Form 15 Compliance certificate for building design or specification

Queensland Government

This form is the approved form that must be used in accordance with section 10 of the Building Act 1975 and sections 73 and 7 7 of the Building Regulation 2021 (Design -specification certificate) stating that an aspect of building work or specification will, if installed or carried out as stated in this form, comply with the building assessment provisions. Additional explanatory information is included in the Appendix at the end of this form.

1 . Property description

This section need only be completed if details of street address and property description are applicable. E.g. in the case of (standard/generic) pool design/shell manufacture and/or patio and carport systems this section may not be applicable. Where applicable, the description must identify all land the subject of the application. The lot and plan details (e.g. SP/RP) are shown on title documents or a rates notice. If the plan is not registered by title, provide previous lot and plan details .

Street address	No. 331 HINKLER DRIVE		
		Suburb/locality	WORONGARY (SKYRIDGE STAGES 10-14)
State	QLD	Postcode	4213

Lot and plan details (attach list if necessary)

Lot 5000 on SP327218

Local government area the land is situated in

Gold Coast City Council

2 . Description of aspect/s certified

Clearly describe the extent of work covered by this certificate, e.g. all structural aspects of the steel roof beams.
Structural design of the building structure for the residence as depicted on the referenced engineering drawings.

Structural design of retaining walls for the proposed retaining walls (skyridge stages 10-14) as depicted on the referenced engineering drawings.

3 . Basis of certification

Detail the basis for giving the certificate and the extent to which tests, specifications, rules, standards, codes of practic e and other publications were relied upon.

BCA – Building Code of Australia – NCC Volume Two 2022 edition, AS/NZS 1170.0- 2002 General Principles, AS/NZS 1170.1- 2002 Loading Code, AS 3600-2018 Concrete structures, AS4678-2002 Earth Retaining Structures, AS4100-2020 Steel Structures, QDC MP1.4 - Building Over or Near Relevant Infrastructure – 2014, Arcadis "Construction Issue" drawings Project No. 30062655, Douglas Partners Geotechnical investigation, Landslip Hazard Risk Assessment and Global Stability Assessment Report ref No. 210286.00 Dated November 2022 Rev3,
retaining structures have been designed in accordance with Council's Planning Scheme and Policies, AS 3798 Guidelines on earthworks for commercial and residential developments, and comply with the requirements of the conditions of the development permits and achieved a long-term factor of safety greater than 1.5

4 . Reference documentation

Clearly identify any relevant documentation, e.g. numbered structural engineering plans.

24TR015/S001 L, 24TR015/S002 E, 24TR015/S101 H, 24TR015/S102 J, 24TR015/S103 H, 24TR015/S104 H, 24TR015/S105 J, 24TR015/S106 H, 24TR015/S111 H, 24TR015/S112 J, 24TR015/S113 H, 24TR015/S114 H, 24TR015/S115 J, 24TR015/S116 H, 24TR015/S117 F, 24TR015/S118 F, 24TR015/S121 E, 24TR015/S122 E, 24TR015/S123 F, 24TR015/S124 F, 24TR015/S200 C, 24TR015/S211 C, 24TR015/S212 C, 24TR015/S213 C, 24TR015/S214 C, 24TR015/SK01 C

5 . Building certifier reference number and building development approval number

Building certifier reference number		Building development application number (if available)	

6 . Appointed competent person details

Under Part 6 of the Building Regulation 2021 a person must be assessed as a competent for the type of work (design -specification) by the relevant building certifier.

Name (in full)	Shaun Malin		
Company name (if applicable)	Morgan Consulting Engineers Pty Ltd		
Contact person			
Business phone number	07 3369 8411	Mobile	
Email address	mail@morgance.com.au		
Postal address	1 Great George Street		
		Suburb/locality	Paddington
State	QLD	Postcode	4064
Licence class or registration type (if applicable)	RPEQ		
Licence or registration number *(if applicable)*	RPEQ 22944		

9. Signature of appointed competent person

This certificate must be signed by the individual assessed and appointed by the building certifier as competent to give design - specification help.

Signature		Date	30 October 2025

LOCAL GOVERNMENT USE ONLY

Date received		Reference number/s	

Appendix – explanatory information

IMPORTANT NOTE : I t is an offence for a competent person to give a building certifier a document, including this form, that the person knows or reasonably suspects, is false or misleading.

Who can complete this certificate? (section 10 of the Building Act 1975 (Building Act) and 73 and 77 of the Building Regulation 2021 (BR 2021) .

A building certifier can accept from a competent person (design -specification) a certificate stating that the competent person has assessed the building design or specification for the aspect of building work, and it will, if installed or carried out under the certificate, comply with the building assessment provisions , including any relevant standards and codes.

Schedule 10 of the BR 2021 defines building design or specification *as any material, system, method of building or other thing related to the design of or specifications for building work.*

When completing the certificate, a competent person is required under section 77 of the BR 2021 to include the basis for givi ng the certificate and state the extent to which the competent person has relied on tests, specifications, rules, standards, cod es of practice or other publications.

What is the purpose of this form?

(section 10 of the Building Act and sections 73 and 77 of the BR2 2021) The information in this form informs the building certifier's decision making when they are assessing a building development application , issuing the building development approval for the building work the subject of the certificate (form) and when amending the building development approval due to the receipt of updated aspect information such as glazing or truss specifications or revised excavation drawings

Can a manufacturer or supplier give this Form 15 *?*

A building certifier can accept this form from a manufacturer or supplier who the certifier has decided is a competent person (design -specification) . A manufacture r or supplier of building materials can give this form if they have undertaken the design component for the product. For example a window manufacturer who designs, constructs and supplies the windows to industry could give this form.

Competent person

(section 10 of the Building Act 1975 *and Part 6 of the BR 2021) A building certifier must assess and decide to appoint an individual as a competent person before they can accept design -specification help. When deciding whether a person can be a competent person, the building certifier must assess the person having regard to their experience, qualifications and skills and ensure the person holds a licence or registration if required. The building certifier is required to keep detailed records about what was considered when appointing a competent person. For further information about assessment of someone as a competent person refer to the* ***Guideline for the assessment of competent persons.***

What is required if a manufacturer or supplier did not do the design work for the product?

A manufacturer or supplier who is not part of the design process may give the construction contractor, builder, competent person or the building certifier evidence of suitability such as a product technical statement under Part A5 of the Building Code of Australia (BCA), for an aspect or material stating that it is compliant with the relevant reference documents in the BCA i.e. the applicable Australian Standard/s.

What if there is not enough space for all the supporting material/documents?

Items 2, 3 and 4 requires the competent person to clearly identify the extent of the assessment that was undertaken for aspec t/s of work identified in this form. For instance, there is provision for material such as specifications, standards, codes or other relevant publications to be referenced in the form. However, if the space in the form is not sufficient to accommodate all of this material, you can crea te and refer to additional material in an addendum or attachment to the form. The form is the Microsoft Word version, that you can download and edit ed to include additional material in the relevant parts of the form. ***Note*** *: that editing th e form in the Microsoft Word version may cause the relevant boxes to expand and increase the length of the document. This is acceptable and does not change the approved form, provided the section text (description on t he left -hand side of the page) is not a ltered.*

Appointed competent person (design -specification) – (sections 34 and 36 of the BR 2021 *)*

A building certifier must assess and decide to appoint an individual as a competent person before they can, as a competent person, give design -specification help. The building certifier is required to keep detailed records about what was considered when ap pointing a competent person. A building certifier must be satisfied that an individual is competent to give the type of help having regard to the individu al's experience, qualifications and skills and if required by law to hold a licence or registration, that the individual is approp r iately registered or licensed. An individual is appointed as competent to give design -specification help on or from a particular day. For further information about assessment of someone as a competent person refer to the ***Guideline for the assessment of competent persons.***

PRIVACY NOTICE

The Department of Energy and Public Works is collecting personal information as required under the Building Act 1975 *. This information may be stored by the Department, and will be used for administration, compliance, statistical research and*

evaluation of building laws. Your personal information will be disclosed to other government agencies, local government authorities and third parties for purposes relating to administering and monitoring compliance with the Building Act 1975 *. Personal information will otherwise only be disclosed to third parties with your consent or unless authorised or required by law.*

For any enquires or to book an inspection please contact reception to organise booking on 07 3369 8411. 24hrs notice is preferred.

PROPOSED SLEEPER RETAINING WALLS AT No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

RETAINING WALL NOTES

1. STEEL COLUMNS TO BE MINIMUM GRADE 300 UNO & HOT DIPPED GALVANIZED IN ACCORDANCE WITH AS2312.2 & AS4680.
2. ALL CONCRETE SHALL COMPLY WITH THE REQUIREMENTS OF AS3600, AS1379 & AS3610 AS APPROPRIATE.
3. ALL REINFORCEMENT SHALL COMPLY WITH THE REQUIREMENTS OF AS1302, AS1303 & AS1304 AS APPROPRIATE.
4. CONCRETE FOR WALLS SHALL BE CLASS 40 MPa TO AS3600 WITH A SLUMP OF 150mm & NOMINAL 6mm AGGREGATE.
5. IF THE WALL IS TO BE WITHIN 1 KM OF THE SEA, INCREASE CONCRETE STRENGTH TO 50 MPa.
6. ALL CONCRETE TO PRECAST UNITS SHALL BE CAST IN RIGID FORMS & SUBJECT TO INTENSE VIBRATION.
7. THE CONCRETE COVER OF ANY REINFORCEMENT OR STEEL COLUMN IS TO BE AS FOLLOWS UNO:
   - SLEEPERS 25mm
   - FOOTINGS 70mm
8. CONCRETE FOR FOOTINGS SHALL BE CLASS 25 MPa TO AS3600, 20mm AGGREGATE & 80mm SLUMP.
9. POST & FOOTINGS SHALL BE CONSTRUCTED AS DETAILED, IN A SINGLE POUR & CAST FULL DEPTH IN UNDISTURBED MATERIAL.
10. CONSTRUCTION TRAFFIC MUST BE KEPT A DISTANCE EQUIVALENT TO THE WALL HEIGHT AWAY FROM THE BACK OF THE WALL.
11. CONTRACTOR TO ENSURE THAT BACKFILLING DOES NOT TAKE PLACE UNTIL THE CONCRETE HAS BEEN SUFFICIENTLY CURED.
12. MINIMUM ALLOWABLE BEARING CAPACITY ACHIEVED FOR POST FOOTINGS TO BE 150 kPa.
13. THESE WALL HAVE BEEN DESIGNED FOR 5kPa & 10kPa SURCHARGE
14. WHERE FENCES ARE REQUIRED, THE RETAINING WALLS HAVE BEEN DESIGNED FOR A 1.8m HIGH ENCLOSED FENCE WITH A MAX WIND RATING OF N2. REFER TO SHEETS S111-S116 FOR RETAINING WALL DESIGN WITH FENCE LOADS.
15. LARGE TREES ARE NOT TO BE PLANTED CLOSE TO THE WALL. SMALL SHRUBS MAY BE PLANTED, LANDSCAPE ARCHITECT IS TO CONFIRM SHRUB SIZES WITH ENGINEER PRIOR TO PLANTING. REDESIGN MAY BE REQUIRED
16. NO EXCAVATION TO TAKE PLACE WITHIN 1.5M OF THE FRONT OF THE WALL
17. THIS WALL IS NOT SUITABLE FOR AREA SUBJECT TO FLOODING.
18. THIS DESIGN IS NOT SUITABLE FOR 'POOR' SOILS.
19. REFER TYPICAL WALL SECTIONS FOR BATTERING REQUIREMENTS INCLUDING MAXIMUM UPHILL AND DOWNHILL SLOPES AND OFFSETS FROM WALL.
20. RETAINING WALL NOT TO BE PLACED ON THE LOWER SIDE OF AN EXISTING RETAINING WALL, WITHIN '1.5 X THE LOWER RETAINING WALL HEIGHT' UNO.
21. RETAINING WALL NOT TO BE PLACED ON THE UPPER SIDE OF AN EXISTING RETAINING WALL, WITHIN '1.5 x THE LOWER RETAINING WALL HEIGHT' UNO.
22. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

REFER "CONSTRUCTION ISSUE" DRAWINGS PROVIDED BY ARCADIS AUSTRALIA PACIFIC LIMITED PROJECT No. 30062855 DRG No. SRE-AAP-DD-P0310-DRG-CV-0061, SRE-AAP-DD-P0310-DRG-CV-0101, /102, /103, /104, /105 FOR SLEEPER WALL LOCATIONS

REFER TO SHEETS S101-S116 FOR TYPICAL CONCRETE SLEEPER RETAINING WALL DETAILS AND GENERAL REQUIREMENTS

LOCALITY PLAN
NOT TO SCALE
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DRAWING REGISTER

TITLE	DRG No		REV
GENERAL NOTES AND LOCALITY PLAN	24TR015	S001	L
OVERALL SITE PLAN	24TR015	S002	E
SINGLE WALL 1600mm CRS - WITHOUT FENCE LOADING (5kPa SURCHARGE)	24TR015	S101	H
SINGLE WALL 2000mm CRS - WITHOUT FENCE LOADING (5kPa SURCHARGE)	24TR015	S102	J
SINGLE WALL 2400mm CRS - WITHOUT FENCE LOADING (5kPa SURCHARGE)	24TR015	S103	H
SINGLE WALL 1600mm CRS - WITHOUT FENCE LOADING (10kPa SURCHARGE)	24TR015	S104	H
SINGLE WALL 2000mm CRS - WITHOUT FENCE LOADING (10kPa SURCHARGE)	24TR015	S105	J
SINGLE WALL 2400mm CRS - WITHOUT FENCE LOADING (10kPa SURCHARGE)	24TR015	S106	H
SINGLE WALL 1600mm CRS - WITH FENCE LOADING (5kPa SURCHARGE)	24TR015	S111	H
SINGLE WALL 2000mm CRS - WITH FENCE LOADING (5kPa SURCHARGE)	24TR015	S112	J
SINGLE WALL 2400mm CRS - WITH FENCE LOADING (5kPa SURCHARGE)	24TR015	S113	H
SINGLE WALL 1600mm CRS - WITH FENCE LOADING (10kPa SURCHARGE)	24TR015	S114	H
SINGLE WALL 2000mm CRS - WITH FENCE LOADING (10kPa SURCHARGE)	24TR015	S115	J
SINGLE WALL 2400mm CRS - WITH FENCE LOADING (10kPa SURCHARGE)	24TR015	S116	H
TYPICAL TIRED WALL DETAILS - SHEET 1	24TR015	S117	F
TYPICAL TIRED WALL DETAILS - SHEET 2	24TR015	S118	F
TYPICAL B.O.S NOTES AND DETAILS - SHEET 1	24TR015	S121	E
TYPICAL STEEL BRIDGING BEAM DETAIL- UP TO 2.4m HIGH	24TR015	S122	E
TYPICAL STEEL BRIDGING BEAM DETAIL- 2.6m UP TO 3m	24TR015	S123	F
TYPICAL DETAILS WALLS WITH BATERS IN FRONT or BEHIND	24TR015	S124	F
RETAINING WALL JUNCTION MAP	24TR015	S200	C
TYPICAL RETAINING WALL JUNCTION 5.2m HIGH	24TR015	S211	C
TYPICAL RETAINING WALL JUNCTION 5.8m HIGH	24TR015	S212	C
TYPICAL RETAINING WALL JUNCTION 6m HIGH	24TR015	S213	C
POST EXTENSION DETAIL	24TR015	SK01	C

CODE	REVISION	DATE	BY
J	FOR CONSTRUCTION	24.07.25	N.W
L	FOR CONSTRUCTION	30.10.25	NW
K	FOR CONSTRUCTION	04.09.25	NW

MORGAN CONSULTING ENGINEERS
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FAX: (07) 3369 1893
EMAIL: mail@morgance.com.au

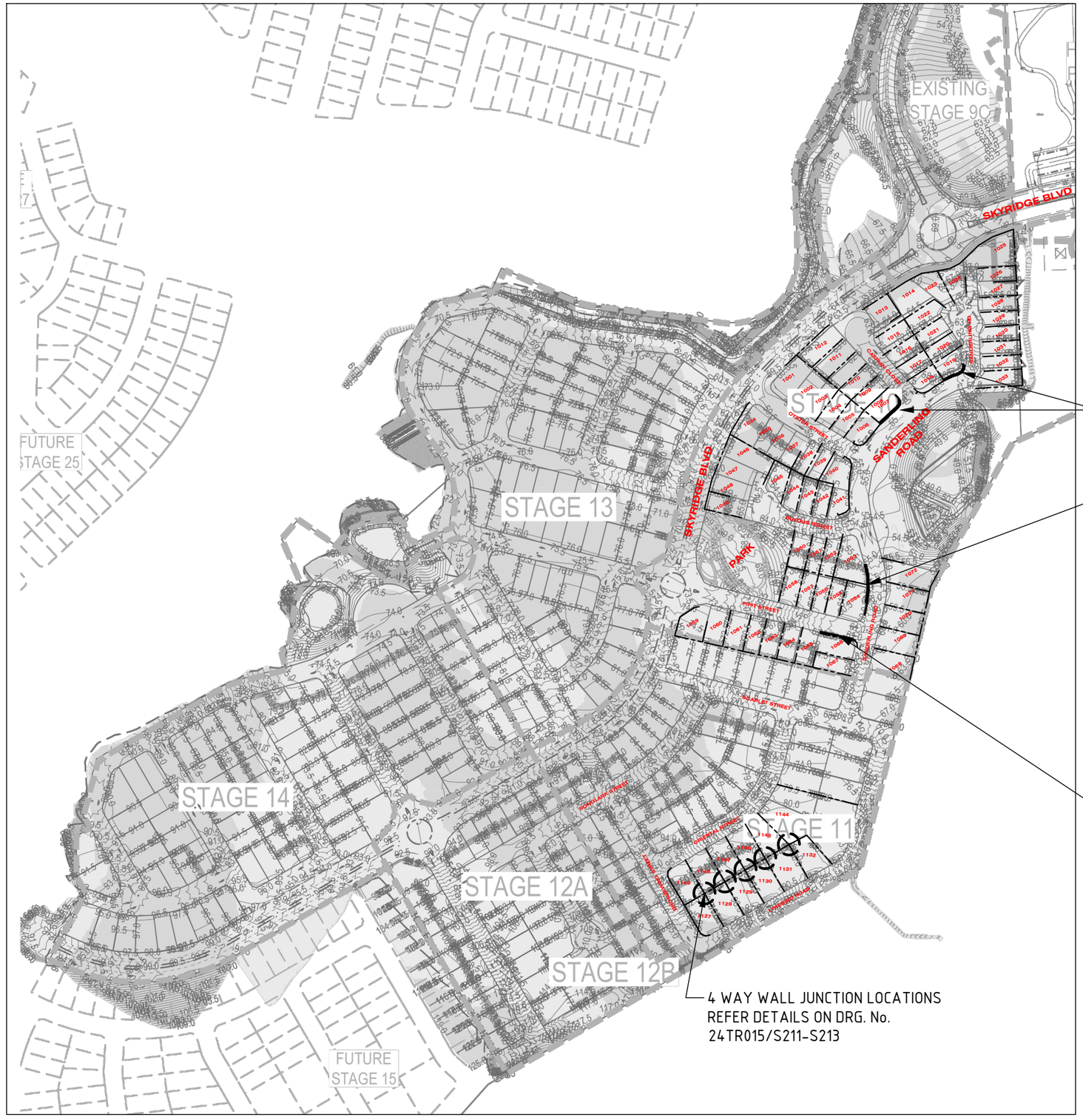
Scales (at A3): N.T.S.
Designed: SM | Checked: S.M
Drawn: NW | Date: APR 24
Authorised for issue: SHAUN MALIN

Project: PROPOSED SLEEPER RETAINING WALLS
Address: No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title: GENERAL NOTES AND LOCALITY PLAN

Drawing No: 24TR015/S001
Revision: L

CONTACT RECEPTION TO BOOK AN INSPECTION
PH: 07 3369 8411 (24HR NOTICE PREFERRED)



CODE	REVISION	DATE	BY
C	FOR CONSTRUCTION	17.06.25	N.W
E	FOR CONSTRUCTION	30.10.25	N.W
D	FOR CONSTRUCTION	18.07.25	NW

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Scales (at A3)	N.T.S
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
OVERALL SITE PLAN

Drawing No 24TR015/S002
Revision E

RETAINING WALL SPECIFICATION TABLE
5kPa SURCHARGE WITHOUT FENCE

POST SPACING (CTRS)	'H' (RETAINING WALL HIGHT)	POST SIZE	POST EMBEDMENT (MIN)	'D' PIER DEPTH 'CONDITION 1'	'CONDITION 2'	'CONDITION 3'	PIER ⌀
1600mm	600mm	100 UC 14.8	200mm	700mm	700mm	600mm	450⌀
1600mm	800mm	100 UC 14.8	300mm	800mm	800mm	700mm	450⌀
1600mm	1000mm	100 UC 14.8	300mm	900mm	900mm	700mm	450⌀
1600mm	1200mm	100 UC 14.8	300mm	1100mm	1000mm	800mm	450⌀
1600mm	1400mm	100 UC 14.8	300mm	1200mm	1200mm	900mm	450⌀
1600mm	1600mm	100 UC 14.8	300mm	1400mm	1300mm	1100mm	450⌀
1600mm	1800mm	100 UC 14.8/ 180 UB 18.1	300mm	1600mm	1500mm	1200mm	450⌀
1600mm	2000mm	100 UC 14.8/ 180 UB 18.1	300mm	1800mm	1600mm	1300mm	450⌀
1600mm	2200mm	150 UC 23.4	400mm	2000mm	1800mm	1400mm	450⌀
1600mm	2400mm	150 UC 23.4	400mm	2200mm	2000mm	1600mm	450⌀
1600mm	2600mm	150 UC 23.4	400mm	2400mm	2200mm	1700mm	450⌀
1600mm	2800mm	150 UC 30	400mm	2600mm	2400mm	1900mm	450⌀
1600mm	3000mm	150 UC 30	400mm	2900mm	2700mm	2000mm	450⌀
1600mm	3200mm	150 UC 37.2	400mm	3100mm	2900mm	2200mm	450⌀
1600mm	3400mm	200 UC 46.2	400mm	3400mm	3100mm	2300mm	450⌀
1600mm	3600mm	200 UC 46.2	400mm	3700mm	3400mm	2500mm	450⌀
1600mm	3800mm	200 UC 59	400mm	3300mm	3100mm	2300mm	600⌀
1600mm	4000mm	200 UC 59	400mm	3600mm	3300mm	2500mm	600⌀
1600mm	4200mm	250 UC 72.9	400mm	3800mm	3500mm	2600mm	600⌀

NOTE: ALL PIER DEPTHS MUST EQUAL TO WALL HEIGHTS U.N.O. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

** 2ND FROM THE END POST SIZE WILL NEED TO BE INCREASED TO NEXT SIZE UP FOR END WALLS WHERE NO HEIGHT REDUCTION OR CORNER OCCURS

SOIL PARAMETERS TABLES

SOIL CONDITION	BULK DENSITY (kN/m³)	INTERNAL FRICTION ANGLE
CONDITION 1	20	25°
CONDITION 2	22	30°
CONDITION 3	22	42°

VALUES FROM GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

SOIL CLASSIFICATION

SOIL GROUP	TYPICAL SOILS IN GROUP
CONDITION 1	Engineered fill and residual clay/sand - stiff/medium dense (or stronger/denser)
CONDITION 2	Greywacke - very low to low strength
CONDITION 3	Greywacke - medium strength (or stronger)

SLEEPER SPECIFICATION TABLE - ENGINEERED FILL

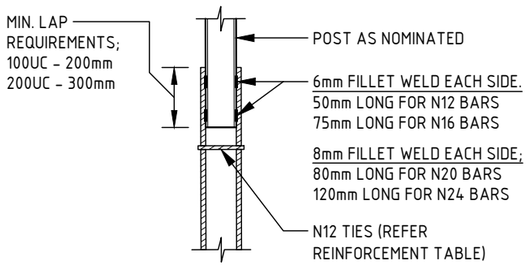
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 2000	2xN10	0 - 2400	2xN12
	2200 - 2600	3xN10	2600 - 2800	3xN12
90mm	2000 - 2800	2xN10	2800 - 3200	2xN12
	2800 - 3200	3xN10	3200 - 3600	3xN12
2/70mm	2600 -3600	2xN10	-	-
2/90mm	3600 - 4000	2xN10	3600 - 4000	3x N12

SLEEPER SPECIFICATION TABLE - GREYWACKE

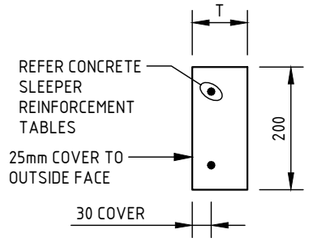
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 2000	2xN10	0 - 2600	2xN12
	2000 - 2800	3xN10	2600 - 3200	3xN12
90mm	2800 - 3200	2xN10	3200 - 3600	2xN12
	3200 - 3600	3xN10	3600 - 4000	3xN12
2/70mm	3600 -4000	2xN10	-	-
2/90mm	-	-	3000 - 4000	3x N12

STEEL REINFORCING BAR SCHEDULE

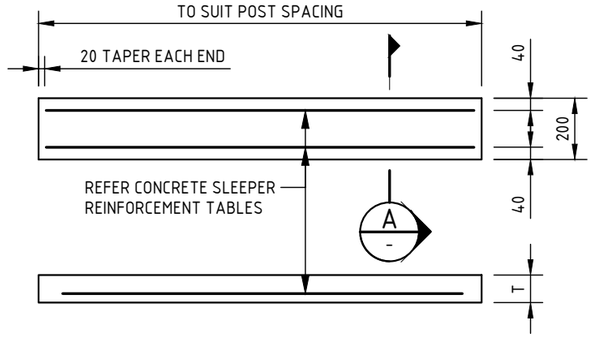
WALL HEIGHT	FRONT FACE REINFORCEMENT	REAR FACE REINFORCEMENT	N12 TIES
< 1000	2/N12	2/N12	NIL
1000 -1600	2/N12	3/N12	NIL
1800 - 2000	2/N12	2/N16	NIL
2200 - 2600	2/N12	3/N16	NIL
2800 - 3200	2/N12	4/N20	YES
3400	2/N12	5/N20	YES
3600 - 4000	2/N16	5/N24	YES



