

PROJECT: OUR LADY OF VICTORY
CATHOLIC ELEMENTARY SCHOOL
ADDITION & RENOVATION

CLIENT: HALTON CATHOLIC DISTRICT SCHOOL BOARD

PROJECT No.: 25106

DATE: MAY 2026

BINDER: **C** ARCHITECTURAL DETAILS,
GEOTECHNICAL REPORT &
DESIGNATED SUBSTANCE REPORT



CONSULTANTS:



105-1939 IRONOK WAY
OAKVILLE, ONTARIO L6H 3V8
Tel (905) 815-8284



Consulting Engineering & Project Management
555 Industrial Drive
Suite 201
Milton, Ontario
L9T 5E1
Tel: (905) 567-8678
Fax: (905) 875-1339
Email: mgm@mgm.on.ca
www.mgm.on.ca



No. of Pages

SPECIFICATIONS BINDER “C”

ARCHITECTURAL DETAILS

Detail No. Title

TRAFFIC SIGNAGE PLANS

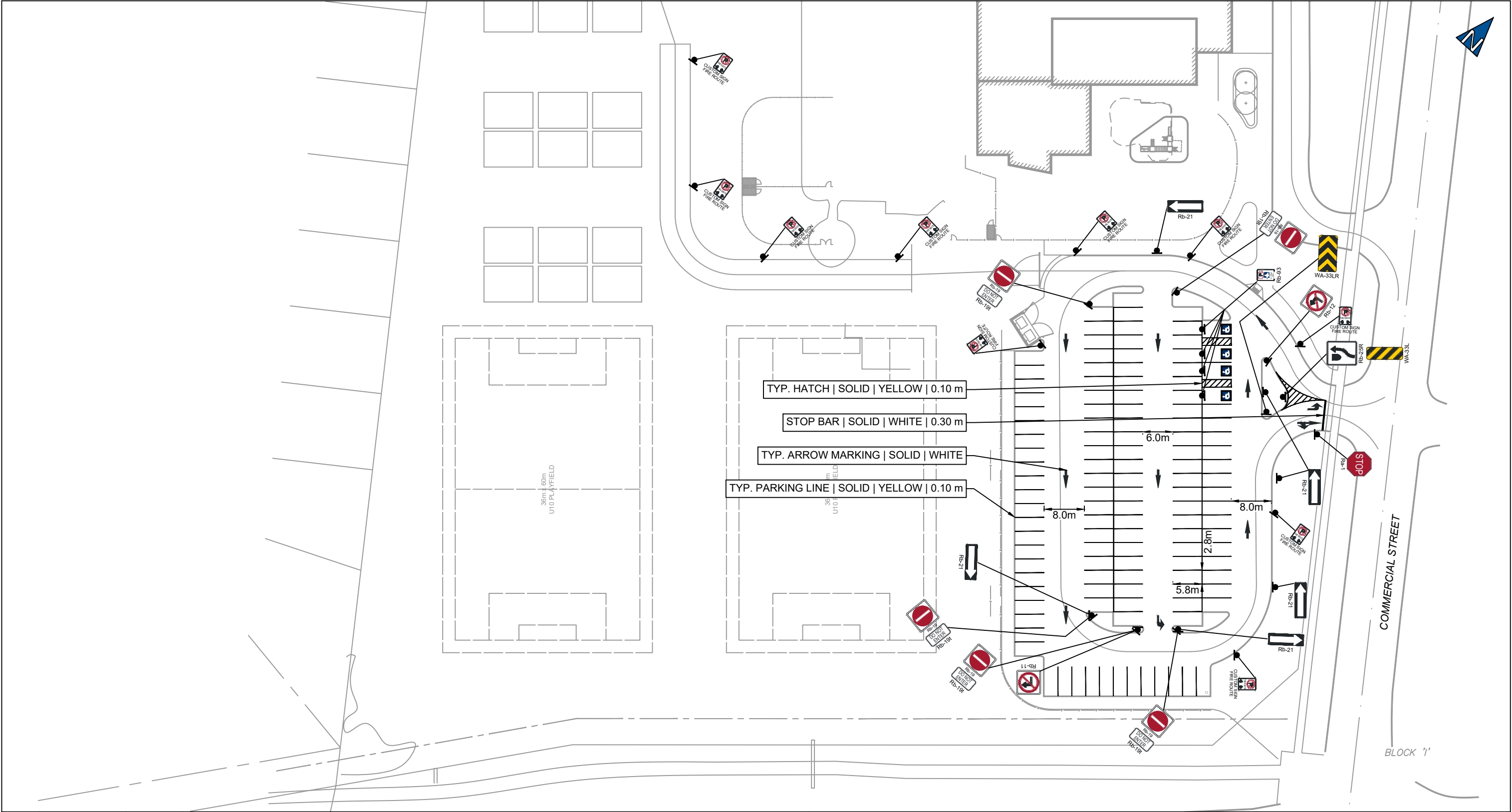
Drawing 01 (11x17 reduced scale)

ARCHITECTURAL DETAILS

AD 213	Light Standard
AD 214	Job Site Sign
AD 215	Job Site Sign
AD 257A	Job Site Signage
AD 257B	Job Site Signage
AD 302	Roof Concrete Paver Detail
AD 303	Conduit Roof Paver Detail
AD 304	Pipe Roller Roof Paver Detail
AD 305	Pipe Support Roof Paver Detail
AD 400	Firestopping Detail at Cavity Wall
AD 401	Exterior Cavity Wall Control Joint Detail
AD 411	Wall Control Joint Details Interior Side
AD 412	Brick Vent Details
AD 450	Top of Wall Construction at non-fire rated assemblies
AD 455	Mechanical Curb
AD 459	Vent Stack Detail
AD 460	Gooseneck Curb Detail
AD 501	Porcelain Tile Base
AD 503	Drinking Fountains Mounting Heights
AD 517	Roof Access Ladder
AD 520	Co-Lab Wood Bench - M7
AD 525	Gym Divider Curtain Detail
AD 542A	D2 – Art Display Case
AD 542B	D2 – Art Display Case - Section
AD 601	Cabinet Type B1
AD 602	Cabinet Type B2
AD 606	Cabinet Type B6
AD 608	Cabinet Type B8
AD 609	Cabinet Type B9
AD 617A	Cabinet Type B13 – Co-lab Bench
AD 617B	Cabinet Type B14 – Co-lab Bench @ Rad
AD 621	Cabinet Type U1
AD 622	Cabinet Type U2

	<u>No. of Pages</u>
AD 623 Cabinet Type U3	
AD 624 Cabinet Type U4	
AD 625A Cabinet Type U5-A	
AD 625B Cabinet Type U5-B	
AD 627 Cabinet Type B34	
AD 629 Cabinet Type B36	
AD 631 Kindergarten Closet and Doors - Type K1	
AD 634 Child Care Cubbies – Type K5	
AD 635 Child Care Cubbies – Washrooms – Type K6	
AD 638A Mail Slots – C8 – Elevation	
AD 638B Mail Slots – C8 – Section	
AD 639 Kindergarten Cabinet – Type K9	
AD 642 Type C3 – Storage Cabinet	
AD 650 Modular Control Panel	
AD 651 Modular Control Panel Sections	
AD 652 Interior Signage Panel	
AD 653 Teacher’s Closet Type C1	
AD 654 Cabinet Type C4	
AD 661 Millwork Filler Strip Detail	
AD 725 Top of Wall Fire Separation Assembly	
AD 800 Door Types	
AD 801A Hollow Metal Frames and Screens	
AD 801B Hollow Metal Frames and Screens	
AD 801C Hollow Metal Frames and Screens	
AD 802 Door Jamb Sections	
AD 904 Locker Base Detail	
AD 1000 Washroom Fixture Mounting Heights	
AD 2001 Sliding Boards Details (Classroom)	
AD 2002 Aluminum Cross Detail	
 <u>DESIGNATED SUBSTANCE REPORT</u>	
02 28 00 Designated Substance Report – General	1
Limited Designated Substance Survey Report	27
 <u>GEOTECHNICAL REPORT</u>	
31 09 15 Geotechnical Information	1
31 09 16 Geotechnical Investigation	48
Soil Chemical Testing Report	21

THIS DRAWING HAS BEEN PREPARED USING BASE PLANS PROVIDED BY OTHERS. THE PRACTITIONER HAS NOT INSPECTED THE ACCURACY AND/OR THE COMPLETENESS OF THESE BASE PLANS AND SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH MAY BE INCORPORATED HEREIN AS A RESULT.



NO.	DATE	INITIAL	REVISION DETAIL

PAVEMENT MARKING AND SIGNAGE PLAN

540 COMMERCIAL STREET

TOWN OF MILTON



PROJECT NO.: 250701

DESIGN: DC

DATE: JAN 2026

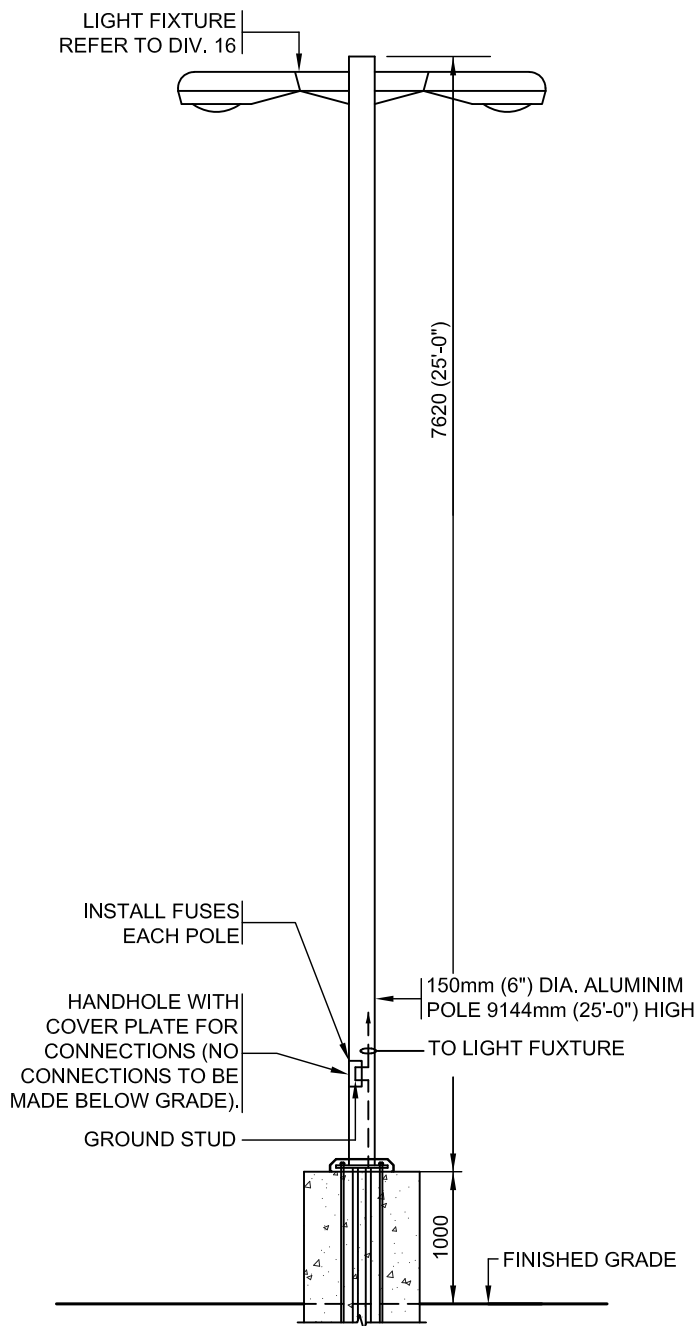
DRAWN: DC

SCALE: 1:750

CHECK: GL

DRAWING NO.:

01



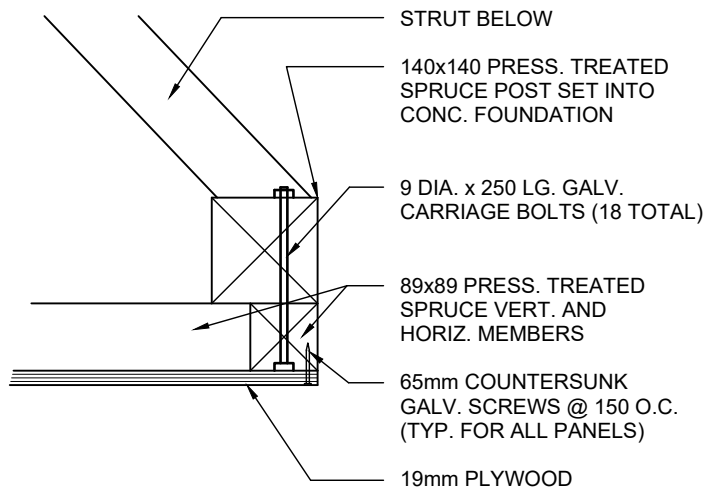
LIGHT STANDARD

PROJ: 25106
SCALE: 1:50
DRAWN: JA
DATE: 26 05 05

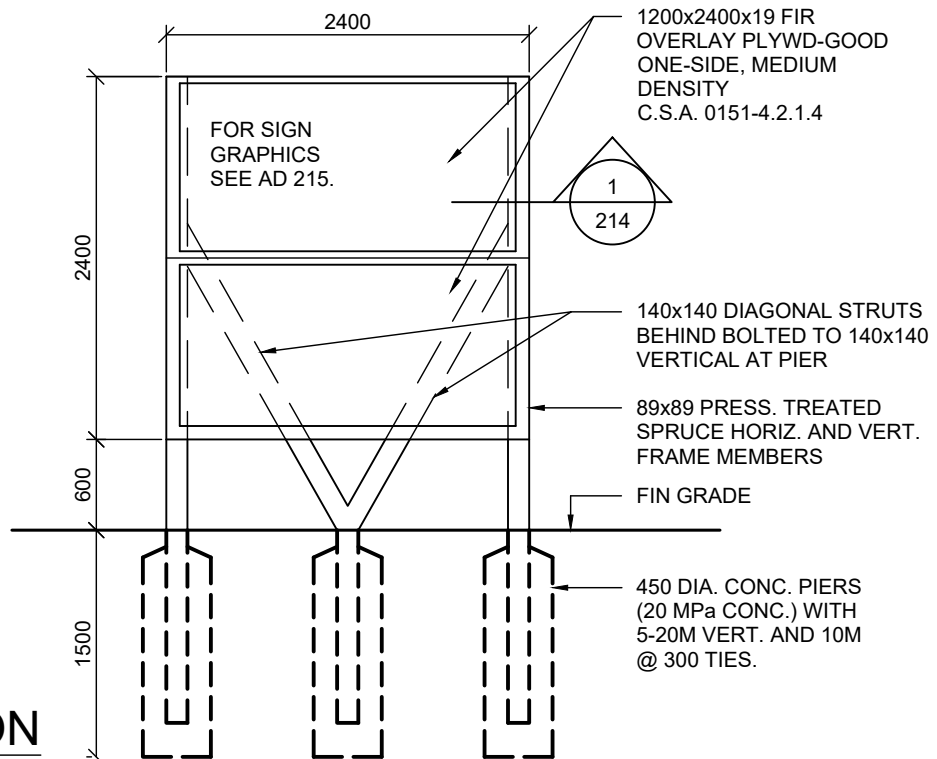


ISSUE/REV.
00

AD
213



SECTION 1
SCALE: 1:5



ELEVATION
SCALE: 1:50

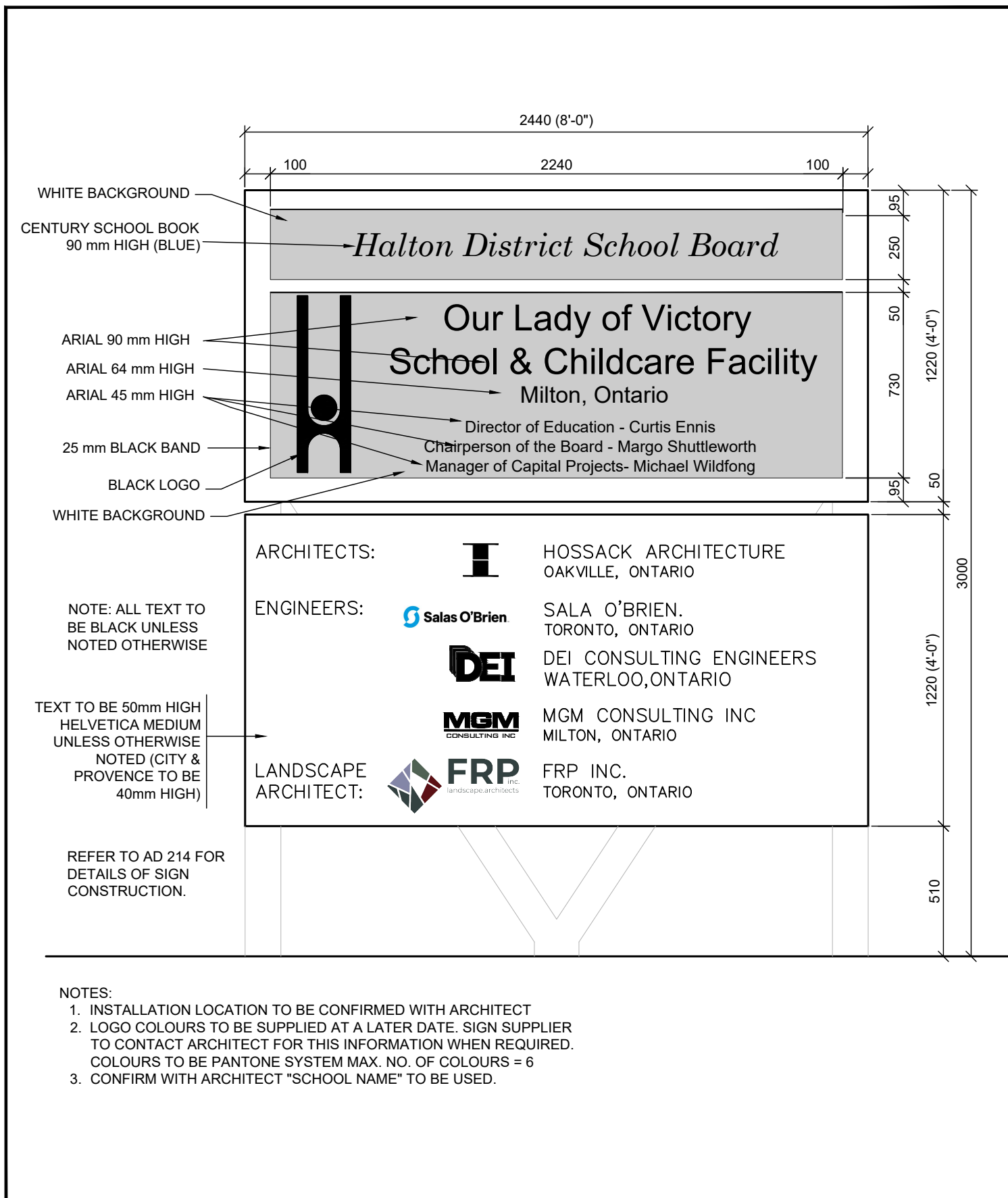
JOB SITE SIGN

PROJ: 25106
SCALE: NOTED
DRAWN: GB
DATE: 26 01 17



ISSUE/REV.

AD
214



JOB SITE SIGN

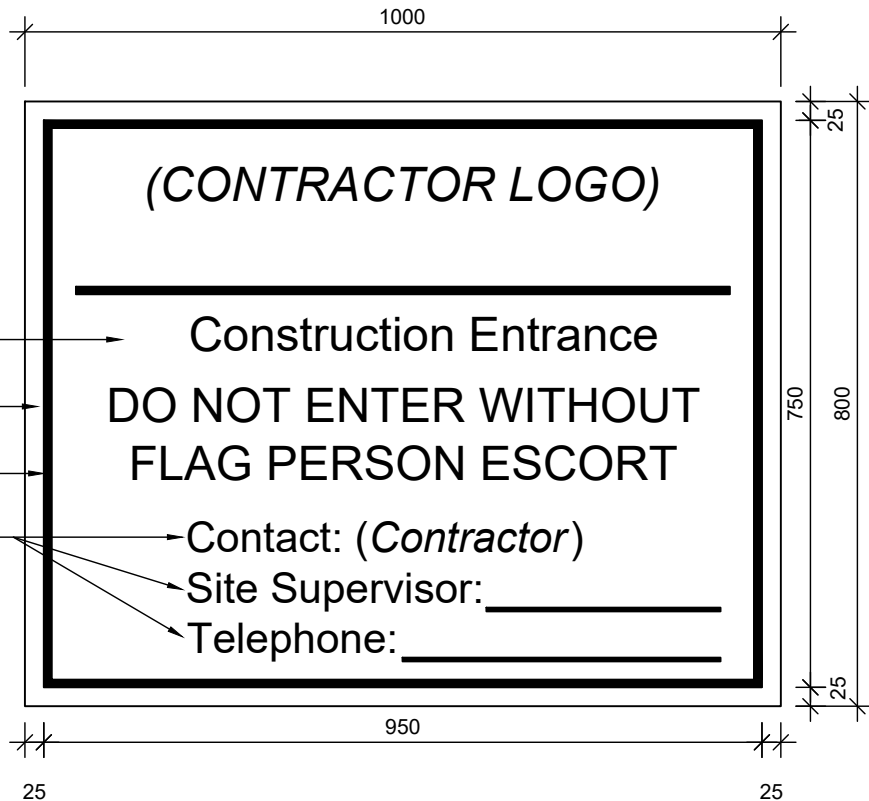
PROJ: 25106
SCALE: 1:20
DRAWN: AM
DATE: 26 01 17



ISSUE/REV.

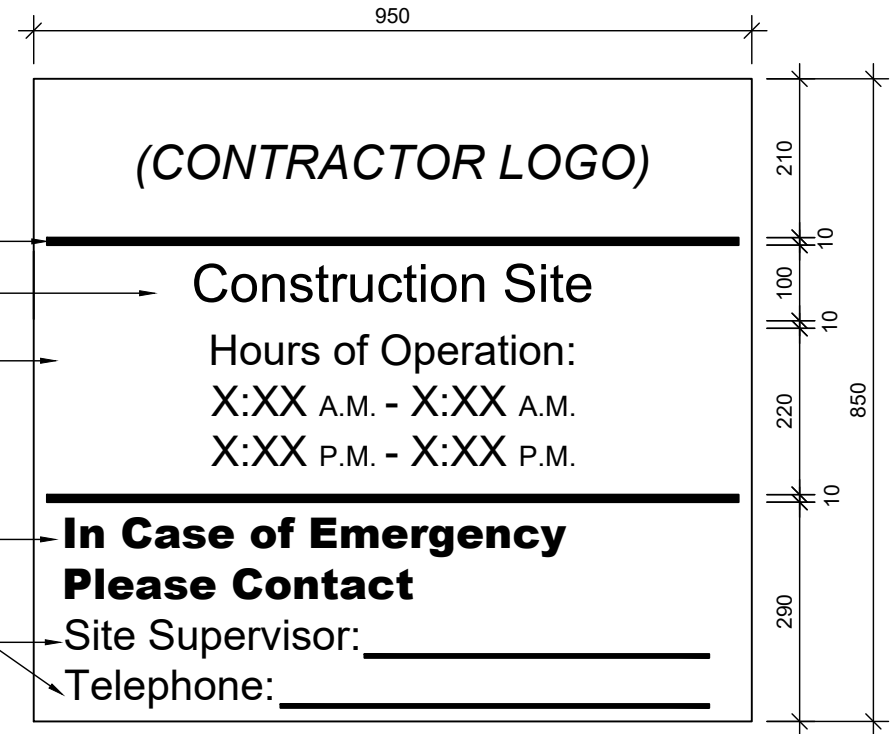
AD
215

A



- Arial 45 mm high (black)
- Arial 45 mm high
- 15mm black band
- Arial 40 mm high

B



- 10mm black band
- Arial 50 mm high
- Arial 40 mm high (black)
- Arial 40 mm high (black)
- Arial 40 mm high

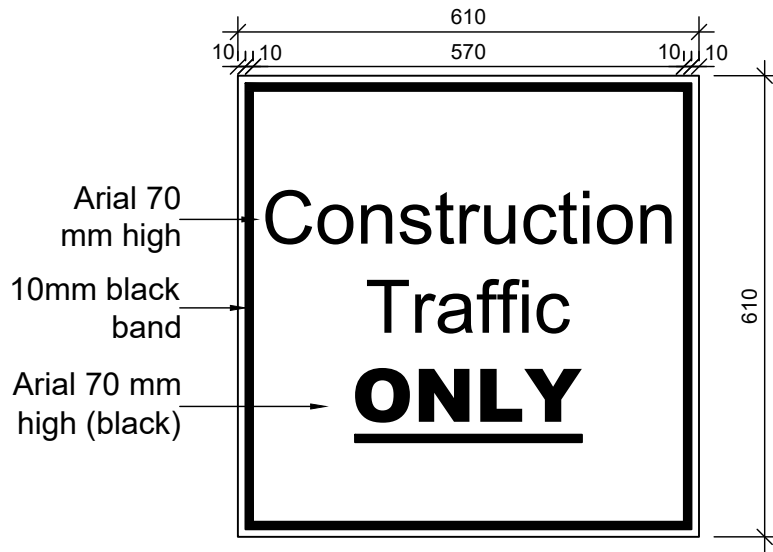
JOB SITE SIGNAGE

PROJ:	25106
SCALE:	1:10
DRAWN:	GB
DATE:	26 01 17

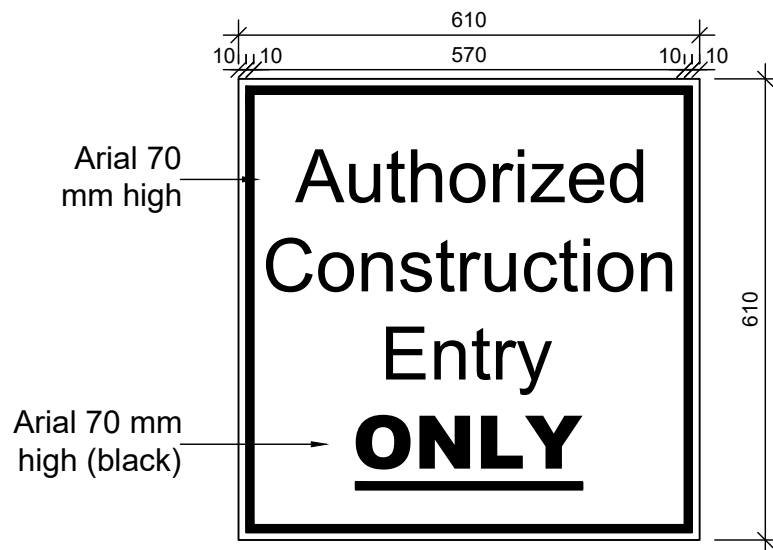


ISSUE/REV.
00

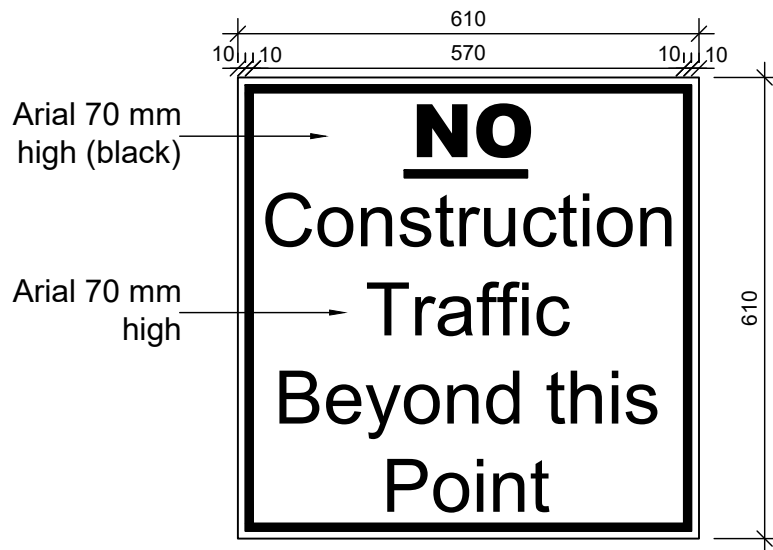
AD
257A



C



D



E

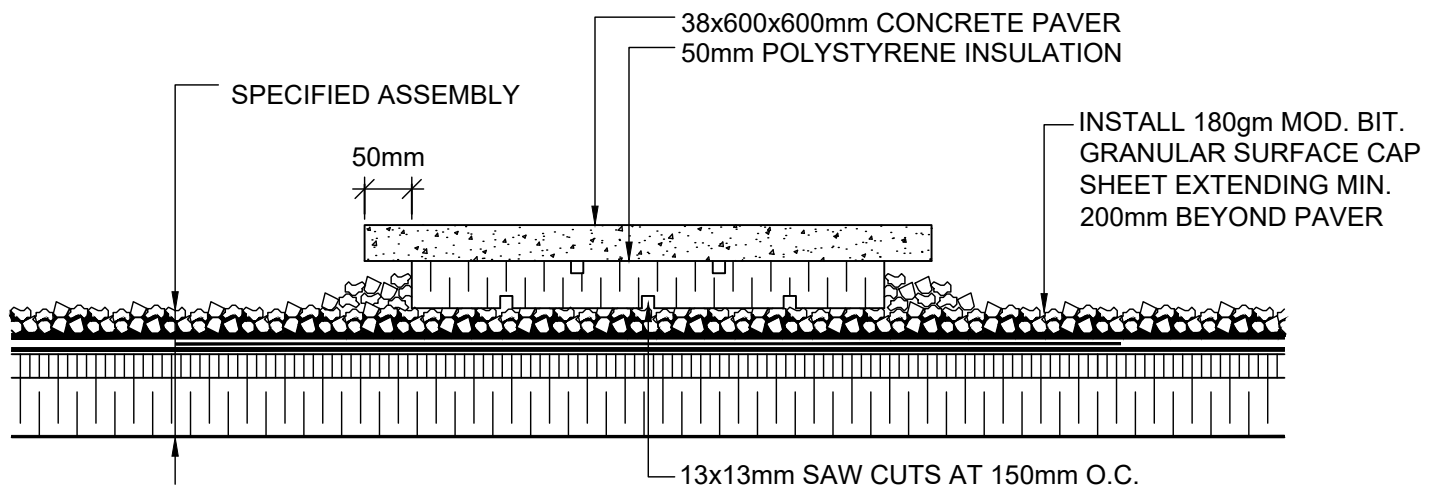
JOB SITE SIGNAGE

PROJ: 25106
SCALE: 1:10
DRAWN: GB
DATE: 26 01 17



ISSUE/REV.
00

AD
257B



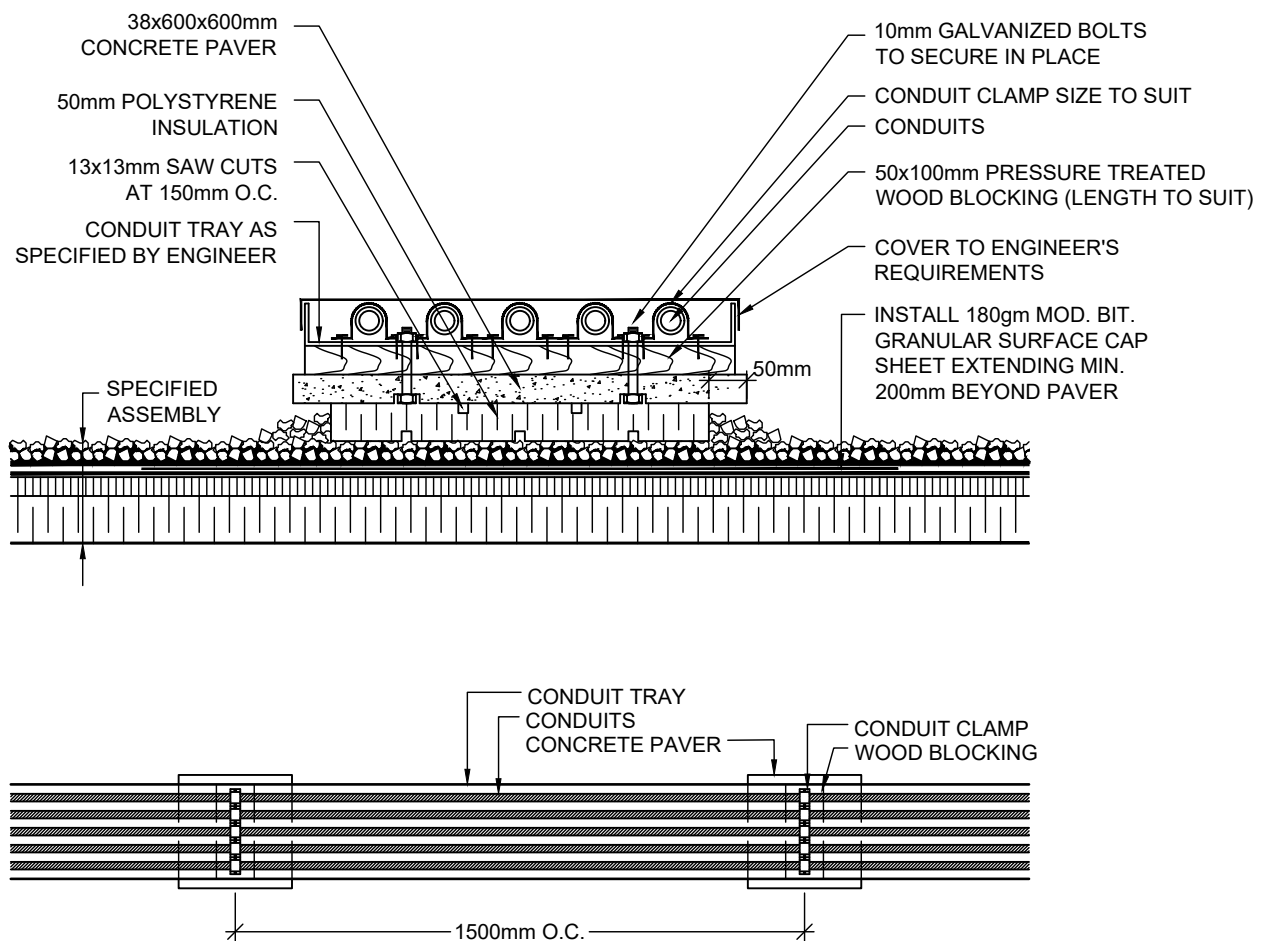
ROOF CONCRETE PAVER DETAIL

PROJ:	25106
SCALE:	1:8
DRAWN:	KB
DATE:	26 01 17



ISSUE/REV.

AD
302



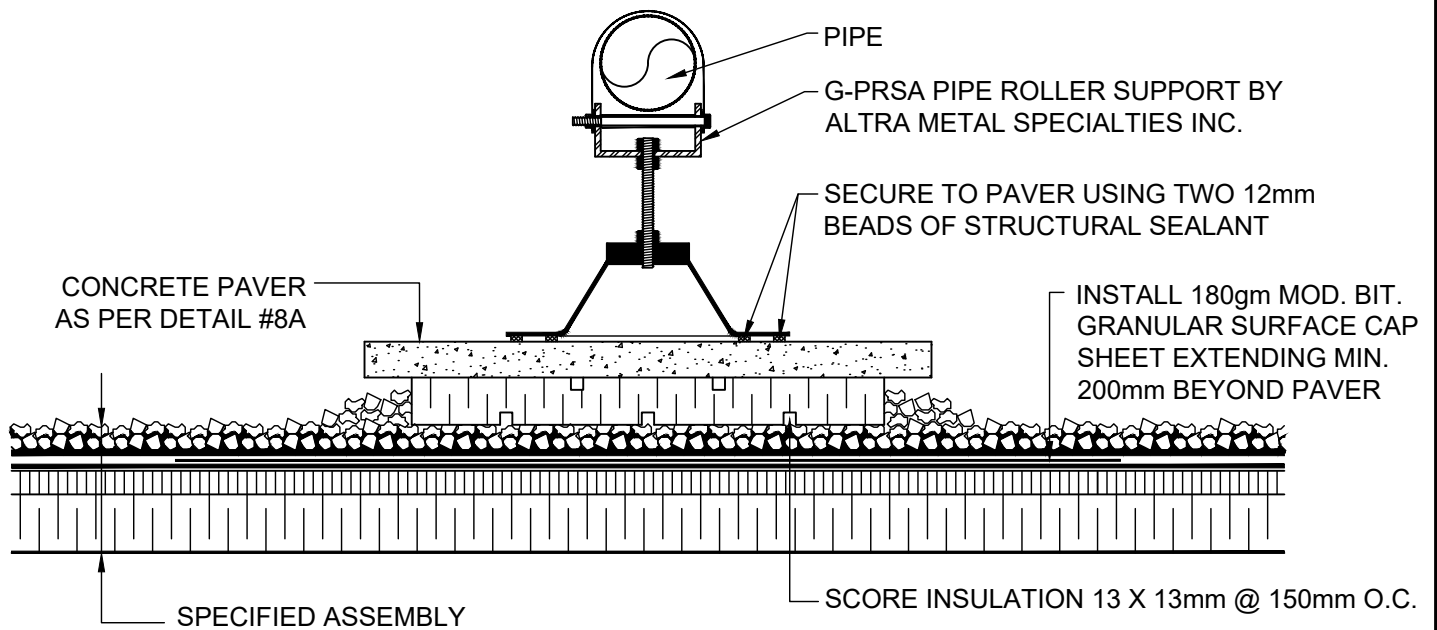
CONDUIT ROOF PAVER DETAIL

PROJ:	25106
SCALE:	1:10
DRAWN:	KB
DATE:	26 01 17



ISSUE/REV.

AD
303



NOTE:

1. THIS DETAIL APPLIES FOR PIPES UP TO 100mm IN DIAMETER ONLY.

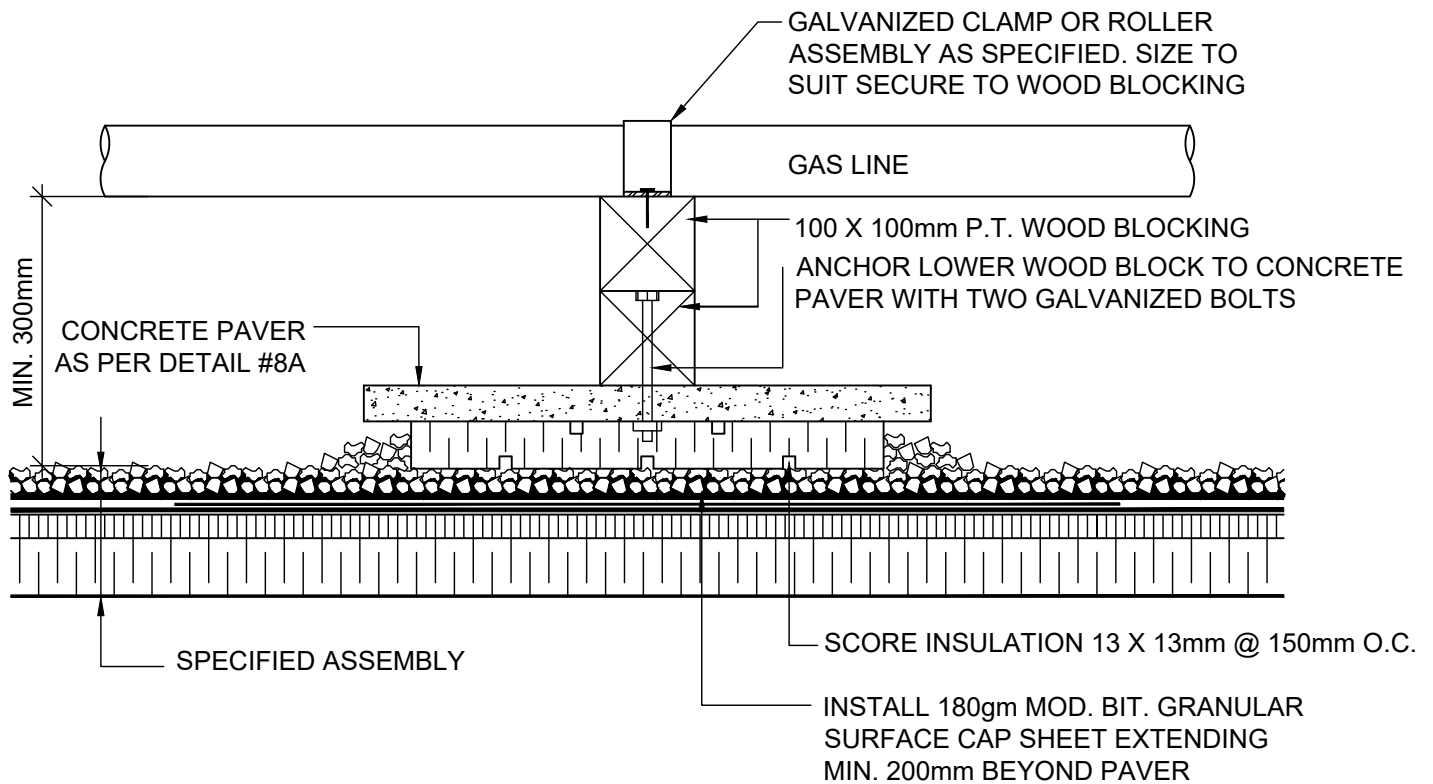
PIPE ROLLER ROOF PAVER DETAIL

PROJ:	25106
SCALE:	1:8
DRAWN:	KB
DATE:	26 01 17



ISSUE/REV.

AD
304



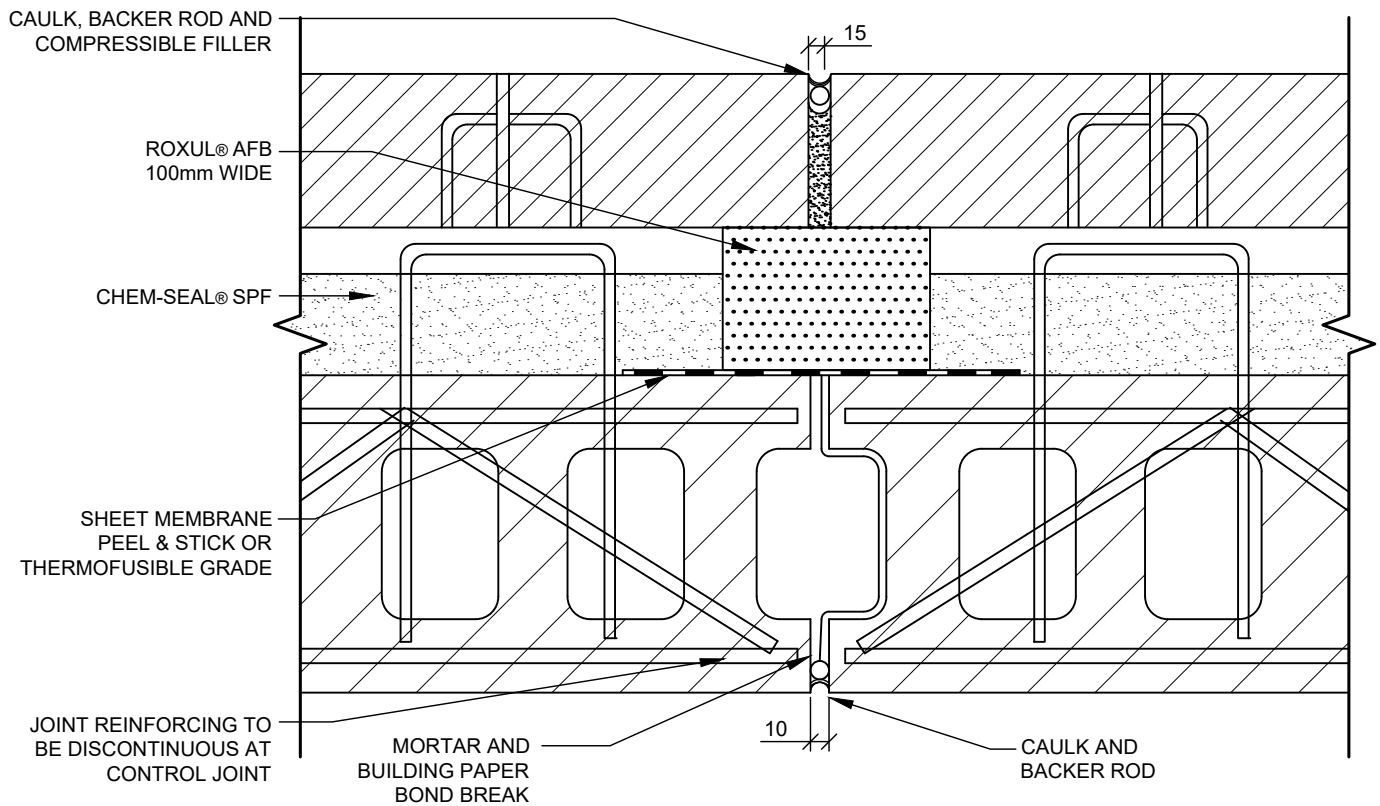
PIPE SUPPORT ROOF PAVER DETAIL

PROJ:	25106
SCALE:	1:8
DRAWN:	KB
DATE:	26 01 17

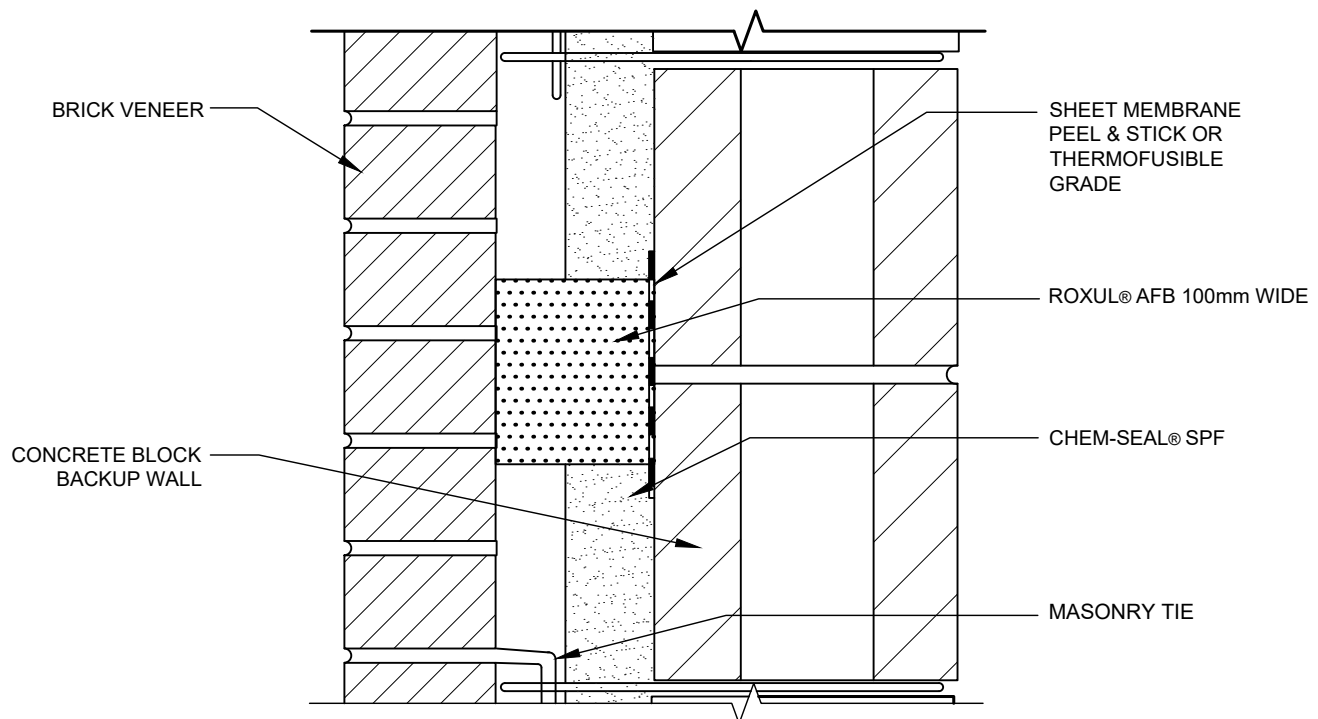


ISSUE/REV.

AD
305



VERTICAL FIRE STOPPING



HORIZONTAL FIRE STOPPING

FIRESTOPPING DETAIL AT CAVITY WALL

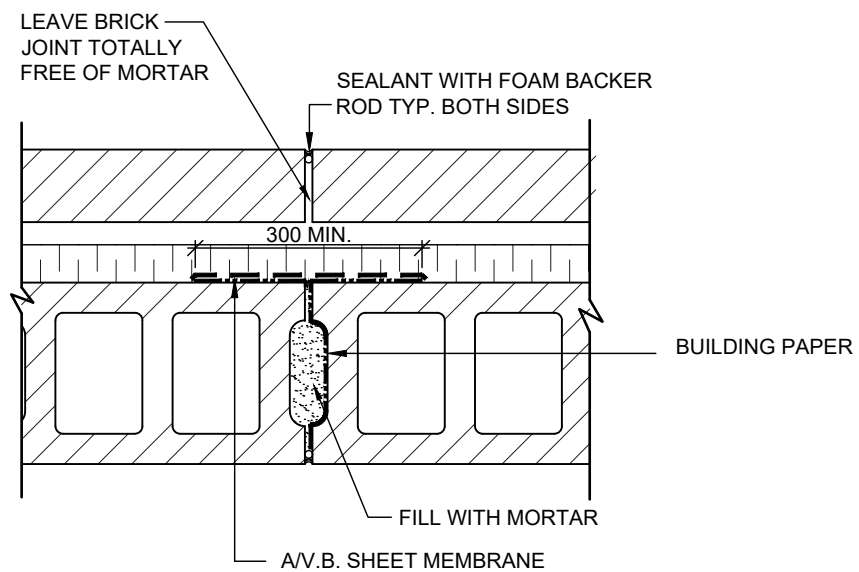
PROJ: 25106
SCALE: 1:5
DRAWN: GB
DATE: 26 01 17



ISSUE/REV.
00

AD
400

WALL CONSTRUCTION:
FACE BRICK
AIR SPACE
INSULATION
CONC. BLOCK



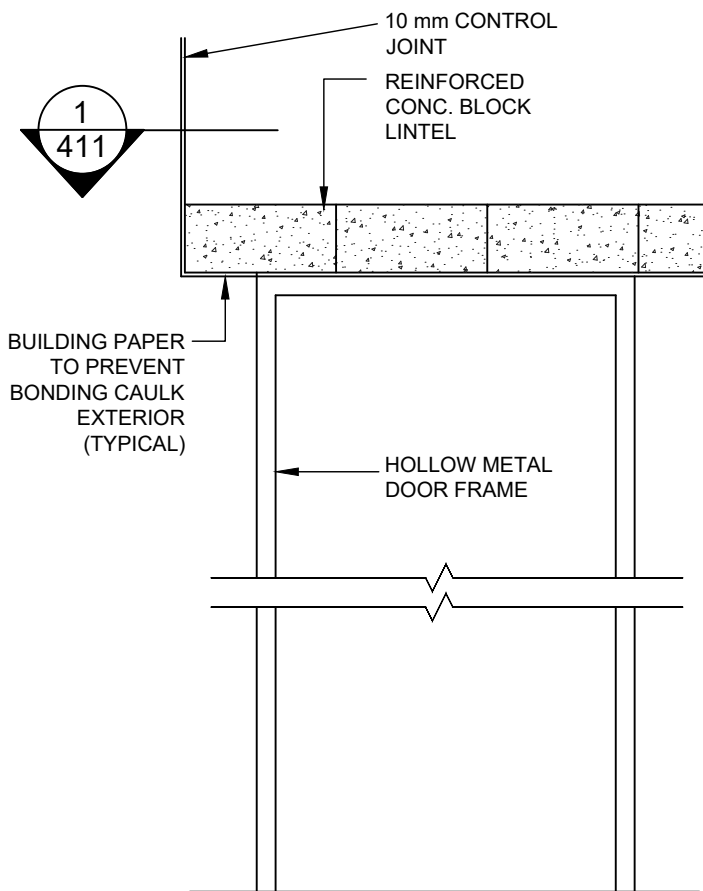
EXTERIOR CAVITY WALL CONTROL JOINT DETAIL

PROJ: 25106
SCALE: NTS
DRAWN: GB
DATE: 26 01 17

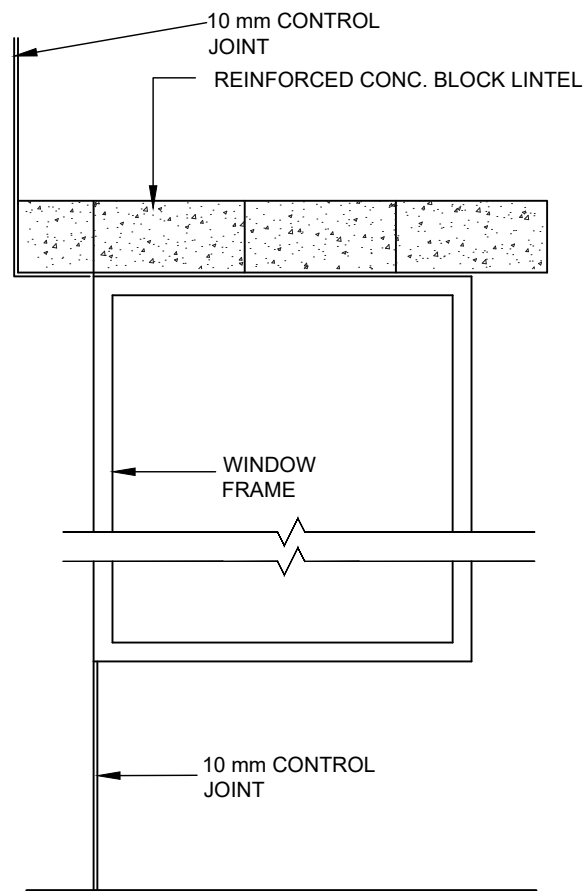


ISSUE/REV.
00

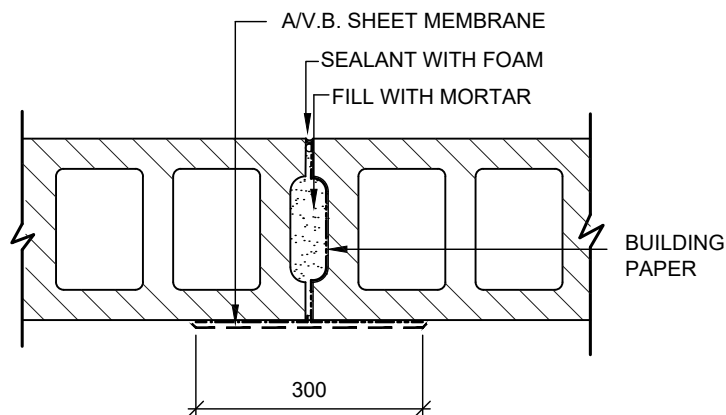
AD
410



1 DOOR CONTROL JOINT
AD411 SCALE 1:20



2 WINDOW CONTROL JOINT
AD411 SCALE 1:20



3 PLAN DETAIL
AD411 SCALE 1:10

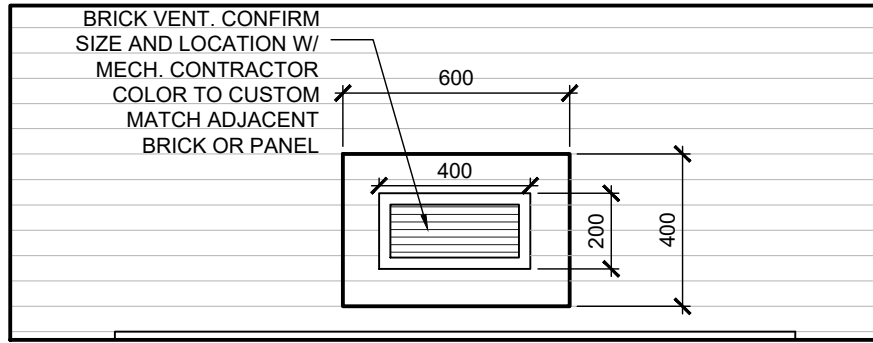
WALL CONTROL JOINT DETAILS INTERIOR SIDE

PROJ: 25106
SCALE: NOTED
DRAWN: GB
DATE: 26 01 17

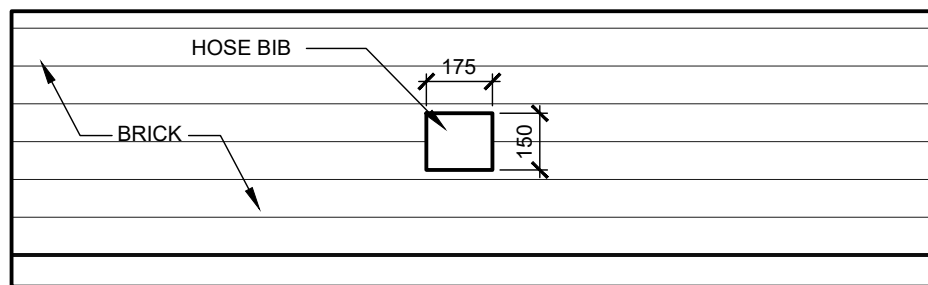


ISSUE/REV.
00

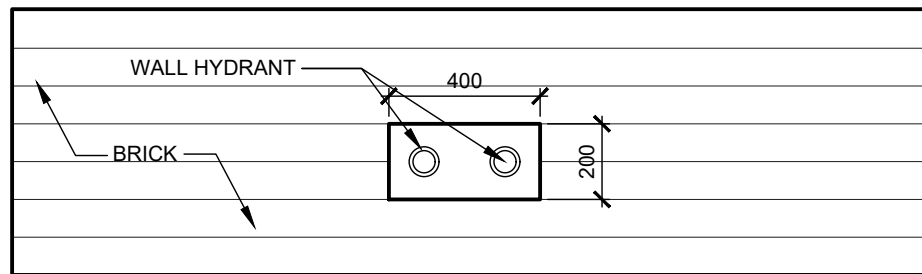
AD
411



1 BRICK VENT DETAIL
AD412



2 HOSE BIB DETAIL
AD412



3 WALL HYDRANT DETAIL
AD412

BRICK VENT DETAILS

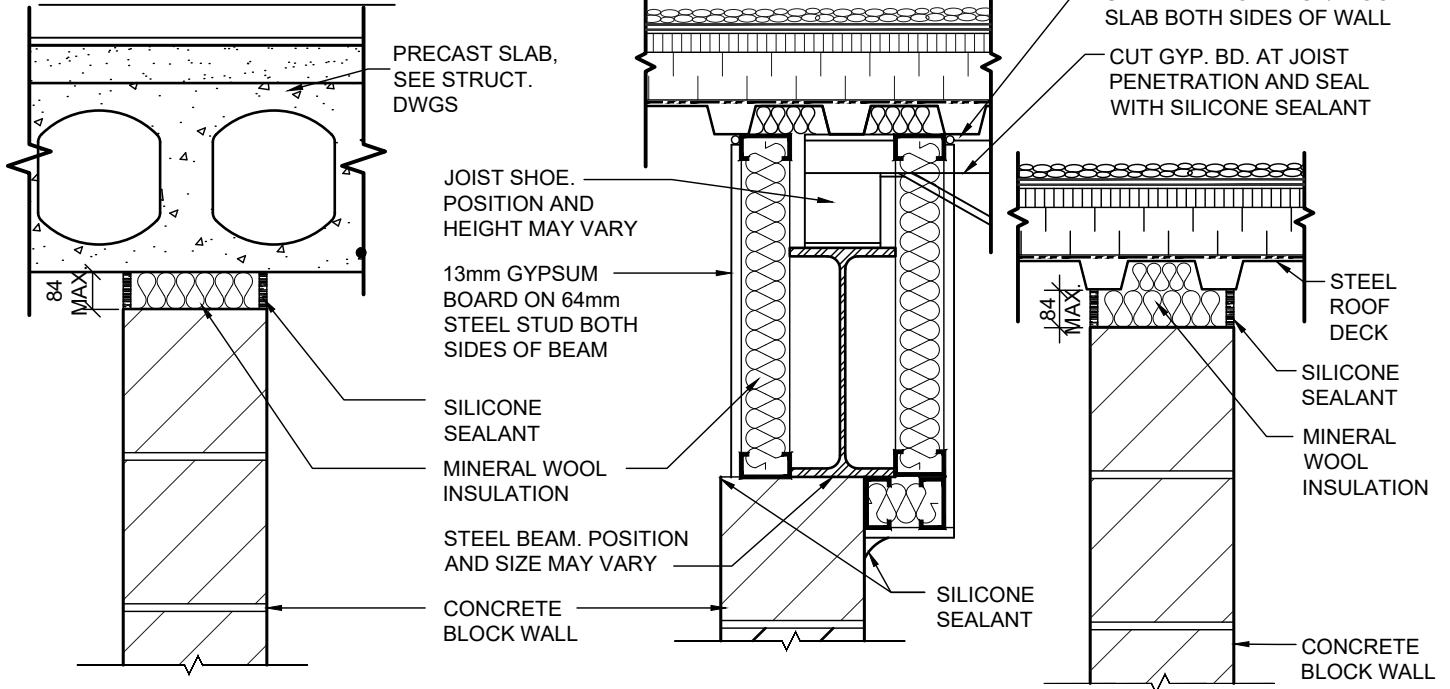
PROJ: 25106
SCALE: NTS
DRAWN: GB
DATE: 26 01 17



