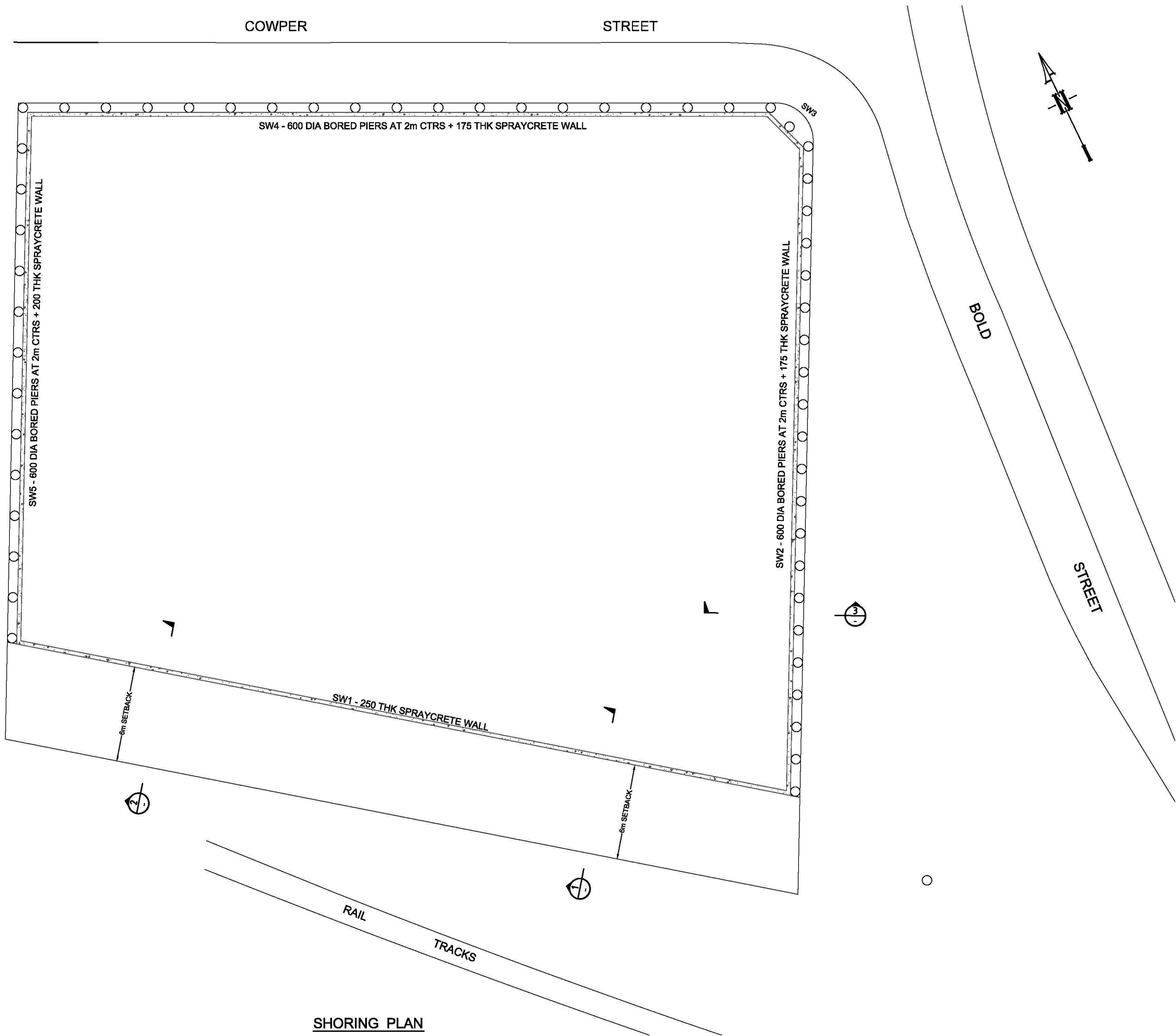


COWPER

STREET



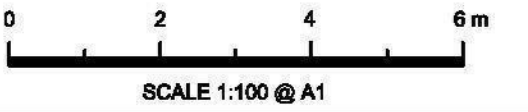
SHORING PLAN

SHORING WORKS ANCHORING NOTES:

- ALL ANCHORS UNLESS NOTED OTHERWISE ARE TO BE TEMPORARY AND DESTRESSED FOLLOWING THE COMPLETION OF BASEMENT LEVELS AND GROUND LEVEL STRUCTURES INCLUDING ALL RAMPS AS PER STANDARD NOTES BELOW AND THE SPECIFICATION.
- ALL STAND TO BE 15.2mm U.N.O.
- ALL ANCHORS TO BE TESTED, THEN STRESSED AND LOCKED OFF TO THEIR NOMINATED WORKING LOAD BEFORE EXCAVATION TO THE NEXT BENCH LEVEL CAN PROCEED.
- A SURVEYOR SHALL BE USED TO VERIFY ANCHOR SETOUT.
- SERVICES AND NEIGHBOURING BUILDING FOUNDATIONS THAT ARE SHOWN ARE INDICATIVE ONLY. SUBCONTRACTOR SHALL VERIFY THE LOCATION AND SETOUT OF THESE ELEMENTS PRIOR TO WORK COMMENCING ON SITE.
- ANCHORS MAY NEED TO BE ANGLED IN PLAN OR SHIFT RELATIVE TO THE INDICATIVE POSITIONS SHOWN TO ENSURE THEY DO NOT HIT EXITING BUILDING FOOTINGS OR SERVICES. IT IS THE SUBCONTRACTORS RESPONSIBILITY TO ENSURE THAT ANCHORS ARE INSTALLED IN SUCH A MANNER SO AS TO MESS THIS ELEMENT TO ASSESS ALL ANCHOR FOR POSSIBLE CLASHES WITH EXISTING SERVICES AND/ OR STRUCTURE AS SUCH ALL ANCHOR POSITIONS AND WHALER SIZES WHERE PROVIDED ARE INDICATIVE ONLY AND MAY BE SUBJECT TO CHANGE.
- THE ANCHORING CONTRACTOR WILL BE RESPONSIBLE FOR COMPLETING ALL SHOP DRAWINGS AND CALCULATIONS GIVING ANCHOR SETOUT, GEOMETRY AND DESIGN, TAKING INTO ACCOUNT ALL INTERFACES WITH EXISTING SERVICES AND NEIGHBOURING BUILDING FOUNDATIONS. THE SHOP DRAWINGS AND CALCULATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR INFORMATION A MINIMUM OF 3 WEEKS BEFORE WORK STARTS ON SITE.
- UNLESS NOTED OTHERWISE ALL ANCHORS ARE TO BE INSTALLED PERPENDICULAR TO THE SHORING FACE AND DECLINED TO THE HORIZONTAL AT THE ANGLE SPECIFIED. IF THIS NEEDS TO BE ALTERED THE HEAD CONTRACTOR IS TO BE NOTIFIED IMMEDIATELY.
- THE CONTRACTOR IS TO ENGAGE AND PAY A GEOTECHNICAL ENGINEER TO INSPECT AND CERTIFY GEOTECHNICAL ASPECTS OF THE EXCAVATION AND SHORING WORKS INCLUDING:
 - ANCHOR LOCATIONS, LENGTHS (FIXED AND FREE) AND CAPACITIES.
 - TEMPORARY STABILITY AND EXCAVATION STAGING
 - GEOTECHNICAL CAPACITY OF PILES AND FOOTINGS.
 - CHANGES TO SHORING SEQUENCE OR DETAILS TO SUIT SITE CONDITIONS.
 - BATTER SLOPES AND STABILITY. OR
 - ANCHORING AND ROCK PIN REQUIREMENTS IN CUT ROCK FACES AND EXTENT OF REQUIRED SHOTCRETE FOR GEOTECHNICAL RESTRAINT OF CUT ROCK FACES.
- EXCAVATION AND INSTALLATION OF ALL ROCK ANCHORS SHALL OCCUR AS DIRECTED BY THE CONTRACTOR'S GEOTECHNICAL ENGINEER. THE CONTRACTOR'S GEOTECHNICAL ENGINEER SHALL ALSO ADVISE ON ALLOWABLE TEMPORARY BATTER ANGLES WHERE REQUIRED.
- THE SUBCONTRACTOR'S GEOTECHNICAL ENGINEER IS TO VERIFY THE SAFE WORKING LOADS OF ALL ANCHORS AS SPECIFIED AND HENCE VERIFY ALL ANCHOR EMBEDMENTS.
- APPROVALS FOR ANCHORING AND EXCAVATION FOR ADJOINING OWNER & AUTHORITIES IS REQUIRED BEFORE ANY WORKS WHICH TRAVERSE PROPERTY BOUNDARIES IS UNDERTAKEN.