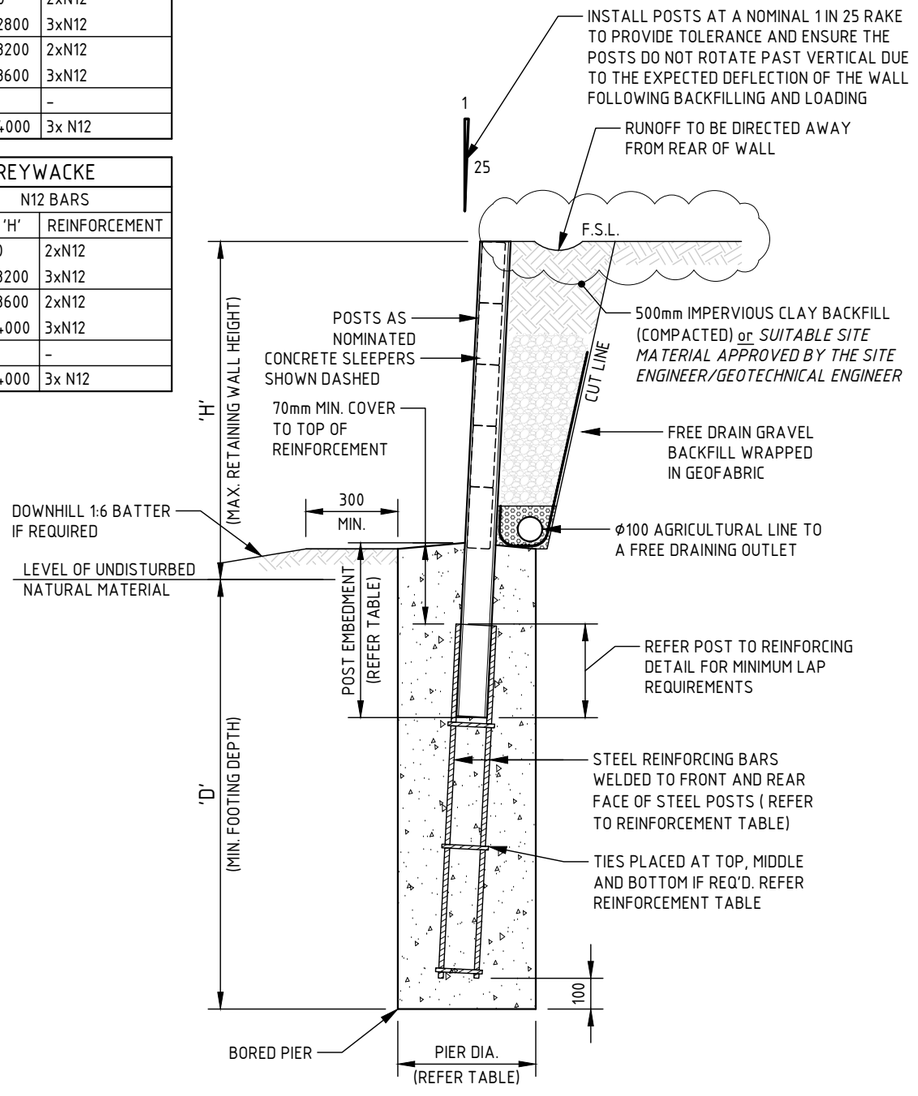
POST TO REINFORCING BAR WELDING DETAIL
SCALE 1:20



SECTION A
SCALE 1:10



CONCRETE SLEEPER REINFORCEMENT DETAIL
SCALE 1:20



TYPICAL CONCRETE SLEEPER WALL
SCALE 1:20

CODE	REVISION	DATE	BY
F	CHANGES CLOUDED	17.06.25	NW
H	FOR CONSTRUCTION	30.10.25	NW
G	FOR CONSTRUCTION	18.07.25	NW

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EMAIL: mail@morgance.com.au

Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
SINGLE WALL 1600MM CRS - WITHOUT FENCE LOADING (5KPA SURCHARGE)

Drawing No	Revision
24TR015/S101	H

RETAINING WALL SPECIFICATION TABLE
5kPa SURCHARGE WITHOUT FENCE

POST SPACING (CTRS)	'H' (RETAINING WALL HIGHT)	POST SIZE	POST EMBEDMENT (MIN)	'D' PIER DEPTH 'CONDITION 1'	'D' PIER DEPTH 'CONDITION 2'	'D' PIER DEPTH 'CONDITION 3'	PIER ϕ
2000mm	600mm	100 UC 14.8	200mm	700mm	700mm	600mm	450ϕ
2000mm	800mm	100 UC 14.8	300mm	800mm	800mm	700mm	450ϕ
2000mm	1000mm	100 UC 14.8	300mm	1000mm	1000mm	800mm	450ϕ
2000mm	1200mm	100 UC 14.8	300mm	1200mm	1200mm	900mm	450ϕ
2000mm	1400mm	100 UC 14.8	300mm	1400mm	1400mm	1000mm	450ϕ
2000mm	1600mm	100 UC 14.8	300mm	1600mm	1600mm	1200mm	450ϕ
2000mm	1800mm	150 UC 23.4/ 180 UB 18.1	300mm	1800mm	1800mm	1300mm	450ϕ
2000mm	2000mm	150 UC 23.4/ 180 UB 18.1	300mm	2000mm	2000mm	1400mm	450ϕ
2000mm	2200mm	150 UC 23.4	400mm	2200mm	2200mm	1600mm	450ϕ
2000mm	2400mm	150 UC 30	400mm	2400mm	2400mm	1700mm	450ϕ
2000mm	2600mm	150 UC 30	400mm	2600mm	2600mm	1900mm	450ϕ
2000mm	2800mm	150 UC 37.2	400mm	2800mm	2800mm	2100mm	450ϕ
2000mm	3000mm	200 UC 46.2	400mm	3000mm	3000mm	2300mm	450ϕ
2000mm	3200mm	200 UC 46.2	400mm	3300mm	3200mm	2500mm	450ϕ
2000mm	3400mm	200 UC 46.2	400mm	3600mm	3400mm	2700mm	450ϕ
2000mm	3600mm	200 UC 59	400mm	3500mm	3300mm	2400mm	600ϕ
2000mm	3800mm	200 UC 59	400mm	3800mm	3500mm	2600mm	600ϕ
2000mm	4000mm	250 UC 72.9	400mm	4100mm	3800mm	2800mm	600ϕ
2000mm	4200mm	250 UC 72.9	400mm	4400mm	4000mm	3000mm	600ϕ

NOTE: ALL PIER DEPTHS MUST EQUAL TO WALL HEIGHTS U.N.O. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

** 2ND FROM THE END POST SIZE WILL NEED TO BE INCREASED TO NEXT SIZE UP FOR END WALLS WHERE NO HEIGHT REDUCTION OR CORNER OCCURS

SOIL PARAMETERS TABLES

SOIL CONDITION	BULK DENSITY (kN/m³)	INTERNAL FRICTION ANGLE
CONDITION 1	20	25°
CONDITION 2	22	30°
CONDITION 3	22	42°

VALUES FROM GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

SOIL CLASSIFICATION

SOIL GROUP	TYPICAL SOILS IN GROUP
CONDITION 1	Engineered fill and residual clay/sand – stiff/medium dense (or stronger/denser)
CONDITION 2	Greywacke – very low to low strength
CONDITION 3	Greywacke – medium strength (or stronger)

SLEEPER SPECIFICATION TABLE – ENGINEERED FILL

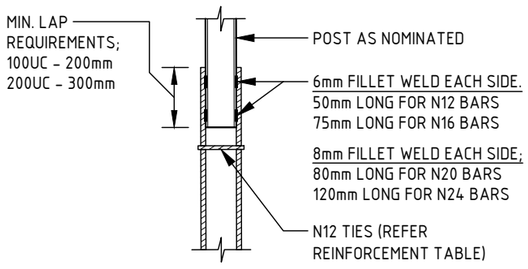
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 – 1400	2xN10	0 – 2000	2xN12
	1400 – 2000	3xN10	2000 – 2400	3xN12
90mm	2000 – 2200	2xN10	2400 – 2600	2xN12
	2200 – 2600	3xN10	2600 – 3000	3xN12
2/70mm	2600 –3200	2xN10	–	–
2/90mm	–	–	3000 – 4000	3x N12

SLEEPER SPECIFICATION TABLE – GREYWACKE

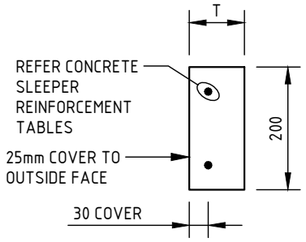
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 – 1800	2xN10	0 – 2400	2xN12
	1400 – 2400	3xN10	2000 – 2800	3xN12
90mm	2000 – 2600	2xN10	2400 – 3000	2xN12
	2200 – 3000	3xN10	2600 – 3400	3xN12
2/70mm	2600 –3600	2xN10	–	–
2/90mm	–	–	3000 – 4000	3x N12

STEEL REINFORCING BAR SCHEDULE

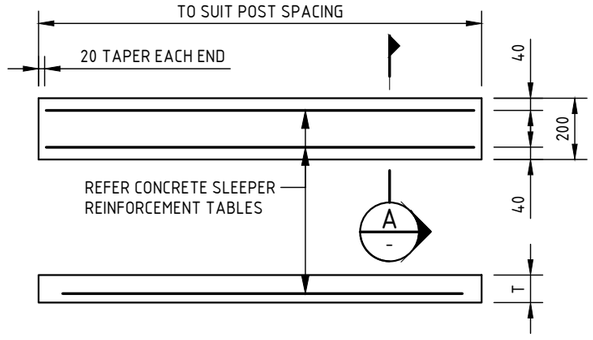
WALL HEIGHT	FRONT FACE REINFORCEMENT	REAR FACE REINFORCEMENT	N12 TIES
< 1000	2/N12	2/N12	NIL
1000 –1600	2/N12	3/N12	NIL
1800 – 2000	2/N12	2/N16	NIL
2200 – 2600	2/N12	3/N16	NIL
2800 – 3200	2/N12	4/N20	YES
3400	2/N12	5/N20	YES
3600 – 4000	2/N16	5/N24	YES



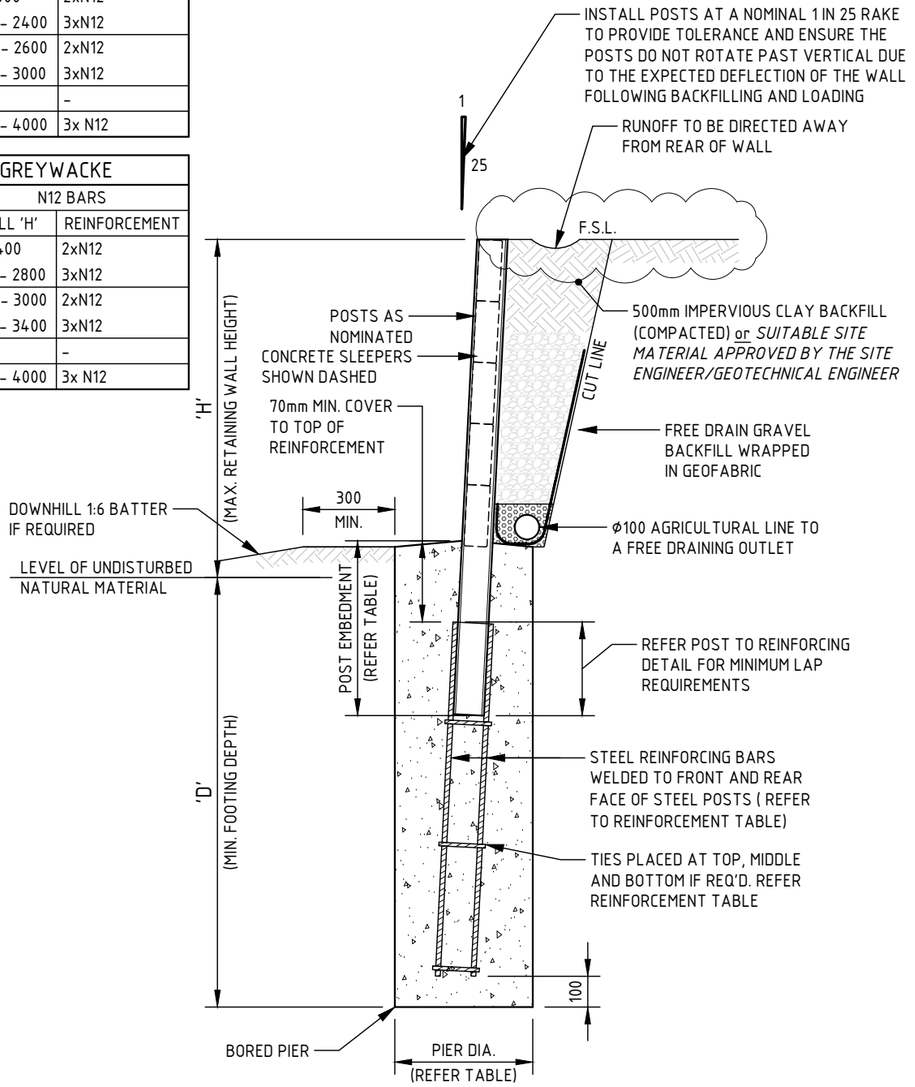
POST TO REINFORCING BAR WELDING DETAIL
SCALE 1:20



SECTION A
SCALE 1:10



CONCRETE SLEEPER REINFORCEMENT DETAIL
SCALE 1:20



TYPICAL CONCRETE SLEEPER WALL
SCALE 1:20

CODE	REVISION	DATE	BY
J	FOR CONSTRUCTION	30.10.25	N.W
H	FOR CONSTRUCTION	18.07.25	NW
G	FOR CONSTRUCTION	17.06.25	NW

MORGAN CONSULTING ENGINEERS
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PHONE: (07) 3369 8411
FAX: (07) 3369 1893
EMAIL: mail@morgance.com.au

Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
SINGLE WALL 2000MM CRS – WITHOUT FENCE LOADING (5KPA SURCHARGE)

Drawing No 24TR015/S102
Revision J

RETAINING WALL SPECIFICATION TABLE
5kPa SURCHARGE WITHOUT FENCE

POST SPACING (CTRS)	'H' (RETAINING WALL HIGHT)	POST SIZE	POST EMBEDMENT (MIN)	'D' PIER DEPTH 'CONDITION 1'	'D' PIER DEPTH 'CONDITION 2'	'D' PIER DEPTH 'CONDITION 3'	PIER ϕ
2400mm	600mm	100 UC 14.8	300mm	800mm	700mm	600mm	450ϕ
2400mm	800mm	100 UC 14.8	300mm	900mm	900mm	700mm	450ϕ
2400mm	1000mm	100 UC 14.8	300mm	1100mm	1000mm	900mm	450ϕ
2400mm	1200mm	100 UC 14.8	300mm	1300mm	1200mm	1000mm	450ϕ
2400mm	1400mm	100 UC 14.8	300mm	1500mm	1400mm	1100mm	450ϕ
2400mm	1600mm	100 UC 14.8	300mm	1700mm	1600mm	1300mm	450ϕ
2400mm	1800mm	150 UC 23.4	300mm	2000mm	1800mm	1400mm	450ϕ
2400mm	2000mm	150 UC 23.4	400mm	2200mm	2000mm	1600mm	450ϕ
2400mm	2200mm	150 UC 23.4	400mm	2500mm	2300mm	1700mm	450ϕ
2400mm	2400mm	150 UC 30	400mm	2800mm	2500mm	1900mm	450ϕ

NOTE: ALL PIER DEPTHS MUST EQUAL TO WALL HEIGHTS U.N.O. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

** 2ND FROM THE END POST SIZE WILL NEED TO BE INCREASED TO NEXT SIZE UP FOR END WALLS WHERE NO HEIGHT REDUCTION OR CORNER OCCURS

SOIL PARAMETERS TABLES

SOIL CONDITION	BULK DENSITY (kN/m^3)	INTERNAL FRICTION ANGLE
CONDITION 1	20	25°
CONDITION 2	22	30°
CONDITION 3	22	42°

VALUES FROM GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

SOIL CLASSIFICATION

SOIL GROUP	TYPICAL SOILS IN GROUP
CONDITION 1	Engineered fill and residual clay/sand - stiff/medium dense (or stronger/denser)
CONDITION 2	Greywacke - very low to low strength
CONDITION 3	Greywacke - medium strength (or stronger)

SLEEPER SPECIFICATION TABLE - ENGINEERED FILL

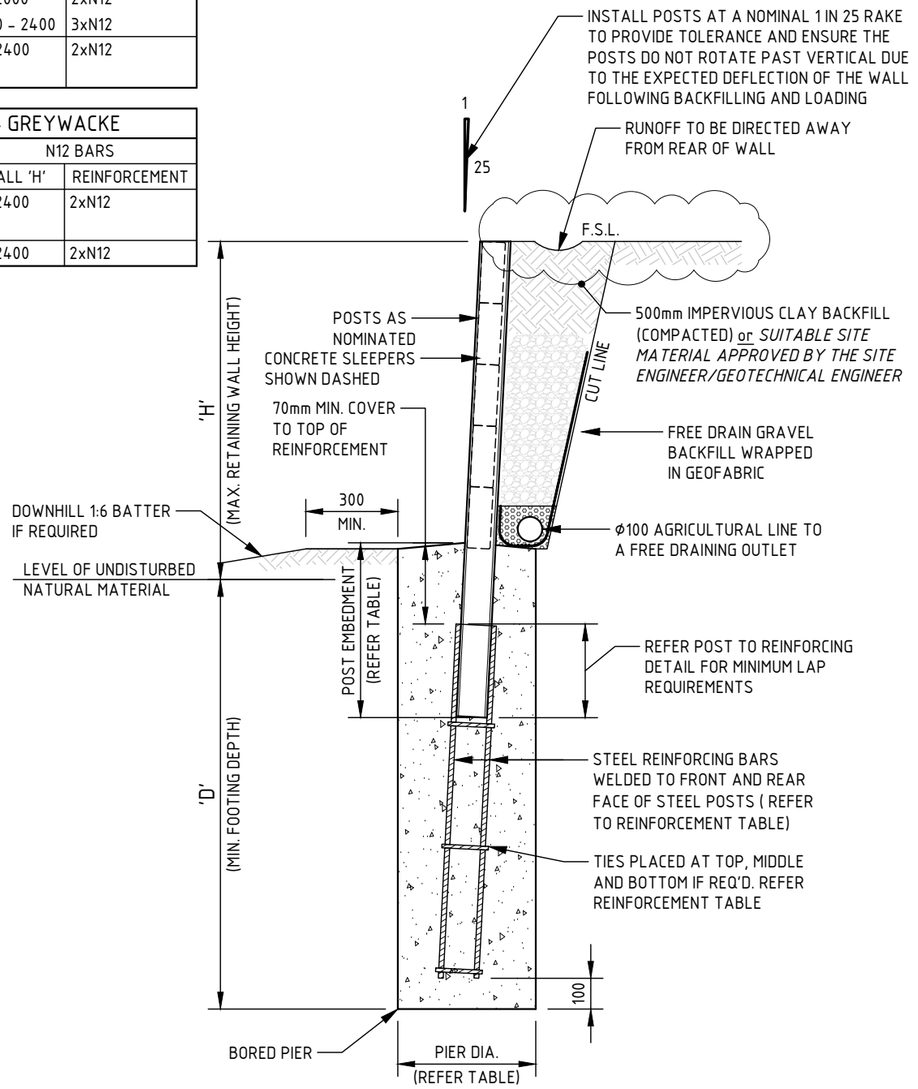
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 1400	2xN10	0 - 2000	2xN12
	1400 - 2000	3xN10	2000 - 2400	3xN12
90mm	2000 - 2200	2xN10	0 - 2400	2xN12
	2200 - 2400	3xN10		

SLEEPER SPECIFICATION TABLE - GREYWACKE

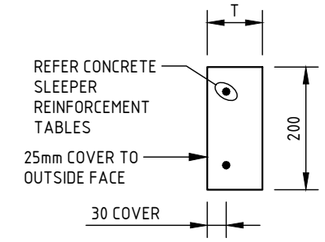
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 1800	2xN10	0 - 2400	2xN12
	1400 - 2400	3xN10		
90mm	2000 - 2400	2xN10	0 - 2400	2xN12

STEEL REINFORCING BAR SCHEDULE

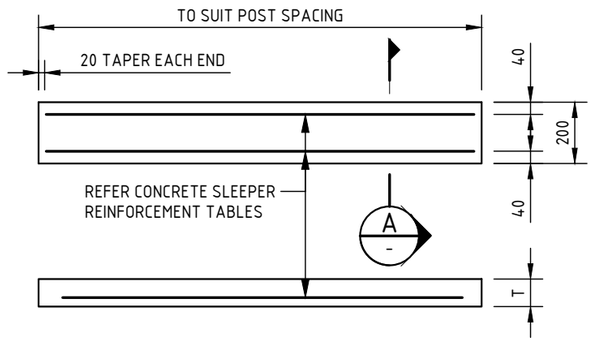
WALL HEIGHT	FRONT FACE REINFORCEMENT	REAR FACE REINFORCEMENT	N12 TIES
< 1000	2/N12	2/N12	NIL
1000 -1600	2/N12	3/N12	NIL
1800 - 2000	2/N12	2/N16	NIL
2200 - 2400	2/N12	3/N16	NIL



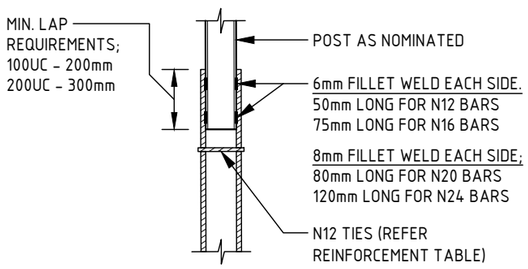
TYPICAL CONCRETE SLEEPER WALL
SCALE 1:20



SECTION A
SCALE 1:10



CONCRETE SLEEPER REINFORCEMENT DETAIL
SCALE 1:20



POST TO REINFORCING BAR WELDING DETAIL
SCALE 1:20

CODE	REVISION	DATE	BY
F	FOR CONSTRUCTION	17.06.25	NW
H	FOR CONSTRUCTION	30.10.25	NW
G	FOR CONSTRUCTION	18.07.25	NW

MORGAN CONSULTING ENGINEERS
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FAX: (07) 3369 1893
EMAIL: mail@morgance.com.au

Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
SINGLE WALL 2400MM CRS - WITHOUT FENCE LOADING (5KPA SURCHARGE)

Drawing No 24TR015/S103
Revision H

RETAINING WALL SPECIFICATION TABLE
10kPa SURCHARGE WITHOUT FENCE

POST SPACING (CTRS)	'H' (RETAINING WALL HIGHT)	POST SIZE	POST EMBEDMENT (MIN)	'D' PIER DEPTH 'CONDITION 1'	'CONDITION 2'	'CONDITION 3'	PIER ⌀
1600mm	600mm	100 UC 14.8	300mm	800mm	700mm	600mm	450⌀
1600mm	800mm	100 UC 14.8	300mm	900mm	900mm	700mm	450⌀
1600mm	1000mm	100 UC 14.8	300mm	1100mm	1000mm	800mm	450⌀
1600mm	1200mm	100 UC 14.8	300mm	1200mm	1200mm	900mm	450⌀
1600mm	1400mm	100 UC 14.8	300mm	1400mm	1300mm	1100mm	450⌀
1600mm	1600mm	100 UC 14.8	300mm	1600mm	1500mm	1200mm	450⌀
1600mm	1800mm	150 UC 23.4/ 180 UB 18.1	300mm	1800mm	1700mm	1300mm	450⌀
1600mm	2000mm	150 UC 23.4/ 180 UB 18.1	400mm	2000mm	1800mm	1400mm	450⌀
1600mm	2200mm	150 UC 23.4	400mm	2200mm	2000mm	1600mm	450⌀
1600mm	2400mm	150 UC 30	400mm	2400mm	2300mm	1700mm	450⌀
1600mm	2600mm	150 UC 30	400mm	2700mm	2500mm	1900mm	450⌀
1600mm	2800mm	150 UC 37.2	400mm	2900mm	2700mm	2000mm	450⌀
1600mm	3000mm	200 UC 46.2	400mm	3200mm	2900mm	2200mm	450⌀
1600mm	3200mm	200 UC 46.2	400mm	3500mm	3200mm	2400mm	450⌀
1600mm	3400mm	200 UC 46.2	400mm	3800mm	3400mm	2500mm	450⌀
1600mm	3600mm	200 UC 59	400mm	3400mm	3100mm	2300mm	600⌀
1600mm	3800mm	200 UC 59	400mm	3600mm	3300mm	2500mm	600⌀
1600mm	4000mm	250 UC 72.9	400mm	3900mm	3600mm	2600mm	600⌀
1600mm	4200mm	250 UC 72.9	400mm	4100mm	3800mm	2800mm	600⌀

NOTE: ALL PIER DEPTHS MUST EQUAL TO WALL HEIGHTS U.N.O. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

** 2ND FROM THE END POST SIZE WILL NEED TO BE INCREASED TO NEXT SIZE UP FOR END WALLS WHERE NO HEIGHT REDUCTION OR CORNER OCCURS

SOIL PARAMETERS TABLES

SOIL CONDITION	BULK DENSITY (kN/m^3)	INTERNAL FRICTION ANGLE
CONDITION 1	20	25°
CONDITION 2	22	30°
CONDITION 3	22	42°

VALUES FROM GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

SOIL CLASSIFICATION

SOIL GROUP	TYPICAL SOILS IN GROUP
CONDITION 1	Engineered fill and residual clay/sand - stiff/medium dense (or stronger/denser)
CONDITION 2	Greywacke - very low to low strength
CONDITION 3	Greywacke - medium strength (or stronger)

SLEEPER SPECIFICATION TABLE - ENGINEERED FILL

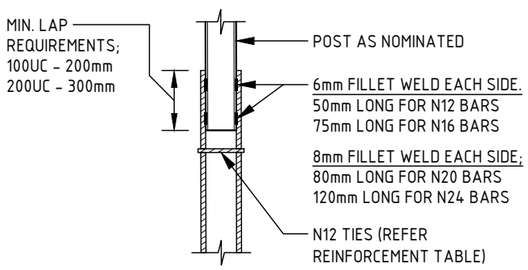
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 1800	2xN10	0 - 2200	2xN12
	1800 - 2200	3xN10	2200 - 2600	3xN12
90mm	2200 - 2600	2xN10	2600 - 3000	2xN12
	2600 - 3000	3xN10	3200 - 3400	3xN12
2/70mm	3200 -3400	2xN10	-	-
2/90mm	3600 - 4000	2xN10	3400 - 4000	3x N12

