAST AGAINST FORMS (mm)	CAST AGAINST FORMS WATERPROOF MEMBRANE (mm)	CAST AGAINST GROUND (mm)	
	INTERNAL	EXTERNAL	INTERNAL	EXTERNAL
Footings	50	50	50	75
Slab on ground				
Top	25	40		
Bottom			30	75
Columns	30	40		
Walls	30	40		
Beams	30	40	40	75
Suspended slabs				
Top	30	35		
Bottom	30	35	40	

13.	No brickwork or partition walls are to be constructed on suspended slabs until all propping is removed and the slab has undertaken its dead load deflection.	
14.	All concrete, including slabs on ground, shall be deposited in place using approved methods, in uniform layers and shall be compacted using mechanical means such as insertion vibrators. Insertion vibrators shall not be used to move concrete in the forms. A spare vibrator shall be kept on site at all times during concrete pours.	
15.	All concrete surfaces required to receive additional concrete from subsequent pours shall be suitable roughened by mechanical means to remove laitance and other soft material.	
16.	Oil or any other deleterious product spill on the surface of concrete shall be remove to the satisfaction of the engineer.	
17.	Provide 2 layers of full width slip joint material such as Alcor or galvanised strip on top of masonry required to support the concrete. The slip joint material shall be properly secured in place to ensure it is not dislodged during concreting.	
18.	Penetrations through concrete shall be made using percussion drilling. The use of diamond coring for penetrations shall not be permitted without written permission from the engineer. No reinforcement is to be cut in making any penetration without written approval from the engineer. The use of ground penetrating radar is suggested as one means of locating reinforcement and post tensioning ducts in slabs of normal thickness.	
19.	Requests for approval for any penetration or chasing of concrete shall be submitted to the engineer on a 'Request for Penetration' form and shall describe fully the location and size of the penetration. No penetration shall be made without a 'Request for Penetration' form being signed by the engineer, a copy of which must be kept on the person carrying out the work. A register of 'Request for Penetration' forms must be kept on site for the duration of the works. If coring of the structure is approved by the engineer, the extracted cores are to be logged and kept on site for the duration of the works for review, if deemed necessary by the engineer. Approval to create penetrations through the structure relates only to structural adequacy and does not address other services that may be buried in the concrete. The contractor is to make all necessary enquiries regarding safety for the drilling operator before commencing any drilling or coring.	
20.	Refer to the specification for placement of concrete during periods of extreme heat or cold.	
21.	If the concrete strength specified for the floor system is less than 0.75 times that specified for the column, the column shall be mushroomed through the floor with concrete strength greater than or equal to 0.75 times that specified for the column U.N.O.	
22.	Slurry used to lubricate the pump lines shall not be used in any structural member.	

PILING

1. Piles and piling to be in accordance with AS 2159 and are to be designed by the specialist sub-contractor, engaged by the contractor.
2. The contractor shall investigate the presence of any existing services in the ground likely to be affected by the piling operations. Confirmation of the investigation and the final design drawings shall be forwarded to the engineer, in CAD form, prior to commencement of any piling on site.
3. Refer geotechnical information note for site investigation information.
4. The contractor is responsible for the set out of the piles. Maximum acceptable deviation from correct position of piles is 75mm. Maximum acceptable deviation from vertical alignment is 1 in 100.
5. Piles are to be designed for the loads indicated on the engineer's drawings and shall incorporate the maximum out of position eccentricity of 75mm in addition to a lateral stability load of 2.5% of the maximum vertical load in the pile, applied at the top of the pile.
6. Piling is to be designed, constructed and certified in accordance with the specification and requirements set out on the drawings. Details of each pile type and capacity are to be submitted to the superintendent as required before any piling is commenced.
7. All piles are to be inspected by a qualified geotechnical engineer to verify design bearing pressures.
8. All pile borings are to be inspected to ensure they are cleaned and free of loose material and water prior to pouring concrete, which should be with minimal delay and on the same day as boring.
9. The inspection should ensure adequate roughness is achieved in the pile shaft to guarantee shaft adhesion, the extent of roughening tool is recommended.
10. Some groundwater seepage into piles can be expected. Water should be pumped from the shafts immediately prior to pouring concrete. Tremie methods should be used if depth of water exceeds 1000mm.
11. Obstructions may be expected when drilling through existing fill.
12. Concrete cover to piles to be 75mm.
13. Concrete strength to be 40 MPa.
14. The contractor should make all necessary site investigations to confirm the accuracy or otherwise of the geotechnical report. Tender to nominate unit rates for variation in pile lengths from estimated values.
15. On completion of piling, a drawing prepared by a registered surveyor shall be prepared giving the position of the piles relative to their nominated position and the level of the top of the piles. The drawing shall be forwarded to the engineer for approval before any further work associated with the piles commences.
16. The contractor shall be responsible for the design and rectification of any work associated with the use of piles exceeding the above tolerances.

This shall include the following:

- a. Design checking by the engineer
- b. Assessment by the engineer of any rectification proposals
- c. Design of any rectification works
- d. Inspection by the engineer of any rectification works
- e. Costs for any work associated with these activities shall be payable by the contractor to the engineer at current hourly rates.

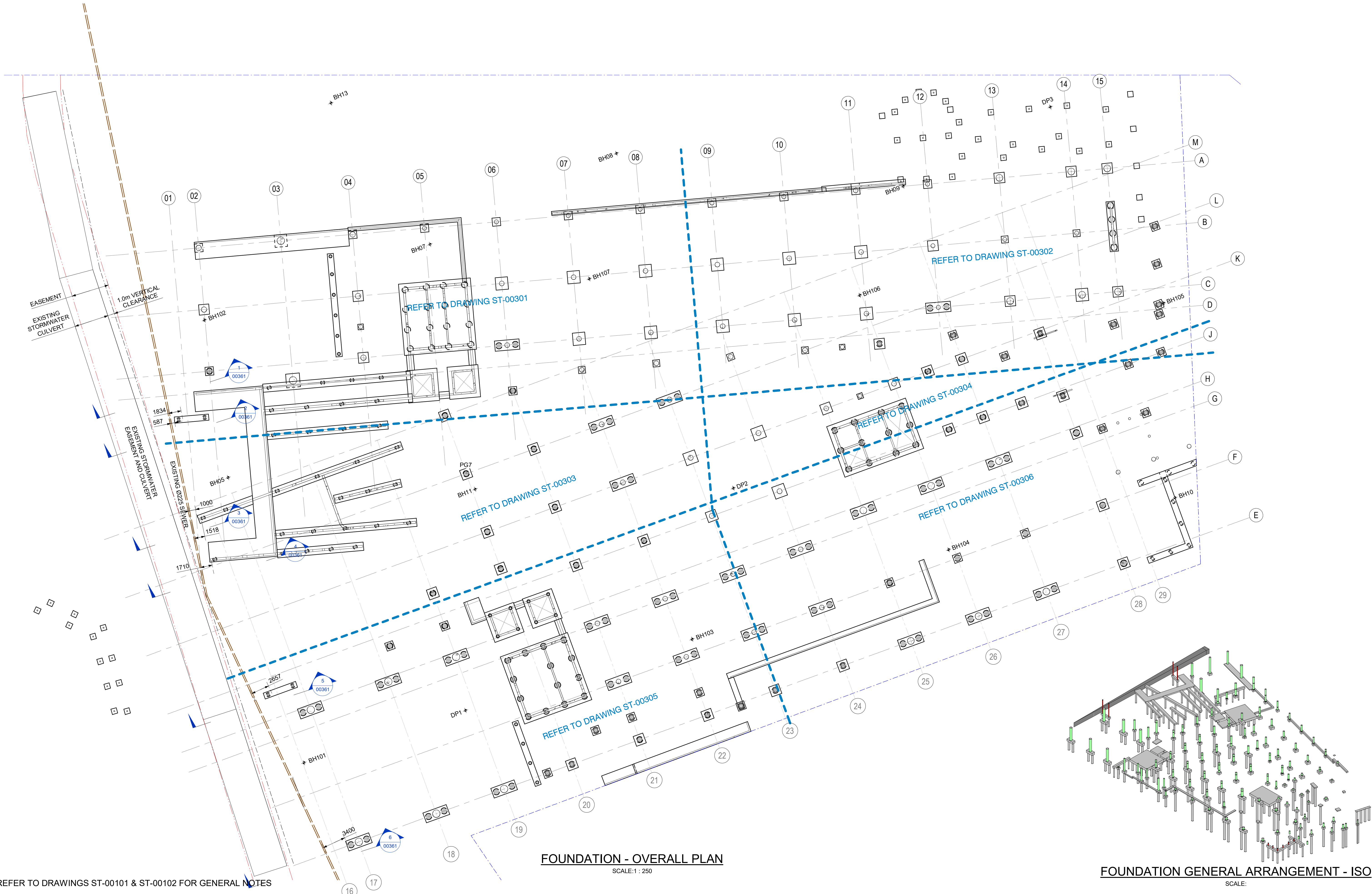
MASONRY		
1.	All materials and workmanship to be in accordance with AS 3700, AS4455 and AS4773.	
2.	Minimum durability classification of built in components to be R3 unless noted otherwise to AS 4773.	
3.	Minimum cover to reinforcement and tendons in grouted cavities or cores to be 30mm unless noted otherwise, measured from inside face of block cores.	
4.	Strengths of bricks, class of blocks, type of mortar and maximum joint spacing shall be as follows:Bricks shall be solid or perforated, to a maximum of 25%. The contractor shall submit to the engineer,before construction commences, expected moisture expansion characteristic values for the bricks to be used on the project.	

ELEMENT	MATERIAL	Strength (f _{uc})	Mortar classification	Mortar Mix C : L : S	Maximum joint spacing
Reinforced Blockwork	Concrete Block	15 MPa	M4	1 : 0.5 : 4.5	10
Unreinforced Blockwork. External face finished, rendered and or painted	Concrete Block	15 MPa	M3	1 : 1 : 6	7
Unreinforced Blockwork. External with openings more than 900mm in height	Concrete Block	15 MPa	M3	1 : 1 : 6	5
Unreinforced Blockwork. Internal face finished or sheeted	Concrete Block	15 MPa	M3	1 : 1 : 6	6
Unreinforced Blockwork. Internal rendered and or painted	Concrete Block	15 MPa	M3	1 : 1 : 6	5
Load-bearing Brickwork	Brick	20 MPa	M3	1 : 1 : 6	6

5.	Load-bearing masonry shall have full bedded joint unless noted otherwise. All mortar joints to be finished with standard tooling rods to produce compacted joints to a maximum depth of 3mm. Perpendts shall be fully filled.	
6.	Mortar admixtures shall not be used without the written approval of the engineer.	
7.	All masonry supporting or supported by concrete floors shall be provided with vertical joints to match any control joints in the concrete.	
8.	For joint locations in brickwork and blockwork, refer to architectural drawings. Joints in straight continuous walls shall not exceed the values given in Note 4. Joints are to be 10mm wide unless noted otherwise.	
9.	No horizontal or diagonal chasing of walls will be allowed. Maximum depth of vertical chasing in core filled blockwork to be 20mm. Chasing of load bearing masonry shall only be permitted where shown on engineering drawings.	
10.	Slabs that are to support masonry are not be de-propped for 28 days.	
11.	Do not load masonry units onto a supporting slab until the slab is de-propped.	
12.	Load all masonry pallets onto the slab prior to laying and finishing head details.	
13.	Do not load pallets on cantilevered slabs.	
14.	Only load-bearing masonry is indicated on the drawings. Refer to architectural drawings for extent of masonry elements.	
15.	All masonry is to be tied to abutting steel or concrete columns and where relevant provide head restraints attached to underside of structure above. For wall ties and head restraints refer to the specification. Ties to be heavy duty galvanised unless noted otherwise.	
16.	GROUT for core filling, where required, shall have a nominal composition of C1 : S3 : A2 (10mm coarse aggregate). The grout shall have a slump of 230mm plus or minus 30mm and a compressive strength of 25 MPa minimum.	
17.	Walls to be full height before grouting cores.	
18.	Clean out openings to be provided at bottom course in all cores.	
19.	Before placing vertical reinforcement, if any, cores are to be cleaned of all mortar fins and droppings through clean out openings, which are not to be closed until inspected by the engineer.	
20.	Maximum continuous pour height of grout to be 3600mm.	
21.	Retaining walls to be free draining granular material unless otherwise noted.	
22.	Provide subsoil drain to falls or weep holes as noted. Refer also to Note 23.	
23.	Retaining walls (other than cantilever walls) shall not be backfilled until the (floor) construction at the top and bottom has been completed and has attained adequate strength. Cantilever walls shall not be backfilled until they have attained adequate strength.	
24.	Ensure free draining backfill and drainage lines to falls (or weep holes) are in place.	
25.	Refer to architectural drawings for location of all joints in masonry. Control joints to be at 6 metre centres maximum.	
26.	Vertical control joints are to be as described in AS 4773.1 or as indicated on the drawings. Joints shall be maintained to be free of all non-compressible material.	
27.	Vertical control joints shall be 20mm wide and be provided with flexible masonry anchors across the joint, placed in accordance with manufacturer's recommendations. Joints are to be treated at the outside using an approved flexible polyurethane base caulking sealant jointing material placed against a 25mm diameter closed cellular polythene foam backing rod.	
28.	The following conditions must also be satisfied: a. Fire rating b. Sound insulation c. Waterproofing	
29.	Non-load bearing masonry shall be constructed to within 20mm of the underside of the structure or shelf angles over.	
30.	Gaps are to be built to a tolerance of -0mm, +3mm.	
31.	Mortar and other material shall not be allowed to fall into cavities or remain in control joints.	
32.	Place polystyrene foam in all vertical joints during construction to ensure mortar droppings do not fall into the joints.	
33.	The contractor shall submit the names of all proprietary products proposed to be used in masonry construction before commencement of the works.	
34.	Where masonry abuts to the underside of any member, sloping or horizontal, provide flexible perpend fixings at 3 masonry units spacing. Perpend fixings shall be equivalent to M.E.T. 4-3 and shall be secured to the structure over using 2 x 6mm diameter Ramset head drive pins (or approved equivalent).	
35.	Fixing of masonry ties to steelwork shall be designed by the contractor and shall have load capacity not less than that specified by the manufacturer of the ties.	
36.	In cavity construction, ties between skins of the masonry shall be rated for the width of the cavity. Spacing of ties shall be designed by the contractor for the wind pressure to which the wall will be subject. Cavity ties shall be heavy duty, spaced at 600mm x 600mm centres maximum. At control joints, door and window openings the spacing shall be at 300mm centres maximum.	
37.	In solid masonry construction, ties between contiguous leaves shall be heavy duty spaced at 400mm x 400mm centres.	
38.	In hollow block construction, grout fill end blocks (or use solid blocks) at control joints,door or window openings.	
39.	All fixings, drive pins, nails, screws, bolts, nuts and washers into masonry shall be galvanised to R2 level in accordance with AS 3700 and AS 269.	
40.	All steelwork built into or abutting masonry shall be hot dip galvanised.	
41.	Where needling and propping of openings is required, the builder shall provide all details to the engineer for review before the work commences.	
42.	In reinforced masonry all reinforcement is to be continuous, fully lapped and anchored. Minimum lap/anchorage length to be 40 x bar diameter. Provide continuous horizontal reinforcement at all 'T' and 'L' junctions as required.	
43.	Minimum reinforcement in blockwork nominated as core filled to be as follows U.N.O.: a. 140 Blockwork - N12-400 each way, central b. 190 Blockwork - N16-400 each way, central c. 290 Blockwork - N16-400 each way, each face	

POST TENSIONING	
1.	Post tensioning slab system is to be used throughout unless noted otherwise.
2.	All strands to be either: 12.7mm diameter, super grade strand, stress relieved with a minimum breaking load of 184 kN. Relaxation 2.5% maximum after 1000 hours at 70% of breaking load unless noted otherwise or 15.2mm diameter, super grade strand, stress relieved with a minimum breaking load of 290 kN. Relaxation 2.5% maximum after 1000 hours at 70% of breaking load unless noted otherwise.
3.	Duct: flat duct 70mm x 19mm, $\mu = 0.2 / = 0.020$.
4.	Dead ends to be crion heads with metal spacers.
5.	Stressing
a.	Strand all tendons to 25% ultimate tensile stress at approximately 24 hours after completion of pour.
b.	Full stress tendons shall have concrete attains f'c = 22 MPa for 12.7mm diameter strand and f'c = 25 MPa for 15.2mm diameter strand
c.	Jack tendons to 85% minimum breaking load 156 kN 4mm 12.7mm diameter strand and lock off 212.5 kN for 15.2mm diameter strand and lock off
d.	Tendon profile points are from the slab soffit to underside of duct. Offset points are indicated over supports and at mid span unless noted otherwise. At the end of the tendon, the tendon profile shall be parabolic between high and low points. Jack central tendons first and progress progressively outwards on each side of structure (see drawing for stressing). The tendon profile shall be marked on slab soffits by the use of embedded plastic buttons at grid and mid-grid locations; proposed arrangement to be submitted for approval.
6.	Stressing equipment calibration records, including jack and gauge numbers, shall be forwarded to the engineer prior to stressing operations commencing. Cables shall be positioned and secured in accordance with the design documents produced by the specialist sub-contractor and profiled to a vertical tolerance of laterally plus/minus 4mm. The tendon profile shall be marked on slab soffits at maximum centres along the full length to prevent the cable from being displaced laterally or vertically during concreting.
7.	The specialist contractor shall ensure that anchored wires shall be on site and ensure the proper treatment of post tensioning ducts during all relevant concrete pours.
8.	Ducts shall be rigid enough to withstand treatment during concreting and shall be adequately sealed at all points where they enter the ducts.
9.	Duct profiles shall take precedence over any reinforcement or conduit within the concrete. Any interference with reinforcement positioning shall be brought to the attention of the engineer immediately. The reinforcement shall be installed prior to top reinforcement shall not be laid until after tendons have been placed.
10.	Typical anchor and reinforcement details shown on the drawings are for pricing purposes only and the final anchorage reinforcement details shall be the responsibility of the engineer. The engineer shall ensure that reinforcement shall not displace post tensioning ducts from achieving the required drape.
11.	Particular care shall be taken during placement and compaction of concrete, especially around and over the ducts, to ensure that the concrete is fully and uniformly vibrated using insertion vibrators. The use of reduced aggregate size, as well as the inclusion of superplasticiser additives in the concrete to assist placement may be appropriate.
12.	Cable shall be taken to ensure all girth tubes and cable ducts are not damaged during concreting.
13.	Concrete cylinder compressive strength values taken during placement of concrete shall be provided to the engineer before stressing of the strands commences. Concrete test cylinders shall be representative of the area where strands are to be loaded are situated.
14.	The sequencing of applying load to post tensioning strands shall be determined by the specialist sub-contractor, taking into account the loads that are to be transferred to the formwork system. The formwork designer and post tensioning sub-contractor shall coordinate to ensure the formwork is sufficient to support the applied loads during the stressing operation.
15.	Strand extensions determined during stressing shall be forwarded to the engineer for review within 24 hours of stressing. No strand shall be cut without the approval of the engineer. The engineer shall determine the extent of stressing of strands, or other actions, if the recorded extensions are acceptable.
16.	Cables shall not be trimmed without written approval from the design engineer. Grouting of ducts shall be completed within 48 hours of written acceptance of the stressing operations. Written confirmation of satisfactory completion of grouting to ducts shall be forwarded to the engineer.