ISSUE/REV.
00

AD
412

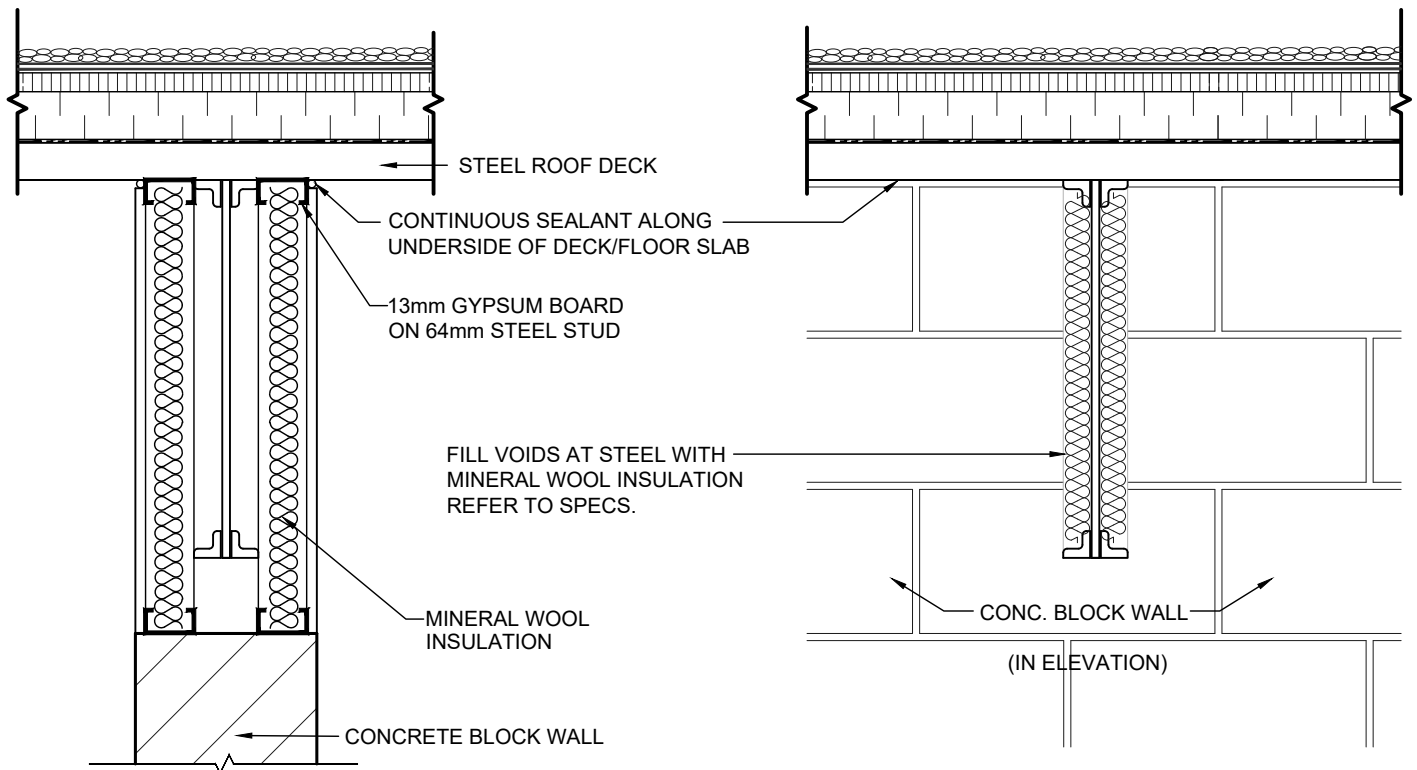
CONDITION AT OFFSET BEAM / JOIST AT ROOF



CONDITION AT FLOOR

CONDITION AT FLOOR

CONDITION AT ROOF



CONDITION AT PARALLEL JOIST OR BEAM

NOTE: ADJUST STEEL STUD SIZES TO SUIT BLOCK WALL CONDITION.
MIN. 64mm STUD AT MAX. 400 O.C.
REF. SPECS FOR FIRE-RATED SEALANTS

CONDITION AT PERPENDICULAR JOIST OR BEAM

TOP OF WALL CONSTRUCTION AT NON-FIRE RATED ASSEMBLIES

PROJ: 25106

SCALE: 1:5

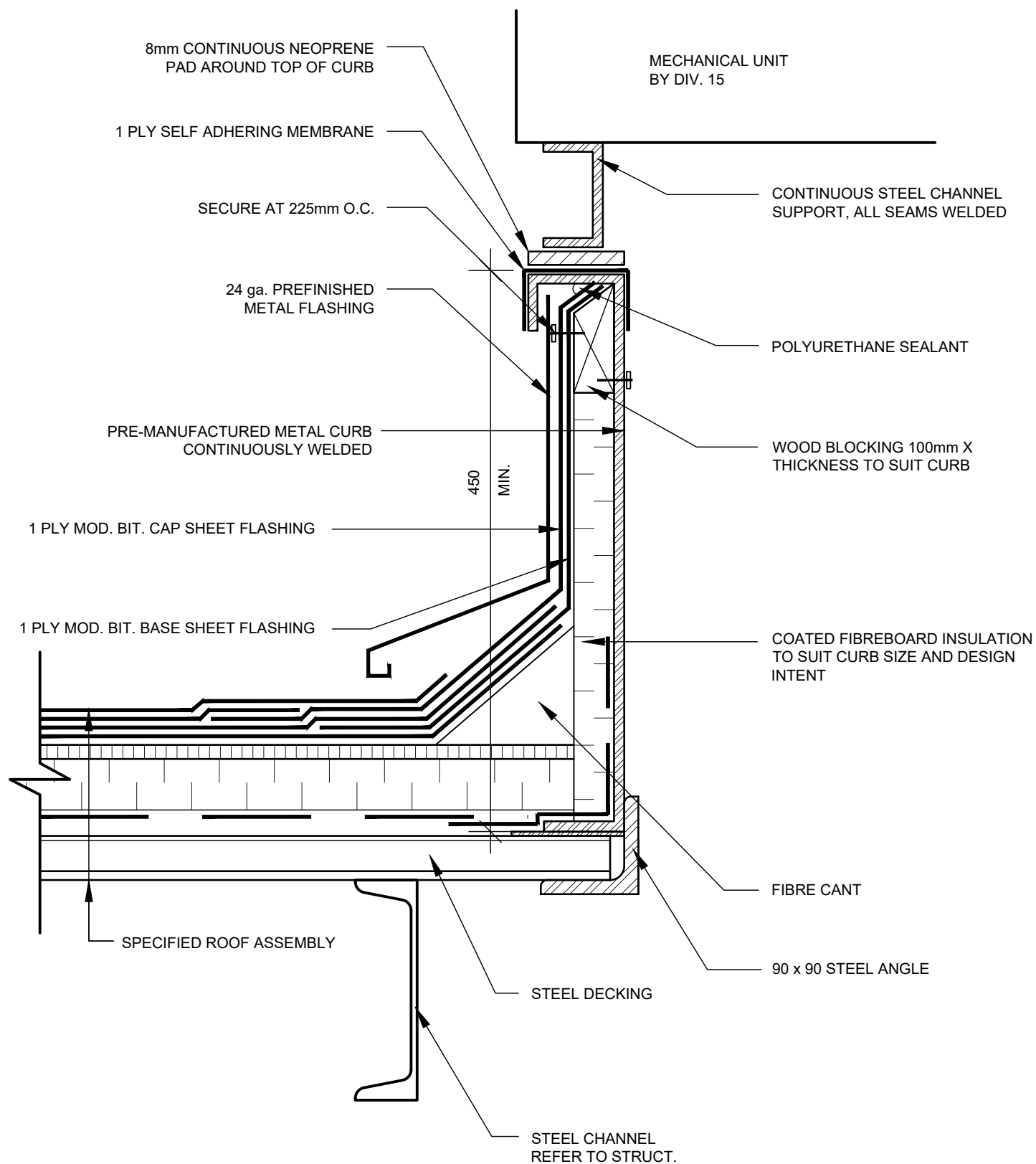
DRAWN: CC

DATE: 26 01 17

HOSSACK
ARCHITECTURE

ISSUE/REV.
00

AD
450



MECHANICAL CURB

PROJ: 25106
 SCALE: 1:5
 DRAWN: GB
 DATE: 26 01 17

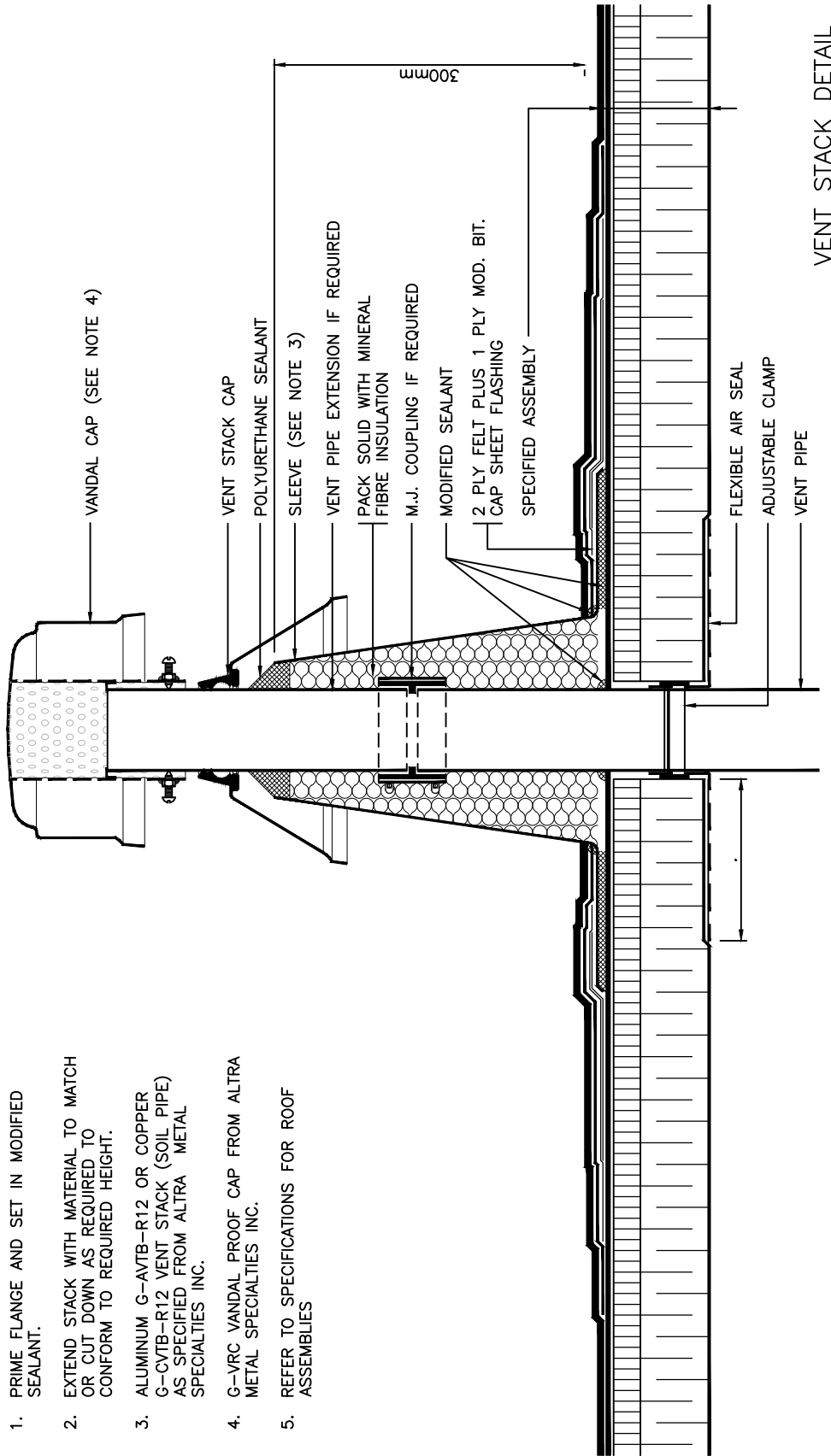


ISSUE/REV.
 00

AD
 455

NOTES:

1. PRIME FLANGE AND SET IN MODIFIED SEALANT.
2. EXTEND STACK WITH MATERIAL TO MATCH OR CUT DOWN AS REQUIRED TO CONFORM TO REQUIRED HEIGHT.
3. ALUMINUM G-AVTB-R12 OR COPPER G-CVTB-R12 VENT STACK (SOIL PIPE) AS SPECIFIED FROM ALTRA METAL SPECIALTIES INC.
4. G-VRC VANDAL PROOF CAP FROM ALTRA METAL SPECIALTIES INC.
5. REFER TO SPECIFICATIONS FOR ROOF ASSEMBLIES



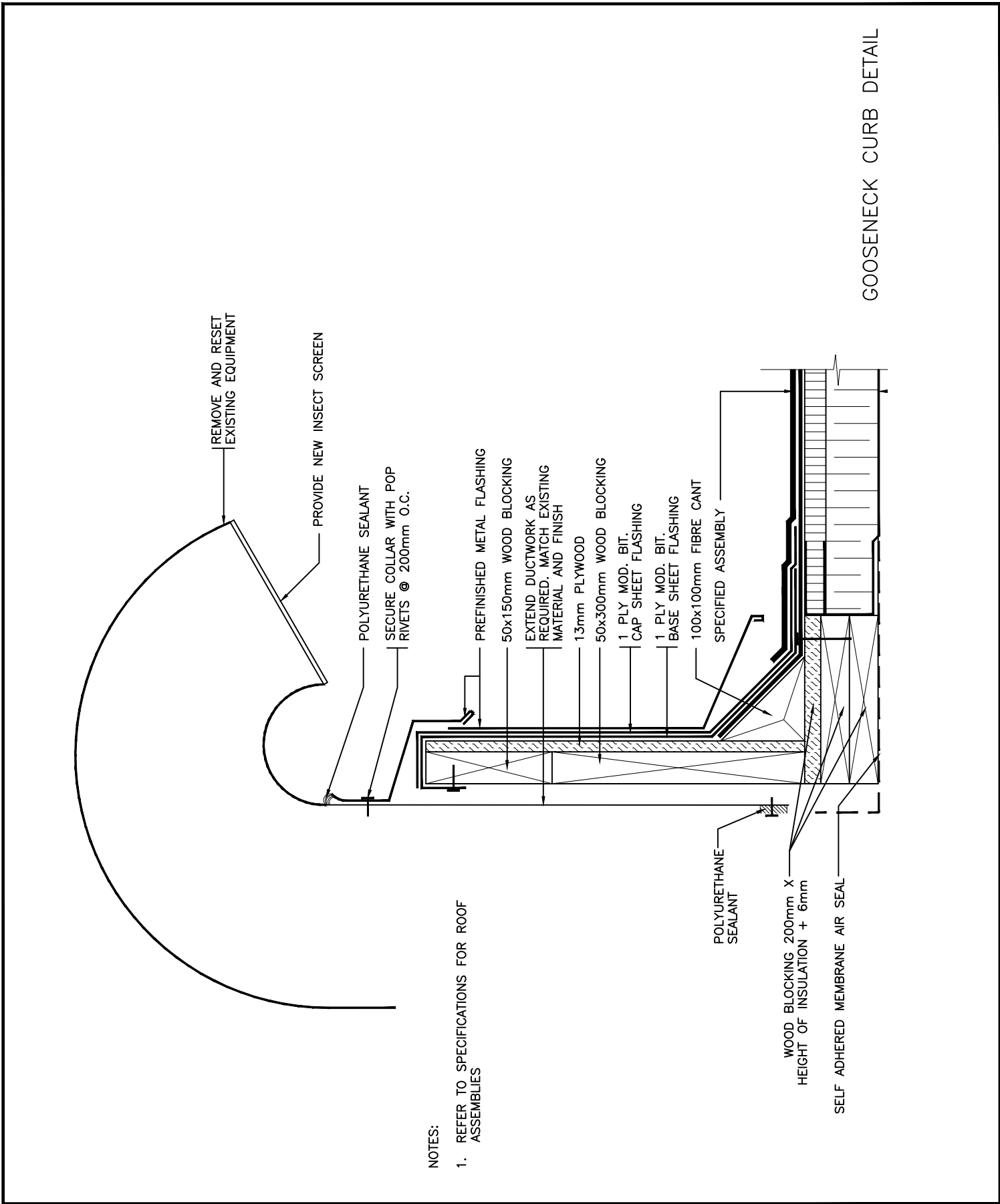
VENT STACK DETAIL

PROJ: 25106
SCALE: NTS
DRAWN: GB
DATE: 26 01 17



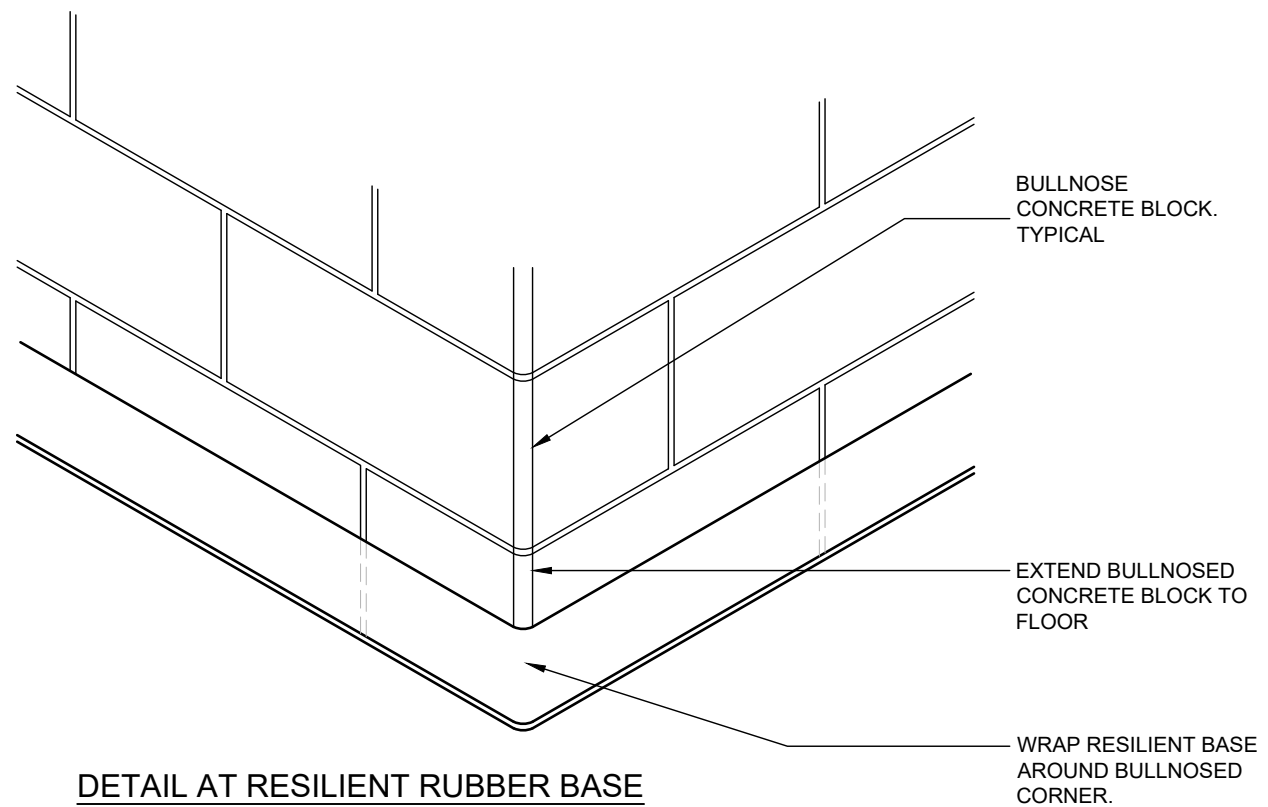
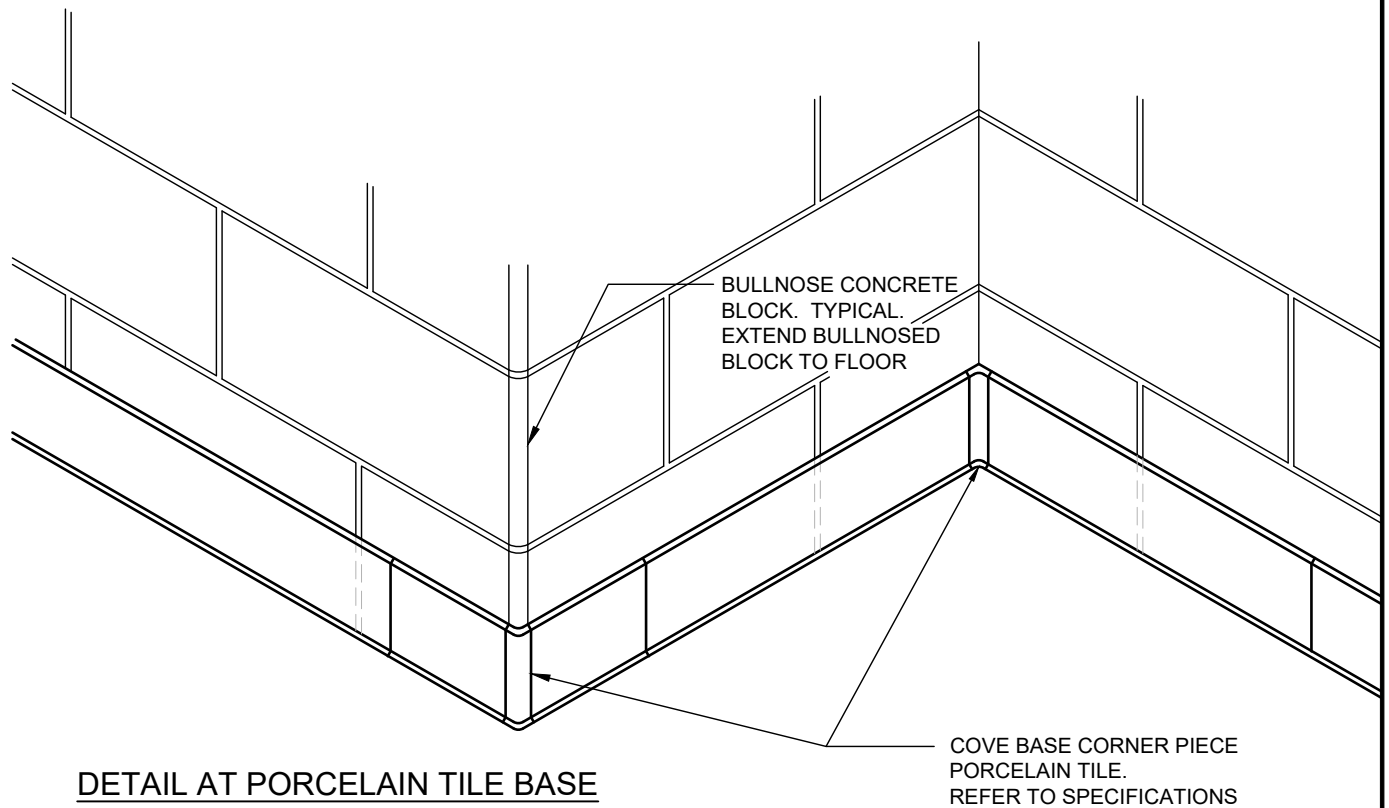
ISSUE/REV.
00

AD
459



GOOSENECK CURB DETAIL

- NOTES:
1. REFER TO SPECIFICATIONS FOR ROOF ASSEMBLIES



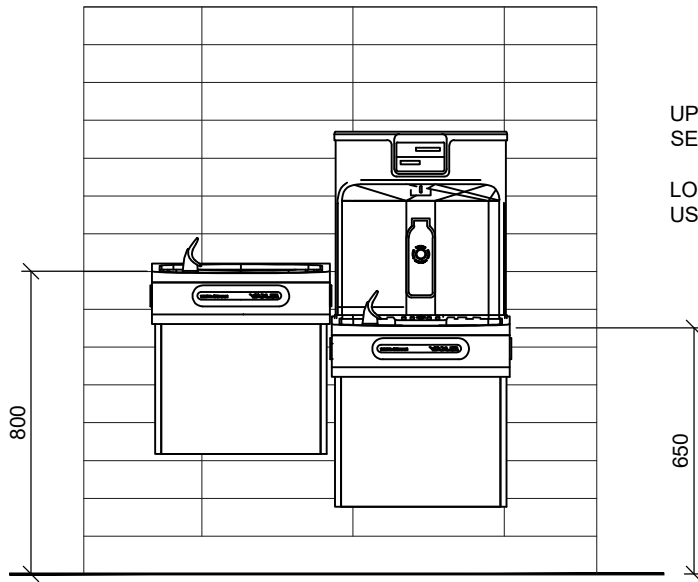
PORCELAIN TILE BASE

PROJ: 25106
 SCALE: NTS
 DRAWN: GB
 DATE: 26 01 17



ISSUE/REV.
 00

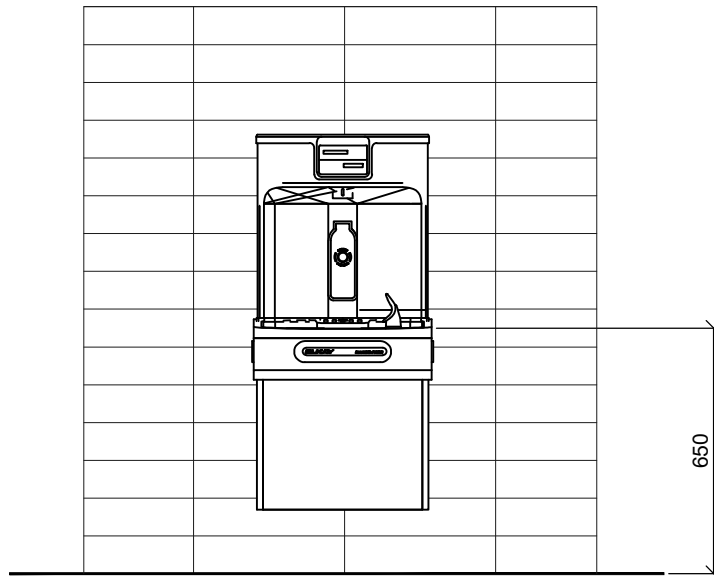
AD
 501



UPPER DRINKING FOUNTAIN HEIGHT
SET FOR BARRIER FREE

LOWER DRINKING FOUNTAIN IS FOR
USE BY SMALL CHILDREN

FRONT ELEVATION 1



FRONT ELEVATION 2

DRINKING FOUNTAINS MOUNTING HEIGHTS

PROJ: 20127
SCALE: N.T.S.
DRAWN: GB
DATE: 22 05 11

**HOSSACK
& ASSOCIATES
ARCHITECTS**

ISSUE/REV.
00

AD
503

FLASHING & CAULKING
AT PENETRATIONS

FLAT BAR SUPPORTS
TO BE MOUNTED IN
SEAMS PROVIDED IN
METAL SIDING TO BE
COORDINATED BY
GENERAL
CONTRACTOR

ALUM. COMPOSITE PANELS ON
Z-GIRTS

FLASHING AND
CAULKING AT
PENETRATIONS

GALV. STEEL
ANGLE FASTENED
TO MASONRY

PLAN

SOLID FILLED CONCRETE
BLOCK AT ROOF LADDER

TYPICAL BRICK AND BLOCK

FLASHING &
CAULKING AT
PENETRATIONS

BRICK AND BLOCK
MASONRY WALL
CONSTRUCTION

FLASHING AND
CAULKING AT
PENETRATIONS

GALV. STEEL ANGLE
FASTENED TO
MASONRY

PLAN

LADDER SUPPORT A ARS-500
ACCESS LADDER SUPPORT
BY THALER METAL INDUSTRIES,
REFER TO SPECS

1252

STEEL GRATING

SLOPE 8%

PRECAST
PAVER
600x600

6473
U/S NEW GYM DECK

6133
U/S EX. GYM DECK

3645 +/-

215

450
MIN

PRECAST PAVER
600x600

3880
U/S STL DECK

3533
EX. U/S STL DECK

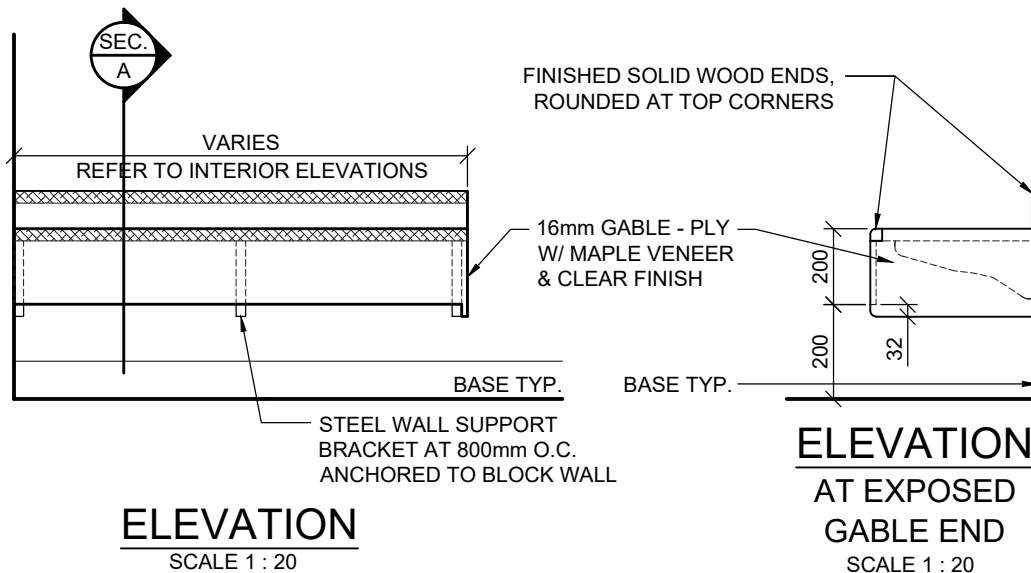
ROOF ACCESS LADDER

PROJ: 25106
SCALE: N.T.S.
DRAWN: GB
DATE: 26 01 17

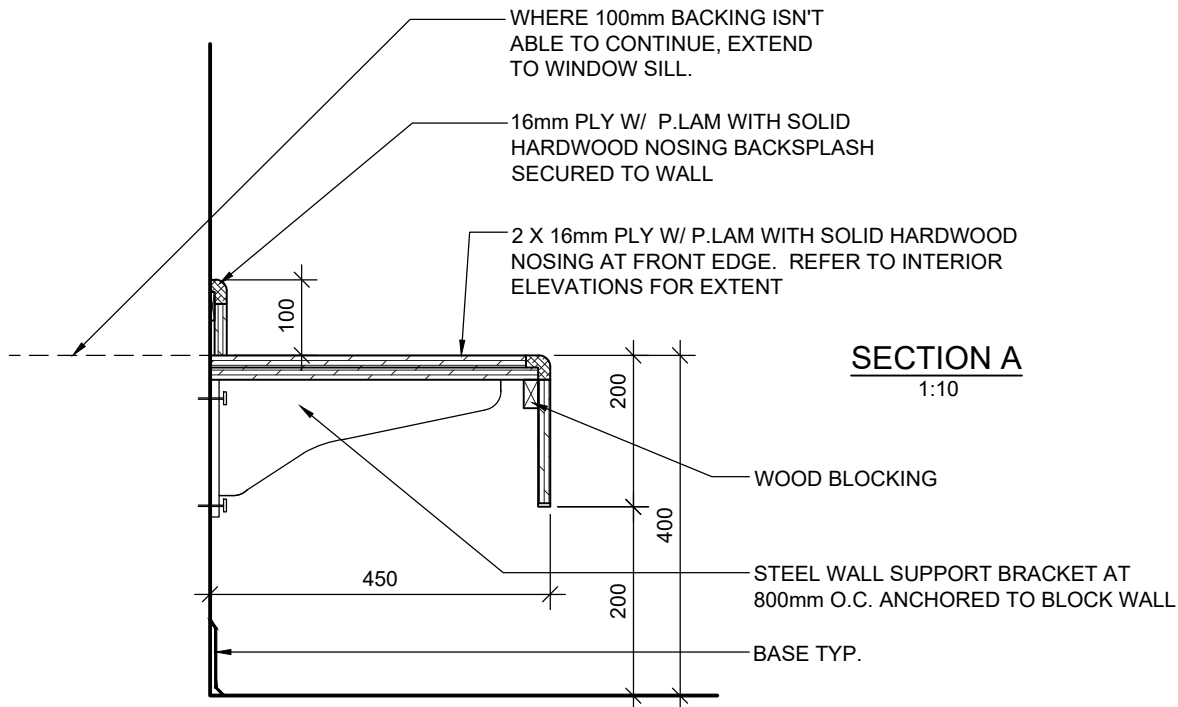


ISSUE/REV.
00

AD
517



- NOTES:**
- REFER TO SPECIFICATIONS FOR MILLWORK CONSTRUCTION AND HARDWARE.
 - CONFIRM LOCATION AND QUANTITIES WITH PLANS AND INTERIOR ELEVATIONS.
 - CONFIRM UNIT SIZE WITH INTERIOR ELEVATIONS. TYP.
 - NO BACKSPLASH AT WINDOWS



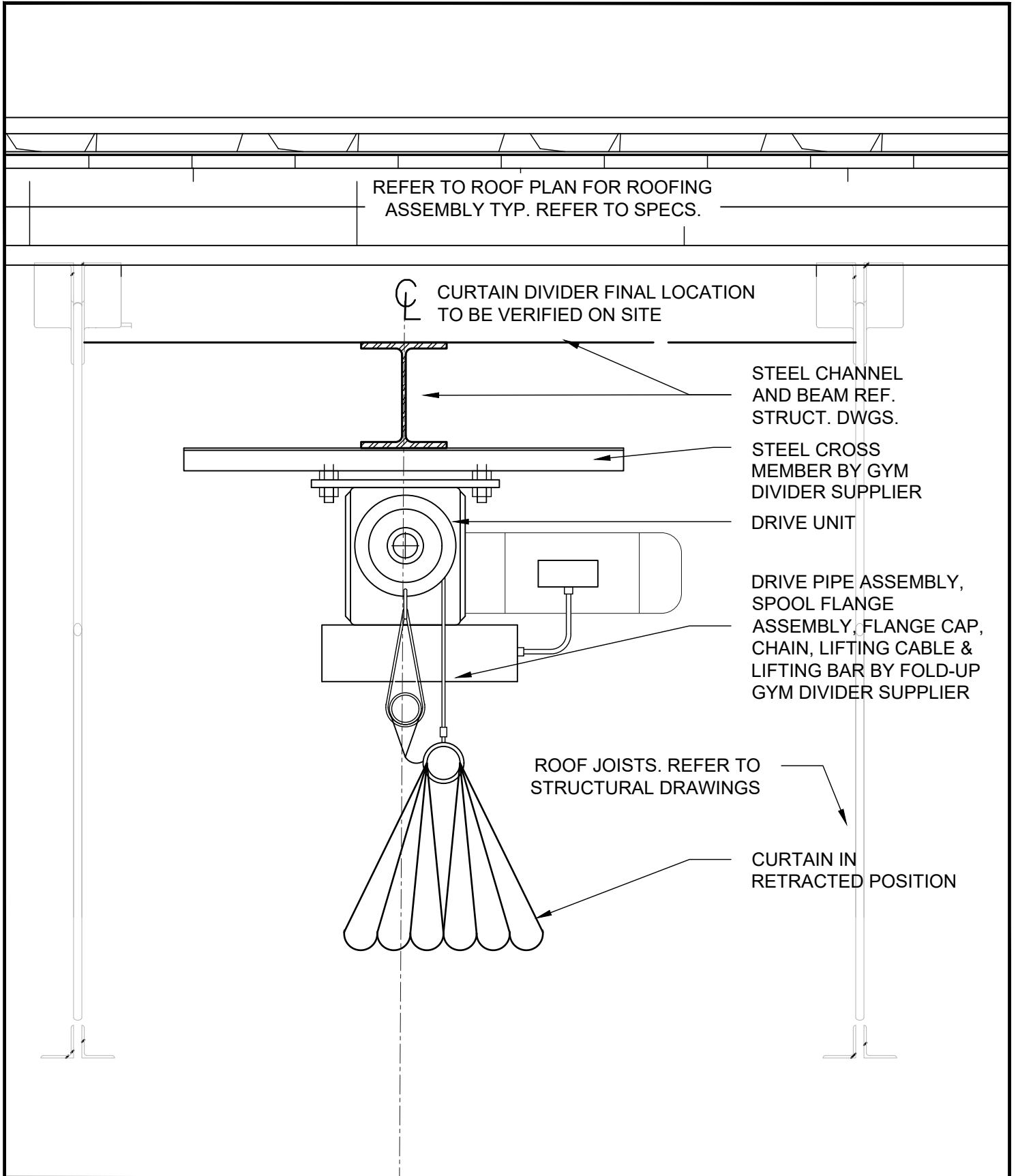
CO-LAB WOOD BENCH - M7

PROJ: 25106
SCALE: NOTED
DRAWN: GB
DATE: 26 01 17



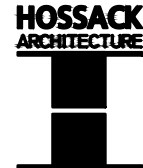
ISSUE/REV.

AD
520

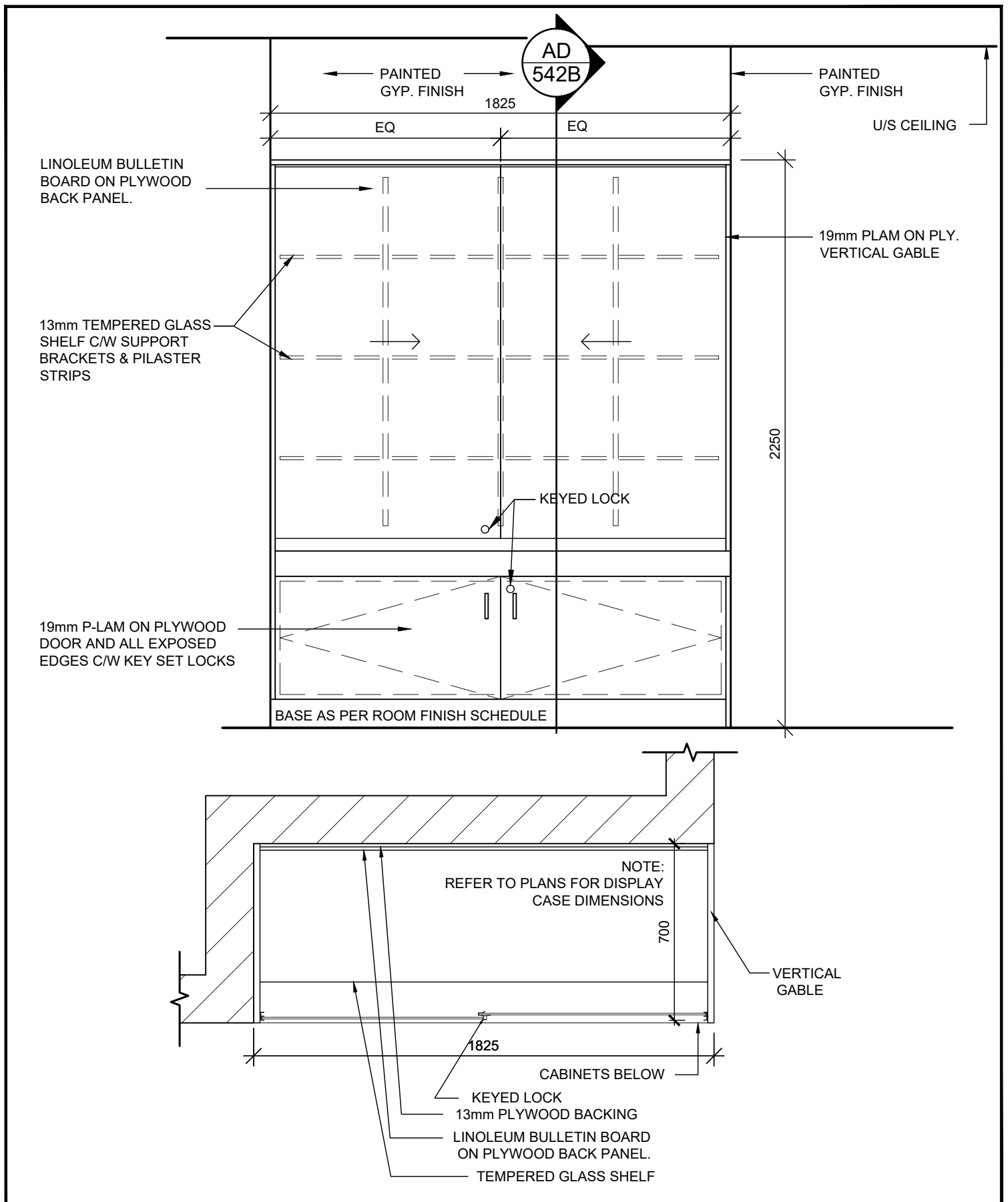


GYM DIVIDER CURTAIN DETAIL

PROJ:	25106
SCALE:	1:50
DRAWN:	KB
DATE:	26 01 17



ISSUE/REV.
AD 525



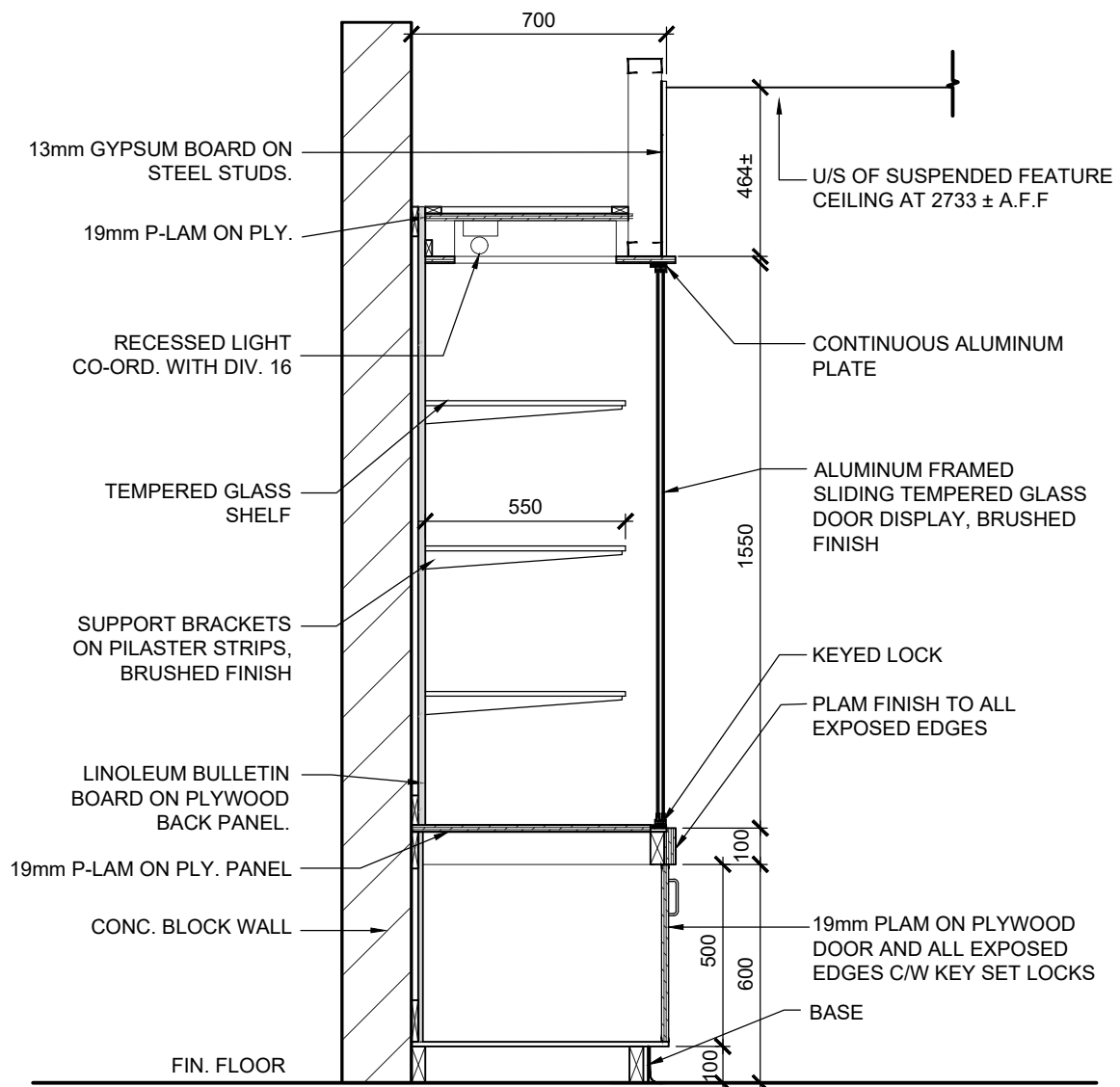
D2 - ART DISPLAY CASE
REFER TO FLOOR PLAN FOR LOCATIONS

PROJ: 25106
SCALE: 1:20
DRAWN: AH
DATE: 26 03 23



ISSUE/REV.
00

AD
542A



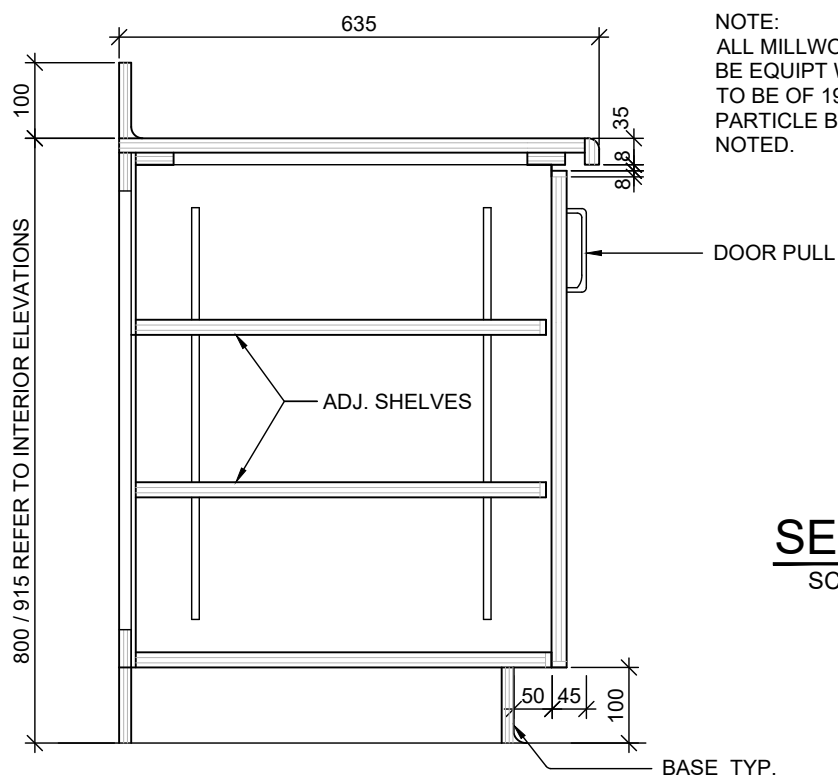
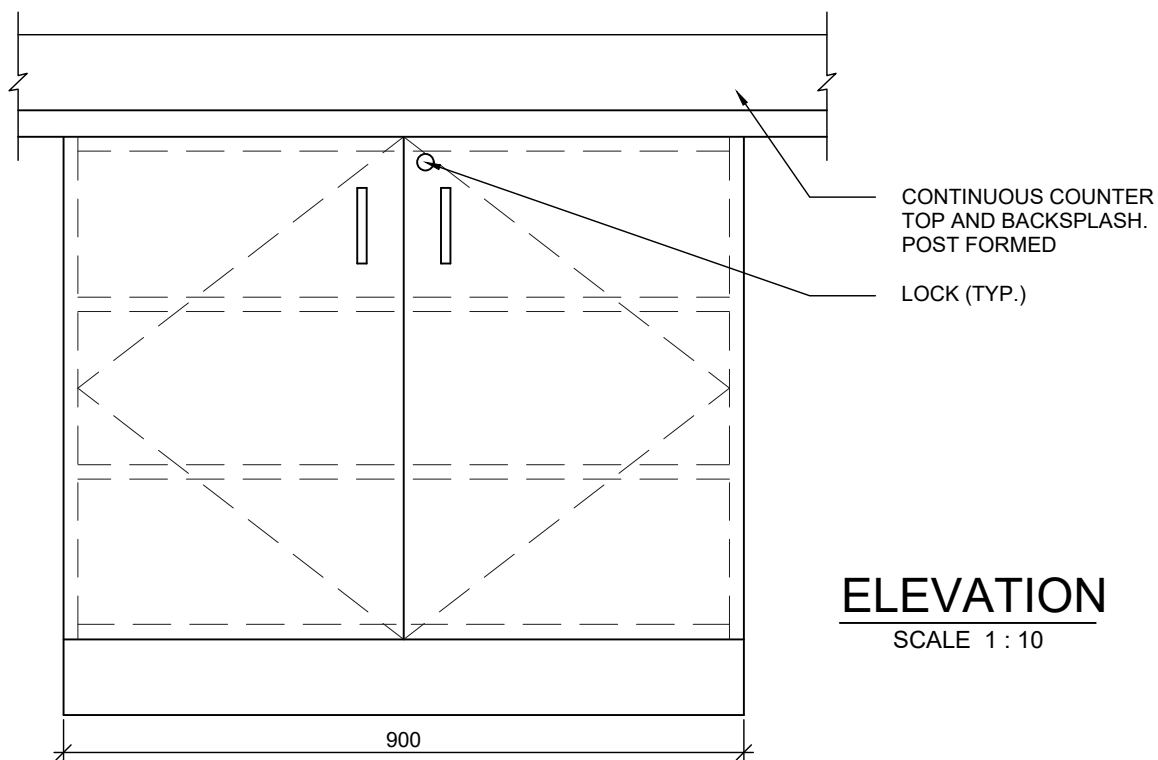
D2 - ART DISPLAY CASE - SECTION
REFER TO FLOOR PLAN FOR LOCATIONS

PROJ: 25106
SCALE: 1:20
DRAWN: KB
DATE: 26 03 23



ISSUE/REV.
00

AD
542B



NOTE:
ALL MILLWORK DOORS AND DRAWERS TO
BE EQUIPT WITH LOCKS. ALL MILLWORK
TO BE OF 19mm MELAMINE FACED
PARTICLE BOARD UNLESS OTHERWISE
NOTED.

SECTION

SCALE 1 : 10

CABINET TYPE B1

PROJ: 25106

SCALE: 1:10

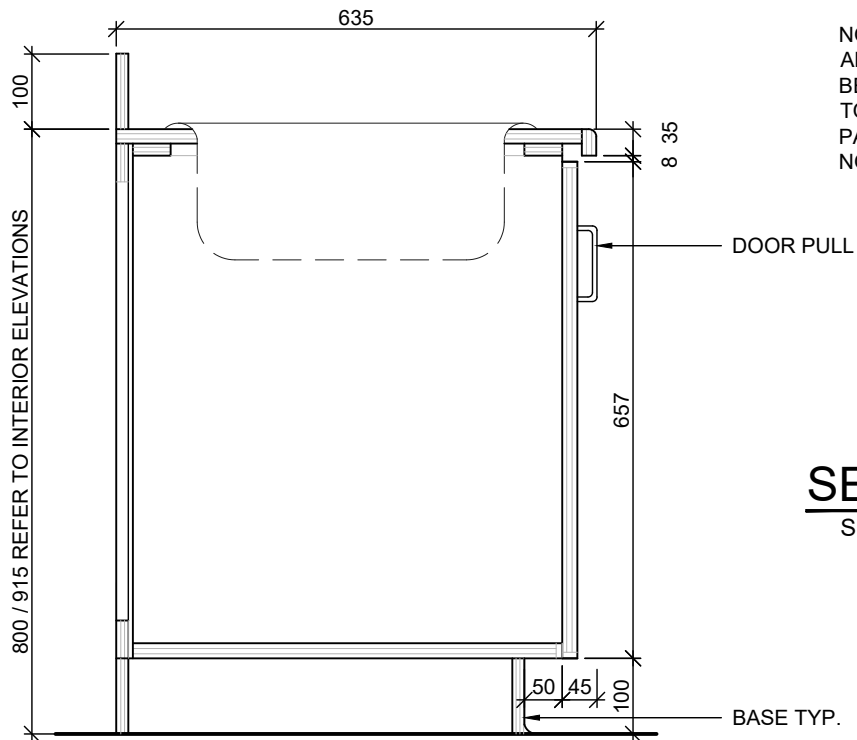
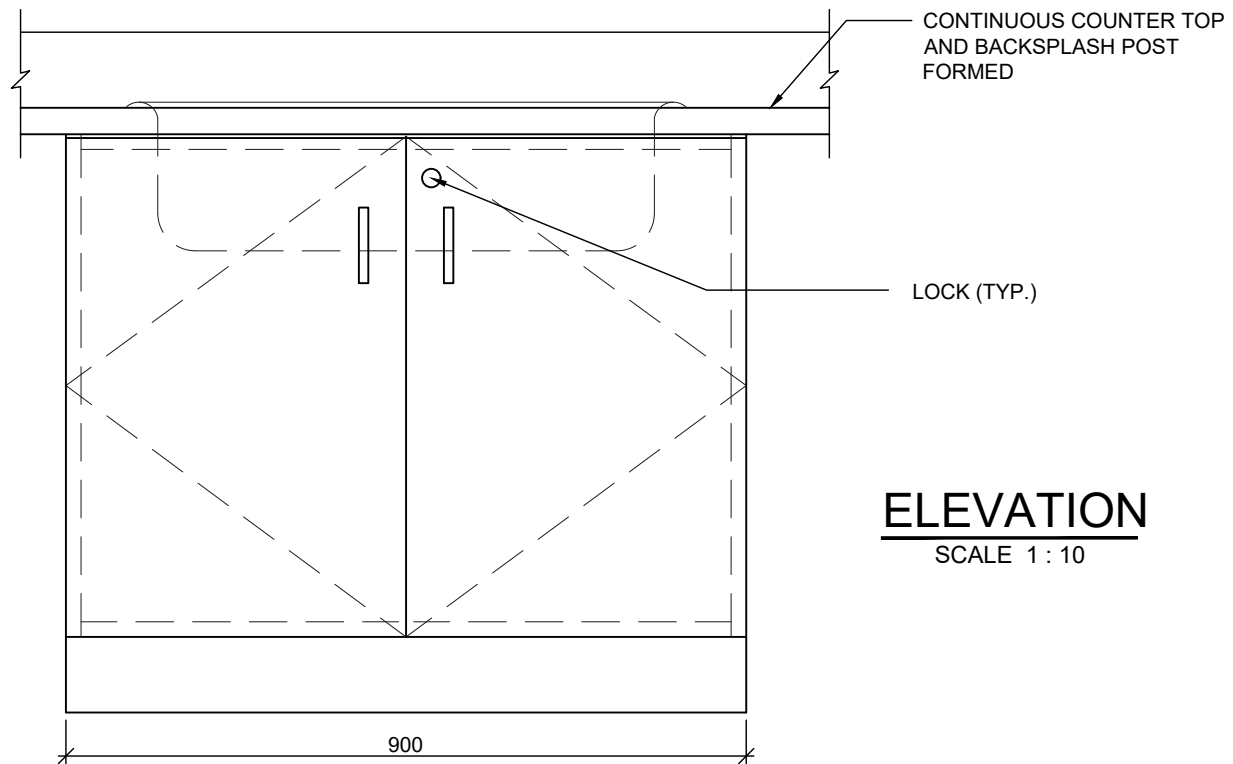
DRAWN: GB

DATE: 26 01 17



ISSUE/REV.
00

AD
601



NOTE:
ALL MILLWORK DOORS AND DRAWERS TO
BE EQUIPT WITH LOCKS. ALL MILLWORK
TO BE OF 19mm MELAMINE FACED
PARTICLE BOARD UNLESS OTHERWISE
NOTED.