GENERAL SHORING NOTES:

- ROCK LEVELS WHICH HAVE BEEN PROVIDED ARE INDICATIVE AND EXTRAPOLATED THE GEOTECHNICAL REPORT.
- REFER TO THE GEOTECHNICAL REPORT FOR A DETAILED DESCRIPTION OF ANTICIPATED STRATA.
- IT IS THE SUBCONTRACTORS RESPONSIBILITY TO ENSURE THAT ALL SHORING WALLS INSTALLED DO NOT DAMAGE ADJACENT STRUCTURES OR SERVICES.
- A VIBRATION AND MOVEMENT MONITORING PLAN MUST BE PREPARED AND MONITORING RESULTS ARE TO BE REPORTED REGULARLY TO THE MANAGING CONTRACTOR.
- WHERE MONITORING RESULTS ARE BEYOND ACCEPTABLE CRITERIA, AS OUTLINED WITHIN THE ENGINEERING DOCUMENTS, THE ENGINEER SHALL BE IDENTIFIED IMMEDIATELY.
- THE SUBCONTRACTOR'S GEOTECHNICAL ENGINEER SHALL ADVISE ON ALLOWABLE TEMPORARY BATTER ANGLES AS EXCAVATION PROCEEDS.
- NOTIFY THE ENGINEER IF ANY REINFORCED PILE IS DAMAGED IN ANY WAY.
- REFER TO RELEVANT SERVICE CONSULTANTS DRAWINGS FOR SIZE AND POSITION OF ALL SERVICE PENETRATIONS, UNLESS DIRECTED BY THE HEAD CONTRACTOR.
- THE PRESENCE OF UNCONTROLLED FILL (REFER SOILS REPORT) MAY CONTAIN ELEMENTS WHICH WILL NEED TO BE REMOVED AND REPLACED BEFORE SHORING INSTALLATION CAN PROCEED.
- THE SHORING CONTRACTOR SHALL PROVIDE AS-BUILT DRAWINGS OF THE SHORING WALLS FOR THE ANCHORING SUBCONTRACTOR'S USE IN PREPARING THE ANCHOR SETOUT SHOP DRAWINGS. THE AS BUILT DRAWINGS ARE TO BE PROVIDED WITHIN 2 WEEKS OF COMPLETION OF SHORING AND ARE CONTAIN ALL INFORMATION AS DESCRIBED IN THE SPECIFICATION. ALL RECORDS ARE TO BE SUBMITTED BEFORE EXCAVATION PROCEEDS.
- AN ENCROACHMENT SURVEY INCLUDING FOOTING TEST PITS IS TO BE CARRIED OUT PRIOR TO SHORING INSTALLATIONS.
- THE SHORING CONTRACTORS IS TO CONFIRM CLEARANCE AND TOLERANCE REQUIREMENTS.
- REFER GEOTECHNICAL REPORT FOR ACTUAL ROCK TYPES AND DESCRIPTION TO JUDGE EASE OF EXCAVATION.
- IT IS THE SUBCONTRACTORS RESPONSIBILITY TO ENSURE THAT EXCAVATION STAGING ACROSS THE SITE DOES NOT OVERLOAD ANY STRUCTURAL MEMBER TO BOTH THE EXISTING SURROUNDING STRUCTURES AND THE NEW STRUCTURE BEING CONSTRUCTED.