Sheet number **MSP-EN-ST-00102** Revision **13**
Status
FOR CROWN CERTIFICATE



REFER TO DRAWINGS ST-00101 & ST-00102 FOR GENERAL NOTES

Recent revision history		
#	Description	Date
4	Draft 90% Schematic Design	24.05.19
5	Schematic Design	14.06.19
6	Schematic Design	21.01.20
7	Issued for Foundation Loads	15.05.20
8	Issued for Information	20.05.20
9	Issued for Information	29.05.20
10	Issued For Information 50% Design Development	05.06.20
11	50% DD Updates	19.06.20
12	75% Documentation Issue	08.07.20
13	For Crown Certificate	23.07.20

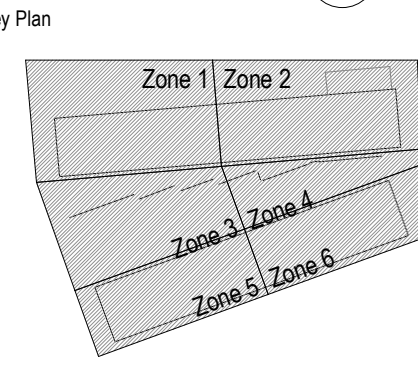
Notes

Key Plan

Zone 1 Zone 2

Zone 3 Zone 4

Zone 5 Zone 6



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Project number
5645

Size check
25mm

Checked
NLK

Approved
MOS

Sheet size
A1

Scale
1:250

Sheet title
**FOUNDATION GENERAL
ARRANGEMENT**

Sheet number
MSP-EN-ST-00300

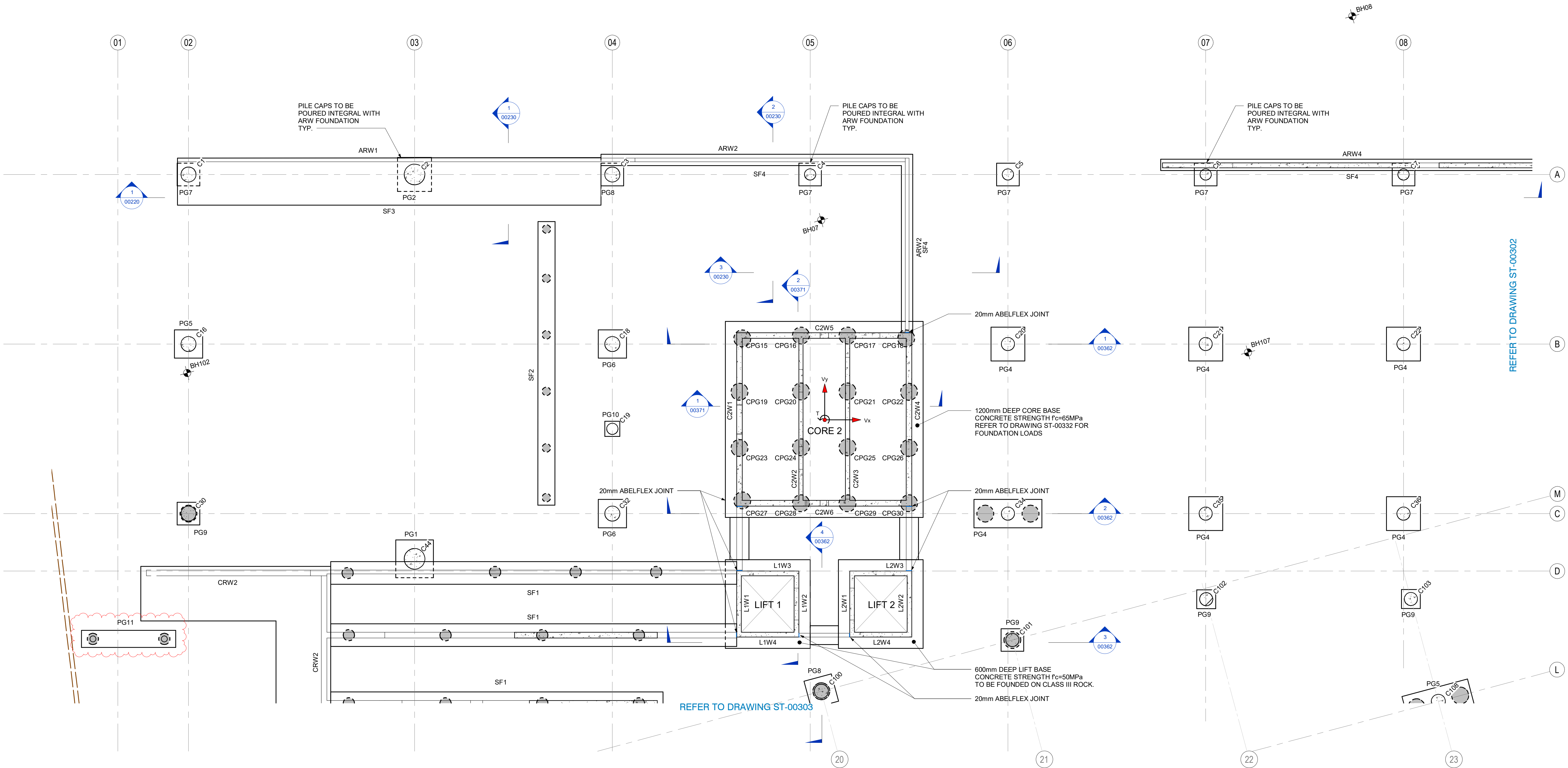
Status
FOR CROWN CERTIFICATE

Revision
13

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NOTES (cont.):
8. FOR PAD FOOTING AND STRIP FOOTING DETAILS AND NOTES REFER TO ST-00331 TO ST-00351
9. FOR FOUNDATION SECTIONS REFER TO DRG. ST-00361
10. PILE DESIGN BASED ON GEOTECHNICAL CAPACITIES PROVIDED IN THE GEOTECHNICAL REPORTS.
11. FOR PILE SCHEDULE AND NOTES REFER DRG. ST-00331
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13. REFER TO DRAWING ST-00561 TO ST-00570 FOR RC WALL ELEVATIONS
14. REFER TO DRAWING ST-00501 TO ST-00502 FOR COLUMN SCHEDULE
15. REFER TO DRAWING ST-00331 & ST-00332 FOR LATERAL FOUNDATION LOADS
16. REFER TO DRAWING ST-00331 & GENERAL NOTES FOR GROUND ANCHOR NOTES
17. REFER TO DRAWING ST-00331 FOR CORE WALL GRAVITY LOADS
18. DEPTH OF FOUNDATION TO BE CO-ORDINATED WITH IN-GROUND SERVICES



REFER TO DRAWINGS ST-00101 & ST-00102 FOR GENERAL NOTES

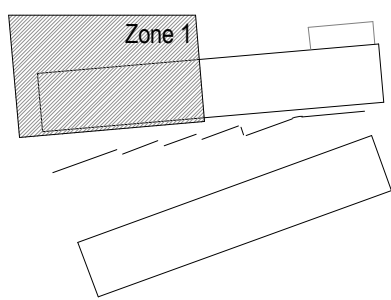
FOUNDATION - GENERAL ARRANGEMENT - ZONE 1

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Recent revision history		
#	Description	Date
1	Issued for Foundation Loads	15.05.20
2	Issued for Information	29.05.20
3	Issued For Information 50% Design Development	05.06.20
4	Issued For Design Development Updates	12.06.20
5	50% DD Updates	19.06.20
6	75% Documentation Issue	08.07.20
7	For Crown Certificate	23.07.20

Notes

Key Plan



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5645	25mm
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Sheet title
FOUNDATION GENERAL ARRANGEMENT - ZONE 1

Sheet number	Revision
MSP-EN-ST-00301	7
Status	FOR CROWN CERTIFICATE

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- DP3 DENOTES BORE HOLES. REFER GEOTECHNICAL REPORTS

REFER TO DRAWING ST-00301

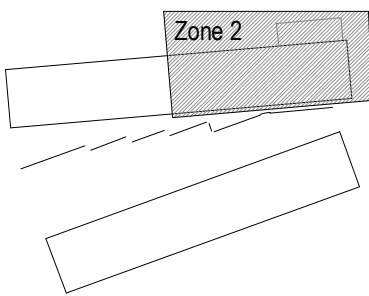
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 18. DEPTH OF FOUNDATION TO BE CO-ORDINATED WITH IN-GROUND SERVICES

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Recent revision history		
#	Description	Date
1	Issued for Foundation Loads	15.05.20
2	Issued for Information	29.05.20
3	Issued For Information 50% Design Development	05.06.20
4	50% DD Updates	19.06.20
5	50% DD Updates	24.06.20
6	75% Documentation Issue For Crown Certificate	08.07.20
7		23.07.20

Notes

Key Plan



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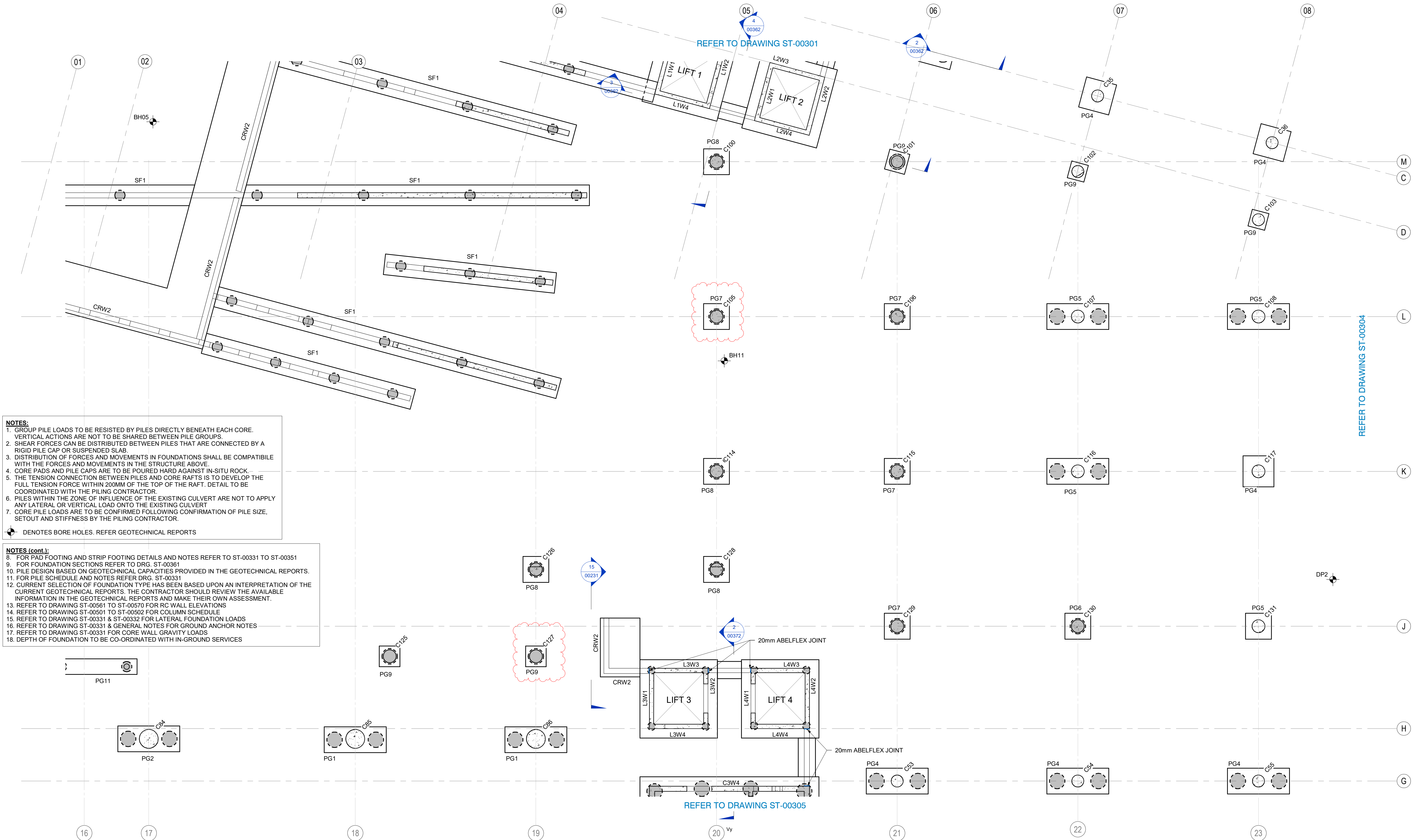
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Sheet title
**FOUNDATION GENERAL
ARRANGEMENT - ZONE 2**

Sheet number
MSP-EN-ST-00302

Status
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Revision
7



NOTES:

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Recent revision history		
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2	Issued for Information	29.05.20
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4	50% DD Updates	19.06.20
5	75% Documentation Issue	08.07.20
6	For Crown Certificate	23.07.20

Notes	Key Plan

FOUNDATION - GENERAL ARRANGEMENT - ZONE 3

SCALE: 1 : 100

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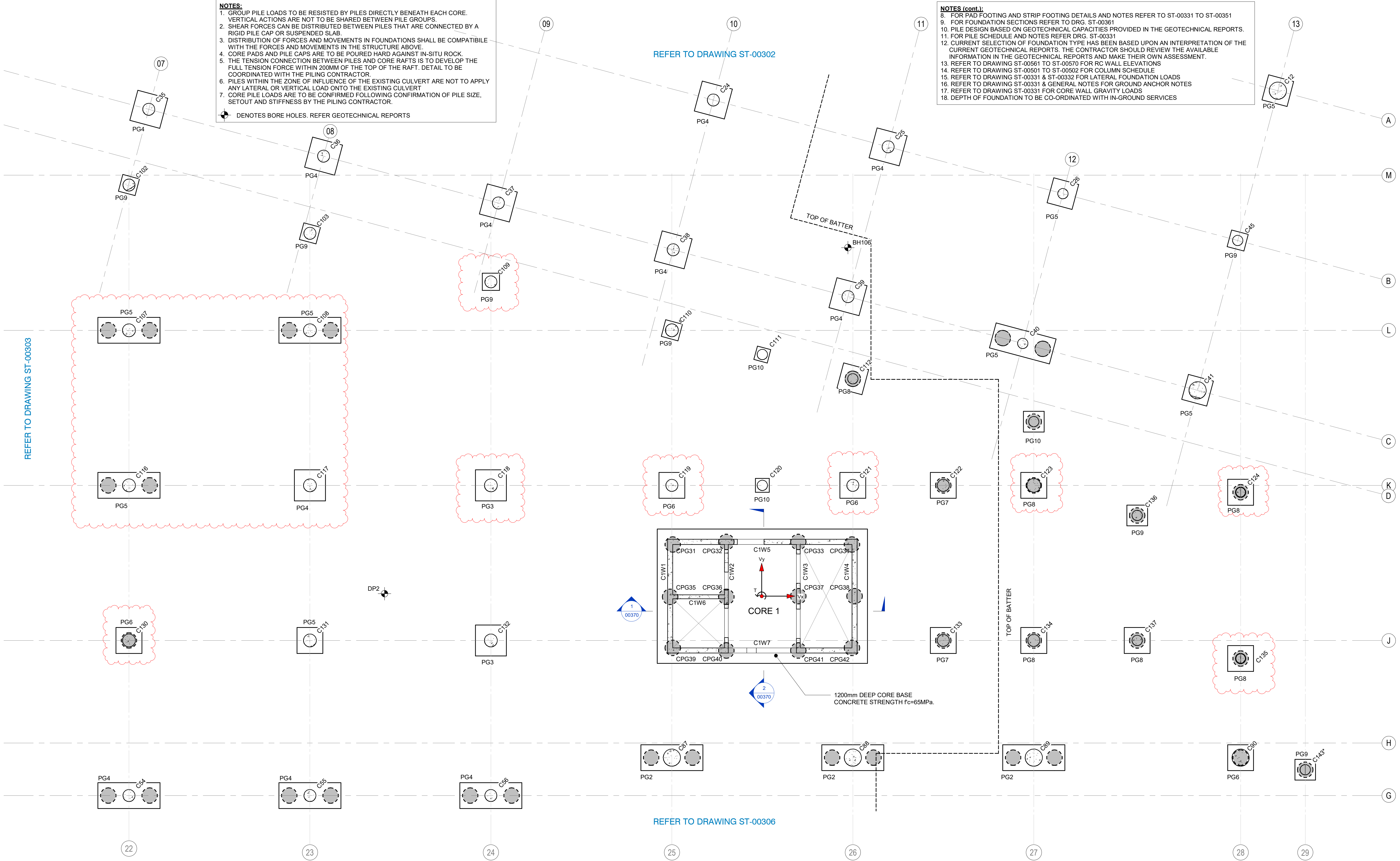
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Sheet title
**FOUNDATION GENERAL
ARRANGEMENT - ZONE 3**