SECTION
SCALE 1: 10

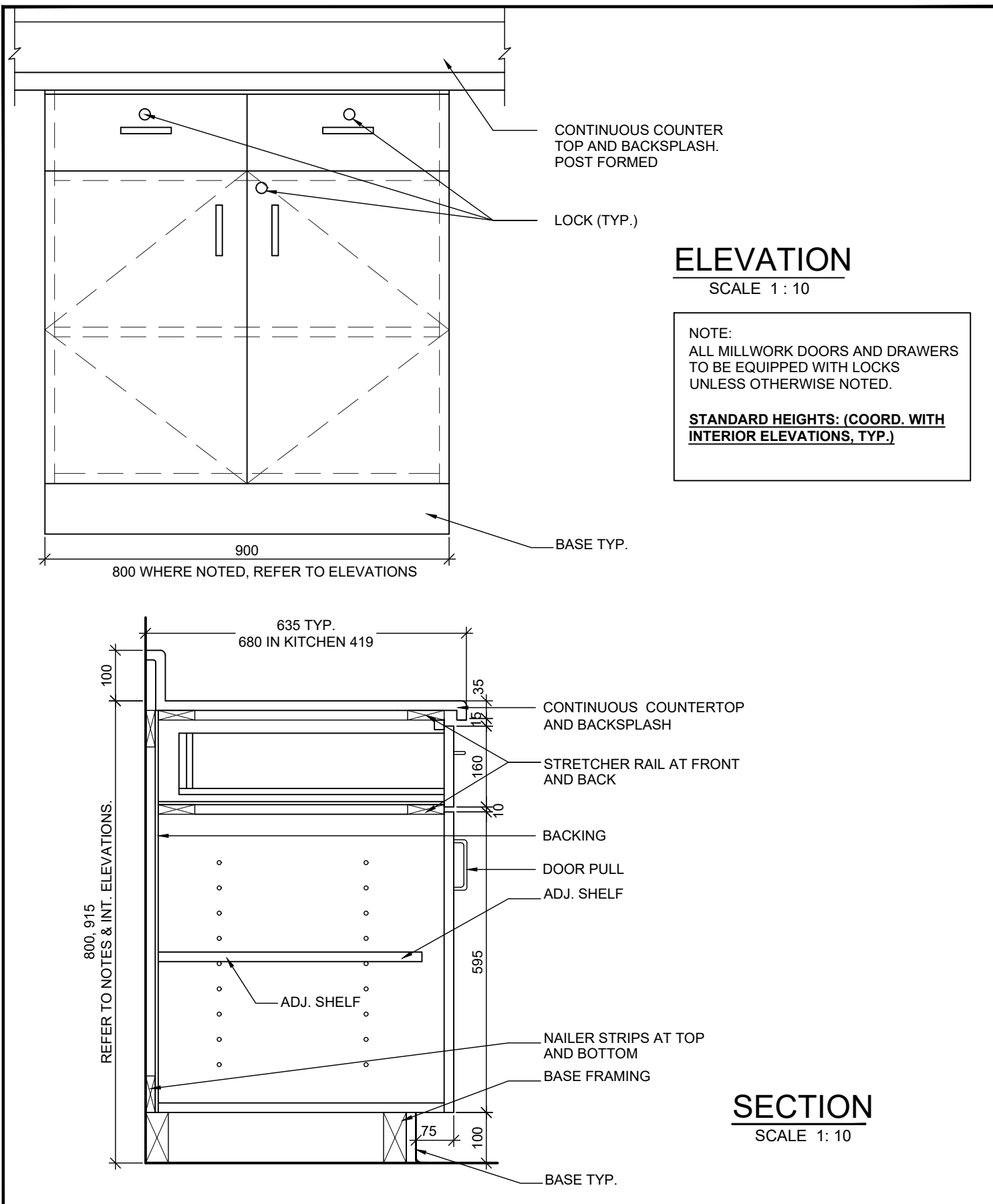
CABINET TYPE B2

PROJ: 25106
SCALE: 1:10
DRAWN: GB
DATE: 26 01 17



ISSUE/REV.
00

AD
602



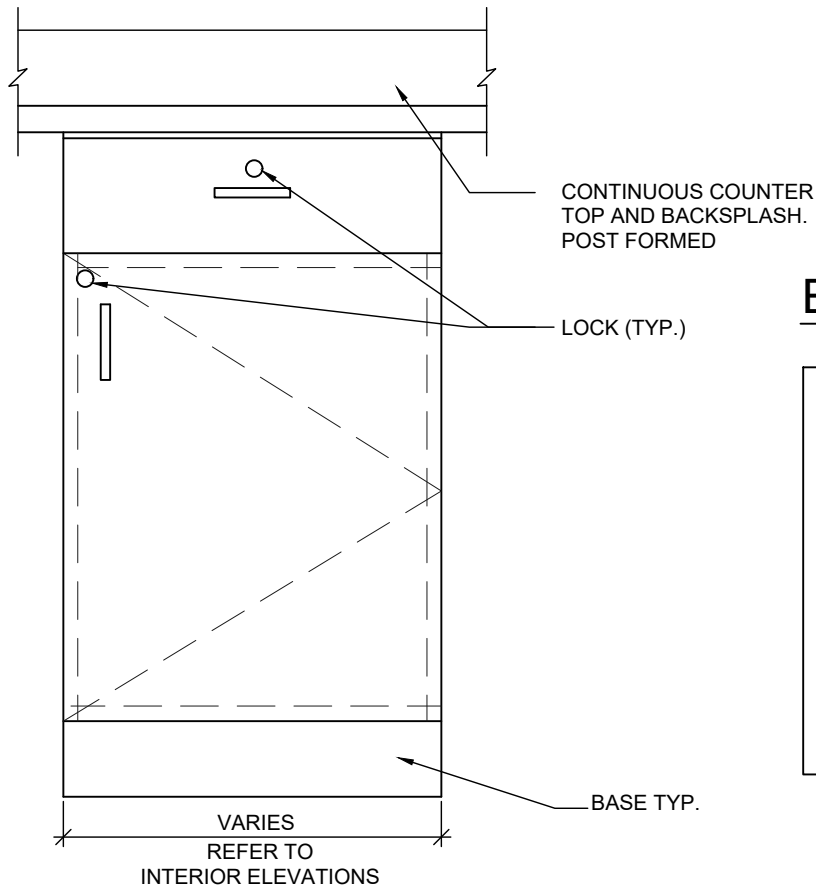
TYPE B6 - LOWER CABINET WITH DRAWERS

PROJ: 25106
SCALE: 1:10
DRAWN: KB
DATE: 26 01 17



ISSUE/REV.
00

AD
606



ELEVATION

SCALE 1 : 10

NOTE:

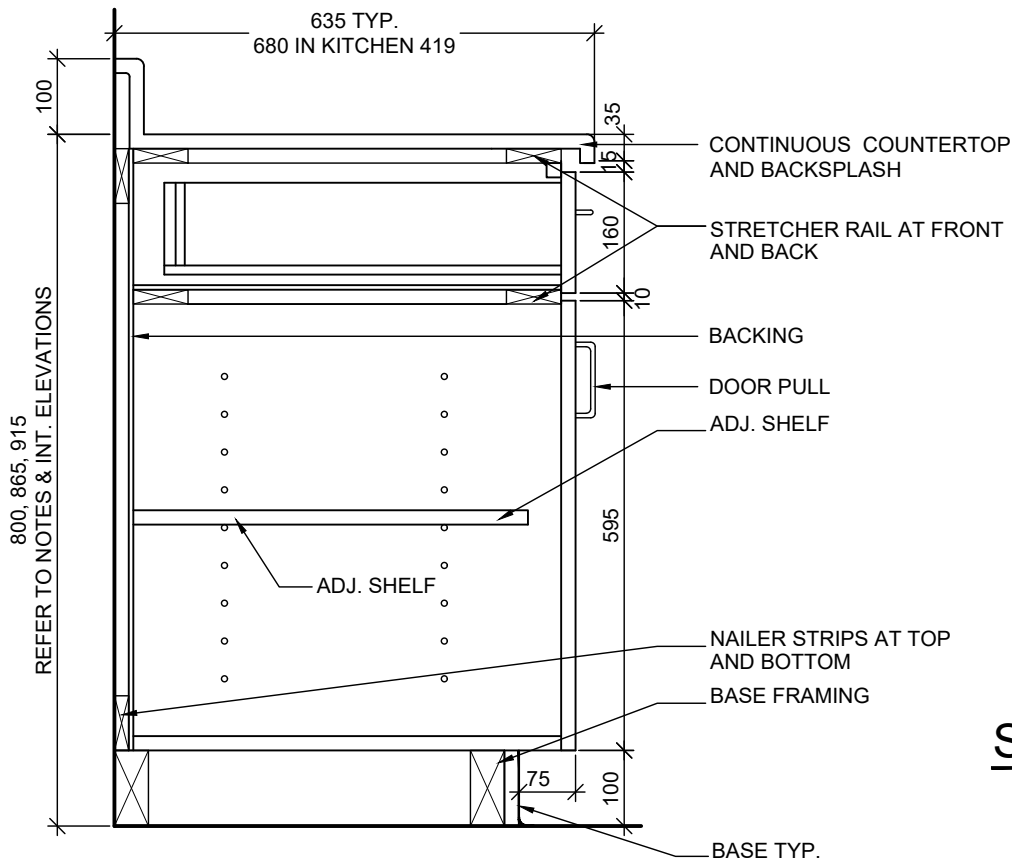
ALL MILLWORK DOORS AND DRAWERS TO BE EQUIPPED WITH LOCKS UNLESS OTHERWISE NOTED.

STANDARD HEIGHTS: (COORD. WITH INTERIOR ELEVATIONS, TYP.)

800 - LIBRARY 209

865 - KITCHENETTE 151

915 - KITCHEN 419, KITCHENETTE 159, LAUNDRY 418.



SECTION

SCALE 1 : 10

TYPE B8

PROJ: 25106

SCALE: 1:10

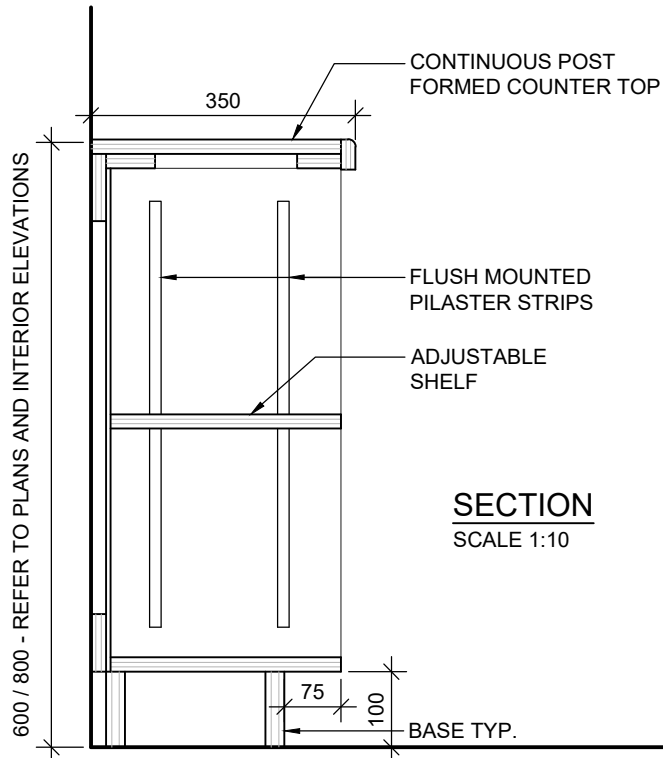
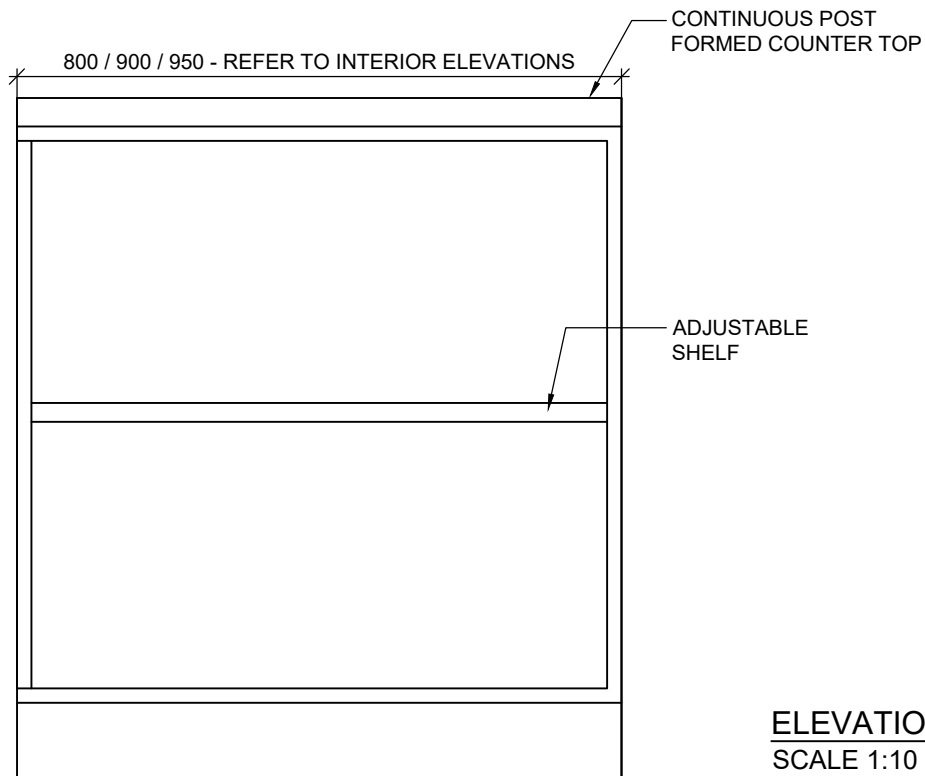
DRAWN: KB

DATE: 26 01 17



ISSUE/REV.
00

AD
608



NOTE:
-REFER TO FLOOR PLANS FOR QUANTITIES AND LAYOUT
-COORDINATE HEIGHT OF CABINET WITH INSTALLATION OF STB IN CLASSROOMS WHERE APPLICABLE

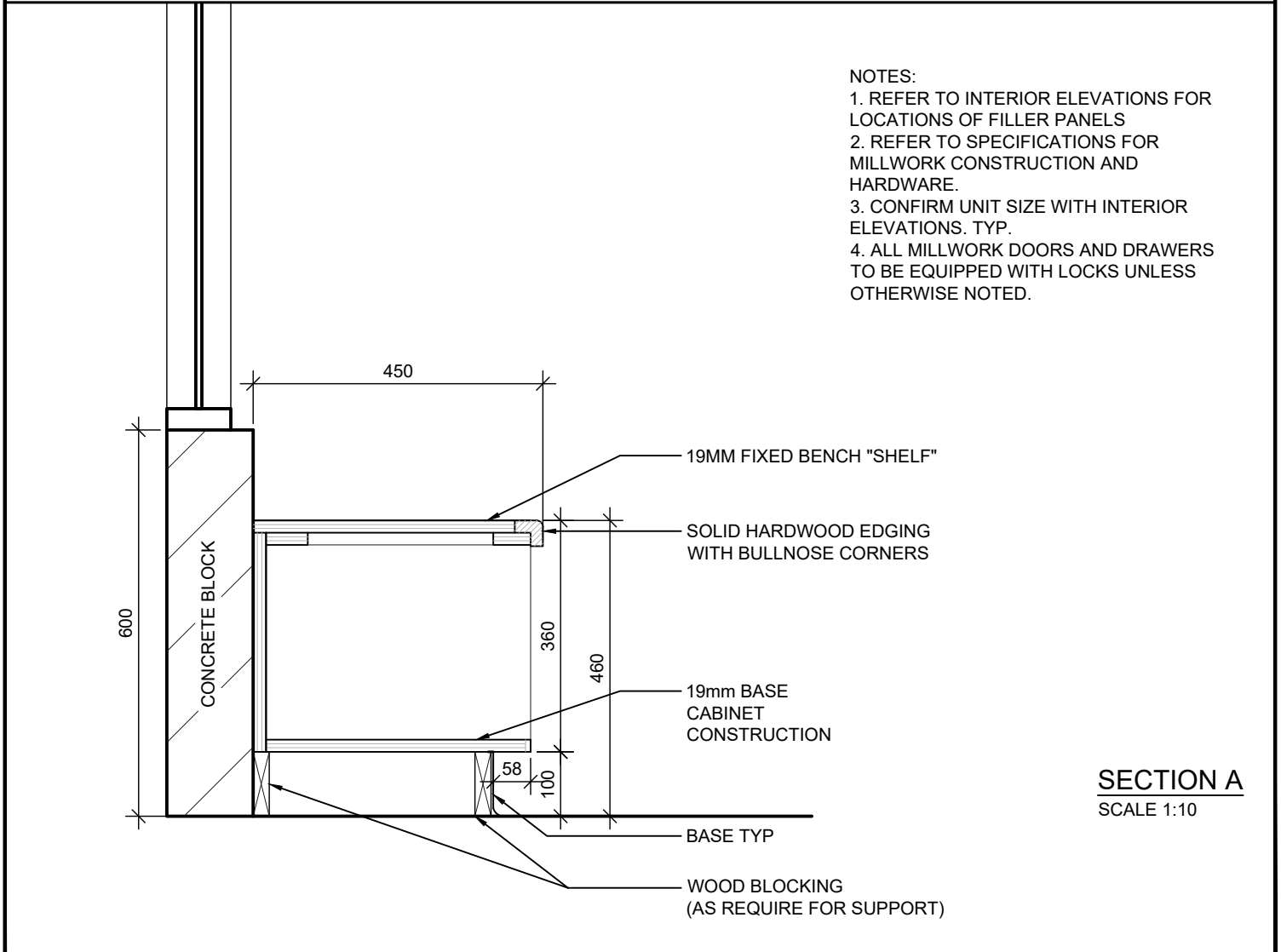
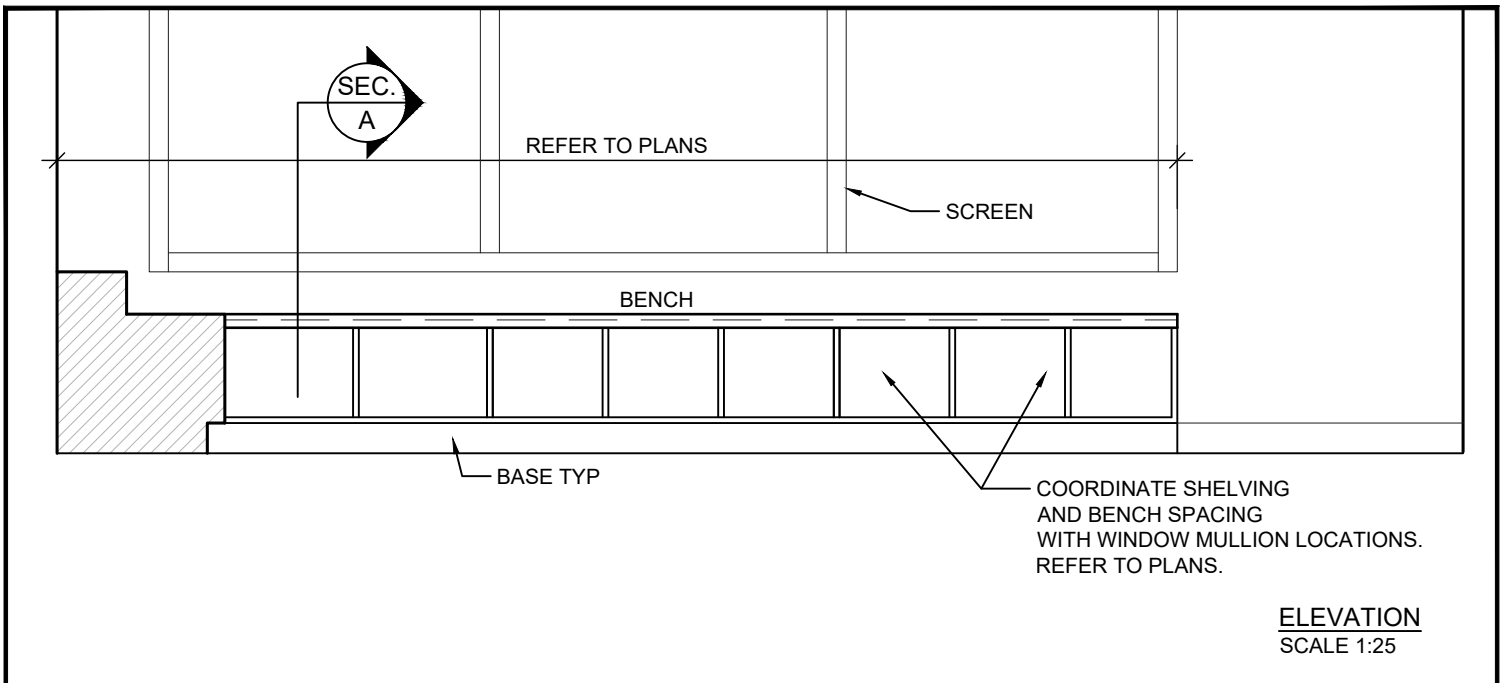
CABINET TYPE B9

PROJ: 25106
SCALE: NOTED
DRAWN: GB
DATE: 26 01 17



ISSUE/REV.
00

AD
609



CABINET TYPE B13 - CO-LAB BENCH

PROJ: 25106

SCALE: NOTED

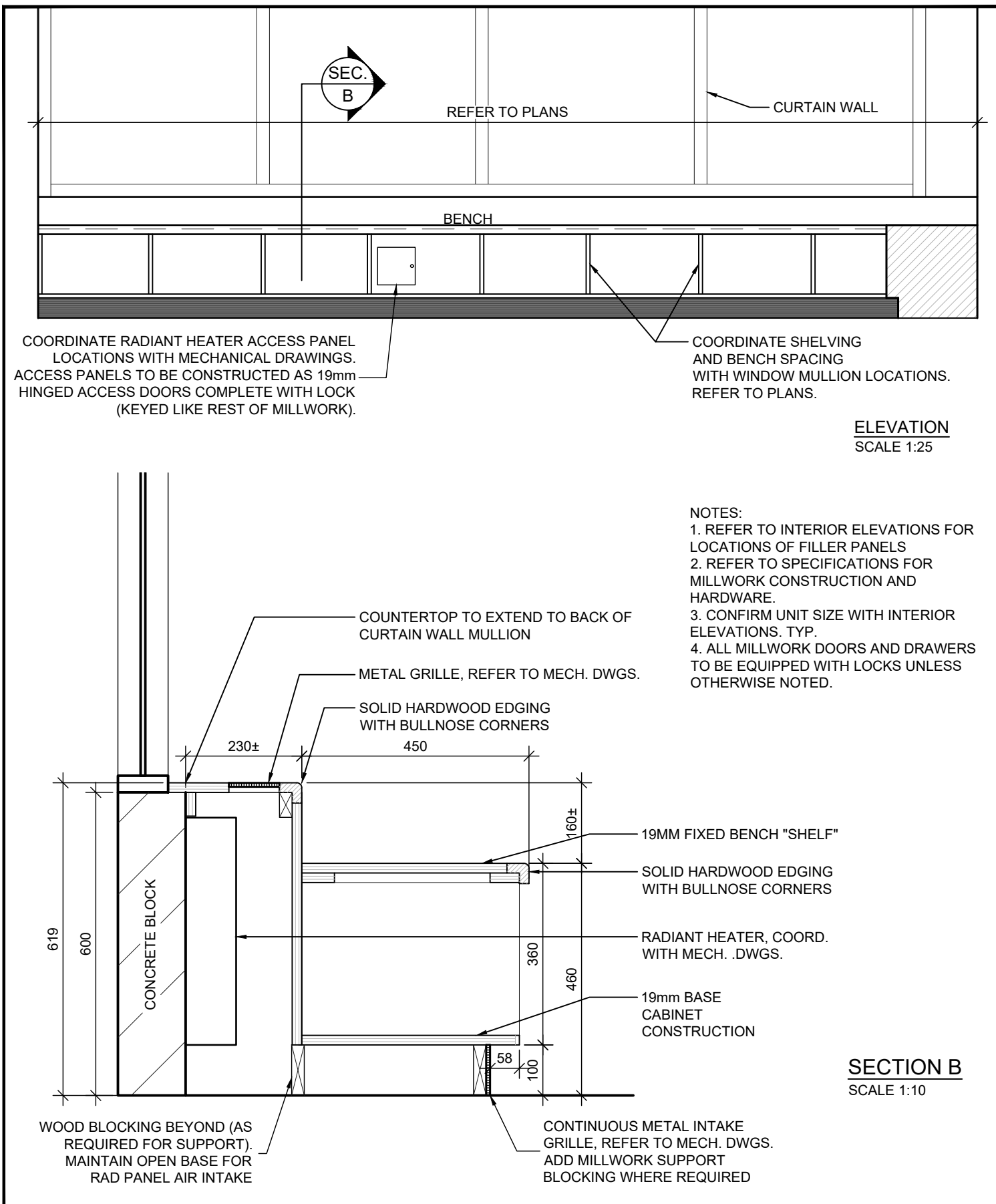
DRAWN: AH

DATE: 26 03 23



ISSUE/REV.
00

AD
617A



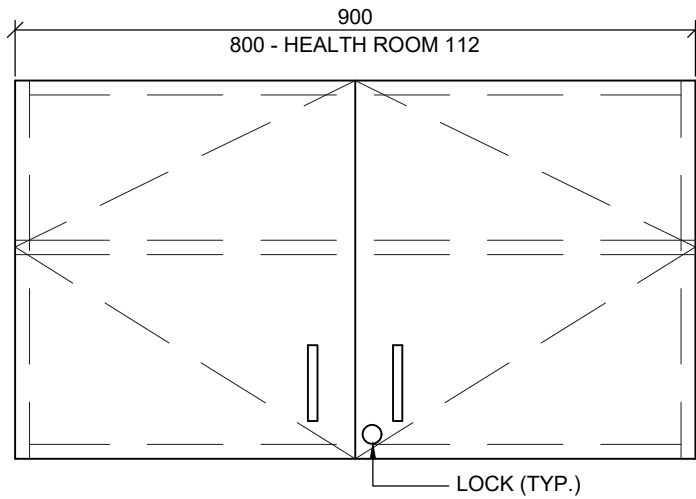
CABINET TYPE B14 CO-LAB BENCH @ RAD

PROJ: 25106
SCALE: NOTED
DRAWN: AH
DATE: 26 03 23



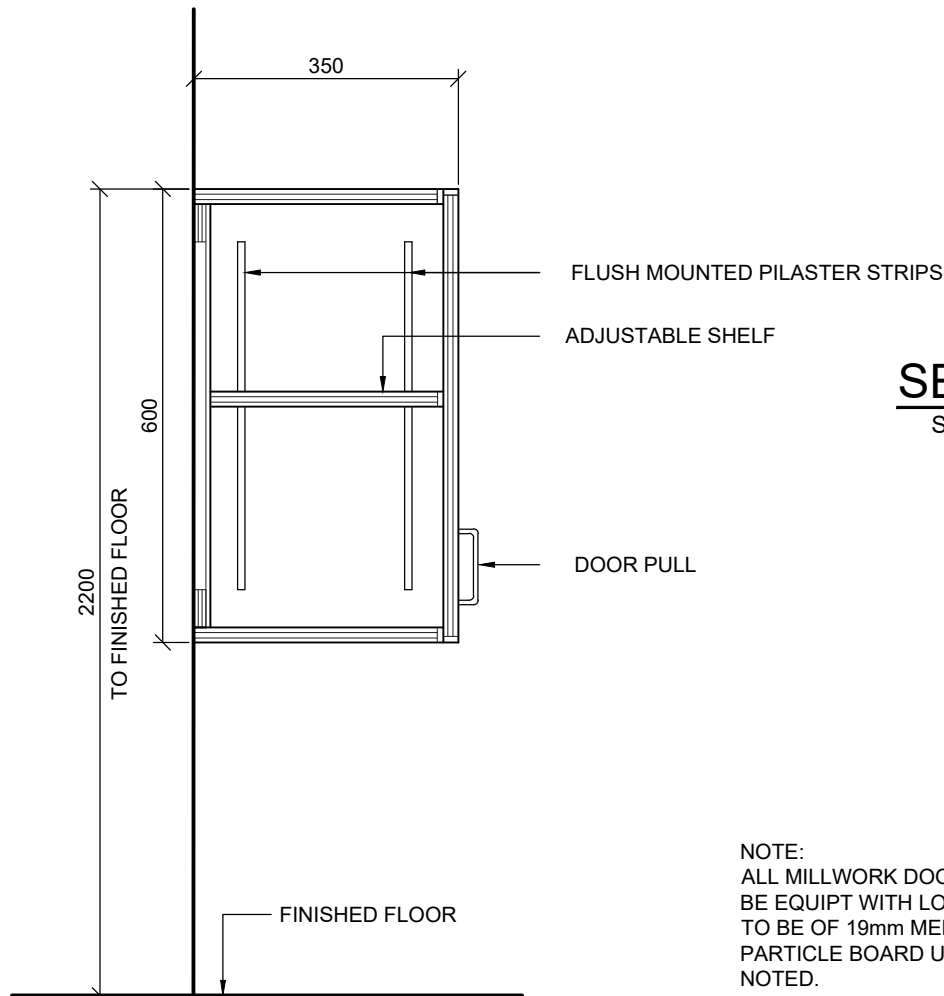
ISSUE/REV.
00

AD
617B



ELEVATION

SCALE 1 : 10



SECTION

SCALE 1: 10

NOTE:
ALL MILLWORK DOORS AND DRAWERS TO
BE EQUIPT WITH LOCKS. ALL MILLWORK
TO BE OF 19mm MELAMINE FACED
PARTICLE BOARD UNLESS OTHERWISE
NOTED.

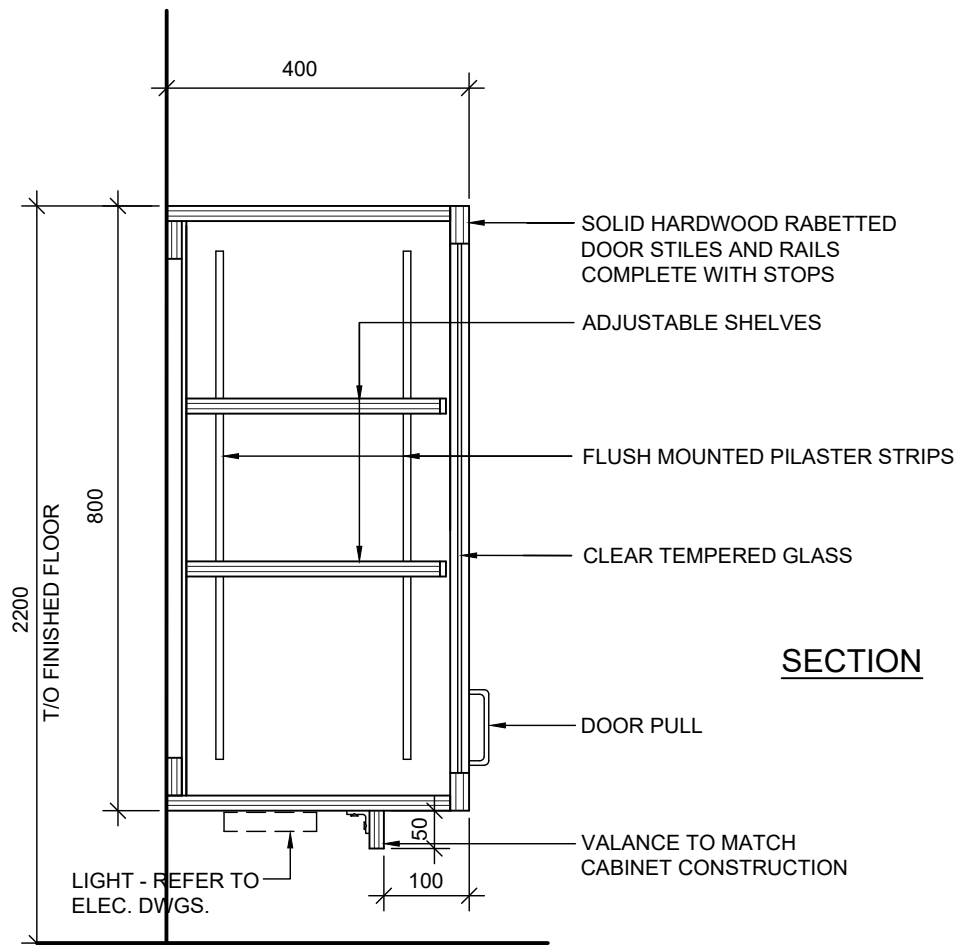
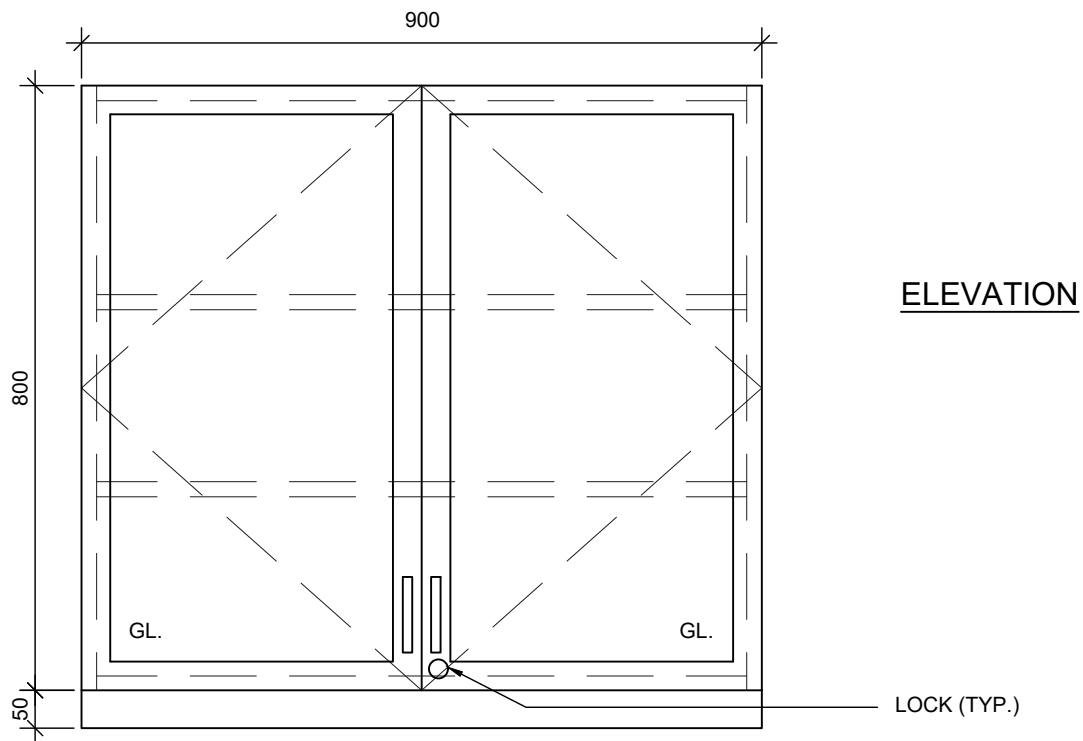
CABINET TYPE U2

PROJ:	25106
SCALE:	1:10
DRAWN:	GB
DATE:	26 01 17



ISSUE/REV.
00

AD
622



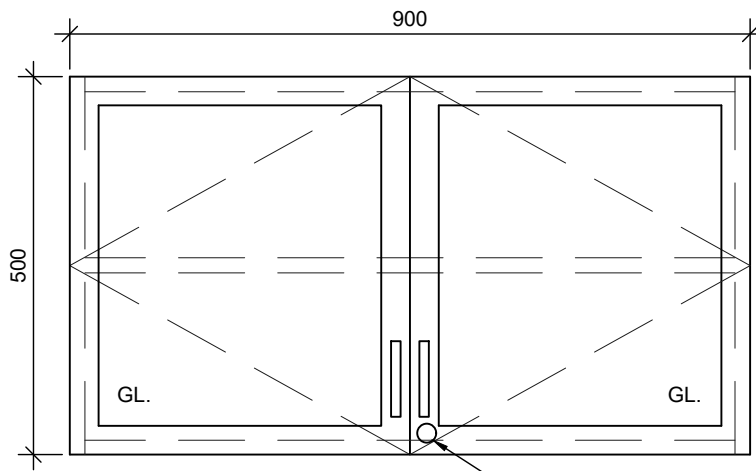
CABINET TYPE U5-A

PROJ: 25106
SCALE: 1:10
DRAWN: GB
DATE: 26 01 17

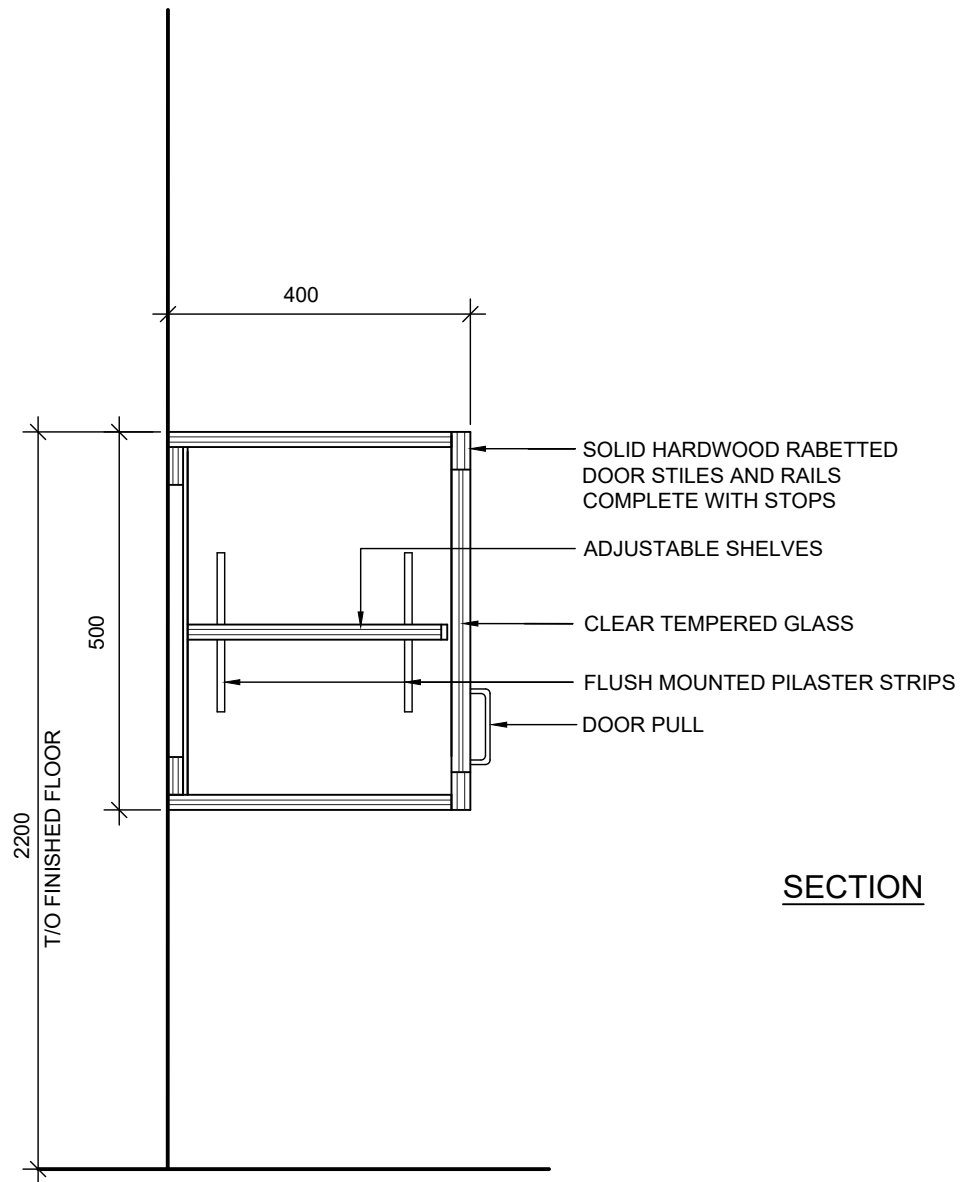


ISSUE/REV.
00

AD
625A



ELEVATION



SECTION

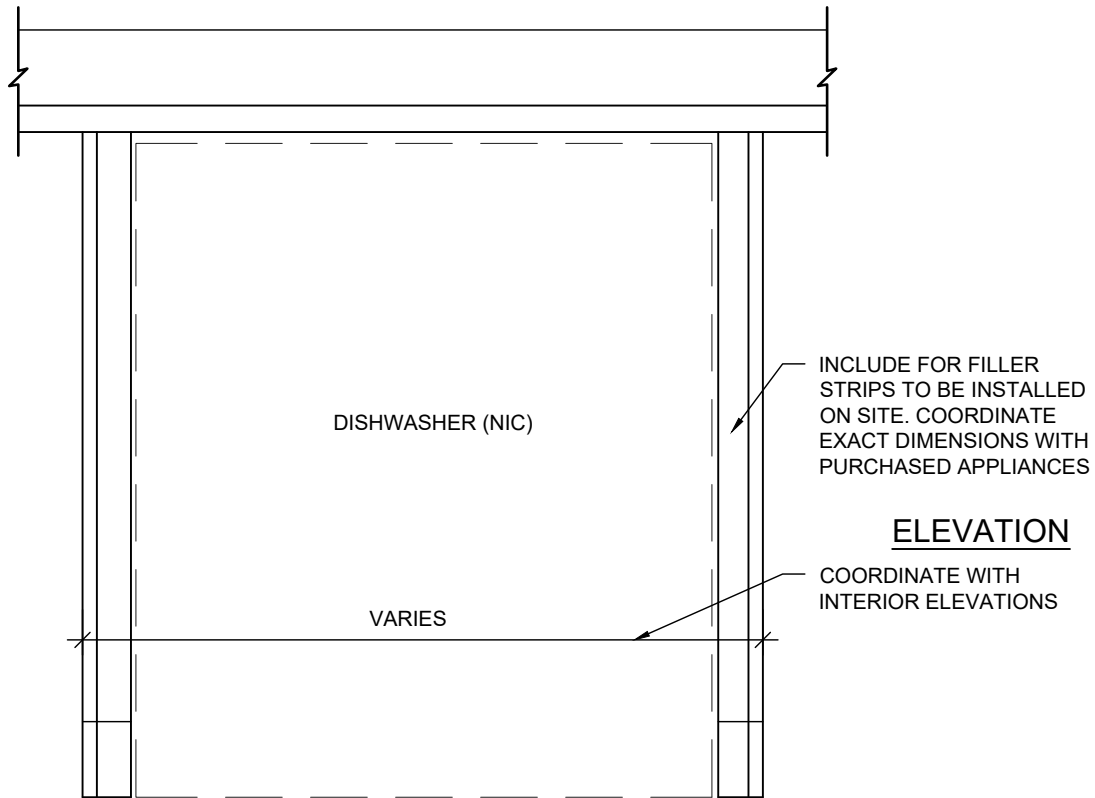
CABINET TYPE U5-B

PROJ:	25106
SCALE:	1:10
DRAWN:	GB
DATE:	26 01 17

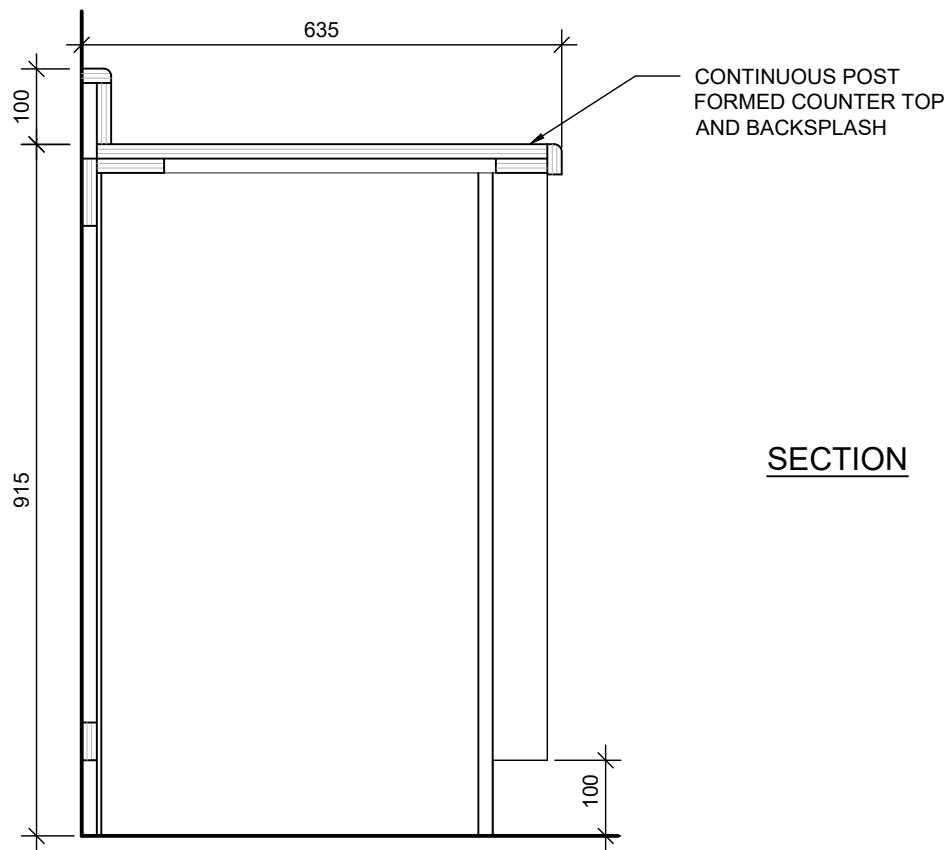


ISSUE/REV.
00

AD
625B



ELEVATION



SECTION

TYPE B34 - LOWER MILLWORK AT
DISHWASHER

PROJ: 25106
SCALE: 1:10
DRAWN: KB
DATE: 26 01 17



ISSUE/REV.
00

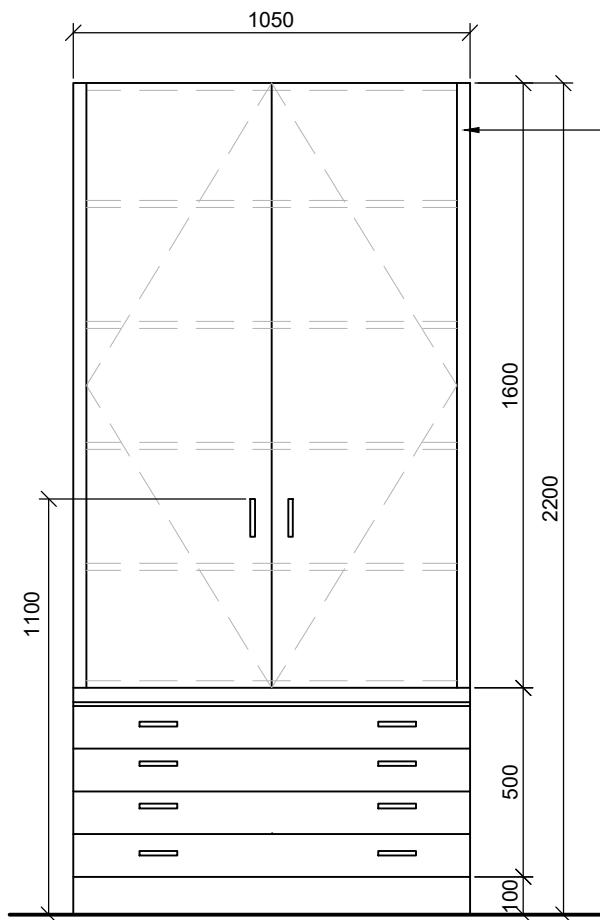
AD
627



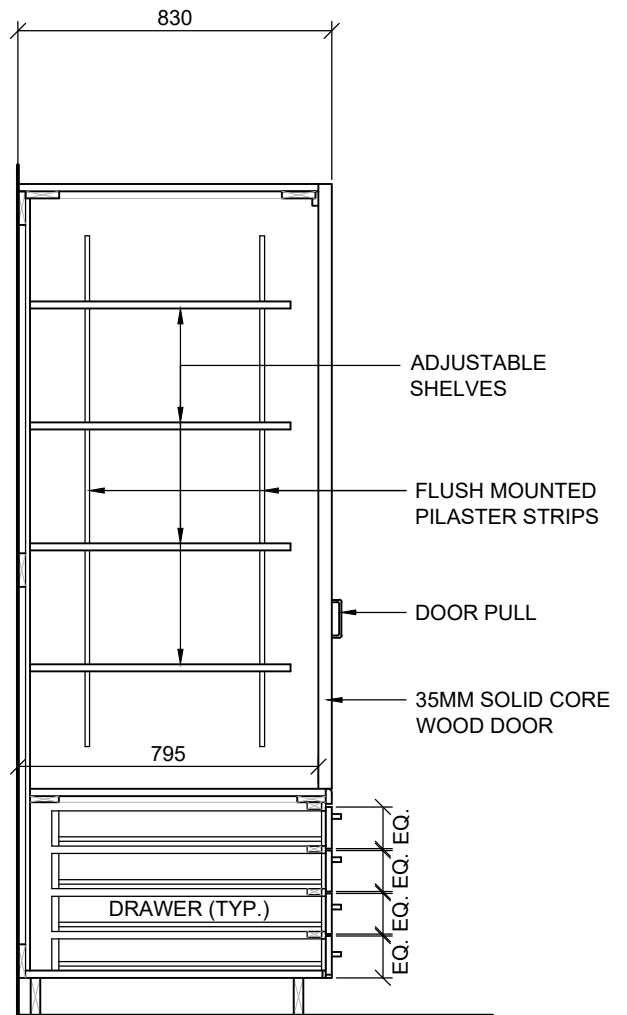
TO BE EQUIPPED WITH LOCKS
UNLESS OTHERWISE NOTED.
REFER TO SPECIFICATION FOR
MILLWORK CONSTRUCTION AND
HARDWARE.

SECTION
SCALE 1: 10

AD
629



ELEVATION



SECTION

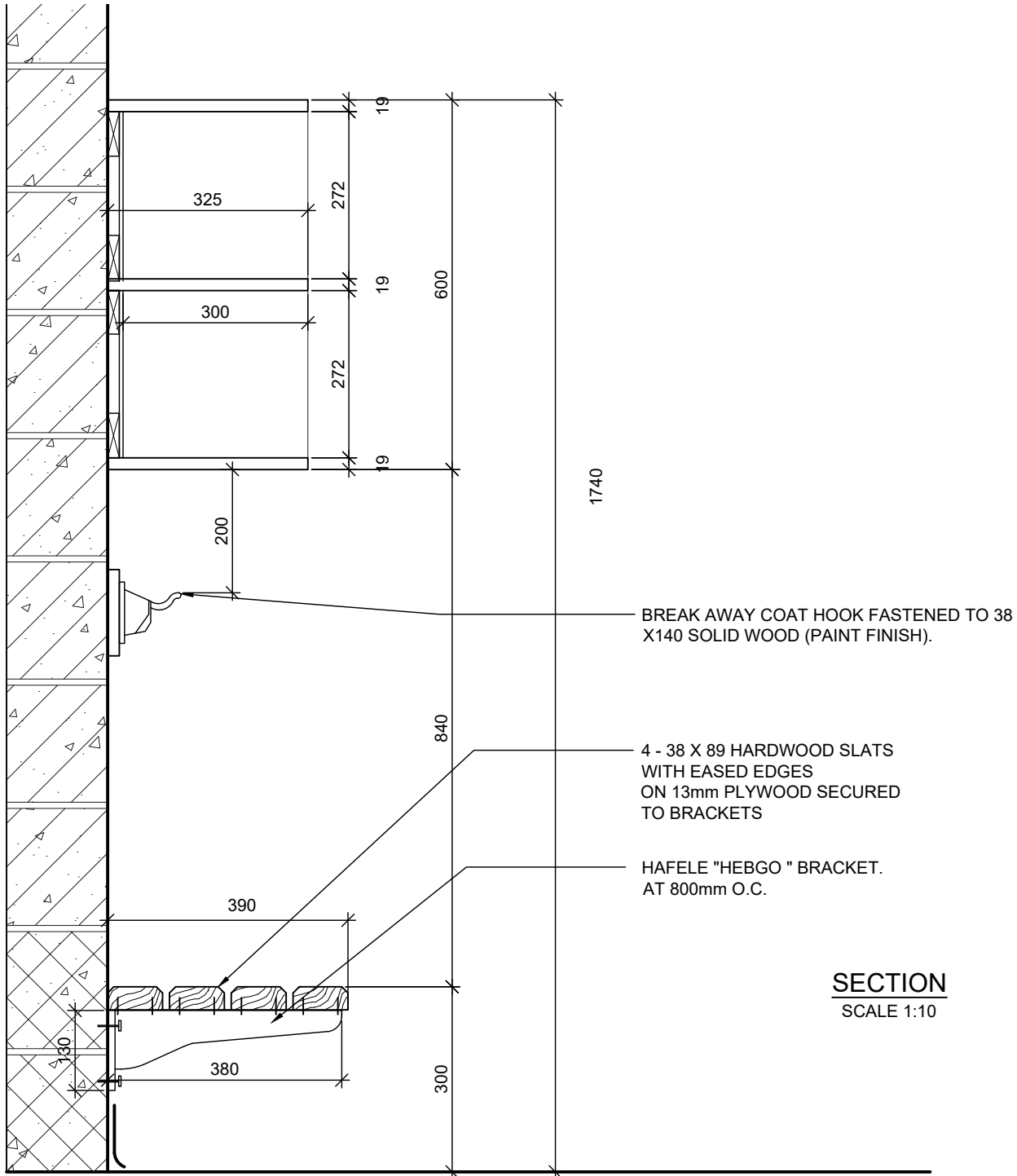
KINDERGARTEN CLOSET AND DOORS
TYPE K1

PROJ: 25106
SCALE: NTS
DRAWN: GB
DATE: 26 05 05



ISSUE/REV.
00

AD
631



NOTE:
REFER TO SPECIFICATION FOR MILLWORK
CONSTRUCTION AND HARDWARE.

REFER TO PLANS & INTERIOR ELEVATIONS
FOR LOCATIONS AND LAYOUT.

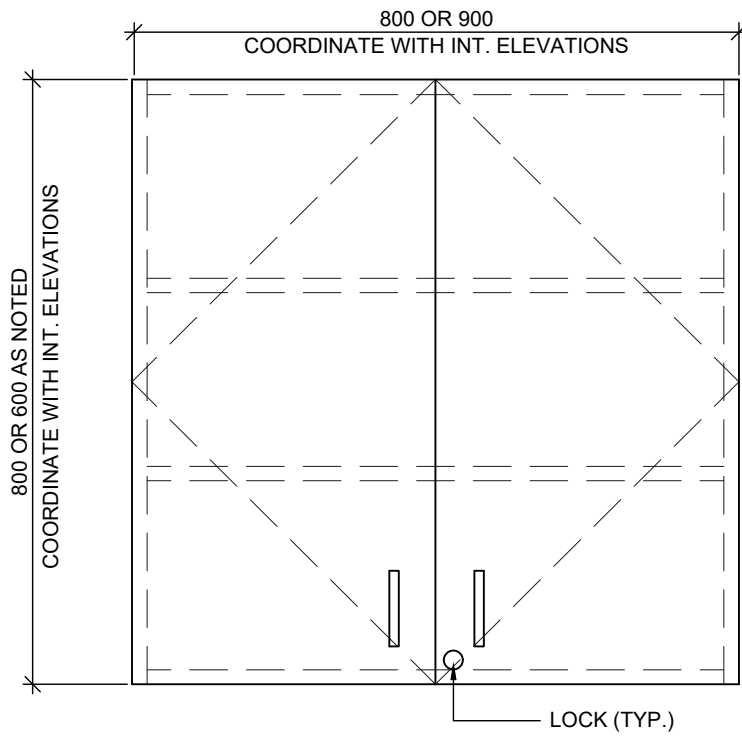
CHILD CARE CUBBIES TYPE K5

PROJ:	25106
SCALE:	1:10
DRAWN:	GB
DATE:	26 01 17



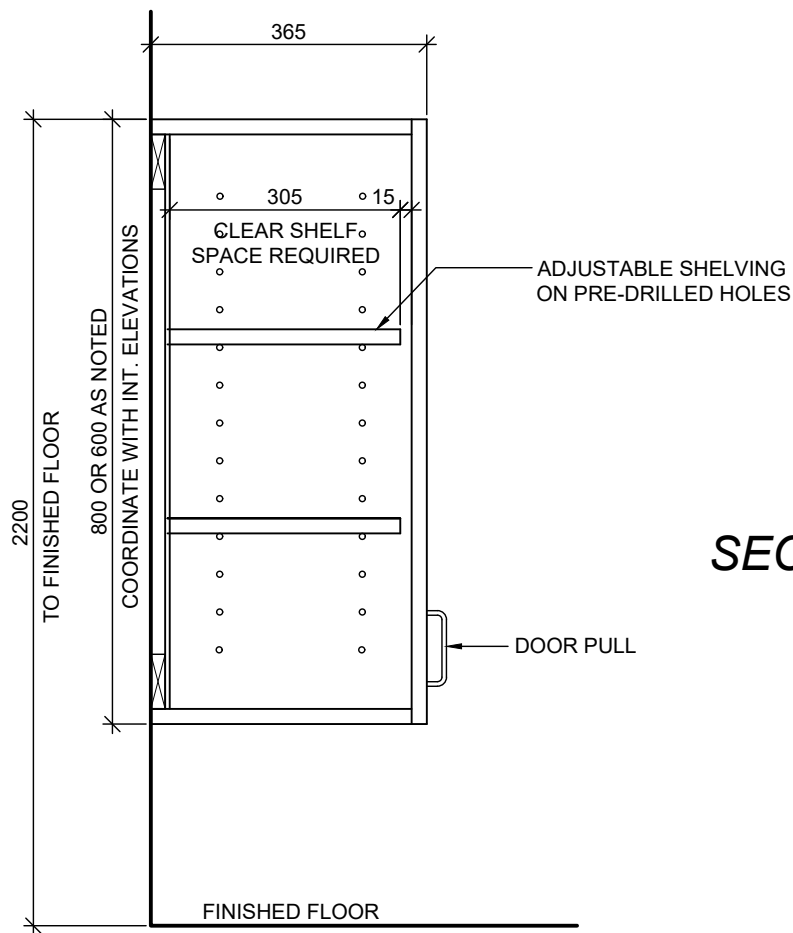
ISSUE/REV.

AD
634



NOTE:
ALL MILLWORK DOORS AND DRAWERS
TO BE EQUIPT WITH LOCKS.
UNLESS OTHERWISE NOTED.

ELEVATION



SECTION

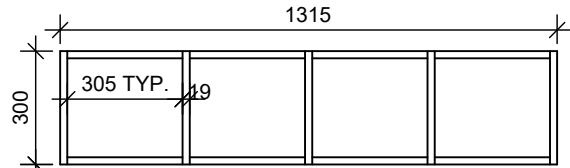
UPPER CABINET TYPE U1

PROJ:	25106
SCALE:	1:10
DRAWN:	GB
DATE:	26 01 17



ISSUE/REV.

AD
621

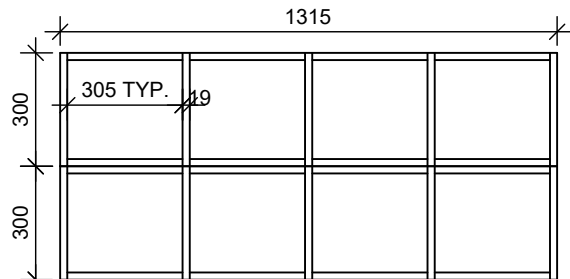


TODDLER WASHROOM

ELEVATION A
SCALE 1:20

1500

BASE TYP.