NOT FOR CONSTRUCTION

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| A | ISSUE FOR DEVELOPMENT APPLICATION | 30/07/2015 | EVE | MBR | |
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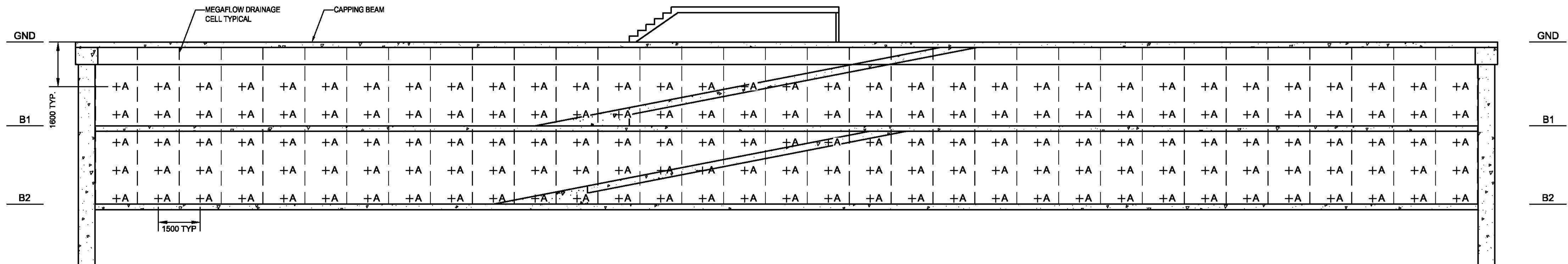
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Project
**2-6 BOLD STREET AND
80-82 COWPER STREET, GRANVILLE
PROPOSED MULTI-UNIT DEVELOPMENT
STRUCTURAL DESIGN
DEVELOPMENT APPLICATION**

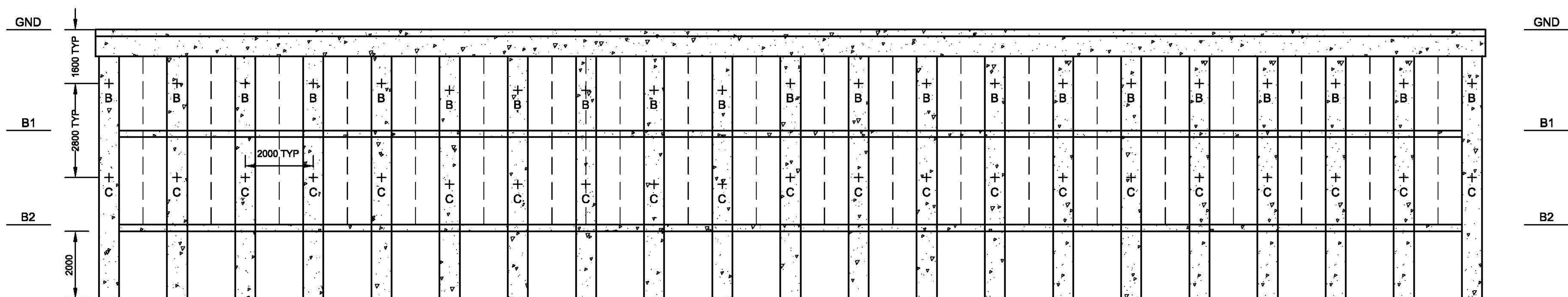
Drawing Title
SHORING PLAN

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| Scale | A1 | Project No. | Dwg. No. | Issue |
| 1:100 | | UMB13035.STR | SK01 | A |



SW 1 ELEVATION
SCALE 1:100
SPRAYCRETE WALL TO BE 250 THK U.N.O.