Sheet number
MSP-EN-ST-00303

Revision
6

Status
FOR CROWN CERTIFICATE



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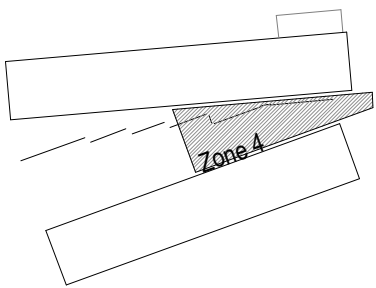
REFER TO DRAWINGS ST-00101 & ST-00102 FOR GENERAL NOTES

FOUNDATION - GENERAL ARRANGEMENT - ZONE 4

SCALE: 1 : 100

Recent revision history			Notes
#	Description	Date	
1	Issued For Foundation Loads	15.05.20	Key Plan
2	Issued For Information	29.05.20	
3	Issued For Information 50% Design Development	05.06.20	
4	Issued For Design Development Updates	12.06.20	
5	50% DD Updates	19.06.20	
6	50% DD Updates	24.06.20	
7	75% Documentation Issue	08.07.20	
8	For Crown Certificate	23.07.20	

Key Plan



Contractor



Project
MEADOWBANK EDUCATION AND EMPLOYMENT PRECINCT SCHOOLS PROJECT



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Project number 5645	Size check 25mm
Checked NLK	Approved MOS
Sheet size A1	Scale 1 : 100

Sheet title
FOUNDATION GENERAL ARRANGEMENT - ZONE 4

Sheet number MSP-EN-ST-00304	Revision 8
Status FOR CROWN CERTIFICATE	

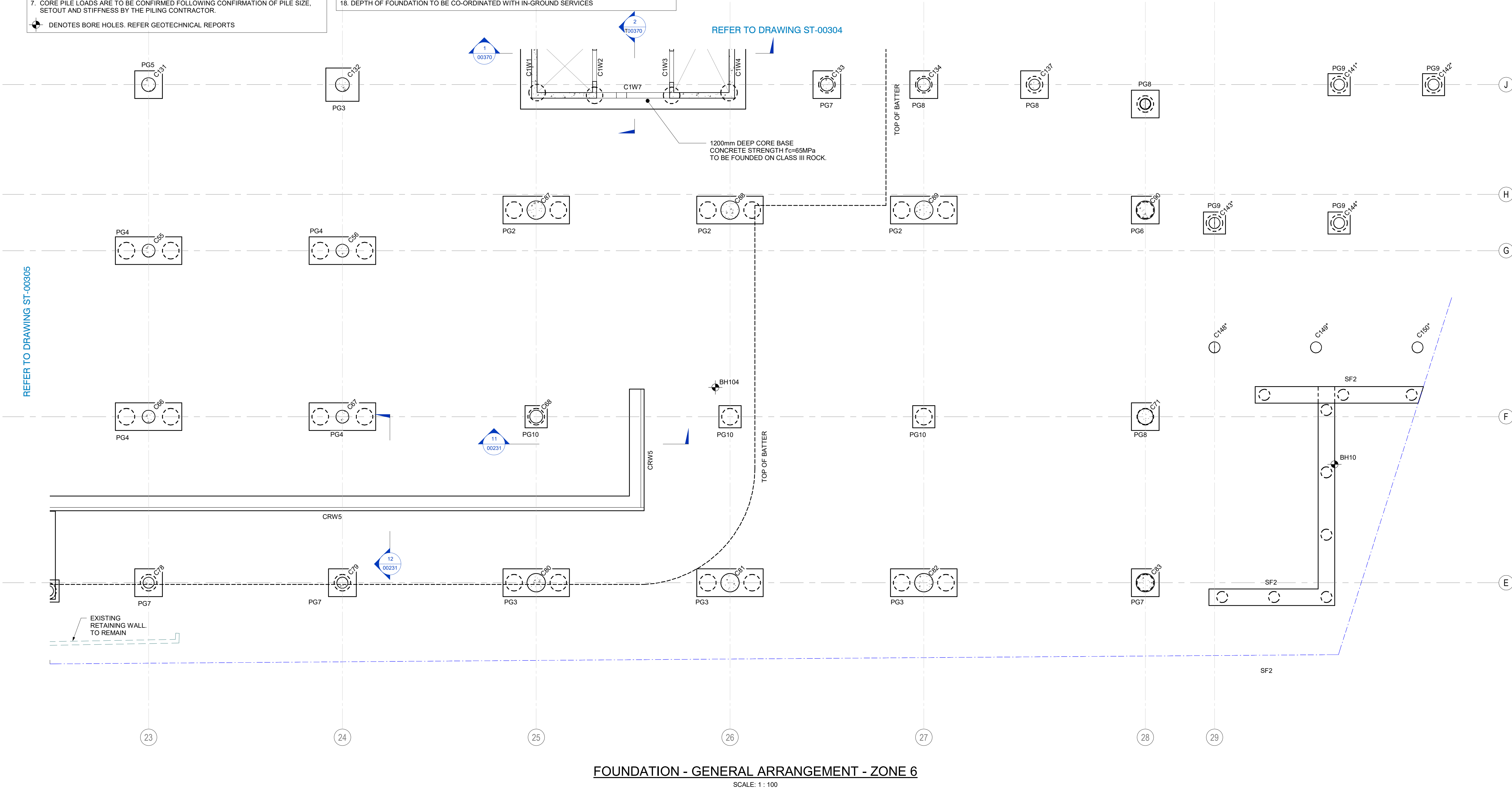
NOTES:

- GROUP PILE LOADS TO BE RESISTED BY PILES DIRECTLY BENEATH EACH CORE. VERTICAL ACTIONS ARE NOT TO BE SHARED BETWEEN PILE GROUPS.
- SHEAR FORCES CAN BE DISTRIBUTED BETWEEN PILES THAT ARE CONNECTED BY A RIGID PILE CAP OR SUSPENDED SLAB.
- DISTRIBUTION OF FORCES AND MOVEMENTS IN FOUNDATIONS SHALL BE COMPATIBLE WITH THE FORCES AND MOVEMENTS IN THE STRUCTURE ABOVE.
- CORE PADS AND PILE CAPS ARE TO BE POURED HARD AGAINST IN-SITU ROCK.
- THE TENSION CONNECTION BETWEEN PILES AND CORE RAFTS IS TO DEVELOP THE FULL TENSION FORCE WITHIN 200MM OF THE TOP OF THE RAFT. DETAIL TO BE COORDINATED WITH THE PILING CONTRACTOR.
- PILES WITHIN THE ZONE OF INFLUENCE OF THE EXISTING CULVERT ARE NOT TO APPLY ANY LATERAL OR VERTICAL LOAD ONTO THE EXISTING CULVERT
- CORE PILE LOADS ARE TO BE CONFIRMED FOLLOWING CONFIRMATION OF PILE SIZE, SETOUT AND STIFFNESS BY THE PILING CONTRACTOR.

⬮ DENOTES BORE HOLES. REFER GEOTECHNICAL REPORTS

NOTES (cont.):

- FOR PAD FOOTING AND STRIP FOOTING DETAILS AND NOTES REFER TO ST-00331 TO ST-00351
- FOR FOUNDATION SECTIONS REFER TO DRG. ST-00361
- PILE DESIGN BASED ON GEOTECHNICAL CAPACITIES PROVIDED IN THE GEOTECHNICAL REPORTS.
- FOR PILE SCHEDULE AND NOTES REFER DRG. ST-00331
- CURRENT SELECTION OF FOUNDATION TYPE HAS BEEN BASED UPON AN INTERPRETATION OF THE CURRENT GEOTECHNICAL REPORTS. THE CONTRACTOR SHOULD REVIEW THE AVAILABLE INFORMATION IN THE GEOTECHNICAL REPORTS AND MAKE THEIR OWN ASSESSMENT.
- REFER TO DRAWING ST-00561 TO ST-00570 FOR RC WALL ELEVATIONS
- REFER TO DRAWING ST-00501 TO ST-00502 FOR COLUMN SCHEDULE
- REFER TO DRAWING ST-00331 & ST-00332 FOR LATERAL FOUNDATION LOADS
- REFER TO DRAWING ST-00331 & GENERAL NOTES FOR GROUND ANCHOR NOTES
- REFER TO DRAWING ST-00331 FOR CORE WALL GRAVITY LOADS
- DEPTH OF FOUNDATION TO BE CO-ORDINATED WITH IN-GROUND SERVICES



REFER TO DRAWINGS ST-00101 & ST-00102 FOR GENERAL NOTES

Recent revision history		
#	Description	Date
1	Issued for Foundation Loads	15.05.20
2	Issued for Information	29.05.20
3	Issued for Information	02.06.20
4	Issued For Information 50% Design Development	05.06.20
5	50% DD Updates	19.06.20
6	50% DD Updates	26.06.20
7	75% Documentation Issue	08.07.20
8	For Crown Certificate	23.07.20

Notes	Key Plan

Contractor



Project
MEADOWBANK EDUCATION AND
EMPLOYMENT PRECINCT
SCHOOLS PROJECT

Client
 Education
School Infrastructure

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Project number
5645

Size check
25mm

Checked
NLK

Approved
MOS

Sheet size
A1

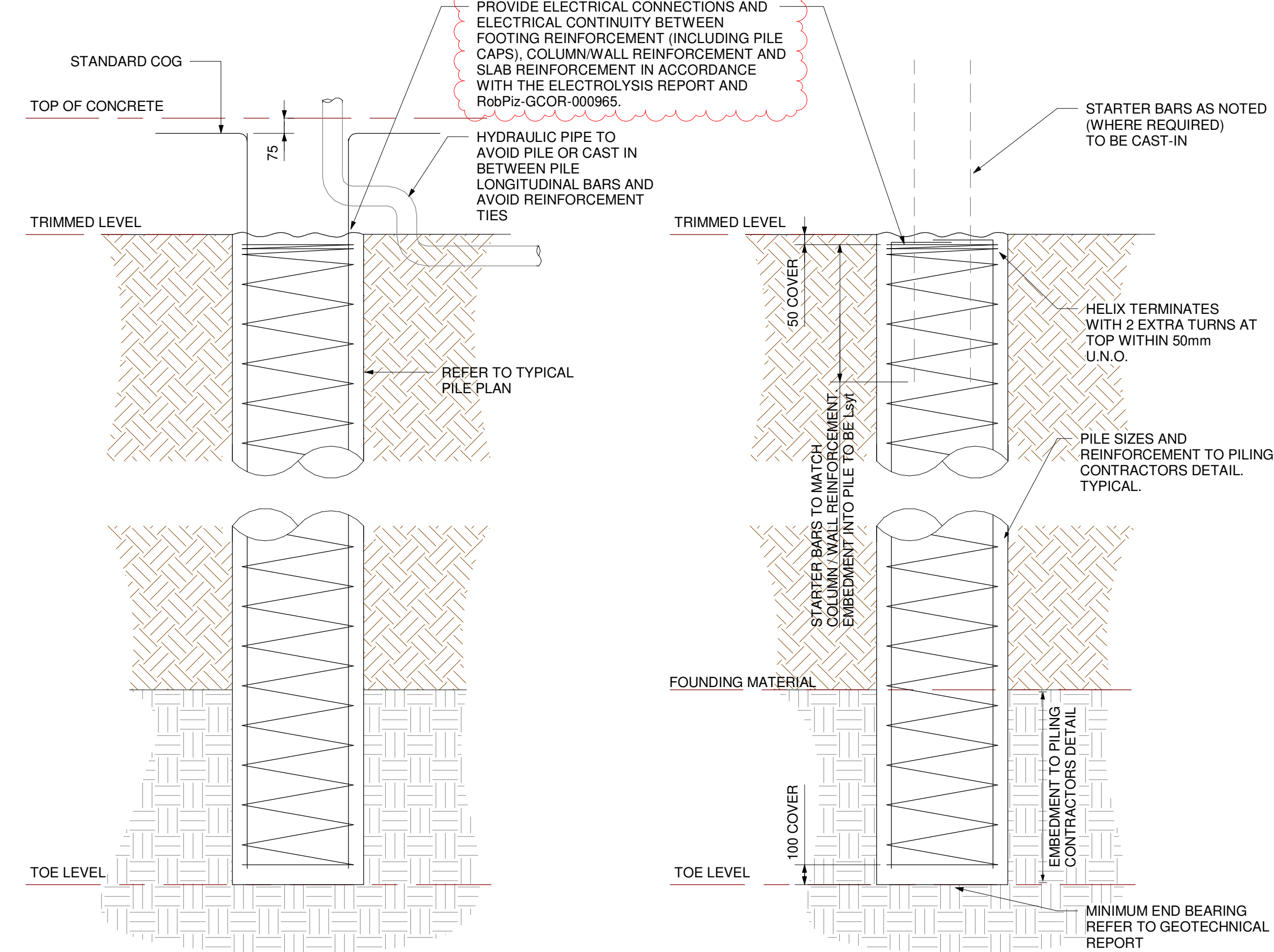
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Sheet title
FOUNDATION GENERAL
ARRANGEMENT - ZONE 6

Sheet number
MSP-EN-ST-00306

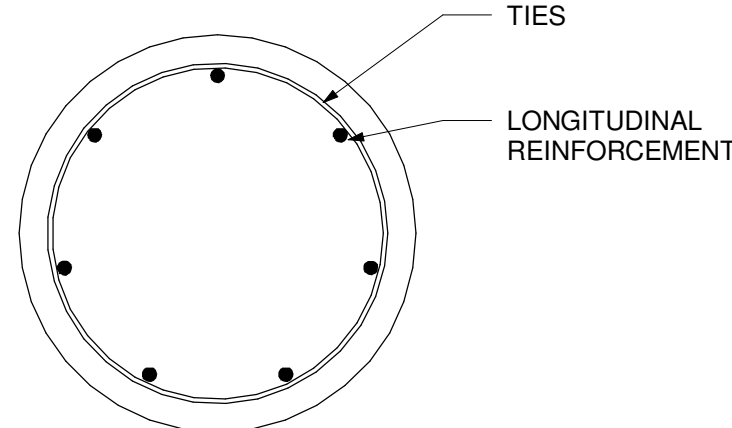
Status
FOR CROWN CERTIFICATE

Revision
8



TYPICAL PILE AT SLAB / PILE CAP / BEAM / CORE FOUNDATION

TYPICAL PILE TO CONCRETE COLUMN



TYPICAL PILE DETAIL

NOTE:
PILES TO BE DESIGNED AND
CERTIFIED BY PILING CONTRACTOR

PILE NOTES

- PILES AND PILING TO BE IN ACCORDANCE WITH AS 2159.
- REFER TO THE PILING CONTRACTORS DOCUMENTATION FOR PILE SIZES.
- PILES TO BE LOCATED WITHIN 75mm OF POSITION NOMINATED AND BE WITHIN 1.75 FOR PLUMB.
- ALL PILES TO BE INSPECTED BY A QUALIFIED GEOTECHNICAL ENGINEER TO VERIFY DESIGN BEARING PRESSURES.
- ALL PILE BORINGS ARE TO BE INSPECTED TO ENSURE THEY ARE CLEANED AND FREE OF LOOSE MATERIAL AND WATER PRIOR TO POURING CONCRETE, WHICH SHOULD BE WITH MINIMAL DELAY AND ON THE SAME DAY AS BORING.
- THE INSPECTION SHOULD ENSURE ADEQUATE ROUGHNESS IS ACHIEVED IN THE PILE SHAFT TO GUARANTEE SHAFT ADHESION, THE USE OF A ROUGHENING TOOL IS RECOMMENDED.
- SOME GROUNDWATER SEEPAGE INTO PILES CAN BE EXPECTED. WATER SHOULD BE PUMPED FROM THE PILES IMMEDIATELY PRIOR TO POURING CONCRETE. TREMIE METHODS SHOULD BE USED IF DEPTH OF WATER EXCEEDS 100mm
- OBSTRUCTIONS MAY BE EXPECTED WHEN DRILLING THROUGH EXISTING FILL
- INFORMATION RELATING TO GROUND CONDITIONS HAS BEEN BASED ON ALLIANCE GEOTECHNICAL: 9280-GR-1-1 REV[1] 11/10/2019, MSP: MSP-DP-GT-011 REV[0] 11/10/2018 & ARUP: 258661-GDR-01 REV[1] 28/2/2018
- PILE DESIGN TO BE IN ACCORDANCE WITH GEOTECHNICAL REPORTS: ALLIANCE GEOTECHNICAL: 9280-GR-1-1 REV[1] 11/10/2019, MSP: MSP-DP-GT-011 REV[0] 11/10/2018 & ARUP: 258661-GDR-01 REV[1] 28/2/2018
- THE CONTRACTOR SHALL SATISFY THEMSELVES TO THE CORRECTNESS, OR OTHERWISE, OF THE ESTIMATED TOP OF GEOTECHNICAL MATERIAL LEVELS. THE CONTRACTOR SHALL MAKE ALL ALLOWANCES NECESSARY TO COVER FOR VARIANCE BETWEEN ESTIMATED GEOTECHNICAL MATERIAL LEVELS AND ACTUAL GEOTECHNICAL MATERIAL LEVELS. NO TIME OR COST VARIATION WILL BE GIVEN SHOULD THERE EXIST A DIFFERENCE BETWEEN ACTUAL GEOTECHNICAL MATERIAL LEVELS AND ESTIMATED GEOTECHNICAL MATERIAL LEVELS.
- ALL PILES MUST BE CAPABLE OF CARRYING THE ULTIMATE LOADS NOMINATED AND IN ADDITION A MINIMUM LATERAL LOAD EQUIVALENT TO THE MAXIMUM OF 2.5% OF VERTICAL ULTIMATE LOAD OR 75kN U.N.O.
- ALL PILES MUST BE CAPABLE OF CARRYING THE ULTIMATE LOADS NOMINATED AND IN ADDITION A MINIMUM MOMENT THAT TAKES INTO ACCOUNT THE BUILDING TOLERANCE OF THE PILES.
- PILES TO BE DESIGNED TO LIMIT SETTLEMENT TO 10mm OR DIFFERENTIAL SETTLEMENT BETWEEN ADJACENT COLUMNS OR WALLS SPACING/1000mm - WHICHEVER IS LESS
- SHEAR AND TENSION/COMPRESSION IS TO BE CONSIDERED TOGETHER. SHEAR FORCES CANNOT BE DISTRIBUTED BETWEEN PILES.
- REINFORCEMENT MUST CARRY ALL TENSION LOAD IN PILES.
- REFER TO ARCHITECTS DRAWINGS FOR ALL LEVELS
- SELF-WEIGHT OF PILES TO BE ADDED TO ALL COMPRESSION LOADS BY THE PILING CONTRACTOR
- REFER TO PILING CONTRACTORS DRAWINGS FOR PILE DETAILS
- PILE DESIGN TO ACCOUNT FOR INTERACTION BETWEEN PILES IN PILE GROUPS
- ALL CHANGES TO NOMINATED PILE DIAMETERS TO BE SUBMITTED FOR ENSTRUCT REVIEW. CHANGES IN PILE DIAMETER MAY CHANGE LATERAL PILE LOADS.
- PILES ARE TO BE DESIGNED ASSUMING NO FIXITY AT THE PILE CAP