SLEEPER SPECIFICATION TABLE - GREYWACKE

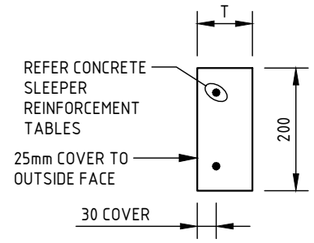
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 1800	2xN10	0 - 2400	2xN12
	2000 - 2400	3xN10	2000 - 3000	3xN12
90mm	2400 - 2800	2xN10	3000 - 3400	2xN12
	2800 - 3400	3xN10	3400 - 3800	3xN12
2/70mm	3600 -4000	2xN10	-	-
2/90mm	-	-	3800 - 4000	3x N12

STEEL REINFORCING BAR SCHEDULE

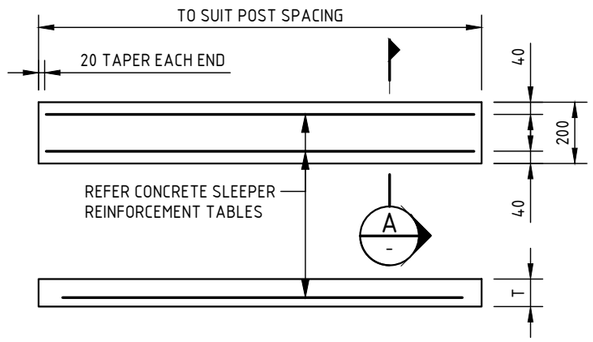
WALL HEIGHT	FRONT FACE REINFORCEMENT	REAR FACE REINFORCEMENT	N12 TIES
< 1000	2/N12	2/N12	NIL
1000 -1600	2/N12	3/N12	NIL
1800 - 2000	2/N12	2/N16	NIL
2200 - 2600	2/N12	3/N16	NIL
2800 - 3200	2/N12	4/N20	YES
3400	2/N12	5/N20	YES
3600 - 4000	2/N16	5/N24	YES



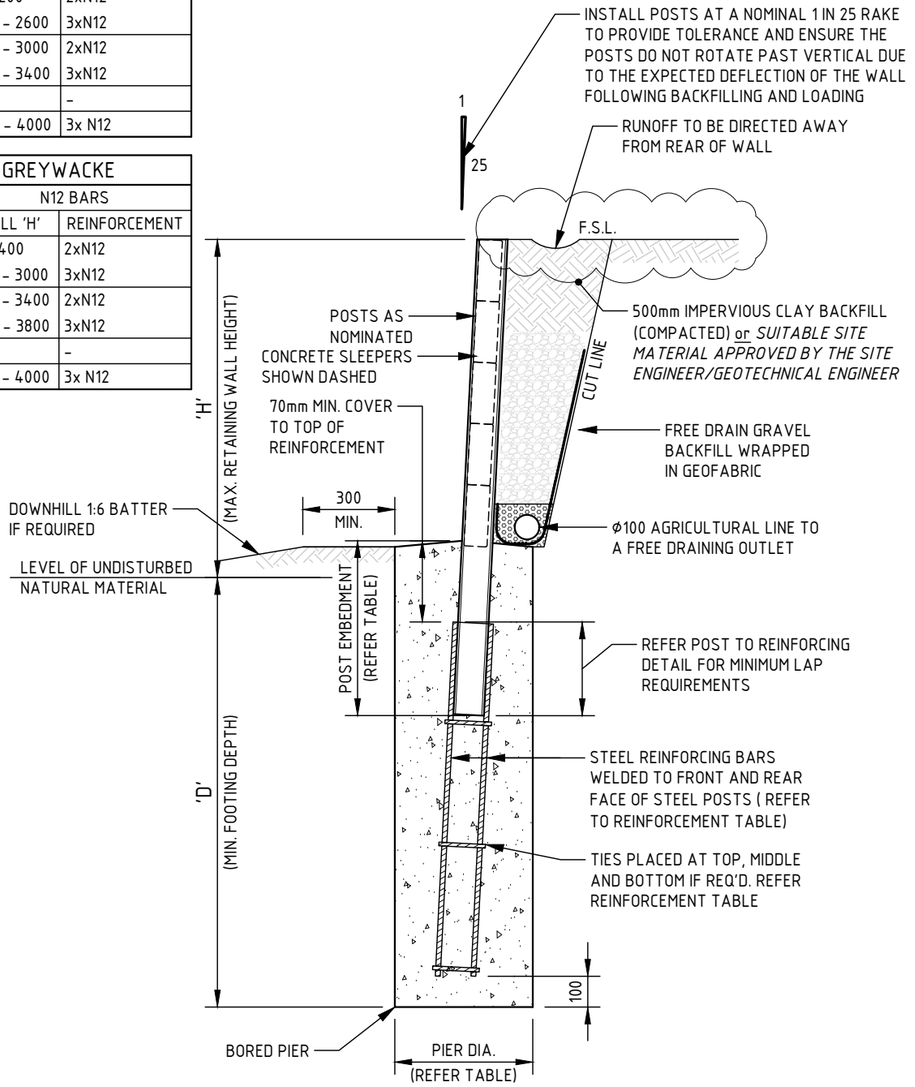
POST TO REINFORCING BAR WELDING DETAIL
SCALE 1:20



SECTION A-
SCALE 1:10



CONCRETE SLEEPER REINFORCEMENT DETAIL
SCALE 1:20



TYPICAL CONCRETE SLEEPER WALL
SCALE 1:20

CODE	REVISION	DATE	BY
F	CHANGES CLOUDED	17.06.25	NW
H	FOR CONSTRUCTION	30.10.25	NW
G	FOR CONSTRUCTION	18.07.25	NW

MORGAN CONSULTING ENGINEERS
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FAX: (07) 3369 1893
EMAIL: mail@morgance.com.au

Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
SINGLE WALL 1600MM CRS - WITHOUT FENCE LOADING (10KPA SURCHARGE)

Drawing No 24TR015/S104
Revision H

RETAINING WALL SPECIFICATION TABLE
10kPa SURCHARGE WITHOUT FENCE

POST SPACING (CTRS)	'H' (RETAINING WALL HIGHT)	POST SIZE	POST EMBEDMENT (MIN)	'D' PIER DEPTH 'CONDITION 1'	'D' PIER DEPTH 'CONDITION 2'	'D' PIER DEPTH 'CONDITION 3'	PIER ⌀
2000mm	600mm	100 UC 14.8	300mm	800mm	800mm	700mm	450⌀
2000mm	800mm	100 UC 14.8	300mm	900mm	900mm	800mm	450⌀
2000mm	1000mm	100 UC 14.8	300mm	1100mm	1000mm	900mm	450⌀
2000mm	1200mm	100 UC 14.8	300mm	1300mm	1200mm	1000mm	450⌀
2000mm	1400mm	100 UC 14.8	300mm	1500mm	1400mm	1200mm	450⌀
2000mm	1600mm	150 UC 23.4 / 180 UB 18.1	300mm	1700mm	1600mm	1300mm	450⌀
2000mm	1800mm	150 UC 23.4 / 180 UB 18.1	300mm	1900mm	1800mm	1400mm	450⌀
2000mm	2000mm	150 UC 23.4	400mm	2100mm	2000mm	1600mm	450⌀
2000mm	2200mm	150 UC 30	400mm	2300mm	2200mm	1800mm	450⌀
2000mm	2400mm	150 UC 30	400mm	2500mm	2400mm	1900mm	450⌀
2000mm	2600mm	150 UC 37.2	400mm	2800mm	2600mm	2100mm	450⌀
2000mm	2800mm	150 UC 37.2	400mm	3100mm	2900mm	2300mm	450⌀
2000mm	3000mm	200 UC 46.2	400mm	3300mm	3100mm	2500mm	450⌀
2000mm	3200mm	200 UC 59	400mm	3300mm	3100mm	2300mm	600⌀
2000mm	3400mm	200 UC 59	400mm	3600mm	3300mm	2500mm	600⌀
2000mm	3600mm	250 UC 72.9	400mm	3900mm	3600mm	2600mm	600⌀
2000mm	3800mm	250 UC 72.9	400mm	4200mm	3800mm	2800mm	600⌀
2000mm	4000mm	250 UC 72.9	400mm	4500mm	4100mm	3000mm	600⌀
2000mm	4200mm	250 UC 89.5	400mm	4800mm	4400mm	3200mm	600⌀

NOTE: ALL PIER DEPTHS MUST EQUAL TO WALL HEIGHTS U.N.O. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

** 2ND FROM THE END POST SIZE WILL NEED TO BE INCREASED TO NEXT SIZE UP FOR END WALLS WHERE NO HEIGHT REDUCTION OR CORNER OCCURS

SOIL PARAMETERS TABLES

SOIL CONDITION	BULK DENSITY (kN/m³)	INTERNAL FRICTION ANGLE
CONDITION 1	20	25°
CONDITION 2	22	30°
CONDITION 3	22	42°

VALUES FROM GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

SOIL CLASSIFICATION

SOIL GROUP	TYPICAL SOILS IN GROUP
CONDITION 1	Engineered fill and residual clay/sand - stiff/medium dense (or stronger/denser)
CONDITION 2	Greywacke - very low to low strength
CONDITION 3	Greywacke - medium strength (or stronger)

SLEEPER SPECIFICATION TABLE - ENGINEERED FILL

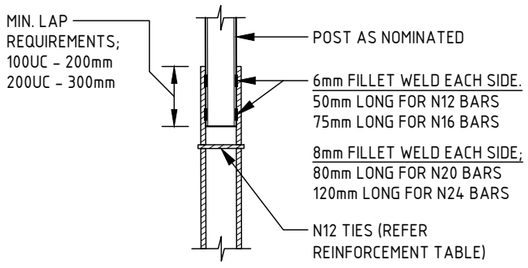
THICK (T)	N10 BARS WALL 'H'	N10 BARS REINFORCEMENT	N12 BARS WALL 'H'	N12 BARS REINFORCEMENT
70mm	0 - 1400	2xN10	0 - 2000	2xN12
	1400 - 2000	3xN10	2000 - 2400	3xN12
90mm	2000 - 2200	2xN10	2400 - 2600	2xN12
	2200 - 2600	3xN10	2600 - 3000	3xN12
2/70mm	2600 -3200	2xN10	-	-
2/90mm	-	-	3000 - 4000	3x N12

SLEEPER SPECIFICATION TABLE - GREYWACKE

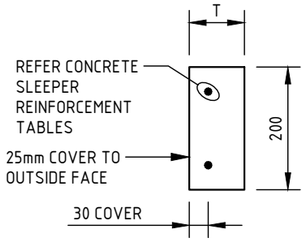
THICK (T)	N10 BARS WALL 'H'	N10 BARS REINFORCEMENT	N12 BARS WALL 'H'	N12 BARS REINFORCEMENT
70mm	0 - 1800	2xN10	0 - 2400	2xN12
	1400 - 2400	3xN10	2000 - 2800	3xN12
90mm	2000 - 2600	2xN10	2400 - 3000	2xN12
	2200 - 3000	3xN10	2600 - 3400	3xN12
2/70mm	2600 -3600	2xN10	-	-
2/90mm	-	-	3000 - 4000	3x N12

STEEL REINFORCING BAR SCHEDULE

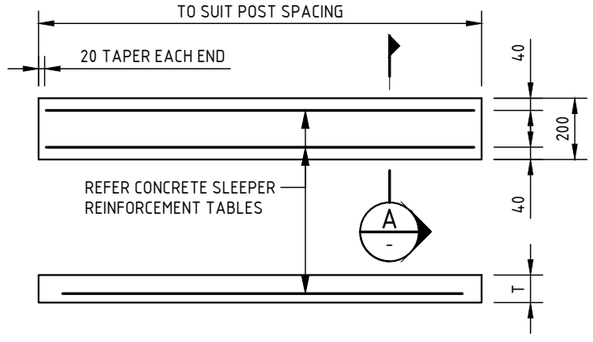
WALL HEIGHT	FRONT FACE REINFORCEMENT	REAR FACE REINFORCEMENT	N12 TIES
< 1000	2/N12	2/N12	NIL
1000 -1600	2/N12	3/N12	NIL
1800 - 2000	2/N12	2/N16	NIL
2200 - 2600	2/N12	3/N16	NIL
2800 - 3200	2/N12	4/N20	YES
3400	2/N12	5/N20	YES
3600 - 4000	2/N16	5/N24	YES



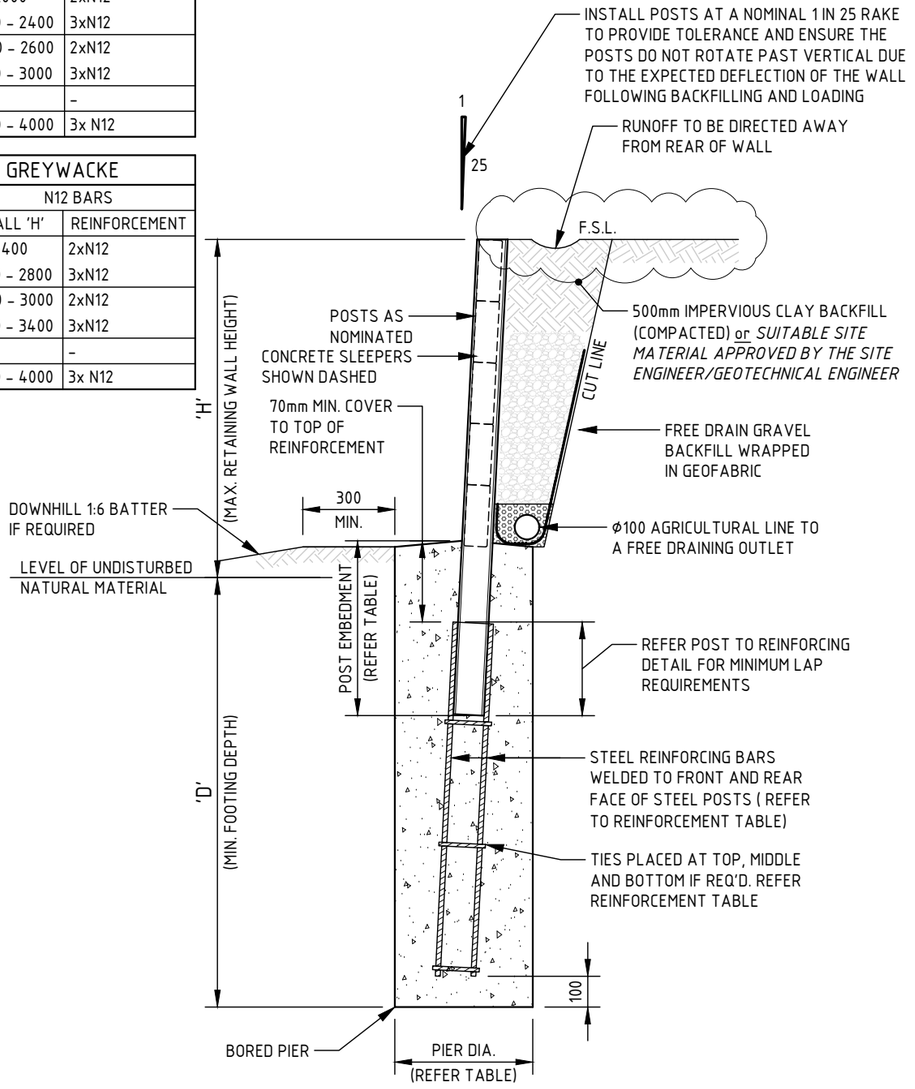
POST TO REINFORCING BAR WELDING DETAIL
SCALE 1:20



SECTION A
SCALE 1:10



CONCRETE SLEEPER REINFORCEMENT DETAIL
SCALE 1:20



TYPICAL CONCRETE SLEEPER WALL
SCALE 1:20

CODE	REVISION	DATE	BY
J	FOR CONSTRUCTION	30.10.25	NW
H	FOR CONSTRUCTION	18.07.25	NW
G	FOR CONSTRUCTION	17.06.25	NW

MORGAN CONSULTING ENGINEERS
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FAX: (07) 3369 1893
EMAIL: mail@morgance.com.au

Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
SINGLE WALL 2000MM CRS - WITHOUT FENCE LOADING (10KPA SURCHARGE)

Drawing No 24TR015/S105
Revision J

RETAINING WALL SPECIFICATION TABLE
10kPa SURCHARGE WITHOUT FENCE

POST SPACING (CTRS)	'H' (RETAINING WALL HIGHT)	POST SIZE	POST EMBEDMENT (MIN)	'D' PIER DEPTH 'CONDITION 1'	'D' PIER DEPTH 'CONDITION 2'	'D' PIER DEPTH 'CONDITION 3'	PIER ϕ
2400mm	600mm	100 UC 14.8	300mm	900mm	800mm	700mm	450ϕ
2400mm	800mm	100 UC 14.8	300mm	1100mm	1000mm	800mm	450ϕ
2400mm	1000mm	100 UC 14.8	300mm	1300mm	1200mm	1000mm	450ϕ
2400mm	1200mm	100 UC 14.8	300mm	1500mm	1400mm	1100mm	450ϕ
2400mm	1400mm	100 UC 14.8	300mm	1700mm	1600mm	1200mm	450ϕ
2400mm	1600mm	150 UC 23.4	300mm	2000mm	1800mm	1400mm	450ϕ
2400mm	1800mm	150 UC 23.4	300mm	2200mm	2100mm	1600mm	450ϕ
2400mm	2000mm	150 UC 23.4	400mm	2500mm	2300mm	1700mm	450ϕ
2400mm	2200mm	150 UC 30	400mm	2800mm	2600mm	1900mm	450ϕ
2400mm	2400mm	150 UC 37.2	400mm	3100mm	2900mm	2100mm	450ϕ

NOTE: ALL PIER DEPTHS MUST EQUAL TO WALL HEIGHTS U.N.O. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

** 2ND FROM THE END POST SIZE WILL NEED TO BE INCREASED TO NEXT SIZE UP FOR END WALLS WHERE NO HEIGHT REDUCTION OR CORNER OCCURS

SOIL PARAMETERS TABLES

SOIL CONDITION	BULK DENSITY (kN/m^3)	INTERNAL FRICTION ANGLE
CONDITION 1	20	25°
CONDITION 2	22	30°
CONDITION 3	22	42°

VALUES FROM GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

SOIL CLASSIFICATION

SOIL GROUP	TYPICAL SOILS IN GROUP
CONDITION 1	Engineered fill and residual clay/sand - stiff/medium dense (or stronger/denser)
CONDITION 2	Greywacke - very low to low strength
CONDITION 3	Greywacke - medium strength (or stronger)

SLEEPER SPECIFICATION TABLE - ENGINEERED FILL

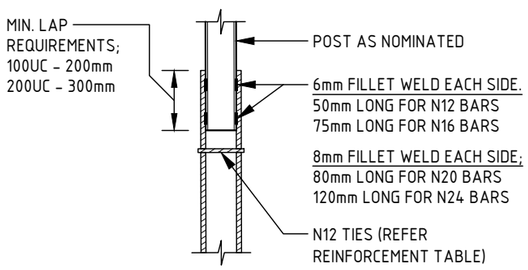
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 1400	2xN10	0 - 2000	2xN12
	1400 - 2000	3xN10	2000 - 2400	3xN12
90mm	2000 - 2200	2xN10	0 - 2400	2xN12
	2200 - 2400	3xN10		

SLEEPER SPECIFICATION TABLE - GREYWACKE

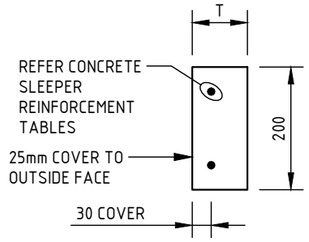
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 1800	2xN10	0 - 2400	2xN12
	1400 - 2400	3xN10		
90mm	2000 - 2400	2xN10	0 - 2400	2xN12

STEEL REINFORCING BAR SCHEDULE

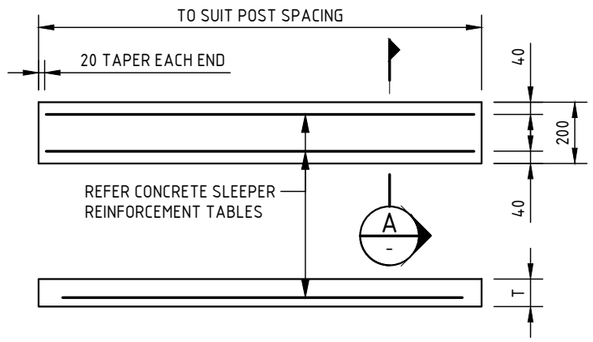
WALL HEIGHT	FRONT FACE REINFORCEMENT	REAR FACE REINFORCEMENT	N12 TIES
< 1000	2/N12	2/N12	NIL
1000 -1600	2/N12	3/N12	NIL
1800 - 2000	2/N12	2/N16	NIL
2200 - 2400	2/N12	3/N16	NIL



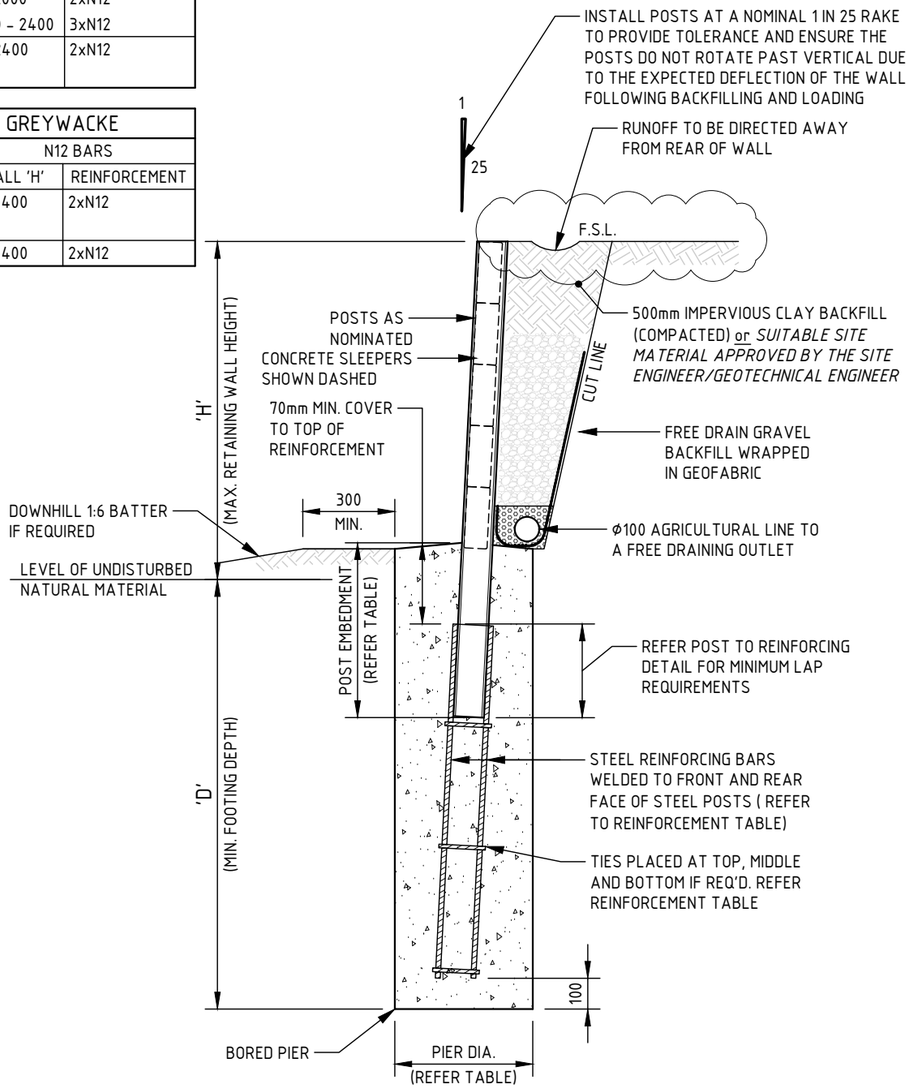
POST TO REINFORCING BAR WELDING DETAIL
SCALE 1:20



SECTION A-A
SCALE 1:10



CONCRETE SLEEPER REINFORCEMENT DETAIL
SCALE 1:20



TYPICAL CONCRETE SLEEPER WALL
SCALE 1:20

CODE	REVISION	DATE	BY
F	FOR CONSTRUCTION	17.06.25	NW
H	FOR CONSTRUCTION	30.10.25	NW
G	FOR CONSTRUCTION	18.07.25	NW

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EMAIL: mail@morgance.com.au

Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
SINGLE WALL 2400MM CRS - WITHOUT FENCE LOADING (10KPA SURCHARGE)

Drawing No 24TR015/S106
Revision H

RETAINING WALL SPECIFICATION TABLE
5kPa SURCHARGE WITH FENCE (MAX 1.8m HIGH FENCE)

				'D' PIER DEPTH			
POST SPACING (CTRS)	'H' (RETAINING WALL HIGHT)	POST SIZE	POST EMBEDMENT (MIN)	'CONDITION 1'	'CONDITION 2'	'CONDITION 3'	PIER ϕ
1600mm	600mm	100 UC 14.8	300mm	1100mm	1100mm	1000mm	450ϕ
1600mm	800mm	100 UC 14.8	300mm	1200mm	1200mm	1100mm	450ϕ
1600mm	1000mm	100 UC 14.8	300mm	1300mm	1300mm	1200mm	450ϕ
1600mm	1200mm	100 UC 14.8	300mm	1500mm	1400mm	1300mm	450ϕ
1600mm	1400mm	100 UC 14.8	300mm	1600mm	1500mm	1400mm	450ϕ
1600mm	1600mm	100 UC 14.8 *0	300mm	1800mm	1700mm	1500mm	450ϕ
1600mm	1800mm	150 UC 23.4/ 180 UB 18.1	300mm	1900mm	1800mm	1600mm	450ϕ
1600mm	2000mm	150 UC 23.4/ 180 UB 18.1	400mm	2100mm	2000mm	1700mm	450ϕ
1600mm	2200mm	150 UC 23.4	400mm	2300mm	2200mm	1800mm	450ϕ
1600mm	2400mm	150 UC 30	400mm	2500mm	2400mm	1900mm	450ϕ
1600mm	2600mm	150 UC 30	400mm	2700mm	2600mm	2100mm	450ϕ
1600mm	2800mm	150 UC 30 *0	400mm	3000mm	2800mm	2200mm	450ϕ
1600mm	3000mm	150 UC 37.2 *0	400mm	3200mm	3000mm	2400mm	450ϕ
1600mm	3200mm	200 UC 46.2	400mm	3500mm	3200mm	2500mm	450ϕ
1600mm	3400mm	200 UC 46.2	400mm	3700mm	3500mm	2700mm	450ϕ
1600mm	3600mm	200 UC 59	400mm	3400mm	3200mm	2500mm	600ϕ
1600mm	3800mm	200 UC 59	400mm	3600mm	3400mm	2600mm	600ϕ
1600mm	4000mm	250 UC 72.9	400mm	3800mm	3600mm	2800mm	600ϕ
1600mm	4200mm	250 UC 72.9	400mm	4100mm	3800mm	2900mm	600ϕ