REFER TO SK04 FOR CONSTRUCTION
SEQUENCE AND TYPICAL DETAILS



SW 2 ELEVATION
SCALE 1:100
600 DIA BORED PIERS AT 2M CTRS + 175
THK SPRAYCRETE WALL

REFER TO SK04 FOR CONSTRUCTION
SEQUENCE AND TYPICAL DETAILS

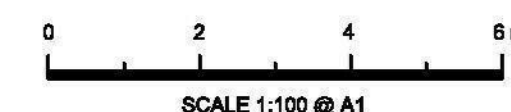
| ROCK ANCHOR LOADS | | | | |
|-------------------|--------------|-------------|-------------------|---------------------|
| ANCHOR TYPE | WORKING LOAD | BOND LENGTH | DECLINATION ANGLE | ANCHOR TYPE |
| A | 200KN | | 15° | N28 GALV. SOIL NAIL |
| B | 400KN | 6000mm | 30° | 3/S 15.2 |
| C | 400KN | 6000mm | 15° | 3/S 15.2 |

CONCRETE NOTS

| LOCATION | f _c |
|-----------------|----------------|
| BORED PEIRS | N40 |
| SPRAYCRETE WALL | N40 |
| CAPPING BEAM | N32 |

CONCRETE COVER

| LOCATION | COVER |
|-----------------|-------|
| BORED PEIRS | 50mm |
| SPRAYCRETE WALL | 35mm |
| CAPPING BEAM | 50mm |



NOT FOR CONSTRUCTION

| Issue | Description | Date | Drawn | Design |
|-------|-----------------------------------|------------|-------|--------|
| A | ISSUE FOR DEVELOPMENT APPLICATION | 27/07/2015 | EVE | MBR |