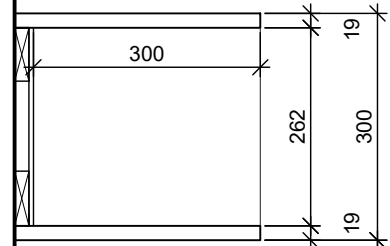


INFANT WASHROOM

ELEVATION B
SCALE 1:20

1500

BASE TYP.



SECTION
SCALE 1:10

1500

NOTE:
REFER TO SPECIFICATION FOR MILLWORK
CONSTRUCTION AND HARDWARE.

REFER TO PLANS & INTERIOR ELEVATIONS
FOR LOCATIONS AND LAYOUT.

CHILD CARE CUBBIES - WASHROOMS TYPE K6

PROJ: 25106

SCALE: 1:10

DRAWN: GB

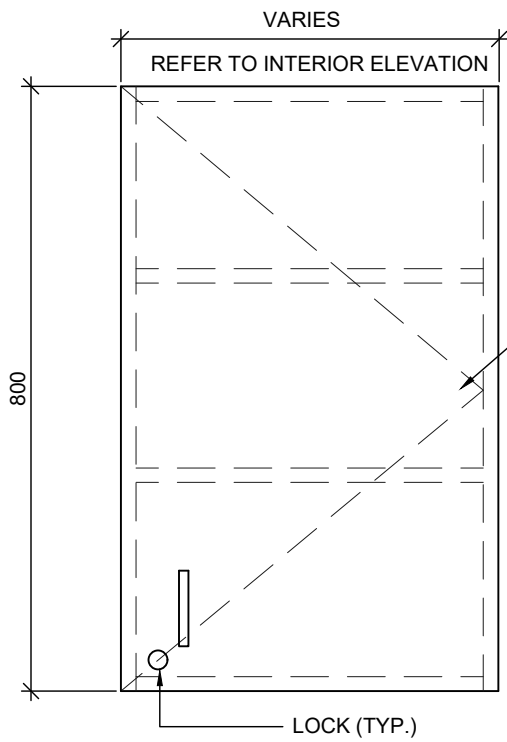
DATE: 26 01 17

HOSSACK
ARCHITECTURE



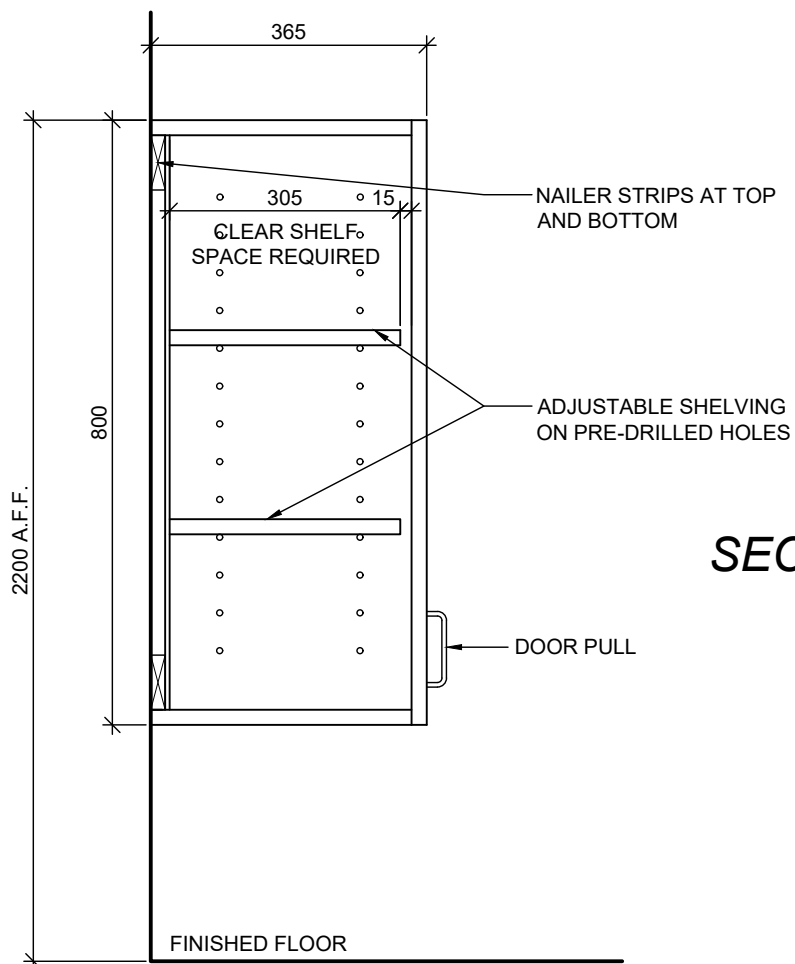
ISSUE/REV.

AD
635



ELEVATION

NOTE:
ALL MILLWORK DOORS AND DRAWERS
TO BE EQUIPT WITH LOCKS.
UNLESS OTHERWISE NOTED.



SECTION

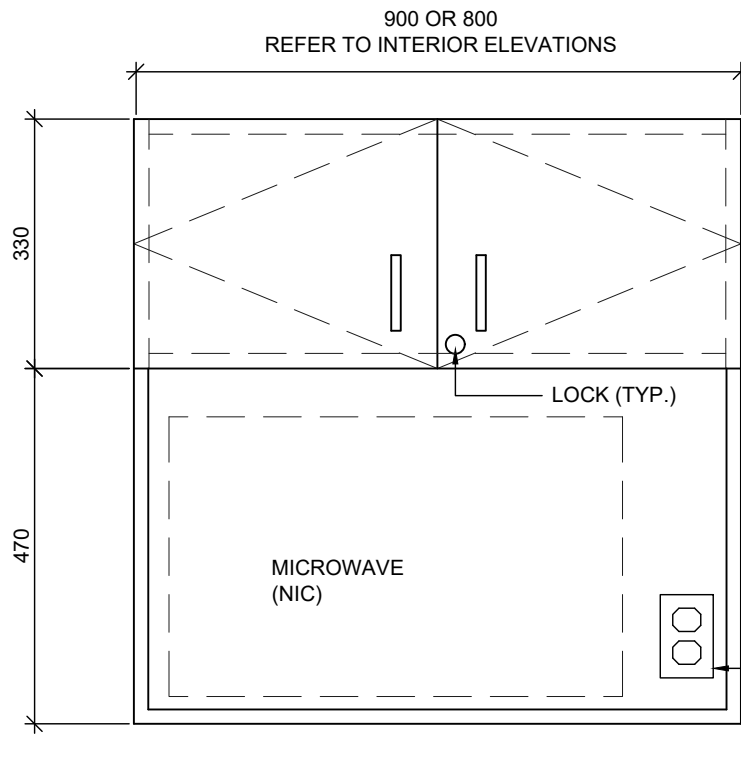
UPPER CABINET TYPE U3

PROJ:	25106
SCALE:	1:10
DRAWN:	CC
DATE:	26 01 17



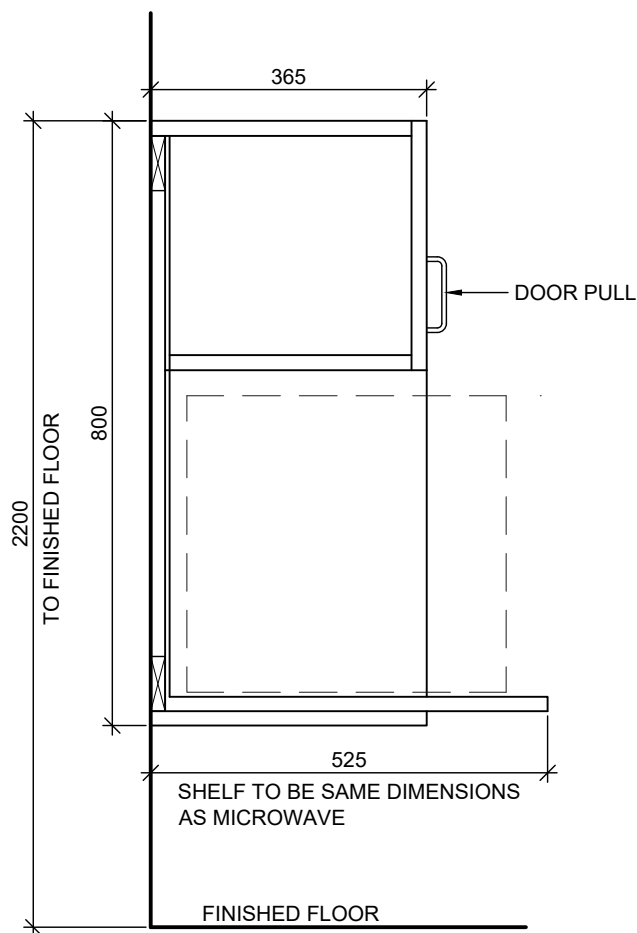
ISSUE/REV.

AD
622



NOTE:
ALL MILLWORK DOORS AND DRAWERS
TO BE EQUIPT WITH LOCKS.
UNLESS OTHERWISE NOTED.

ELEVATION



SECTION

UPPER CABINET TYPE U4

PROJ:	25106
SCALE:	1:10
DRAWN:	CC
DATE:	26 01 17

HOSSACK
ARCHITECTURE



ISSUE/REV.

AD
623



PROJ:	25106
SCALE:	1:20
DRAWN:	GB
DATE:	26 01 17

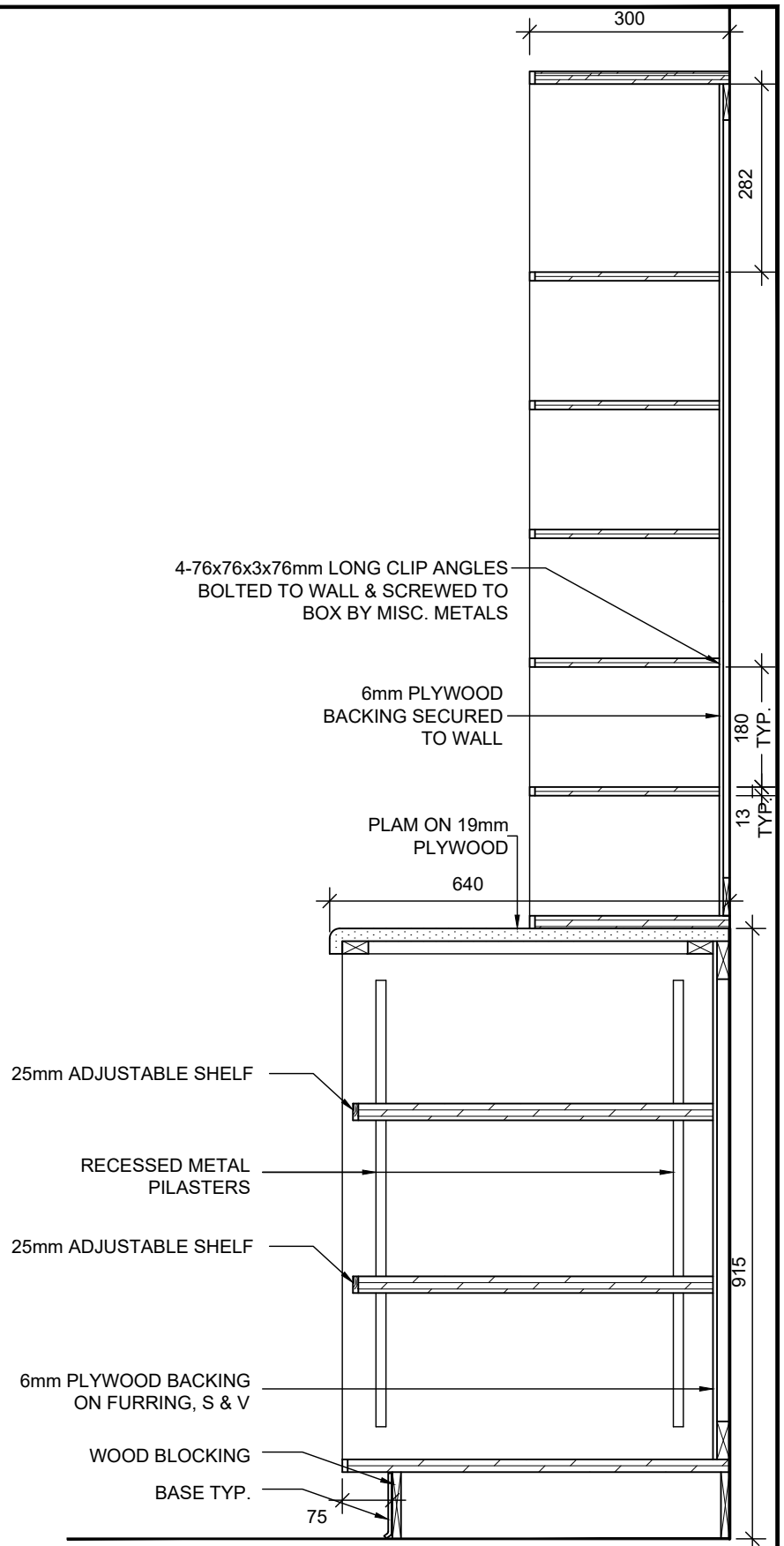


AD
638A

SECTION A
SCALE 1:10

NOTE:

- NUMBER OF SLOTS = SCHOOL STAFF + 20% (TO BE CONFIRMED DURING CONSTRUCTION).
- TEACHER NAME PLATES TO BE INCLUDED IN CONTRACT.
- REFER TO SPECIFICATIONS FOR MILLWORK CONSTRUCTION AND HARDWARE.
- CONFIRM UNIT SIZE WITH INTERIOR ELEVATIONS. TYP.
- ALL MILLWORK DOORS AND DRAWERS TO BE EQUIPPED WITH LOCKS UNLESS OTHERWISE NOTED.



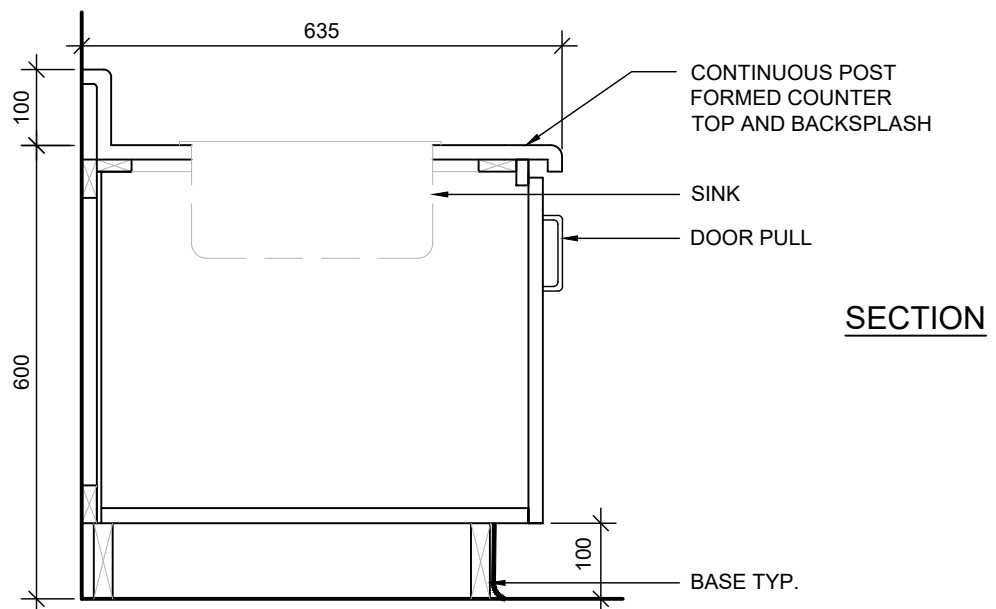
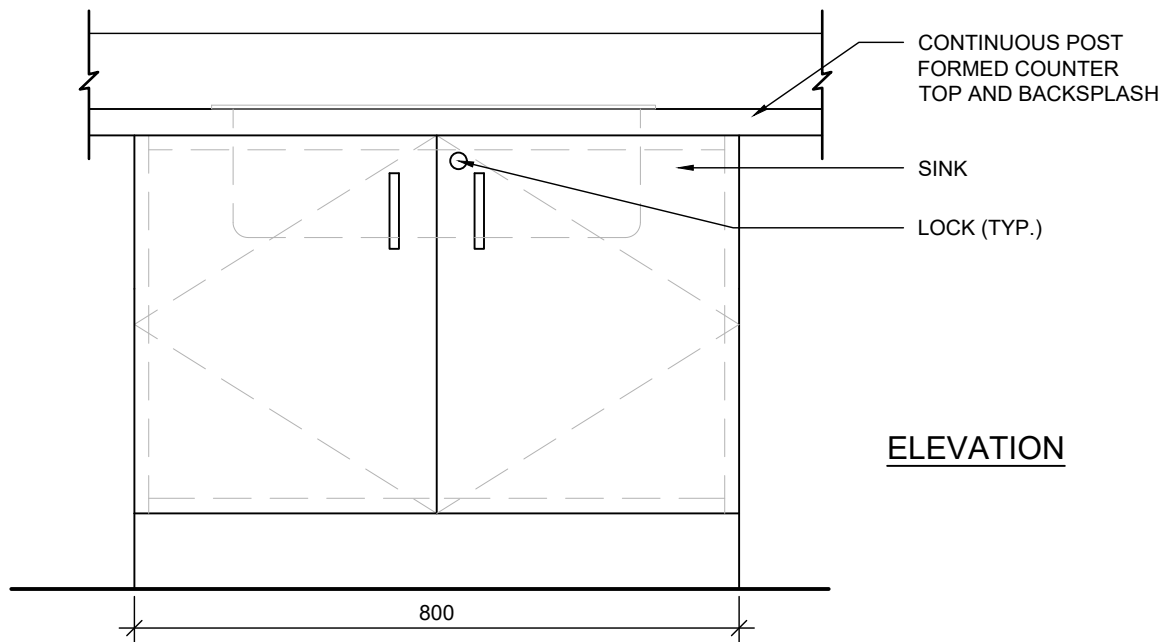
MAIL SLOTS - C8
SECTION

PROJ: 25106
SCALE: 1:10
DRAWN: GB
DATE: 26 01 17



ISSUE/REV.

AD
638B



CHILD CARE LOWER CABINET WITH SINK
TYPE K9

PROJ:	25106
SCALE:	NTS
DRAWN:	GB
DATE:	26 01 17



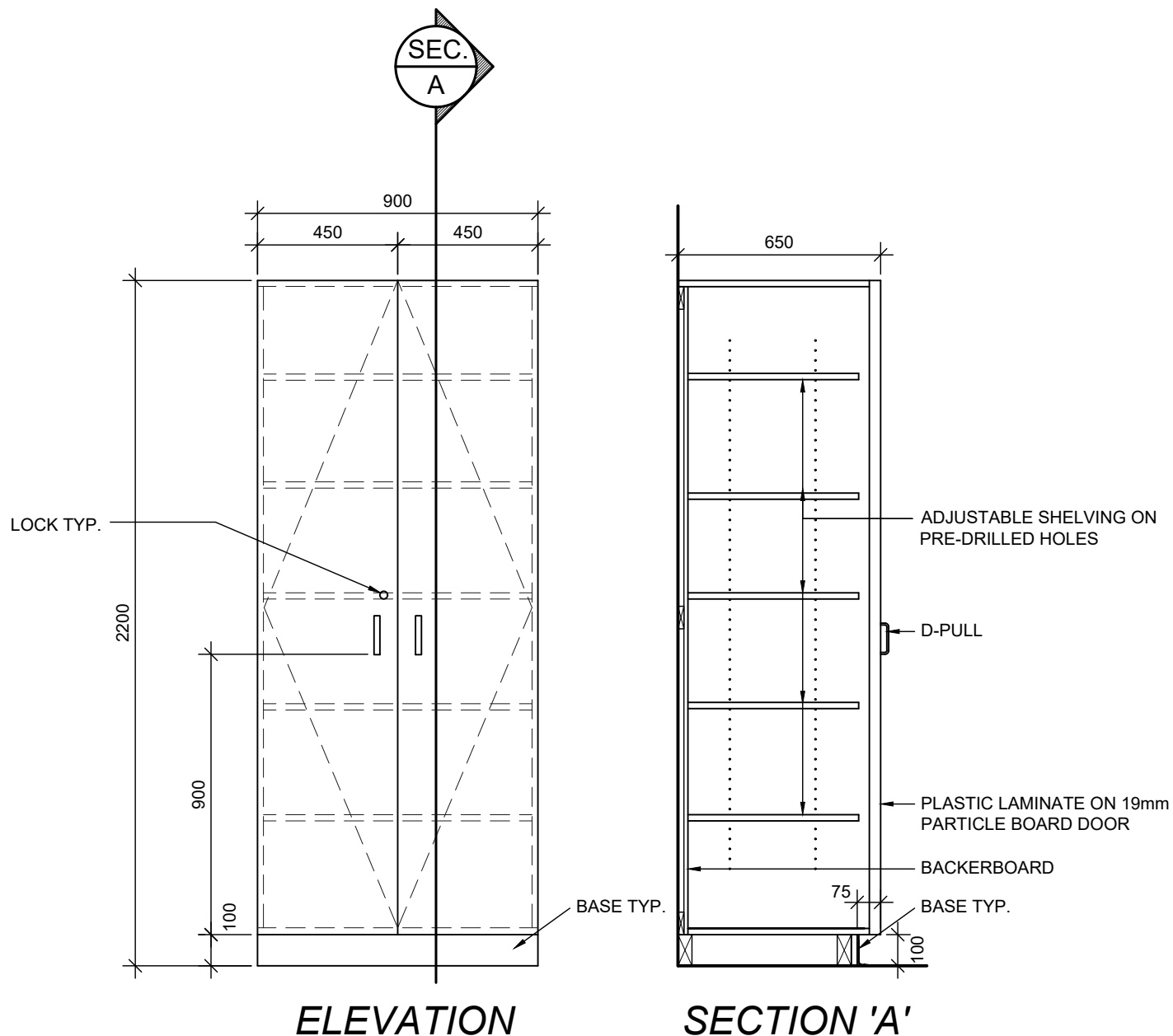
ISSUE/REV.
00

AD
639

NOTE:
ALL MILLWORK DOORS AND DRAWERS
TO BE EQUIPT WITH LOCKS.
UNLESS OTHERWISE NOTED.

TYPICAL SIZE - 900 WIDE x 650 DEEP

REFER TO PLANS & ELEVATIONS.



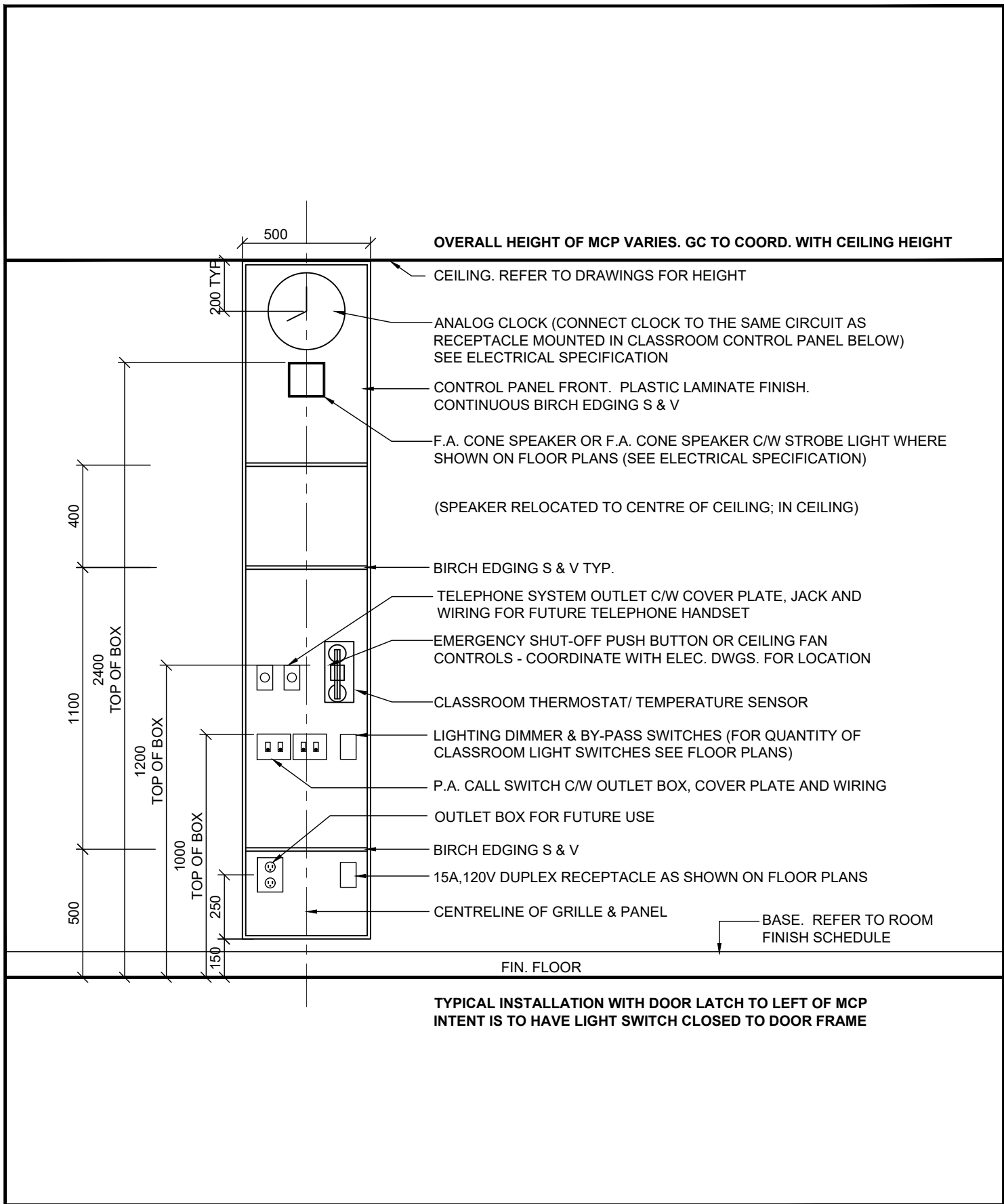
TYPE C3 - STORAGE CABINET

PROJ: 25106
SCALE: 1:20
DRAWN: KB/CC
DATE: 26 01 17



ISSUE/REV.
00

AD
642



MODULAR CONTROL PANEL

DOOR LATCH LEFT OF MCP

PROJ: 25106

SCALE: 1:20

DRAWN:GB

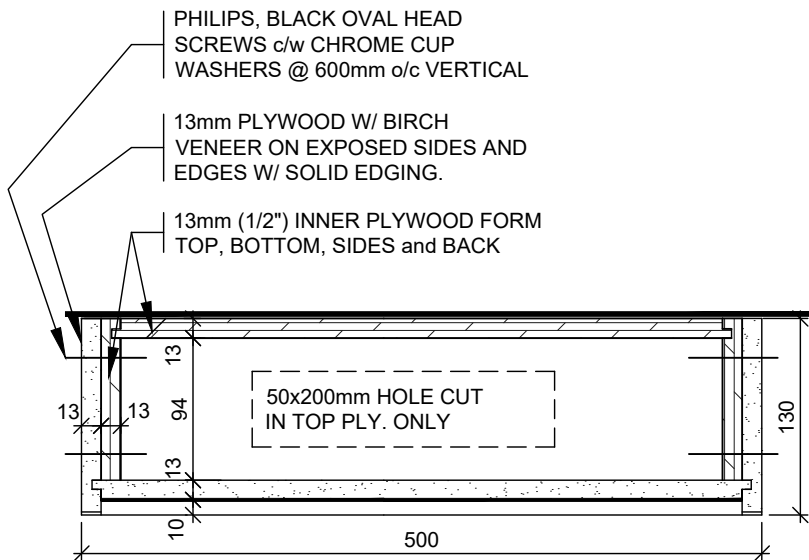
DATE: 26 01 17



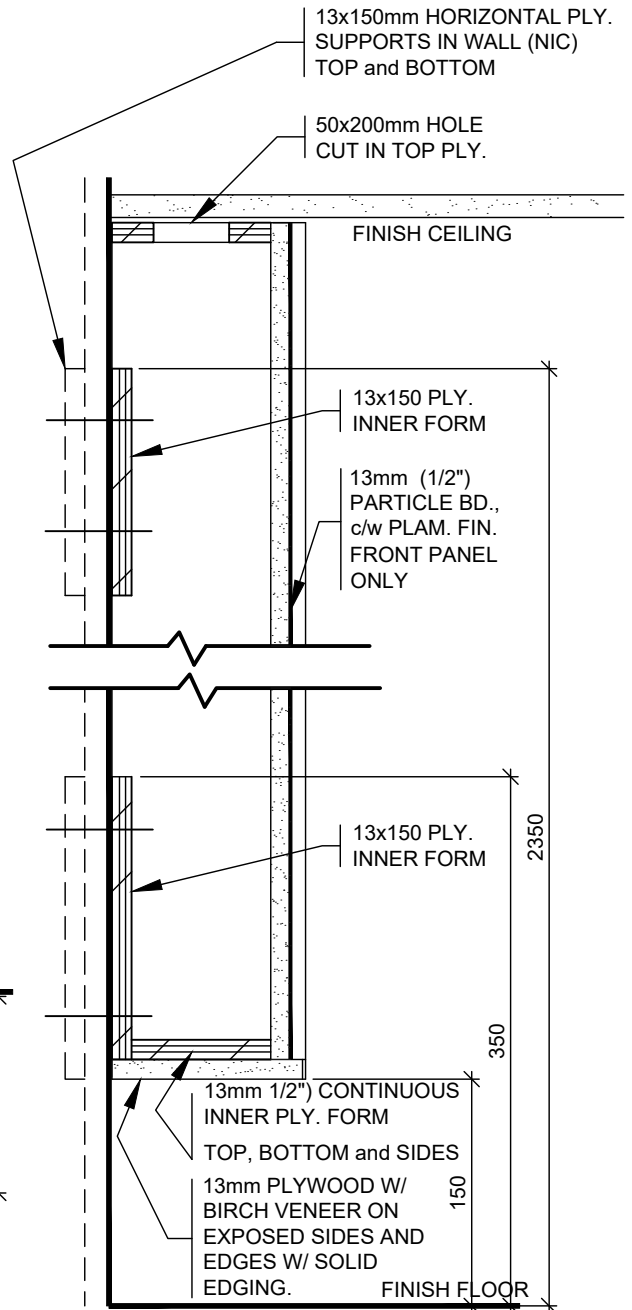
ISSUE/REV.

AD
650

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE SECTIONS AND DETAILS LISTED, AND THE WRITTEN SPECIFICATION.



1 SECTION
650 PLAN VIEW



2 SECTION
650

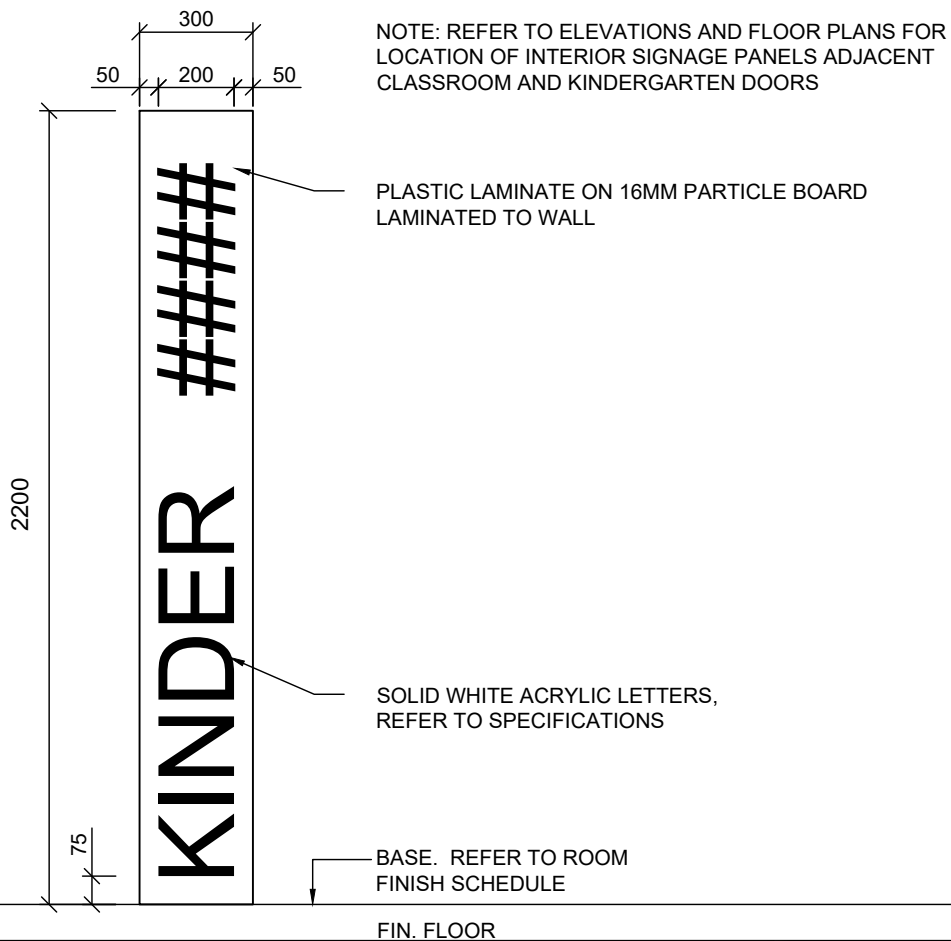
MODULAR CONTROL PANEL SECTIONS

PROJ: 25106
SCALE: 1:5
DRAWN:GB
DATE: 26 01 17



ISSUE/REV.

AD
651



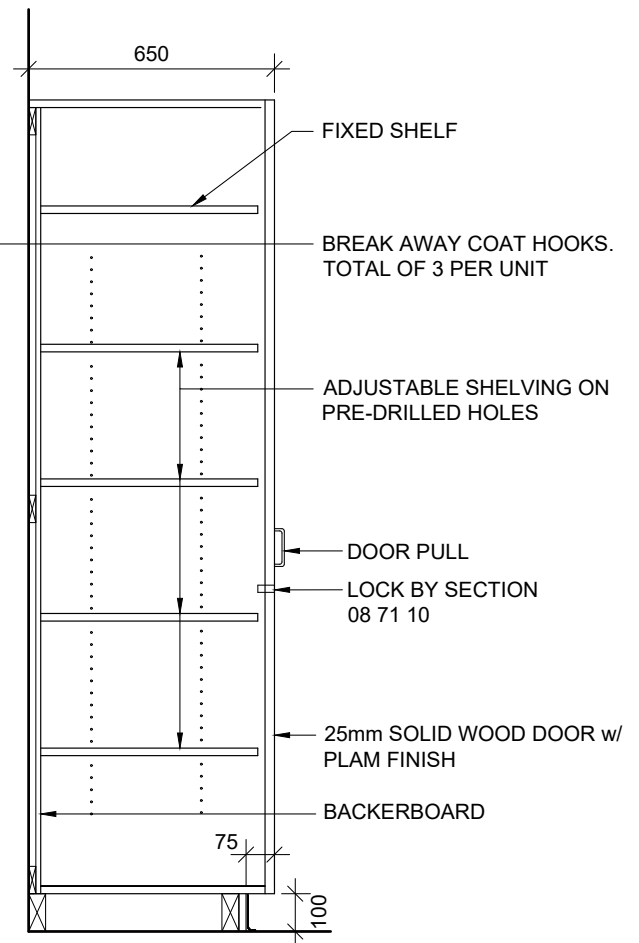
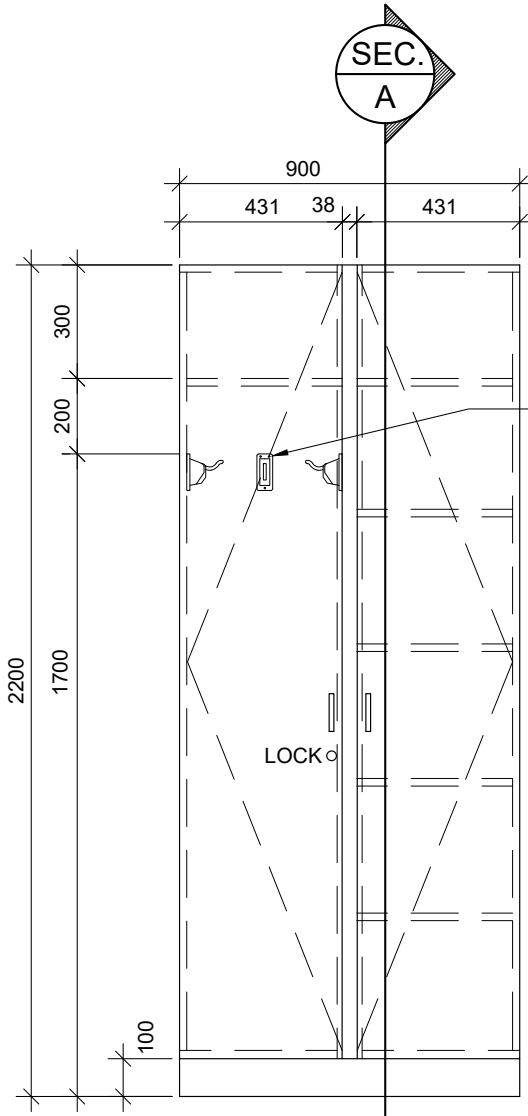
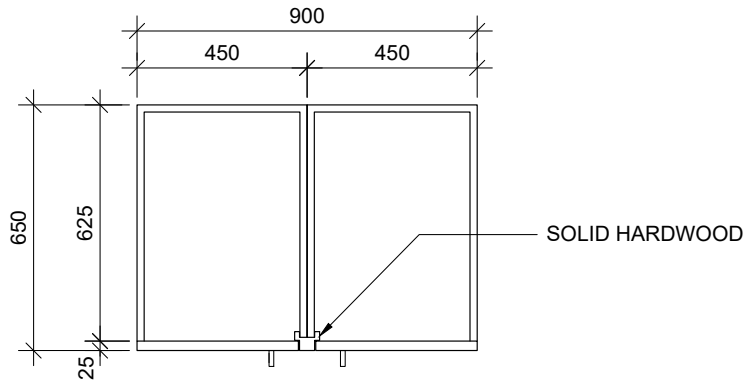
INTERIOR SIGNAGE PANEL (ISP)

PROJ:	25106
SCALE:	1:20
DRAWN:	AM
DATE:	26 01 17



ISSUE/REV.

AD
652



TEACHER'S CLOSET TYPE C1

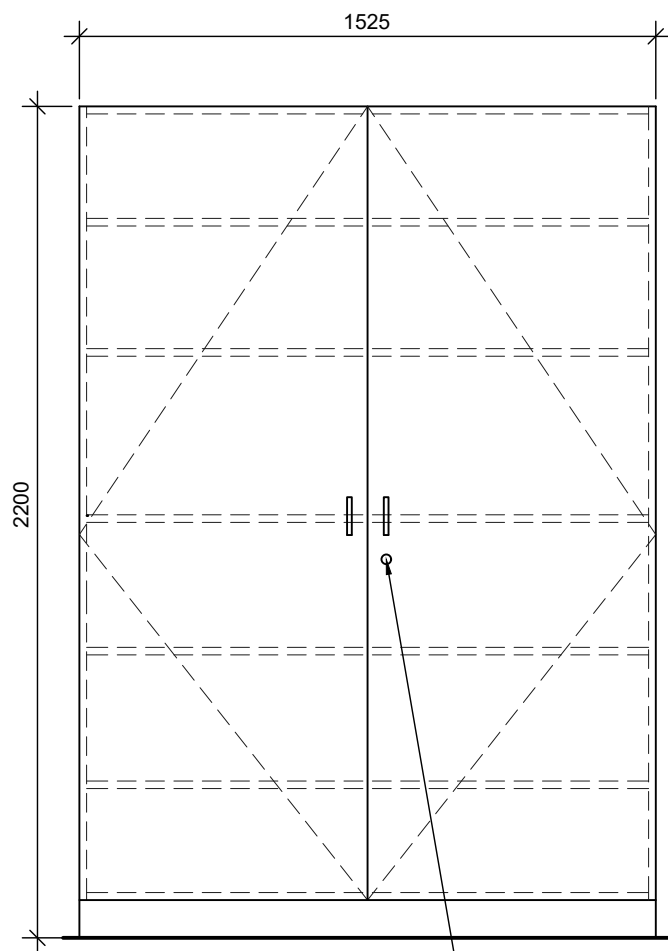
PROJ: 25106
SCALE: 1:20
DRAWN: GB
DATE: 26 01 17

HOSSACK
ARCHITECTURE



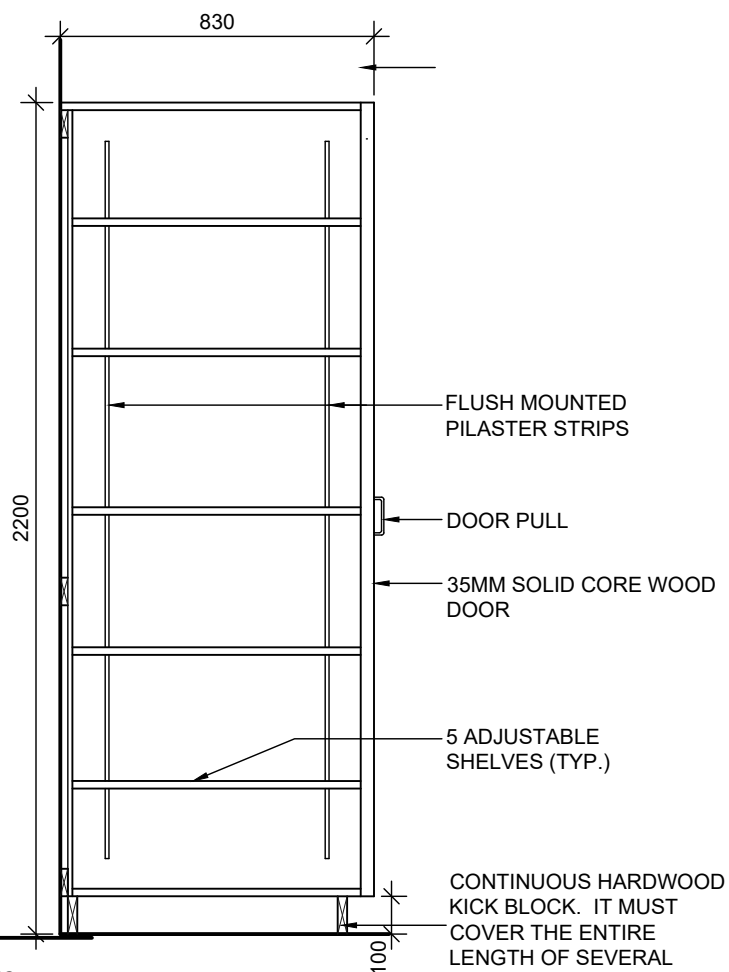
ISSUE/REV.

AD
653



ELEVATION
SCALE 1:20

LOCK (TYP.) ALIKE TO
ALL CABINETS WITHIN
THE SAME
CLASSROOM



SECTION
SCALE 1:20

FLUSH MOUNTED
PILASTER STRIPS

DOOR PULL

35MM SOLID CORE WOOD
DOOR

5 ADJUSTABLE
SHELVES (TYP.)

CONTINUOUS HARDWOOD
KICK BLOCK. IT MUST
COVER THE ENTIRE
LENGTH OF SEVERAL
UNITS OF CABINETS

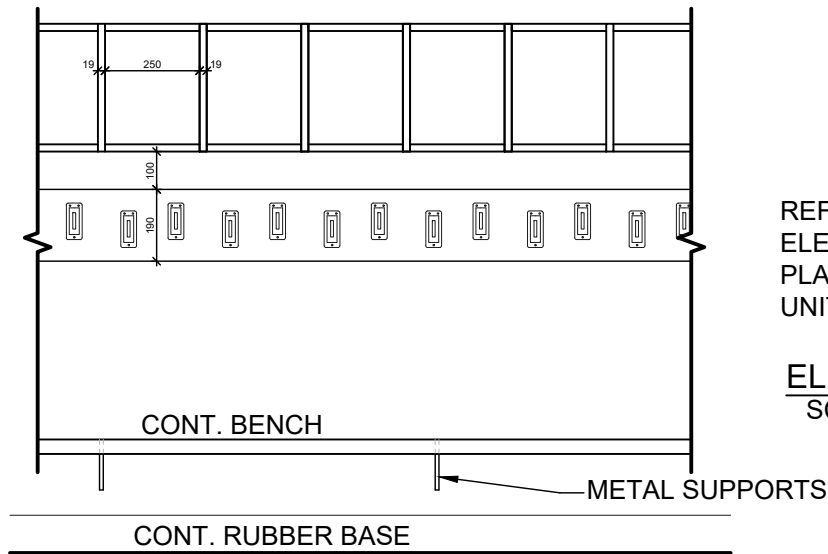
CABINET TYPE C4

PROJ:	25106
SCALE:	NOTED
DRAWN:	GB
DATE:	26 01 17



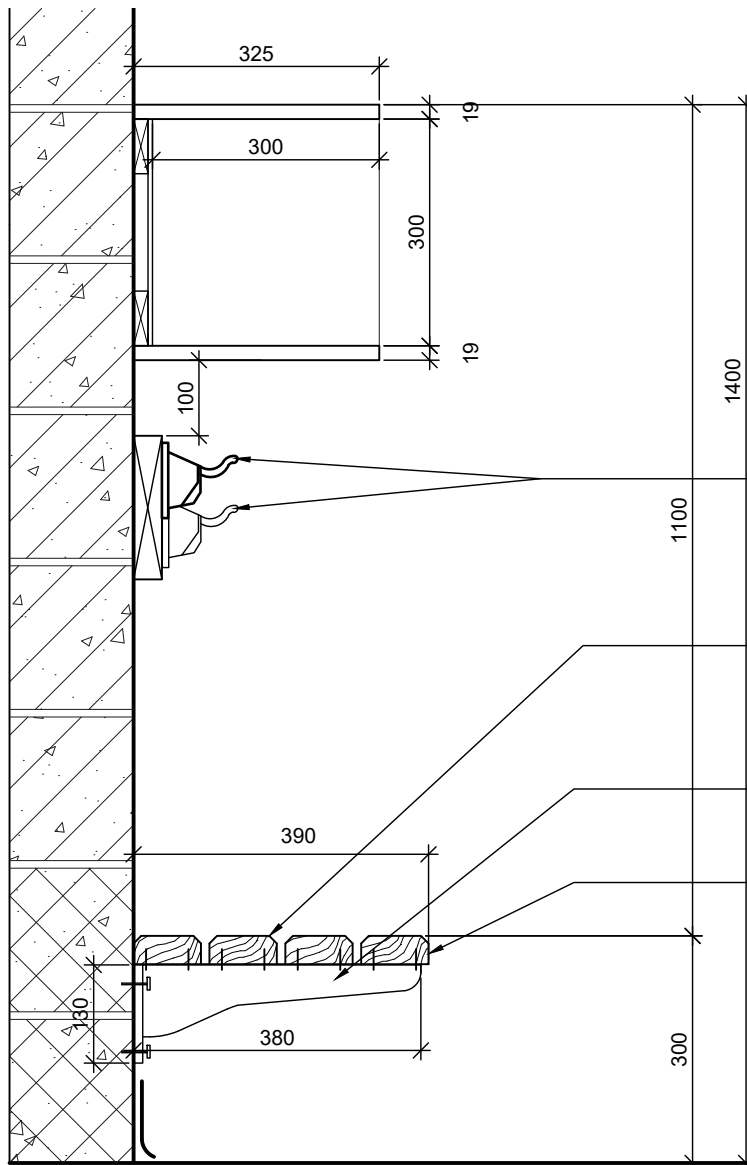
ISSUE/REV.
00

AD
654



REFER TO INTERIOR
ELEVATIONS & FLOOR
PLANS FOR QUANTITY OF
UNITS

ELEVATION
SCALE 1:20



NOTE:
FOR LENGTH OF CUBBIES, REFER TO
INTERIOR ELEVATIONS.

BREAK AWAY COAT HOOKS FASTENED TO
CONTINUOUS 38X190mm SOLID WOOD -
CLEAR URETHANE FINISH. HOOKS ON TOP
AND BOTTOM ROW STAGGERED

4 - 38 X 89 HARDWOOD SLATS
WITH EASED EDGES SECURED
TO BRACKETS

HAFELE "HEBGO" BRACKET. AT 800mm O.C.
BOLTED TO WALL WITH 9x60 LAG BOLTS

CHAMFER EDGE OF BENCH IN
KINDERGARTEN CLASSROOM
WHERE NO HALF WALL EXIST AT
ADJACENT B3 UNIT

SECTION
SCALE 1:10

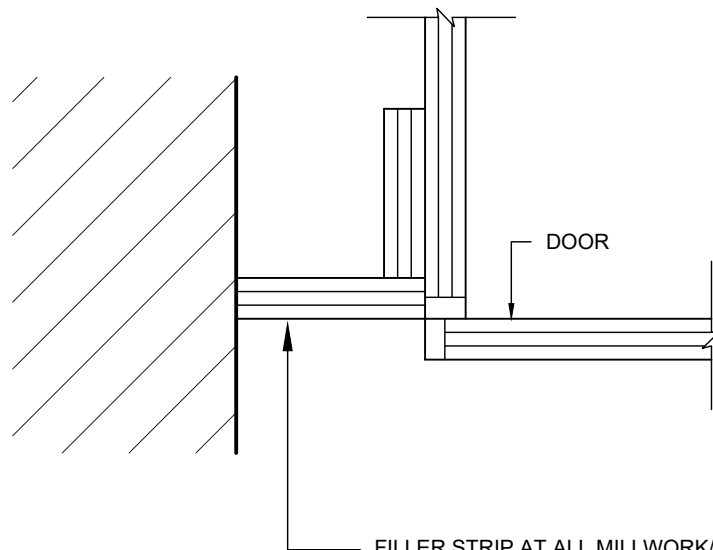
KINDERGARTEN CUBBIES TYPE K4

PROJ: 25106
SCALE: NOTED
DRAWN: CC
DATE: 26 01 17



ISSUE/REV.

AD
655



FILLER STRIP AT ALL MILLWORK/
WALL CONNECTIONS. (TYPICAL).