NOTE: ALL PIER DEPTHS MUST EQUAL TO WALL HEIGHTS U.N.O. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

** 2ND FROM THE END POST SIZE WILL NEED TO BE INCREASED TO NEXT SIZE UP FOR END WALLS WHERE NO HEIGHT REDUCTION OR CORNER OCCURS

SOIL PARAMETERS TABLES

SOIL CONDITION	BULK DENSITY (kN/m^3)	INTERNAL FRICTION ANGLE
CONDITION 1	20	25°
CONDITION 2	22	30°
CONDITION 3	22	42°

VALUES FROM GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

SOIL CLASSIFICATION

SOIL GROUP	TYPICAL SOILS IN GROUP
CONDITION 1	Engineered fill and residual clay/sand - stiff/medium dense (or stronger/denser)
CONDITION 2	Greywacke - very low to low strength
CONDITION 3	Greywacke - medium strength (or stronger)

SLEEPER SPECIFICATION TABLE - ENGINEERED FILL

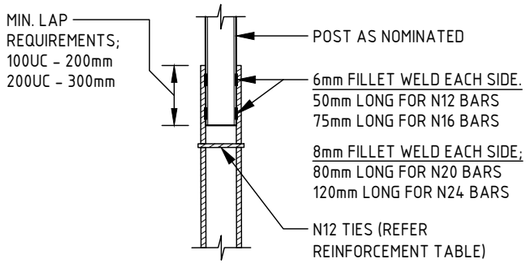
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 2000	2xN10	0 - 2400	2xN12
	2200 - 2600	3xN10	2600 - 2800	3xN12
90mm	2000 - 2800	2xN10	2800 - 3200	2xN12
	2800 - 3200	3xN10	3200 - 3600	3xN12
2/70mm	2600 -3600	2xN10	-	-
2/90mm	3600 - 4000	2xN10	3600 - 4000	3x N12

SLEEPER SPECIFICATION TABLE - GREYWACKE

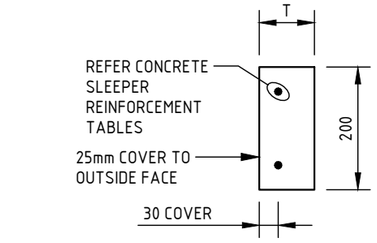
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 2000	2xN10	0 - 2600	2xN12
	2000 - 2800	3xN10	2600 - 3200	3xN12
90mm	2800 - 3200	2xN10	3200 - 3600	2xN12
	3200 - 3600	3xN10	3600 - 4000	3xN12
2/70mm	3600 -4000	2xN10	-	-
2/90mm	-	-	3000 - 4000	3x N12

STEEL REINFORCING BAR SCHEDULE

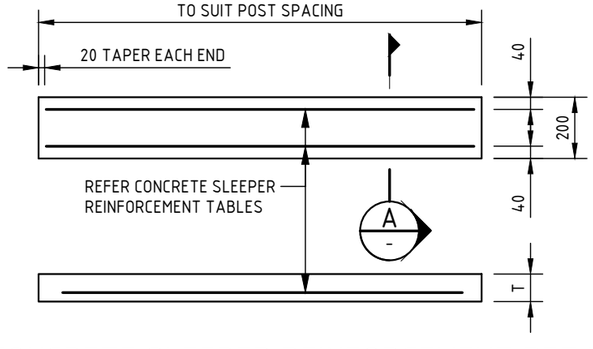
WALL HEIGHT	FRONT FACE REINFORCEMENT	REAR FACE REINFORCEMENT	N12 TIES
< 1000	2/N12	2/N12	NIL
1000 -1600	2/N12	3/N12	NIL
1800 - 2000	2/N12	2/N16	NIL
2200 - 2600	2/N12	3/N16	NIL
2800 - 3200	2/N12	4/N20	YES
3400	2/N12	5/N20	YES
3600 - 4000	2/N16	5/N24	YES



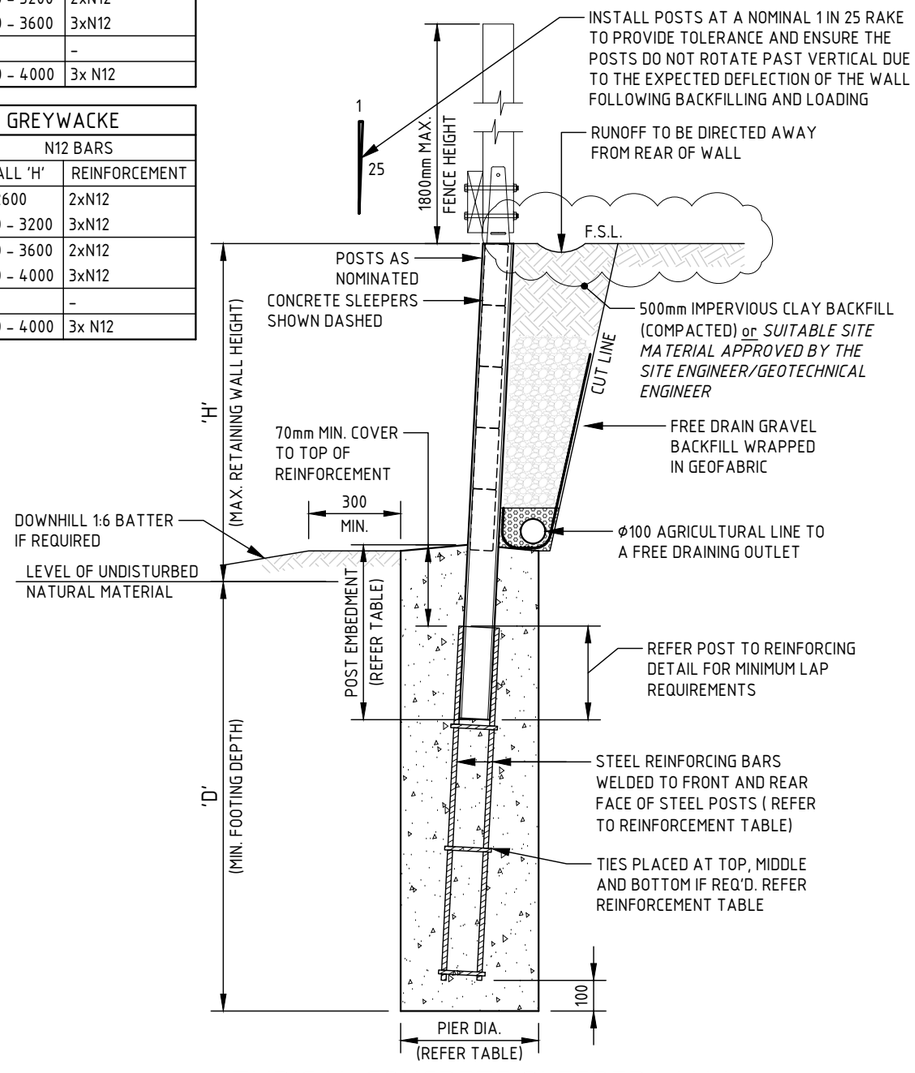
POST TO REINFORCING BAR WELDING DETAIL
SCALE 1:20



SECTION A - SCALE 1:10



CONCRETE SLEEPER REINFORCEMENT DETAIL
SCALE 1:20



TYPICAL CONCRETE SLEEPER WALL
SCALE 1:20

CODE	REVISION	DATE	BY
F	FOR CONSTRUCTION	17.06.25	NW
H	FOR CONSTRUCTION	30.10.25	NW
G	FOR CONSTRUCTION	18.07.25	NW

MORGAN CONSULTING ENGINEERS
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FAX: (07) 3369 1893
EMAIL: mail@morgance.com.au

Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
SINGLE WALL 1600MM CRS - WITH FENCE LOADING (5KPA SURCHARGE)

Drawing No 24TR015/S111
Revision H

RETAINING WALL SPECIFICATION TABLE
5kPa SURCHARGE WITH FENCE (MAX 1.8m HIGH FENCE)

POST SPACING (CTRS)	'H' (RETAINING WALL HIGHT)	POST SIZE	POST EMBEDMENT (MIN)	'D' PIER DEPTH 'CONDITION 1'	'D' PIER DEPTH 'CONDITION 2'	'D' PIER DEPTH 'CONDITION 3'	PIER Ø
2000mm	600mm	100 UC 14.8	300mm	1200mm	1100mm	1100mm	450Ø
2000mm	800mm	100 UC 14.8	300mm	1300mm	1200mm	1200mm	450Ø
2000mm	1000mm	100 UC 14.8	300mm	1400mm	1400mm	1300mm	450Ø
2000mm	1200mm	100 UC 14.8	300mm	1500mm	1500mm	1400mm	450Ø
2000mm	1400mm	100 UC 14.8 *0	300mm	1700mm	1600mm	1500mm	450Ø
2000mm	1600mm	150 UC 23.4/ 180 UB 18.1	300mm	1800mm	1800mm	1600mm	450Ø
2000mm	1800mm	150 UC 23.4/ 180 UB 18.1	300mm	2100mm	2000mm	1700mm	450Ø
2000mm	2000mm	150 UC 23.4	400mm	2300mm	2200mm	1800mm	450Ø
2000mm	2200mm	150 UC 30	400mm	2500mm	2400mm	2000mm	450Ø
2000mm	2400mm	150 UC 30	400mm	2700mm	2600mm	2100mm	450Ø
2000mm	2600mm	150 UC 37.2	400mm	3000mm	2800mm	2300mm	450Ø
2000mm	2800mm	150 UC 37.2	400mm	3300mm	3200mm	2500mm	450Ø
2000mm	3000mm	200 UC 46.2	400mm	3600mm	3400mm	2600mm	450Ø
2000mm	3200mm	200 UC 46.2*0	400mm	3800mm	3600mm	2800mm	450Ø
2000mm	3400mm	200 UC 59	400mm	3600mm	3300mm	2600mm	600Ø
2000mm	3600mm	200 UC 59	400mm	3800mm	3600mm	2800mm	600Ø
2000mm	3800mm	250 UC 72.9	400mm	4100mm	3800mm	2900mm	600Ø
2000mm	4000mm	250 UC 72.9	400mm	4400mm	4100mm	3100mm	600Ø
2000mm	4200mm	250 UC 72.9*0	400mm	4700mm	4400mm	3300mm	600Ø

NOTE: ALL PIER DEPTHS MUST EQUAL TO WALL HEIGHTS U.N.O. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

** 2ND FROM THE END POST SIZE WILL NEED TO BE INCREASED TO NEXT SIZE UP FOR END WALLS WHERE NO HEIGHT REDUCTION OR CORNER OCCURS

SOIL PARAMETERS TABLES

SOIL CONDITION	BULK DENSITY (kN/m^3)	INTERNAL FRICTION ANGLE
CONDITION 1	20	25°
CONDITION 2	22	30°
CONDITION 3	22	42°

VALUES FROM GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

SOIL CLASSIFICATION

SOIL GROUP	TYPICAL SOILS IN GROUP
CONDITION 1	Engineered fill and residual clay/sand – stiff/medium dense (or stronger/denser)
CONDITION 2	Greywacke – very low to low strength
CONDITION 3	Greywacke – medium strength (or stronger)

SLEEPER SPECIFICATION TABLE – ENGINEERED FILL

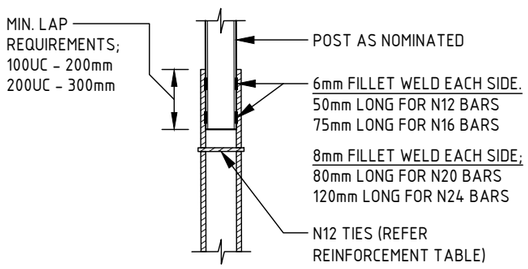
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 – 1400	2xN10	0 – 2000	2xN12
	1400 – 2000	3xN10	2000 – 2400	3xN12
90mm	2000 – 2200	2xN10	2400 – 2600	2xN12
	2200 – 2600	3xN10	2600 – 3000	3xN12
2/70mm	2600 –3200	2xN10	–	–
2/90mm	–	–	3000 – 4000	3x N12

SLEEPER SPECIFICATION TABLE – GREYWACKE

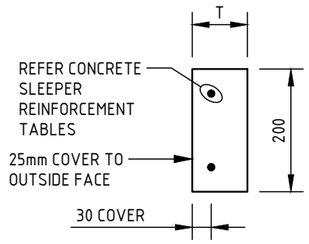
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 – 1800	2xN10	0 – 2400	2xN12
	1400 – 2400	3xN10	2000 – 2800	3xN12
90mm	2000 – 2600	2xN10	2400 – 3000	2xN12
	2200 – 3000	3xN10	2600 – 3400	3xN12
2/70mm	2600 –3600	2xN10	–	–
2/90mm	–	–	3000 – 4000	3x N12

STEEL REINFORCING BAR SCHEDULE

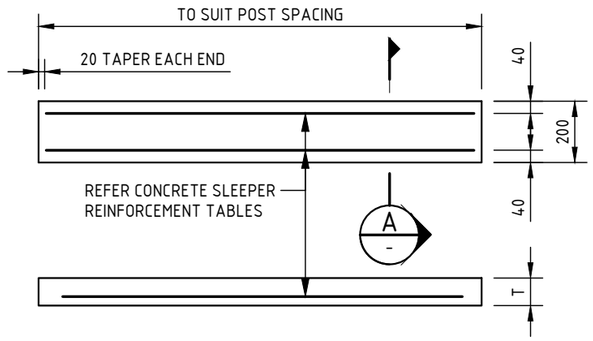
WALL HEIGHT	FRONT FACE REINFORCEMENT	REAR FACE REINFORCEMENT	N12 TIES
< 1000	2/N12	2/N12	NIL
1000 –1600	2/N12	3/N12	NIL
1800 – 2000	2/N12	2/N16	NIL
2200 – 2600	2/N12	3/N16	NIL
2800 – 3200	2/N12	4/N20	YES
3400	2/N12	5/N20	YES
3600 – 4000	2/N16	5/N24	YES



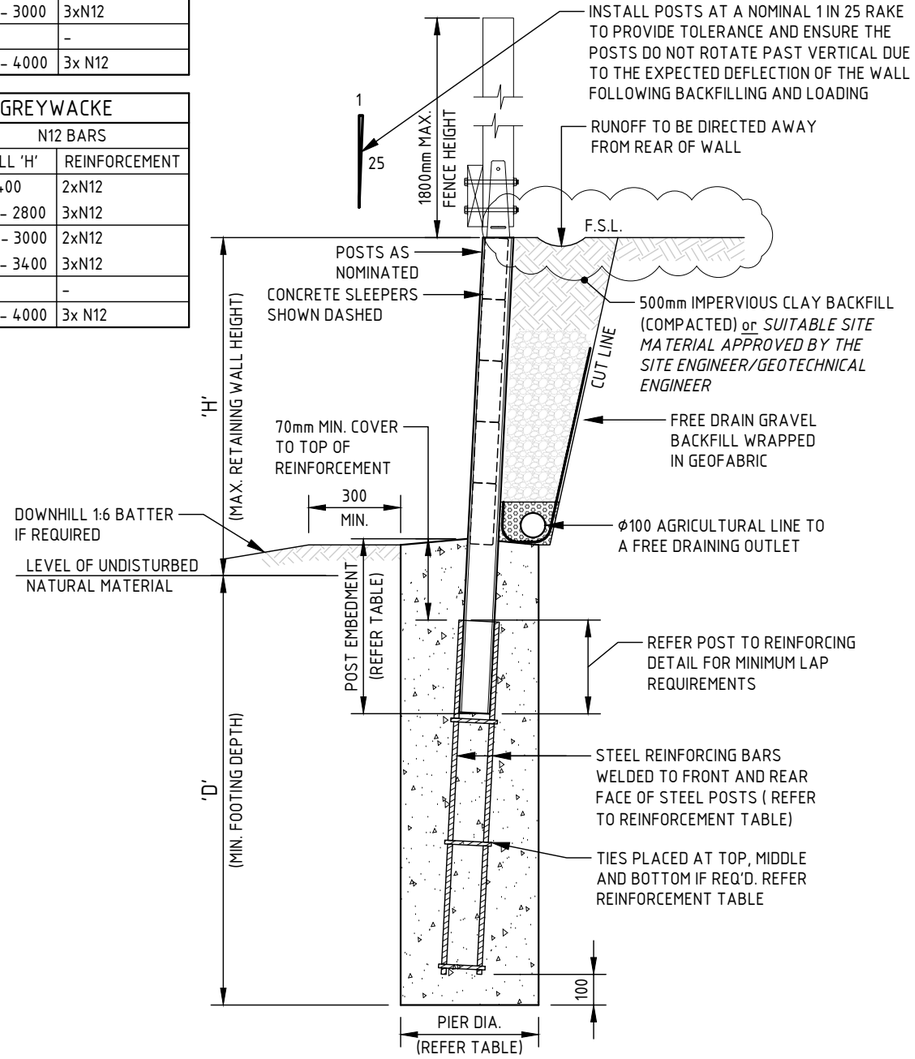
POST TO REINFORCING BAR WELDING DETAIL
SCALE 1:20



SECTION A-
SCALE 1:10



CONCRETE SLEEPER REINFORCEMENT DETAIL
SCALE 1:20



TYPICAL CONCRETE SLEEPER WALL
SCALE 1:20

CODE	REVISION	DATE	BY
J	FOR CONSTRUCTION	30.10.25	N.W
H	FOR CONSTRUCTION	18.07.25	NW
G	FOR CONSTRUCTION	17.06.25	NW

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Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
SINGLE WALL 2000MM CRS – WITH FENCE LOADING (5KPA SURCHARGE)

Drawing No 24TR015/S112
Revision J

RETAINING WALL SPECIFICATION TABLE
5kPa SURCHARGE WITH FENCE (MAX 1.8m HIGH FENCE)

POST SPACING (CTRS)	'H' (RETAINING WALL HIGHT)	POST SIZE	POST EMBEDMENT (MIN)	'D' PIER DEPTH 'CONDITION 1'	'D' PIER DEPTH 'CONDITION 2'	'D' PIER DEPTH 'CONDITION 3'	PIER ϕ
2400mm	600mm	100 UC 14.8	300mm	1200mm	1200mm	1200mm	450ϕ
2400mm	800mm	100 UC 14.8	300mm	1400mm	1300mm	1200mm	450ϕ
2400mm	1000mm	100 UC 14.8	300mm	1500mm	1500mm	1300mm	450ϕ
2400mm	1200mm	100 UC 14.8 *0	300mm	1700mm	1600mm	1500mm	450ϕ
2400mm	1400mm	150 UC 23.4	300mm	1900mm	1800mm	1600mm	450ϕ
2400mm	1600mm	150 UC 23.4	300mm	2100mm	2000mm	1700mm	450ϕ
2400mm	1800mm	150 UC 23.4	300mm	2400mm	2300mm	1800mm	450ϕ
2400mm	2000mm	150 UC 23.4 *0	400mm	2700mm	2500mm	2000mm	450ϕ
2400mm	2200mm	150 UC 30	400mm	3000mm	2800mm	2200mm	450ϕ
2400mm	2400mm	150 UC 37.2	400mm	3200mm	3000mm	2300mm	450ϕ

NOTE: ALL PIER DEPTHS MUST EQUAL TO WALL HEIGHTS U.N.O. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

** 2ND FROM THE END POST SIZE WILL NEED TO BE INCREASED TO NEXT SIZE UP FOR END WALLS WHERE NO HEIGHT REDUCTION OR CORNER OCCURS

SOIL PARAMETERS TABLES

SOIL CONDITION	BULK DENSITY (kN/m^3)	INTERNAL FRICTION ANGLE
CONDITION 1	20	25°
CONDITION 2	22	30°
CONDITION 3	22	42°

VALUES FROM GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

SOIL CLASSIFICATION

SOIL GROUP	TYPICAL SOILS IN GROUP
CONDITION 1	Engineered fill and residual clay/sand – stiff/medium dense (or stronger/denser)
CONDITION 2	Greywacke – very low to low strength
CONDITION 3	Greywacke – medium strength (or stronger)

SLEEPER SPECIFICATION TABLE – ENGINEERED FILL

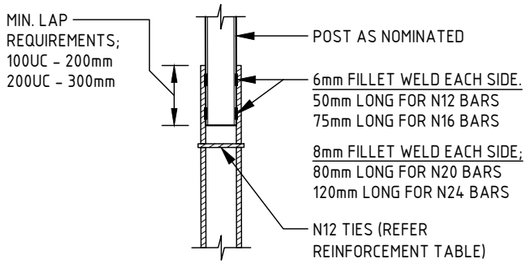
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 – 1400	2xN10	0 – 2000	2xN12
	1400 – 2000	3xN10	2000 – 2400	3xN12
90mm	2000 – 2200	2xN10	0 – 2400	2xN12
	2200 – 2400	3xN10		

SLEEPER SPECIFICATION TABLE – GREYWACKE

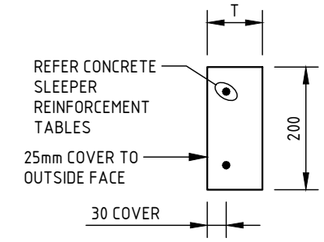
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 – 1800	2xN10	0 – 2400	2xN12
	1400 – 2400	3xN10		
90mm	2000 – 2400	2xN10	0 – 2400	2xN12

STEEL REINFORCING BAR SCHEDULE

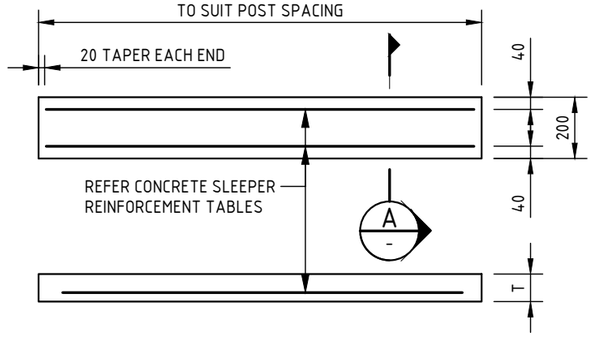
WALL HEIGHT	FRONT FACE REINFORCEMENT	REAR FACE REINFORCEMENT	N12 TIES
< 1000	2/N12	2/N12	NIL
1000 –1600	2/N12	3/N12	NIL
1800 – 2000	2/N12	2/N16	NIL
2200 – 2400	2/N12	3/N16	NIL



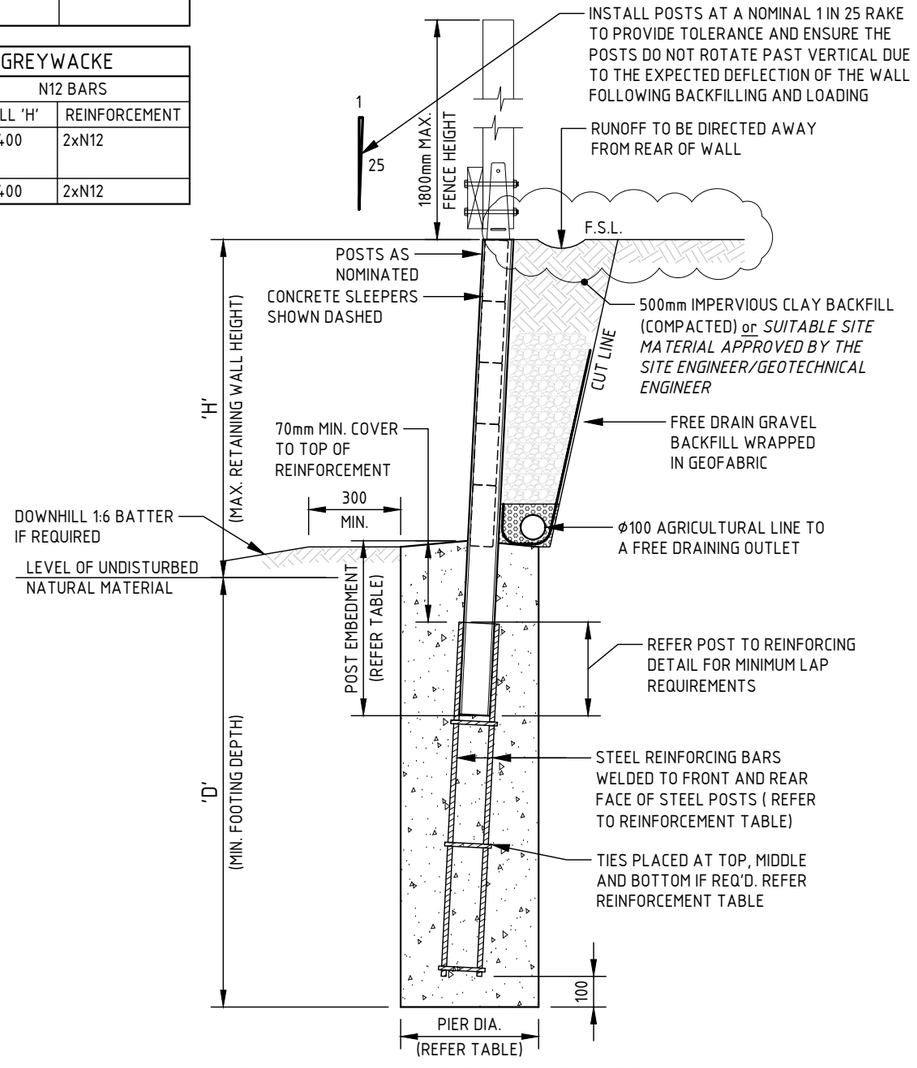
POST TO REINFORCING BAR WELDING DETAIL
SCALE 1:20