NOTES:

- FOR PAD FOOTING AND STRIP FOOTING DETAILS AND NOTES REFER TO ST-00331 TO ST-00351
- FOR FOUNDATION SECTIONS REFER TO DRG. ST-00361
- PILE DESIGN BASED ON GEOTECHNICAL CAPACITIES PROVIDED IN THE GEOTECHNICAL REPORTS.
- FOR PILE SCHEDULE AND NOTES REFER DRG. ST-00331
- CURRENT SELECTION OF FOUNDATION TYPE HAS BEEN BASED UPON AN INTERPRETATION OF THE CURRENT GEOTECHNICAL REPORTS. THE CONTRACTOR SHOULD REVIEW THE AVAILABLE INFORMATION IN THE GEOTECHNICAL REPORTS AND MAKE THEIR OWN ASSESSMENT.
- REFER TO DRAWING ST-00561 TO ST-00570 FOR RC WALL ELEVATIONS
- REFER TO DRAWING ST-00501 TO ST-00502 FOR COLUMN SCHEDULE
- REFER TO DRAWING ST-00331 FOR LATERAL FOUNDATION LOADS
- REFER TO DRAWING ST-00331 & GENERAL NOTES FOR GROUND ANCHOR NOTES
- REFER TO DRAWING ST-00331 FOR CORE WALL GRAVITY LOADS

REFER TO DRAWINGS ST-00101 & ST-00102 FOR GENERAL NOTES

Recent revision history

#	Description	Date
4	Issued For Information 50% Design Development	05.06.20
5	50% DD Updates	19.06.20
6	50% DD Updates	24.06.20
7	75% Documentation Issue	08.07.20
8	Issued for Construction Certificate	22.07.20
A	Issued for Construction- Zone 1 & 2 Pile Loads Only	31.07.20
B	Issued for Construction	05.08.20
C	For Crown Certificate	12.08.20

Key Plan

Notes

Contractor



Client

Project

MEADOWBANK EDUCATION AND EMPLOYMENT PRECINCT SCHOOLS PROJECT

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Project number

5645

Size check

25mm

Checked

Approved

Sheet size

Scale

NLK

MOS

A1

1 : 20

Sheet number

MSP-EN-ST-00331

Revision

C

Status

FOR CROWN CERTIFICATE

LATERAL FOUNDATION LOADS

TAG	ULTIMATE COMPRESSION	ULTIMATE TENSION	WORKING COMPRESSION	WORKING TENSION
	[kN]	[kN]	[kN]	[kN]
CPG1	10,000	7,250	3,000	0
CPG2	8,500	5,750	2,500	0
CPG3	10,500	7,250	3,000	0
CPG4	10,000	7,250	3,000	0
CPG5	7,000	4,500	2,500	0
CPG6	3,500	1,500	1,500	0
CPG7	6,500	4,250	2,500	0
CPG8	7,500	4,250	3,000	0
CPG9	3,500	1,250	2,000	0
CPG10	7,500	4,500	2,500	0
CPG11	10,000	7,250	3,000	0
CPG12	8,500	5,250	3,000	0
CPG13	12,500	8,250	4,000	0
CPG14	10,000	7,250	3,000	0
CPG15	10,500	6,750	4,500	250
CPG16	9,500	5,250	4,500	0
CPG17	9,000	5,250	4,000	0
CPG18	10,500	6,750	4,500	250
CPG19	7,000	4,500	3,000	250
CPG20	2,500	750	1,500	0
CPG21	2,500	750	1,500	0
CPG22	7,500	4,750	3,500	250
CPG23	7,000	4,500	3,000	250
CPG24	2,500	750	1,500	0
CPG25	2,500	750	1,500	0
CPG26	7,500	4,750	3,500	250
CPG27	10,500	6,750	4,500	250
CPG28	8,000	5,000	3,000	250
CPG29	7,500	4,750	3,000	500
CPG30	10,500	6,750	4,500	250
CPG31	11,000	8,250	3,000	250
CPG32	9,500	6,000	3,500	0
CPG33	8,500	5,250	3,000	0
CPG34	11,000	8,250	3,000	250
CPG35	9,000	5,500	3,000	0
CPG36	1,500	250	1,000	0
CPG37	1,500	0	1,000	0
CPG38	9,000	5,750	3,000	0
CPG39	11,000	8,250	3,000	250
CPG40	8,500	4,750	3,500	0
CPG41	9,000	5,500	3,500	0
CPG42	11,000	8,250	3,000	250
CPG43	10,500	8,750	3,000	1,000
CPG44	2,500	1,750	1,000	250
CPG45	2,500	1,750	1,000	250
CPG46	10,500	8,750	3,000	1,000

	CORE 1 - SHEAR AND TORSION LOAD SCHEDULE		
	Vx	Vy	T
	[kN]	[kN]	[kNm]
	250	2,000	500
ULTIMATE WIND - DIRECTION 1	250	2,000	500
ULTIMATE WIND - DIRECTION 2	1,000	250	250
EARTHQUAKE - DIRECTION 1	16,000	23,000	31,500
EARTHQUAKE - DIRECTION 2	39,000	9,250	30,500
WORKING WIND - DIRECTION 1	250	1,500	500
WORKING WIND - DIRECTION 2	750	250	250

	CORE 3 - SHEAR AND TORSION LOAD SCHEDULE		
	Vx	Vy	T
	[kN]	[kN]	[kNm]
	250	2,500	500
ULTIMATE WIND - DIRECTION 1	250	2,500	500
ULTIMATE WIND - DIRECTION 2	250	250	250
EARTHQUAKE - DIRECTION 1	8,250	35,250	28,000
EARTHQUAKE - DIRECTION 2	18,500	17,000	16,500
WORKING WIND - DIRECTION 1	250	1,750	250
WORKING WIND - DIRECTION 2	250	250	250

	CORE 2 - SHEAR AND TORSION LOAD SCHEDULE		
	Vx	Vy	T
	[kN]	[kN]	[kNm]
	250	5,250	6,250
ULTIMATE WIND - DIRECTION 1	250	5,250	6,250
ULTIMATE WIND - DIRECTION 2	1,250	250	500
EARTHQUAKE - DIRECTION 1	3,500	24,750	57,750
EARTHQUAKE - DIRECTION 2	24,750	3,750	17,000
WORKING WIND - DIRECTION 1	250	3,750	4,500
WORKING WIND - DIRECTION 2	1,000	250	250

	SHEAR WALL - SHEAR AND TORSION LOAD SCHEDULE		
	Vx	Vy	T
	[kN]	[kN]	[kNm]
	250	1,750	250
ULTIMATE WIND - DIRECTION 1	250	1,750	250
ULTIMATE WIND - DIRECTION 2	250	250	250
EARTHQUAKE - DIRECTION 1	250	10,500	250
EARTHQUAKE - DIRECTION 2	250	2,500	250
WORKING WIND - DIRECTION 1	250	1,250	250
WORKING WIND - DIRECTION 2	250	250	250

1. ALL EARTHQUAKE ACTIONS ARE TO BE CONSIDERED TO ACT IN THE POSITIVE OR NEGATIVE DIRECTION, WHICHEVER IS WORSE FOR THE CONBINATION BEING...
2. WHEN AN EARTHQUAKE ACTION IN ONE DIRECTION IS BEING CONSIDERED, 30% OF THE EARTHQUAKE ACTION IN THE OTHER DIRECTION IS TO BE CONSIDERED...
3. GLOBAL EARTHQUAKE FORCES ARE TO BE COMBINED IN ACCORDANCE WITH AS/NZS 1170.1 AND AS1170.4.
4. EARTHQUAKE LOADS PROVIDED ARE ULTIMATE LOADS.
5. FORCES ARE SUBJECT TO CHANGE AS THE DESIGN DEVELOPS AND STRUCTURAL LOADS AND CORE WALL PENETRATIONS ARE FINALISED.
6. GEOTECHNICAL ADVICE ON THE LATERAL STIFFNESS OF PILES IS TO BE PROVIDED ONCE PILE SIZES AND NUMBER OF PILES ARE CONFIRMED BY THE PILING...
7. THE LOADS ABOVE INCLUDE NO ALLOWANCE FOR GRAVITY LOADS. REFER TO CORE WALL GRAVITY LOAD SCHEDULUE FOR GRAVITY LOADS.
8. SHEAR FORCE IS TO BE DISTRIBUTED BETWEEN ALL PILES CONNECTED BY A RIGID CAP ACCORDING TO AN ELASTIC DISTRIBUTION .
9. FOLLOWING RECEIPT OF PROPOSED PILE SIZES AND LOCATIONS FROM THE PILING CONTRACTOR, LOADS FOR INDIVIDUAL PILES WILL BE PROVIDED.
10. WORKING WIND LOADS CAN BE CALCULATED BY APPLYING A FACTOR OF 0.72 TO THE LOADS ABOVE.