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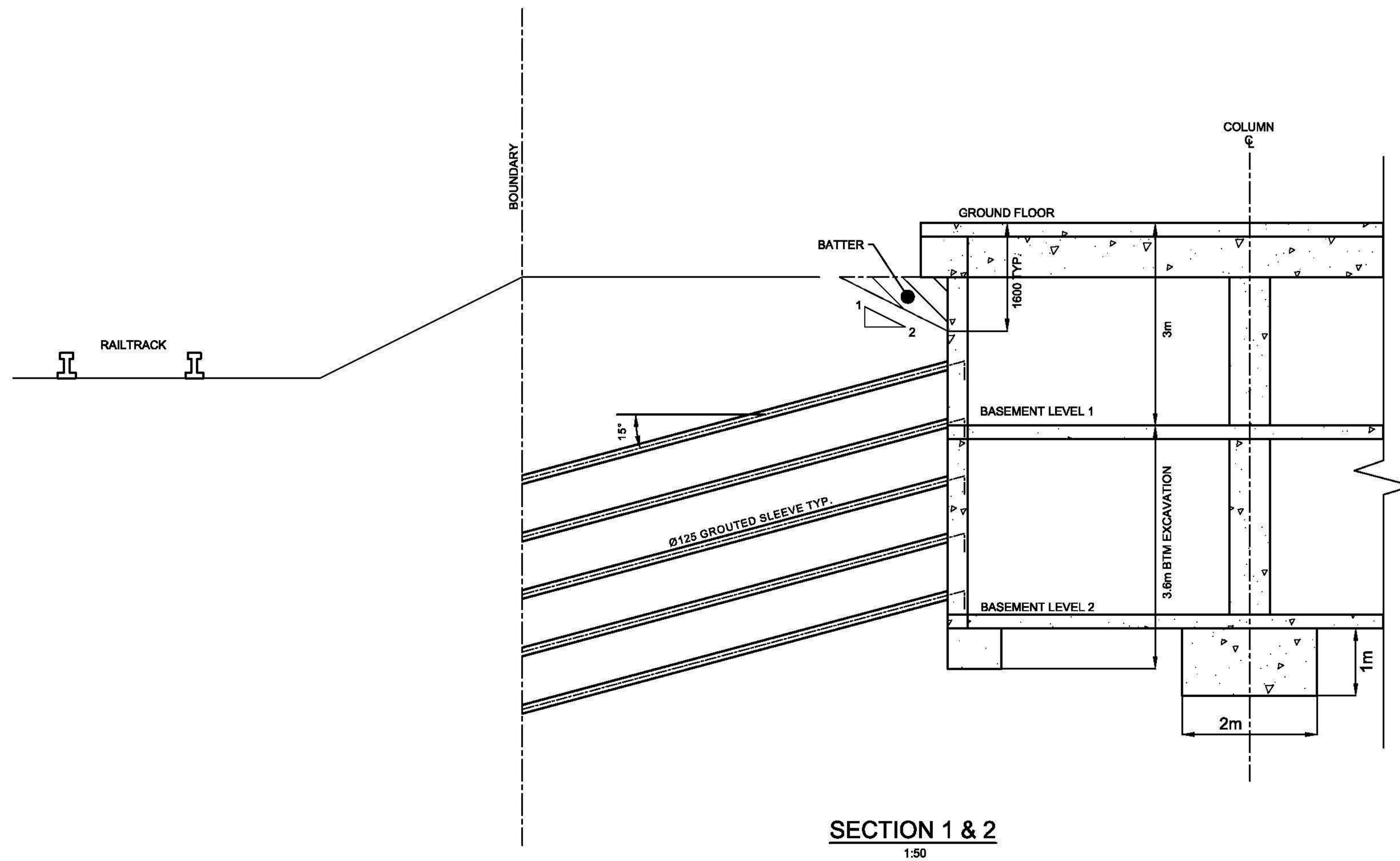
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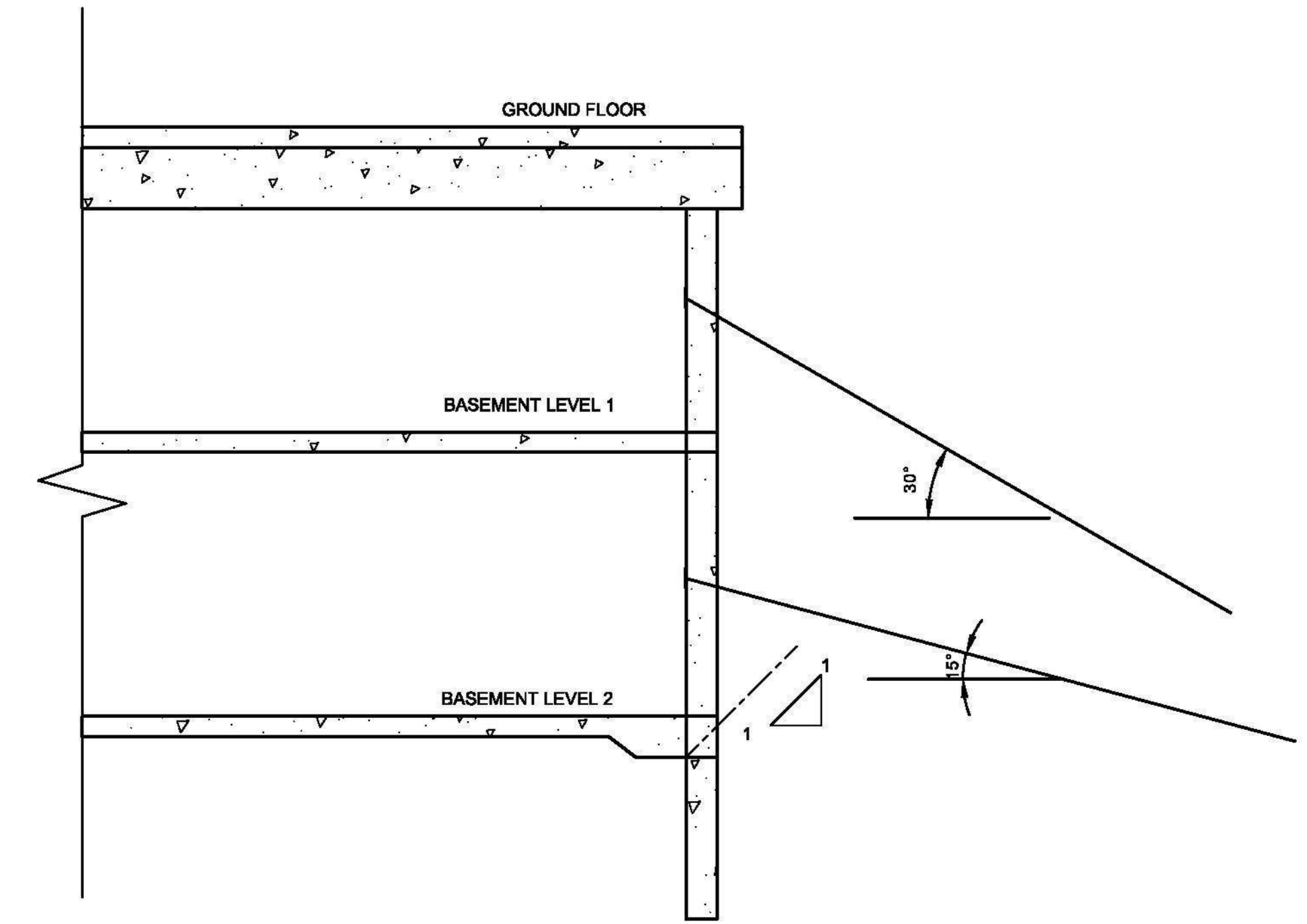
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PROPOSED MULTI-UNIT DEVELOPMENT
STRUCTURAL DESIGN
DEVELOPMENT APPLICATION**