SECTION A-A
SCALE 1:10



CONCRETE SLEEPER REINFORCEMENT DETAIL
SCALE 1:20



TYPICAL CONCRETE SLEEPER WALL
SCALE 1:20

CODE	REVISION	DATE	BY
F	FOR CONSTRUCTION	17.06.25	NW
H	FOR CONSTRUCTION	30.10.25	NW
G	FOR CONSTRUCTION	18.07.25	NW

MORGAN CONSULTING ENGINEERS
•STRUCTURAL•CIVIL•HOUSING•FORENSIC•
1 GREAT GEORGE STREET
PADDINGTON QLD 4064
PHONE: (07) 3369 8411
FAX: (07) 3369 1893
EMAIL: mail@morgance.com.au

Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
SINGLE WALL 2400MM CRS – WITH FENCE LOADING (5KPA SURCHARGE)

Drawing No	Revision
24TR015/S113	H

RETAINING WALL SPECIFICATION TABLE
10kPa SURCHARGE WITH FENCE (MAX 1.8m HIGH FENCE)

POST SPACING (CTRS)	'H' (RETAINING WALL HIGHT)	POST SIZE	POST EMBEDMENT (MIN)	'D' PIER DEPTH 'CONDITION 1'	'D' PIER DEPTH 'CONDITION 2'	'D' PIER DEPTH 'CONDITION 3'	PIER ⌀
1600mm	600mm	100 UC 14.8	300mm	1200mm	1100mm	1100mm	450⌀
1600mm	800mm	100 UC 14.8	300mm	1300mm	1300mm	1200mm	450⌀
1600mm	1000mm	100 UC 14.8	300mm	1400mm	1400mm	1200mm	450⌀
1600mm	1200mm	100 UC 14.8	300mm	1600mm	1500mm	1300mm	450⌀
1600mm	1400mm	100 UC 14.8 *0	300mm	1800mm	1700mm	1400mm	450⌀
1600mm	1600mm	150 UC 23.4/ 180 UB 18.1	300mm	1900mm	1800mm	1600mm	450⌀
1600mm	1800mm	150 UC 23.4/ 180 UB 18.1	300mm	2100mm	2000mm	1700mm	450⌀
1600mm	2000mm	150 UC 23.4	400mm	2300mm	2200mm	1800mm	450⌀
1600mm	2200mm	150 UC 30	400mm	2500mm	2400mm	1900mm	450⌀
1600mm	2400mm	150 UC 30	400mm	2800mm	2600mm	2100mm	450⌀
1600mm	2600mm	150 UC 37.2	400mm	3000mm	2800mm	2200mm	450⌀
1600mm	2800mm	150 UC 37.2 *0	400mm	3300mm	3000mm	2400mm	450⌀
1600mm	3000mm	200 UC 46.2	400mm	3500mm	3300mm	2500mm	450⌀
1600mm	3200mm	200 UC 46.2	400mm	3800mm	3500mm	2700mm	450⌀
1600mm	3400mm	200 UC 59	400mm	3400mm	3200mm	2500mm	600⌀
1600mm	3600mm	200 UC 59	400mm	3700mm	3400mm	2600mm	600⌀
1600mm	3800mm	200 UC 59	400mm	3900mm	3600mm	2800mm	600⌀
1600mm	4000mm	250 UC 72.9	400mm	4200mm	3900mm	3000mm	600⌀
1600mm	4200mm	250 UC 72.9	400mm	4400mm	4100mm	3100mm	600⌀

NOTE: ALL PIER DEPTHS MUST EQUAL TO WALL HEIGHTS U.N.O. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

** 2ND FROM THE END POST SIZE WILL NEED TO BE INCREASED TO NEXT SIZE UP FOR END WALLS WHERE NO HEIGHT REDUCTION OR CORNER OCCURS

SOIL PARAMETERS TABLES

SOIL CONDITION	BULK DENSITY (kN/m^3)	INTERNAL FRICTION ANGLE
CONDITION 1	20	25°
CONDITION 2	22	30°
CONDITION 3	22	42°

VALUES FROM GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

SOIL CLASSIFICATION

SOIL GROUP	TYPICAL SOILS IN GROUP
CONDITION 1	Engineered fill and residual clay/sand – stiff/medium dense (or stronger/denser)
CONDITION 2	Greywacke – very low to low strength
CONDITION 3	Greywacke – medium strength (or stronger)

SLEEPER SPECIFICATION TABLE – ENGINEERED FILL

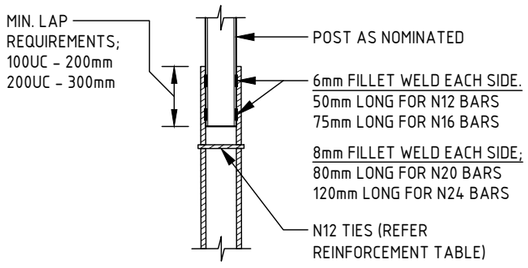
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 – 1800	2xN10	0 – 2200	2xN12
	1800 – 2200	3xN10	2200 – 2600	3xN12
90mm	2200 – 2600	2xN10	2600 – 3000	2xN12
	2600 – 3000	3xN10	3200 – 3400	3xN12
2/70mm	3200 –3400	2xN10	–	–
2/90mm	3600 – 4000	2xN10	3400 – 4000	3x N12

SLEEPER SPECIFICATION TABLE – GREYWACKE

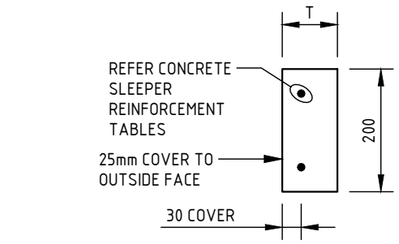
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 – 1800	2xN10	0 – 2400	2xN12
	2000 – 2400	3xN10	2000 – 3000	3xN12
90mm	2400 – 2800	2xN10	3000 – 3400	2xN12
	2800 – 3400	3xN10	3400 – 3800	3xN12
2/70mm	3600 –4000	2xN10	–	–
2/90mm	–	–	3800 – 4000	3x N12

STEEL REINFORCING BAR SCHEDULE

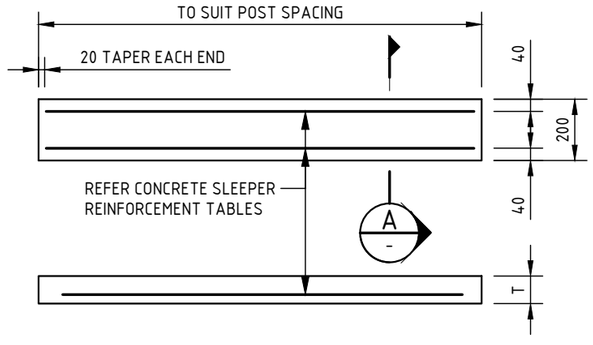
WALL HEIGHT	FRONT FACE REINFORCEMENT	REAR FACE REINFORCEMENT	N12 TIES
< 1000	2/N12	2/N12	NIL
1000 –1600	2/N12	3/N12	NIL
1800 – 2000	2/N12	2/N16	NIL
2200 – 2600	2/N12	3/N16	NIL
2800 – 3200	2/N12	4/N20	YES
3400	2/N12	5/N20	YES
3600 – 4000	2/N16	5/N24	YES



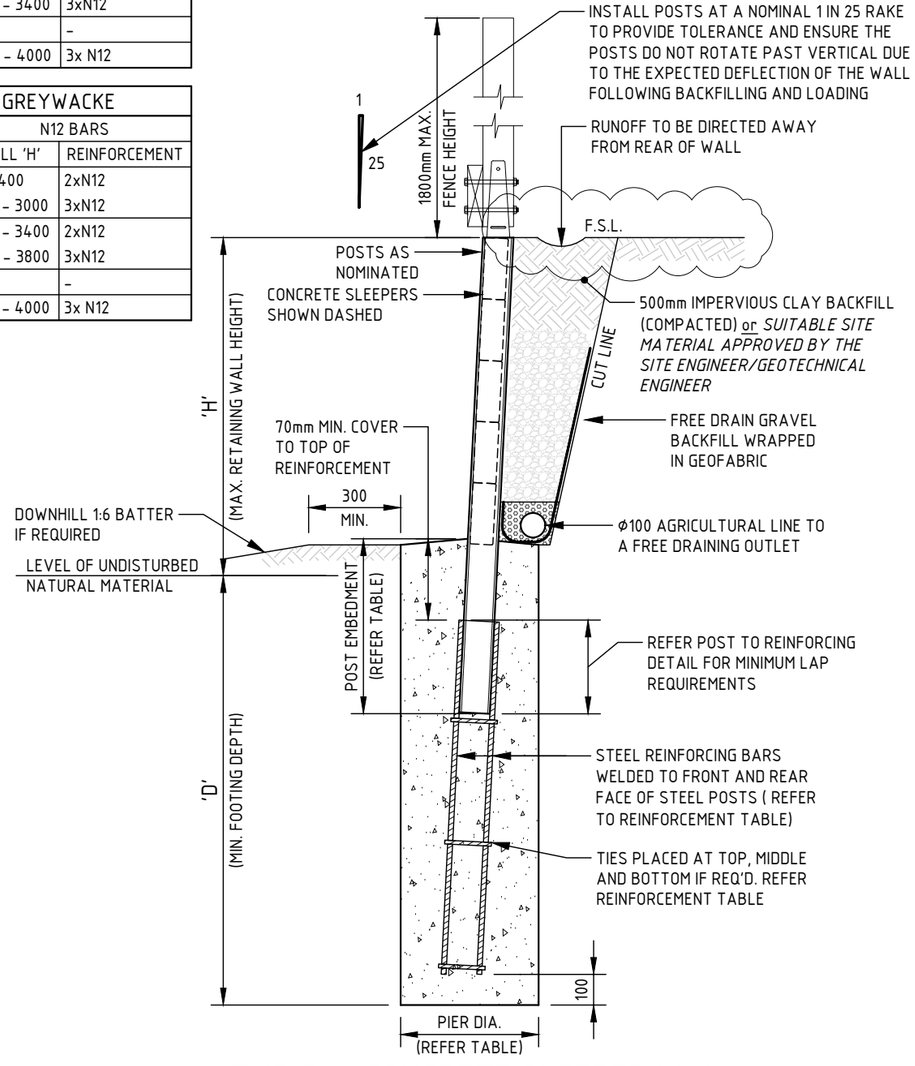
POST TO REINFORCING BAR WELDING DETAIL
SCALE 1:20



SECTION A
SCALE 1:10



CONCRETE SLEEPER REINFORCEMENT DETAIL
SCALE 1:20



TYPICAL CONCRETE SLEEPER WALL
SCALE 1:20

CODE	REVISION	DATE	BY
F	FOR CONSTRUCTION	17.06.25	NW
H	FOR CONSTRUCTION	30.10.25	NW
G	FOR CONSTRUCTION	18.07.25	NW

MORGAN CONSULTING ENGINEERS
♦STRUCTURAL♦CIVIL♦HOUSING♦FORENSIC♦
1 GREAT GEORGE STREET
PADDINGTON QLD 4064
PHONE: (07) 3369 8411
FAX: (07) 3369 1893
EMAIL: mail@morgance.com.au

Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
SINGLE WALL 1600MM CRS – WITH FENCE LOADING (10KPA SURCHARGE)

Drawing No 24TR015/S114
Revision H

RETAINING WALL SPECIFICATION TABLE
10kPa SURCHARGE WITH FENCE (MAX 1.8m HIGH FENCE)

POST SPACING (CTRS)	'H' (RETAINING WALL HIGHT)	POST SIZE	POST EMBEDMENT (MIN)	'D' PIER DEPTH 'CONDITION 1'	'D' PIER DEPTH 'CONDITION 2'	'D' PIER DEPTH 'CONDITION 3'	PIER ⌀
2000mm	600mm	100 UC 14.8	300mm	1200mm	1200mm	1100mm	450⌀
2000mm	800mm	100 UC 14.8	300mm	1400mm	1300mm	1200mm	450⌀
2000mm	1000mm	100 UC 14.8	300mm	1500mm	1500mm	1300mm	450⌀
2000mm	1200mm	100 UC 14.8 *0	300mm	1700mm	1600mm	1400mm	450⌀
2000mm	1400mm	150 UC 23.4/ 180 UB 18.1	300mm	1800mm	1800mm	1600mm	450⌀
2000mm	1600mm	150 UC 23.4/ 180 UB 18.1	300mm	2000mm	1900mm	1700mm	450⌀
2000mm	1800mm	150 UC 23.4	300mm	2300mm	2200mm	1800mm	450⌀
2000mm	2000mm	150 UC 23.4*0	400mm	2500mm	2400mm	2000mm	450⌀
2000mm	2200mm	150 UC 30	400mm	2800mm	2600mm	2100mm	450⌀
2000mm	2400mm	150 UC 37.2	400mm	3000mm	2800mm	2300mm	450⌀
2000mm	2600mm	150 UC 37.2	400mm	3200mm	3100mm	2500mm	450⌀
2000mm	2800mm	200 UC 46.2	400mm	3600mm	3400mm	2700mm	450⌀
2000mm	3000mm	200 UC 46.2	400mm	3900mm	3700mm	2900mm	450⌀
2000mm	3200mm	200 UC 59	400mm	3600mm	3400mm	2600mm	600⌀
2000mm	3400mm	200 UC 59	400mm	3900mm	3600mm	2800mm	600⌀
2000mm	3600mm	250 UC 72.9	400mm	4200mm	3900mm	3000mm	600⌀
2000mm	3800mm	250 UC 72.9	400mm	4500mm	4100mm	3100mm	600⌀
2000mm	4000mm	250 UC 72.9	400mm	4800mm	4400mm	3300mm	600⌀
2000mm	4200mm	250 UC 89.5	400mm	5100mm	4700mm	3500mm	600⌀

NOTE: ALL PIER DEPTHS MUST EQUAL TO WALL HEIGHTS U.N.O. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

** 2ND FROM THE END POST SIZE WILL NEED TO BE INCREASED TO NEXT SIZE UP FOR END WALLS WHERE NO HEIGHT REDUCTION OR CORNER OCCURS

SOIL PARAMETERS TABLES

SOIL CONDITION	BULK DENSITY (kN/m^3)	INTERNAL FRICTION ANGLE
CONDITION 1	20	25°
CONDITION 2	22	30°
CONDITION 3	22	42°

VALUES FROM GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

SOIL CLASSIFICATION

SOIL GROUP	TYPICAL SOILS IN GROUP
CONDITION 1	Engineered fill and residual clay/sand - stiff/medium dense (or stronger/denser)
CONDITION 2	Greywacke - very low to low strength
CONDITION 3	Greywacke - medium strength (or stronger)

SLEEPER SPECIFICATION TABLE - ENGINEERED FILL

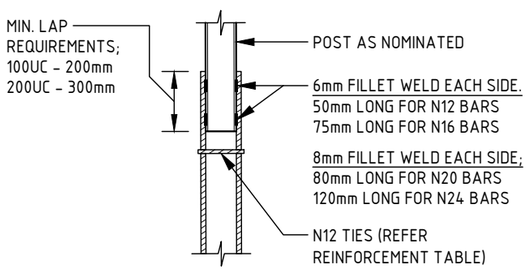
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 1400	2xN10	0 - 2000	2xN12
	1400 - 2000	3xN10	2000 - 2400	3xN12
90mm	2000 - 2200	2xN10	2400 - 2600	2xN12
	2200 - 2600	3xN10	2600 - 3000	3xN12
2/70mm	2600 -3200	2xN10	-	-
2/90mm	-	-	3000 - 4000	3x N12

SLEEPER SPECIFICATION TABLE - GREYWACKE

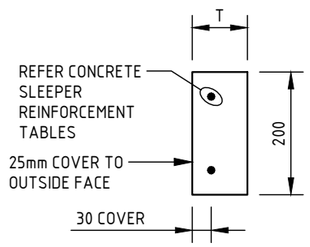
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 1800	2xN10	0 - 2400	2xN12
	1400 - 2400	3xN10	2000 - 2800	3xN12
90mm	2000 - 2600	2xN10	2400 - 3000	2xN12
	2200 - 3000	3xN10	2600 - 3400	3xN12
2/70mm	2600 -3600	2xN10	-	-
2/90mm	-	-	3000 - 4000	3x N12

STEEL REINFORCING BAR SCHEDULE

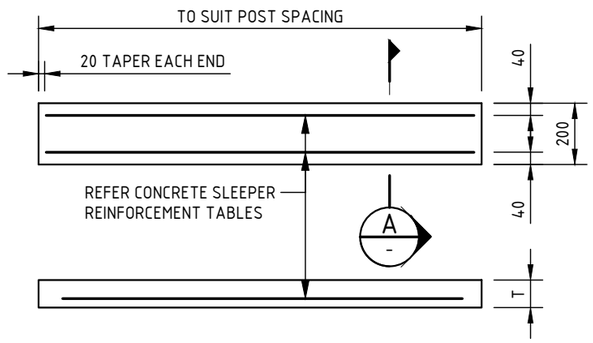
WALL HEIGHT	FRONT FACE REINFORCEMENT	REAR FACE REINFORCEMENT	N12 TIES
< 1000	2/N12	2/N12	NIL
1000 -1600	2/N12	3/N12	NIL
1800 - 2000	2/N12	2/N16	NIL
2200 - 2600	2/N12	3/N16	NIL
2800 - 3200	2/N12	4/N20	YES
3400	2/N12	5/N20	YES
3600 - 4000	2/N16	5/N24	YES



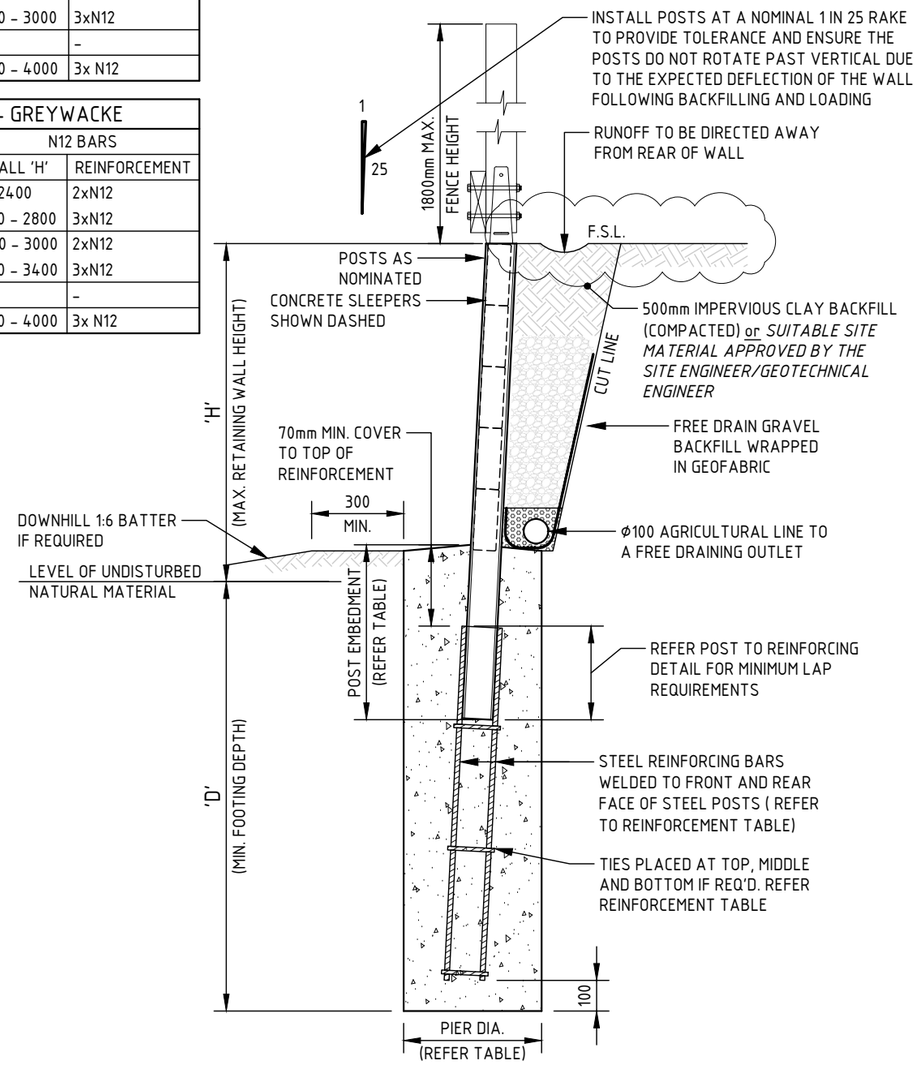
POST TO REINFORCING BAR WELDING DETAIL
SCALE 1:20



SECTION A-A
SCALE 1:10



CONCRETE SLEEPER REINFORCEMENT DETAIL
SCALE 1:20



TYPICAL CONCRETE SLEEPER WALL
SCALE 1:20

CODE	REVISION	DATE	BY
J	FOR CONSTRUCTION	30.10.25	NW
H	FOR CONSTRUCTION	18.07.25	NW
G	FOR CONSTRUCTION	17.06.25	NW

MORGAN CONSULTING ENGINEERS
•STRUCTURAL•CIVIL•HOUSING•FORENSIC•
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EMAIL: mail@morgance.com.au

Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
SINGLE WALL 2000MM CRS - WITH FENCE LOADING (10KPA SURCHARGE)

Drawing No 24TR015/S115
Revision J

RETAINING WALL SPECIFICATION TABLE
10kPa SURCHARGE WITH FENCE (MAX 1.8m HIGH FENCE)

POST SPACING (CTRS)	'H' (RETAINING WALL HIGHT)	POST SIZE	POST EMBEDMENT (MIN)	'D' PIER DEPTH 'CONDITION 1'	'D' PIER DEPTH 'CONDITION 2'	'D' PIER DEPTH 'CONDITION 3'	PIER ϕ
2400mm	600mm	100 UC 14.8	300mm	1300mm	1300mm	1200mm	450ϕ
2400mm	800mm	100 UC 14.8	300mm	1500mm	1400mm	1300mm	450ϕ
2400mm	1000mm	100 UC 14.8 *0	300mm	1700mm	1600mm	1400mm	450ϕ
2400mm	1200mm	100 UC 14.8 *0	300mm	1900mm	1800mm	1600mm	450ϕ
2400mm	1400mm	150 UC 23.4	300mm	2100mm	2000mm	1700mm	450ϕ
2400mm	1600mm	150 UC 23.4	300mm	2400mm	2200mm	1800mm	450ϕ
2400mm	1800mm	150 UC 23.4	350mm	2700mm	2500mm	2000mm	450ϕ
2400mm	2000mm	150 UC 30	450mm	3000mm	2800mm	2200mm	450ϕ
2400mm	2200mm	150 UC 37.2	450mm	3300mm	3000mm	2300mm	450ϕ
2400mm	2400mm	200 UC 46.2	450mm	3600mm	3300mm	2500mm	450ϕ

NOTE: ALL PIER DEPTHS MUST EQUAL TO WALL HEIGHTS U.N.O. REFER GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

** 2ND FROM THE END POST SIZE WILL NEED TO BE INCREASED TO NEXT SIZE UP FOR END WALLS WHERE NO HEIGHT REDUCTION OR CORNER OCCURS

SOIL PARAMETERS TABLES

SOIL CONDITION	BULK DENSITY (kN/m^3)	INTERNAL FRICTION ANGLE
CONDITION 1	20	25°
CONDITION 2	22	30°
CONDITION 3	22	42°

VALUES FROM GEOTECHNICAL INVESTIGATION REPORT CONDUCTED BY DOUGLAS PARTNERS PROJECT No. 210286.00 DOCUMENT No. R.003.REV3 ISSUE DATED 22ND NOVEMBER 2022

SOIL CLASSIFICATION

SOIL GROUP	TYPICAL SOILS IN GROUP
CONDITION 1	Engineered fill and residual clay/sand - stiff/medium dense (or stronger/denser)
CONDITION 2	Greywacke - very low to low strength
CONDITION 3	Greywacke - medium strength (or stronger)

SLEEPER SPECIFICATION TABLE - ENGINEERED FILL

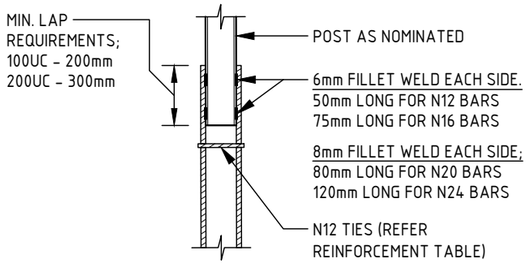
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 1400	2xN10	0 - 2000	2xN12
	1400 - 2000	3xN10	2000 - 2400	3xN12
90mm	2000 - 2200	2xN10	0 - 2400	2xN12
	2200 - 2400	3xN10		

SLEEPER SPECIFICATION TABLE - GREYWACKE

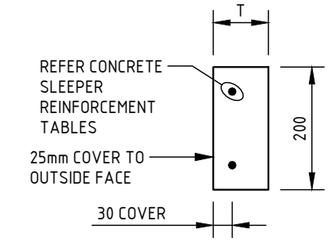
	N10 BARS		N12 BARS	
THICK (T)	WALL 'H'	REINFORCEMENT	WALL 'H'	REINFORCEMENT
70mm	0 - 1800	2xN10	0 - 2400	2xN12
	1400 - 2400	3xN10		
90mm	2000 - 2400	2xN10	0 - 2400	2xN12

STEEL REINFORCING BAR SCHEDULE

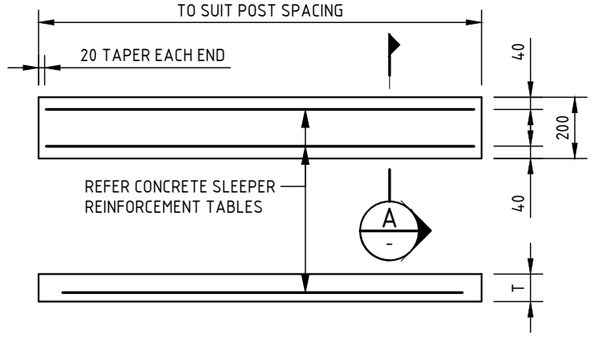
WALL HEIGHT	FRONT FACE REINFORCEMENT	REAR FACE REINFORCEMENT	N12 TIES
< 1000	2/N12	2/N12	NIL
1000 -1600	2/N12	3/N12	NIL
1800 - 2000	2/N12	2/N16	NIL
2200 - 2400	2/N12	3/N16	NIL