REFER TO DRAWINGS ST-00101 & ST-00102 FOR GENERAL NOTES

Recent revision history

#	Description	Date
1	50% DD Updates	19.06.20
2	75% Documentation Issue	08.07.20
3	For Crown Certificate	23.07.20

Notes

Key Plan

Contractor

Project

MEADOWBANK EDUCATION AND EMPLOYMENT PRECINCT SCHOOLS PROJECT

Client

Education School Infrastructure

Issuer

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Project number

5645

Checked

NLK

Approved

MOS

Size check

25mm

Sheet size

A1

Scale

Sheet title

TYPICAL PILE DETAILS - SHEET 2

Sheet number

MSP-EN-ST-00332

Status

FOR CROWN CERTIFICATE

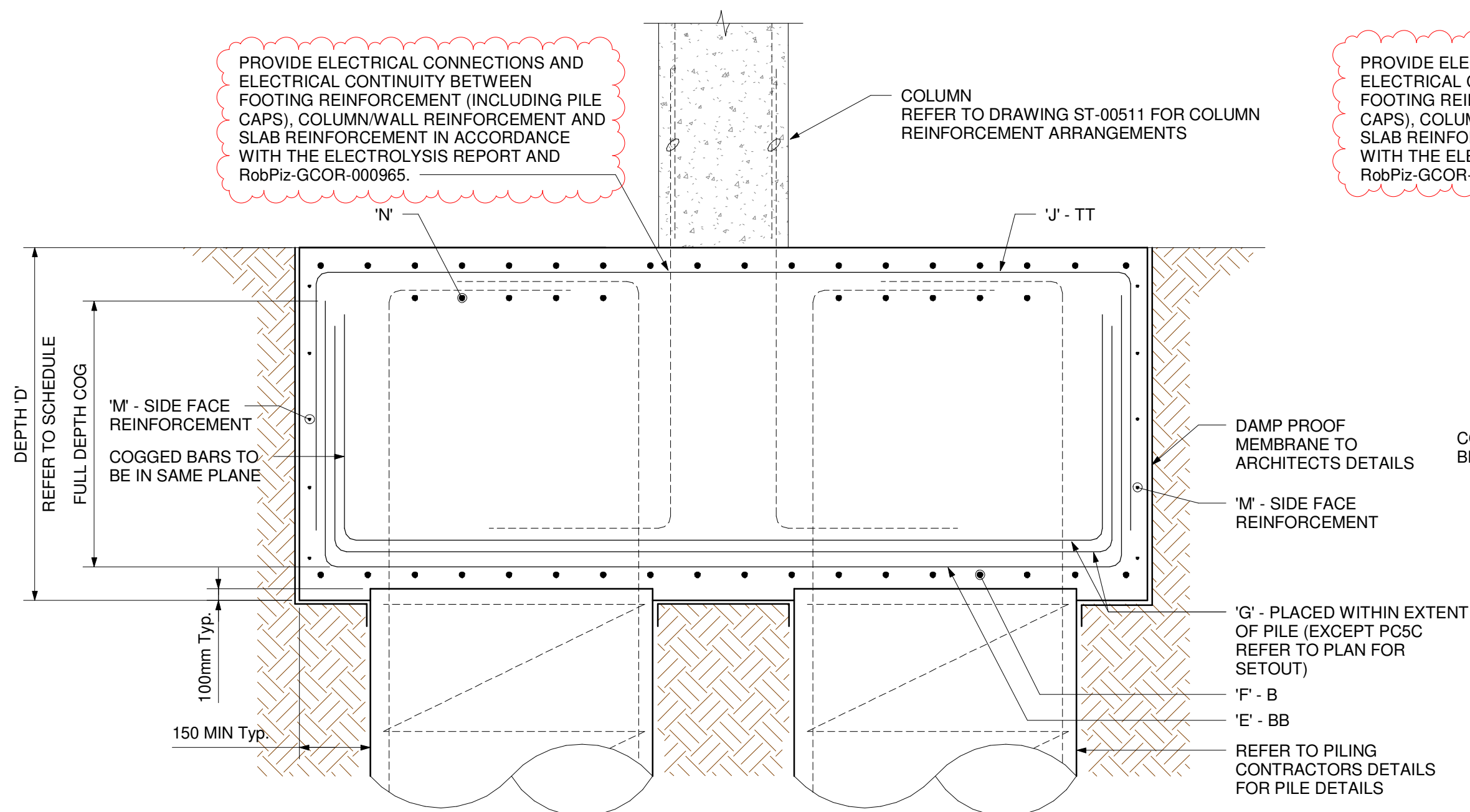
Revision

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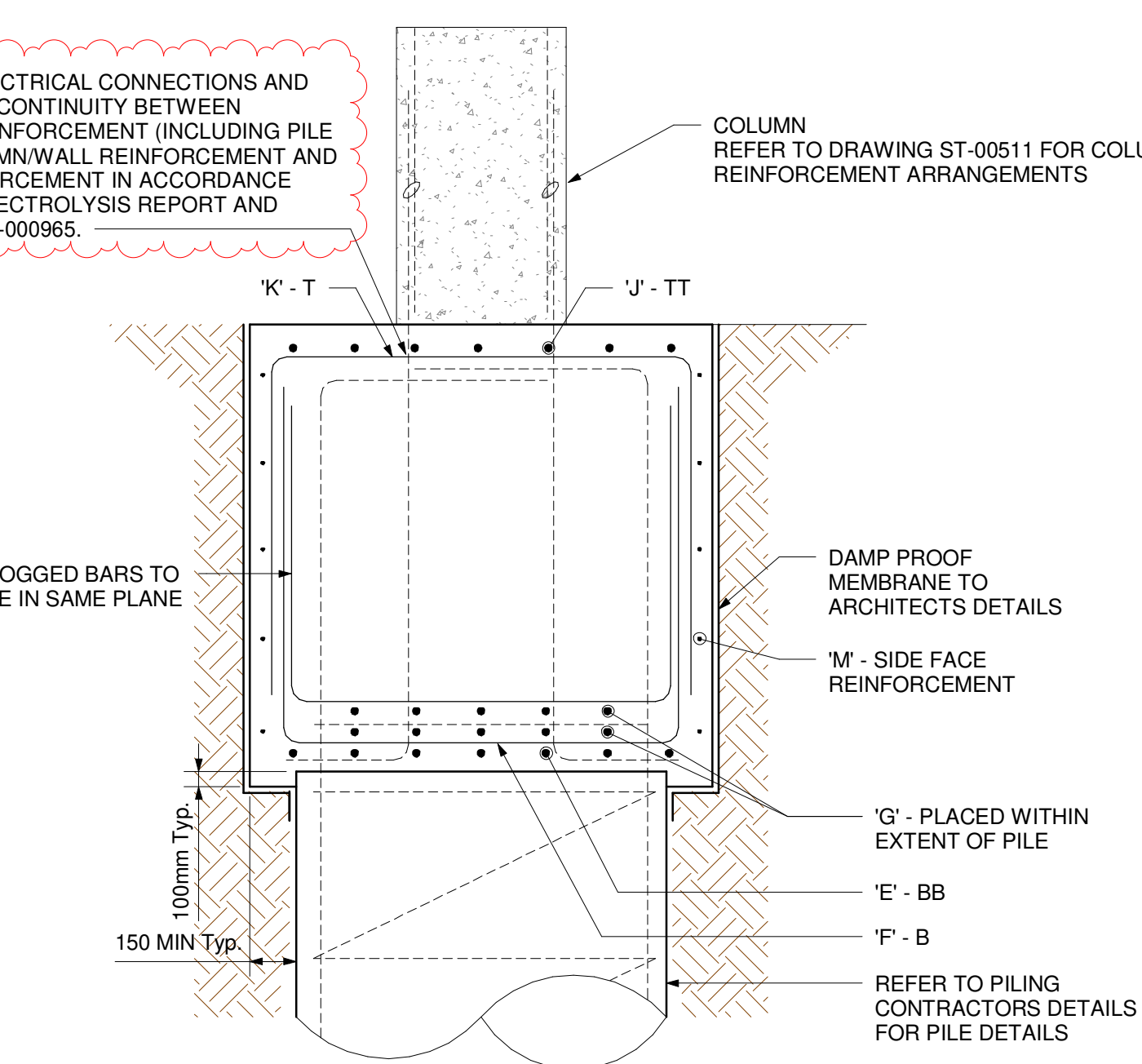
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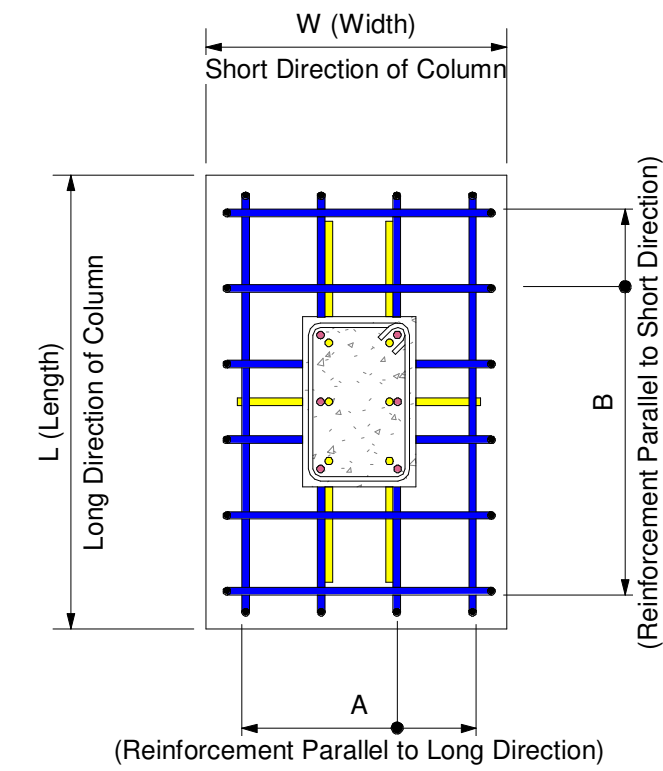
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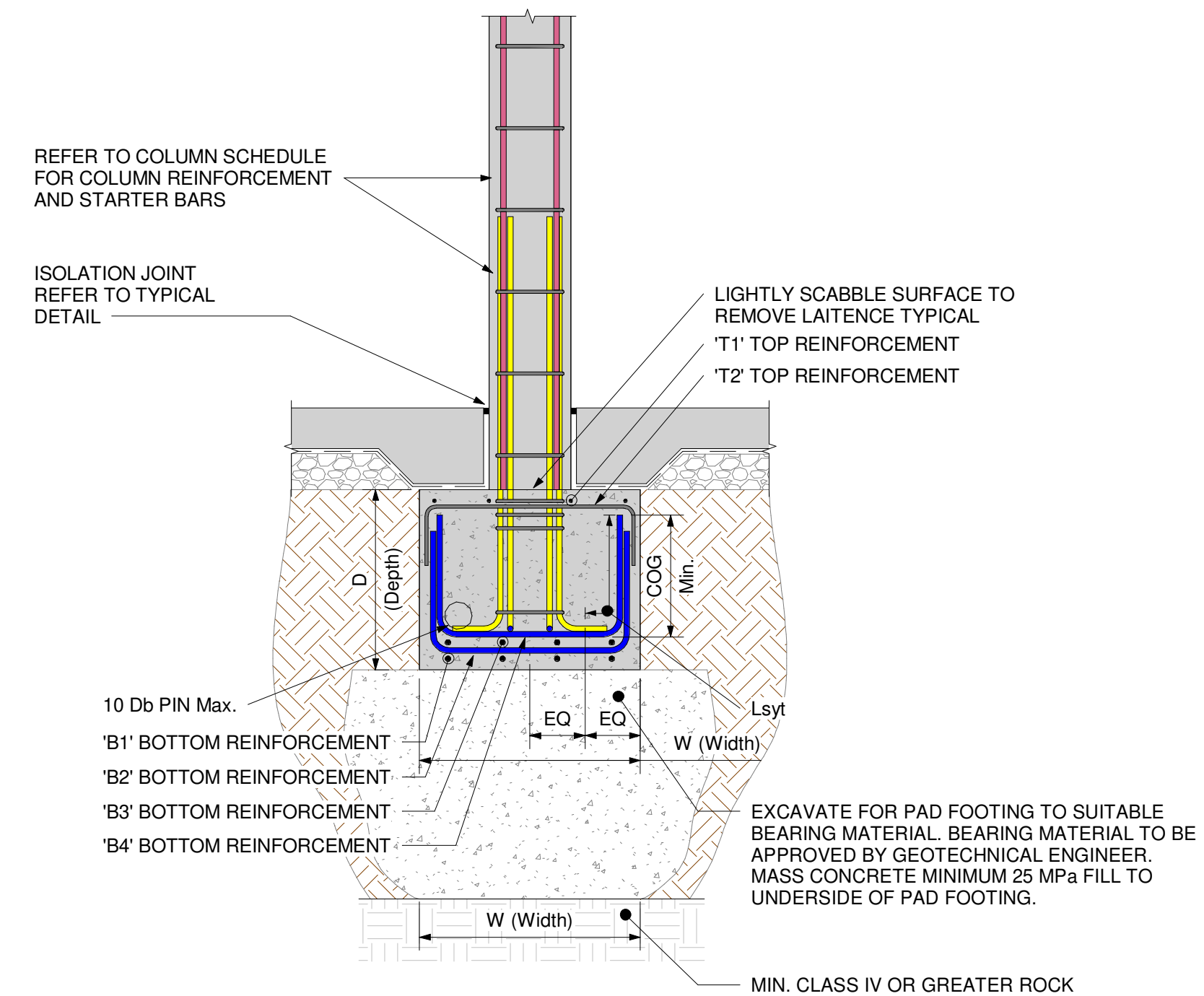
TYPICAL DUAL-PILE PILECAP ELEVATION



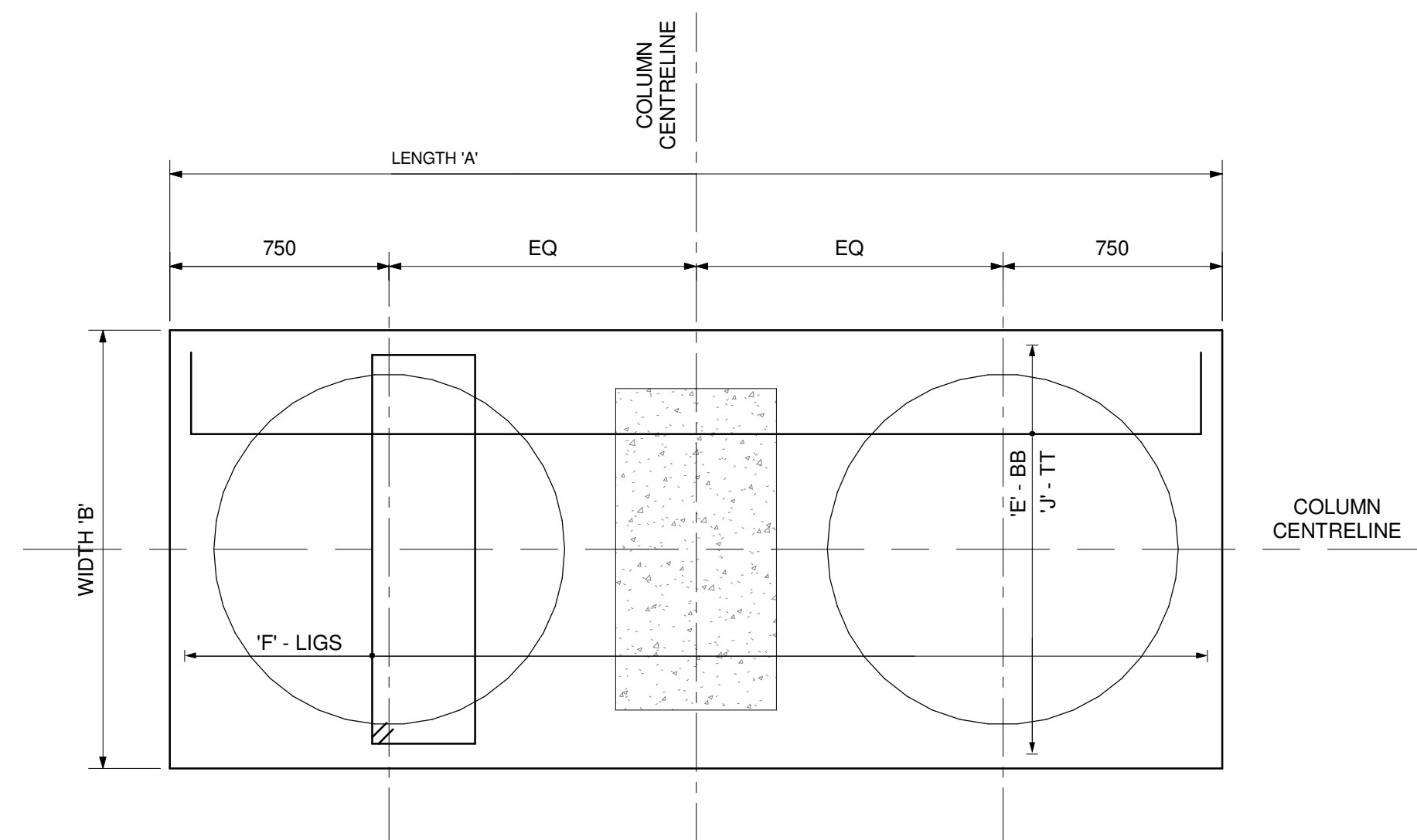
TYPICAL SINGLE-PILE PILECAP ELEVATION



PLAN

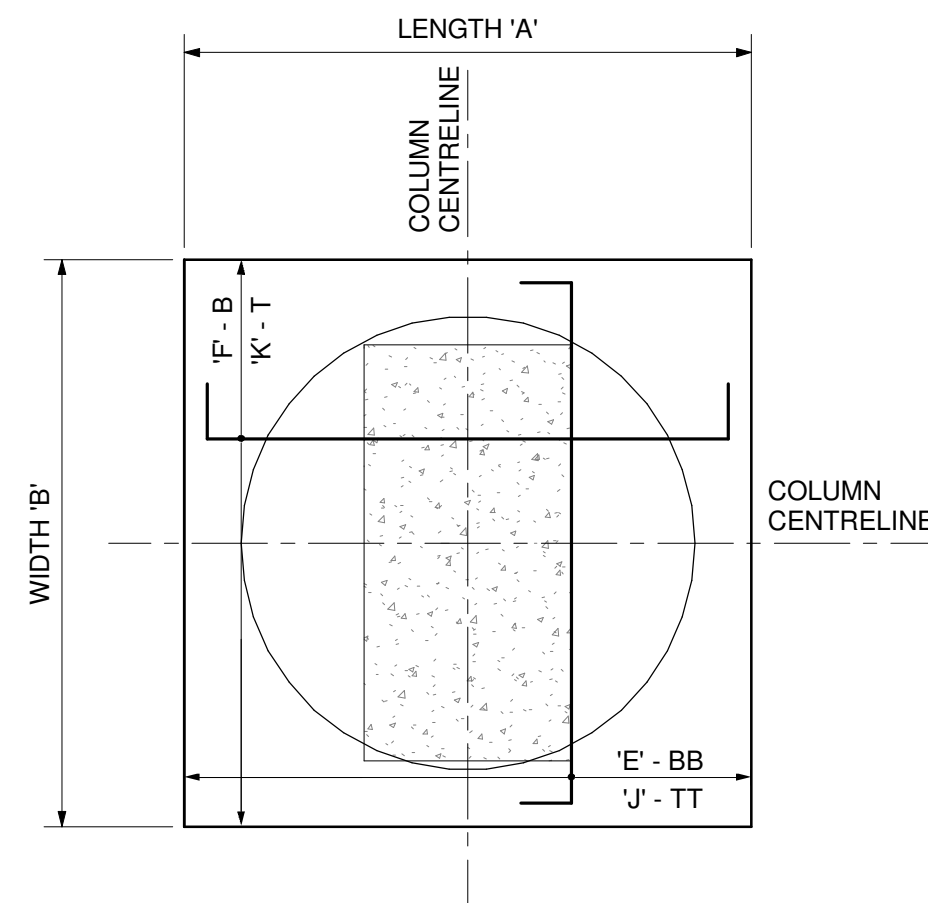


TYPICAL FOOTING SECTION



TYPICAL DUAL-PILE PILECAP PLAN

SCALE = 1:20



TYPICAL SINGLE-PILE PILECAP PLAN

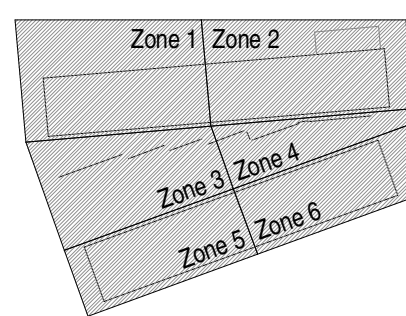
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- ELECTROLYSIS NOTES:**
1. REFER TO POWER EARTH ELECTROLYSIS REPORT NO. 4413REP010101 REVISION 0 DATED 8/7/20 FOR ELECTROLYSIS REQUIREMENTS FOR THE PROJECT.
 2. PROVIDE REINFORCEMENT WELDS/TIES AND ELECTRICAL CONNECTIONS IN ACCORDANCE WITH THE ELECTROLYSIS REPORT.
 3. REFER TO ACONEX CORRESPONDENCE RobPiz-GCOR-000965 FOR ADDITIONAL ELECTRICAL CONNECTIONS REQUIRED WHERE MOVEMENT JOINTS EXIST BETWEEN SLAB-ON-GRADE AND FOOTINGS/COLUMNS.

REFER TO DRAWINGS ST-00101 & ST-00102 FOR GENERAL NOTES

Recent revision history		
#	Description	Date
1	Draft 90% Schematic Design	24.06.19
2	Schematic Design	14.06.19
3	Issued for Foundation Loads	15.05.20
4	Issued For Information 50% Design Development	05.06.20
5	75% Documentation Issue	06.07.20
6	Issued for Construction Certificate	22.07.20
7	For Crown Certificate	12.08.20

Key Plan



Notes

Contractor



Project
MEADOWBANK EDUCATION AND EMPLOYMENT PRECINCT SCHOOLS PROJECT



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Project number
5645

Size check
25mm

Checked
NLK

Approved
MOS

Sheet size
A1

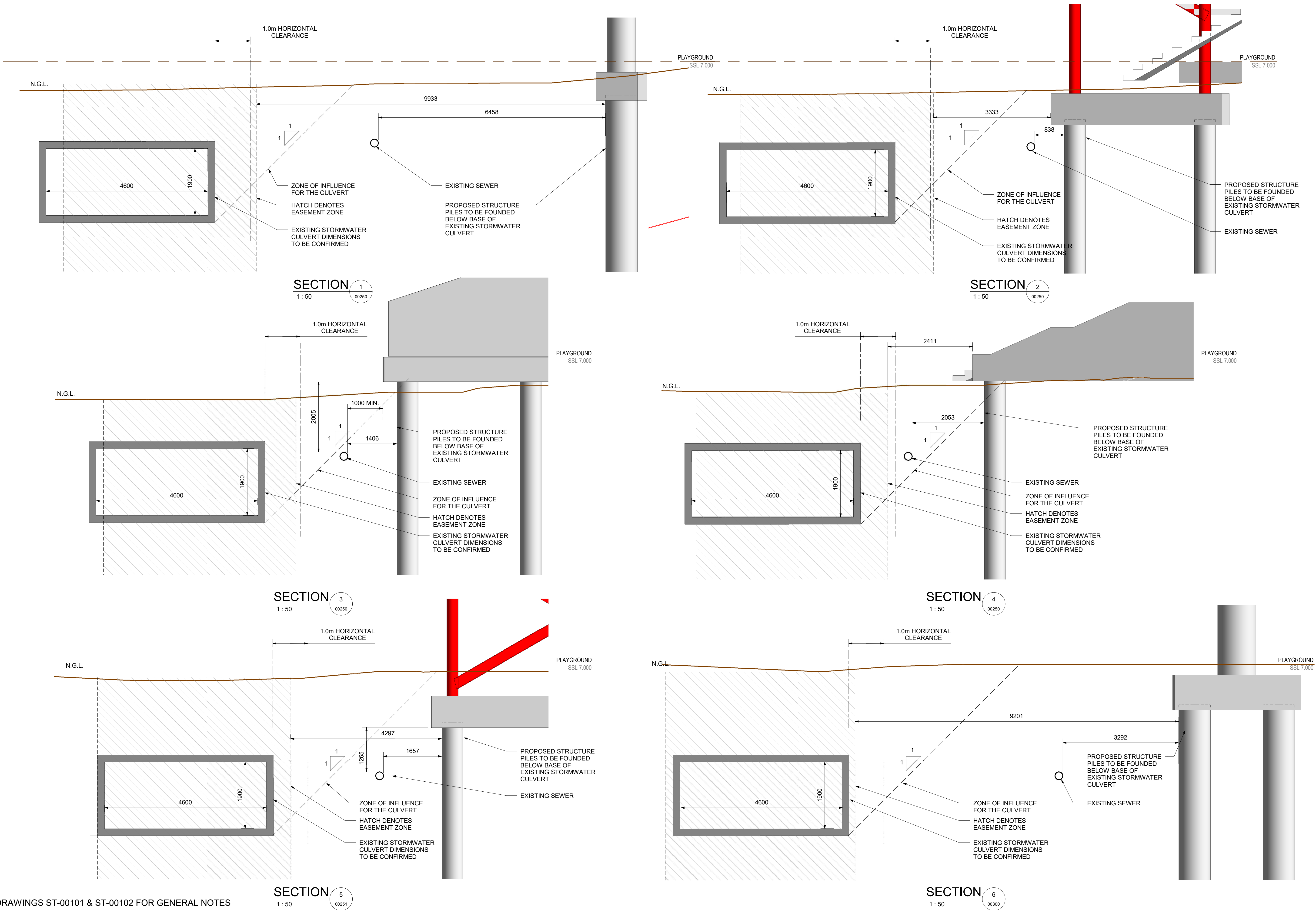
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Sheet title
TYPICAL PILE CAP AND STRIP FOOTING DETAILS - SHEET 1