UPPER CABINETS: PROVIDE AT FRONT, UNDERSIDE AND TOP

LOWER CABINETS: PROVIDE AT FRONT AND BASE

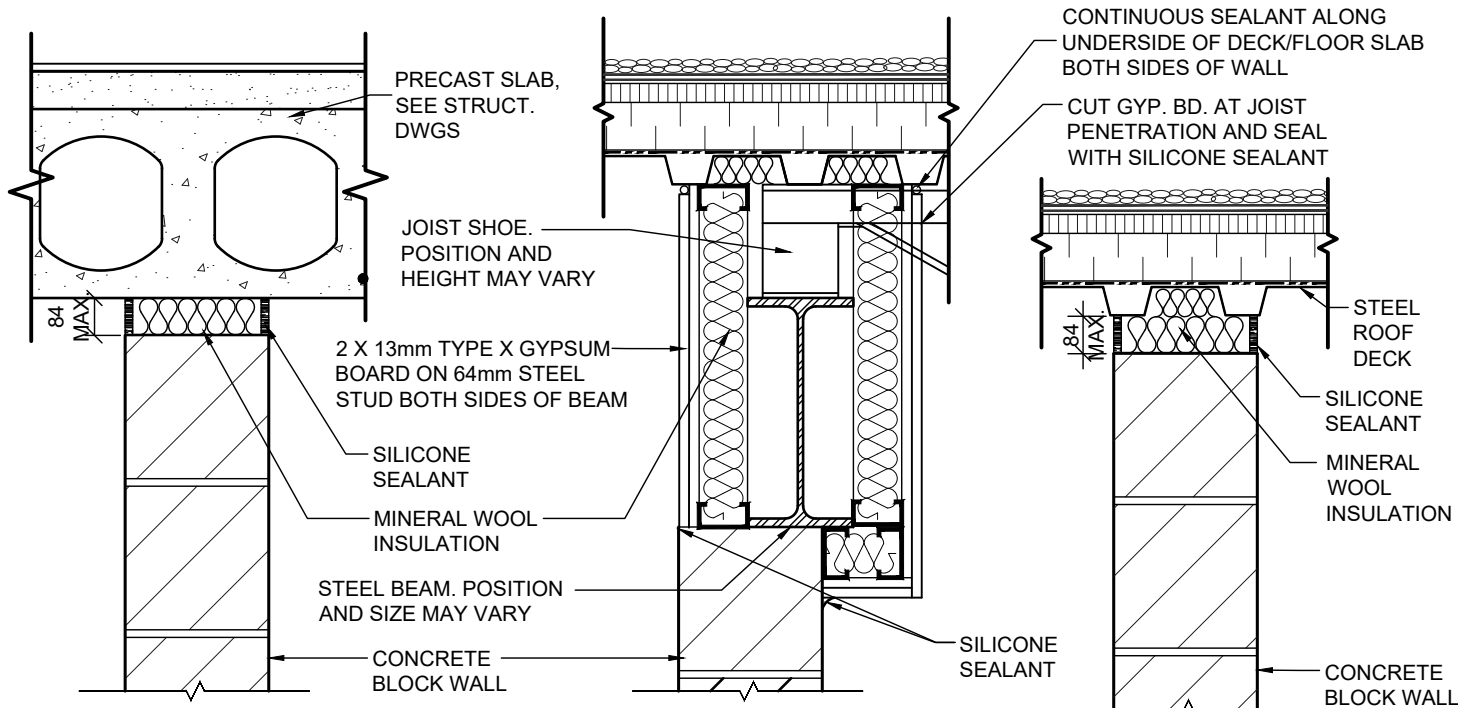
MILLWORK FILLER STRIP DETAIL

PROJ:	25106
SCALE:	1:10
DRAWN:	GB
DATE:	26 01 17



ISSUE/REV.
00

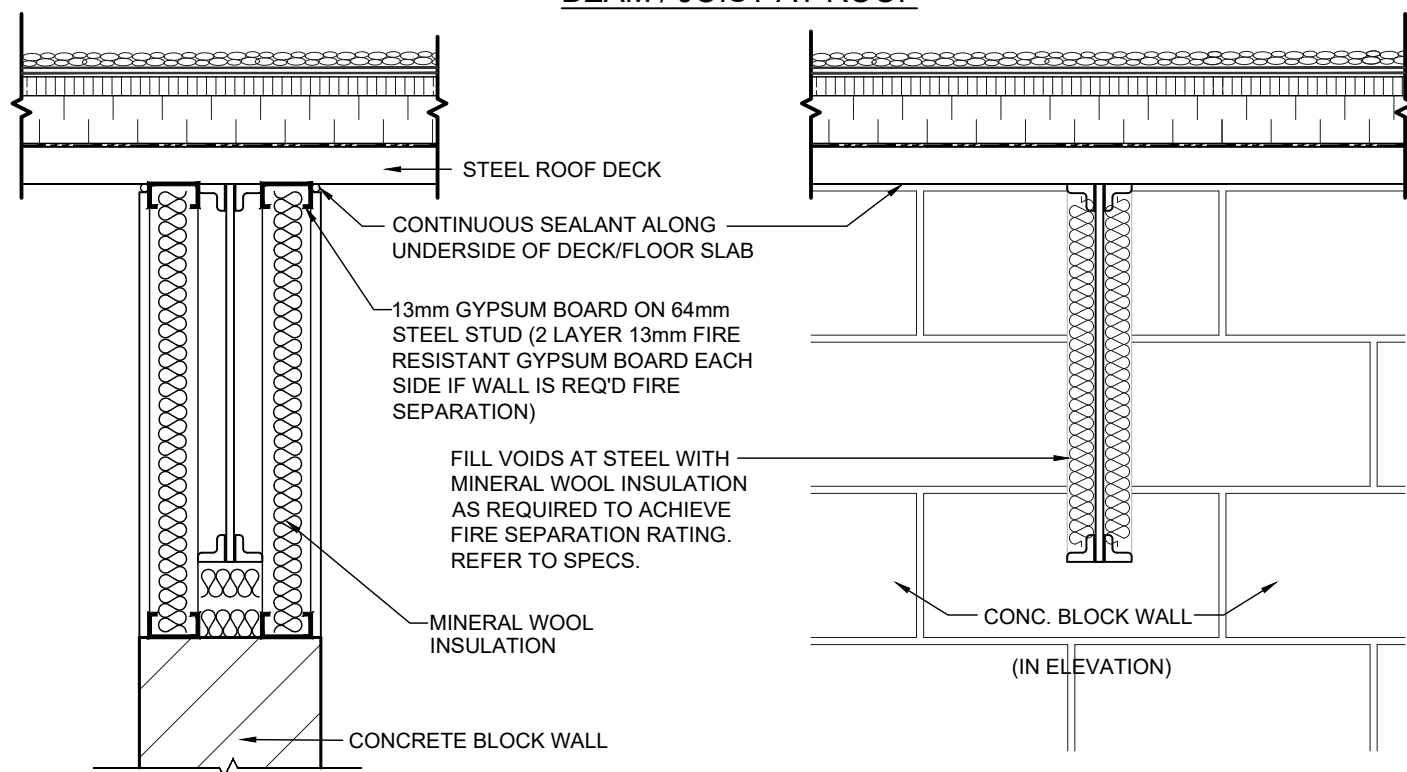
AD
661



CONDITION AT FLOOR

CONDITION AT OFFSET BEAM / JOIST AT ROOF

CONDITION AT ROOF



CONDITION AT PARALLEL JOIST OR BEAM

NOTE: ADJUST STEEL STUD SIZES TO SUIT BLOCK WALL CONDITION.
MIN. 64mm STUD AT MAX. 400 O.C.
REF. SPECS FOR FIRE-RATED SEALANTS

CONDITION AT PERPENDICULAR JOIST OR BEAM

TOP OF WALL CONSTRUCTION AT FIRE SEPARATION ASSEMBLY

PROJ: 25106

SCALE: 1:5

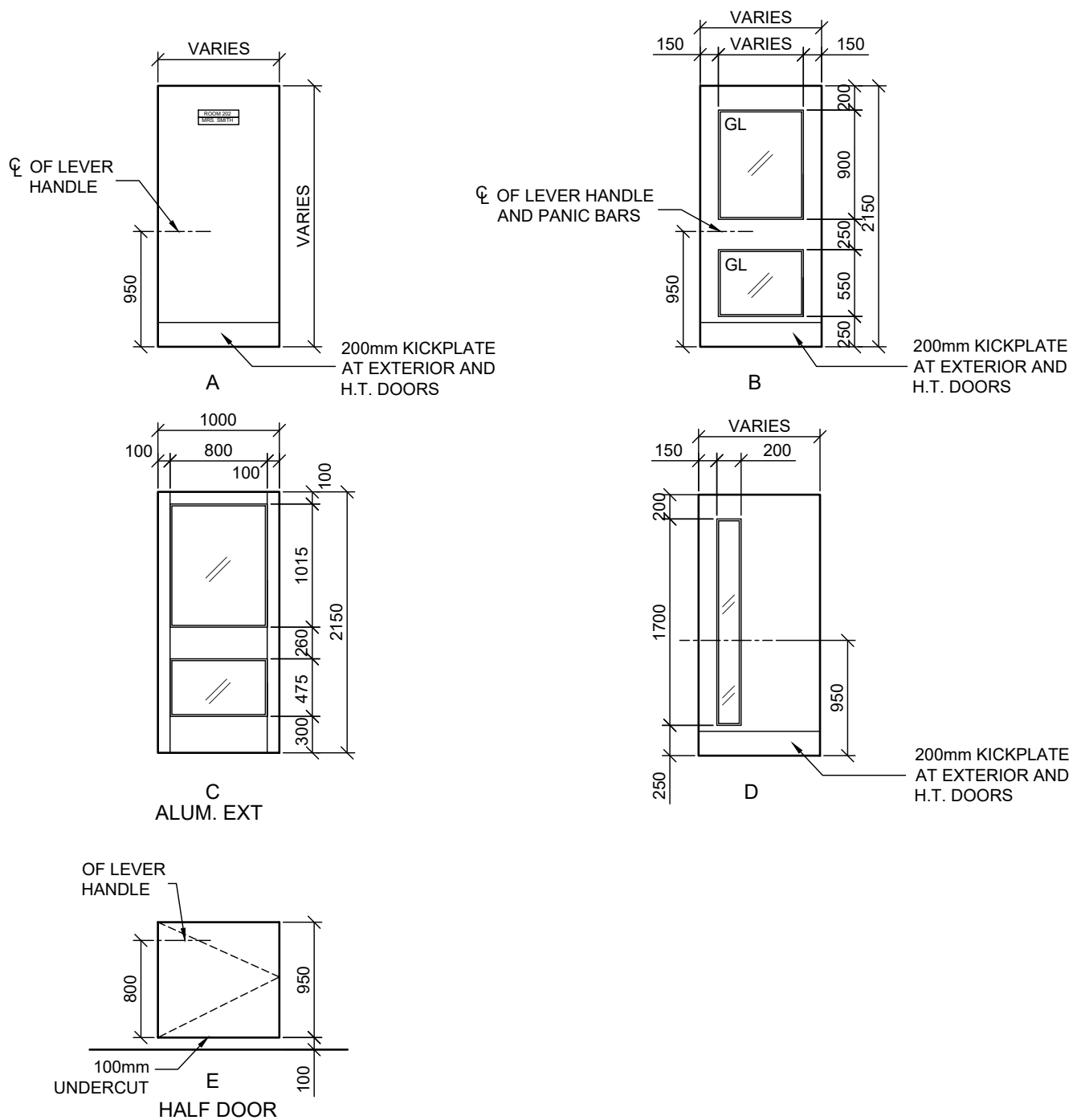
DRAWN: CC

DATE: 26 01 17

HOSSACK
ARCHITECTURE

ISSUE/REV.
00

AD
725



NOTES:

1. REFER TO SPECIFICATIONS AND DOOR SCHEDULE FOR GLAZING TYPE
2. ALL DOORS AND FRAMES ARE VIEWED FROM EXTERIOR OF ROOM OR AREA SERVED

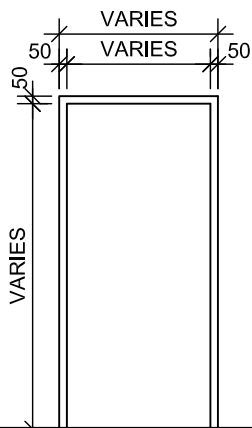
DOOR TYPES

PROJ: 25106
SCALE: 1:50
DRAWN: AM/KB
DATE: 26 01 17

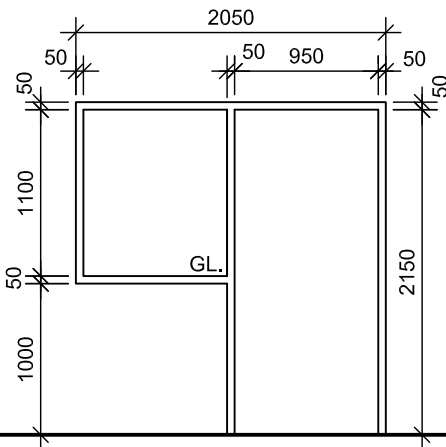


ISSUE/REV.
00

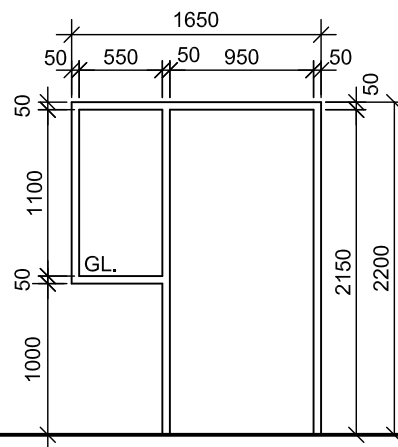
AD
800



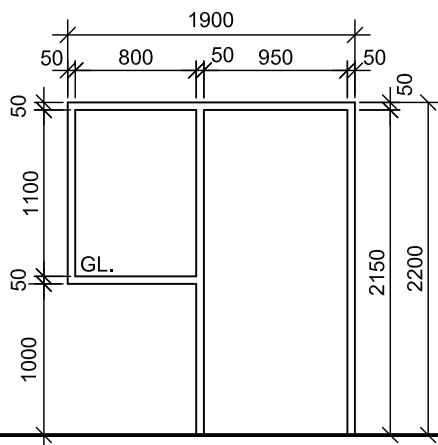
TYPE 1
H.M. INT/EXT



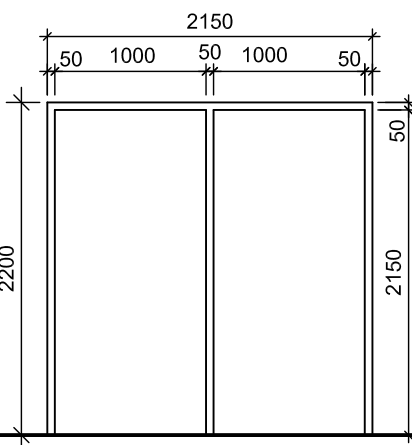
TYPE 2
H.M. INT



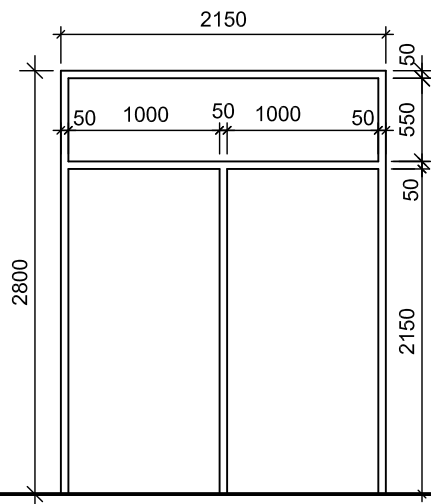
TYPE 3A
H.M. INT



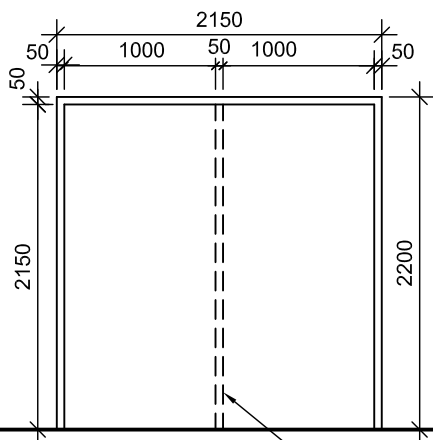
TYPE 3B
H.M. INT



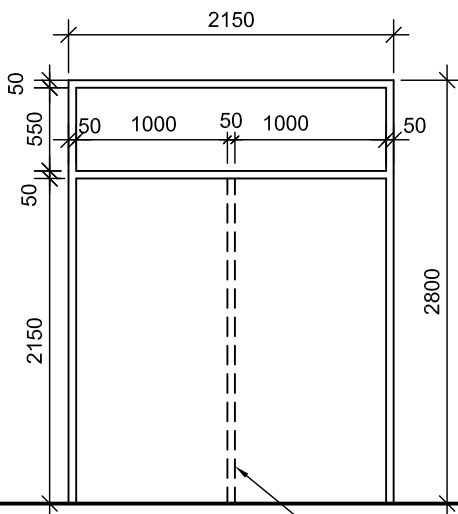
TYPE 4A
H.M. INT



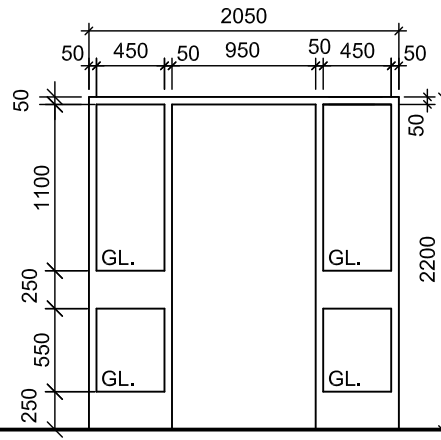
TYPE 4B
H.M. EXT



TYPE 5A
H.M. INT/EXT
KEYED REMOVEABLE MULLION BEYOND



TYPE 5B
H.M. EXT
KEYED REMOVEABLE MULLION BEYOND



TYPE 5C
H.M. EXT

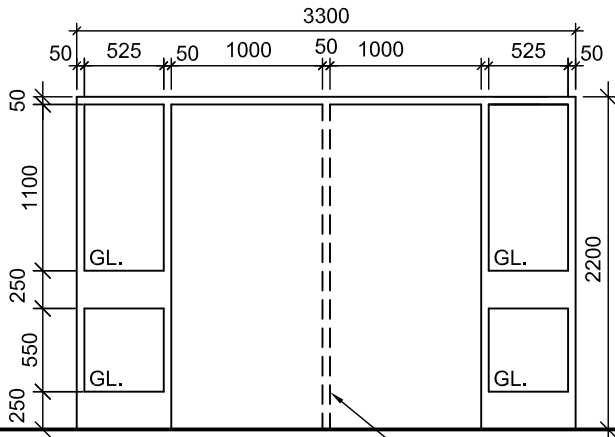
HOLLOW METAL FRAMES

PROJ: 25106
SCALE: 1:50
DRAWN: AH
DATE: 26 01 17



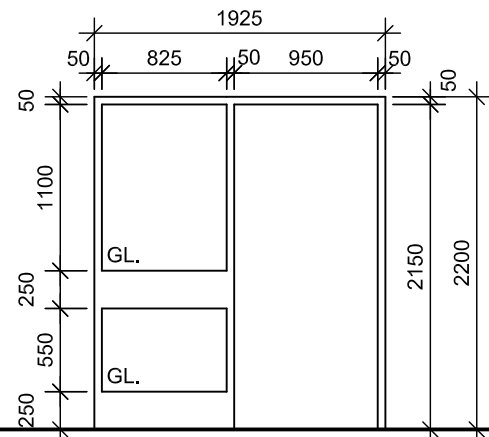
ISSUE/REV.
00

AD
801A

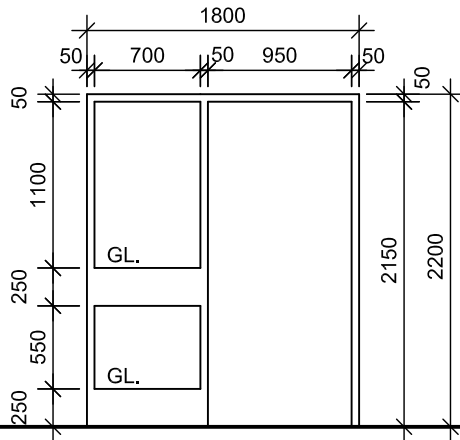


TYPE 6
H.M. INT

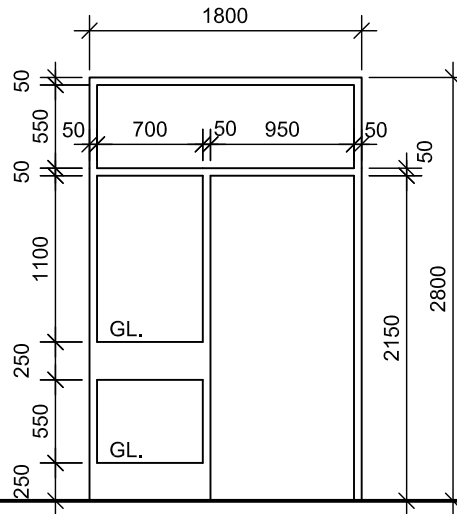
KEYED
REMOVEABLE
MULLION
BEYOND



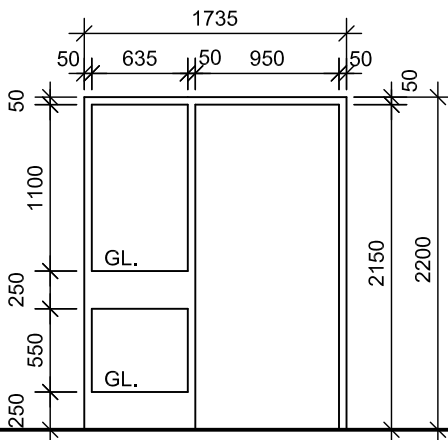
TYPE 7
H.M. INT



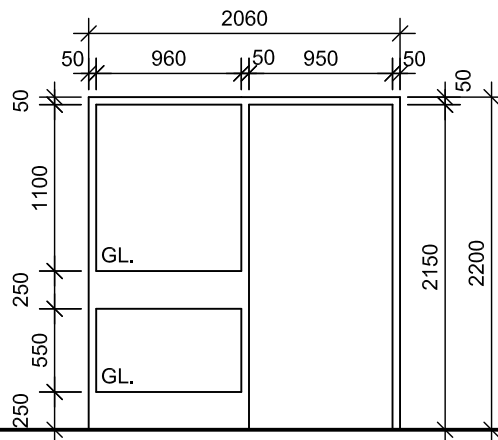
TYPE 8A
HM INT



TYPE 8B
HM EXT



TYPE 9A
H.M. INT



TYPE 9B
H.M. EXT

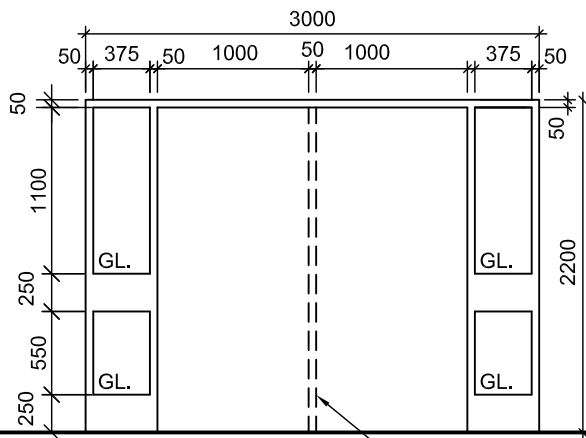
HOLLOW METAL FRAMES

PROJ: 25106
SCALE: 1:50
DRAWN: AH
DATE: 26 01 17



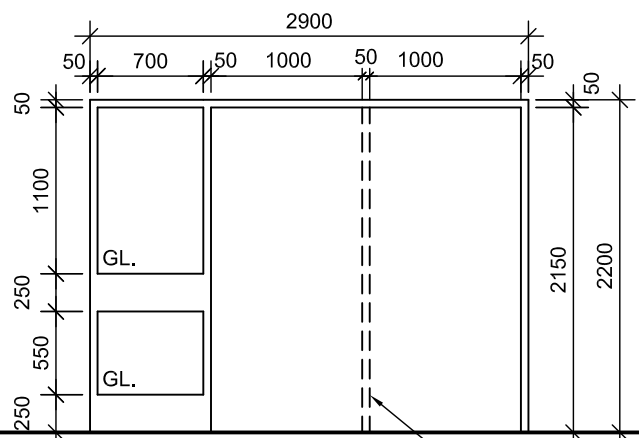
ISSUE/REV.
00

AD
801B



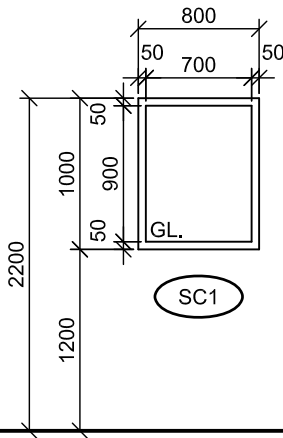
TYPE 10
HM INT/EXT

KEYED
REMOVEABLE
MULLION
BEYOND

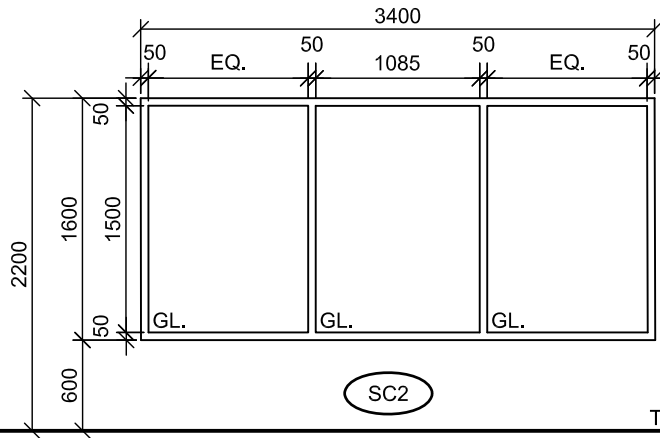


TYPE 11
H.M. INT

KEYED
REMOVEABLE
MULLION
BEYOND

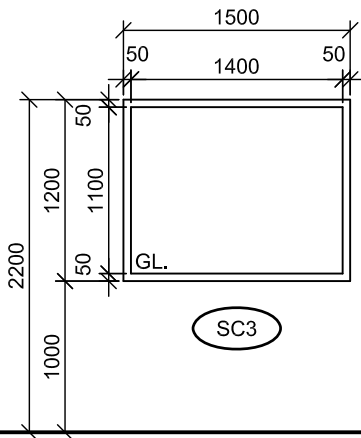


SC1

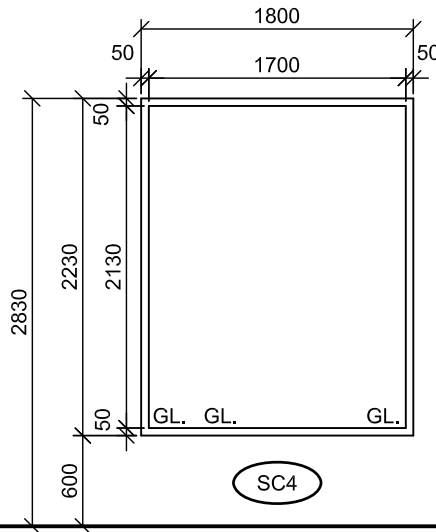


SC2

TOP OF FIN. FLOOR



SC3



SC4

TOP OF FIN. FLOOR

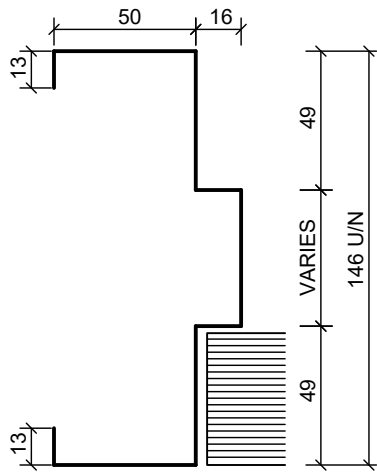
HOLLOW METAL FRAMES AND SCREENS

PROJ: 25106
SCALE: 1:50
DRAWN: AH
DATE: 26 01 17



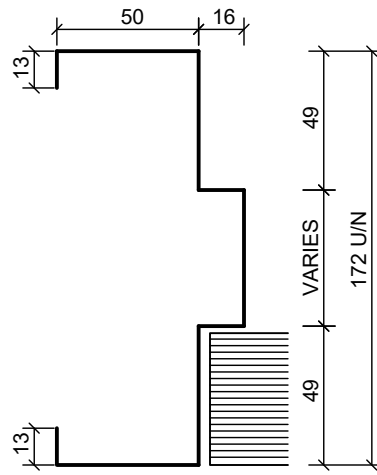
ISSUE/REV.
00

AD
801C



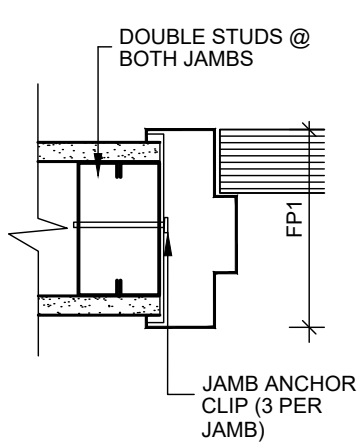
FRAME PROFILE FP1

METAL FRAME SECTION (MASONRY WALLS)
(NTS)

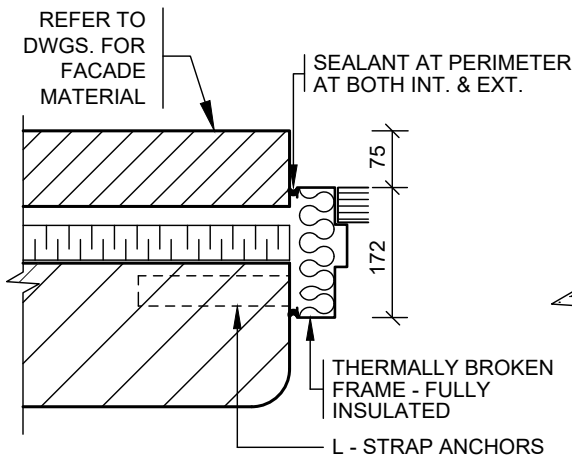


FRAME PROFILE FP2

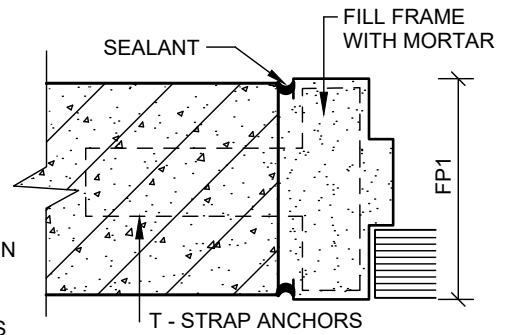
METAL FRAME SECTION (MASONRY WALLS)
(NTS)



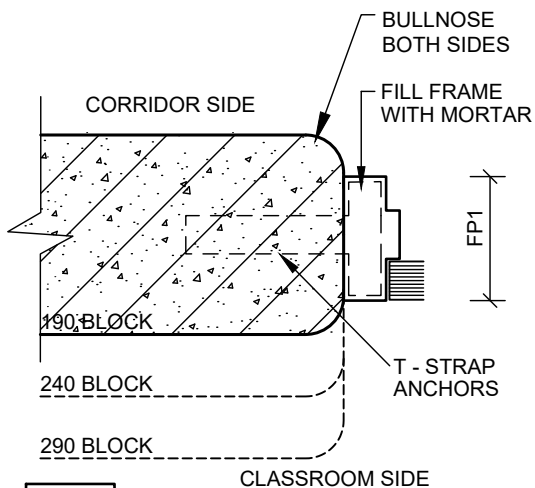
J1 (NTS)



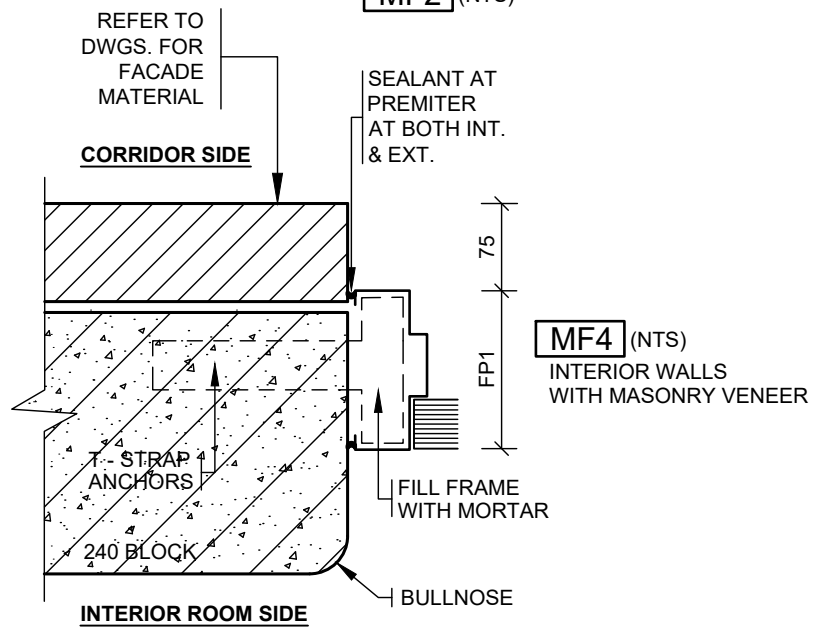
MF1 (NTS)



MF2 (NTS)



MF3 (NTS)



MF4 (NTS)
INTERIOR WALLS
WITH MASONRY VENEER

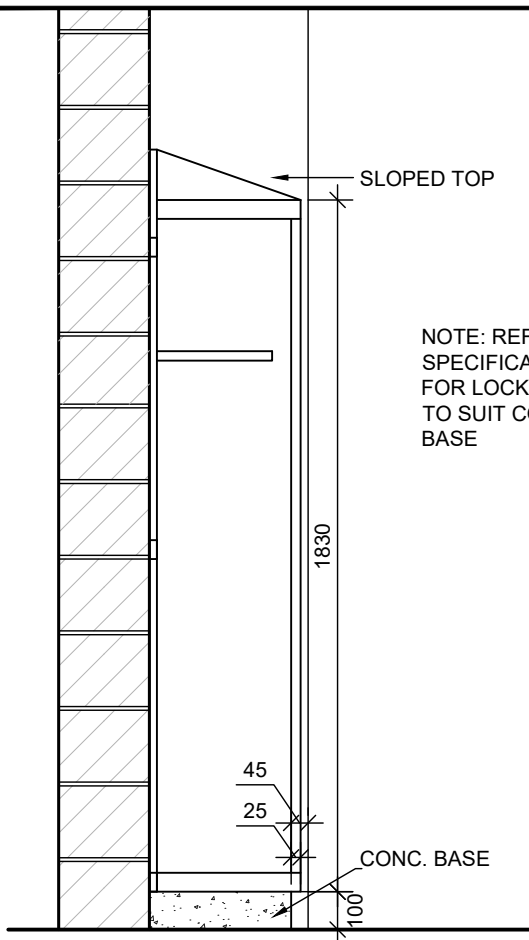
DOOR JAMB SECTIONS

PROJ: 25106
SCALE: NTS
DRAWN: KB
DATE: 26 01 17

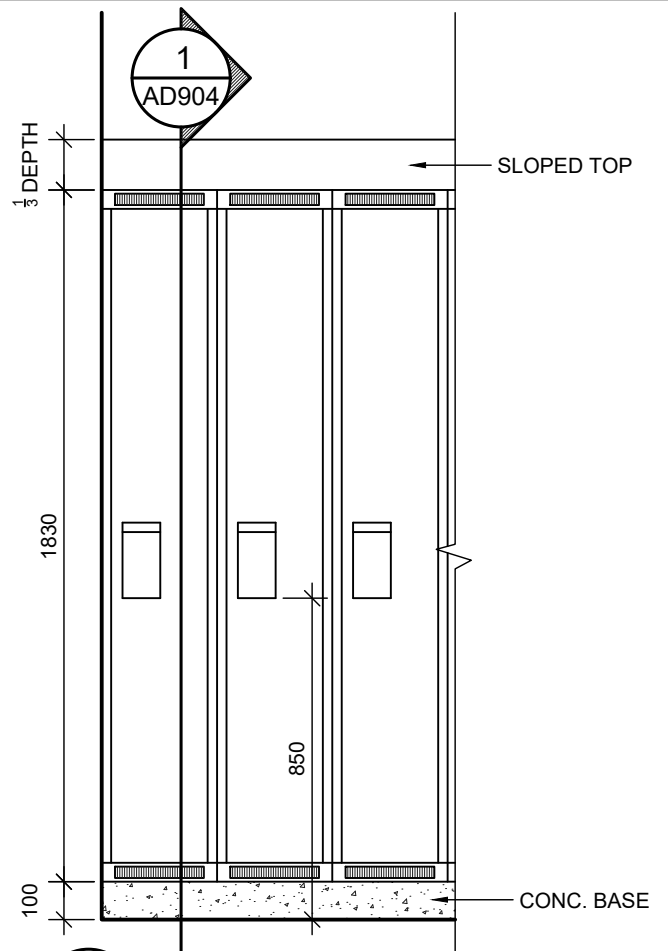


ISSUE/REV.
00

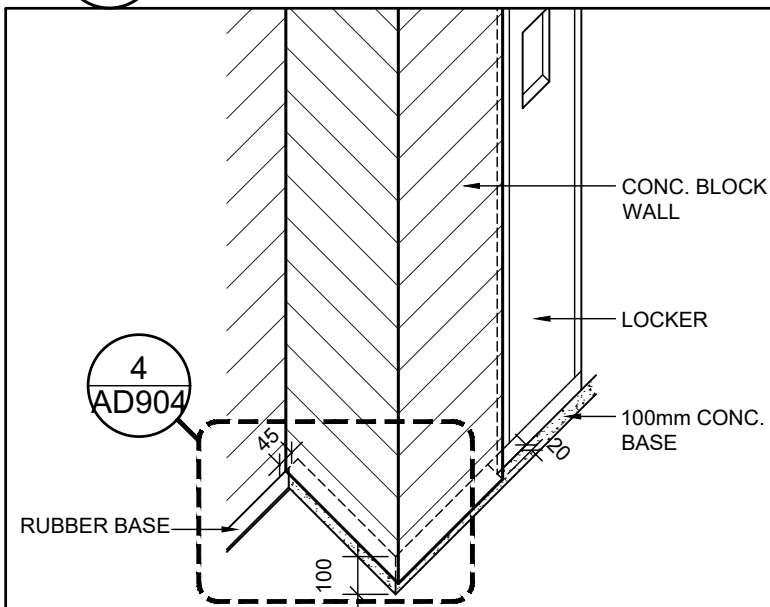
AD
802



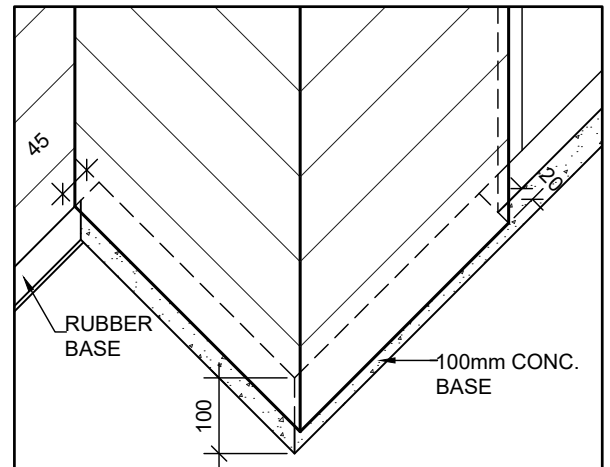
1 LOCKER SECTION
AD904 SCALE 1:20



2 LOCKER ELEVATION
AD904 SCALE 1:20



3 LOCKER ISOMETRIC
AD904



4 LOCKER BASE ISOMETRIC
AD904

LOCKER BASE DETAILS

PROJ: 25106
SCALE: 1:20
DRAWN: GB
DATE: 26 01 17



ISSUE/REV.
00

AD
904

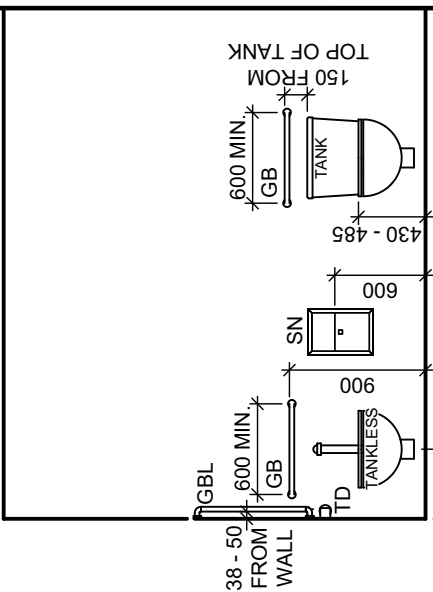
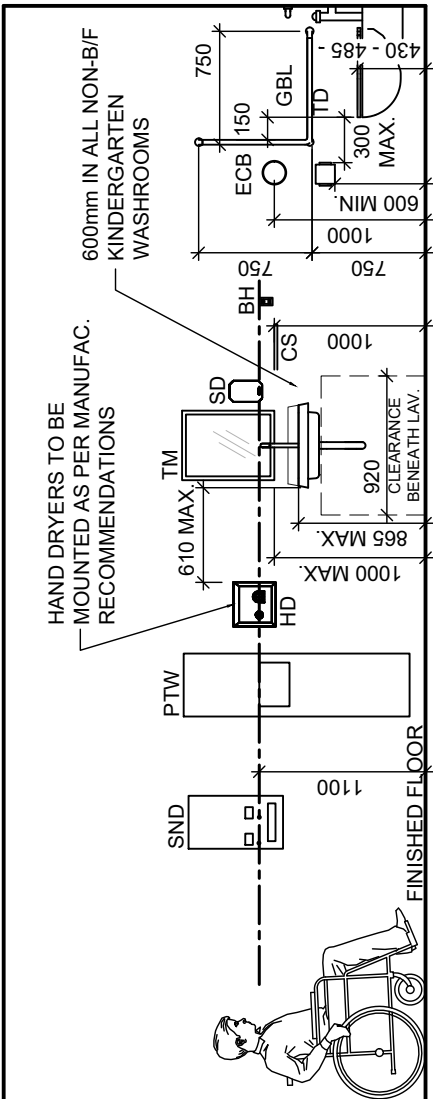
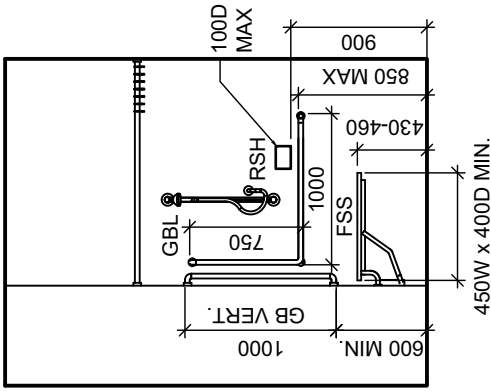
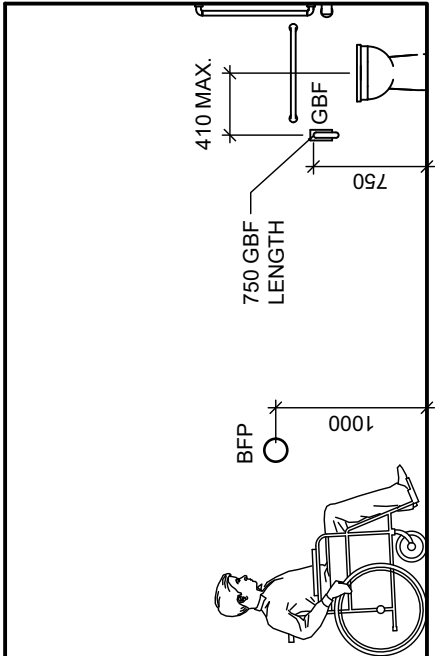
WASHROOM FIXTURE
MOUNTING HEIGHTS

PROJ:	25106
SCALE:	1:50
DRAWN:	KB
DATE:	26 01 17



ISSUE/REV.
00

AD
1000

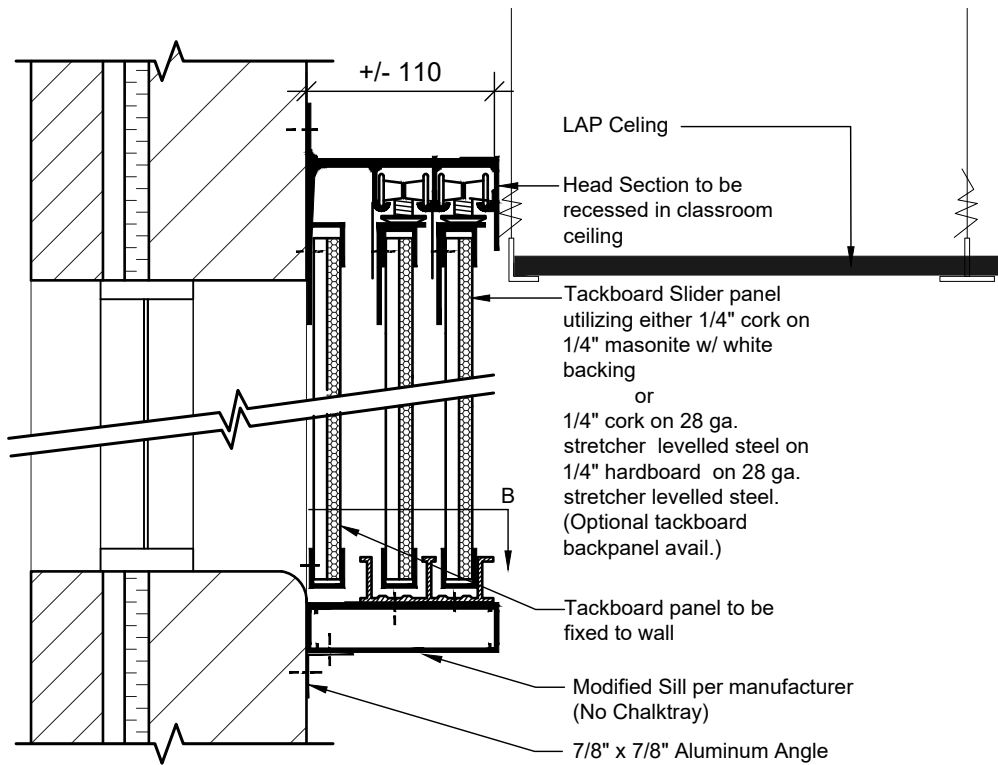
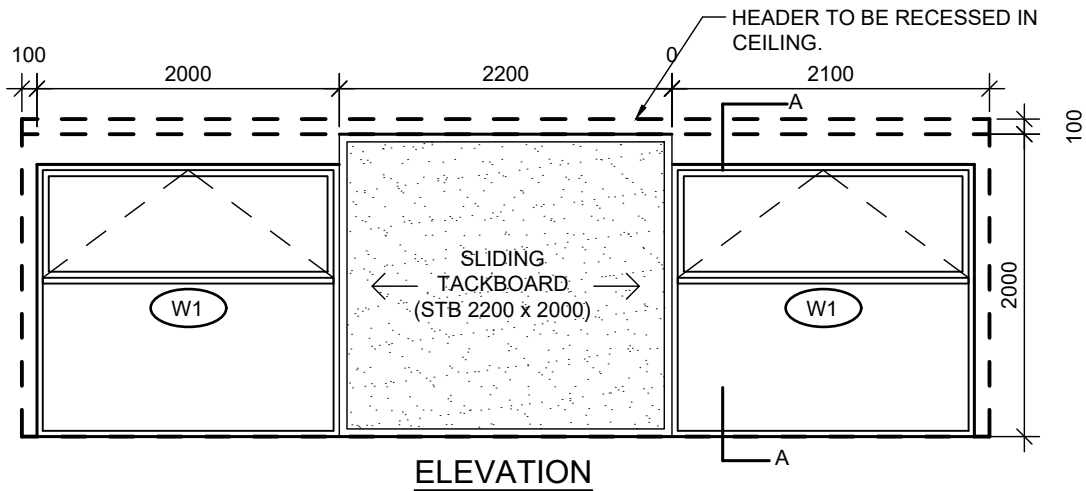


ABBREVIATIONS

- BH BREAK-AWAY TYPE COAT HOOK
- CS CONVENIENCE SHELF
- HD HAND DRYER
- GB GRAB BAR (STRAIGHT)
- GBL GRAB BAR 'L' SHAPE
- GBF GRAB BAR FOLDING TYPE
- PTD PAPER TOWEL DISPENSER
- FSS FOLDING SHOWER SEAT

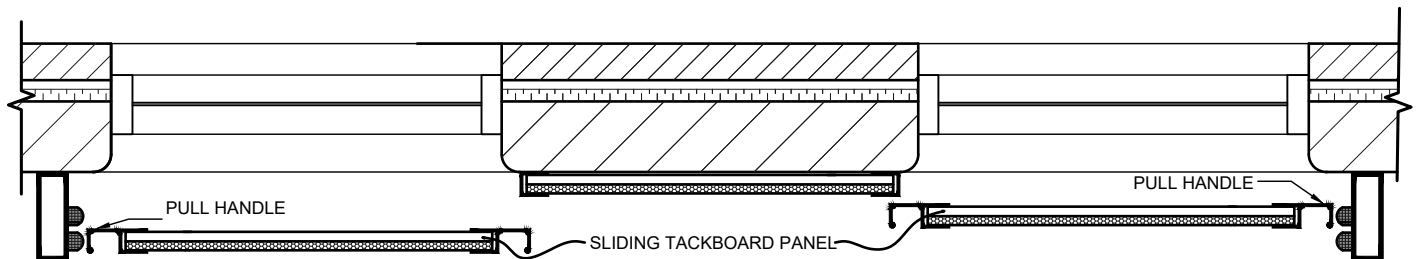
- PTW PAPER TOWEL DISPENSER / WASTE RECEPTACLE COMBO UNIT
- SN SANITARY NAPKIN DISPOSAL
- SND SANITARY NAPKIN DISPENSER
- TM TILTED MIRROR
- TD TOILET PAPER DISPENSER
- BFP BARRIER-FREE PUSH BUTTON
- RSH RECESSED SOAP HOLDER
- ECB EMERGENCY CALL BUTTON

- NOTES:
1. THE DIMENSION IS TO THE CENTRE OF THE OPERATOR.
 2. REFER TO PROJECT FLOOR PLANS AND INTERIOR ELEVATIONS FOR WASHROOM FIXTURE LAYOUT



SECTION A - A

REFER TO SPECIFICATIONS FOR DOUBLE SLIDING TRACK INFO.



PLAN SECTION B

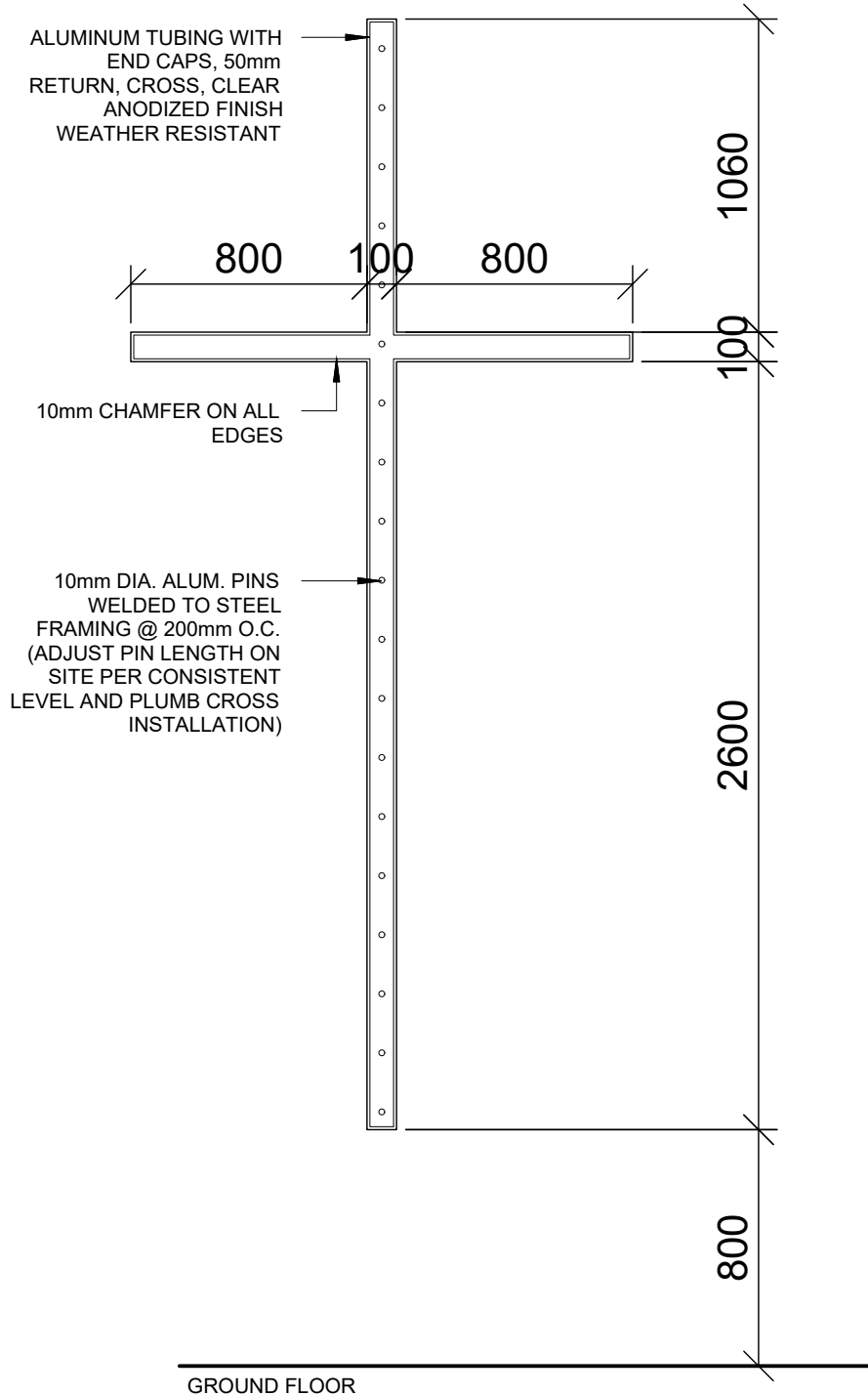
**SLIDING BOARDS DETAILS
(CLASSROOM)**

PROJ: 25106
SCALE: NTS
DRAWN: GB
DATE: 26 01 17



ISSUE/REV.
00

AD
2001



ALUMINUM CROSS DETAIL

PROJ: 25106
SCALE: 1:25
DRAWN: TC
DATE: 26 05 11



ISSUE/REV.
00

AD
2002

Part 1 General

1.1 LIMITED DESIGNATED SUBSTANCE SURVEY REPORT REFERENCE

- .1 Refer to report pertaining to hazardous materials and abatement survey and findings prepared by others bound in to Binder C for convenience only.
- .2 This report outlines the hazardous materials discovered at this site. Report is dated October 15, 2019.
- .3 Direct any questions regarding clarification regarding the Hazardous Building Material Assessment to:

Maple Environmental Inc.

Josh Prosser
Project Technologist

Jason DeSousa
Project Manager

482 South Service Rd. E, Suite 116
Oakville, Ontario L6J 2X6
Tel 905.257-4408

- .5 The specification sections related to Asbestos Survey or Abatement forms part of the Contract Documents but contains information that is not prepared by the Architect or their sub consultants. The referenced asbestos reports and asbestos abatement specifications were not prepared by or under the supervision of the Architect. While every effort has been made to attempt to provide comprehensive abatement testing information for the purposes of design and tendering, the Architect claims no responsibility or liability for the accuracy of the information contained in the report.
- .6 Refer also to Division 1 and Section 01 35 30 and coordinate with this Section.

Part 2 Products

2.1

1. Refer to documents noted above.

Part 3 Execution

- .1 Inspection and Testing will be paid for under Cash Allowances.

END OF SECTION

LIMITED DESIGNATED SUBSTANCE SURVEY REPORT



**Our Lady of Victory Catholic Elementary School
540 Commercial Street
Milton, Ontario**

Presented to:
Halton Catholic District School Board
802 Drury Lane
Burlington, Ontario
L7R 2Y2

Attention: Steve Allum
allums@hcdsb.org

October 15, 2019

Maple Project No. 18258

EXECUTIVE SUMMARY

Maple Environmental Inc. ('Maple') was retained by the Halton Catholic District School Board ('HCDSB') to perform a survey for Designated Substances as well as polychlorinated biphenyls (PCBs) and mould within Our Lady of Victory Catholic Elementary School located at 540 Commercial Street, Milton, Ontario (the 'Site'). It is our understanding that the building requires a survey to identify possible hazardous building materials that may be disturbed during future renovations.

The findings of the current survey are summarized below. Please refer to the main body of this report for details on all materials.

Asbestos

No asbestos-containing materials (ACM) were identified within the building at the time of the assessment.

It should be noted that the details and locations of the planned renovations were not known to Maple at the time of the survey, and as a result no destructive testing was conducted.

Additionally, it should be noted that due to the presence of solid walls and ceilings throughout the building, access for viewing within the wall and ceiling cavities was not always possible. Suspect asbestos-containing materials may be present within wall and ceiling cavities that were not identified but are suspected to be present in this report. Caution should be taken when demolishing solid walls and ceilings within the building.

Lead

Based on the Laboratory Analysis Report for lead samples and visual observations made during the fieldwork:

- Five (5) bulk samples were collected of the predominant paint colours and the results indicated that the painted surfaces are considered to be 'Low-Level Lead' (virtually safe).
- It should be noted that lead may also be present in wiring connectors, electric cable sheathing, solder joints on copper piping, ceramic glazes, lead sheeting, masonry mortar, and as sub-surface layers to the most recent paint layers currently applied, where present at the Site.

Mercury

- Mercury vapour is present in all fluorescent light tubes.

Silica

- Free crystalline silica, present as common construction sand, is present in all concrete and masonry products where present within the building.

Mould

- No visible mould growth was observed to be present within the building at the time of the assessment.
- It is possible that mould growth is present in concealed areas such as wall or ceiling cavities, pipe chases, etc. or in areas not currently assessed by Maple.

The client should notify Maple should any water damage or suspect mould growth be discovered.

PCBs

- The fluorescent lamp fixtures observed contained a combination of T8 and T12 fluorescent light tubes. T12 fixtures are older fixtures and have the potential of using PCB-containing ballast. T8 fixtures have electronic ballast and do not contain PCBs.

Recommendations

Based on the Laboratory Analytical Results and observations made on Site, Maple provides the following recommendations.

- Low Level Lead paints (0.1% or less) are considered virtually safe provided that;
 - airborne lead concentrations are kept below 0.05 mg/m³
 - general dust suppression and worker hygiene procedures are utilized
 - torching or other activities that create fumes are not completed
- Remove all mercury containing components (including fluorescent light tubes) prior to renovations if the materials are being removed. These components should be removed intact and disposed of appropriately.
- Proper dust suppression techniques and other safety precautions to control possible generation of silica dust from the demolition of concrete and masonry products present in the surveyed area should follow those outlined in the Ministry of Labour Guideline- Silica on Construction Projects, 2004.
- Should light fixtures containing ballasts be removed as part of the project, all ballasts not clearly marked as "non-PCB" on the label should be separated, handled and disposed of as PCB-containing or inspected by competent persons to ascertain PCB content.

TABLE OF CONTENTS

1.0	INTRODUCTION	1
2.0	APPLICABLE ONTARIO REGULATIONS.....	1
2.1	DESIGNATED SUBSTANCES AND OTHER HAZARDOUS MATERIALS.....	1
2.2	ONTARIO REGULATION 278/05 (ASBESTOS)	2
2.3	ONTARIO REGULATION 347	2
2.4	ONTARIO REGULATION 362	3
3.0	SURVEY SCOPE AND METHODOLOGY.....	3
3.1	ASBESTOS-CONTAINING BUILDING MATERIALS (ACM)	3
3.2	LEAD.....	5
3.3	MERCURY.....	5
3.4	OTHER DESIGNATED SUBSTANCES	5
3.5	MOULD	6
3.6	POLYCHLORINATED BIPHENYLS	6
3.7	LIMITATIONS AND OMISSIONS FROM SCOPE	6
3.9	PREVIOUS REPORTS.....	7
4.0	INVENTORY FINDINGS.....	7
4.1	ASBESTOS.....	7
4.2	LEAD.....	13
4.3	MERCURY.....	13
4.4	SILICA	13
4.5	ISOCYANATES.....	14
4.6	VINYL CHLORIDE MONOMER	14
4.7	BENZENE	14
4.8	ACRYLONITRILE.....	14
4.9	COKE OVEN EMISSIONS	14
4.10	ARSENIC.....	14
4.11	ETHYLENE OXIDE	14
4.12	MOULD	14
4.13	POLYCHLORINATED BIPHENYLS (PCBs)	14
5.0	RECOMMENDATIONS.....	15
5.1	ASBESTOS.....	15
5.2	LEAD.....	15
5.3	MERCURY.....	15
5.4	SILICA	15
5.5	POLYCHLORINATED BIPHENYLS	15
6.0	LIMITATIONS.....	15

APPENDICES

APPENDIX I

LABORATORY ANALYSIS REPORT - ASBESTOS

APPENDIX II

LABORATORY ANALYSIS REPORT - LEAD

1.0 INTRODUCTION

Maple Environmental Inc. ('Maple') was retained by the Halton Catholic District School Board ('HCDSB') to perform a survey for Designated Substances as well as polychlorinated biphenyls (PCBs) and mould within Our Lady of Victory Catholic Elementary School located at 540 Commercial Street, Milton, Ontario (the 'Site'). It is our understanding that the building requires a survey to identify possible hazardous building materials that may be disturbed during future renovations.

Section 30 of the Ontario Occupational Health and Safety Act requires that the following Designated Substances be included in a Designated Substance Survey:

Asbestos

Lead

Mercury

Silica

Isocyanates

Vinyl Chloride Monomer

Benzene

Acrylonitrile

Coke Oven Emissions

Arsenic

Ethylene Oxide

The assessment was performed by Josh Prosser of Maple on October 02, 2019.

2.0 APPLICABLE ONTARIO REGULATIONS

Applicable Ontario Regulations for each of the materials included in the investigation are briefly described below.

2.1 Designated Substances and Other Hazardous Materials

Section 30 of the Occupational Health and Safety Act requires building owners or their agents (architects, general contractors, etc.) to prepare or have prepared a Designated Substance report for specified potentially hazardous materials possibly present in a facility. The owner must ensure that a prospective constructor has received a Designated Substance report before entering into a binding contract with the contractor. The owner is liable to the contractor for damages and costs arising from unreported materials (of which the owner should reasonably have been aware), and could also be subject to orders and fines from the Ministry of Labour.

In addition to the requirements under the Occupational Health and Safety Act, Section 6 of the Ministry of Labour Regulations for Construction Projects requires the contractor, when submitting the Notice of Project form, report any Designated Substances likely to be used, handled or disturbed during the project.

The disturbance of asbestos materials on construction projects is controlled by Ministry of Labour Regulation R.R.O. 2005/278. The disposal of asbestos waste is controlled by Ministry of Environment Regulation, R.R.O. 1990/347.

There are no specific Ministry of Labour regulations for control of the other Designated Substances on construction projects. However, the Ministry of Labour actively enforces the general duty clause of the Health and Safety Act which protects workers and provides guidance on exposure monitoring, permissible exposure levels, medical monitoring, etc. for all Designated Substances.

Although Regulations exist for many of the Designated Substances, they apply to industry settings using Designated Substances in manufacturing processes, and do not apply to general property management, renovation or maintenance of buildings.

Polychlorinated Biphenyls ("PCBs") and mould were also included in the investigation, which are not specifically named as Designated Substances. No specific regulations are attached to these materials, but are generally governed by the due diligence section of the Health and Safety Act for employers to protect their workers.

2.2 Ontario Regulation 278/05 (Asbestos)

Ontario Regulation 278/05 applies to buildings with regards to maintenance, renovations or demolition work where asbestos-containing materials (ACM) is present and may be disturbed. The Regulation requires that a detailed asbestos inventory be performed in all buildings where friable and non-friable asbestos materials are present. The inventory must be available at the work place and must identify the type of asbestos, and location of asbestos on a room-by-room basis. The following report does not necessarily meet the requirements for an asbestos survey under Ontario Regulation 278/05.

In addition, the regulation requires all buildings where asbestos has been used as part of the building to implement an Asbestos Management Program (AMP).

The major requirements of the AMP include:

- Preparation and maintenance of an on-site record of where asbestos material is located;
- Written notification provided to tenants or lessees occupying space where asbestos is present;
- Advise workers of the owner, other staff and outside contractors of the presence and location of ACM;
- Institute and maintain a program for the training and instruction of every worker employed in the building that is likely to work in close proximity to and may disturb asbestos.
- Update the asbestos report (minimum annually)
- Preparation of written asbestos work practices;
- Repair or removal of all damaged asbestos where it may be disturbed; and
- Other record keeping.

2.3 Ontario Regulation 347

Ontario Regulation 347 applies to the transport of waste from the location of generation to a landfill site authorized to receive specific wastes. The regulation also prescribes procedures on how the specific wastes are to be handled at the landfill site.

The major requirements of the building owner and the person(s) removing the waste are to ensure that:

- The waste is appropriately packaged and labelled;
- The transport vehicle is appropriately placard; and

- The waste is to be transported as directly as possible to the landfill site once it leaves the site.

Some wastes require the owner to register a Generator (of waste) number and many wastes require classification that can restrict or even prohibit their disposal in landfill.

It is important to note that the building owner can be held responsible for the waste until the waste disposal site accepts it.

2.4 Ontario Regulation 362

Ontario Regulation 362, made under the Ontario Environmental Protection Act applies to the waste management and transport of PCB waste from the location of generation to a landfill site authorized to receive specific wastes. The regulation also prescribes procedures on how the specific wastes are to be handled at the landfill site.

3.0 SURVEY SCOPE AND METHODOLOGY

The methodology included the assessment for hazardous materials and how the assessment was performed is outlined below.

In order to determine the location of materials included in the assessment, the project technologist entered the room where practical (i.e. where access was possible without the demolition of walls, roof or ceilings or destruction of flooring). Representative views were made above accessible suspended ceiling systems. Cavities within solid ceiling and wall systems were accessed via existing access panels only. The inventory did not include demolition of building systems or finishes to check on possible hidden conditions.

3.1 Asbestos-Containing Building Materials (ACM)

The scope of the survey included all friable asbestos products and all major non-friable asbestos materials. The term friable is applied to a material that can be readily reduced to dust or powder by hand or moderate pressure. Asbestos materials that are friable have a much greater potential to release airborne asbestos fibres when disturbed.

Typical friable asbestos materials include: sprayed fireproofing or thermal insulation, textured (stippled) plaster, and thermal mechanical insulation. Typical non-friable materials include: asbestos cement (transite) products, vinyl floor tiles, asbestos textiles and gaskets. Additional materials such as ceiling tiles, drywall joint compounds and vinyl sheet flooring are classified as non-friable, but because of their ability to release dust when disturbed are considered as "potentially friable" for the purpose of this report.

Bulk samples of materials suspected to contain asbestos were collected for analysis during the survey. Specifically, a small volume of material was removed either from a damaged section of suspect material, or taken from intact material. In these latter cases, the material from which the sample was collected was sealed with tape to temporarily prevent fibre release. Samples were placed in plastic bags and sealed until receipt by an independent laboratory. To ensure quality results, the independent laboratory chosen successfully participates in an "Asbestos Proficiency Analytical Testing Program". As such, these independent laboratories are responsible for their findings.