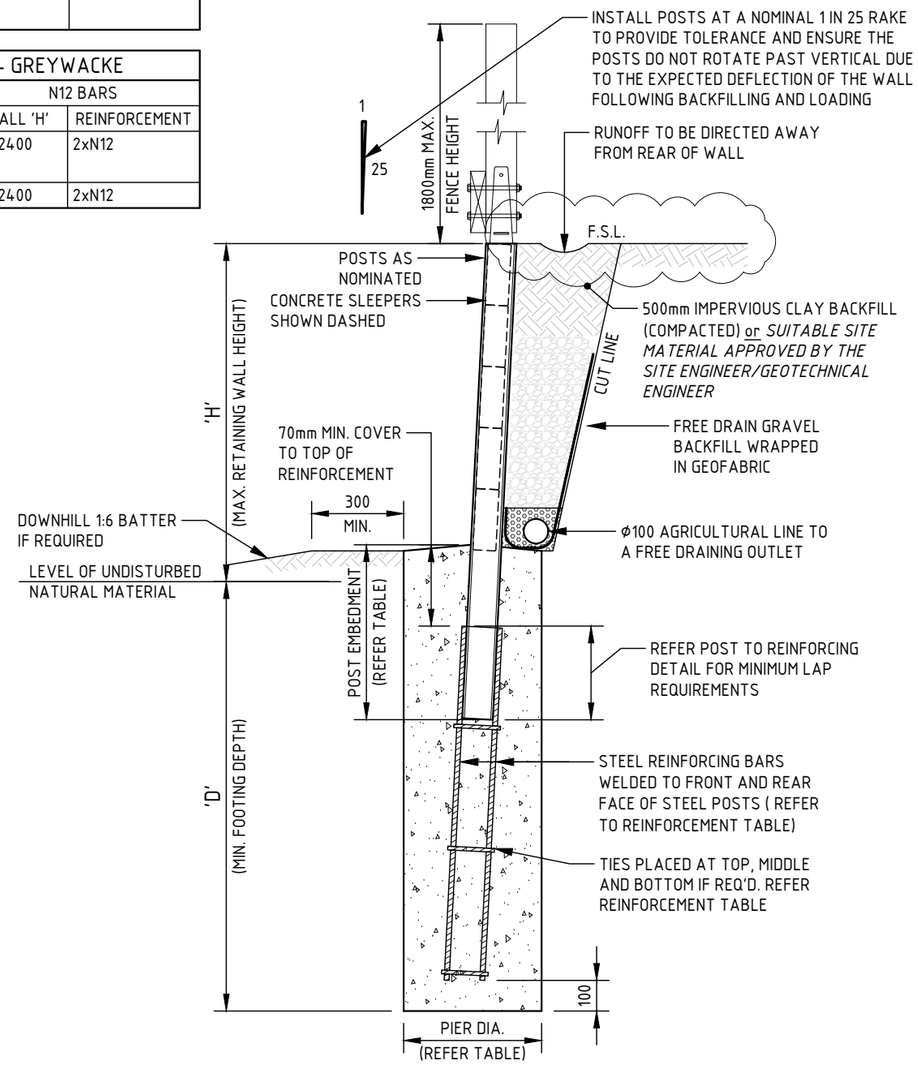
POST TO REINFORCING BAR WELDING DETAIL
SCALE 1:20



SECTION A-A
SCALE 1:10



CONCRETE SLEEPER REINFORCEMENT DETAIL
SCALE 1:20



TYPICAL CONCRETE SLEEPER WALL
SCALE 1:20

CODE	REVISION	DATE	BY
F	FOR CONSTRUCTION	17.06.25	NW
H	FOR CONSTRUCTION	30.10.25	NW
G	FOR CONSTRUCTION	18.07.25	NW

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EMAIL: mail@morgance.com.au

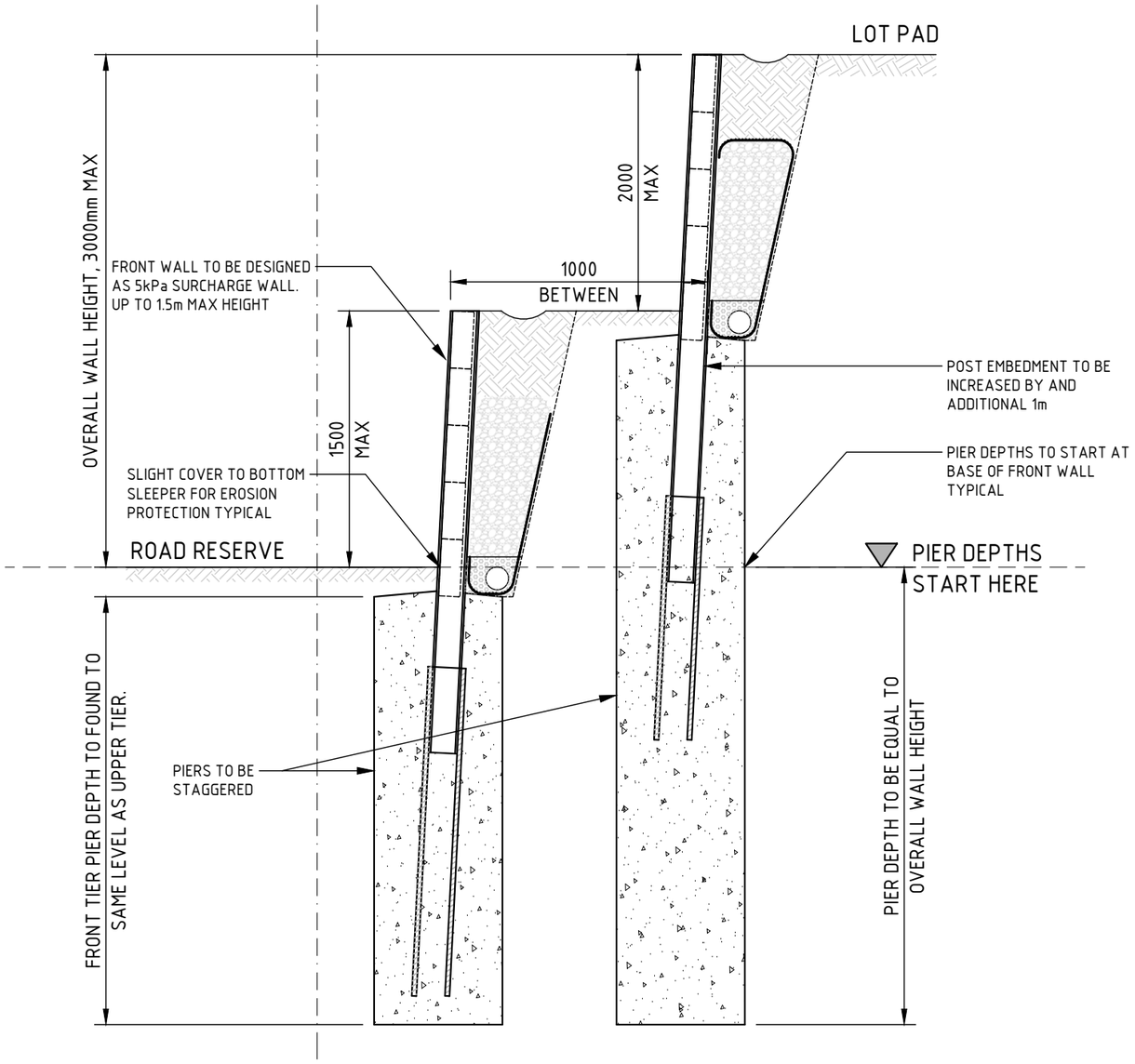
Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
SINGLE WALL 2400MM CRS - WITH FENCE LOADING (10KPA SURCHARGE)

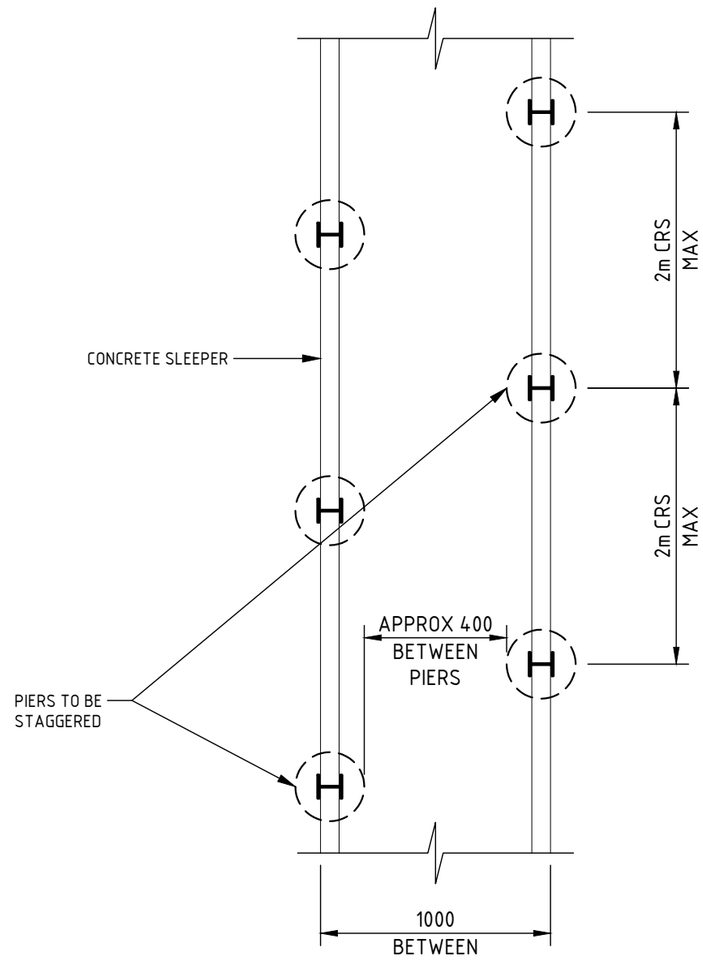
Drawing No	Revision
24TR015/S116	H

NOTE:
SOIL BETWEEN TIERS TO BE UNDISTURBED CONTROLLED MATERIAL OR NATURAL GROUND TYPICAL



TIERED SLEEPER RETAINING WALL TYPE 1 (5kPa SURCHARGE)

SCALE 1:20



TYPICAL ARRANGEMENT OF FOOTING FOR TIERED WALLS

SCALE 1:20

CODE	REVISION	DATE	BY
F	FOR CONSTRUCTION	30.10.25	N.W
E	CHANGES CLOUDED	18.07.25	N.W
D	FOR CONSTRUCTION	17.06.25	N.W

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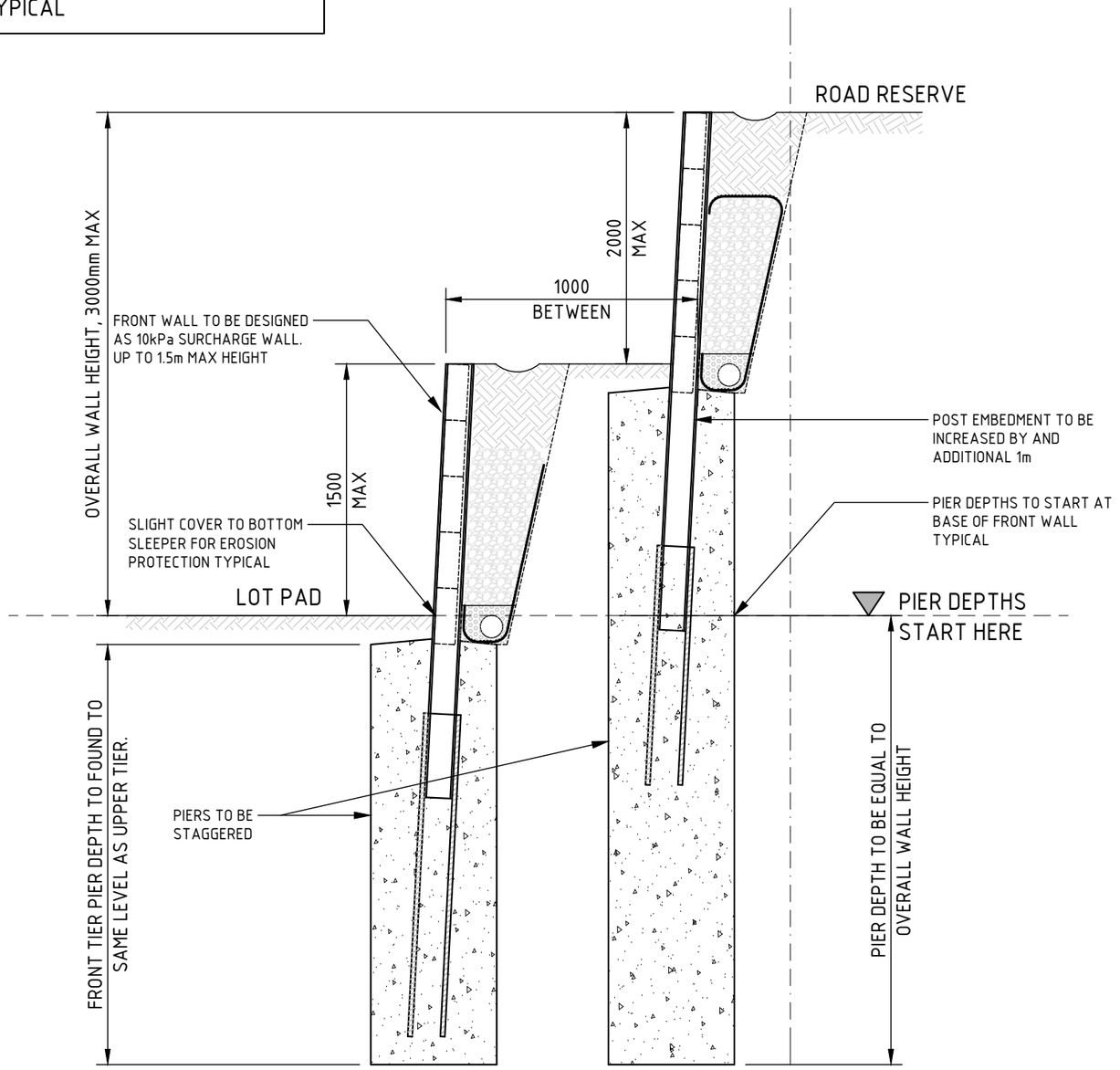
Scales (at A3)	1:20
Designed	S.M
Checked	S.M
Drawn	N.W
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
TYPICAL TIRED WALL DETAILS - SHEET 1

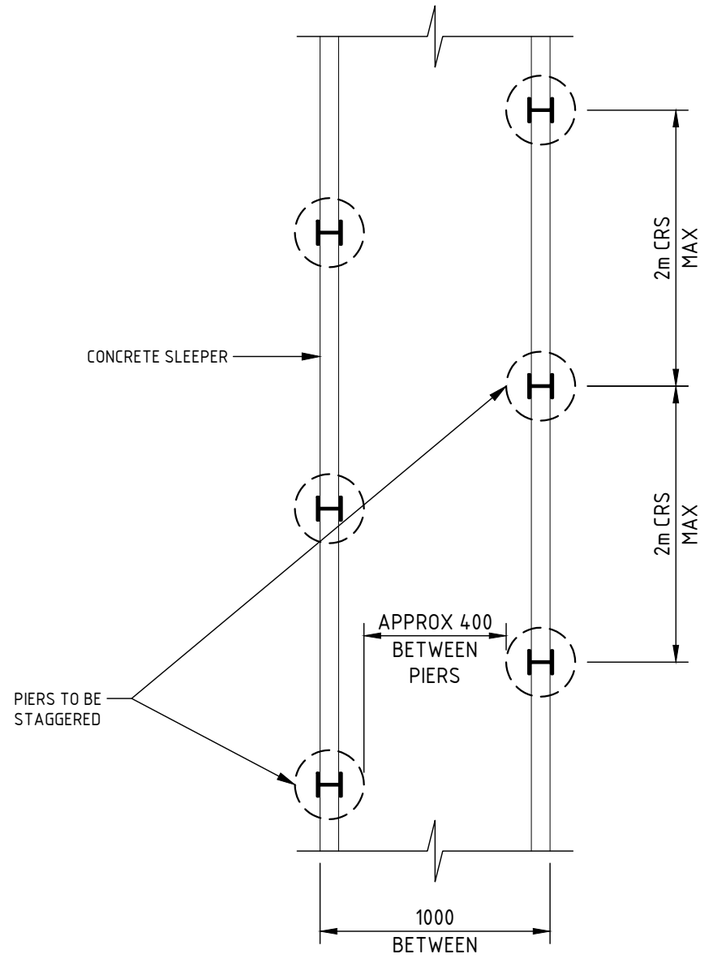
Drawing No 24TR015/S117
Revision F

NOTE:
SOIL BETWEEN TIERS TO BE UNDISTURBED CONTROLLED MATERIAL OR NATURAL GROUND TYPICAL



TIERED SLEEPER RETAINING WALL TYPE 2 (10kPa SURCHARGE)

SCALE 1:20



TYPICAL ARRANGEMENT OF FOOTING FOR TIERED WALLS

SCALE 1:20

CODE	REVISION	DATE	BY
F	FOR CONSTRUCTION	30.10.25	N.W
E	FOR CONSTRUCTION	18.07.25	N.W
D	FOR CONSTRUCTION	17.06.25	NW

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Scales (at A3)	1:20
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
TYPICAL TIRED WALL DETAILS - SHEET 2

Drawing No 24TR015/S118
Revision F

BUILDING OVER NEAR SEWER & STORMWATER INFRASTRUCTURE: (QDC MP1.4 / B.O.S / B.O.N.S.W.

THE NOTES, DETAILS & SPECIFICATIONS CONTAINED WITH THIS DRAWING RELATING TO THE BUILDING OVER NEAR SEWER &/OR STORMWATER INFRASTRUCTURE ONLY DEMONSTRATES COMPLIANCE OF THE SLAB & FOOTING DESIGN WITH THE STRUCTURAL PERFORMANCE CRITERIA SETOUT WITHIN QDC MP1.4 &/OR THE LOCAL AUTHORITY'S B.O.S. / B.O.N.S.W POLICY.

COMPLIANCE WITH ALL NON-STRUCTURAL PERFORMANCE CRITERIA (i.e. ACCESS, FILLING, EXCAVATION, VENTILATION) SETOUT WITHIN THOSE POLICES HAS NOT BEEN ASSESSED OR DETERMINED BY THE OFFICE & IS NOT INCLUDED IN THIS DRAWING OR THE FORM 15 DESIGN CERTIFICATE ISSUED BY THIS OFFICE FOR THE PROPOSED WORK.

REFER TO THE ARCHITECTURAL & OPERATION WORKS / HYDRAULIC DRAWINGS & DOCUMENTATION BY OTHERS FOR COMPLIANCE WITH ALL NON-STRUCTURAL PERFORMANCE CRITERIA.

1. ALL SEWER & STORMWATER INVERTS, MANHOLES & PROPERTY CONNECTION LOCATIONS, DEPTHS & DIAMETERS NOMINATED WITHIN THIS DRAWING ARE INDICATIVE ONLY BEING BASED ON LOCATIONS & DETAILS SHOWN WITHIN INFORMATION, DRAWINGS, &/OR BiMAPS PROVIDED TO THIS OFFICE.

   ALL INVERTS, MANHOLES & PROPERTY CONNECTION LOCATIONS, DEPTHS & DETAILS ARE TO BE CONFIRMED BY THE BUILDER ONSITE PRIOR TO CONSTRUCTION COMMENCING AND ALL WORK IS TO COMPLY WITH 'QDC MP1.4 - BUILDING OVER OR NEAR RELEVANT INFRASTRUCTURE' & THE LOCAL AUTHORITY'S B.O.S. / B.O.N.S.W. REQUIREMENTS AS NECESSARY.

   SHOULD ACTUAL INVERT, MANHOLE & PROPERTY CONNECTION LOCATIONS VARY SIGNIFICANTLY TO THOSE SHOWN WITHIN THIS DRAWING OR SHOULD OTHER INFRASTRUCTURE BE IDENTIFIED BEFORE / DURING / AFTER CONSTRUCTION, THE DESIGN AND DETAILS WITHIN THE DRAWINGS MAY BE INVALID & THIS OFFICE MUST BE CONTACTED PRIOR TO CONSTRUCTION CONTINUING FOR THE DESIGN TO BE REASSESSED AND AMENDED IF DETERMINED NECESSARY.

2. NO RESPONSIBLY IS TAKEN IN THE ACCURACY OF THE INVERTS, PROPERTY CONNECTIONS, & MANHOLE LOCATIONS SHOWN WITHIN THE DRAWING OR IF OTHER COUNCIL INFRASTRUCTURE (SEWER, STORMWATER, EASEMENTS) ARE IDENTIFIED WITHIN THE SITE AREA OR ADJACENT PROPERTIES BEFORE &/OR DURING CONSTRUCTION.

3. EDGE CLEARANCES AND BRIDGING DETAILS SHOWN WITHIN THIS DRAWING ARE BASED UPON THE REQUIREMENTS PROVIDED WITHIN 'QDC MP 1.4 - BUILDING OVER OR NEAR RELEVANT INFRASTRUCTURE' &/OR THE LOCAL AUTHORITY'S B.O.S. / B.O.N.S.W. REQUIREMENTS AS APPLICABLE.

4. WHERE MIN DEPTHS. EDGE DISTANCES OR OTHER REQUIREMENTS CANNOT BE ACHIEVED DURING CONSTRUCTION DUE TO SITE CONSTRAINTS &/OR SUBSURFACE MATERIAL ENCOUNTERED, THE BUILDER IS TO FIRST CONTACT THE RELEVANT OFFICE OF THE LOCAL AUTHORITY ISSUING B.O.S. / B.O.N.S.W. APPROVAL TO SEEK CLARIFICATION & CONFIRMATION ON ACCEPTABLE ALTERNATE CONSTRUCTION &/OR VARIATIONS TO THE APPROVAL DOCUMENTATION PRIOR TO CONTACTING THIS OFFICE.

MIN EDGE CLEARANCE REQUIREMENTS:

ϕ300 SEWER -

* BORED/SCREW PIER FOOTINGS 1200mm OF FURTHER FROM INVERT CAN BE EXCAVATED USING STANDARD METHODS.
* BORED/SCREW PIER FOOTINGS WITHIN 600-1200mm OF INVERT MUST BE BACKHOE EXCAVATED
* BORED/SCREW PIER FOOTINGS WITHIN 600-1200mm OF INVERT MUST BE HAND OR VACUUM EXCAVATED

ϕ225 SEWER -

* BORED/SCREW PIER FOOTINGS 1200mm OF FURTHER FROM INVERT CAN BE EXCAVATED USING STANDARD METHODS.
* BORED/SCREW PIER FOOTINGS WITHIN 600-1200mm OF INVERT MUST BE BACKHOE EXCAVATED
* BORED/SCREW PIER FOOTINGS WITHIN 600-1200mm OF INVERT MUST BE HAND OR VACUUM EXCAVATED

ϕ750 & ϕ825 STORMWATER -

* BORED/SCREW PIER FOOTINGS 1200mm OF FURTHER FROM INVERT CAN BE EXCAVATED USING STANDARD METHODS.
* BORED/SCREW PIER FOOTINGS WITHIN 600-1200mm OF INVERT MUST BE BACKHOE EXCAVATED
* BORED/SCREW PIER FOOTINGS WITHIN 600-1200mm OF INVERT MUST BE HAND OR VACUUM EXCAVATED

ϕ900 & ϕ1050 STORMWATER -

* BORED/SCREW PIER FOOTINGS 1200mm OF FURTHER FROM INVERT CAN BE EXCAVATED USING STANDARD METHODS.
* BORED/SCREW PIER FOOTINGS WITHIN 600-1200mm OF INVERT MUST BE BACKHOE EXCAVATED
* BORED/SCREW PIER FOOTINGS WITHIN 600-1200mm OF INVERT MUST BE HAND OR VACUUM EXCAVATED

FOUNDING REQUIREMENTS:-
SEWER INVERTS -

* ALL PIER FOOTINGS ARE TO BE DEEPENED AS NECESSARY TO FOUND 300 MIN BELOW DEPTH OF ADJACENT SEWER INVERTS, & , 300 MIN INTO SPECIFIED FOUNDING MATERIAL.

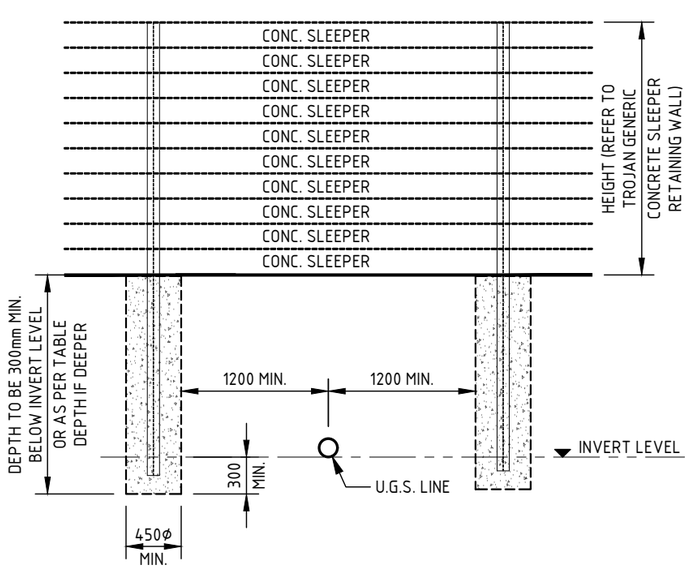
STORMWATER INVERTS -

* ALL PIER FOOTINGS ARE TO BE DEEPENED AS NECESSARY TO FOUND 600 MIN BELOW DEPTH OF ADJACENT STORMWATER INVERTS, & , 300 MIN INTO SPECIFIED FOUNDING MATERIAL

EXISTING SLAB AND FOOTINGS:-
THIS OFFICE ASSUMED THE DESIGN & CONSTRUCTION OF ALL EXISTING SLAB, FOOTING & RETAINING WALL SYSTEMS COMPLIED WITH THE LOCAL AUTHORITY'S B.O.W. / B.O.N.S.W. REQUIREMENTS & POLICIES AT THE TIME OF ORIGINAL CONSTRUCTION.