Sheet number
MSP-EN-ST-00351

Revision
7

Status
FOR CROWN CERTIFICATE

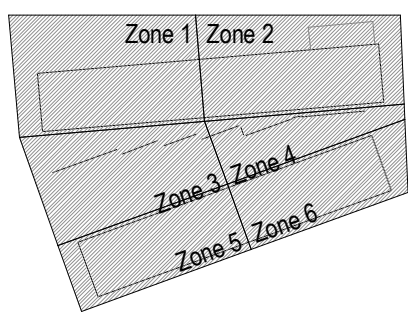


REFER TO DRAWINGS ST-00101 & ST-00102 FOR GENERAL NOTES

Recent revision history		
#	Description	Date
1	Schematic Design	21.01.20
2	Issued for Foundation Loads	15.05.20
3	Issued for Information	20.05.20
4	Issued for Co-ordination	22.05.20
5	Issued For Information 50% Design Development	05.06.20
6	75% Documentation Issue	08.07.20
7	For Crown Certificate	23.07.20

Notes

Key Plan



LEGEND

- EXISTING NATURAL GROUND LEVEL
- CLASS III ROCK
- CLASS IV ROCK
- BULK EXCAVATION LEVEL

Contractor



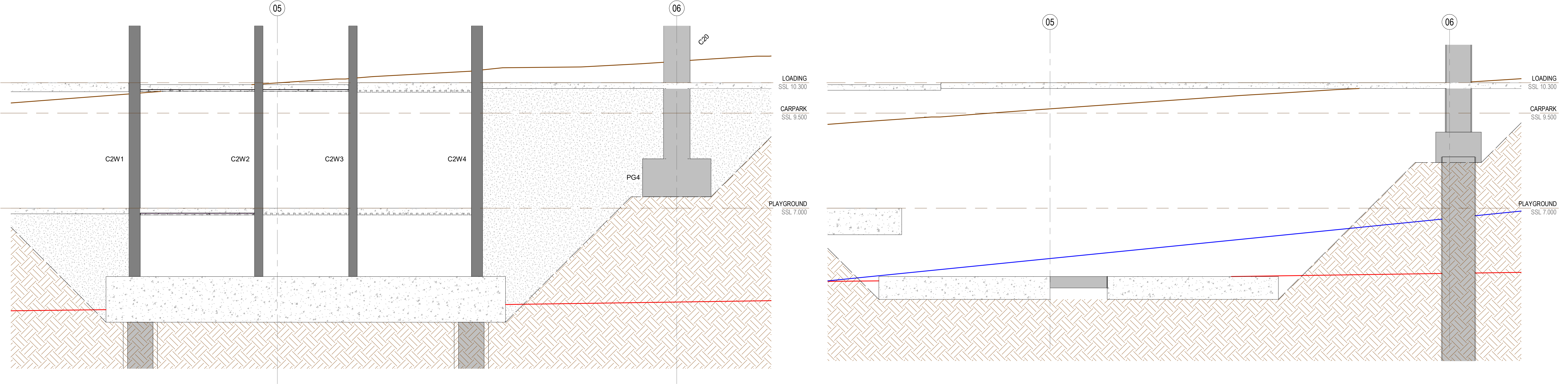
Project
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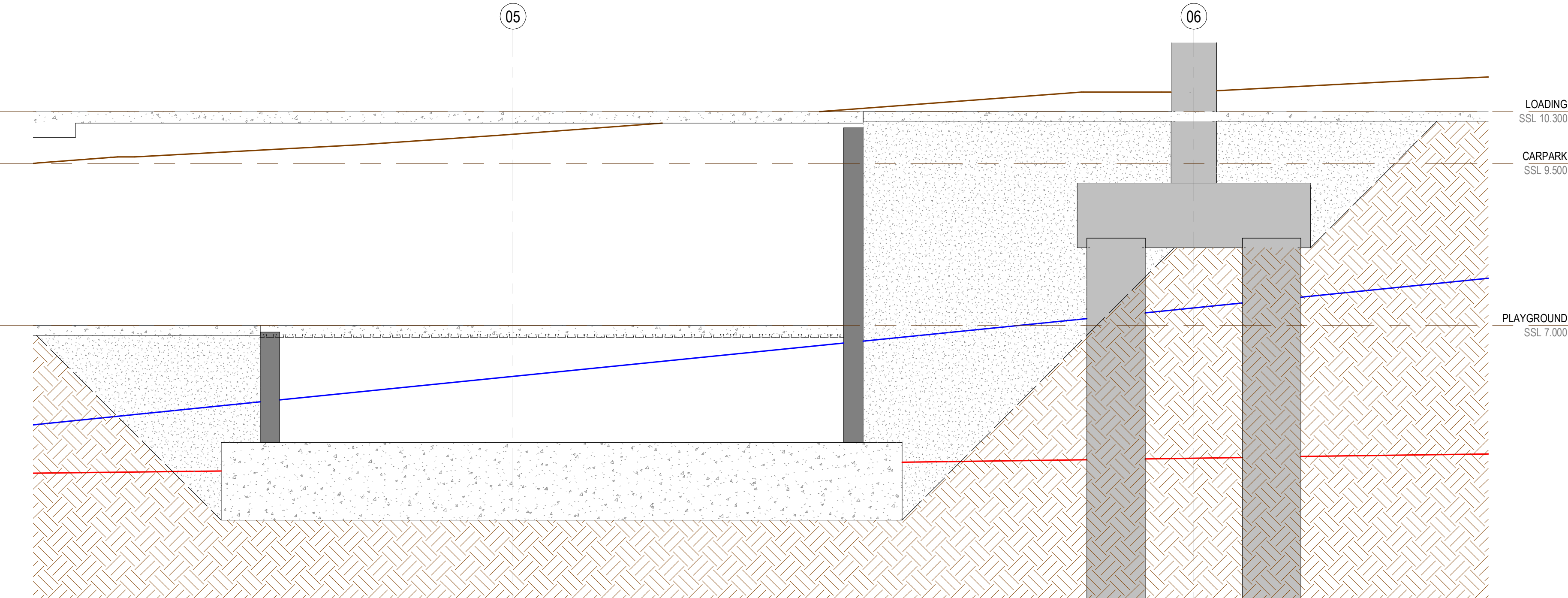
Project number
5645
Checked NLK
Approved MOS
Size check
25mm
Sheet size
A1
Scale
As indicated

Sheet title
FOUNDATION SECTIONS - SHEET 1
Sheet number
MSP-EN-ST-00361
Status
FOR CROWN CERTIFICATE
Revision
7

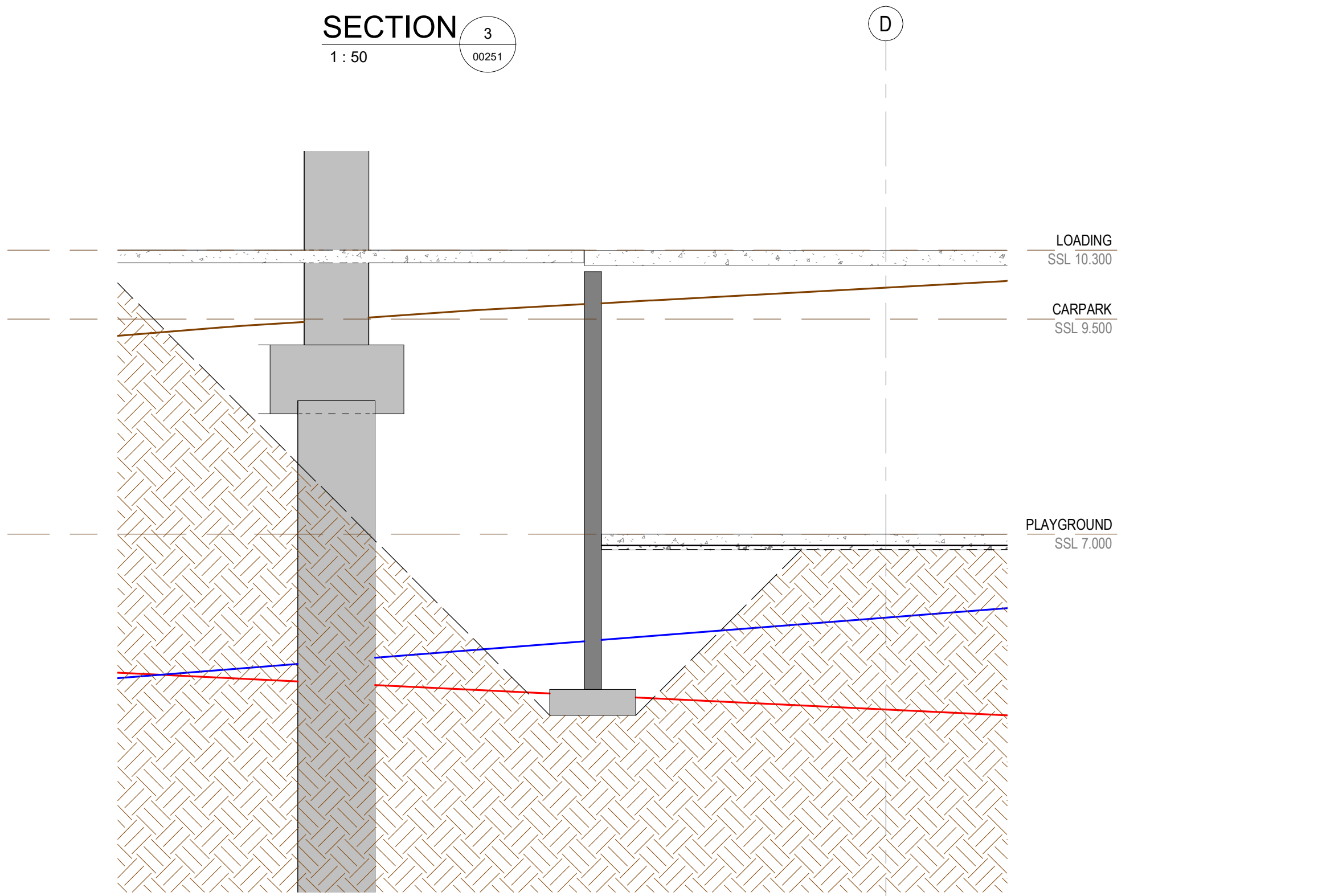


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1 : 50

SECTION 3
1 : 50



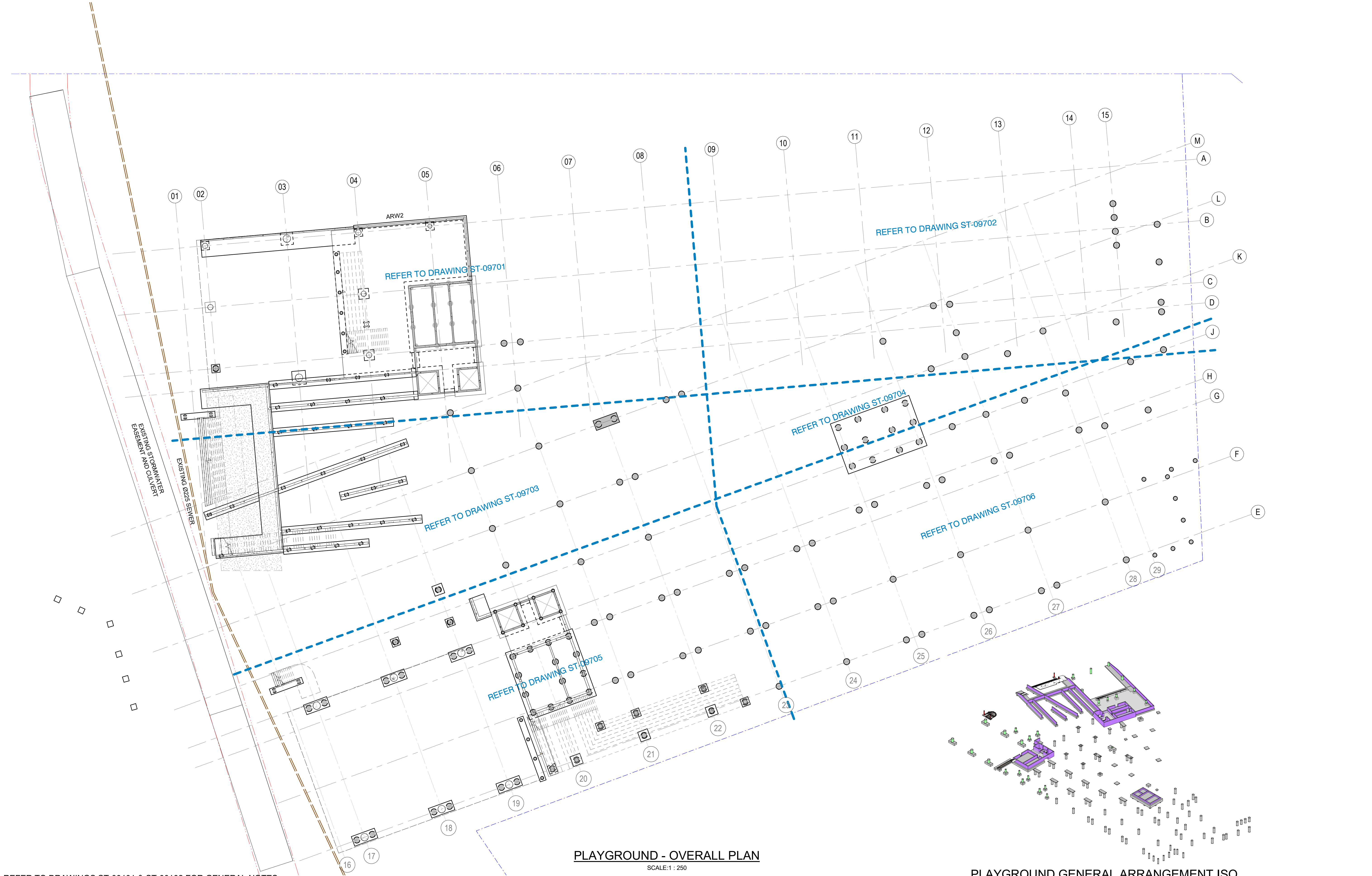
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SECTION 4
1 : 50

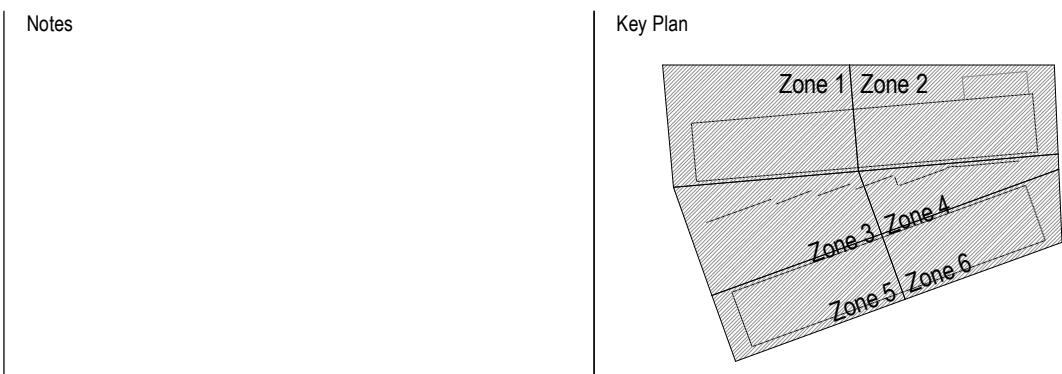
REFER TO DRAWINGS ST-00101 & ST-00102 FOR GENERAL NOTES

<table><tr><th>Recent revision history</th><th></th><th></th></tr><tr><td>#</td><td>Description</td><td>Date</td></tr><tr><td>1</td><td>75% Documentation Issue</td><td>08.07.20</td></tr><tr><td>2</td><td>For Crown Certificate</td><td>23.07.20</td></tr></table>	Recent revision history			#	Description	Date	1	75% Documentation Issue	08.07.20	2	For Crown Certificate	23.07.20	<table><tr><th>Notes</th></tr><tr><td></td></tr></table>	Notes		<table><tr><th>Key Plan</th></tr><tr><td></td></tr></table>	Key Plan		<table><tr><td>Contractor</td><td>Project</td><td>Issuer</td><td>Sheet title</td></tr><tr><td></td><td>MEADOWBANK EDUCATION AND EMPLOYMENT PRECINCT SCHOOLS PROJECT</td><td> enstruct group pty ltd Level 4, 2 Glen Street, Milsons Point NSW 2061 Telephone (02) 8904 1444 http://www.enstruct.com.au</td><td>FOUNDATION SECTIONS - SHEET 2</td></tr><tr><td>Client</td><td>Project number</td><td>Size check</td><td>Sheet number</td></tr><tr><td> Education School Infrastructure</td><td>5645</td><td>25mm</td><td>MSP-EN-ST-00362</td></tr><tr><td></td><td>Checked NLK</td><td>Approved MOS</td><td>Revision 2</td></tr><tr><td></td><td></td><td>Sheet size A1</td><td>Status</td></tr><tr><td></td><td></td><td>Scale 1 : 50</td><td>FOR CROWN CERTIFICATE</td></tr></table>	Contractor	Project	Issuer	Sheet title		MEADOWBANK EDUCATION AND EMPLOYMENT PRECINCT SCHOOLS PROJECT	 enstruct group pty ltd Level 4, 2 Glen Street, Milsons Point NSW 2061 Telephone (02) 8904 1444 http://www.enstruct.com.au	FOUNDATION SECTIONS - SHEET 2	Client	Project number	Size check	Sheet number	Education School Infrastructure	5645	25mm	MSP-EN-ST-00362		Checked NLK	Approved MOS	Revision 2			Sheet size A1	Status			Scale 1 : 50	FOR CROWN CERTIFICATE
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REFER TO DRAWINGS ST-00101 & ST-00102 FOR GENERAL NOTES

Recent revision history		
#	Description	Date
1	Schematic Design	14.06.19
2	Issued for Information	22.05.20
3	Issued for Information	29.05.20
4	Issued For Information 50% Design Development	05.06.20
5	50% DD Updates	19.06.20
6	75% Documentation Issue	08.07.20
7	For Crown Certificate	23.07.20