Bulk samples were collected in accordance with regulatory sampling requirements and with sufficient frequency to obtain a general pattern of asbestos use within the building. Due to building renovations or modifications that may have occurred in the past, the consistency of the application of asbestos materials may not be uniform throughout the entire Site. It is important to note that without sampling each individual wall, pipe section, ceiling tile etc. it is not possible to identify the asbestos content of every material present in the selected areas. For this reason, visually similar materials are considered to be homogenous with those already sampled elsewhere in the building without additional analysis.

O. Reg. 278/05 prescribes that a minimum number of samples be collected of materials suspected to contain asbestos. These minimum sampling requirements are summarized in Table 1, below.

Table 1 - Suspect ACM Bulk Sampling Requirements

Type of Material	Quantity of Material Present	Minimum # of Bulk Samples Required
Surfacing Materials (i.e. sprayed fireproofing, drywall joint compound, texture coat, and plaster)	Up to 90 sq. m. (1000 sq. ft.)	3
	From 90 sq. m. (1000 sq. ft.) to 450 sq. m. (5000 sq. ft.)	5
	Greater than 450 sq. m. (5000 sq. ft.)	7
All other potential ACM	Any	3

Excluding surfacing materials, the laboratory was instructed to cease analysis within Sample Groups of homogenous materials when one of the samples in the group is found to contain asbestos. For example, if three samples of a type of vinyl floor tile are collected (as required by O. Reg. 278/05) and submitted for analysis and the first sample is positively identified as containing asbestos, the balance of the sample group is not analysed.

EMC Scientific Inc. ("EMC"), an independent laboratory, was selected to analyse the collected bulk suspect asbestos samples. EMC successfully participates in an "Asbestos Proficiency Analytical Testing Program" and as such, is responsible for its findings. EMC followed the Code of Practice for the identification of asbestos in bulk material, as detailed in O. Reg. 278/05. Bulk samples were analysed using the Polarized Light Microscopy ("PLM") Technique with Dispersion Staining. The identification of asbestos fibre in bulk material is based on a collective set of parameters dependent on the unique shape and crystallographic properties of each fibre as viewed through the microscope. This method is useful for the qualitative identification of asbestos and the semi-quantitative determination of asbestos content in bulk materials expressed as a percent of projected area. The method identifies types of asbestos and also measures percent of asbestos as perceived by the analyst in comparison to standard area projections or trained experience.

Where possible, Maple made reference to previously completed (by Others) bulk sample results.

The recommendations made as part of this report with respect to asbestos have taken into consideration: the condition and accessibility of the material, vibration, air movement, and general activities likely to occur within the vicinity of the ACM.

In each area or room inventoried, the technician recorded the quantity, condition (GOOD, FAIR, or POOR) of each suspect asbestos-containing material.

The definitions for condition and accessibility of the asbestos-containing items are as follows:

GOOD	Material is intact with no visible signs of damage.
FAIR	Material is visibly damaged but can be repaired.
POOR	Material is damaged beyond repair and likely needs to be removed.

Where ACM is found to be in GOOD condition and not likely to deteriorate or fall, the general recommendation would be to re-evaluate the condition of the material on an annual basis (required by O. Reg. 278/05). This recommendation can be subject to change if the material is located in a manner that persons untrained in asbestos awareness could physically damage it.

Where ACM is found to be damaged (i.e. FAIR or POOR condition), a recommendation to have the material cleaned-up, repaired, removed, enclosed, or encapsulated is offered. The recommendation will also indicate which asbestos procedure should be used to perform the remedial work (i.e. Type 1, Type 2, Type 3, or Glove Bag Removal Methods).

3.2 Lead

The investigation included the collection and analysis of all major paint colour applications for the presence of lead in the paint. Other materials that possibly contain lead were identified by known historic use, where relevant. The lead in paint samples were analysed by EMSL, using atomic absorption spectrophotometry. EMSL is AIHA (American Industrial Hygiene Association) and NIOSH (National Institute of Occupational Safety and Health) accredited for this type of analysis. The Laboratory Analysis Report for lead in paint samples is included with this Report as Appendix II.

3.3 Mercury

The assessment included a visual identification of fluorescent light tubes, switches, electrical controls, heating system thermostats, thermometers, and other components historically known to contain mercury.

3.4 Other Designated Substances

Other materials listed in Section 1.0 of this Report were identified on a visual basis where present, as part of the current assessment. It should be noted that no manufacturing or heavy industrial activities are known by Maple to occur at the Site. Therefore, Designated Substances associated with these activities (i.e. those other than Asbestos, Lead, Mercury, and Silica) would not be expected to be present in the selected areas.

3.5 Mould

The assessment for mould was conducted in accordance with standard industry practice as set out in the Canadian Construction Association (CCA) "Mould Guidelines for the Canadian Construction Industry" for a visual assessment. Although there are no regulatory requirements in Ontario for such an assessment, the CCA Guidelines, and similar guidelines from other agencies have been accepted as the industry standard by most experts, consultants, the Ontario Ministry of Labour, and the Canadian Construction Association.

All guidelines and protocols for mould investigations indicate that investigations should be performed largely on a visual basis with limited collection of bulk and/or air samples. The Ontario Ministry of Labour has consistently enforced the removal of all mould from buildings regardless of mould genus or species, and therefore bulk samples or air samples for confirmation of mould are not typically collected for investigative purposes where mould is visible.

3.6 Polychlorinated Biphenyls

Manufacturers labels/codes collected from fluorescent lamp ballasts suspected of containing Polychlorinated Biphenyls ("PCBs") are compared with Environment Canada's document titled "Identification of Lamp Ballasts Containing PCBs", which identifies PCB-containing ballasts.

3.7 Limitations and Omissions from Scope

Due to the nature of building construction some limitations exist as to the possible thoroughness of any building materials inventory. The field observations, measurements, and analysis are considered sufficient in detail and scope to form a reasonable basis for the findings presented in this report. Maple warrants that the findings and conclusions contained herein have been made in accordance with generally accepted evaluation methods in the industry and applicable regulations at the time of the performance of the inventory.

It is possible that conditions may exist which could not be reasonably identified within the scope of the inventory or which were not apparent during the Site investigation. Maple believes that the information collected during the investigation concerning the property is reliable. No other warranties are implied or expressed.

During a standard ACM inventory performed for the purposes of regulatory compliance, it is industry practice to exclude certain suspect asbestos-containing materials from sampling. These materials are often excluded from sampling due to the risk of compromising the health and safety of the technician, other building occupants, or the integrity of the systems with which these materials are associated. Examples of such materials include; elevator brakes, roofing felts and mastics, high voltage wiring, mechanical packing and gaskets, underground services or piping, fire-doors, window caulking and levelling compound. Where observed, these materials were presumed to be ACM.

It should be noted that the details and locations of the planned renovations were not known to Maple at the time of the survey, and as a result no destructive testing was conducted.

3.9 Previous Reports

Where possible, Maple utilized the observations and representative bulk sampling results from previous Survey Reports that were made available at the time of the survey. Maple utilized sampling data from the following sources:

- February 2009 – Decommissioning Consulting Services Limited – Updated Survey of Asbestos Containing Materials.

4.0 INVENTORY FINDINGS

The findings of the survey are presented separately below for each of the eleven Designated Substances as well as microbial growth (mould), and polychlorinated biphenyls. Asbestos is further detailed by typical applications of asbestos.

4.1 Asbestos

The following is a brief discussion of the extent to which ACM was identified in the building. The discussion is organized under the headings of materials that are generally suspected of containing asbestos. The sample numbers refer to the laboratory analysis report presented as Appendix I and summarised in Table 2 below. Thirty (30) bulk samples were collected for the determination of asbestos content and submitted to the lab to be analysed. Due to the presence of more than one phase of material in some of the original samples the laboratory may have performed multiple analyses for some samples. As a result, a total of fifty-four (54) samples were analyzed.

Table 2 - Summary of Analysis of Asbestos Bulk Samples

Sample No.	Room Name	Sample Description	Result
S-01A	Room 2	Vinyl Floor Tile 12"x12" – Turquoise Chunks	None Detected
		Grey Mastic	None Detected
S-01B	Room 2	Vinyl Floor Tile 12"x12" – Turquoise Chunks	None Detected
		Grey Mastic	None Detected
S-01C	Room 2	Vinyl Floor Tile 12"x12" – Turquoise Chunks	None Detected
		Grey Mastic	None Detected
S-02A	Room 2	Vinyl Floor Tile 12"x12" – Red/Pink Chunks	None Detected
		Grey Mastic	None Detected
S-02B	Room 2	Vinyl Floor Tile 12"x12" – Red/Pink Chunks	None Detected
		Grey Mastic	None Detected
S-02C	Room 2	Vinyl Floor Tile 12"x12" – Red/Pink Chunks	None Detected
		Grey Mastic	None Detected
S-03A	Room 3	Vinyl Floor Tile 12"x12" – Off-White with Brown Streaks	None Detected
		Black Mastic	None Detected

Sample No.	Room Name	Sample Description	Result
S-03B	Room 4	Vinyl Floor Tile 12"x12" – Off-White with Brown Streaks	None Detected
		Black Mastic	None Detected
S-03C	Room 5	Vinyl Floor Tile 12"x12" – Off-White with Brown Streaks	None Detected
		Black Mastic	None Detected
S-04A	Room 3	Vinyl Floor Tile 12"x12" – Beige with White and Brown Flecks	None Detected
		Black Mastic	None Detected
S-04B	Room 3	Vinyl Floor Tile 12"x12" – Beige with White and Brown Flecks	None Detected
		Black Mastic	None Detected
S-04C	Room 9	Vinyl Floor Tile 12"x12" – Beige with White and Brown Flecks	None Detected
		Black Mastic	None Detected
S-05A	Room 3	Vinyl Floor Tile 12"x12" – Beige, Grey, and Brown Chunks	None Detected
		Black Mastic	None Detected
		Grey Cementitious Material	None Detected
S-05B	Room 3	Vinyl Floor Tile 12"x12" – Beige, Grey, and Brown Chunks	None Detected
		Black Mastic	None Detected
		Grey Cementitious Material	None Detected
S-05C	Room 3	Vinyl Floor Tile 12"x12" – Beige, Grey, and Brown Chunks	None Detected
		Black Mastic	None Detected
		Grey Cementitious Material	None Detected
S-06A	Room 3A	Vinyl Floor Tile 12"x12" – Dark Blue Chunks	None Detected
		Black Mastic	None Detected
S-06B	Room 3A	Vinyl Floor Tile 12"x12" – Dark Blue Chunks	None Detected
		Black Mastic	None Detected
S-06C	Room 3A	Vinyl Floor Tile 12"x12" – Dark Blue Chunks	None Detected
		Black Mastic	None Detected
S-07A	Room 51	Vinyl Floor Tile 12"x12" – Beige and Brown Long Streaks	None Detected
		Black Mastic	None Detected
S-07B	Room 51	Vinyl Floor Tile 12"x12" – Beige and Brown Long Streaks	None Detected
		Black Mastic	None Detected
S-07C	Room 51	Vinyl Floor Tile 12"x12" – Beige and Brown Long Streaks	None Detected
		Black Mastic	None Detected

Sample No.	Room Name	Sample Description	Result
S-08A	Room 12	Black Mastic on Vinyl Floor Tile	None Detected
S-08B	Room 11	Black Mastic on Vinyl Floor Tile	None Detected
S-08C	Room 10	Black Mastic on Vinyl Floor Tile	None Detected
S-09A	Corridor 03	Ceramic Base Mortar	None Detected
S-09B	Corridor 03	Ceramic Base Mortar	None Detected
S-09C	Corridor 03	Ceramic Base Mortar	None Detected
S-10A	Corridor 03	Ceramic Grout	None Detected
S-10B	Corridor 03	Ceramic Grout	None Detected
S-10C	Corridor 03	Ceramic Grout	None Detected

No asbestos-containing materials (ACM) were identified at the time of the assessment. Details for all confirmed and suspect asbestos-containing materials are presented below under the headings of the most typical asbestos applications in buildings.

It should be noted that due to the presence of solid walls and ceilings throughout the building, access for viewing within the wall and ceiling cavities was not always possible. Suspect asbestos-containing materials may be present within wall and ceiling cavities that were not identified but are suspected to be present in this report. Caution should be taken when demolishing solid walls and ceilings within the building.

4.1.1 Sprayed Fireproofing

No sprayed fireproofing was identified within the building at the time of the assessment.

4.1.2 Thermal Mechanical Insulation (Friable)

Non-asbestos mechanical insulations are present throughout the building.

Piping Systems:

No asbestos-containing pipe systems were identified within the building at the time of the assessment.

Pipe systems observed within the building were either not insulated or were insulated with fibreglass, which is not suspected to contain asbestos.

Duct Systems

Duct systems observed throughout the building were observed to be either un-insulated or were insulated with foil-face fibreglass insulation which is not suspected to contain asbestos.

Mechanical Equipment

Mechanical equipment observed within the building during the current assessment was observed to be insulated with non-asbestos fibreglass insulation or was uninsulated.

4.1.3 Texture Finish (Friable)

No textured finishes were identified within the building at the time of the assessment.

4.1.4 Acoustic Ceiling Tiles (Potentially Friable)

No asbestos-containing acoustic ceiling tile systems were identified within the building at the time of the assessment. Previous sampling of ceiling tile systems (by Others) confirmed that all ceiling tiles within the building do not contain asbestos.

4.1.5 Vinyl Sheet Flooring (Potentially Friable)

No vinyl sheet flooring finishes were identified within the building at the time of the assessment.

4.1.6 Vinyl Floor Tile (Non-Friable)

No asbestos-containing vinyl floor tile systems were identified within the building at the time of the assessment.

Ten (10) visually distinct types of vinyl floor tiles systems were observed in the building. A brief description of each type of vinyl floor tile is outlined below.

- VFT-01 (12"x12" Light Brown with Brown and Beige Flecks)

VFT-01 was observed to be present within the building in Room 2.

No bulk samples were collected of VFT-01 as the material was previously sampled (by Others) and was found not to contain asbestos.

- VFT-02 (12"x12" Turquoise Chunks)

VFT-02 was observed to be present within the building in Room 2.

Three (3) representative samples (Sample Set S-01A-C) of VFT-02 were collected and analysed for the determination of asbestos content. Analysis of Sample Set S-01 found that the samples do not contain asbestos. Additionally, grey mastic associated with the tile was analyzed as part of the same sample set and also found not to contain asbestos.

- VFT-03 (12"x12" Red/Pink Chunks)

VFT-03 was observed to be present within the building in Room 2.

Three (3) representative samples (Sample Set S-02A-C) of VFT-03 were collected and analysed for the determination of asbestos content. Analysis of Sample Set S-02 found that the samples do not contain asbestos. Additionally, grey mastic associated with the tile was analyzed as part of the same sample set and also found not to contain asbestos.

- VFT-04 (12"x12" Off-White with Brown Steaks)

VFT-04 was observed to be present throughout the building.

Three (3) representative samples (Sample Set S-03A-C) of VFT-04 were collected and analysed for the determination of asbestos content. Analysis of Sample Set S-03 found that the samples do not contain asbestos. Additionally, black mastic associated with the tile was analyzed as part of the same sample set and also found not to contain asbestos.

- VFT-05 (12"x12" Beige with White and Brown Flecks)

VFT-05 was observed to be present throughout the building.

Three (3) representative samples (Sample Set S-04A-C) of VFT-05 were collected and analysed for the determination of asbestos content. Analysis of Sample Set S-04 found that the samples do not contain asbestos. Additionally, black mastic associated with the tile was analyzed as part of the same sample set and also found not to contain asbestos.

- VFT-06 (12"x12" Beige, Grey, Brown Chunks)

VFT-06 was observed to be present within Room 3.

Three (3) representative samples (Sample Set S-05A-C) of VFT-06 were collected and analysed for the determination of asbestos content. Analysis of Sample Set S-05 found that the samples do not contain asbestos. Additionally, a black mastic and cementitious material associated with the tile was analyzed as part of the same sample set and also found not to contain asbestos.

- VFT-07 (12"x12" Beige, Grey, Brown Chunks)

VFT-07 was observed to be present within Room 3.

No bulk samples were collected of VFT-07 as the material was previously sampled (by Others) and was found not to contain asbestos.

- VFT-08 (12"x12" Dark Blue Chunks)

VFT-08 was observed to be present within Room 3A.

Three (3) representative samples (Sample Set S-06A-C) of VFT-08 were collected and analysed for the determination of asbestos content. Analysis of Sample Set S-06 found that the samples do not contain asbestos. Additionally, a black mastic and cementitious material associated with the tile was analyzed as part of the same sample set and also found not to contain asbestos.

- VFT-09 (12"x12" Beige and Brown Long Steaks)

VFT-09 was observed to be present within Room 51.

Three (3) representative samples (Sample Set S-07A-C) of VFT-09 were collected and analysed for the determination of asbestos content. Analysis of Sample Set S-07 found that the samples do not contain asbestos. Additionally, a black mastic and cementitious material associated with the tile was analyzed as part of the same sample set and also found not to contain asbestos.

4.1.7 Asbestos Cement Products "Transite" (Non-Friable)

No transite cement products were identified within the building at the time of the assessment.

4.1.8 Drywall Joint Compound (DJC) (Potentially Friable)

No asbestos-containing drywall joint compound was identified within the building at the time of the assessment.

Drywall finishes were present in the form of wall and ceiling finishes within the building.

Seven (7) representative samples of drywall joint compound were previously collected (by Others) and analyzed for determination of asbestos content. Analysis of the samples found that the samples do not contain asbestos.

4.1.9 Plaster (Potentially Friable)

No plaster finishes were identified within the building at the time of the current assessment.

4.1.10 Vermiculite (Friable)

No vermiculite insulation was observed to be present within the building at the time of the assessment. It should be noted that loose fill vermiculite insulation can often be present within voids of masonry and possibly some pre-manufactured building components that would not be identified during the course of this assessment.

4.1.11 Other

- Black Mastic

Three (3) representative samples (Sample Set S-08A-C) of black mastic associated with vinyl floor tiles were collected and analysed for the determination of asbestos content. Analysis of Sample Set S-08A-C found that the samples do not contain asbestos.

- Ceramic Tile Mortar Base

Three (3) representative samples (Sample Set S-09A-C) of ceramic tile mortar base present below 2"x2" ceramic tiles were collected and analysed for the determination of asbestos content. Analysis of Sample Set S-09A-C found that the samples do not contain asbestos.

- Ceramic Tile Grout

Three (3) representative samples (Sample Set S-10A-C) of ceramic tile grout present between 2"x2" ceramic tiles were collected and analysed for the determination of asbestos content. Analysis of Sample Set S-10A-C found that the samples do not contain asbestos.

- Caulking

No samples of window/door caulking were collected as the details and locations of the planned renovations are unknown. If caulking is likely to be disturbed by the subject renovations the material is to be sampled and tested for asbestos content prior to its disturbance.

- Roofing Materials

No samples of roofing materials were collected as the details and locations of the planned renovations are unknown. If roofing materials are likely to be disturbed by the subject renovations the material is to be sampled and tested for asbestos content prior to its disturbance.

4.2 Lead

Five (5) bulk paint samples of the predominant paint colours were collected for determination of lead content and submitted to EMSL for analysis during the assessment. The sample number refers to the Certificate of Analysis Report presented as Appendix II and summarised in Table 3 below.

Table 3 - Summary of Analysis of Lead-in-Paint Samples

Sample No.	Locations	Sample Description	Result (%)
L-01	Room 9	Light Beige Paint (Wall)	<0.0081%
L-02	Boys Change Room	Dark Beige Paint (Wall)	<0.0081%
L-03	Room V3	Grey Paint (Wall)	<0.0083%
L-04	Library	White - Multi-Layer Paint (Wall)	<0.0083%
L-05	Room 2	Beige Paint (Wall)	<0.0082%

No regulations currently exist in Ontario defining the lower limit of lead-containing material. The Ontario Ministry of Labour (MOL) has issued a guideline for lead abatement, entitled Guideline – Lead on Construction Projects (2004) which is considered enforceable. The Guideline does not specify what constitutes a material as “lead-containing”. Instead, it outlines procedures based on the concentration of airborne lead encountered during removal, as well as provides procedures and/or specific operations for lead-containing material removal. However, the Environmental Abatement Council of Ontario (EACO) Lead Guideline for Construction, Renovation, Maintenance or Repair document classifies paint as either Low-Level, Lead-Containing, or Lead-Based as follows:

TABLE 4 EACO Classification of Lead Paint	
Concentration of Lead (%)	Definition
0.1 or less	Low Level Lead (Virtually Safe)
Greater than 0.1 but less than 0.5	Lead-Containing
0.5 or greater	Lead-Based

Based on these criteria and the results of the sample analysis, all paints sampled are considered to be ‘Low-Level Lead (virtually safe)’.

4.3 Mercury

Mercury vapour is present in all fluorescent light tubes.

4.4 Silica

Free crystalline silica, present as common construction sand, is present in all concrete and masonry products where present in the Select areas surveyed.

4.5 Isocyanates

Free isocyanate compounds would not be expected to be found in a non-manufacturing facility.

4.6 Vinyl Chloride Monomer

Vinyl chloride monomer would not be expected to be found in a non-manufacturing facility.

4.7 Benzene

Benzene would not be expected to be found in a non-manufacturing facility.

4.8 Acrylonitrile

Acrylonitrile would not be expected to be found in a non-manufacturing facility.

4.9 Coke Oven Emissions

Coke oven emissions would not be expected to be found in a non-manufacturing facility.

4.10 Arsenic

Arsenic would not be expected to be found in a non-manufacturing facility.

4.11 Ethylene Oxide

Ethylene oxide would not be expected to be found in a non-manufacturing facility.

4.12 Mould

No visible mould growth was observed to be present within the building at the time of the assessment.

It is possible that mould growth is present in concealed areas such as wall or ceiling cavities, pipe chases, etc. or in areas not currently assessed by Maple. The client should notify Maple should any water damage or suspect mould growth be discovered.

4.13 Polychlorinated Biphenyls (PCBs)

The fluorescent lamp fixtures observed contained a combination of T8 and T12 fluorescent light tubes. T12 fixtures are older fixtures and have the potential of using PCB-containing ballast. T8 fixtures have electronic ballast and do not contain PCBs.

5.0 RECOMMENDATIONS

5.1 Asbestos

No asbestos-containing materials were identified within the building at the time of the assessment.

It should be noted that the details and locations of the planned renovations were not known to Maple at the time of the survey, and as a result no destructive testing was conducted.

Additionally, it is important to note that due to the presence of solid wall and ceiling systems, the assessment was not able to confirm or deny the presence of ACM within wall and ceiling cavities. The presence of concealed ACM should be assumed as well as within rooms that were not accessible during the assessment. It is possible that ACM is present that was not identified in this report.

5.2 Lead

No paint finishes sampled were found to be lead-containing.

Low Level Lead paints (0.1% or less) are considered virtually safe provided that;

- airborne lead concentrations are kept below 0.05 mg/m³;
- general dust suppression and worker hygiene procedures are utilized; and
- torching or other activities that create fumes are not completed.

5.3 Mercury

Mercury vapour is present in all fluorescent light tubes. All fluorescent light tubes should be handled and disposed of appropriately.

5.4 Silica

Proper dust suppression techniques and other safety precautions to control possible generation of silica dust from the demolition of concrete and masonry products present in the building should follow those outlined in the Ministry of Labour Guideline- Silica on Construction Projects, 2004.

5.5 Polychlorinated Biphenyls

Prior to disposal, all fluorescent lamp ballasts should be inspected and compared with Environment Canada's document titled "Identification of Lamp Ballasts Containing PCBs" for the presence of PCBs.

6.0 LIMITATIONS

Due to the nature of building construction some limitations exist as to the possible thoroughness of the subject investigation. The field observations are considered sufficient in detail and scope to form a reasonable basis for the findings presented in this report. Maple warrants that the findings and conclusions contained herein have been made in accordance with generally accepted evaluation methods in the industry and applicable regulations at the time of the performance of the assessment.

It is possible that conditions may exist which could not be reasonably identified within the scope of the investigation or which were not apparent during the site investigation. Maple believes that the information collected during the investigation period concerning the property is reliable. No other warranties are implied or expressed.

Information provided by Maple is intended for Client use ONLY. Any use by a third party, of reports or documents authored by Maple, or any reliance by a third party on or decisions made by a third party based on the findings described in said documents, is the sole responsibility of such third parties. Maple accepts no responsibility for damages suffered by any third party as a result of decisions made or actions conducted.

The liability of Maple or its staff will be limited to the lesser of the fees paid or actual damages incurred by the Client. Maple will not be responsible for any consequential or indirect damages. Maple will only be liable for damages resulting from negligence of Maple; all claims by the Client shall be deemed relinquished if not made within two years after last date of services provided.

Please contact Maple Environmental Inc. at (905) 257-4408 for inquiries regarding this project.

MAPLE ENVIRONMENTAL INC.

Environment, Health and Safety Consultants

Prepared By:



Josh Prosser
Project Technologist

Reviewed By:



Jason DeSousa
Project Manager

APPENDIX I

LABORATORY ANALYSIS REPORT - ASBESTOS

Laboratory Analysis Report

To:

Josh Prosser
Maple Environmental Inc.
482 South Service Road East, Suite 116
Oakville, Ontario
L6J 2X6

EMC LAB REPORT NUMBER: A52872

Job/Project Name: Our Lady of Victory

Analysis Method: Polarized Light Microscopy – EPA 600

Date Received: Oct 4/19

Date Analyzed: Oct 10/19

Analyst: Jon Delos Santos, *Laboratory Supervisor*

Reviewed By: Malgorzata Sybydlo, *Laboratory Manager*

Job No: 18258

Number of Samples: 30

Date Reported: Oct 11/19

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-01A	A52872-1	Vinyl floor tile-12x12 turquoise chunks-room 2	2 Phases: a) Green, vinyl floor tile b) Grey, mastic	ND			100
S-01B	A52872-2	Vinyl floor tile-12x12 turquoise chunks-room 2	2 Phases: a) Green, vinyl floor tile b) Grey, mastic	ND			100
S-01C	A52872-3	Vinyl floor tile-12x12 turquoise chunks-room 2	2 Phases: a) Green, vinyl floor tile b) Grey, mastic	ND			100
S-02A	A52872-4	Vinyl floor tile-12x12 red/pink chunks-room 2	2 Phases: a) Red, vinyl floor tile b) Grey, mastic	ND			100
S-02B	A52872-5	Vinyl floor tile-12x12 red/pink chunks-room 2	2 Phases: a) Red, vinyl floor tile b) Grey, mastic	ND			100
S-02C	A52872-6	Vinyl floor tile-12x12 red/pink chunks-room 2	2 Phases: a) Red, vinyl floor tile b) Grey, mastic	ND			100
S-03A	A52872-7	Vinyl floor tile-12x12 off-white with brown streaks-room 3	2 Phases: a) Grey, vinyl floor tile b) Black, mastic	ND			100

EMC LAB REPORT NUMBER: A52872

Client's Job/Project Name/No.: 18258

Analyst: Jon Delos Santos, *Laboratory Supervisor*

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-03B	A52872-8	Vinyl floor tile-12x12 off-white with brown streaks-room 4	2 Phases: a) Grey, vinyl floor tile b) Black, mastic	ND ND			100 100
S-03C	A52872-9	Vinyl floor tile-12x12 off-white with brown streaks-room 5	2 Phases: a) Grey, vinyl floor tile b) Black, mastic	ND ND			100 100
S-04A	A52872-10	Vinyl floor tile-12x12 beige with white and brown flecks-room 3	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	ND ND			100 100
S-04B	A52872-11	Vinyl floor tile-12x12 beige with white and brown flecks-room 3	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	ND ND			100 100
S-04C	A52872-12	Vinyl floor tile-12x12 beige with white and brown flecks-room 9	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	ND ND			100 100
S-05A	A52872-13	Vinyl floor tile-12x12 beige, grey and brown chunks-room 3	3 Phases: a) Beige, vinyl floor tile b) Black, mastic c) Grey, cementitious material	ND ND ND			100 100 100
S-05B	A52872-14	Vinyl floor tile-12x12 beige, grey and brown chunks-room 3	3 Phases: a) Beige, vinyl floor tile b) Black, mastic c) Grey, cementitious material	ND ND ND			100 100 100

EMC LAB REPORT NUMBER: A52872
Client's Job/Project Name/No.: 18258
Analyst: Jon Delos Santos, *Laboratory Supervisor*

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-05C	A52872-15	Vinyl floor tile-12x12 beige, grey and brown chunks-room 3	3 Phases: a) Beige, vinyl floor tile b) Black, mastic c) Grey, cementitious material	ND			100
S-06A	A52872-16	Vinyl floor tile-12x12 dark blue chunks-room 3A	2 Phases: a) Blue, vinyl floor tile b) Black, mastic	ND			100
S-06B	A52872-17	Vinyl floor tile-12x12 dark blue chunks-room 3A	2 Phases: a) Blue, vinyl floor tile b) Black, mastic	ND			100
S-06C	A52872-18	Vinyl floor tile-12x12 dark blue chunks-room 3A	2 Phases: a) Blue, vinyl floor tile b) Black, mastic	ND			100
S-07A	A52872-19	Vinyl floor tile-12x12 beige and brown long streaks-room 51	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	ND			100
S-07B	A52872-20	Vinyl floor tile-12x12 beige and brown long streaks-room 51	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	ND			100
S-07C	A52872-21	Vinyl floor tile-12x12 beige and brown long streaks-room 51	2 Phases: a) Beige, vinyl floor tile b) Black, mastic	ND			100
S-08A	A52872-22	Mastic on floor tile-room 12	Black, mastic	ND			100
S-08B	A52872-23	Mastic on floor tile-room 11	Black, mastic	ND			100
S-08C	A52872-24	Mastic on floor tile-room 10	Black, mastic	ND			100

EMC LAB REPORT NUMBER: A52872

Client's Job/Project Name/No.: 18258

Analyst: Jon Delos Santos, *Laboratory Supervisor*

Client's Sample ID	Lab Sample No.	Description/Location	Sample Appearance	SAMPLE COMPONENTS (%)			
				Asbestos Fibres		Non-asbestos Fibres	Non-fibrous Material
S-09A	A52872-25	Ceramic base mortar-corridor 03	Grey, cementitious material	ND			100
S-09B	A52872-26	Ceramic base mortar-corridor 03	Grey, cementitious material	ND			100
S-09C	A52872-27	Ceramic base mortar-corridor 03	Grey, cementitious material	ND			100
S-10A	A52872-28	Ceramic grout-corridor 03	Grey, cementitious material	ND			100
S-10B	A52872-29	Ceramic grout-corridor 03	Grey, cementitious material	ND			100
S-10C	A52872-30	Ceramic grout-corridor 03	Grey, cementitious material	ND			100

Note:

1. Bulk samples are analyzed using Polarized Light Microscopy (PLM) and dispersion staining techniques. The analytical procedures are in accordance with EPA 600/R-93/116 method.
2. The results are only related to the samples analyzed. **ND** = None Detected (no asbestos fibres were observed), **NA** = Not Analyzed (analysis stopped due to a previous positive result).
3. This report may not be reproduced, except in full without the written approval of EMC Scientific Inc. This report may not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government.
4. The Ontario Regulatory Threshold for asbestos is 0.5%. The limit of quantification (LOQ) is 0.5%.
5. Vinyl floor tiles may contain very fine asbestos fibres which the PLM method cannot detect. TEM analysis may be necessary to confirm the absence of asbestos.

APPENDIX II

LABORATORY ANALYSIS REPORT – LEAD

**EMSL Canada Inc.**

2756 Slough Street, Mississauga, ON L4T 1G3

Phone/Fax: (289) 997-4602 / (289) 997-4607

<http://www.EMSL.com>torontolab@emsl.com

EMSL Canada Or 551912095

CustomerID: 55MAPL78

CustomerPO: 18258

ProjectID:

Attn: **Josh Prosser**
Maple Environmental, Inc.
482 South Service Road East
Suite 116
Oakville, ON L6J 2X6

Phone: (905) 257-4408
Fax: (905) 257-8865
Received: 10/04/19 2:41 PM
Collected: 10/2/2019

Project: **18258 - Our Lady of Victory****Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)***

<i>Client Sample</i>	<i>Description</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>RDL</i>	<i>Lead Concentration</i>
L-01 551912095-0001		10/2/2019	10/7/2019	0.2466 g	0.0081 % wt	<0.0081 % wt
	Site: Light Beige - Room 9					
L-02 551912095-0002		10/2/2019	10/7/2019	0.2465 g	0.0081 % wt	<0.0081 % wt
	Site: Dark Beige - Boys Change Room					
L-03 551912095-0003		10/2/2019	10/7/2019	0.2419 g	0.0083 % wt	<0.0083 % wt
	Site: Grey - Room V3					
L-04 551912095-0004		10/2/2019	10/7/2019	0.2415 g	0.0083 % wt	<0.0083 % wt
	Site: White (Multi Layer) - Library					
L-05 551912095-0005		10/2/2019	10/7/2019	0.2426 g	0.0082 % wt	<0.0082 % wt
	Site: Beige - Room 02					

Rowena Fanto, Lead Supervisor
or other approved signatory

*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Cert #2845.08; AIHA-LAP, LLC - ELLAP #196142

Initial report from 10/11/2019 09:40:01

Part 1 General

1.1 GEOTECHNICAL INVESTIGATION

- .1 A copy of the following reports from investigations of the Site are enclosed in Binder C.

PROJECT NAME: Geotechnical Investigation

Proposed Additions

Our Lady of Victory Catholic School

Milton, Ontario

Prepared by: Forward Engineering & Associates Ltd.

Project No. : G7613

Date: January 2, 2026

Soil Chemical Testing Report

Our Lady of Victory Catholic School

Milton, Ontario

Prepared by: Forward Engineering & Associates Ltd.

Project No. : 7613

Date: December 22, 2025

DISCLAIMER

- .1 The Geotechnical Report is not part of the Contract Documents prepared by the Architect or his sub consultants. It is bound into the Specifications set for convenient reference only. The Geotechnical report was not prepared by or under the supervision of the Architect. While every effort has been made to attempt to provide comprehensive geotechnical information for the purposes of design and tendering, the Architect claims no responsibility for the accuracy of the information contained in the report.
- .2 Refer to Section 00 21 13 – ‘Instruction to Bidders’, article 1.24-Examination of the Site.

Part 2 Products

2.1 NOT USED

- .1 Not used.

Part 3 Execution

3.1 NOT USED

- .1 Not used.

END OF SECTION

FORWARD ENGINEERING
& ASSOCIATES INC.

Geotechnical, Environmental, Inspection & Material Testing Services
244 Brockport Drive, Unit 15, Toronto, Ontario, M9W 6X9, Tel: (416)798-3500, Fax:(416)798-8481

REPORT
GEOTECHNICAL INVESTIGATION

PROPOSED ADDITIONS
OUR LADY OF VICTORY CATHOLIC SCHOOL
540 COMMERCIAL STREET
MILTON, ONTARIO

PREPARED FOR:
HALTON CATHOLIC DISTRICT SCHOOL BOARD
c/o
HOSSACK & ASSOCIATES ARCHITECTS
2150 Dunwin Drive, Unit 4
Mississauga, ON
L5L 5M8

January 02, 2026
Ref. No. G7613

Distribution: 1 PDF Copy– HOSSACK & ASSOCIATES ARCHITECTS
1 PDF Copy–FORWARD ENGINEERING & ASSOCIATES INC.

List of Contents

INTRODUCTION	1
PURPOSE AND SCOPE	1
PROPOSED DEVELOPMENT.....	2
FIELD AND LABORATORY TESTING	2
Field Works.....	2
Borehole Investigation:	2
Test Pit Investigation:	3
Laboratory Testing.....	3
SITE CONDITIONS.....	4
Surface Conditions.....	4
Subsurface Conditions	4
Borehole Investigation Findings:	4
It should be noted, however, that the groundwater levels are subject to seasonal fluctuations. Consequently, definitive information on the long-term groundwater levels could not be obtained at the present time.....	7
Test Pit Investigation Observations/Findings:	8
GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS	9
Foundations.....	9
Conventional Strip/Spread Footings Founded on Native Soil.....	9
Earthquake Considerations	11
Underground and Retaining Walls	11
Excavation and Backfill.....	12
Slab Construction and Permanent Drainage	13
Underground Utilities	13
Pavement Design.....	14
General Comments.....	15

LIST OF ENCLOSURES:

BOREHOLE LOCATION PLAN - DRAWING NO. 1

PERIMETER DRAINAGE - DRAWING NO. 2

LOG OF BOREHOLE SHEETS (Nos. 1 to 13) - APPENDIX A

TEST PIT OBSERVATION SHEET (TP-1 to TP-3) – APPENDIX B

SHEAR WAVE VELOCITY TEST RESULT REPORT – APPENDIX C

INTRODUCTION

This report presents the results of the geotechnical investigation carried out by Forward Engineering & Associates Inc. for the proposed building additions to existing Our Lady of Victory Catholic Elementary School located at 540 Commercial street in the Town of Milton, Ontario.

The location of the proposed additions in relation to the existing school building and site features is shown on Drawing No. 1. The approximate locations of the drilled boreholes and test pits conducted during this investigation are also presented on Drawing No. 1.

This investigation was authorized by Hossack & Associates Architects on behalf of the Halton Catholic District School Board (HCDSB).

PURPOSE AND SCOPE

The objectives (purpose) of this investigation were to determine the following:

- The extent, depth, and properties of the predominant fill/soil strata as they affect the design and construction of the proposed additions.
- The dimensions and configurations of the existing foundation footings at select locations.
- The short-term groundwater levels, if encountered.
- The appropriate geotechnical design criteria for the building foundations, excavations, backfill, slab construction, utilities, and pavement.

To achieve the above noted objectives, the field program of this investigation consisted of:

- Thirteen [13] boreholes, drilled to a depth ranging from about 1.98 to 8.08 m below the Existing Ground Surface Level (EGSL), and
- Three [3] test pits, excavated to a depth of about 1.3 m below the EGSL.

On completion of the field and laboratory work, an engineering analysis was carried out and this report summary was prepared.

PROPOSED DEVELOPMENT

We understand that the proposed development will primarily consist of new single storey building additions and/or modifications with no basements, at three [3] separate locations as shown in Drawing No. 1, enclosed in Appendix A. The proposed additions are intended for classrooms, preschool, and full-day kindergarten (FDK) with the following details:

- Proposed single-storey classroom with facilities addition to be located at the northerly west area of the existing school building structure (considering the Project North as running parallel to adjacent road; Commercial Street) [area of boreholes/monitoring wells BH/MW-1, BH-2, BH/MW-3, BH/MW-4, and test pit TP-1].
- Proposed single-storey preschool, toddlers, infants, and full-day kindergarten (FDK) with facilities building addition to be located at the southerly west area of the existing school building structure [area of boreholes/monitoring wells BH/MW-5, BH/MW-6, BH-7, and test pit TP-2].
- The existing gymnasium will be demolished and expanded into the kindergarten area, with the parking lot being relocated to the south of the site [area of borehole/monitoring well BH/MW-8, and test pit TP-3].

FIELD AND LABORATORY TESTING

Field Works

Borehole Investigation:

The field work for the borehole investigation consisted of thirteen [13] boreholes (Nos. 1 to 13), drilled on November 27 and 28, 2025, under the supervision of a member of our staff.

The drilled boreholes were located at the approximate locations shown on Drawing No. 1 and extended to a depth ranging from about 1.98 to 8.08 m below the EGSL. Some of the boreholes were relocated in the field from originally intended/planned locations due to existing underground utility locates.

Five [5] of the boreholes (BH/MW-1, BH/MW-4, BH/MW-5, BH/MW-6, and BH/MW-8) were equipped with flush mounted Water Monitoring Wells (WMW's) to facilitate future measurements of the water levels.

Two [2] of the boreholes (BH/MW-3 and BH/MW-10) were equipped with flush mounted piezometers to facilitate future testing of soil percolation.

Soils were sampled in the boreholes following the Standard Penetration Test (SPT) method using a CME-55 Track Mounted Auger Drill Rig using Rotary Drilling with Split Spoon Samplers.

The samples were logged in the field and appropriately stored in plastic bags and re-examined in more detail in the laboratory. The samples will be stored for a period of three months and then discarded, unless we are instructed differently.

Groundwater observations were made in the open boreholes, during and upon completion of the drilling operation. The results are recorded on the Log of Borehole sheets attached in Appendix A.

Elevations referred to in this report are metric and geodetic. The ground level elevations at the borehole locations were interpolated from the *Plan of Survey with Topography* dated August 06, 2025, by Tarasick McMillan Kubicki Ltd., and provided to us by the client.

Test Pit Investigation:

The field work for the test pit investigation consisted of three [3] test pits (TP-1 to TP-3) carried out on November 29 and 30, 2025. The test pits were located at the approximate locations shown on Drawing No. 1 and extended to a depth of about 1.3 m below the EGSL.

The test pit findings were documented, and results are summarized in the Sub Surface conditions section of this report and recorded in the Test Pit Observation sheets attached in Appendix B.

Laboratory Testing

Laboratory testing consisted of determination of the in-situ moisture content of the retrieved and representative soil samples.

SITE CONDITIONS

Surface Conditions

Our Lady of Victory Catholic Elementary School is located at 540 Commercial Street, Milton, Ontario.

For this description it will be assumed that the north bearing is parallel to adjacent local road Commercial Street, to coincide with Project North.

The site condition, as observed during our site visit on November 27, 2025, is presented in the following *Table No. 1*.

Table 1 - Site Surface Observations

East Boundaries:	Commercial Street.
North Boundaries:	Residential dwellings.
West Boundaries:	Residential dwellings.
South Boundaries:	Derry Road.
Surface Coverage:	Asphalt and landscaping.
Ground Level:	The topography of the site is generally flat with localized minor grades sloping down towards the nearest catch basins.
Ditches:	A ditch was observed running parallel with a portion of the north property line.
Berms:	None observed.
Stockpiles:	None observed.
Existing Structures:	School building (1-storey brick structure, with no basement).
Proposed/Intended Land Use:	Institutional (school building additions).

Subsurface Conditions

Borehole Investigation Findings:

The subsurface conditions encountered at the borehole locations are shown on the Log of Borehole sheets, presented in Appendix A, and can be summarized as follows:

Pavement	<p>Pavement layer consisting of approximately 75 to 125 mm of asphalt followed by granular fill (crushed stones) base layer with a thickness ranged from about 75 to 250 mm, was encountered at the surface of borehole Nos. 2, 4 to 6, 8, 10, and 11.</p>
Topsoil/Organic Soil	<p>A layer of blackish/dark brown topsoil/organic soil was encountered at the surface of boreholes No. 1, 3, 9, 12 and 13, with a thickness ranged from approximately 150 mm to 300 mm.</p> <p><i>It should be noted that the measurements of this layer were taken from limited 50 mm diameter Split Spoons and are not considered very accurate to be used for estimating purposes.</i></p>
Fill/Disturbed Soil	<p>A layer of Fill/Disturbed soil was found at the surface, and below the pavement or topsoil layers in borehole Nos. 2, 4 to 6, 8, 10 and 11, extended to a depth ranging from 0.25 to 1.52 m below the EGSL.</p> <p>This layer consisted mainly of brown clayey silt with traces of rootlets and gravel. Occasionally this layer contained sandy silt inclusions and traces of organics.</p> <p>This layer was found in moist to wet state and in loose to compact state of packing.</p>
Clayey Silt Till	<p>A stratum of Clayey Silt Till was encountered below the pavement and fill/disturbed soil layers in all the boreholes, extending to a depth ranging from about 4.57 to 7.62 m below the EGSL. Borehole Nos. 2, 3 and 9 to 13 were terminated withing this layer upon reaching the maximum explored depth of investigation.</p> <p>This brown and reddish brown till occasionally contained wet sandy silt and silty clay layers and was observed mainly in moist to very moist state and in stiff to hard consistency.</p>

Silt Till	<p>Silt Till was encountered in borehole Nos. 1 and 4 to 8, below the Clayey Silt Till layer and extended to the maximum explored depth of investigation.</p> <p>This brown, reddish brown, reddish grey and grey till was observed to contain wet silt inclusions in some of the boreholes.</p> <p>This till was observed mostly in moist state and in dense to very dense state of packing.</p>
Groundwater	<p>Groundwater level observations were made during and immediately upon the completion of the drilling investigation. The results are summarized in the following <i>Table 2a</i>, as shown:</p>

Table 2a: Groundwater & Cave-in Observations Upon Completion of Drilling

Borehole No.	Borehole Depth (m)	Cave-in Depth Below EGSL (m)	Groundwater Depth Below EGSL (m)
BH/MW-1	8.08	Open	Dry
BH-2	5.03	Open	Dry
BH/MW-3	5.03	Open	Dry
BH/MW-4	8.08	Open	Dry
BH/MW-5	8.08	Open	Dry
BH/MW-6	8.08	Open	Dry
BH-7	5.03	Open	Dry
BH/MW-8	7.90	Open	Dry
BH-9	3.51	Open	Dry

BH/MW-10	1.98	Open	Dry
BH-11	3.51	Open	Dry
BH-12	2.74	Open	Dry
BH-13	1.98	Open	Dry

The water level in borehole/monitoring wells BH/MW-1, BH/MW-4, BH/MW-5, BH/MW-6, and BH/MW-8, which were equipped with a flush mounted monitoring well, was measured a few days after the completion of the drilling operation, and our observations are recorded and presented in the following *Table 2b, as shown*.

Table2b: Groundwater Observation 5-6 days after Completion of Drilling

ID & Date of GWL Measurement	Groundwater Depth Below EGSL & (elevation)
BH/MW-1 <i>December 3, 2025</i>	4.50 m (192.50 m)
BH/MW-4 <i>December 3, 2025</i>	5.85 m (190.40 m)
BH/MW-5 <i>December 3, 2025</i>	Dry (lower than 188.12 m)
BH/MW-6 <i>December 3, 2025</i>	6.83 m (189.27 m)
BH/MW-8 <i>December 3, 2025</i>	5.64 m (190.88 m)

It should be noted, however, that the groundwater levels are subject to seasonal fluctuations. Consequently, definitive information on the long-term groundwater levels could not be obtained at the present time.

Test Pit Investigation Observations/Findings:

Findings of the test pit investigation are shown on the Test Pit Observation sheet, presented in Appendix B.

The Test Pit investigation findings can be summarized in the following *Table 3*:

Table 3–Test Pit Observation and Existing Footing Dimensions

Test Pit No.	Depth from EGSL to Top of Footing (mm)	Footing Thickness (mm)	Footing Projection (mm)	Test Pit Ground Surface Elevation (m)	Founding Soil Material
TP-1	1115	180	150	196.45	Clayey Silt Till
TP-2	1080	180	150	196.40	Clayey Silt Till
TP-3	1140	150	180	196.55	Clayey Silt Till

- The foundation system consisted of formed concrete foundation wall and footing.
- Test Pit #1 encountered water seepage entering from the wet/saturated pavement granular base and upper fill layers.
- Test Pit #3 encountered a rebar on the exterior of the concrete, running horizontally with the top of the footing.

GEOTECHNICAL DISCUSSION AND RECOMMENDATIONS

Foundations

The proposed building additions will consist of a single-storey structures, with no basements.

The Geodetic Finished Floor Elevation (FFE) for the new north west south west additions, and south east modification/extension area are anticipated be similar to that of the existing building at the respective locations of the addition which is, according to the available topographical survey plan, was found to be ranging between FFE = 196.59 m and 196.61 m.

The design loads are not known at this stage.

Based on the encountered subsurface conditions at the borehole locations, the recommend foundation support system is the following.

Conventional Strip/Spread Footings Founded on Native Soil

The proposed addition's structures can be supported on conventional spread/strip footings established, below the fill/disturbed soil layer, on the undisturbed, native sandy silt, or the silt till stratum at or below the depths/elevations presented in Table 4, shown below.

The size of the new strip/spread footings can be proportioned to the following bearing resistances:

Factored Bearing Resistance at Ultimate Limit State (ULS) = 375 kPa

Bearing Resistance at Serviceability Limit State (SLS) = 250 kPa

Table 3 - Foundation Depth and Elevation (at or below) for Strip/Spread Footing

Borehole No.	BH Ground Surface Elevation (m)	Founding Depth Below EGSL (m) (at/or Below)	Founding Elevation (m) (at/or Below)
1	197.00	1.05	195.95
2	196.50	0.75	195.75
3	196.80	1.05	195.75
4	196.25	0.75	195.50
5	196.20	0.75	195.45
6	196.10	0.75	195.35
7	196.51	0.75	195.76
8	196.52	1.05	195.47

Foundation Notes:

It should be noted that the as-built vertical/horizontal alignment and conditions of existing underground services and buried structures should be established prior to the design/construction stage.

In the areas of existing service trenches, the footings should be established below the invert of the existing services, in the original undisturbed soils, or could potentially, if practical, be bridged over the trench backfill (subject to review by a structural engineer).

Excavation for new footings shall start from the face of the existing structure to expose the existing footings and to match the founding depth of the new footing with the depth of the adjacent existing footings.

Adjacent footings, founded at different elevations, should be stepped at 10 to 7 (horizontal to vertical). If this condition cannot be met/complied with, underpinning of the existing footings will be required.

For frost protection requirements, all exterior footings, and footings in unheated areas, must have a minimum soil cover of 1.2 m.

Under no circumstances should the footings be constructed over loose, soft, or frozen subgrade soil or within ponded water. During winter construction, the footings must be adequately protected against the effects of frost.

Concrete should be placed without delay after excavation to avoid softening of the subgrade surface. Hand cleaning of footing bases should be carried out as directed by the field inspector.

Total settlements of the footings designed and constructed in accordance with the above recommended resistances at SLS should be less than the tolerable limits of 25 mm. The differential settlements are expected to be less than 19 mm.

Furthermore, the recommended bearing capacity and foundation elevations have been calculated from the limited borehole information and are intended for design purposes only.

More specific information, with respect to founding conditions between the boreholes will become available when the proposed construction is underway. Therefore, the encountered founding conditions must be verified in the field and all footings must be inspected by this office before placement of concrete.

Earthquake Considerations

For structural design seismic consideration, the seismic provisions of the Ontario Building Code (*OBC 2024*) outline the classification of sites for Seismic Site Response in Table 4.1.8.4.(2b) of the National Building Code of Canada (*NBC 2020*).

According to Table 4.1.8.4.(2b). of the code, and the conducted Shear Wave Velocity Test report (attached in Appendix C), the applicable **Site Designation Class** is ‘X₅₈₃’.

Underground and Retaining Walls

Underground/retaining walls should be designed to resist a pressure "p", at any depth, "h" below the surface, as given by the expression:

$$p = K[\gamma h + q]$$

Where:

1) Soil parameters are as presented in the following Table:

<i>Parameter</i>	<i>On-site soil</i>	<i>Granular B</i>
Active lateral earth pressure coefficient, <i>Ka</i>	0.33	0.30
Passive lateral earth pressure coefficient, <i>Kp</i>	3.00	3.33
Unit Weight, γ (kN/m ³)	20	21

2) *q* = an allowance for surcharge

The above equation assumes that perimeter drains will be provided, and that the backfill against the subsurface walls would be a free draining granular material, such as Granular B.

Excavation and Backfill

No major problems should be encountered for the anticipated depth of excavation. The excavation should be back-sloped at 45 degrees or flatter in accordance with the current Ontario Occupational Health and Safety Act (OHSA).

The anticipated water seepage, if any, into the excavations from the more permeable seams/lenses or surface run-off can be handled by conventional pumping methods.

The material to be used for backfilling under floor slab should be suitable for compaction, i.e., free of organics and with natural moisture content, which is within 2 percent of the optimum moisture content and no pieces larger than 150mm in size. The backfill material should be compacted to at least 98 percent of the Standard Proctor Maximum Dry Density (SPMDD).

Selected on site excavated fill and native soils can be used as backfill under the floor slab or in-service trenches, provided the excavated materials are not allowed to become wet. However, the excavated materials will be very sensitive to moisture content, and the use of Granular B/C is preferred.

The backfill against the subsurface walls, and confined spaces, should be free draining granular fill, preferably conforming to the Ontario Provincial Standard Specification for granular base course, Granular B.

Slab Construction and Permanent Drainage

The surficial fill/disturbed soil layer at borehole BH/MW-8 location, which extended to a depth of about 0.76 m below EGSL, and to less extent boreholes BH/MW-4, BH/MW-5 locations, were found in loose state of packings and therefore, this layer must be thoroughly densified with heavy vibratory sheepsfoot roller.

The floor slab can be constructed following the standard slab-on-grade technique provided that all topsoil/organic soil and fill/disturbed soils with noticeable amount of organics are removed and the entire base of the additions building footprint is thoroughly proof-rolled. Any soft spots revealed during proof-rolling should be sub-excavated, backfilled, and adequately compacted.

New fill, where needed, should be placed in shallow lifts (not more than 200 mm thick) and thoroughly compacted to a minimum 98 % of its SPMDD.

The floor slabs should rest on a well compacted layer of “19 mm clear stone” at least 150 mm thick when compacted. The stone bed would act as a barrier and prevent capillary rise of moisture from the subgrade to the floor slab.

Based on the quality of encountered subgrade subsoil strata, for all the proposed additions, an average value of vertical modulus of subgrade reaction (k_s) of 34 MPa/m (125 pci) can be utilized in the design of the concrete slab-on-grade.

No perimeter drainage will be required, if the floor slab is at least 150 mm above the exterior grade, which slopes away from the building at an inclination of 1 to 2 percent, to prevent surface ponding of water close to exterior walls. If this condition cannot be complied with, then perimeter drainage as shown on Drawing No. 2 should be provided.

Underground Utilities

The problem areas of road settlement largely occur adjacent to manholes, catch basins and service crossings. The sand and silt material is generally difficult to compact in these areas, and it is therefore recommended that a sand backfill be used in confined areas.

The backfill in the upper 1.0 m, from road subgrade, should be compacted to 98% of Standard Proctor maximum dry density. Below this zone, a 95 % Standard Proctor compaction is considered to be acceptable.

Sewer Pipe Bedding

The cover and bedding material for any buried utilities should consist of OPSS 1010 Granular Class 'A' or 'B' Type II, conforming to and in accordance with the relevant Ontario Provincial Standard Drawings series OPSD 802.033 for rigid pipe bedding and/or OPSD 802.010 for flexible pipe embedment.

The minimum thickness of granular material bedding below the pipe invert should be 150 mm and this bedding thickness may, however, have to be increased depending on the sewer diameter or when wet or weak subgrade conditions are encountered.

If wet or saturated conditions exist within any utility excavation, consideration should be given to using 19 mm diameter crushed clear stone wrapped in a geotextile filter fabric as pipe bedding.

Pavement Design

In the proposed pavement areas, any organic soil and/or fill with organics, expected to be found in localized areas, must be entirely removed, and the base shall be thoroughly proof-rolled. Any soft spots revealed during proof-rolling shall be sub-excavated and backfilled with suitable materials, compacted to at least 98 % SPMDD.

The subgrade soil is frost susceptible. The design of pavement is therefore mainly influenced by the need to minimize the effects of freezing and thawing. Consequently, the ground must not be unnecessarily disturbed.

The subgrade shall be sloped to facilitate drainage towards catch basins and the final subgrade shall be compacted before pavement is constructed.

It should be noted that the subgrade shall be dry and firm, not spongy, during compaction and during the construction of the [sub] base.

The subgrade will suffer strength regression if water is allowed to infiltrate into the mantle. Therefore, sub-drains shall be installed along the edge of all pavement areas to prevent surface water from infiltrating into the subgrade.

Within the parking lots, sub-drains radiating from the catch basins shall also be installed. These sub-drains should be at least 3 m long in each direction and have inverts at least 0.75 m below the pavement surface.

All granular materials used in the construction of pavement shall be compacted to 98 % of Standard Proctor maximum dry density.

Based on the engineering properties of the subgrade soil, climatic conditions and the anticipated use of the pavement, typical flexible asphaltic pavement designs for this development are as follows:

Table 5 - Typical Flexible Asphaltic Pavement Design

Pavement Components	Heavy Duty	Medium Duty	Light Duty
Asphaltic Concrete	40 mm HL3	40 mm HL3	50 mm HL3
	60 mm HL8	40 mm HL8	
19 mm Crushed Limestone	150 mm	150 mm	150 mm
Granular B Sub-base or 50 mm Crushed Limestone	300 mm	200 mm	200 mm

If the proposed pavements are to be constructed during wet seasons, the moisture content in the subgrade will probably be above the optimum, and this will render its shear strength inadequate to support paving equipment traffic. In this case, it is recommended that suitable filter fabric, such as *Terratrack 200W* or equivalent, be used at the interface of the native soil and the granular sub-base/base fill.

General Comments

This geotechnical report is provided on the basis of the terms of reference provided above and, on the assumption, that the design will be in accordance with the applicable codes and standards.

If there is any change in the design features relevant to the geotechnical analyses, or if any questions arise regarding the geotechnical aspects of the codes and standards, this office should be contacted to review the design.

The comments given in this report are intended only for the guidance of design engineers.

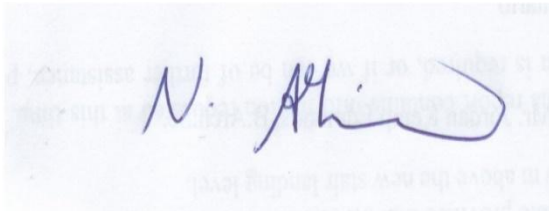
In addition, the purpose of the investigation was to reveal the subsurface conditions, and to determine the various soil properties that are relevant for the construction of the foundations of the school building, the associated site services, the pavements, and the play areas.

Contractors bidding on or undertaking the works should, in this light, decide on their own investigations, as well as their own interpretations of the factual borehole results. This concern specifically applies to the classification of the fill/organic/topsoil cover and the potential reuse of these soils on/off site. The prospective contractors must draw their own conclusions as to how the near surface and subsurface conditions may affect them.

We trust this report contains information requested at this time. However, if any clarification is required, or if we can be of further assistance, please contact this office.