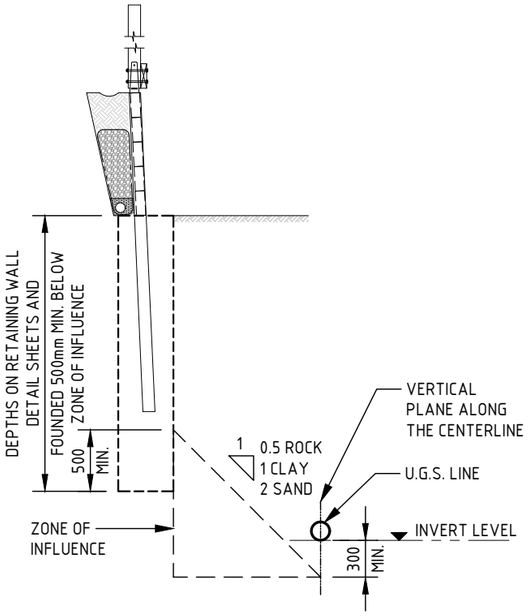
COMPLIANCE &/OR CERTIFICATION OF EXISTING SLAB, FOOTINGS & RETAINING WALLS WITH LOCAL AUTHORITY'S B.O.S. / B.O.N.S.W. POLICY &/OR QDC MP1.4 IS NOT INCLUDES WITHIN THE DESIGN CERTIFICATION (FORM 15) BY THIS OFFICE FOR THE PROPOSED WORK.

THIS OFFICE ACCEPTS NO RESPONSIBILITY IF IT IS FOUND THAT NO APPROVAL FROM THE LOCAL AUTHORITY WAS SOUGHT OR OBTAINED FOR THE CONSTRUCTION OF EXISTING SLAB, FOOTING & RETAINING WALL SYSTEMS OR THAT THEIR ACTUAL CONSTRUCTION DOES NOT COMPLY WITH QDC MP1.4 &/OR LOCAL AUTHORIY;S B.O.S. / B.O.N.S.W REQUIREMENTS



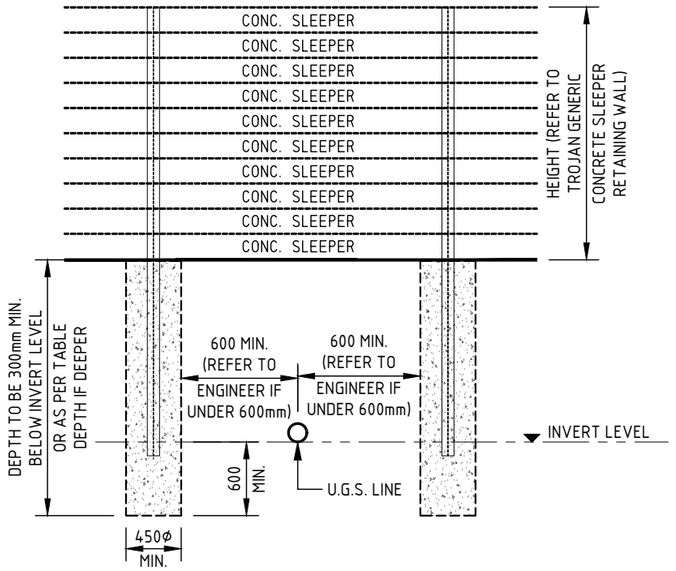
CONCRETE SLEEPER WALL B.O.S. DETAIL - 1200mm MIN. FROM U.G.S. LINE

SCALE 1:50



BUILD NEAR INFRASTRUCTURE DETAIL

SCALE 1:50



CONCRETE SLEEPER WALL B.O.S. DETAIL - UNDER 1200mm FROM U.G.S. LINE

SCALE 1:50

C	FOR CONSTRUCTION	17.06.25	N.W
E	FOR CONSTRUCTION	30.10.25	N.W
D	FOR CONSTRUCTION	18.07.25	NW
CODE	REVISION	DATE	BY

MORGAN CONSULTING ENGINEERS
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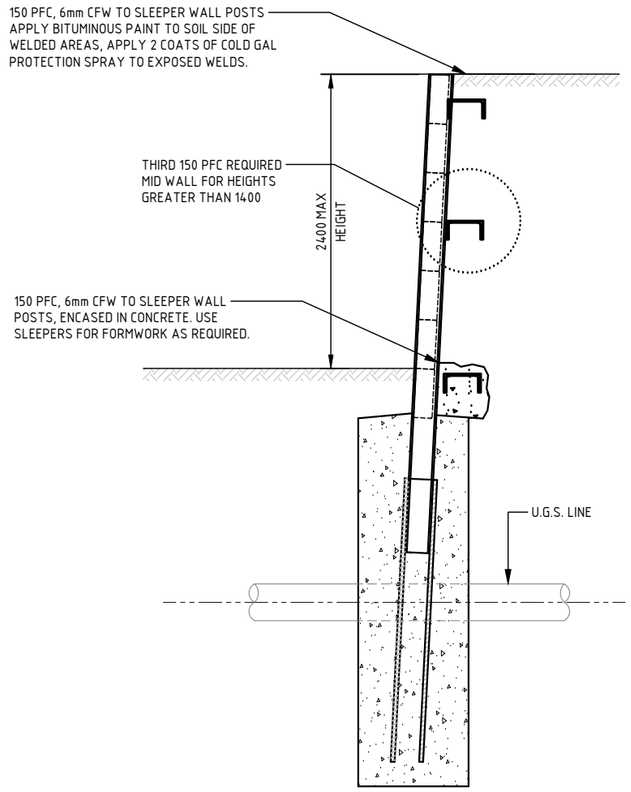
Scales (at A3)	1:20, 1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

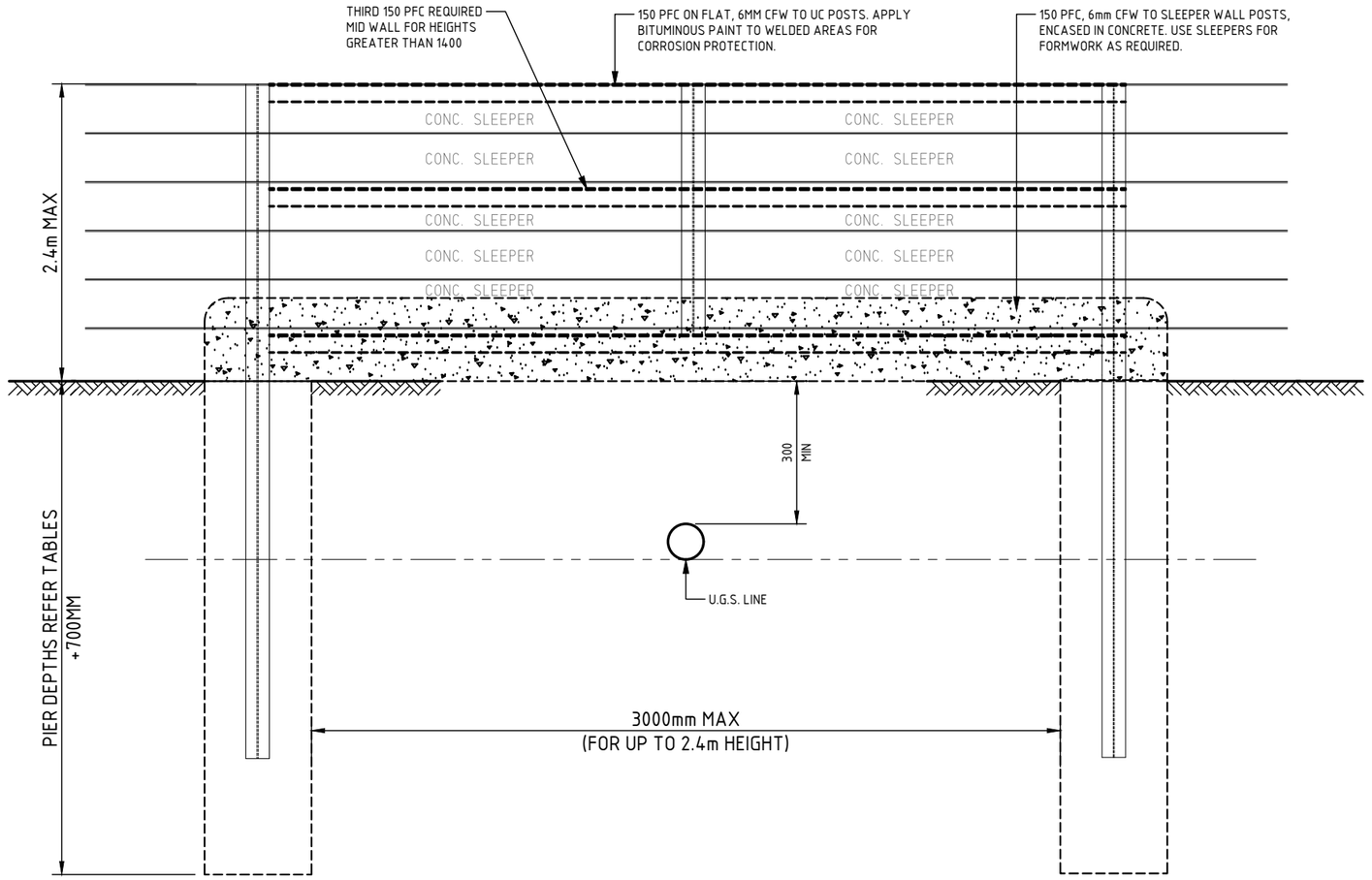
Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
TYPICAL B.O.S NOTES AND DETAILS - SHEET 1

Drawing No	24TR015/S121
Revision	E



TYPICAL CONCRETE SLEEPER WALL AT STEEL BRIDGING BEAM
SCALE 1:20



TYPICAL SECTION THROUGH - STEEL BRIDGING BEAM UP TO 2.4m HIGH
SCALE 1:20

CODE	REVISION	DATE	BY
C	FOR CONSTRUCTION	17.06.25	N.W
E	FOR CONSTRUCTION	30.10.25	N.W
D	FOR CONSTRUCTION	18.07.25	NW

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EMAIL: mail@morgance.com.au

Scales (at A3) 1:20
Designed SM | Checked S.M
Drawn NW | Date APR 24
Authorised for issue SHAUN MALIN

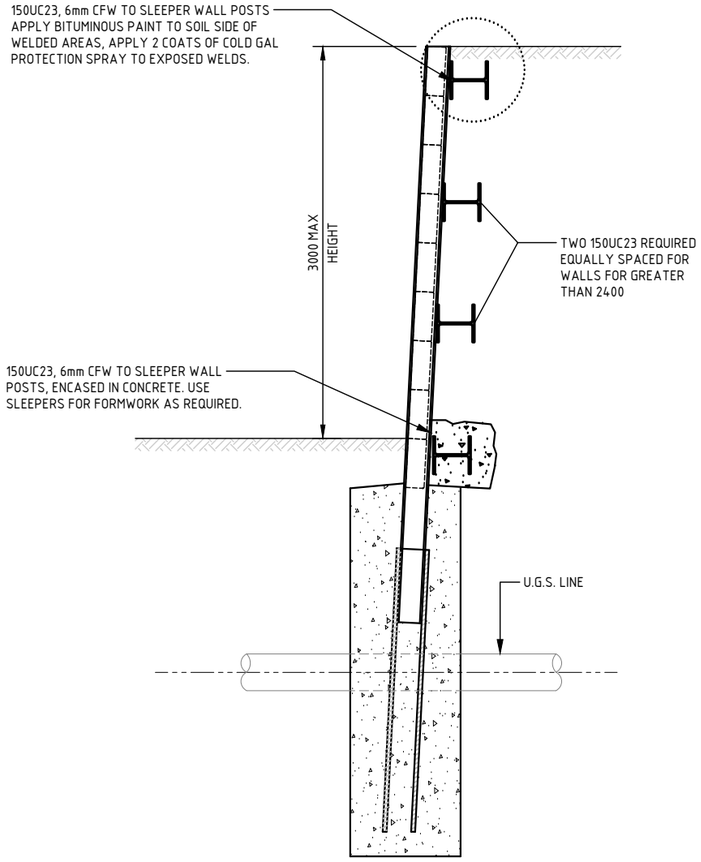
Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
TYPICAL STEEL BRIDGING BEAM DETAIL- UP TO 2.4M HIGH

Drawing No 24TR015/S122
Revision E

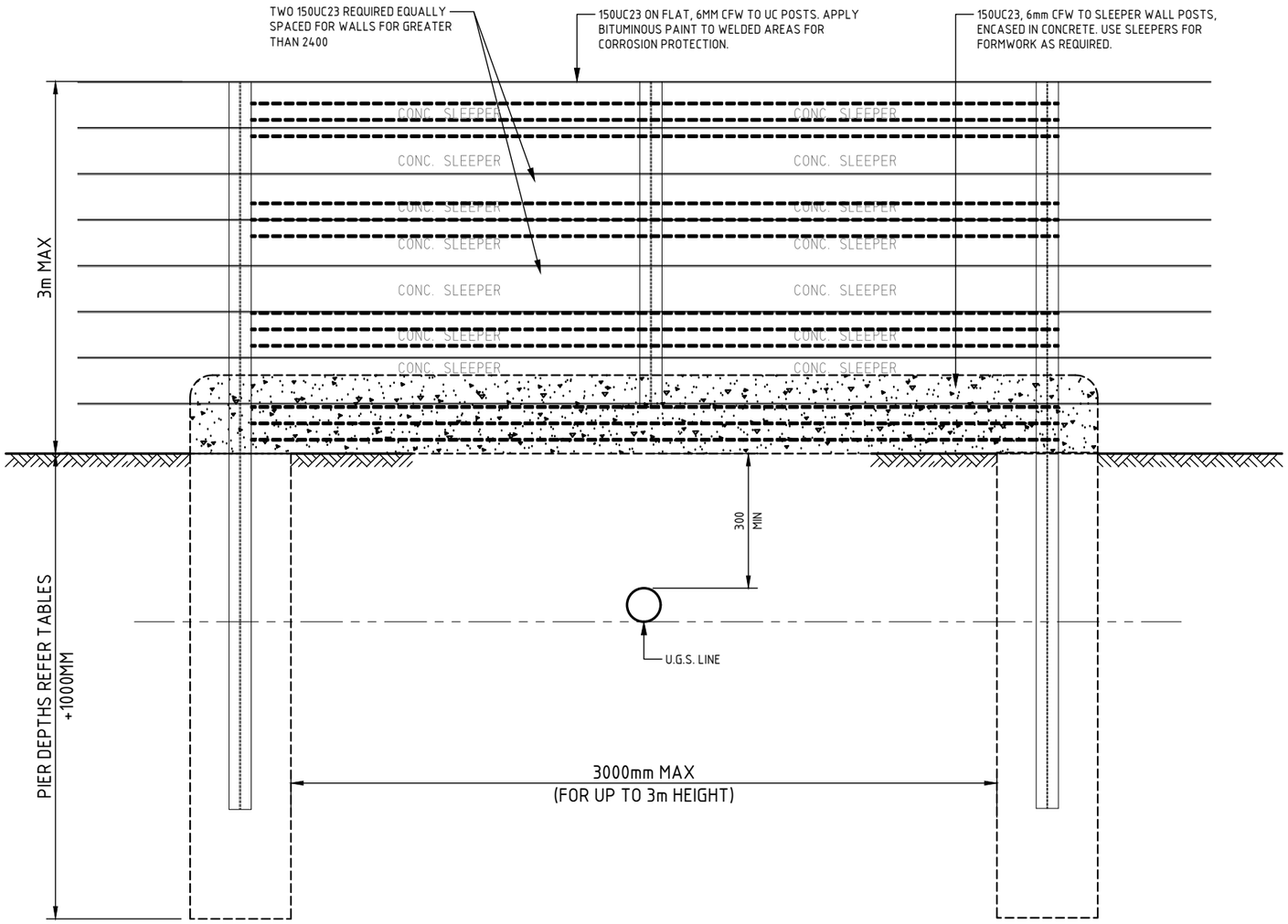
NOTE

150UC23 BEAMS CAN BE SUBSTITUTED WITH 7/ 150 PFC'S EQUALLY SPACED IF REQUIRED



TYPICAL CONCRETE SLEEPER WALL AT STEEL BRIDGING BEAM

SCALE 1:20



TYPICAL SECTION THROUGH - STEEL BRIDGING BEAM FROM 2.6m-3m HIGH

SCALE 1:20

CODE	REVISION	DATE	BY
F	FOR CONSTRUCTION	30.10.25	N.W
E	FOR CONSTRUCTION	24.07.25	N.W
D	FOR CONSTRUCTION	18.07.25	NW

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Scales (at A3)	1:20
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

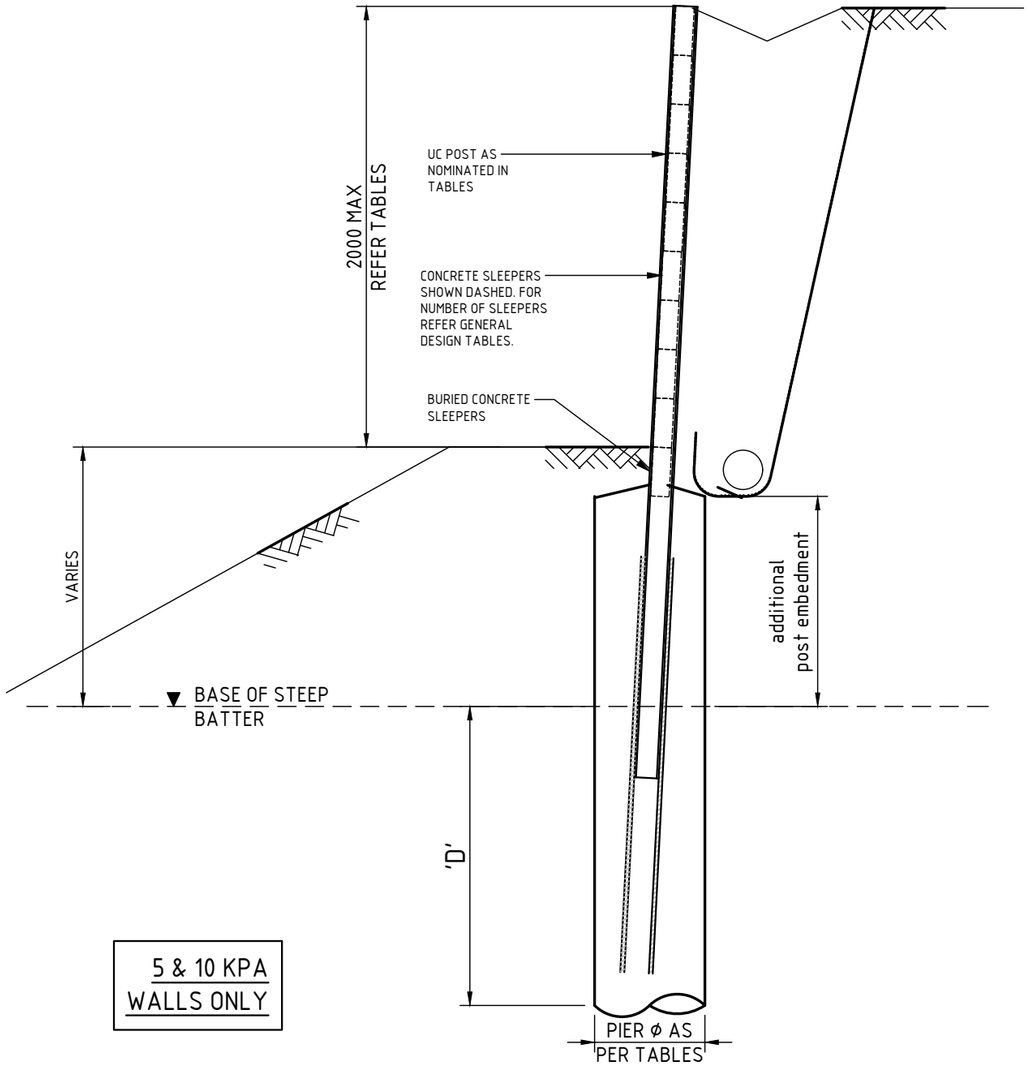
Project
PROPOSED SLEEPER RETAINING WALLS

Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
TYPICAL STEEL BRIDGING BEAM DETAIL- 2.6M UP TO 3M

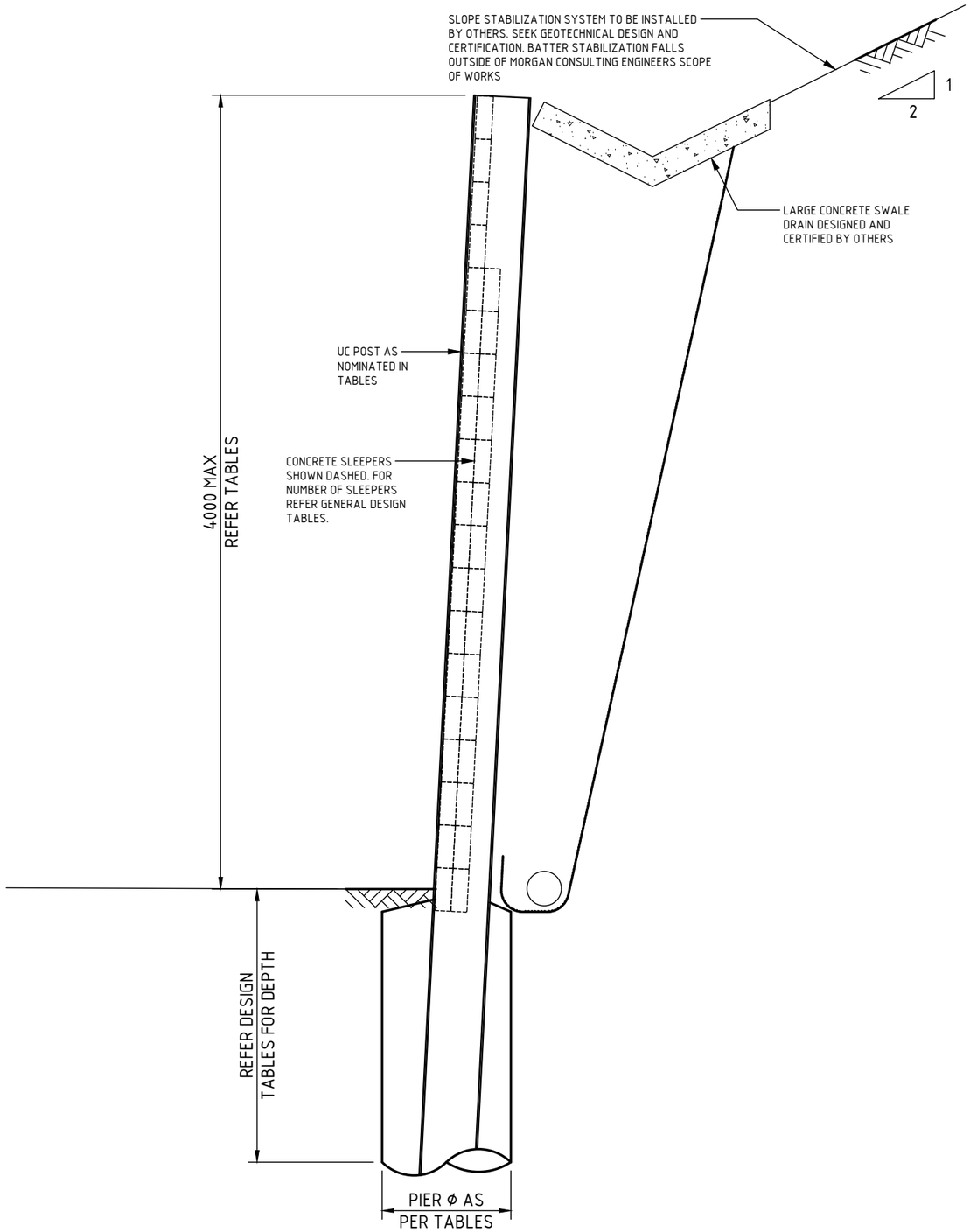
Drawing No 24TR015/S123

Revision F



TYPICAL CONCRETE SLEEPER WALL WITH STEEP BATTER IN FRONT OF WALL

SCALE 1:20



TYPICAL CONCRETE SLEEPER WALL WITH STEEP BATTER AND SWALE BEHIND

SCALE 1:20

CODE	REVISION	DATE	BY
F	FOR CONSTRUCTION	30.10.25	N.W
E	FOR CONSTRUCTION	04.09.25	N.W
D	FOR CONSTRUCTION	18.07.25	NW

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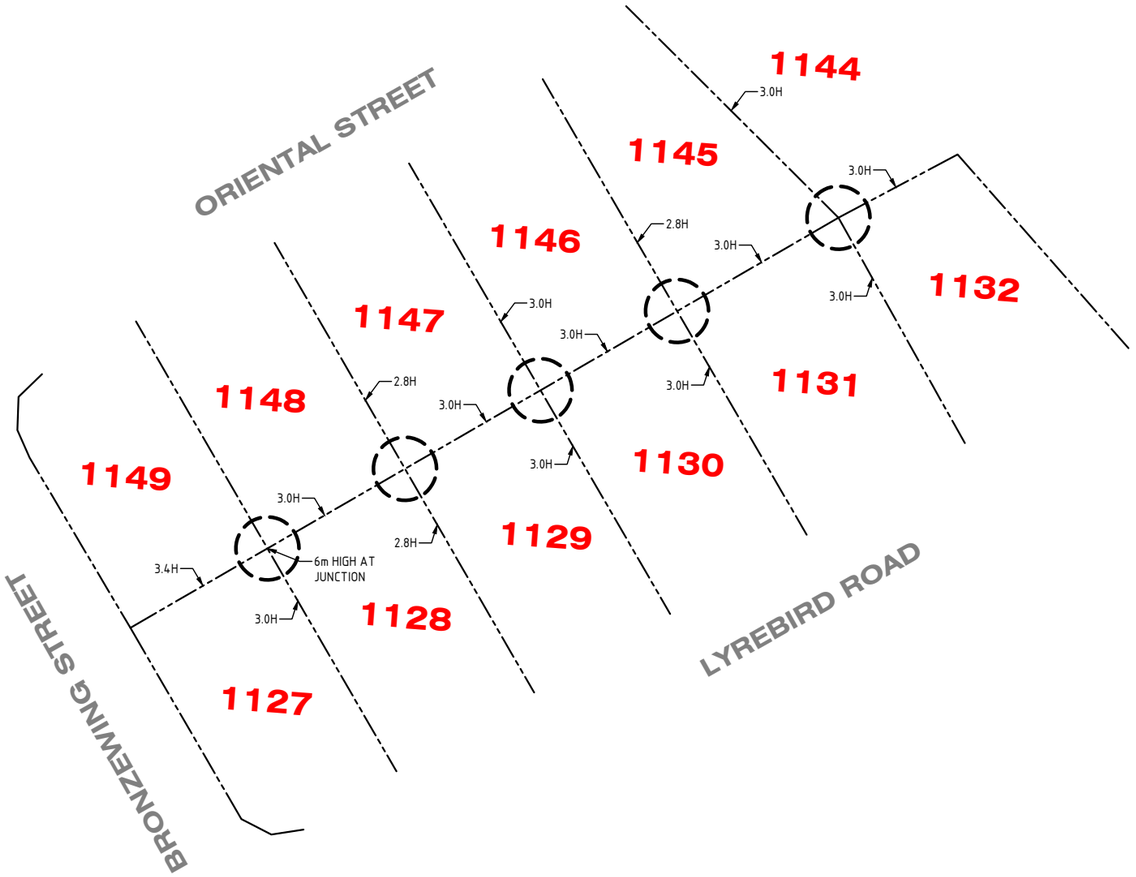
Scales (at A3)	1:23.939
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
TYPICAL DETAILS WALLS WITH BATERS IN FRONT OR BEHIND