- NOTES:
- POST TENSIONED CONCRETE WORKS TO SPECIALIST P/T CONTRACTORS DETAIL
 - REFER TO PT CONCRETE SPECIFICATION
 - SLABS TO BE 180 THICK PT MINIMUM TYPICAL U.N.O.
 - ALL BEAMS TO BE P/T U.N.O.
 - ALL SLAB FOLDS TO BE 900mm WIDE U.N.O.
 - ALL FACADE FIXINGS TO BE COORDINATED WITH P/T AND REINFORCEMENT
 - REFER TO DRAWING ST-01231 & ST-01232 FOR TYPICAL SUSPENDED SLAB DETAILS
 - REFER TO DRAWING ST-00550 FOR CORE WALL SIZES TYPICALLY U.N.O.
 - REFER TO DRAWING ST-00511 FOR COLUMN SIZES TYPICALLY U.N.O.
 - KF40 REFERS TO FIELDS KF40 0.75 BMT

Contractor



Project
MEADOWBANK EDUCATION AND
EMPLOYMENT PRECINCT
SCHOOLS PROJECT

Client
NSW
GOVERNMENT
Education
School Infrastructure

Issuer
enstruct
enstruct group pty ltd
Level 4, 2 Glen Street, Milsons Point NSW 2061
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Project number
5645

Size check
25mm

Checked
NLK

Approved
MOS

Sheet size
A1

Scale
1:250

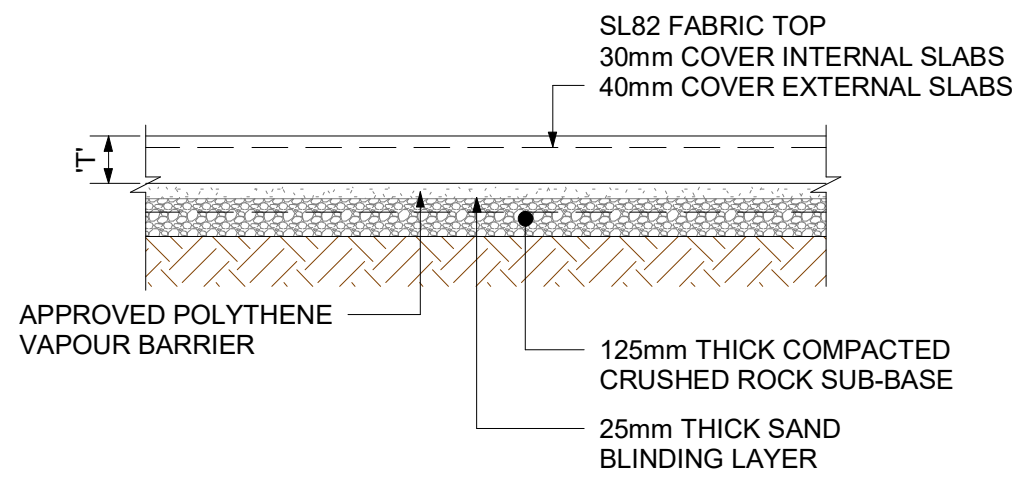
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PLAYGROUND - OVERALL PLAN

Sheet number
MSP-EN-ST-09700

Status
FOR CROWN CERTIFICATE

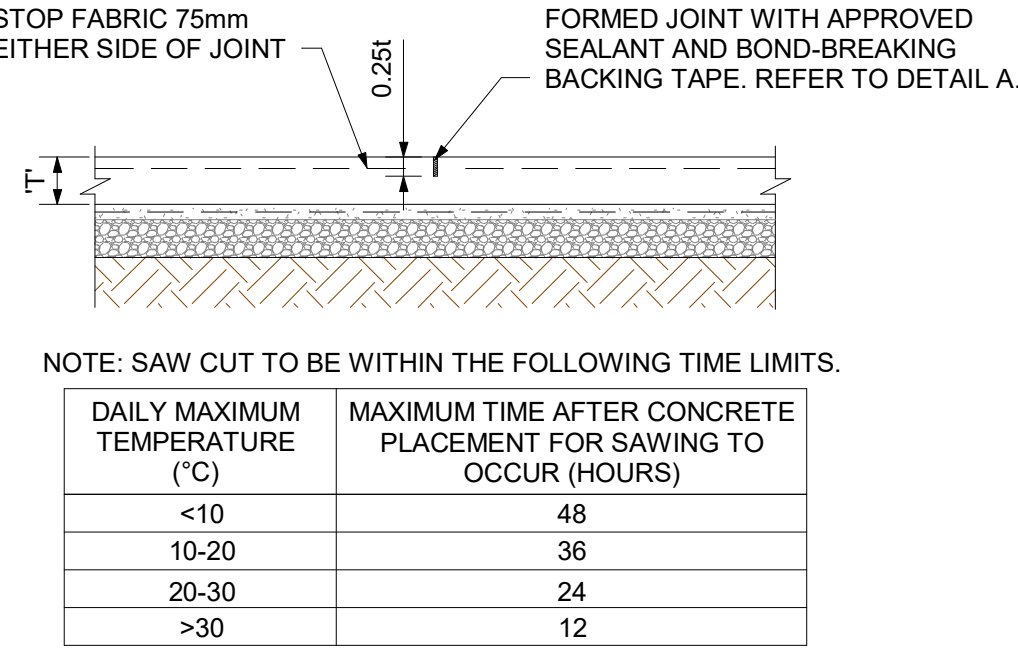
Revision
7

TYPICAL 150mm SLAB ON GRADE SECTION



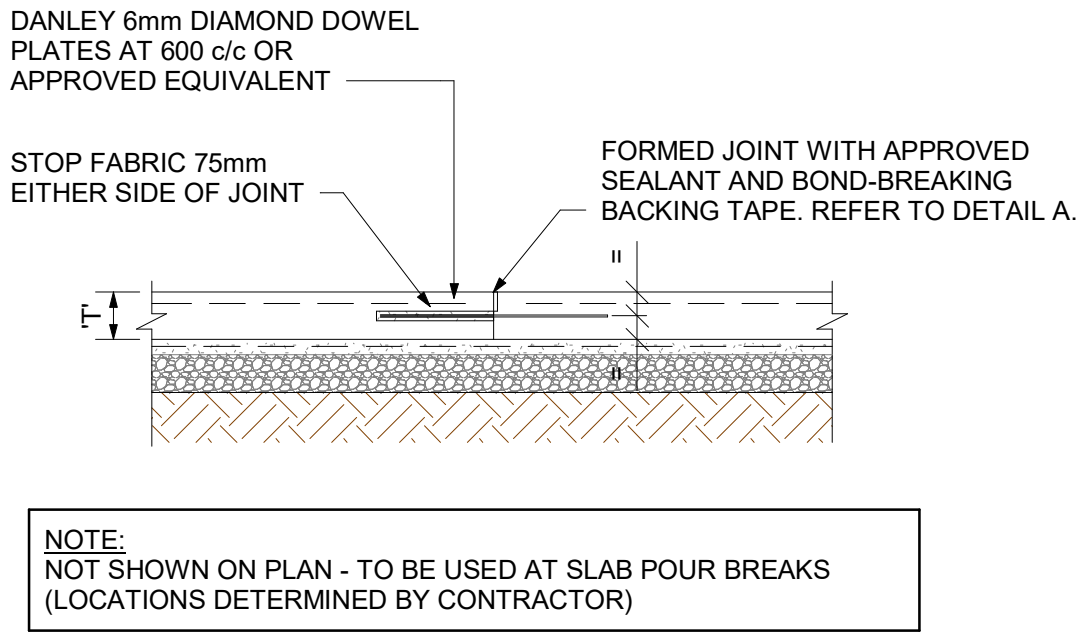
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TYPICAL SAWN CONTRACTION JOINT (S.C.J)



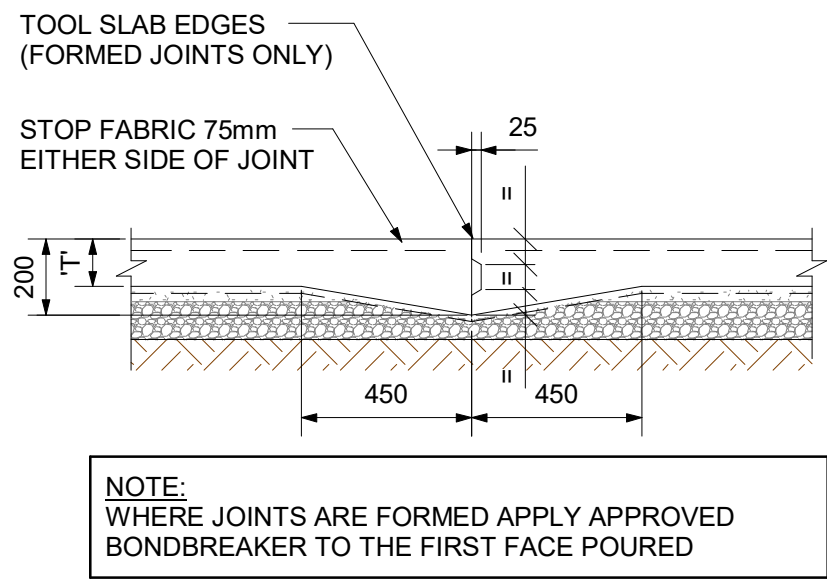
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FORMED CONSTRUCTION JOINT (F.C.J)



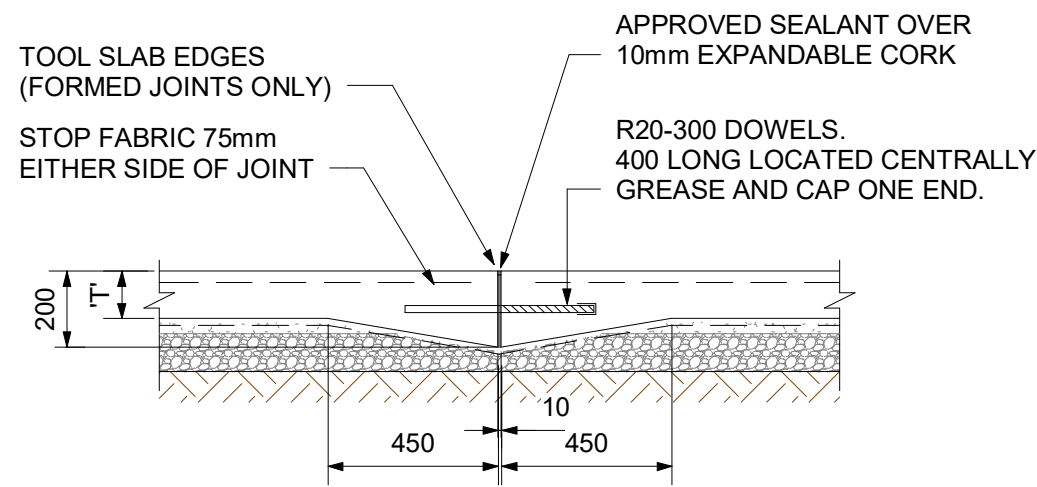
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KEYED JOINT (K.J.)

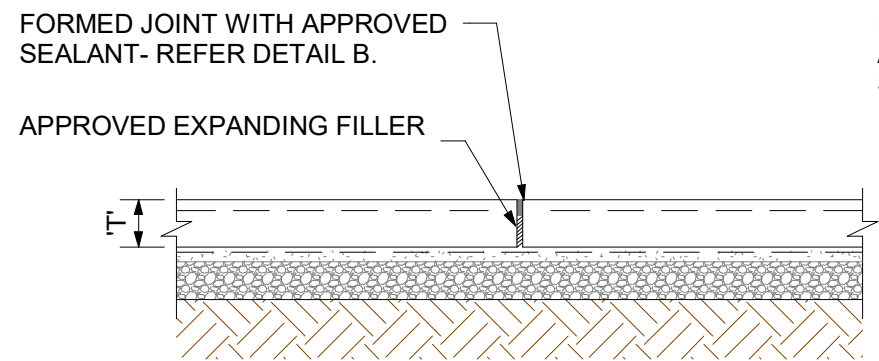


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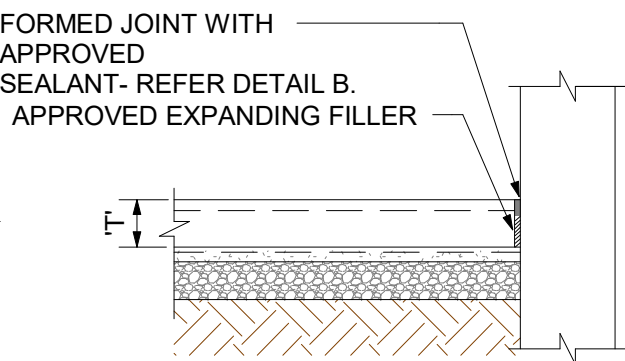
EXPANSION JOINT (E.J.)



SCALE 1:20



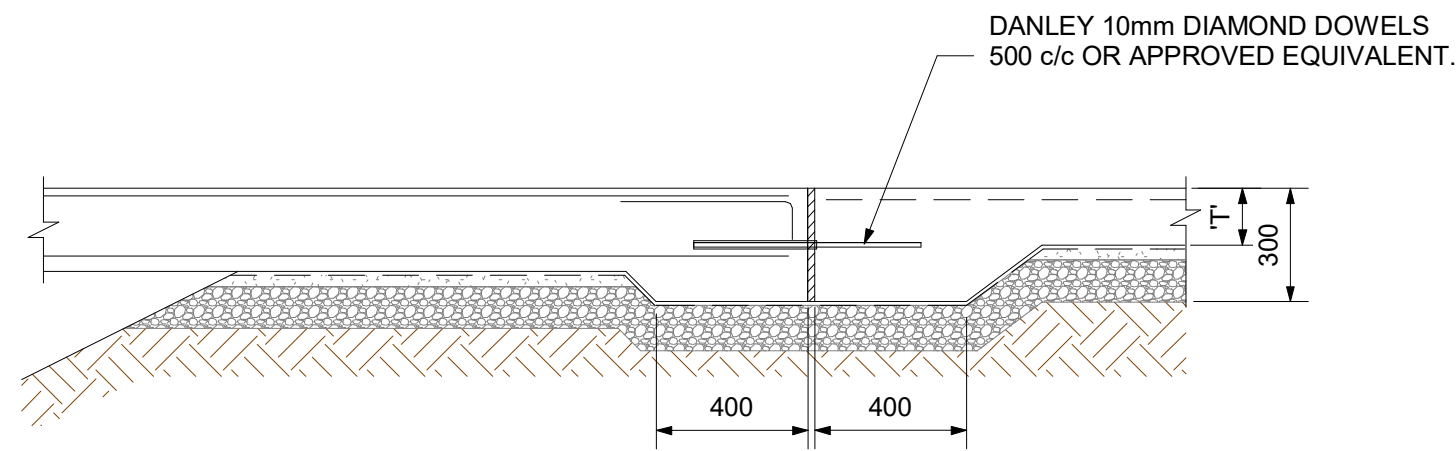
ADJOINING SLAB



ABUTTING STRUCTURE

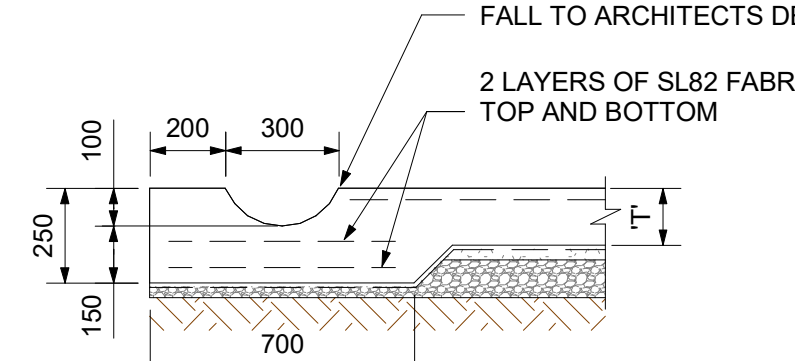
TYPICAL ISOLATION JOINT (I.J)

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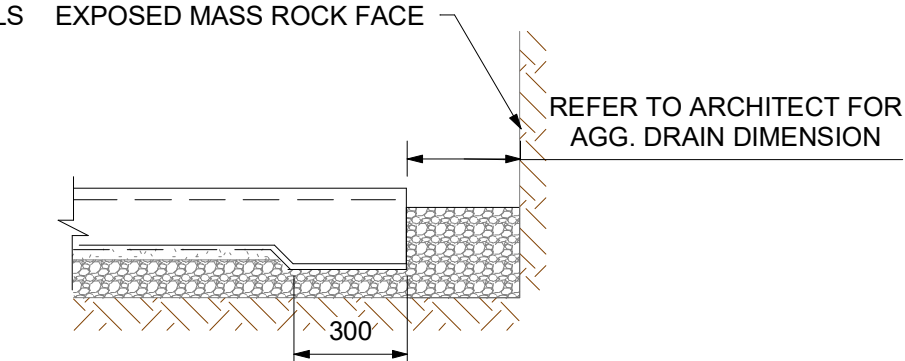
MOVEMENT JOINT (M.J.) CONNECTION TO SUSPENDED SLAB

SCALE 1:20



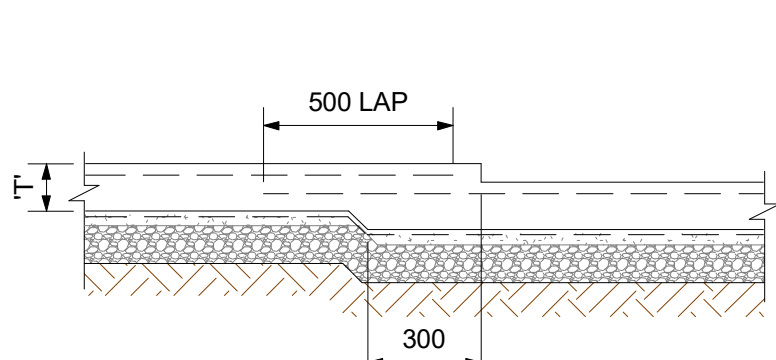
SPOON DRAIN DETAIL

SCALE 1:20

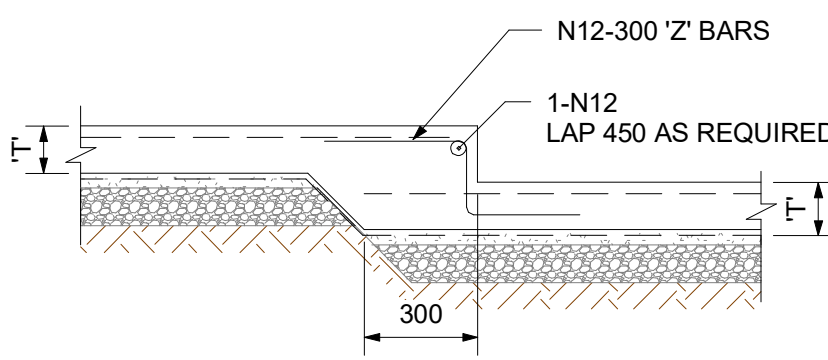


TYPICAL SLAB EDGE THICKENING (ET1)