Yours truly,

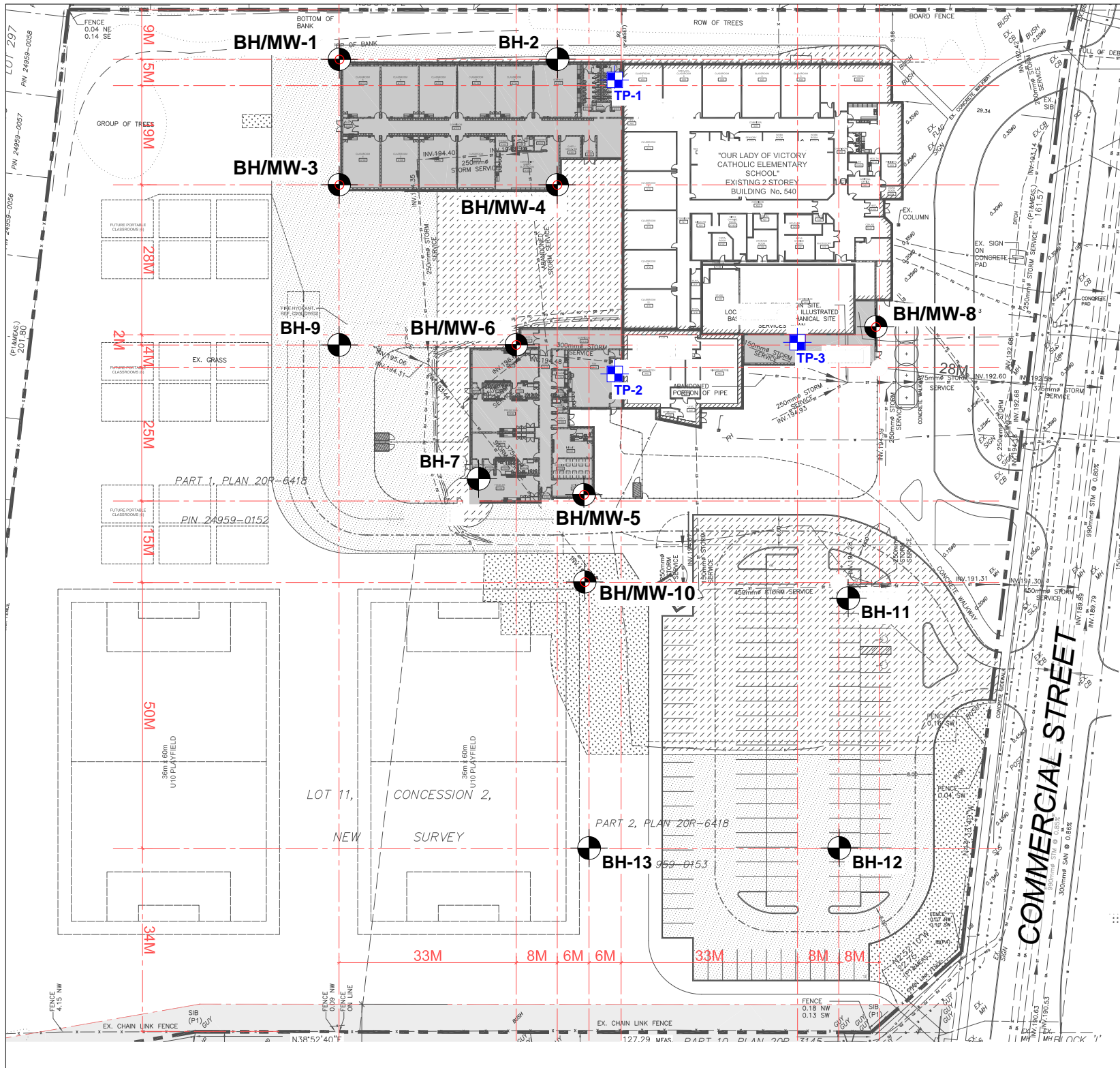
Forward Engineering & Associates Inc.




Nasser Abdelghani, M.Sc., P.Eng.
Project Geotechnical Engineer





G. S. Semaan, M.Eng., P.Eng.
Principal

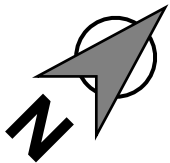


NOTES:

BH  = BOREHOLE LOCATION

BH/MW  = BOREHOLE/ MONITORING WELL LOCATION

TP  = TEST PIT LOCATION




DRAWING No. 1
BOREHOLE & TEST PIT
LOCATION PLAN

04	
03	
02	
01	
Rev.	DATE REVISION / ISSUE

Project Name: PROPOSED ADDITIONS -
OUR LADY OF VICTORY CATHOLIC
ELEMENTARY SCHOOL

Address: 540 COMMERCIAL STREET,
MILTON, ONTARIO

PROJECT No.	:7613
DRAWING DATE	:DEC. 10, 2025
DRAWN BY:	P.R.
CHECKED BY:	G.S.
	PAGE 1 of 1



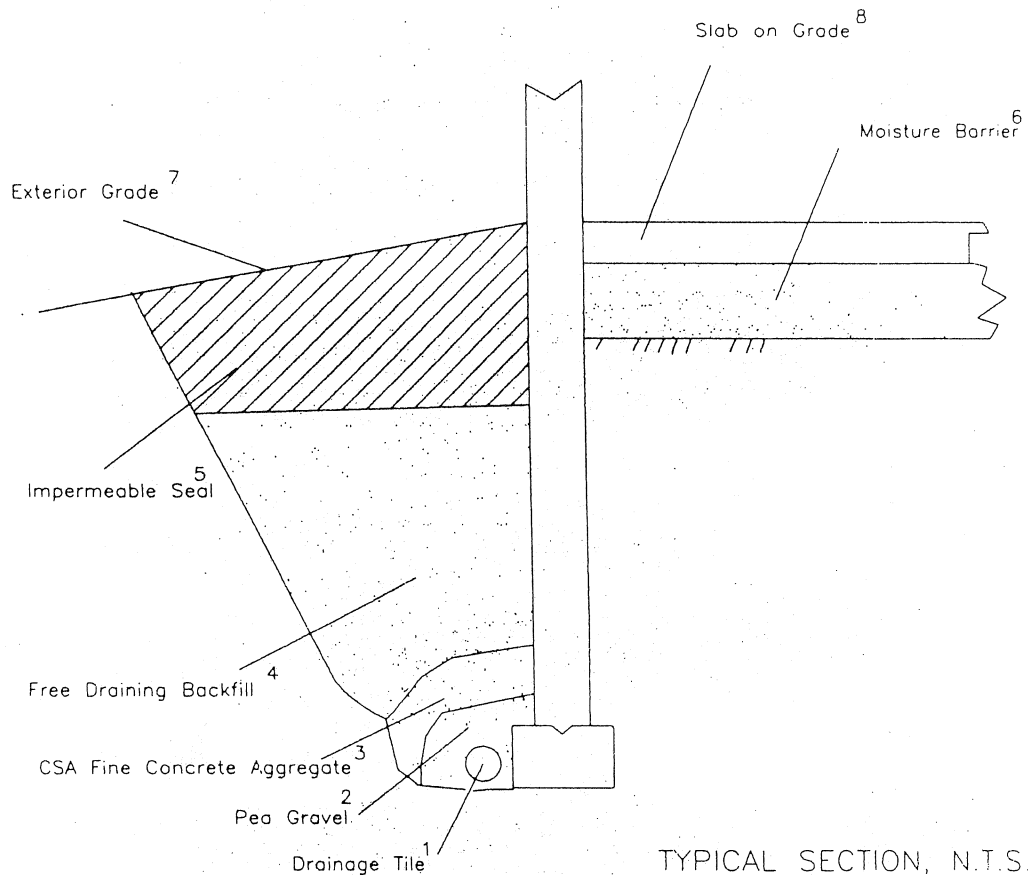
FORWARD ENGINEERING
& Associates Inc.

Forward Engineering & Associates Inc.
244 Brockport Drive, Unit 15
Toronto, Ontario M9W 6X9
Tel: 416-798-3500 Fax: 416-798-8481

www.forwardengineering.ca

DRAINAGE AND BACKFILL RECOMMENDATIONS

(Not to Scale)



NOTES:

1. Drainage tile to consist of 100 (4") diam. Weeping tile or equivalent perforated pipe leading to a positive sump or outlet. Invert to be minimum 150mm (6") below underside of floor slab.
2. Pea gravel 150mm (6") top and sides of drain. If drain is not on footing, 100 mm (4") of pea gravel below drain. Clear 20mm (3/4") crushed stone may be used provided it is covered by an approved porous membrane (TerraFix 270R or equivalent).
3. C.S.A. Fine aggregate to act as filter material. Minimum 300 mm (12") top and sides of tile drain. This may be replaced by an approved porous plastic membrane as indicated in 2.
4. Free draining backfill - Class B pit-run gravel or equivalent compacted to 93 - 95 % Standard Proctor Maximum Dry Density (SPMDD).
5. Impermeable backfill seal compacted clay, day silt or equivalent. If original soil is free draining seal may be omitted.
6. Moisture barrier to consist of 20mm (3/4") compacted crushed stone. Layer to be 200mm (8") thick.
7. Exterior grade to slope away from wall.
8. Slab on grade should not be structurally connected to wall footing.
9. If the 20mm (3/4") stone requires surface blinding, use 6mm (1/4") stone chips.

APPENDIX A

**BOREHOLE LOG SHEETS
(1 – 13)**

Project No: 7613

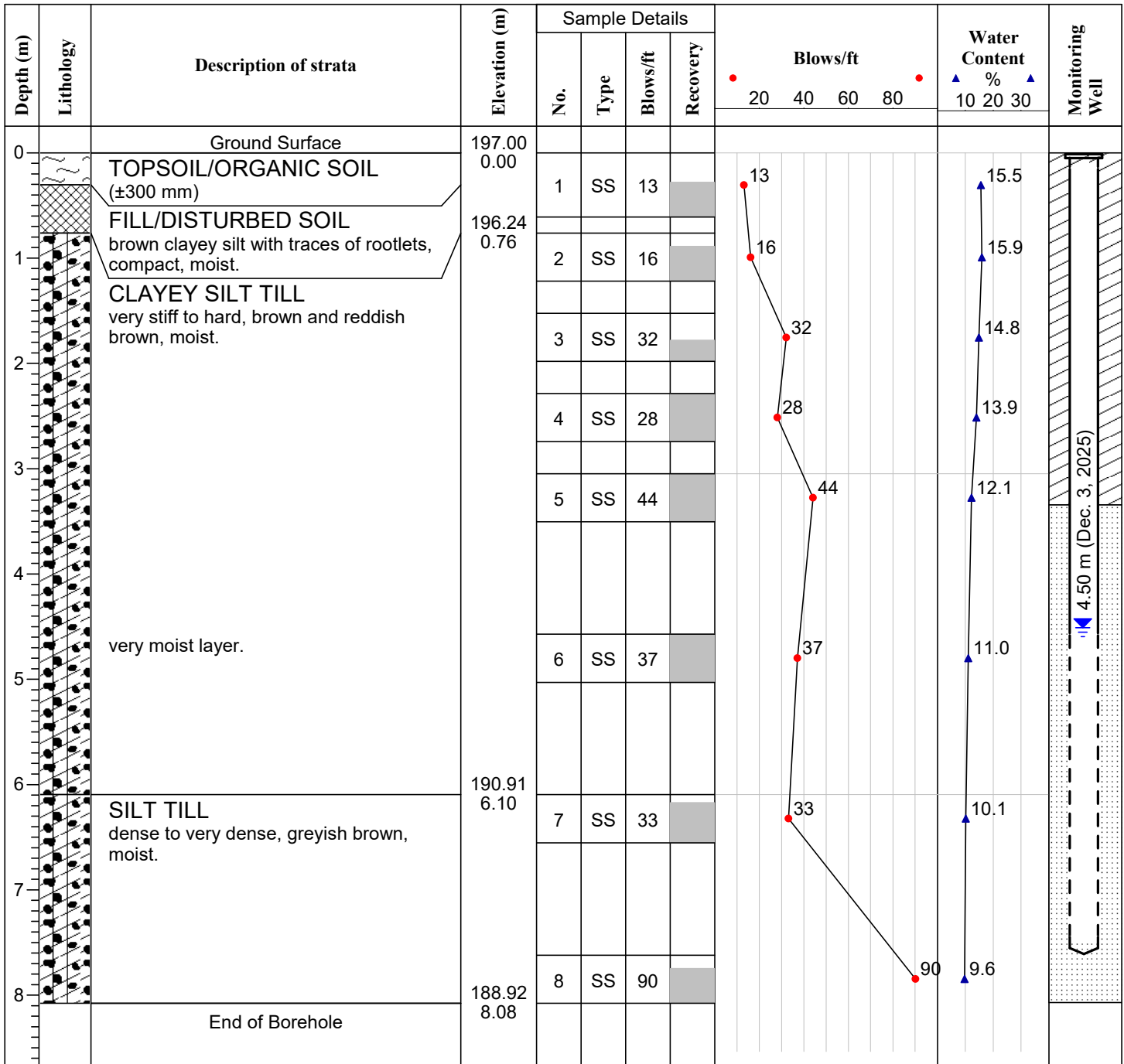
Log of Borehole BH/MW-1

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 2

Location: 540 COMMERCIAL STREET, MILTON, ON.



Remarks: -Upon completion of drilling, the borehole was open and dry.
 -On Dec. 3, 2025, the water level in the installed well was measured at 4.50 m below EGSL.

Drill Method: CME 55 - SOLID

Drill Date: 27 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7613

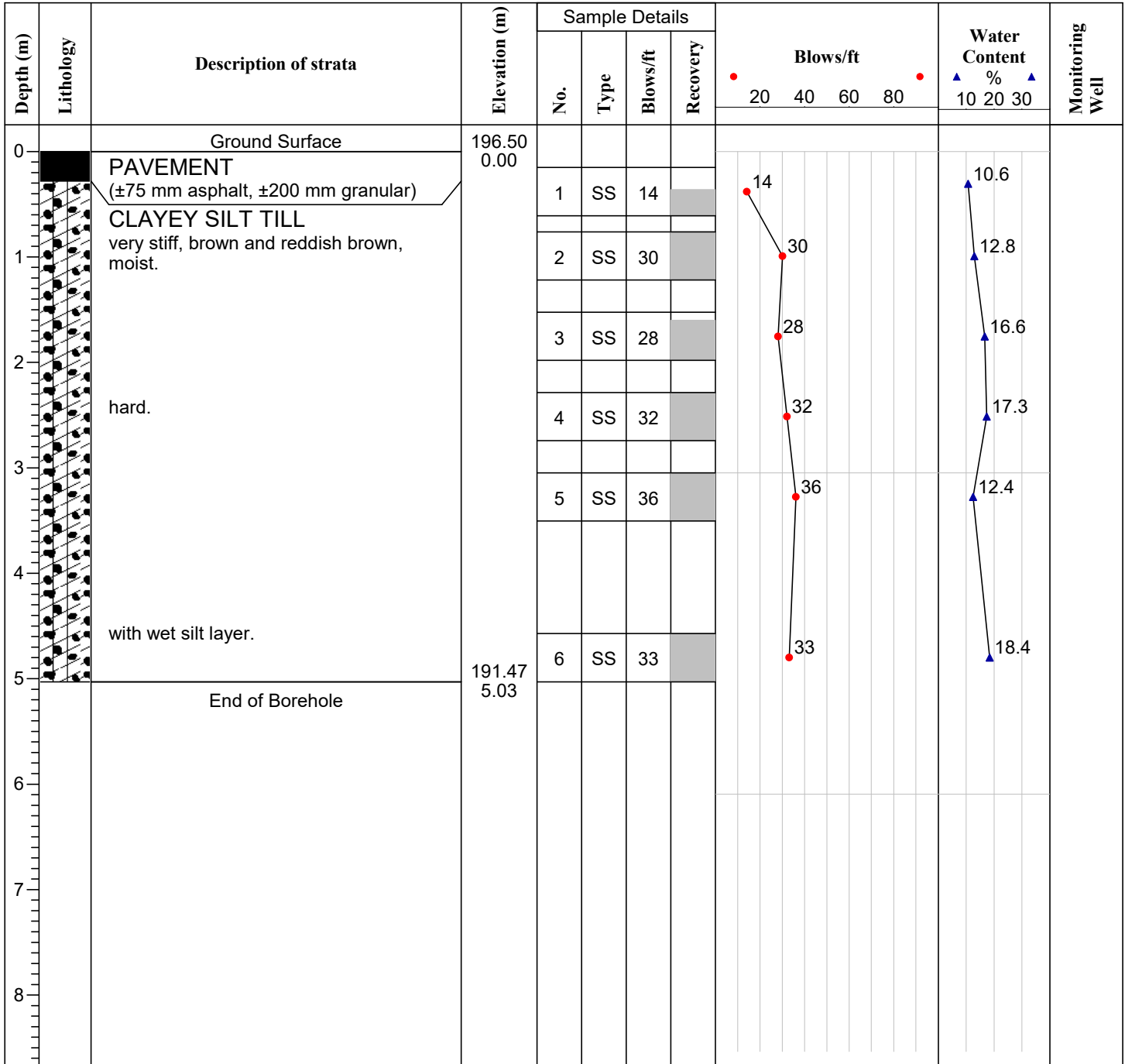
Log of Borehole BH-2

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 3

Location: 540 COMMERCIAL STREET, MILTON, ON.



Remarks: -Upon completion of drilling, the borehole was open and dry.

Drill Method: CME 55 - SOLID

Drill Date: 28 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7613

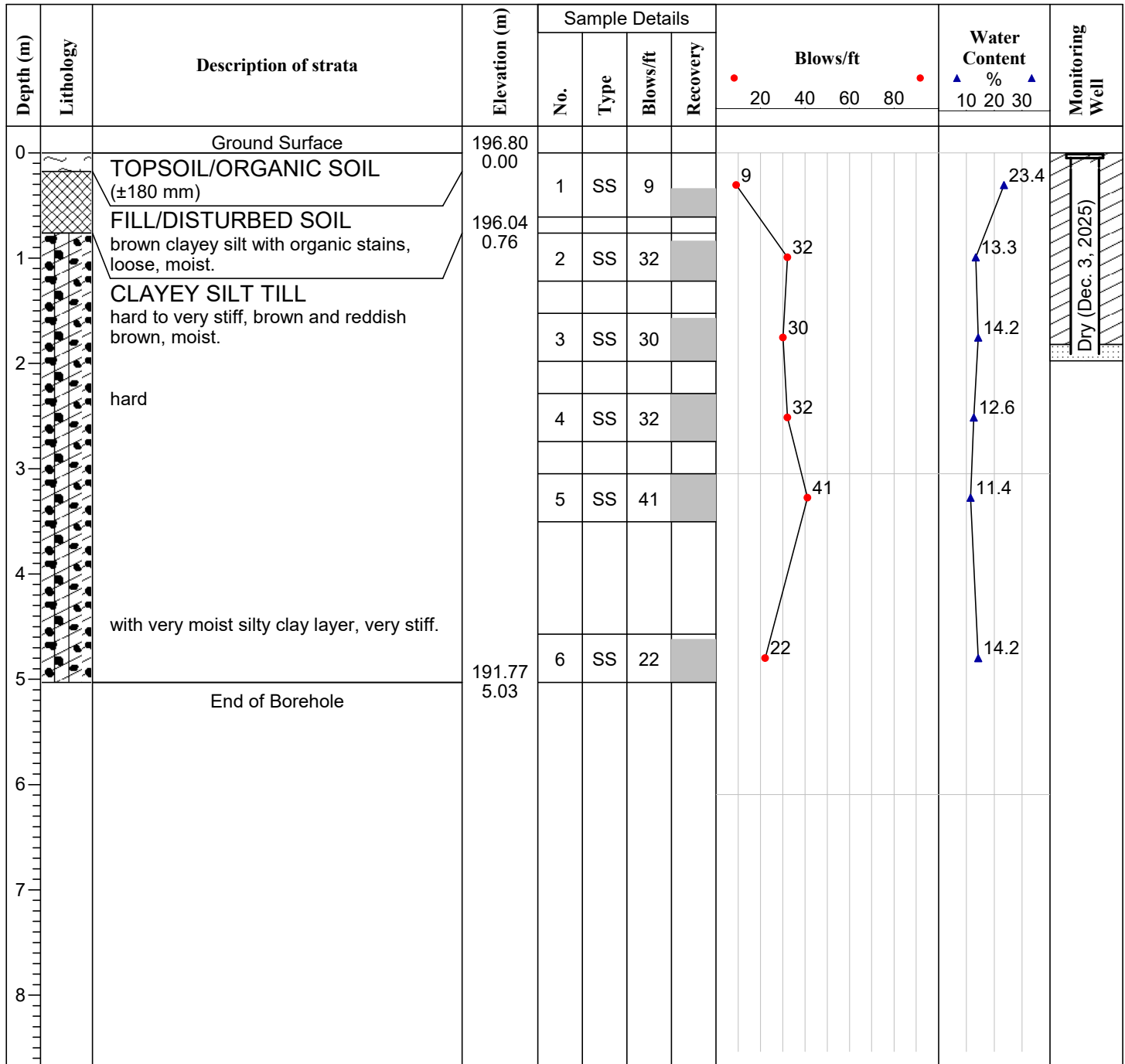
Log of Borehole BH/MW-3

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 4

Location: 540 COMMERCIAL STREET, MILTON, ON.

**Remarks:** -Upon completion of drilling, the borehole was open and dry.

-On Dec. 3, 2025, the water level in the installed well was measured and observed to be dry.

Drill Method: CME 55 - SOLID

Drill Date: 27 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7613

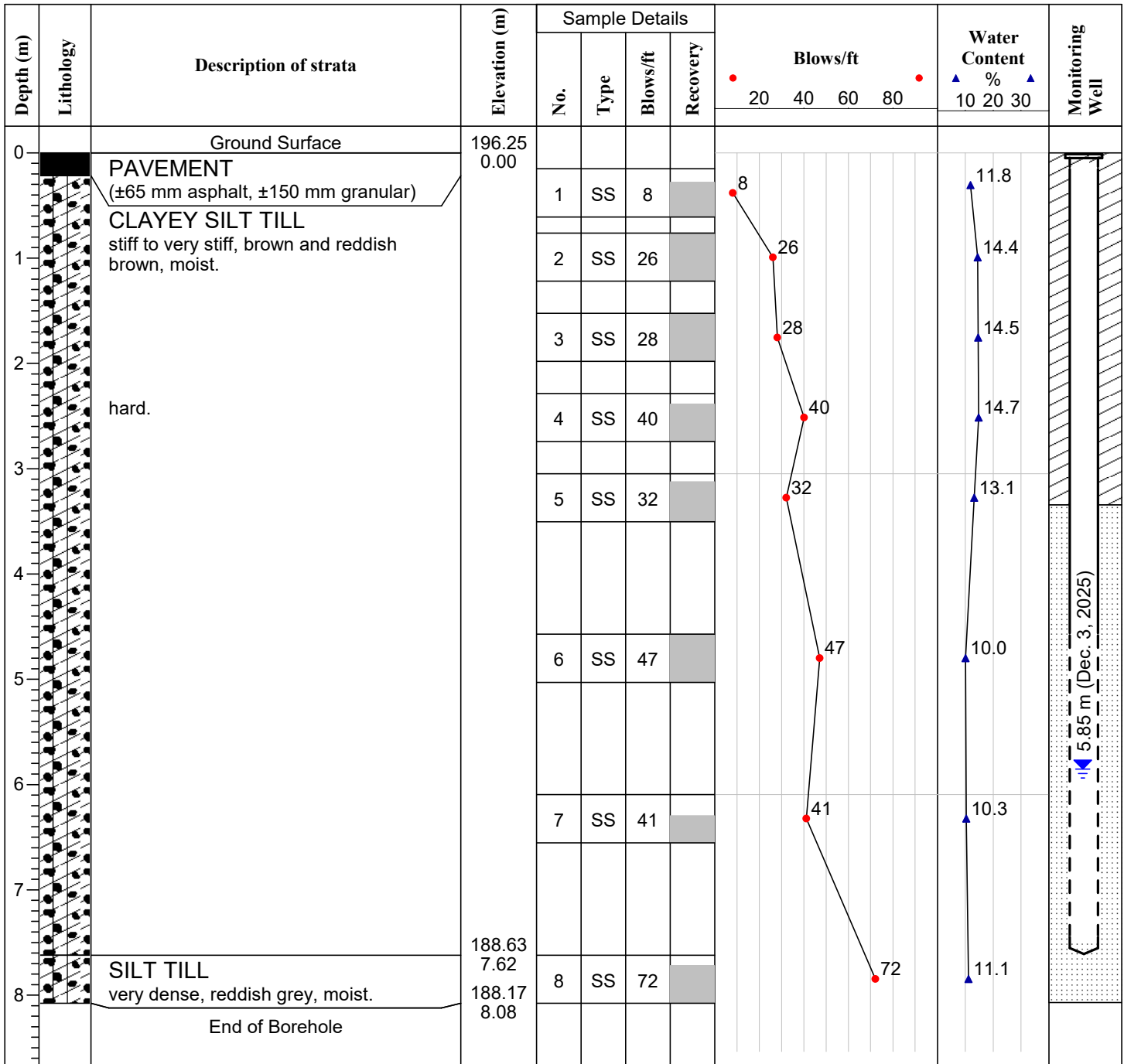
Log of Borehole BH/MW-4

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 5

Location: 540 COMMERCIAL STREET, MILTON, ON.



Remarks: -Upon completion of drilling, the borehole was open and dry.
 -On Dec. 3, 2025, the water level in the installed well was measured at 5.85 m below EGSL.

Drill Method: CME 55 - SOLID

Drill Date: 28 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7613

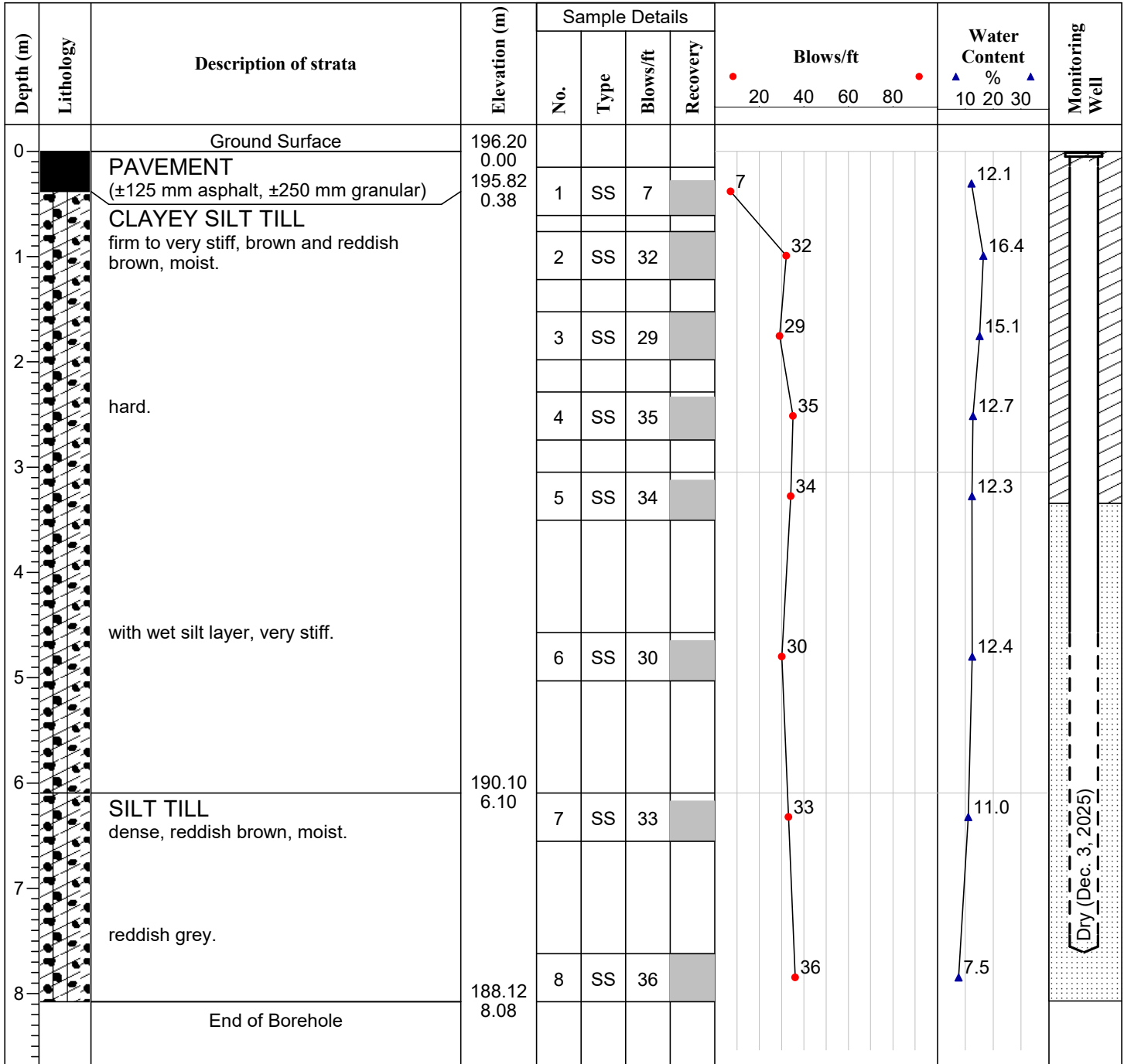
Log of Borehole BH/MW-5

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 6

Location: 540 COMMERCIAL STREET, MILTON, ON.



Remarks: -Upon completion of drilling, the borehole was open and dry.
 -On Dec. 3, 2025, the water level in the installed well was measured and was observed to be dry.

Drill Method: CME 55 - SOLID

Drill Date: 27 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7613

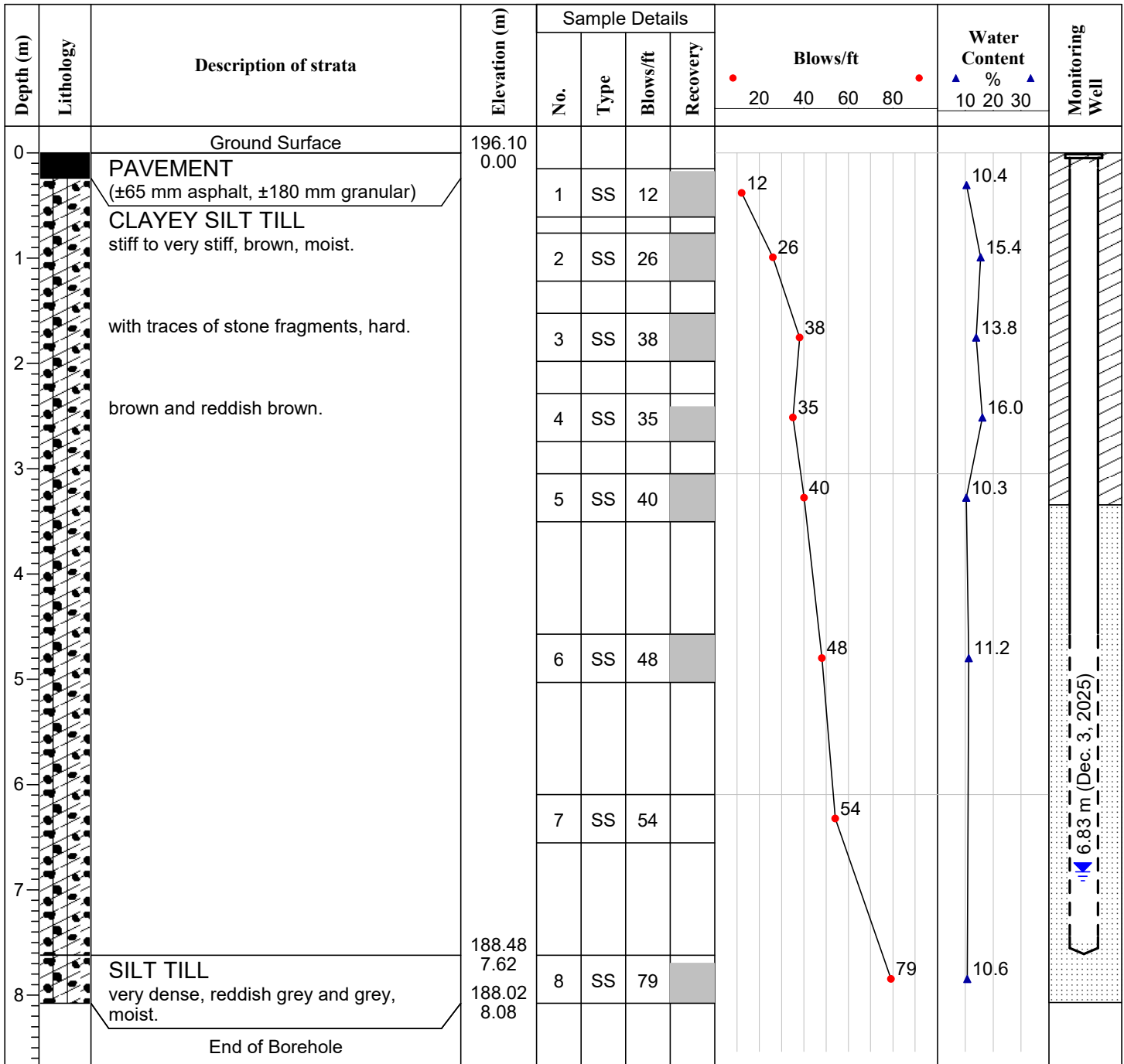
Log of Borehole BH/MW-6

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 7

Location: 540 COMMERCIAL STREET, MILTON, ON.



Remarks: -Upon completion of drilling, the borehole was open and dry.
 -On Dec. 3, 2025, the water level in the installed well was measured at 6.83 m below EGSL.

Drill Method: CME 55 - SOLID

Drill Date: 28 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7613

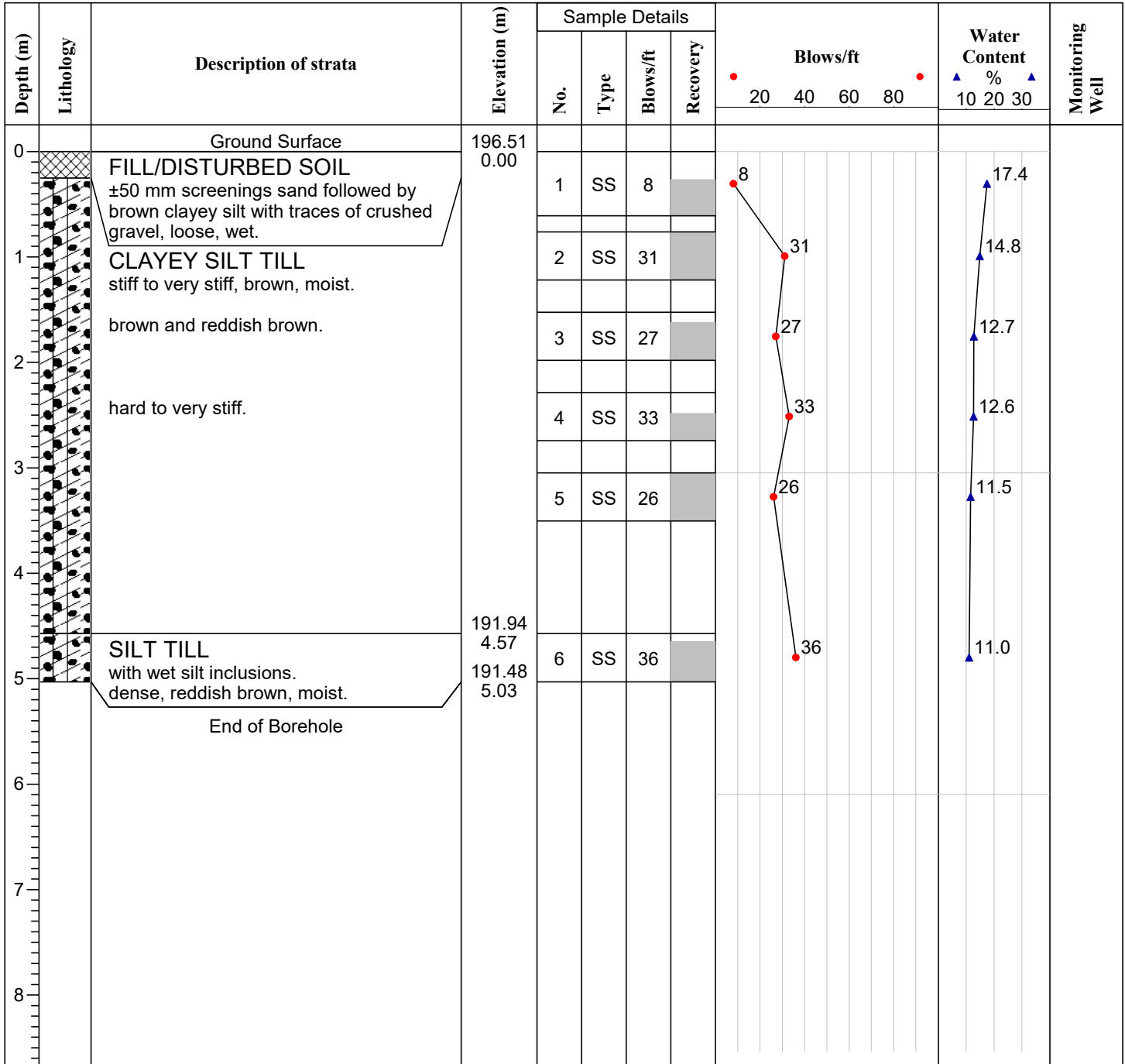
Log of Borehole BH-7

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 8

Location: 540 COMMERCIAL STREET, MILTON, ON.



Remarks: -Upon completion of drilling, the borehole was open and dry.

Drill Method: CME 55 - SOLID

Drill Date: 28 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7613

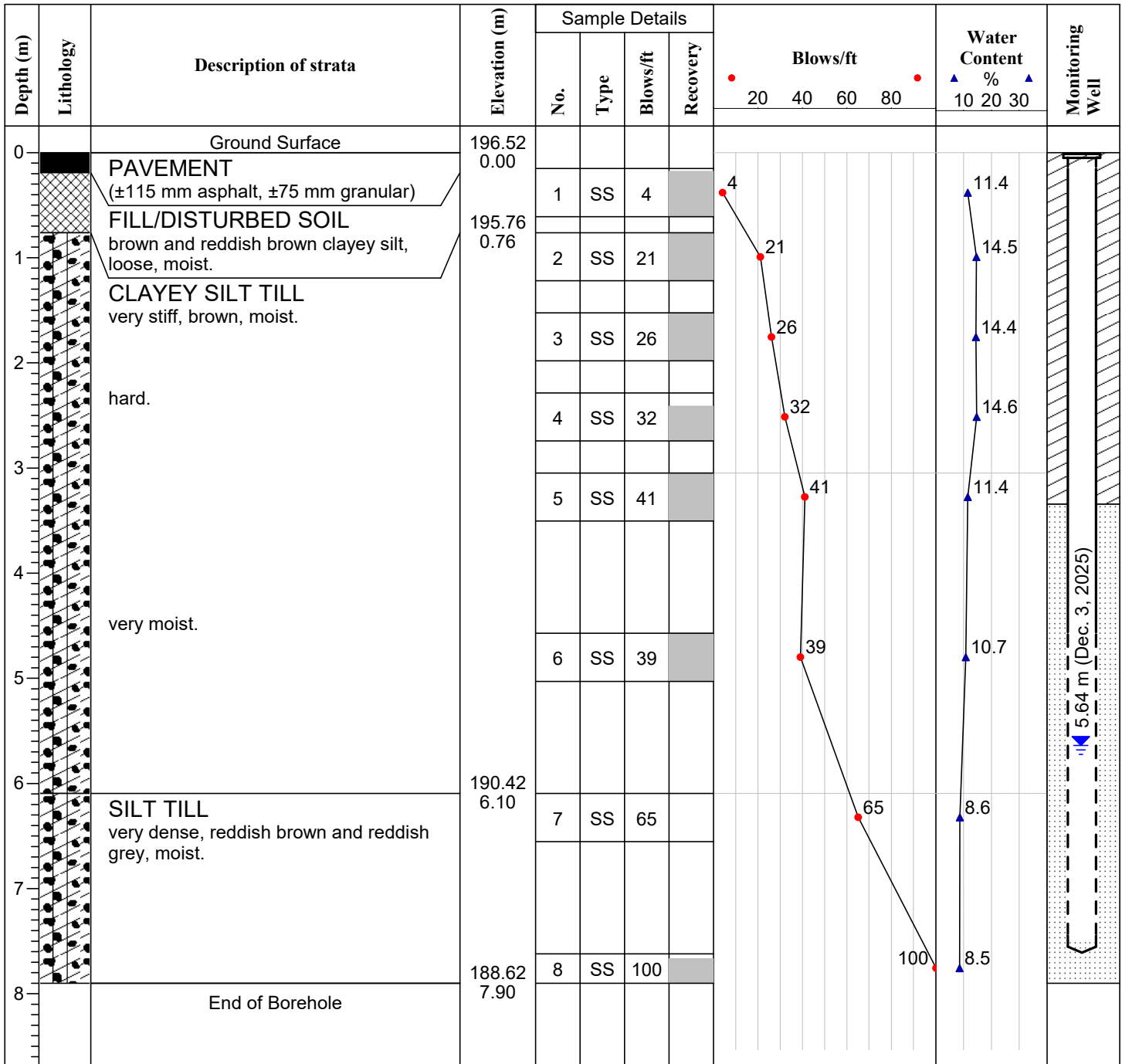
Log of Borehole BH/MW-8

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 9

Location: 540 COMMERCIAL STREET, MILTON, ON.



Remarks: -Upon completion of drilling, the borehole was open and dry.
 -On Dec. 3, 2025, the water level in the installed well was measured at 5.64 m below EGSL.

Drill Method: CME 55 - SOLID

Drill Date: 28 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7613

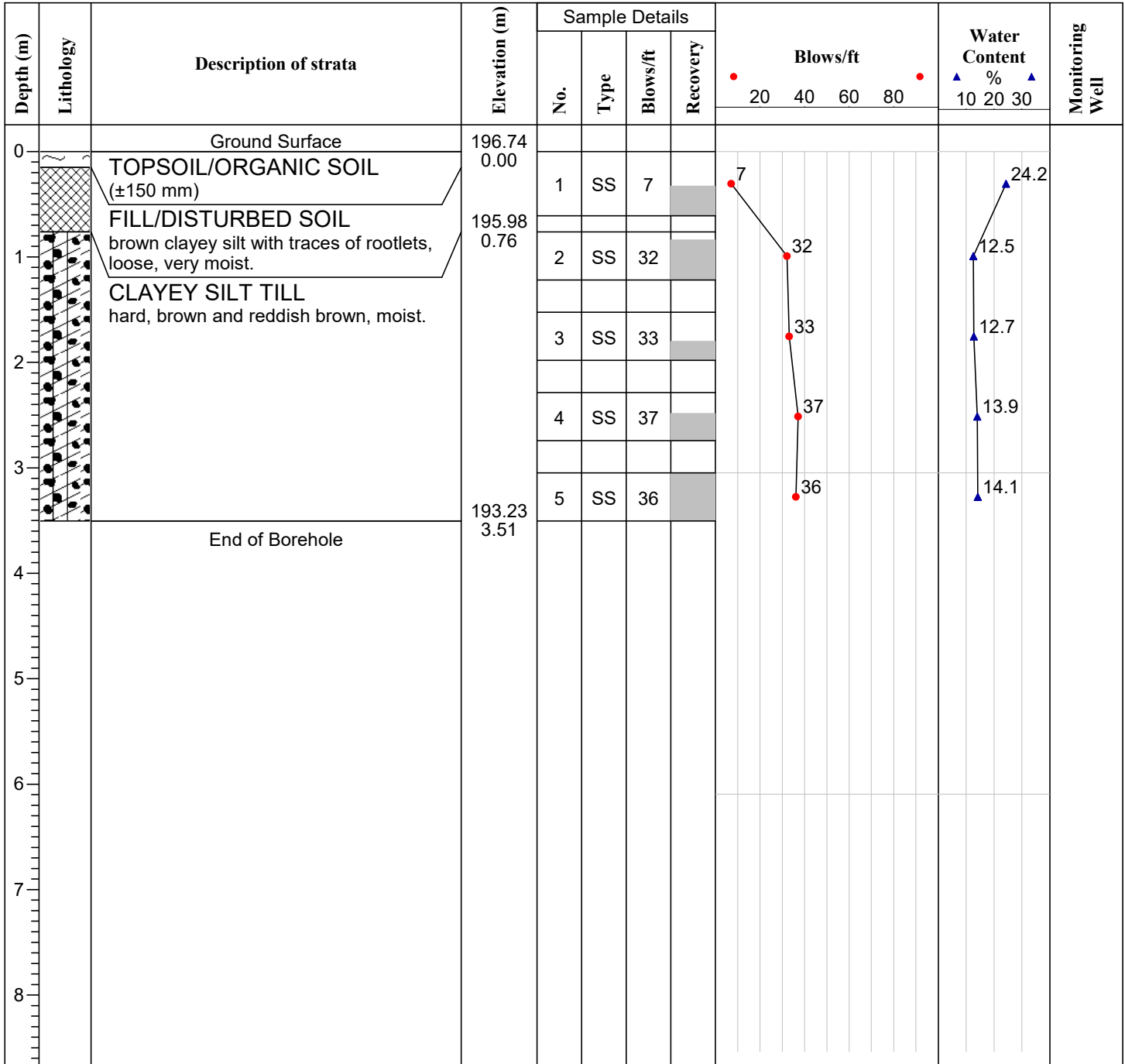
Log of Borehole BH-9

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 10

Location: 540 COMMERCIAL STREET, MILTON, ON.



Remarks: -Upon completion of drilling, the borehole was open and dry.

Drill Method: CME 55 - SOLID

Drill Date: 29 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7613

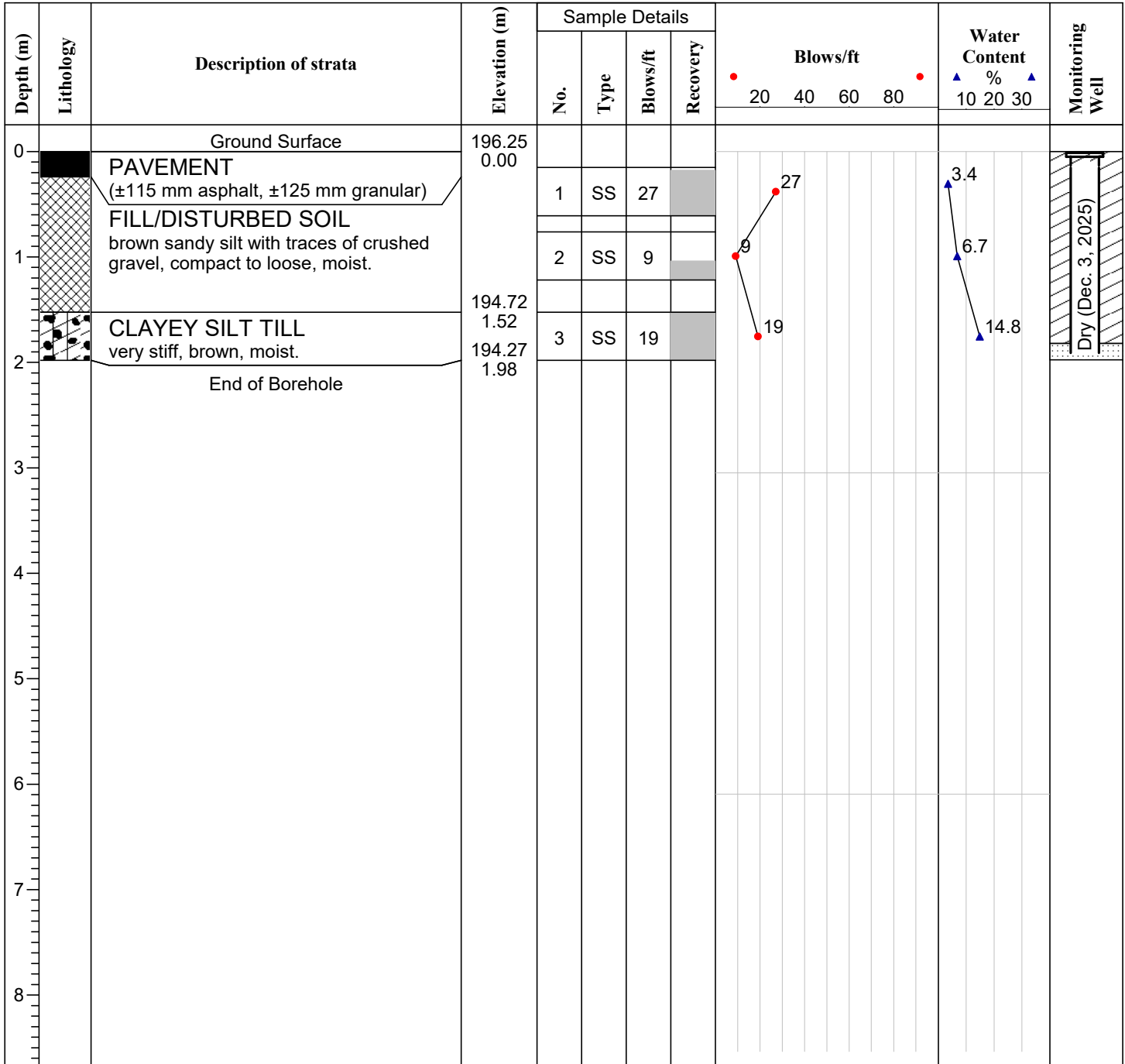
Log of Borehole BH/MW-10

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 11

Location: 540 COMMERCIAL STREET, MILTON, ON.

**Remarks:** -Upon completion of drilling, the borehole was open and dry.

-On Dec. 3, 2025, the water level in the installed well was measured and observed to be dry.

Drill Method: CME 55 - SOLID

Drill Date: 27 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7613

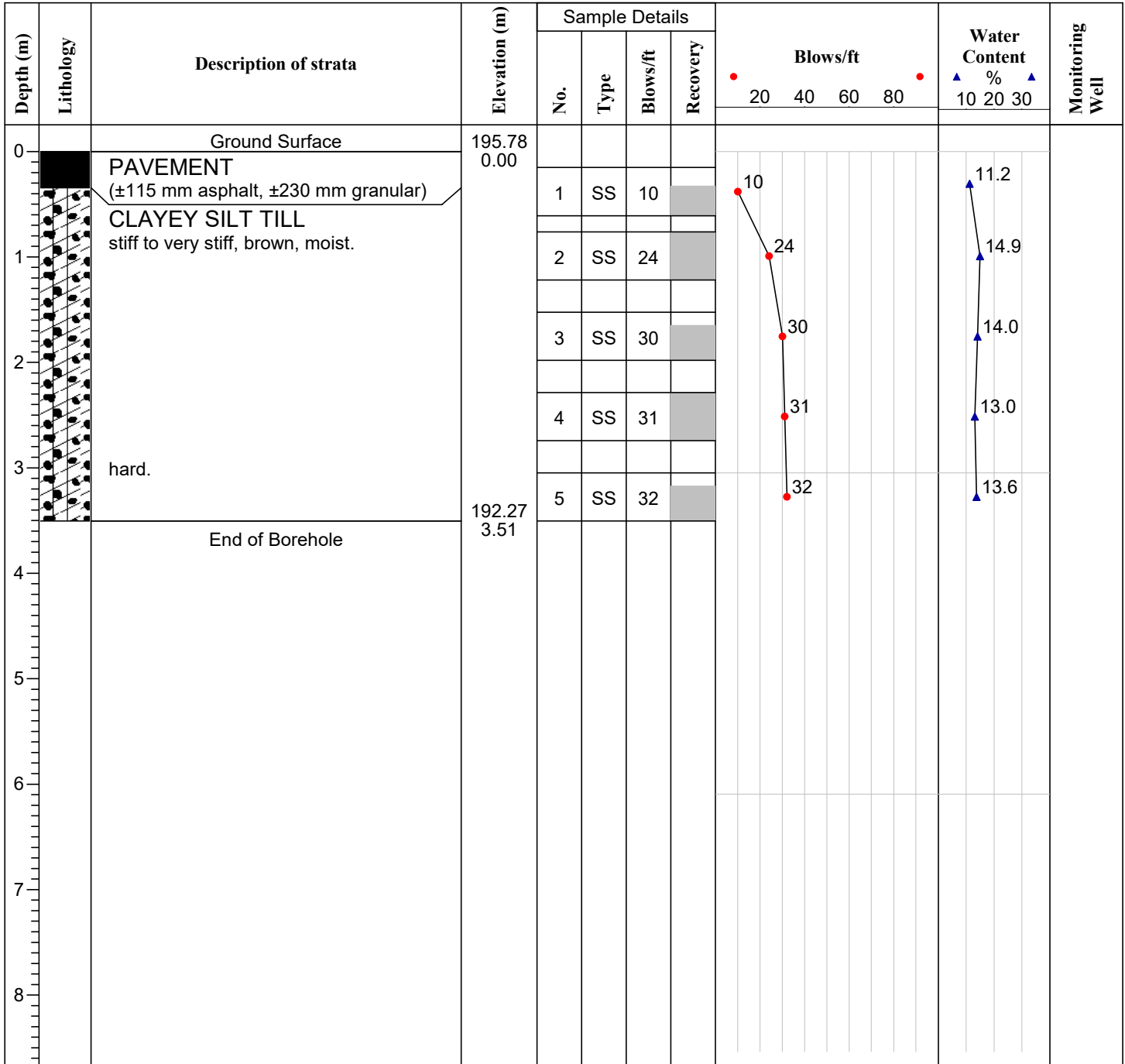
Log of Borehole BH-11

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 12

Location: 540 COMMERCIAL STREET, MILTON, ON.



Remarks: -Upon completion of drilling, the borehole was open and dry.

Drill Method: CME 55 - SOLID

Drill Date: 27 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7613

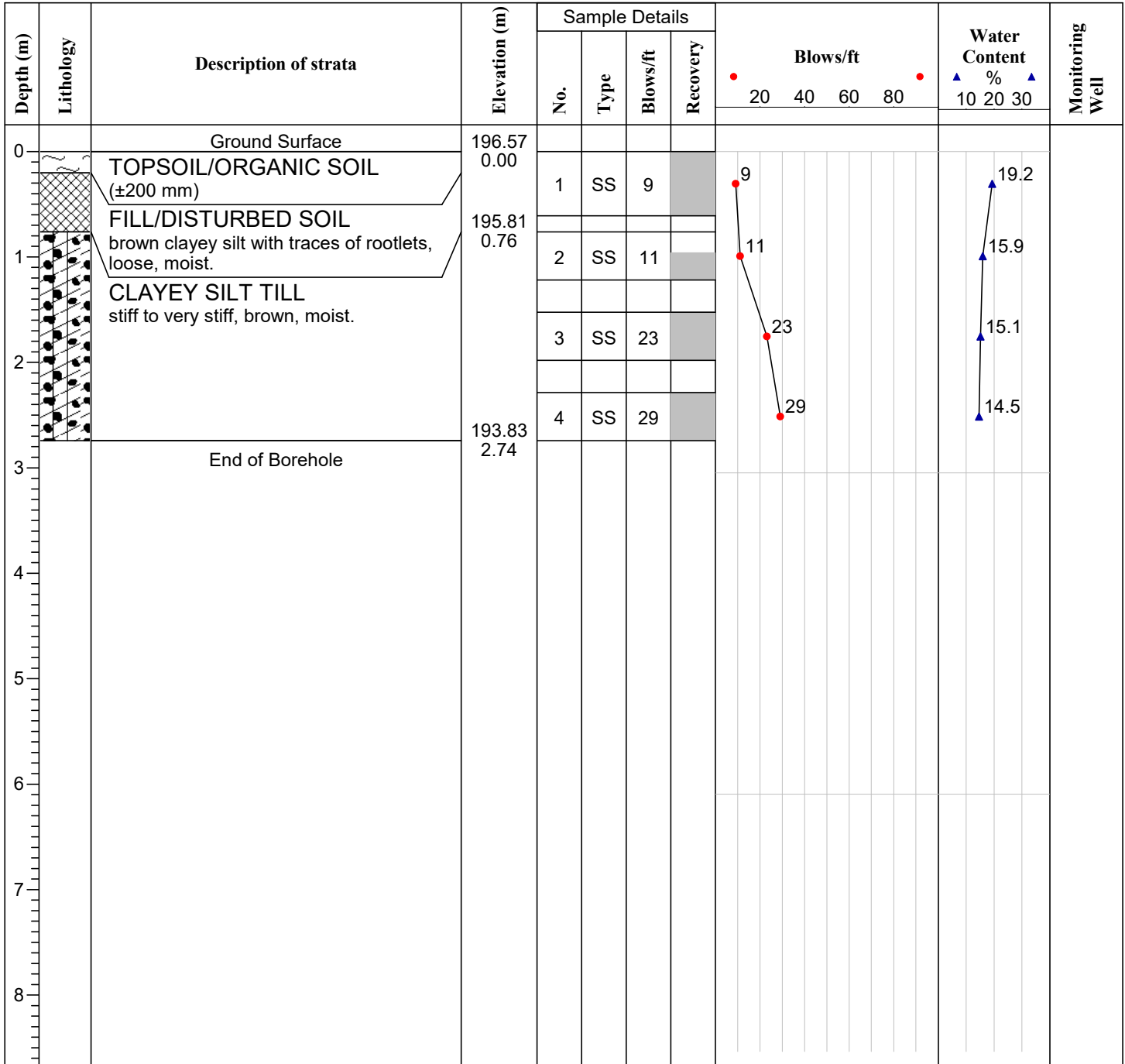
Log of Borehole BH-12

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 13

Location: 540 COMMERCIAL STREET, MILTON, ON.



Remarks: -Upon completion of drilling, the borehole was open and dry.

Drill Method: CME 55 - SOLID

Drill Date: 27 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

Checked by: G.S.