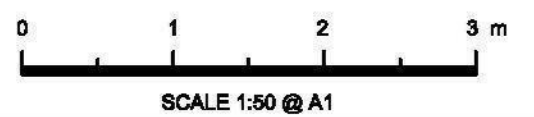
| ELEVATION SW1 & 2 | | | | |
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| Scale | A1 | Project No. | Dwg. No. | Issue |
| 1:100 | | UMB13035.STR | SK02 | A |



SECTION 1 & 2
1:50



SECTION 3
1:50



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| Issue | Description | Date | Drawn | Design |
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Project
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PROPOSED MULTI-UNIT DEVELOPMENT
STRUCTURAL DESIGN
DEVELOPMENT APPLICATION

| Drawing Title | Scale | A1 | Project No. | Dwg. No. | Issue |
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| SECTION 1,2 & 3 | 1:50 | | UMB13035.STR | SK03 | A |

1. INSTALL & CONSTRUCT BORED PIERS INCLUDING CAPPING BEAM
2. EXCAVATE SITE TO FIRST BENCH LEVEL INSTALLING SHOTCRETE AS EXCAVATION PROGRESSES
3. INSTALL ANCHORS, TEST & LOCK OFF AT LOCK OFF LOAD
4. PROGRESS TO NEXT BENCH LEVEL AFTER ALL ANCHORS COMPLETED & LOCKED OFF, FOLLOWING SIGN OFF BY GEOTECHNICAL ENGINEER

1. BENCH DOWN IN HIT 1, MISS 2 SLOTS 4m WIDE TO FIRST BENCHING LEVEL.
2. INSTALL SHOTCRETE WALL AND SOIL NAILS.
3. COMPLETE 2nd HIT, SHOTCRETE WALL AND SOIL NAILS.
4. COMPLETE 3rd HIT, SHOTCRETE WALL AND SOIL NAILS.
5. PROCESS TO NEXT BENCH LEVEL AFTER ALL SOIL NAILS INSTALLED.

GEOTECHNICAL ENGINEER TO SIGN OFF STABILITY OF FIRST BENCH LEVEL AND CONFIRM THE REMAINING EXCAVATION BENCHING CAN BE COMPLETED IN FULL WIDTH STRIPS.



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| Drawing Title | SHORING DETAILS SHEET |
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| Scale | A1 | Project No. | Dwg. No. | Issue |
| As Shown | | UMB13035.STR | SK04 | A |

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