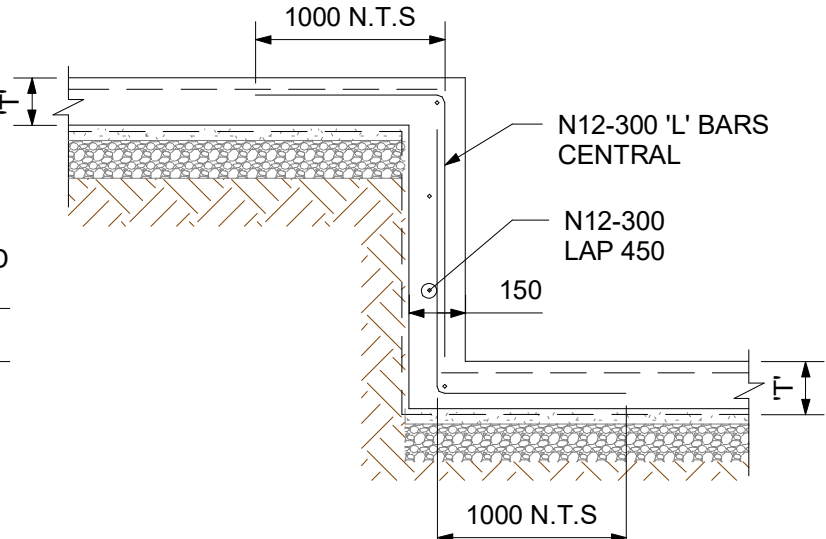
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STEP <50mm



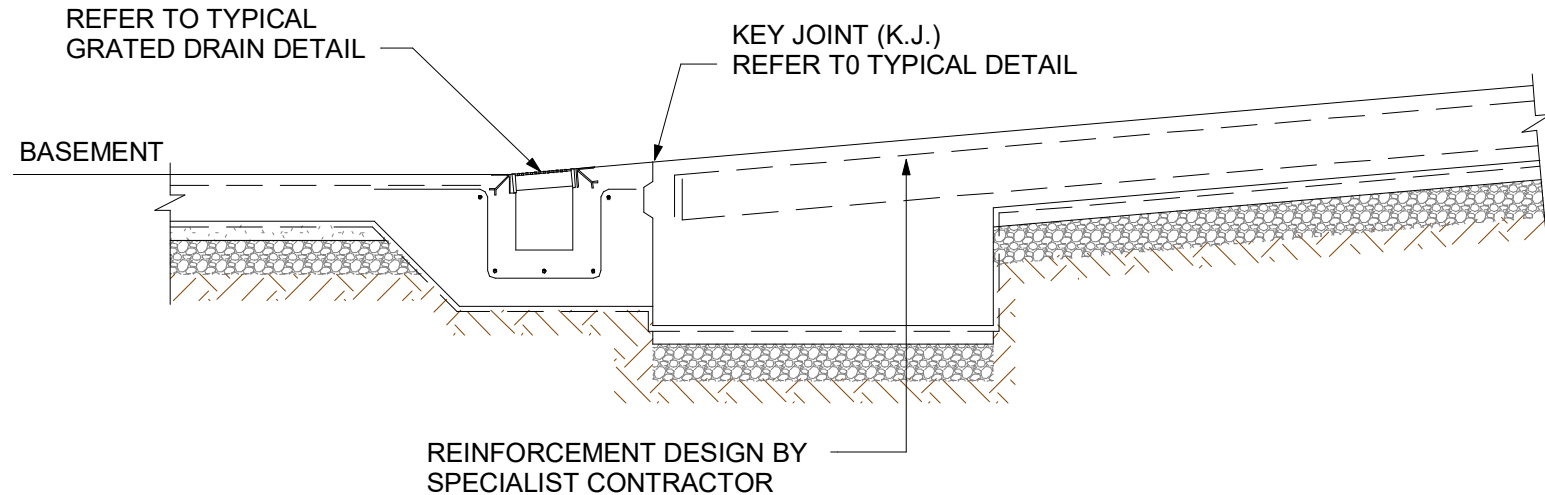
STEP ≥ 50mm AND < 450mm



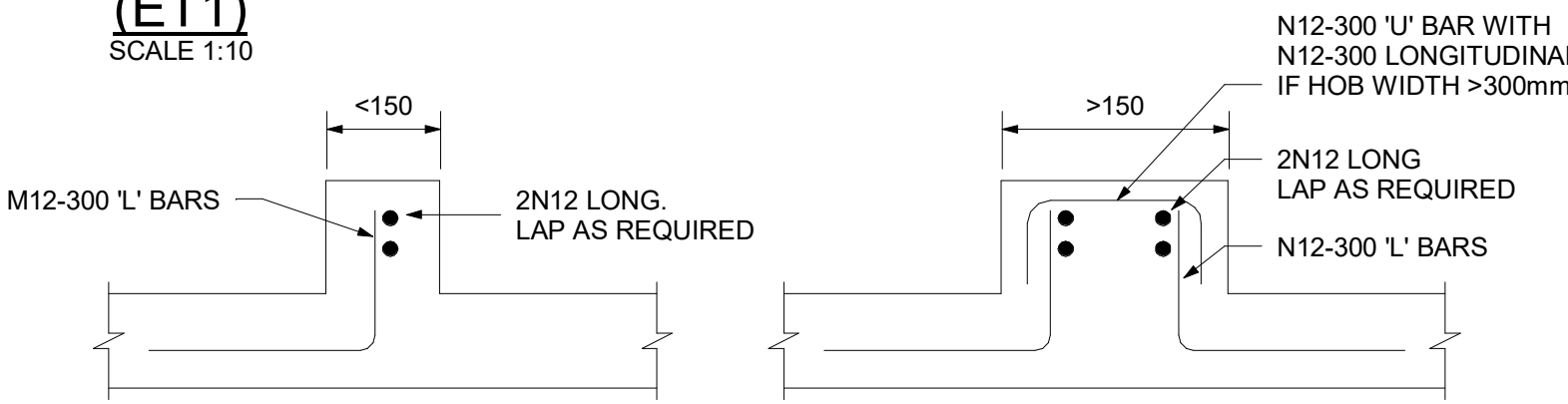
STEP ≥450mm

TYPICAL SLAB ON GRADE STEP DETAIL

SCALE 1:20



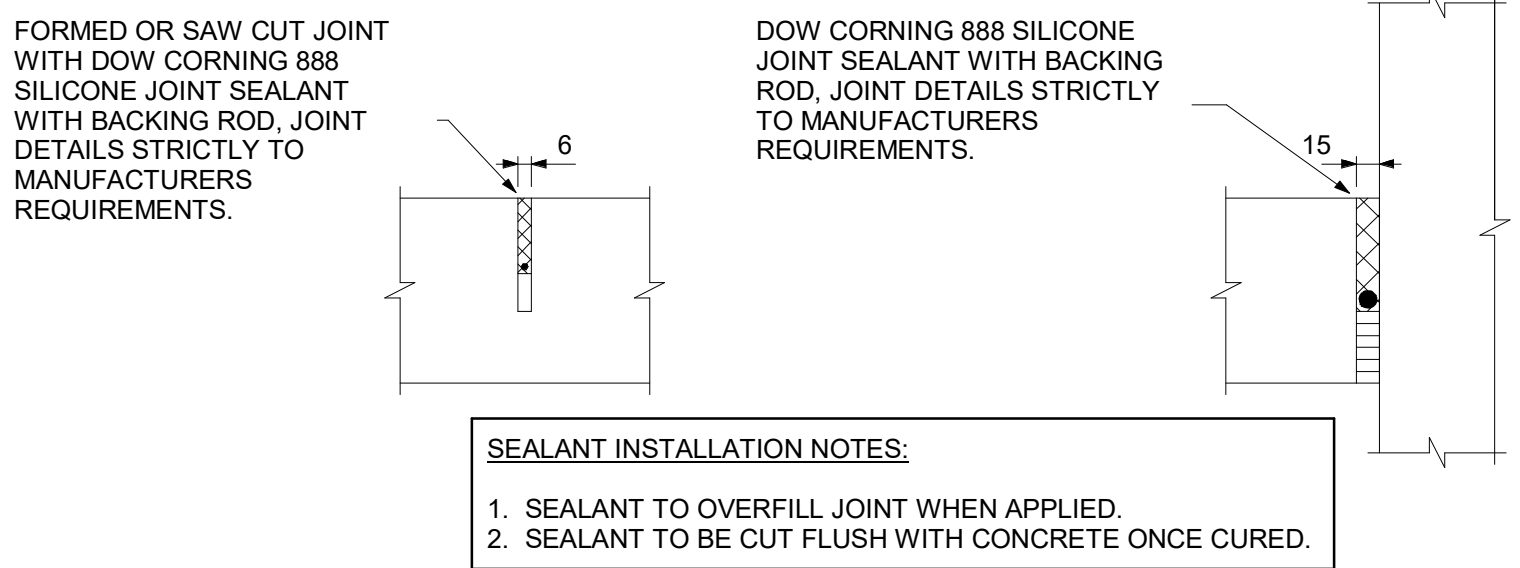
RAMP KEY JOINT ON GRADE GRATED DRAIN DETAIL



TYPICAL HOB DETAILS

SCALE 1:20

- NOTE:
- REFER ARCHITECTS DRAWINGS FOR HOB LOCATIONS.
 - JOINTS IN HOB TO CORRESPOND WITH SLAB JOINT LOCATIONS.
 - ALL HOB TO BE POURED INTEGRAL WITH PRIMARY STRUCTURAL SLAB.

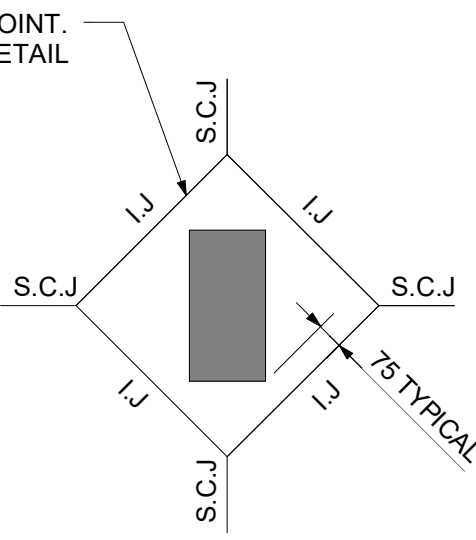


DETAIL A

SCALE = 1:20

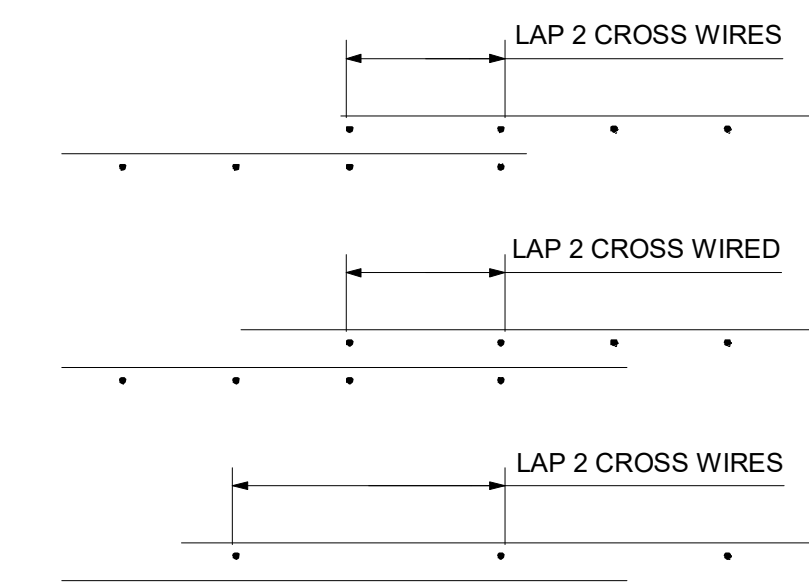
DETAIL B

SCALE = 1:20



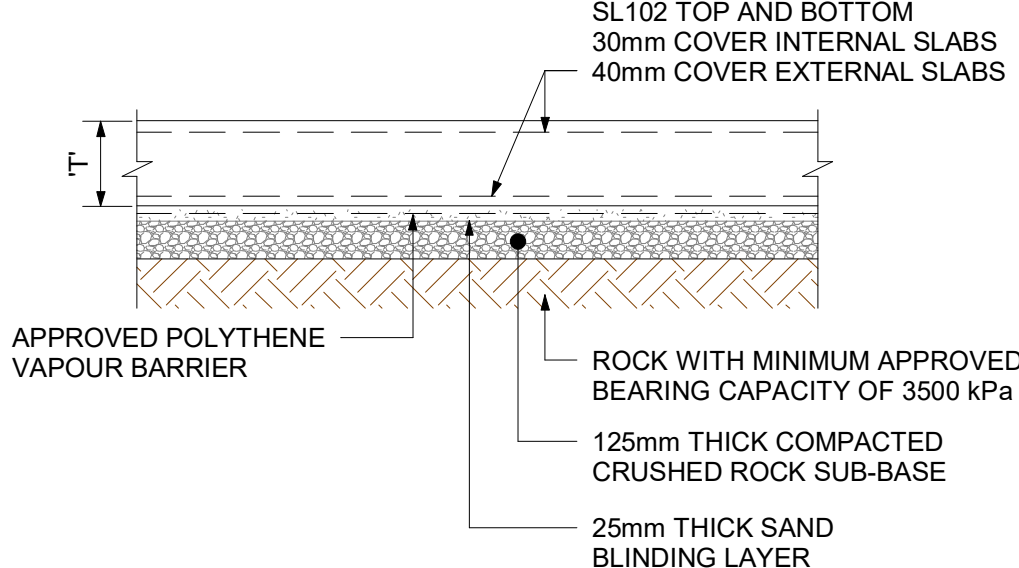
TYPICAL PLAN AT JOINT JUNCTION

SCALE 1:20



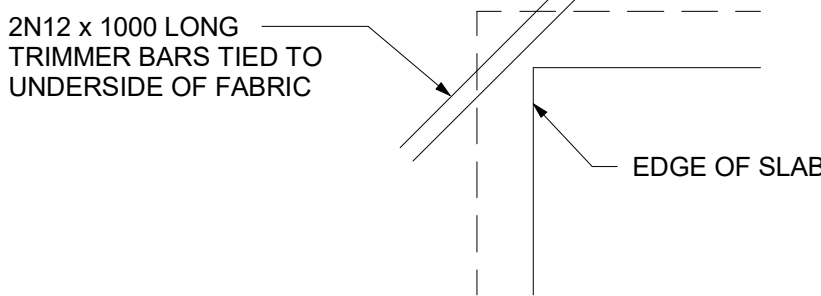
MESH REINFORCEMENT LAP DETAILS

SCALE 1:20



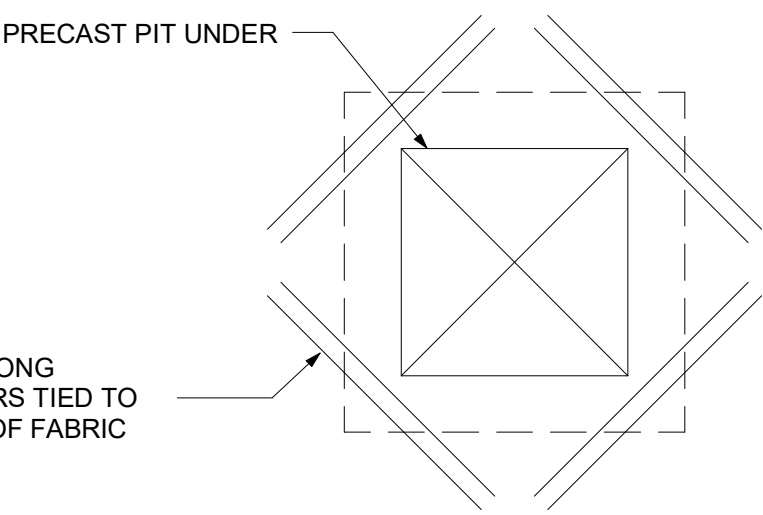
TYPICAL 250mm SLAB ON GRADE SECTION

SCALE 1:20



TYPICAL RE-ENTRANT CORNER DETAIL

SCALE 1:20



TYPICAL PRECAST PIT PLAN DETAIL

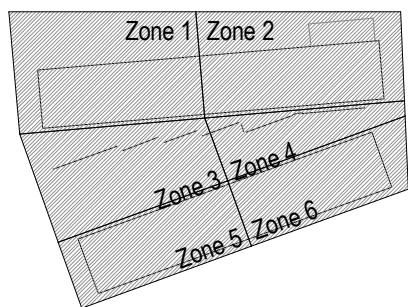
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REFER TO DRAWINGS ST-00101 & ST-00102 FOR GENERAL NOTES

Recent revision history		
#	Description	Date
1	Draft 90% Schematic Design	24.05.19
2	Schematic Design	14.06.19
3	Issued For Information 50% Design Development	05.06.20
4	Issued For Design Development Updates	12.06.20
5	50% DD Updates	19.06.20
6	75% Documentation Issue	08.07.20
7	For Crown Certificate	23.07.20

Notes

Key Plan



Contractor



Project
MEADOWBANK EDUCATION AND
EMPLOYMENT PRECINCT
SCHOOLS PROJECT

Client



Issuer

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Project number
5645

Checked
NLK

Size check
25mm

Approved
MOS

Sheet size
A1

Scale
1:20

Sheet title

TYPICAL SLAB ON GRADE
DETAILS

Sheet number

MSP-EN-ST-09931

Status

FOR CROWN CERTIFICATE

Revision

7