Drawing No 24TR015/S124

Revision F



RETAINING WALL JUNCTION MAP
SCALE N.T.S

CODE	REVISION	DATE	BY
C	FOR CONSTRUCTION	30.10.25	N.W
B	FOR CONSTRUCTION	18.07.25	N.W
A	FOR CONSTRUCTION	17.06.25	NW

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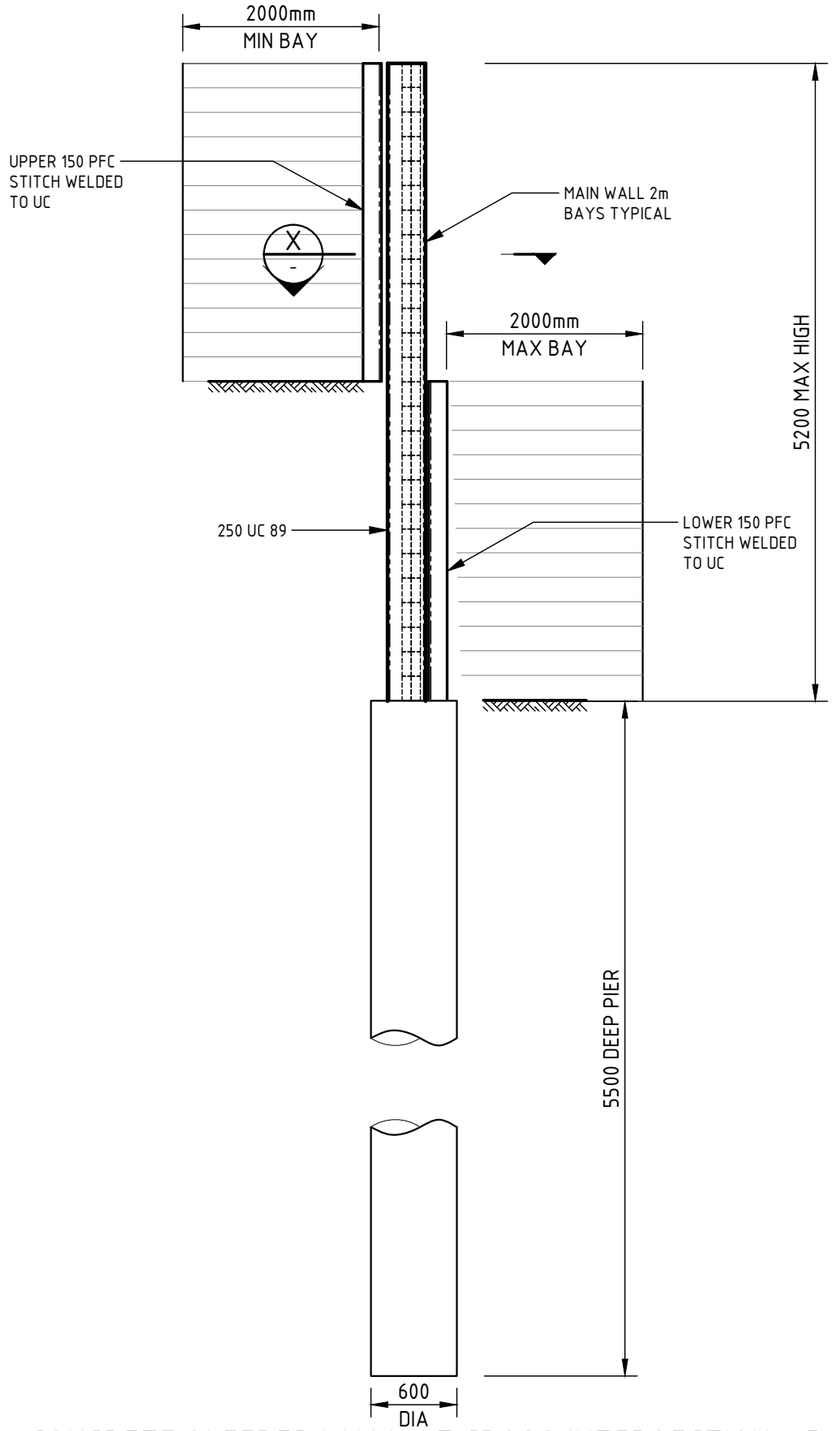
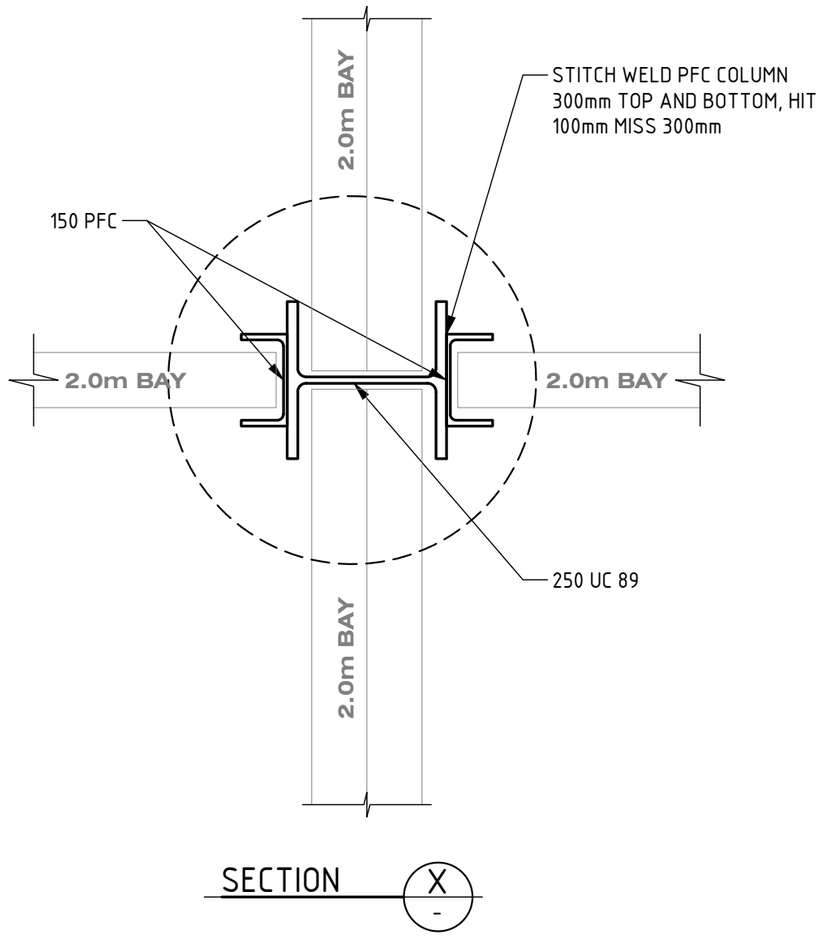
Scales (at A3)	N.T.S, 1:50
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
RETAINING WALL JUNCTION MAP

Drawing No 24TR015/S200
Revision C





CONCRETE SLEEPER WALL AT CROSS INTERSECTION - 5.2m HIGH

SCALE 1:50

CODE	REVISION	DATE	BY
C	FOR CONSTRUCTION	30.10.25	N.W
B	FOR CONSTRUCTION	18.07.25	N.W
A	FOR CONSTRUCTION	17.06.25	NW

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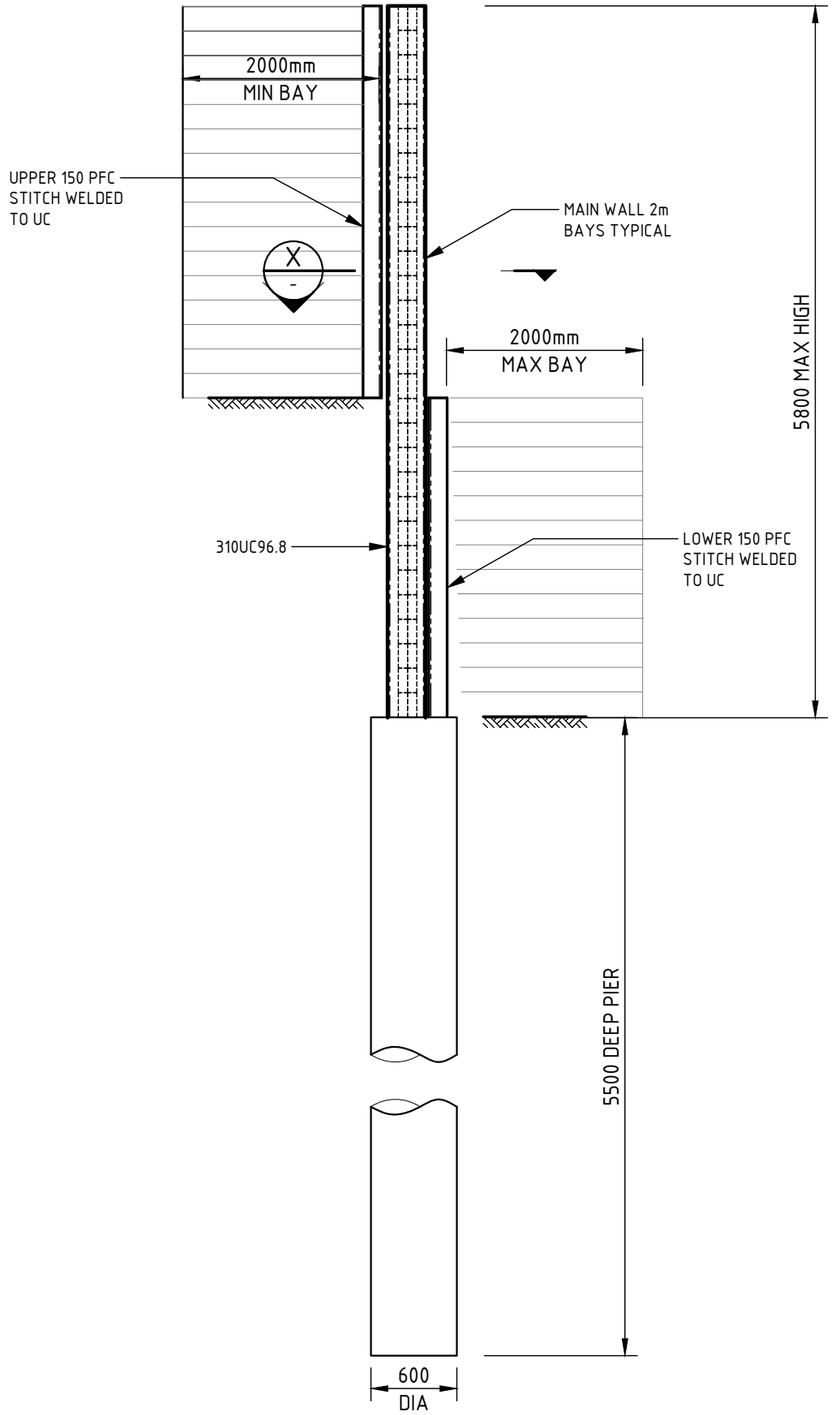
Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

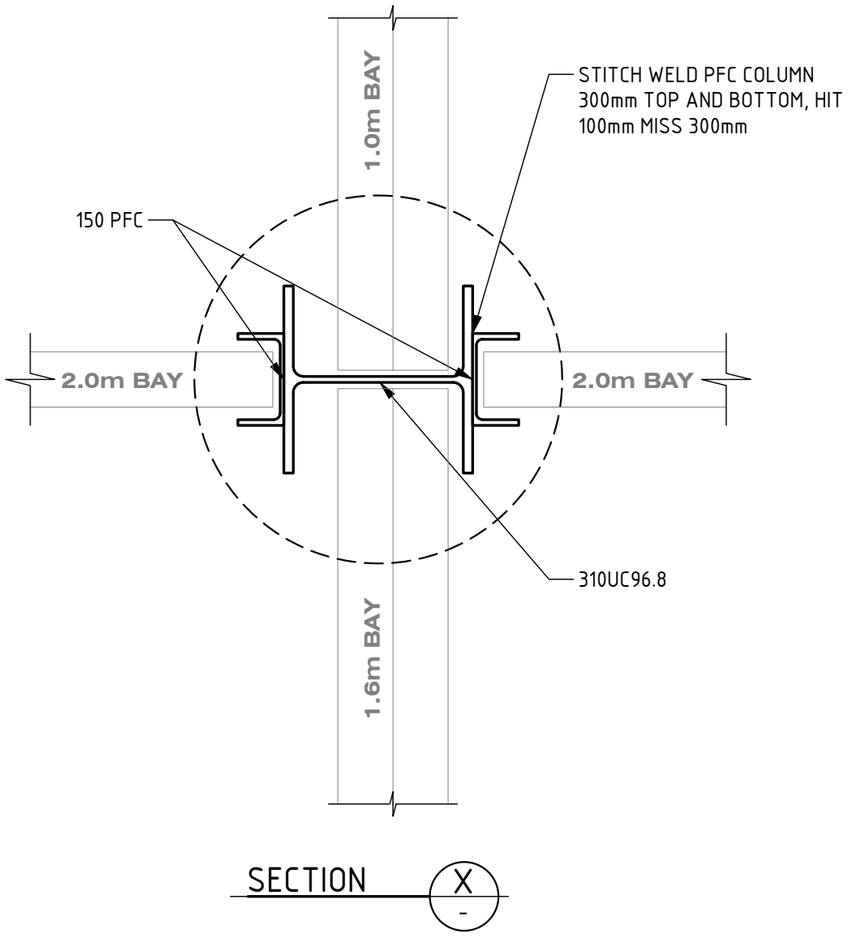
Drawing title
TYPICAL RETAINING WALL JUNCTION 5.2M HIGH

Drawing No 24TR015/S211
Revision C



CONCRETE SLEEPER WALL AT CROSS INTERSECTION – 5.8m HIGH

SCALE 1:50



CODE	REVISION	DATE	BY
C	FOR CONSTRUCTION	30.10.25	N.W
B	FOR CONSTRUCTION	18.07.25	N.W
A	FOR CONSTRUCTION	17.06.25	NW

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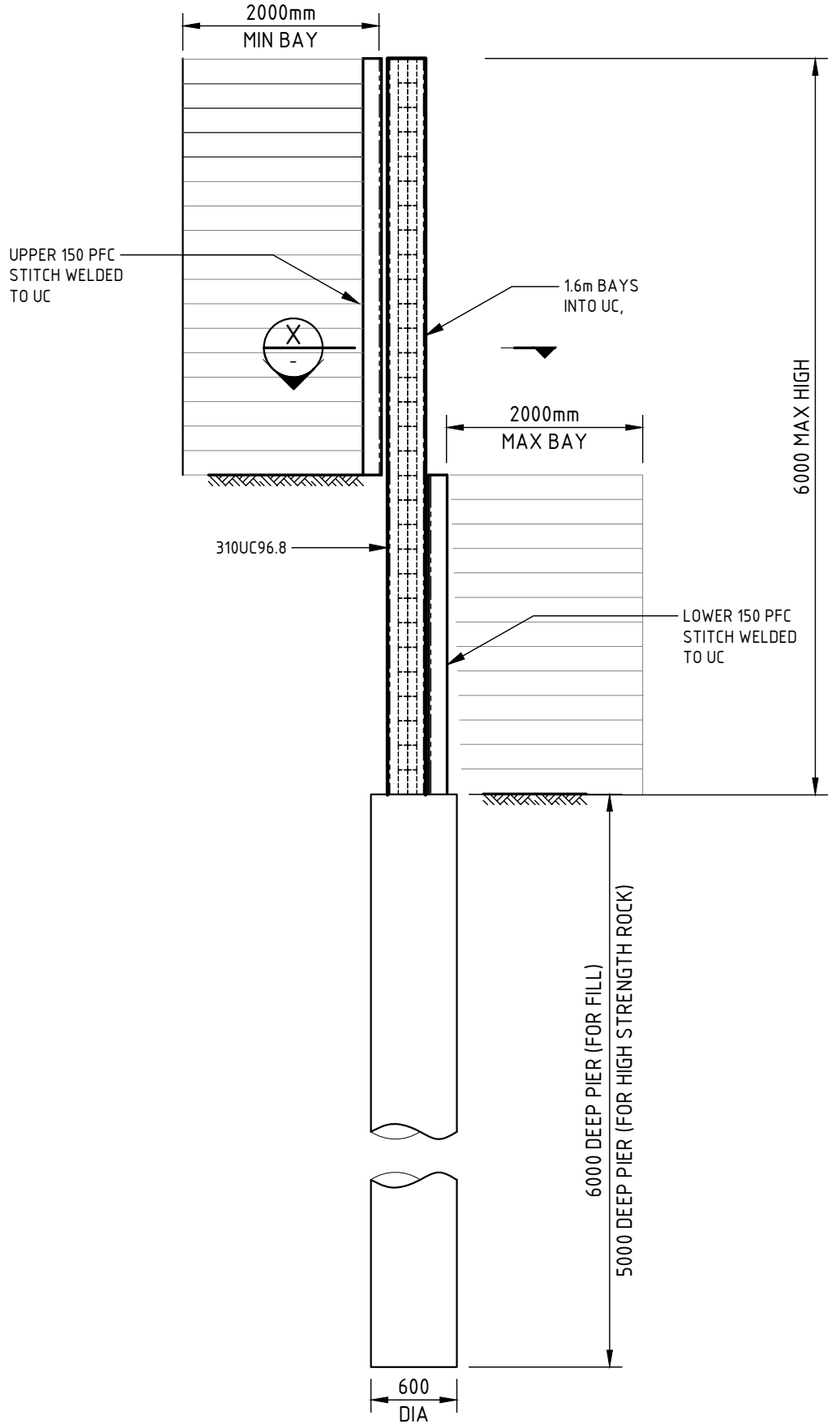
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

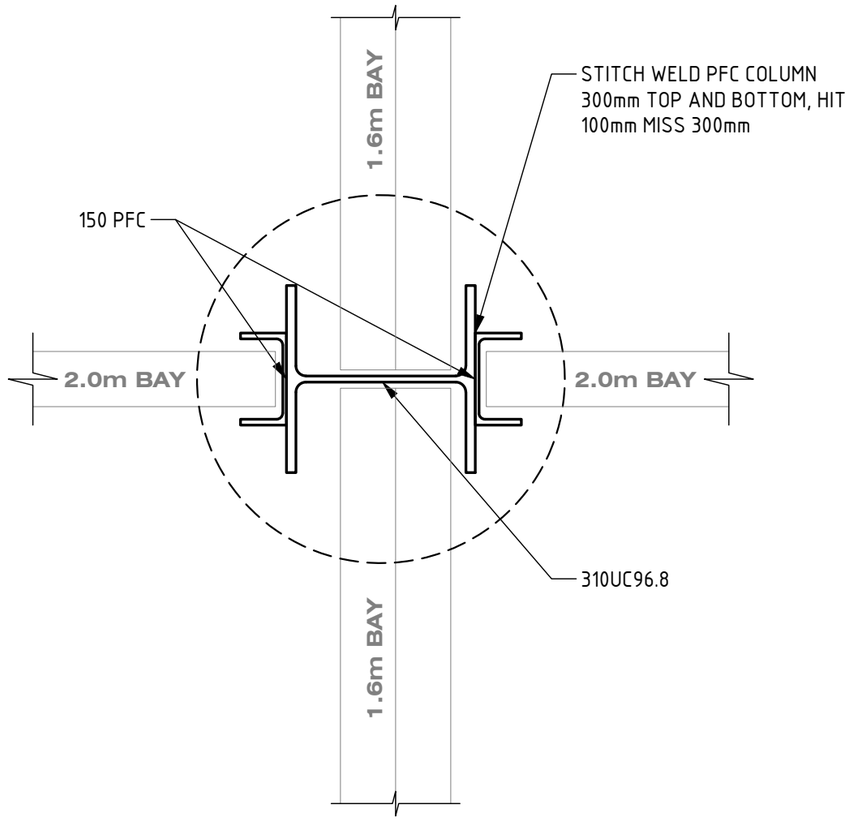
Project
PROPOSED SLEEPER RETAINING WALLS
Address
No. 331 HINKLER DRIVE, WORONGARY (SKYRIDGE STAGES 10-14)

Drawing title
TYPICAL RETAINING WALL JUNCTION 5.8M HIGH

Drawing No 24TR015/S212

Revision C





SECTION X -

CONCRETE SLEEPER WALL AT CROSS INTERSECTION - 6m HIGH

SCALE 1:50

CODE	REVISION	DATE	BY
C	FOR CONSTRUCTION	30.10.25	N.W
B	FOR CONSTRUCTION	18.07.25	NW
A	FOR CONSTRUCTION	17.06.25	NW

MORGAN CONSULTING ENGINEERS
•STRUCTURAL•CIVIL•HOUSING•FORENSIC•
1 GREAT GEORGE STREET
PADDINGTON QLD 4064
PHONE: (07) 3369 8411
FAX: (07) 3369 1893
EMAIL: mail@morgance.com.au

Scales (at A3): 1:50, 1:10

Designed	Checked
SM	S.M
Drawn	Date
NW	APR 24

Authorised for issue: SHAUN MALIN

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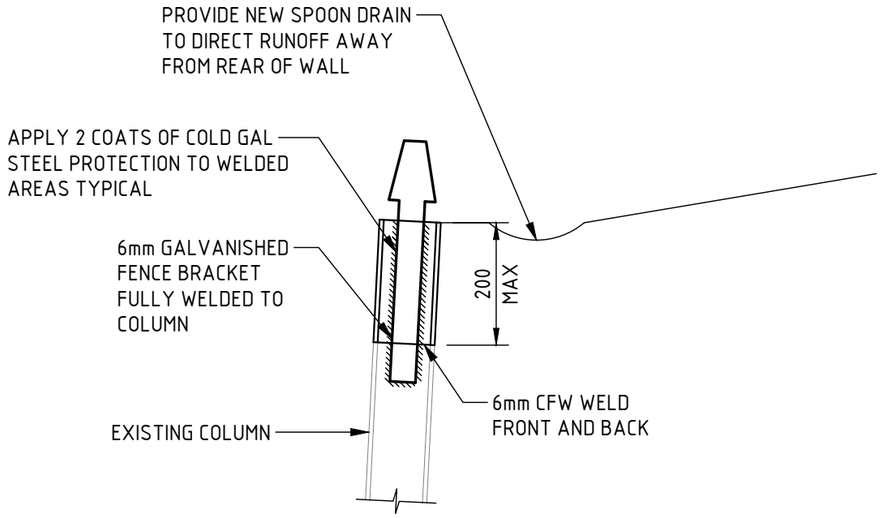
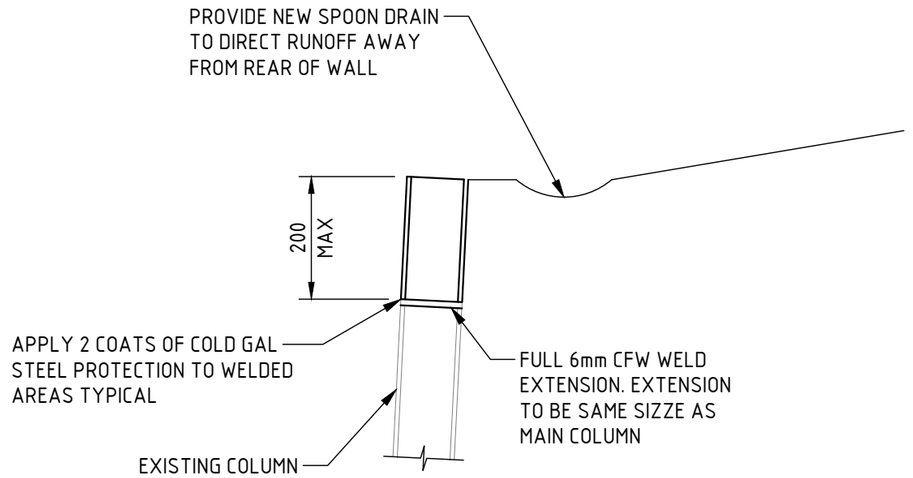
GENERAL NOTE

1. ALL STEEL WORK TO BE HOT-DIPPED GALVANISED
2. PROVIDE 8mm CAP PLATES TO OPEN ENDS OF ALL CHANNEL MEMBERS
3. ALL JOIN COMPONENTS ARE TO BE 6mm CFW
4. ALL WELDS TO BE TREATED WITH 2x COATS OF COLD GALVANIZE



DETAIL 1 / OPTION 1 -



DETAIL 2 / OPTION 2 -

CODE	REVISION	DATE	BY
C	FOR CONSTRUCTION	30.10.25	N.W
B	FOR CONSTRUCTION	18.07.25	N.W
A	FOR CONSTRUCTION	17.06.25	NW

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Scales (at A3)	1:10
Designed	SM
Checked	S.M
Drawn	NW
Date	APR 24
Authorised for issue	SHAUN MALIN

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PROPOSED SLEEPER RETAINING WALLS
Address
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Drawing title
POST EXTENSION DETAIL

Drawing No 24TR015/SK01
Revision C