Sheet No. 1 of 1

Project No: 7613

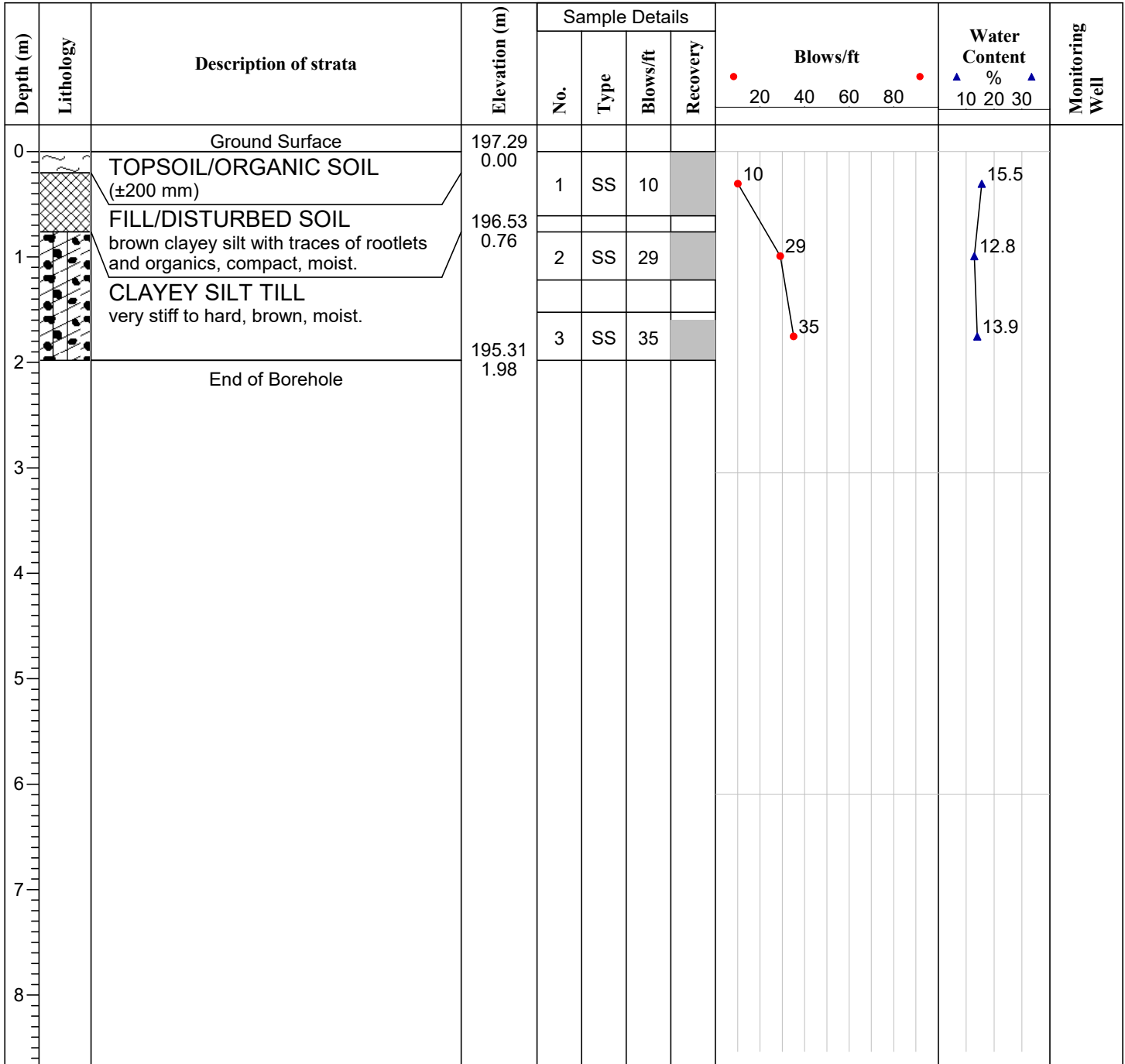
Log of Borehole BH-13

Project: PROPOSED ADDITIONS TO OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL

Client: HCDSB c/o HOSSACK ARCHITECTURE

Enclosure: 14

Location: 540 COMMERCIAL STREET, MILTON, ON.



Remarks: -Upon completion of drilling, the borehole was open and dry.

Drill Method: CME 55 - SOLID

Drill Date: 27 NOV. 2025

Datum: GEODETIC

Engineer: P.R.

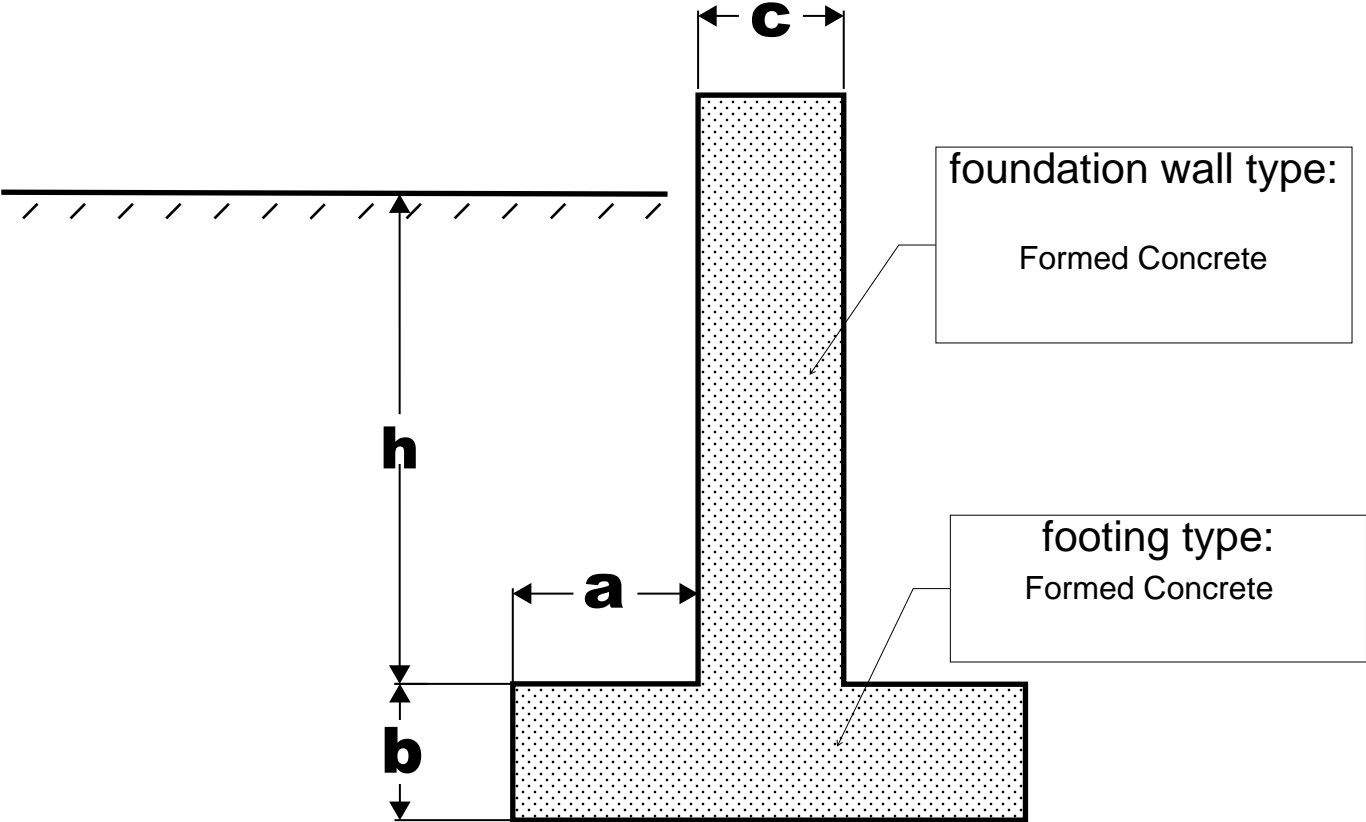
Checked by: G.S.

Sheet No. 1 of 1

APPENDIX B

TEST PIT OBSERVATION & EXISTING FOOTING SKETCH SHEET

Test Pit No.	a mm	b mm	c mm	h mm	Founding Material	Water Comment	test pit ground surface elevation (m)
TP1	150	180	N/A	1115	Clayey Silt Till	Water quickly entering from saturated gravel and fill	196.45
TP2	150	180	N/A	1080	Clayey Silt Till	Dry	196.40
TP3	180	150	N/A	1140	Clayey Silt Till	Dry	196.55



**FORWARD ENGINEERING
& Associates Inc.**
Forward Engineering & Associates Inc.
244 Brockport Drive, Unit 15
Toronto, Ontario M9W 6X9
Tel: 416-798-3500 Fax: 416-798-8481

www.forwardengineering.ca

TEST PIT OBSERVATIONS

Project Name: PROPOSED ADDITIONS -
OUR LADY OF VICTORY CATHOLIC
ELEMENTARY SCHOOL
Address: 540 COMMERCIAL STREET,
MILTON, ONTARIO

PROJECT No.	: 7613
DRAWING DATE	: Dec. 22, 2025
DRAWN BY: P.R.	PAGE 1 of 1
CHECKED BY: G.S.	

NOTES:



APPENDIX C

**REPORT BY
FRONTWAVE GEOPHYSICS INC.**



FRONTWAVE
G E O P H Y S I C S

**SHEAR WAVE VELOCITY TESTING
FOR SEISMIC SITE CLASSIFICATION
OUR LADY OF VICTORY CATHOLIC ELEMENTARY SCHOOL
540 COMMERCIAL STREET, MILTON, ONTARIO**

Submitted to:

Forward Engineering & Associates Inc.
244 Brockport Drive, Unit 15
Toronto, Ontario M9W 6X9

Attention:

Mr. Pablo Rios

Email: pablo@forwardengineering.ca

File No. F-25454

December 10, 2025

Frontwave Geophysics Inc.
Brampton, ON
(647) 514-4724
www.frontwave.ca

TABLE OF CONTENTS

1	INTRODUCTION	1
2	INVESTIGATION METHODOLOGY	1
3	RESULTS	4
4	CLOSURE	8

LIST OF FIGURES

Figure 1.	Survey location plan.....	2
Figure 2.	The procedure of MASW data processing using the SeisImager SW software package	3
Figure 3.	Example shot record and MASW dispersion images.....	5
Figure 4.	Shear wave velocity profile from MASW sounding.....	6

LIST OF TABLES

Table 1.	Shear wave velocities from MASW sounding.....	7
Table 2.	V_{s30} values from MASW sounding.....	7

1 INTRODUCTION

Frontwave Geophysics Inc. was retained by Forward Engineering & Associates Inc. to carry out a geophysical investigation for the proposed additions to Our Lady of Victory Catholic Elementary School located at 540 Commercial Street in Milton, Ontario.

The objective of the survey was to determine site designation for seismic site response based on average shear wave velocity value measured in the upper 30 m (V_{s30}). The multi-channel analysis of surface waves (MASW) method was used to obtain shear wave velocity profile.

The fieldwork was conducted on December 6, 2025. The location of the MASW survey line is shown in Figure 1.

This report describes the basic principles of MASW, survey design, interpretation method, and presents the results of the investigation in the chart and table format.

2 INVESTIGATION METHODOLOGY

Overview

The Multi-channel Analysis of Surface Waves (MASW) is a seismic method widely applied to produce shear wave velocity (V_s) profiles. It is based on the dispersive nature of Rayleigh or Love surface waves in layered media. Surface waves with longer wavelengths propagate deeper in the subsurface, hence, their phase velocity is more influenced by the elastic properties of deeper layers. The velocity of surface waves depends mainly on the shear wave velocity of the medium. The distribution of surface waves phase velocities as a function of wavelength (or frequency) can be visualized as a dispersion curve. The inverse problem is then solved by modelling the experimental data with a theoretical dispersion curve; the model parameters are typically limited to layer thickness and shear wave velocity with an assumption of horizontally layered strata. As a result of the inversion, a shear wave velocity depth profile is obtained. Figure 2 illustrates the overall procedure of the MASW method.

Two approaches different in data acquisition and processing can be implemented. The active method involves using artificial sources (e.g., sledgehammer, drop weight) to generate seismic energy, whereas the passive method utilizes energy generated by natural sources (wind, waves, microseismicity) and human activities (mostly vehicle traffic). The energy that can be generated with easily accessible active sources such as sledgehammers is typically concentrated within a relatively high frequency range, and the maximum depth of penetration for active surveys is limited to approximately 15-30 m, depending on the mass of the source and geology of the site. Ambient vibrations registered with the passive acquisition are usually of lower frequency and provide better resolution at greater depths. When survey logistics allow, the active and passive source methods are combined for obtaining well-resolved dispersion images over a wide frequency range, thus increasing the depth of investigation while retaining high resolution at shallow depths.



Legend



Location of MASW survey line
(69 m geophone spread)

Image: Google Earth 2018

Date: 2025-12-10

File No: F-25454

Title: Survey location plan

Location: 540 Commercial St
Milton, ON

Figure:
1

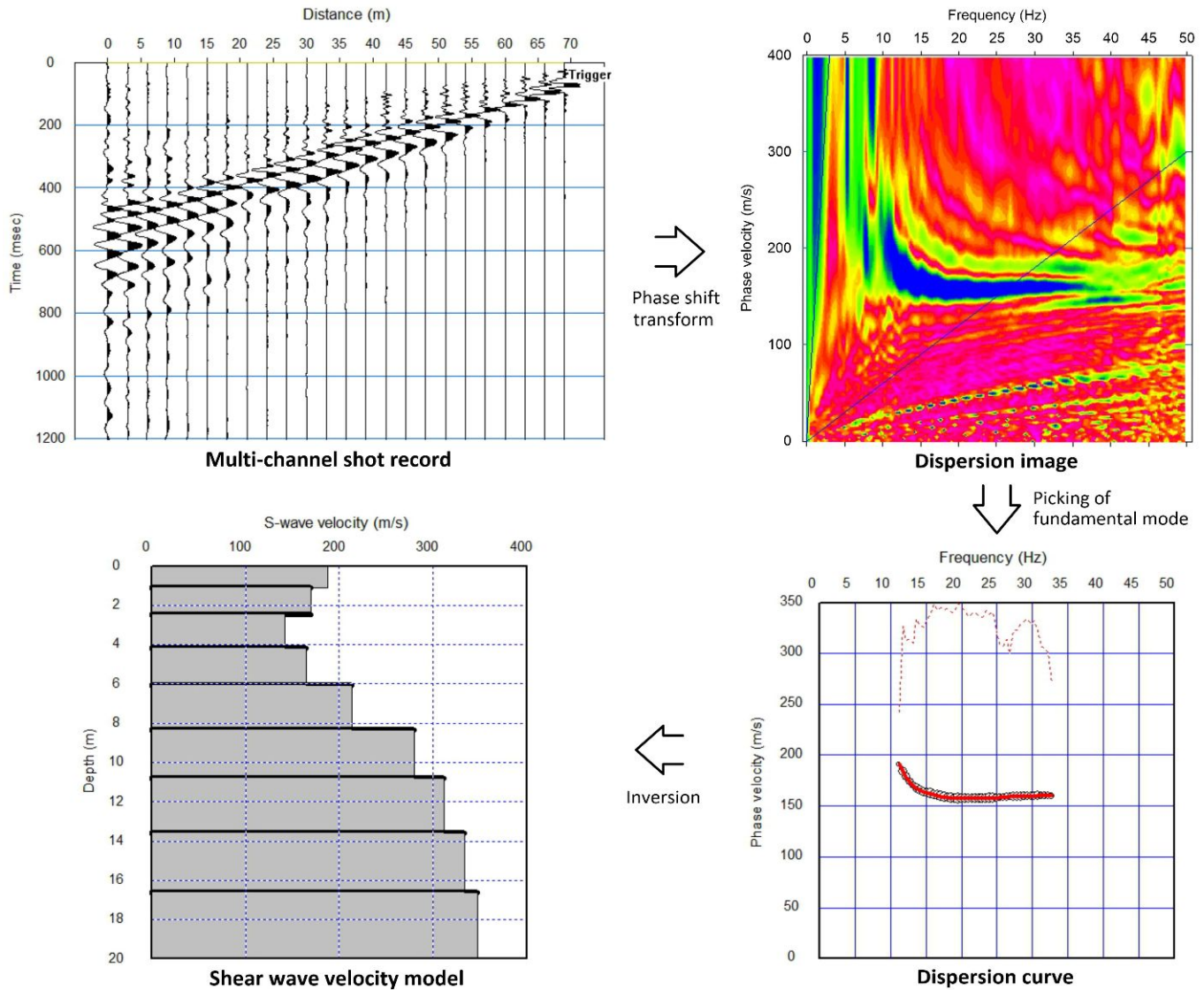


Figure 2 The procedure of MASW data processing using the SeisImager SW software package.

Survey Design

The acquisition layout consisted of 24 receivers in a linear array (spread), connected with a multicore cable to a DAQLink 4 seismograph. 4.5 Hz natural frequency vertical geophones were used for this survey. To optimize sampling of different wavelengths, two sets of measurements were conducted with spread lengths of 23 m and 69 m (1 m and 3 m spacing between geophones, respectively). Data collected with longer spreads provide a greater depth of investigation, whereas data collected with shorter geophone spacings ensure better resolution in the uppermost few meters of the subsurface.

An 8-kg sledgehammer was used as an energy source for active acquisition. Shots were executed at five locations per spread: two shots close to the ends of the spread, one shot in the middle of

the spread, and two shots with an offset of 30 m from the ends of the spread. A total of 10 shot records was collected. The record length was set to 1500 ms with a 0.05 ms sampling interval.

For passive acquisition, a linear 24-channel array with 3 m spacing between geophones was used. Ambient wavefield was recorded for 10 minutes with a sampling interval of 2 ms.

Interpretation

A dispersion curve is obtained from each field record by converting the shot gather into a dispersion image and then identifying and picking the fundamental mode. A shear wave velocity profile is obtained through inversion of the dispersion curve by modelling the subsurface as a horizontally layered medium with the model parameters limited to the number of layers, their thickness and shear-wave velocity.

SeisImager SW software package was used for processing, picking and inversion of the MASW data.

Some variability among the dispersion curves and resulting models obtained from different shot records is always observed due to lateral velocity variations, near and far field effects, different signal-to-noise ratio, etc. Combining independent inversion results from multiple shot records improves the estimation of the actual shear wave velocity and provides an assessment of uncertainty. The results of the interpretation are presented in the form of the average shear wave velocity profile; the observed variability of the MASW data is reported as upper and lower bound velocity profiles.

Accuracy of the results

The accuracy of MASW generally depends on the complexity of the subsurface and specific site conditions (noise levels, topography, etc.). Lateral velocity variations and steeper bedrock topography increase the dispersion uncertainty. The presence of high velocity contrast layers such as bedrock will require the use of a-priori information to optimize model parameters for more accurate results. Hence, if the a-priori information is not available (e.g. when the data are overly noisy to carry out refraction analysis), the accuracy decreases.

The uncertainty of the resulting S-wave velocity depth profile is evaluated using the upper and lower bound velocity profiles. Typically, the error margin of average V_{s30} value determined from MASW is within $\pm 10\%$.

3 RESULTS

The collected surface wave data were of very good quality; the dispersion images showed good resolution and covered a wide frequency range of approximately 10 to 80 Hz. Example shot record and MASW dispersion images obtained at this site are presented in Figure 3.

Seismic refraction analysis indicated that the depth to bedrock at this site could be approximately 16-18 m. Compressional (P) wave velocities in the overburden ranged from 360-500 m/s above the water table to approximately 1750 m/s below the water table.

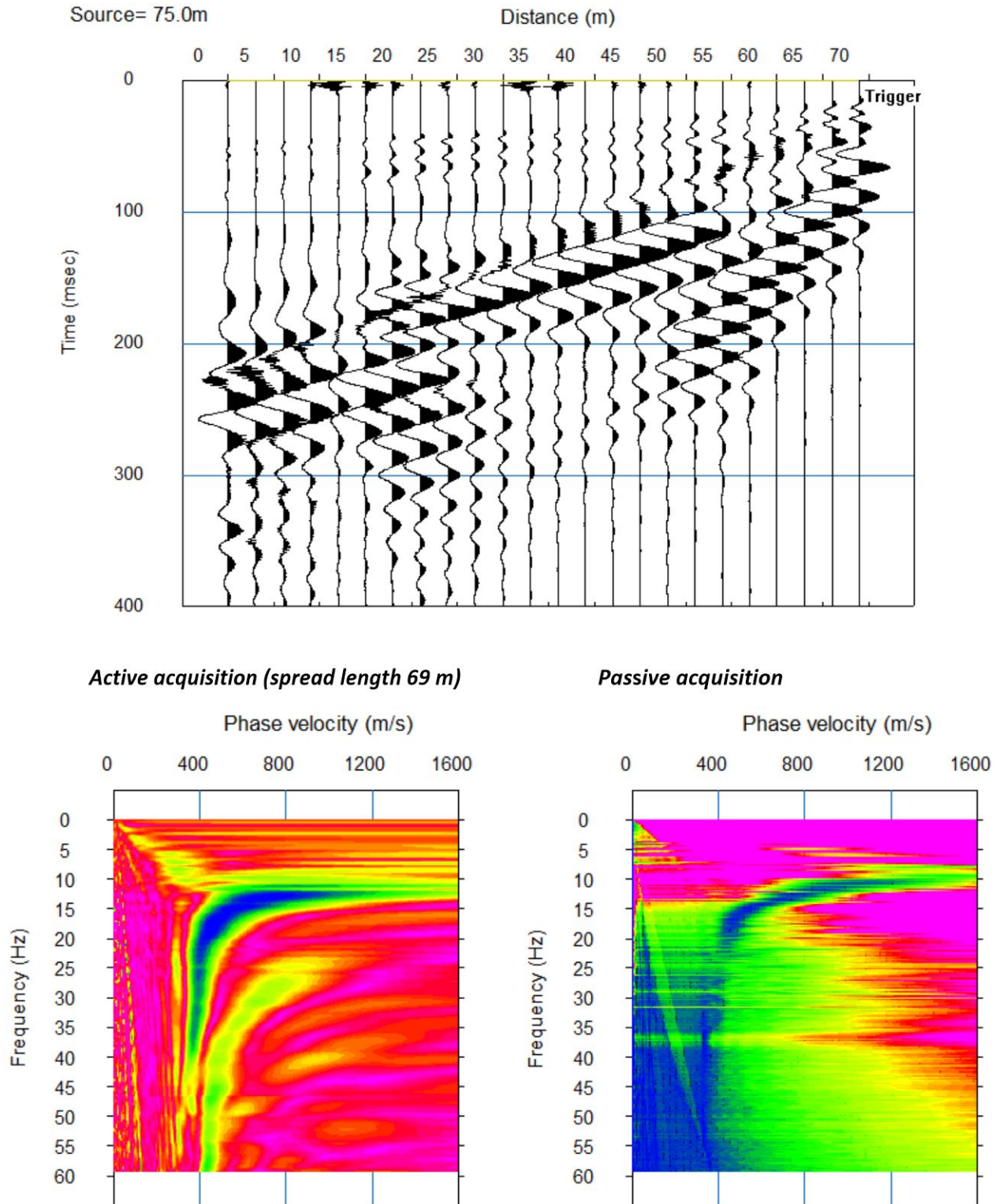


Figure 3 Example shot record (top) and MASW dispersion images (bottom).

The results of the MASW sounding are presented in Figure 4. The average shear wave velocity profile from the active shot records and passive data is plotted in the chart as a solid line. The dashed lines represent the upper and lower bound S-wave velocity profiles.

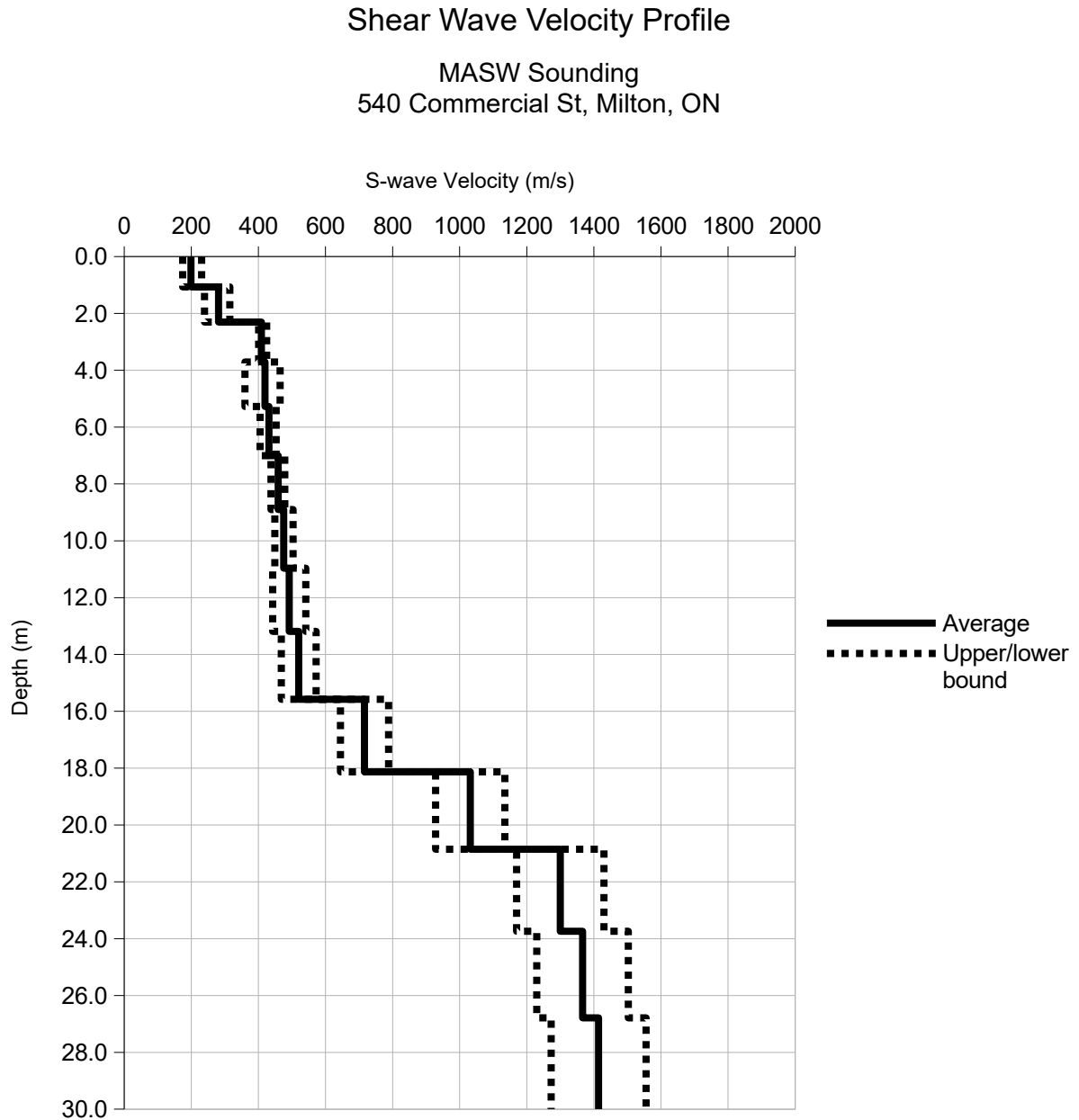


Figure 4 Shear wave velocity profile from MASW sounding.

The tabulated shear wave velocity model is presented in Table 1.

Table 1 *Shear wave velocities from MASW sounding.*

Depth Interval (m)		S-wave Velocity (m/s)
From	To	
0.0	1.1	199
1.1	2.3	281
2.3	3.7	409
3.7	5.3	420
5.3	7.0	431
7.0	8.9	459
8.9	11.0	475
11.0	13.2	492
13.2	15.6	520
15.6	18.1	716
18.1	20.9	1032
20.9	23.7	1300
23.7	26.8	1366
26.8	30.0	1414

The average shear wave velocity within the upper 30 meters (V_{s30}) is defined as the travel-time weighted average velocity from surface to a depth of 30 m and calculated using the following formula:

$$V_{s30} = 30 / \Sigma (d/V_s),$$

where d is the thickness of any layer and V_s is the layer S-wave velocity. In other words, V_{s30} is calculated as 30 m divided by the sum of the S-wave travel times for each layer within the topmost 30 m.

The calculated V_{s30} values are presented in Table 2.

Table 2 *V_{s30} values from MASW sounding.*

Depth Range (m)	Minimum V_{s30} (m/s)	Average V_{s30} (m/s)	Maximum V_{s30} (m/s)	NBC 2020 Site Designation
0 to 30	528	583	636	X₅₈₃

The V_{s30} values obtained from the MASW sounding varied from 528 m/s to 636 m/s with an average of 583 m/s.

Based on Sentence 4.1.8.4.(2b) of the National Building Code of Canada 2020 (NBC 2020), the **Site Designation** is **X₅₈₃**.

4 CLOSURE

Shear wave velocity testing involving the multi-channel analysis of surface waves (MASW) method was carried out for the proposed additions to Our Lady of Victory Catholic Elementary School located at 540 Commercial Street in Milton, Ontario.

The average shear wave velocity (V_{s30}) value calculated from in situ shear wave velocity measurements was **583 m/s**. Based on Sentence 4.1.8.4.(2b) of the National Building Code of Canada 2020 (NBC 2020), the applicable **Site Designation** is **X₅₈₃**.

We hope you find this report satisfactory. Should you have any questions or require additional information, please do not hesitate to contact the undersigned.

Frontwave Geophysics Inc.



Ilia Gusakov, P.Geo.
Geophysicist
(647) 514-4724
ilia.gusakov@frontwave.ca





7613

December 22, 2025

Hossack Architecture
105-1939 Ironoak Way
Oakville, Ontario
L6H 3V8

Attention: Mr. Jonathan Knight
B. Arch. Sci., M. Arch., OAA, MRAIC

Dear Sir:

Re: Soil Chemical Testing Report
Our Lady of Victory Catholic Elementary School
540 Commercial Street
Milton, Ontario

1.0 INTRODUCTION

As requested, Forward Engineering & Associates Inc. (**Forward**) conducted a chemical testing program for the above project site.

The report of the chemical testing program is to be used for Characterization of the materials for disposal purposes only.

2.0 BACKGROUND

The purpose of this program is to test the materials to be excavated during the construction of the addition to the building.

3.0 FIELD WORKS

3.1 Sampling

The field sampling was carried out from the boreholes drilled on November 27 and 28, 2025.

Examination of the soil samples did not indicate visual and/or olfactory evidence of contamination.

Six [6] representative samples, obtained from the boreholes, were prepared for laboratory chemical testing.



4.0 ANALYTICAL TESTING PROGRAM

4.1 Soil Testing

The samples were prepared, and chemically tested, as presented at the following table:

Laboratory Sample ID	Field Sample ID	Tested Parameters
2551030-01	BH1/SS2	Metals and Inorganics
2551030-02	BH4/SS2	Metals and Inorganics
2551030-03	BH5/SS2	Metals and Inorganics
2551030-04	BH6/SS2	Metals and Inorganics
2551030-05	BH8/SS2	Metals and Inorganics
2551030-.06	BH10/SS-1B+SS-2	Metals and Inorganics

* BH1/SS2 stands for sample No. 2 obtained from Borehole No. 1, Split Spoon No. (2).

The soil samples were submitted to PARACEL Laboratories, Mississauga, Ontario, which are independent laboratories and are certified by the Canadian Association of Environmental Analytical Laboratories (CAEAL).

5.0 FINDINGS AND DISCUSSIONS

5.1 Soils Type and Condition

The tested materials consisted of fine texture materials (Clayey Silt).

5.2 Analytical Testing Results

5.2.1 Results Compared to Table 1 Residential/Parkland/ Industrial/Commercial Criteria

The results, enclosed in Appendix A, were compared to *Reg 406/19-Table1 Residential/Parkland/Industrial/Commercial/Community Criteria*.

The results met the above Table 1 Criteria except the following:

- "SAR" parameter for samples BH4/SS2, BH5/SS2, BH6/SS2, BH8/SS2 and BH10/SS-1B+SS-2.
- "Conductivity" parameter for samples BH4/SS2, BH5/SS2, Bh6/SS2 and BH8/SS2



5.2.2 Results Compared to Tables 2.1 and 3.1 Residential/Parkland/Institutional Criteria

The results, enclosed in Appendix B, were compared to *Reg 406/19-Table 2.1 Residential/Parkland/Institutional Criteria*.

The results met the above Tables 2.1 and 3.1 Criteria except the following:

- "SAR" parameter for samples BH4/SS2, BH5/SS2 and BH6/SS2.
- "Conductivity" parameter for samples BH5/SS2, Bh6/SS2 and BH8/SS2

5.2.3 Results Compared to Table 2.1 Industrial/Commercial Criteria

The results, enclosed in Appendix C, were compared to *Reg 406/19-Table 2.1 Industrial Commercial Criteria*.

The results met the above Table 2.1 Criteria except the following:

- "SAR" parameter for sample BH5/SS2.
- "Conductivity" parameter for sample BH5/SS2

For disposal purposes, it should be noted that the acceptance of fill materials depends on the discretion of the receiving site.

We trust this report meets our terms of reference. However, if any clarification is required, or if we can be of further assistance, please contact this office.

Sincerely yours,
FORWARD ENGINEERING & ASSOCIATES INC.

Juan Chahine, P. Eng.
Senior Project Manager



APPENDIX A

Laboratory Chemical Testing Results Compared to Table 1 Residential Criteria

TABLE 1		CLIENT: Forward Engineering & Associates Inc.							
PARACEL LABORATORIES LTD.		ATTENTION: George Semaan							
WORKORDER: 2551030		PROJECT: 7613							
REPORT DATE: 12/19/2025		REFERENCE: SO Forward Engineering & Associates Inc. - ENV							
Parameter	Units	MDL	Regulation	Sample					
				BH1/SS2 2551030-01	BH4/SS2 2551030-02	BH5/SS2 2551030-03	BH6/SS2 2551030-04	BH8/SS2 2551030-05	BH10/SS-1B + SS-2 2551030-06
Sample Date (m/d/y)			Reg 406/19 -T1 Res/Park/Ind/Com	12/12/2025	12/12/2025	12/12/2025	12/12/2025	12/12/2025	12/12/2025
Physical Characteristics									
% Solids	% by Wt.	0.1		86.8	87.7	86.0	86.7	87.5	95.5
General Inorganics									
SAR	N/A	0.01	2.4	0.19	5.12	36.8	7.40	3.67	2.80
Conductivity	mS/cm	0.005	0.57	0.164	0.661	2.95	1.33	0.880	0.462
Cyanide, free	ug/g dry	0.03	0.051	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
pH	pH Units	0.05		6.82	6.77	7.09	7.28	7.42	7.92
Metals									
Antimony	ug/g dry	1.0	1.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	ug/g dry	1.0	18	6.2	6.4	6.2	6.0	5.3	3.6
Barium	ug/g dry	1.0	220	96.3	102	115	89.6	75.3	43.4
Beryllium	ug/g dry	0.5	2.5	1.1	0.9	0.9	0.8	0.9	<0.5
Boron, available	ug/g dry	0.5		<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Boron	ug/g dry	5.0	36	9.4	12.2	14.0	13.1	11.8	8.1
Cadmium	ug/g dry	0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (VI)	ug/g dry	0.2	0.66	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	ug/g dry	5.0	70	27.8	23.9	26.5	25.3	22.7	8.4
Cobalt	ug/g dry	1.0	21	16.7	15.6	15.6	14.8	13.8	3.6
Copper	ug/g dry	5.0	92	31.7	34.4	31.0	27.5	26.5	24.2
Lead	ug/g dry	1.0	120	13.1	11.6	11.6	10.4	10.1	103
Mercury	ug/g dry	0.1	0.27	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	ug/g dry	1.0	2	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	ug/g dry	5.0	82	27.2	27.6	27.3	24.8	23.5	6.6
Selenium	ug/g dry	1.0	1.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	ug/g dry	0.3	0.5	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Thallium	ug/g dry	1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Uranium	ug/g dry	1.0	2.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	ug/g dry	10.0	86	36.7	32.0	35.1	34.7	30.6	13.1
Zinc	ug/g dry	20.0	290	65.5	63.1	71.2	55.0	52.9	222



APPENDIX B

Laboratory Chemical Testing Results Compared to Tables 2.1 and 3.1 Residential/Parkland/Institutional Criteria

TABLE 1		CLIENT: Forward Engineering & Associates Inc.							
PARACEL LABORATORIES LTD.		ATTENTION: George Semaan							
WORKORDER: 2551030		PROJECT: 7613							
REPORT DATE: 12/19/2025		REFERENCE: SO Forward Engineering & Associates Inc. - ENV							
Parameter	Units	MDL	Regulation	Sample					
				BH1/SS2 2551030-01	BH4/SS2 2551030-02	BH5/SS2 2551030-03	BH6/SS2 2551030-04	BH8/SS2 2551030-05	BH10/SS-1B + SS-2 2551030-06
Sample Date (m/d/y)			Reg 406/19 - T2.1 Res/Park/Inst	12/12/2025	12/12/2025	12/12/2025	12/12/2025	12/12/2025	12/12/2025
Physical Characteristics									
% Solids	% by Wt.	0.1		86.8	87.7	86.0	86.7	87.5	95.5
General Inorganics									
SAR	N/A	0.01	5	0.19	5.12	36.8	7.40	3.67	2.80
Conductivity	mS/cm	0.005	0.7	0.164	0.661	2.95	1.33	0.880	0.462
Cyanide, free	ug/g dry	0.03	0.051	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
pH	pH Units	0.05	5	6.82	6.77	7.09	7.28	7.42	7.92
Metals									
Antimony	ug/g dry	1.0	7.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	ug/g dry	1.0	18	6.2	6.4	6.2	6.0	5.3	3.6
Barium	ug/g dry	1.0	390	96.3	102	115	89.6	75.3	43.4
Beryllium	ug/g dry	0.5	4	1.1	0.9	0.9	0.8	0.9	<0.5
Boron, available	ug/g dry	0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Boron	ug/g dry	5.0	120	9.4	12.2	14.0	13.1	11.8	8.1
Cadmium	ug/g dry	0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (VI)	ug/g dry	0.2	8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	ug/g dry	5.0	160	27.8	23.9	26.5	25.3	22.7	8.4
Cobalt	ug/g dry	1.0	22	16.7	15.6	15.6	14.8	13.8	3.6
Copper	ug/g dry	5.0	140	31.7	34.4	31.0	27.5	26.5	24.2
Lead	ug/g dry	1.0	120	13.1	11.6	11.6	10.4	10.1	103
Mercury	ug/g dry	0.1	0.27	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	ug/g dry	1.0	6.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	ug/g dry	5.0	100	27.2	27.6	27.3	24.8	23.5	6.6
Selenium	ug/g dry	1.0	2.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	ug/g dry	0.3	20	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Thallium	ug/g dry	1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Uranium	ug/g dry	1.0	23	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	ug/g dry	10.0	86	36.7	32.0	35.1	34.7	30.6	13.1
Zinc	ug/g dry	20.0	340	65.5	63.1	71.2	55.0	52.9	222

TABLE 1		CLIENT: Forward Engineering & Associates Inc.							
PARACEL LABORATORIES LTD.		ATTENTION: George Semaan							
WORKORDER: 2551030		PROJECT: 7613							
REPORT DATE: 12/19/2025		REFERENCE: SO Forward Engineering & Associates Inc. - ENV							
Parameter	Units	MDL	Regulation	Sample					
				BH1/SS2 2551030-01	BH4/SS2 2551030-02	BH5/SS2 2551030-03	BH6/SS2 2551030-04	BH8/SS2 2551030-05	BH10/SS-1B + SS-2 2551030-06
Sample Date (m/d/y)			Reg 406/19 -T3.1 Res/Park	12/12/2025	12/12/2025	12/12/2025	12/12/2025	12/12/2025	12/12/2025
Physical Characteristics									
% Solids	% by Wt.	0.1		86.8	87.7	86.0	86.7	87.5	95.5
General Inorganics									
SAR	N/A	0.01	5	0.19	5.12	36.8	7.40	3.67	2.80
Conductivity	mS/cm	0.005	0.7	0.164	0.661	2.95	1.33	0.880	0.462
Cyanide, free	ug/g dry	0.03	0.051	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
pH	pH Units	0.05	5	6.82	6.77	7.09	7.28	7.42	7.92
Metals									
Antimony	ug/g dry	1.0	7.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	ug/g dry	1.0	18	6.2	6.4	6.2	6.0	5.3	3.6
Barium	ug/g dry	1.0	390	96.3	102	115	89.6	75.3	43.4
Beryllium	ug/g dry	0.5	4	1.1	0.9	0.9	0.8	0.9	<0.5
Boron, available	ug/g dry	0.5	1.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Boron	ug/g dry	5.0	120	9.4	12.2	14.0	13.1	11.8	8.1
Cadmium	ug/g dry	0.5	1.2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (VI)	ug/g dry	0.2	8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	ug/g dry	5.0	160	27.8	23.9	26.5	25.3	22.7	8.4
Cobalt	ug/g dry	1.0	22	16.7	15.6	15.6	14.8	13.8	3.6
Copper	ug/g dry	5.0	140	31.7	34.4	31.0	27.5	26.5	24.2
Lead	ug/g dry	1.0	120	13.1	11.6	11.6	10.4	10.1	103
Mercury	ug/g dry	0.1	0.27	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	ug/g dry	1.0	6.9	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	ug/g dry	5.0	100	27.2	27.6	27.3	24.8	23.5	6.6
Selenium	ug/g dry	1.0	2.4	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	ug/g dry	0.3	20	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Thallium	ug/g dry	1.0	1	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Uranium	ug/g dry	1.0	23	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	ug/g dry	10.0	86	36.7	32.0	35.1	34.7	30.6	13.1
Zinc	ug/g dry	20.0	340	65.5	63.1	71.2	55.0	52.9	222



APPENDIX C

Laboratory Chemical Testing Results Compared to Table 2.1 Industrial/Commercial Criteria

TABLE 1		CLIENT: Forward Engineering & Associates Inc.							
PARACEL LABORATORIES LTD.		ATTENTION: George Semaan							
WORKORDER: 2551030		PROJECT: 7613							
REPORT DATE: 12/19/2025		REFERENCE: SO Forward Engineering & Associates Inc. - ENV							
Parameter	Units	MDL	Regulation	Sample					
				BH1/SS2 2551030-01	BH4/SS2 2551030-02	BH5/SS2 2551030-03	BH6/SS2 2551030-04	BH8/SS2 2551030-05	BH10/SS-1B + SS-2 2551030-06
Sample Date (m/d/y)			Reg 406/19 -T2.1 Ind/Com	12/12/2025	12/12/2025	12/12/2025	12/12/2025	12/12/2025	12/12/2025
Physical Characteristics									
% Solids	% by Wt.	0.1		86.8	87.7	86.0	86.7	87.5	95.5
General Inorganics									
SAR	N/A	0.01	12	0.19	5.12	36.8	7.40	3.67	2.80
Conductivity	mS/cm	0.005	1.4	0.164	0.661	2.95	1.33	0.880	0.462
Cyanide, free	ug/g dry	0.03	0.051	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
pH	pH Units	0.05	5	6.82	6.77	7.09	7.28	7.42	7.92
Metals									
Antimony	ug/g dry	1.0	40	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Arsenic	ug/g dry	1.0	18	6.2	6.4	6.2	6.0	5.3	3.6
Barium	ug/g dry	1.0	670	96.3	102	115	89.6	75.3	43.4
Beryllium	ug/g dry	0.5	8	1.1	0.9	0.9	0.8	0.9	<0.5
Boron, available	ug/g dry	0.5	2	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Boron	ug/g dry	5.0	120	9.4	12.2	14.0	13.1	11.8	8.1
Cadmium	ug/g dry	0.5	1.9	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Chromium (VI)	ug/g dry	0.2	8	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Chromium	ug/g dry	5.0	160	27.8	23.9	26.5	25.3	22.7	8.4
Cobalt	ug/g dry	1.0	80	16.7	15.6	15.6	14.8	13.8	3.6
Copper	ug/g dry	5.0	230	31.7	34.4	31.0	27.5	26.5	24.2
Lead	ug/g dry	1.0	120	13.1	11.6	11.6	10.4	10.1	103
Mercury	ug/g dry	0.1	0.27	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Molybdenum	ug/g dry	1.0	40	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Nickel	ug/g dry	5.0	270	27.2	27.6	27.3	24.8	23.5	6.6
Selenium	ug/g dry	1.0	5.5	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Silver	ug/g dry	0.3	40	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
Thallium	ug/g dry	1.0	3.3	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Uranium	ug/g dry	1.0	33	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Vanadium	ug/g dry	10.0	86	36.7	32.0	35.1	34.7	30.6	13.1
Zinc	ug/g dry	20.0	340	65.5	63.1	71.2	55.0	52.9	222

Certificate of Analysis

Forward Engineering & Associates Inc.

244 Brockport Dr., Unit 15

Toronto, ON M9W 6X9

Attn: George Semaan

Client PO:

Project: 7613

Custody:

Report Date: 19-Dec-2025

Order Date: 15-Dec-2025

Order #: 2551030

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2551030-01	BH1/SS2
2551030-02	BH4/SS2
2551030-03	BH5/SS2
2551030-04	BH6/SS2
2551030-05	BH8/SS2
2551030-06	BH10/SS-1B + SS-2

Approved By:



Alex Enfield, MSc

Lab Manager

Certificate of Analysis

Report Date: 19-Dec-2025

Client: Forward Engineering & Associates Inc.

Order Date: 15-Dec-2025

Client PO:

Project Description: 7613

Analysis Summary Table

Analysis	Method Reference/Description	Lab Location	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.8 - ICP-MS	Hamilton	18-Dec-25	18-Dec-25
Chromium, hexavalent - soil	MOE E3056 - Extraction, colourimetric	Hamilton	18-Dec-25	19-Dec-25
Conductivity	MOE E3138 - probe @25 °C, water ext	Hamilton	18-Dec-25	18-Dec-25
Cyanide, free	MOE E3015 - Auto Colour, water extraction	Hamilton	17-Dec-25	17-Dec-25
Mercury by CVAA	EPA 7471B - CVAA, digestion	Hamilton	18-Dec-25	18-Dec-25
pH, soil	EPA 150.1 - pH probe @ 25 °C, CaCl buffered ext.	Hamilton	19-Dec-25	19-Dec-25
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	Hamilton	18-Dec-25	18-Dec-25
SAR	Calculated	Hamilton	18-Dec-25	18-Dec-25
Solids, %	CWS Tier 1 - Gravimetric	Ottawa	17-Dec-25	18-Dec-25

Certificate of Analysis

Report Date: 19-Dec-2025

Client: Forward Engineering & Associates Inc.

Order Date: 15-Dec-2025

Client PO:

Project Description: 7613

Client ID:	BH1/SS2	BH4/SS2	BH5/SS2	BH6/SS2	-	-
Sample Date:	12-Dec-25 00:00	12-Dec-25 00:00	12-Dec-25 00:00	12-Dec-25 00:00	-	-
Sample ID:	2551030-01	2551030-02	2551030-03	2551030-04	-	-
Matrix:	Soil	Soil	Soil	Soil	-	-
MDL/Units						

Physical Characteristics

% Solids	0.1 % by Wt.	86.8	87.7	86.0	86.7	-	-
----------	--------------	------	------	------	------	---	---

General Inorganics

SAR	0.01 N/A	0.19	5.12	36.8	7.40	-	-
Conductivity	0.005 mS/cm	0.164	0.661	2.95	1.33	-	-
Cyanide, free	0.03 ug/g	<0.03	<0.03	<0.03	<0.03	-	-
pH	0.05 pH Units	6.82	6.77	7.09	7.28	-	-

Metals

Antimony	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-
Arsenic	1.0 ug/g	6.2	6.4	6.2	6.0	-	-
Barium	1.0 ug/g	96.3	102	115	89.6	-	-
Beryllium	0.5 ug/g	1.1	0.9	0.9	0.8	-	-
Boron	5.0 ug/g	9.4	12.2	14.0	13.1	-	-
Boron, available	0.5 ug/g	<0.5	<0.5	<0.5	<0.5	-	-
Cadmium	0.5 ug/g	<0.5	<0.5	<0.5	<0.5	-	-
Chromium	5.0 ug/g	27.8	23.9	26.5	25.3	-	-
Chromium (VI)	0.2 ug/g	<0.2	<0.2	<0.2	<0.2	-	-
Cobalt	1.0 ug/g	16.7	15.6	15.6	14.8	-	-
Copper	5.0 ug/g	31.7	34.4	31.0	27.5	-	-
Lead	1.0 ug/g	13.1	11.6	11.6	10.4	-	-
Mercury	0.1 ug/g	<0.1	<0.1	<0.1	<0.1	-	-
Molybdenum	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-
Nickel	5.0 ug/g	27.2	27.6	27.3	24.8	-	-
Selenium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-
Silver	0.3 ug/g	<0.3	<0.3	<0.3	<0.3	-	-
Thallium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-

Certificate of Analysis

Report Date: 19-Dec-2025

Client: Forward Engineering & Associates Inc.

Order Date: 15-Dec-2025

Client PO:

Project Description: 7613

Client ID:	BH1/SS2	BH4/SS2	BH5/SS2	BH6/SS2		
Sample Date:	12-Dec-25 00:00	12-Dec-25 00:00	12-Dec-25 00:00	12-Dec-25 00:00	-	-
Sample ID:	2551030-01	2551030-02	2551030-03	2551030-04		
Matrix:	Soil	Soil	Soil	Soil		
MDL/Units						

Metals

Uranium	1.0 ug/g	<1.0	<1.0	<1.0	<1.0	-	-
Vanadium	10.0 ug/g	36.7	32.0	35.1	34.7	-	-
Zinc	20.0 ug/g	65.5	63.1	71.2	55.0	-	-

Certificate of Analysis

Report Date: 19-Dec-2025

Client: Forward Engineering & Associates Inc.

Order Date: 15-Dec-2025

Client PO:

Project Description: 7613

Client ID:	BH8/SS2	BH10/SS-1B + SS-2			
Sample Date:	12-Dec-25 00:00	12-Dec-25 00:00			-
Sample ID:	2551030-05	2551030-06			-
Matrix:	Soil	Soil			
MDL/Units					

Physical Characteristics

% Solids	0.1 % by Wt.	87.5	95.5	-	-	-	-
----------	--------------	------	------	---	---	---	---

General Inorganics

SAR	0.01 N/A	3.67	2.80	-	-	-	-
Conductivity	0.005 mS/cm	0.880	0.462	-	-	-	-
Cyanide, free	0.03 ug/g	<0.03	<0.03	-	-	-	-
pH	0.05 pH Units	7.42	7.92	-	-	-	-

Metals

Antimony	1.0 ug/g	<1.0	<1.0	-	-	-	-
Arsenic	1.0 ug/g	5.3	3.6	-	-	-	-
Barium	1.0 ug/g	75.3	43.4	-	-	-	-
Beryllium	0.5 ug/g	0.9	<0.5	-	-	-	-
Boron, available	0.5 ug/g	<0.5	<0.5	-	-	-	-
Boron	5.0 ug/g	11.8	8.1	-	-	-	-
Cadmium	0.5 ug/g	<0.5	<0.5	-	-	-	-
Chromium	5.0 ug/g	22.7	8.4	-	-	-	-
Chromium (VI)	0.2 ug/g	<0.2	<0.2	-	-	-	-
Cobalt	1.0 ug/g	13.8	3.6	-	-	-	-
Copper	5.0 ug/g	26.5	24.2	-	-	-	-
Lead	1.0 ug/g	10.1	103	-	-	-	-
Mercury	0.1 ug/g	<0.1	<0.1	-	-	-	-
Molybdenum	1.0 ug/g	<1.0	<1.0	-	-	-	-
Nickel	5.0 ug/g	23.5	6.6	-	-	-	-
Selenium	1.0 ug/g	<1.0	<1.0	-	-	-	-
Silver	0.3 ug/g	<0.3	<0.3	-	-	-	-
Thallium	1.0 ug/g	<1.0	<1.0	-	-	-	-

Certificate of Analysis

Report Date: 19-Dec-2025

Client: Forward Engineering & Associates Inc.

Order Date: 15-Dec-2025

Client PO:

Project Description: 7613

Client ID:	BH8/SS2	BH10/SS-1B + SS-2			
Sample Date:	12-Dec-25 00:00	12-Dec-25 00:00			- -
Sample ID:	2551030-05	2551030-06			
Matrix:	Soil	Soil			
MDL/Units					

Metals

Uranium	1.0 ug/g	<1.0	<1.0	-	-	- -
Vanadium	10.0 ug/g	30.6	13.1	-	-	- -
Zinc	20.0 ug/g	52.9	222	-	-	- -

Certificate of Analysis

Report Date: 19-Dec-2025

Client: Forward Engineering & Associates Inc.

Order Date: 15-Dec-2025

Client PO:

Project Description: 7613

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics								
Conductivity	ND	0.005	mS/cm					
Cyanide, free	ND	0.03	ug/g					
SAR	ND	0.01	N/A					
Metals								
Boron, available	ND	0.5	ug/g					
Chromium (VI)	ND	0.2	ug/g					
Mercury	ND	0.1	ug/g					
Antimony	ND	1.0	ug/g					
Arsenic	ND	1.0	ug/g					
Barium	ND	1.0	ug/g					
Beryllium	ND	0.5	ug/g					
Boron	ND	5.0	ug/g					
Cadmium	ND	0.5	ug/g					
Chromium	ND	5.0	ug/g					
Cobalt	ND	1.0	ug/g					
Copper	ND	5.0	ug/g					
Lead	ND	1.0	ug/g					
Molybdenum	ND	1.0	ug/g					
Nickel	ND	5.0	ug/g					
Selenium	ND	1.0	ug/g					
Silver	ND	0.3	ug/g					
Thallium	ND	1.0	ug/g					
Uranium	ND	1.0	ug/g					
Vanadium	ND	10.0	ug/g					
Zinc	ND	20.0	ug/g					

Certificate of Analysis

Report Date: 19-Dec-2025

Client: Forward Engineering & Associates Inc.

Order Date: 15-Dec-2025

Client PO:

Project Description: 7613

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
SAR	0.27	0.01	N/A	0.26			3.8	30	
Conductivity	0.283	0.005	mS/cm	0.283			0.0	5	
Cyanide, free	ND	0.03	ug/g	ND			NC	35	
pH	6.70	0.05	pH Units	6.77			1.0	10	
Metals									
Antimony	ND	1.0	ug/g	ND			NC	30	
Arsenic	1.6	1.0	ug/g	1.6			0.8	30	
Barium	11.9	1.0	ug/g	8.9			28.5	30	
Beryllium	ND	0.5	ug/g	ND			NC	30	
Boron, available	ND	0.5	ug/g	ND			NC	35	
Boron	ND	5.0	ug/g	ND			NC	30	
Cadmium	ND	0.5	ug/g	ND			NC	30	
Chromium (VI)	ND	0.2	ug/g	ND			NC	35	
Chromium	5.6	5.0	ug/g	5.4			2.6	30	
Cobalt	1.8	1.0	ug/g	1.6			11.7	30	
Copper	ND	5.0	ug/g	ND			NC	30	
Lead	5.2	1.0	ug/g	4.4			16.2	30	
Mercury	ND	0.1	ug/g	ND			NC	30	
Molybdenum	ND	1.0	ug/g	ND			NC	30	
Nickel	ND	5.0	ug/g	ND			NC	30	
Selenium	ND	1.0	ug/g	ND			NC	30	
Silver	ND	0.3	ug/g	ND			NC	30	
Thallium	ND	1.0	ug/g	ND			NC	30	
Uranium	ND	1.0	ug/g	ND			NC	30	
Vanadium	13.3	10.0	ug/g	12.2			8.1	30	
Zinc	ND	20.0	ug/g	ND			NC	30	
Physical Characteristics									
% Solids	94.3	0.1	% by Wt.	94.4			0.1	25	

Certificate of Analysis

Report Date: 19-Dec-2025

Client: Forward Engineering & Associates Inc.

Order Date: 15-Dec-2025

Client PO:

Project Description: 7613

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
General Inorganics									
Cyanide, free	0.266	0.03	ug/g	ND	85.8	70-130			
Metals									
Antimony	41.7	1.0	ug/g	ND	83.5	70-130			
Arsenic	46.2	1.0	ug/g	ND	91.1	70-130			
Barium	43.0	1.0	ug/g	3.6	78.9	70-130			
Beryllium	50.0	0.5	ug/g	ND	99.9	70-130			
Boron, available	4.03	0.5	ug/g	ND	80.6	70-122			
Boron	51.2	5.0	ug/g	ND	101	70-130			
Cadmium	37.4	0.5	ug/g	ND	74.6	70-130			
Chromium (VI)	5.2	0.2	ug/g	ND	92.0	70-130			
Chromium	50.1	5.0	ug/g	ND	95.8	70-130			
Cobalt	47.4	1.0	ug/g	ND	93.4	70-130			
Copper	47.7	5.0	ug/g	ND	92.8	70-130			
Lead	48.2	1.0	ug/g	1.8	92.8	70-130			
Mercury	1.56	0.1	ug/g	ND	104	70-130			
Molybdenum	45.0	1.0	ug/g	ND	89.2	70-130			
Nickel	41.3	5.0	ug/g	ND	80.4	70-130			
Selenium	45.5	1.0	ug/g	ND	90.2	70-130			
Silver	44.6	0.3	ug/g	ND	89.3	70-130			
Thallium	43.5	1.0	ug/g	ND	86.6	70-130			
Uranium	43.8	1.0	ug/g	ND	87.2	70-130			
Vanadium	52.4	10.0	ug/g	ND	95.1	70-130			
Zinc	51.0	20.0	ug/g	ND	92.6	70-130			

Certificate of Analysis

Client: Forward Engineering & Associates Inc.

Client PO:

Report Date: 19-Dec-2025

Order Date: 15-Dec-2025

Project Description: 7613

Qualifier Notes:**Sample Data Revisions:**

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable

ND: Not Detected

MDL: Method Detection Limit

Source Result: Data used as source for matrix and duplicate samples

%REC: Percent recovery.

RPD: Relative percent difference.

NC: Not Calculated

Soil results are reported on a dry weight basis unless otherwise noted.

Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Any use of these results implies your agreement that our total liability in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.



Paracel Order Number
(Lab Use Only)

Chain Of Custody
(Lab Use Only)

Client Name: Forward Engineering & Associates Inc.	Project Ref: 7613	Page 1 of 1
Contact Name: George Semaan	Quote #:	Turnaround Time <input type="checkbox"/> 1 day <input type="checkbox"/> 3 day <input type="checkbox"/> 2 day <input checked="" type="checkbox"/> Regular Date Required:
Address: 244 Brockport Dr., Unit 15 Toronto ON M9W 6X9	PO #:	
Telephone: (416) 798-3500	E-mail: george@forwardengineering.ca	

<input type="checkbox"/> REG 153/04 <input checked="" type="checkbox"/> REG 406/19 <input type="checkbox"/> Table 1 <input type="checkbox"/> Res/Park <input type="checkbox"/> Med/Fine <input type="checkbox"/> Table 2 <input type="checkbox"/> Ind/Comm <input type="checkbox"/> Coarse <input type="checkbox"/> Table 3 <input type="checkbox"/> Agri/Other <input type="checkbox"/> Table _____ For RSC: <input type="checkbox"/> Yes <input type="checkbox"/> No	Other Regulation <input type="checkbox"/> REG 558 <input type="checkbox"/> PWQO <input type="checkbox"/> CCME <input type="checkbox"/> MISA <input type="checkbox"/> SU - Sani <input type="checkbox"/> SU - Storm Mun: _____ <input type="checkbox"/> Other: _____	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)	Required Analysis																
Sample ID/Location Name			Matrix Air Volume # of Containers	Sample Taken Date Time		PHCs F1-F4+BTEX	VOCs	PAHs	Metals by ICP	Hg	CrVI	B (HWS)	Metals&Inorganics						
1 BH1/SS2			S		1	DEC.12/2025	PM												
2 BH4/SS2			S		1	"	"												
3 BH5/SS2			S		1	"	"												
4 BH6/SS2			S		1	"	"												
5 BH8/SS2			S		1	"	"												
6 BH10/SS-1B+SS-2			S		1	"	"												
7																			
8																			
9																			
10																			

Comments:

Method of Delivery:

Relinquished By (Sign): <i>J. Chahine</i>	Received By Driver/Depot: <i>JW</i>	Received at Lab: <i>RB</i>	Verified By: <i>JW</i>
Relinquished By (Print): <i>JUAN CHAHINE</i>	Date/Time: <i>12/15/2025 11:20</i>	Date/Time: <i>12/16/2025 11:27</i>	Date/Time: <i>12/15/2025 11:26</i>
Date/Time: <i>DEC.15/2025 8:45 AM</i>	Temperature: <i>9.4</i> °C	Temperature: <i>10.6</i> °C	pH Verified: <input type="checkbox"/> By: