

DEVAN StormVAULT INSTALLATION UNDER COMMERCIAL DRIVEWAY
SIDE BY SIDE 120kN AXLE LOAD OR LESS

JOB NO.	DWG. NO.	TITLE	REV	DATE	DESCRIPTION

no	date	issue/revision detail	by	chk
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client
DEVAN TANKS LIMITED

project
**UNDERGROUND TANK INSTALLATION
 UNDER COMMERCIAL DRIVEWAY
 120kN AXLE LOAD OR LESS**

drawing title
**StormVAULT INSTALLATION
 SIDE BY SIDE
 INSTRUCTIONS**

Scale
 AS SHOWN
 File Number
 TU?
 drawing number
2076-C9000-410
 rev.
A



NOTES:

ALL DIMENSIONS IN MILLIMETRES UNLESS OTHERWISE SHOWN
 REFER TO STRUCTURAL SPECIFICATIONS SHEET FOR CONCRETE REINFORCING & OTHER NOTES
 CONTRACTOR TO CONFIRM ALL LEVELS AND DIMENSIONS AND LOCATE AND MARK ALL SERVICES & DRAINS ON SITE BEFORE COMMENCING WORK.
 CONTRACTOR TO FOLLOW MATERIALS SPECIFICATION AND LIMITS OF LOCATION WITH RELATION TO STRUCTURES AND RETAINING WALLS

CONTRACTOR TO NOTIFY A CHARTERED PROFESSIONAL ENGINEER IF ANY OF THE DESIGN REQUIREMENTS OUTLINED IN THIS DRAWING PACKAGE ARE NOT ACHIEVEABLE
 REFER TO DEVAN TANKS LTD FOR MAXIMUM BURIAL DEPTH ALLOWANCES FOR DIFFERENT TANK DIAMETERS
 TEMPORARY SUPPORT AND SHORING TO BE CARRIED OUT IN ACCORDANCE WITH WORKSAFE EXCAVATION SAFETY GUIDELINES
 SLAB DESIGNED FOR HN LOADS AS PER THE NZTA BRIDGE MANUAL SP/M/022 2014 SECTION 3.2 AND D1: PAIR OF AXLE LOADS OF 120kN EACH. TRAFFIC COUNT LESS THAN 100 VPD AND LOW SPEED ZONES

SLAB DESIGNED FOR LIVE LOAD AS PER NZS1170.1 TABLE 3.1:

'LIGHT VEHICLE TRAFFIC AREAS' 2.5kPa AND POINT LOAD OF 13kN

DEVAN AND TANK OWNER TO ENSURE TANK IS PLACED IN A POSITION AS SUCH THAT VEHICLE LOADS WILL NOT EXCEED 2500KG DURING THE LIFE OF THE TANK. IF UNSURE, USE COMMERCIAL SLAB COVERING DESIGN FOR VEHICLES UP TO 10,000KG

DURABILITY ZONE D (NZS3604)

GENERAL:

THESE DRAWINGS SHALL BE READ IN CONJUNCTION WITH ALL ARCHITECTURAL AND OTHER CONSULTANTS DRAWINGS AND SPECIFICATIONS AND WITH SUCH OTHER INSTRUCTIONS AS MAY BE ISSUED DURING THE COURSE OF THE CONTRACT. ALL DISCREPANCIES SHALL BE REFERRED TO THE ENGINEER FOR DECISION BEFORE PROCEEDING WITH THE WORK.

ALL DIMENSIONS RELEVANT TO SETTING OUT AND OFF-SITE WORK SHALL BE VERIFIED BY THE CONTRACTOR BEFORE CONSTRUCTION AND FABRICATION IS COMMENCED. THE ENGINEERS DRAWINGS SHALL NOT BE SCALED.

DURING CONSTRUCTION THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE STRUCTURE IN A STABLE CONDITION AND ENSURING NO PART SHALL BE OVER STRESSED UNDER CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL DESIGN AND PROVIDE PROPPING TO SUPPORT ALL CAST INSITU AND PRE CAST CONCRETE WORK UNTIL SUCH CONCRETE HAS REACHED THE REQUIRED STRENGTH TO BE SELF SUPPORTING. WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE RELEVANT NEW ZEALAND STANDARDS AND LOCAL AUTHORITY REGULATIONS, EXCEPT WHERE VARIED IN THE CONTRACT DOCUMENTS.

THE PRESENCE, LOCATION AND DETAILS OF NIBS, UPSTANDS, RECESSES, PLINTHS, PENETRATIONS, INSERTS, SLEEVES, CHASES, REBATES, CAST IN FIXINGS, BRACKETS, HOLES, FLASHINGS, INSERTS, SLEEVES, CHASES, REBATES, CAST IN FIXINGS, BRACKETS, HOLES, FLASHINGS, DAMP PROOFING AND WATERPROOFING ETC ARE NOT NECESSARILY SHOWN ON THE STRUCTURAL DRAWINGS. REFER TO ARCHITECTURAL, SERVICES, CIVIL, AND OTHER PROJECT DRAWINGS FOR THESE ITEMS.

THE LOCATION, SIZE, AND DETAILS OF ALL PENETRATIONS, RECESSES, SLEEVES, HOLES ETC IN STRUCTURAL MEMBERS MUST BE APPROVED BY THE ENGINEER PRIOR TO CONSTRUCTION UNLESS OTHERWISE SHOWN ON STRUCTURAL DRAWINGS.

SUBSTITUTION FOR OR AMENDMENT OF SPECIFIED DETAILS OR MATERIALS SHALL NOT BE CARRIED OUT WITHOUT APPROVAL OF THE ENGINEER

FIXINGS DURABILITY

MILD STEEL:
 NAILS AND SCREWS IN CLOSED AREAS AND NOT IN CONTACT WITH TIMBER TREATED TO H3.2

GALVANISED STEEL:
 NAIL PLATES IN 'CLOSED' AREAS
 NAILS AND SCREWS IN SHELTERED AREAS AND NOT IN CONTACT WITH TIMBER TREATED TO H3.2 OR HIGHER

HOT-DIPPED GALVANISED:
 NAILS AND SCREWS IN 'CLOSED' AREAS AND IN CONTACT WITH TIMBER TREATED TO H3.2 OR HIGHER
 WIRE DOGS & BOLTS IN 'CLOSED' AREAS

TYPE 304 STAINLESS STEEL:
 SUBFLOOR FIXINGS AND ANY FIXINGS WITHIN 600MM OF THE GROUND
 NAILS AND SCREWS FOR CLADDING FIXING THAT ACTS AS BRACING.
 ALL STRUCTURAL FIXINGS (INCLUDING BOLTS) IN SHELTERED OR EXPOSED AREAS (NOT ALREADY LISTED ABOVE)

ALL FABRICATED BRACKETS SHALL BE MADE FROM 5MM (MINIMUM THICKNESS) STAINLESS STEEL

CONTRACTOR TO ENSURE AGAINST CONTACT BETWEEN DISIMILAR METALS. REFER NZS3604.

STEEL WORK

ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH NZS 3404 : 1997. ALL WELDING SHALL COMPLY WITH AS 1554.1 IN CONJUNCTION WITH NZS 3404 APPENDIX D. ALL WELDS TO BE 5mm CONTINUOUS FILLET WELDS UNLESS NOTED.

BOLTS NOT DESIGNATED SHALL BE COMMERCIAL BOLTS GRADE 4.6 TO AS 1111 AND AS 1112 TIGHTENED TO A SNUG FIT. BOLTS DESIGNATED 8.8 SHALL BE HIGH STRENGTH BOLTS TO AS 1252 TIGHTENED TO A SNUG FIT. BOLTS DESIGNATED 8.8/TF AND 8.8/TB SHALL BE HIGH STRENGTH BOLTS TO AS1252 FULLY TENSIONED IN ACCORDANCE WITH NZS 3404.

THE CONTRACTOR SHALL PROVIDE AND LEAVE IN PLACE UNTIL PERMANENT BRACING ELEMENTS ARE CONSTRUCTED SUCH TEMPORARY BRACING AS IS NECESSARY TO STABILIZE THE STRUCTURE DURING ERECTION. THE ENDS OF ALL TUBULAR MEMBERS ARE TO BE SEALED WITH NOMINAL THICKNESS PLATES AND CONTINUOUS FILLET WELD UNLESS OTHERWISE SHOWN. BEFORE FABRICATION IS COMMENCED THE CONTRACTOR SHALL SUBMIT COPIES OF THE SHOP DRAWINGS TO THE ARCHITECT FOR REVIEW. REVIEW DOES NOT INCLUDE CHECKING OF DIMENSIONS.

CONCRETE

ALL WORKMANSHIP AND MATERIAL SHALL BE IN ACCORDANCE WITH NZS. 3101 : 2006

NO HOLES CHASES OR EMBEDMENT OF PIPES OTHER THAN THOSE SHOWN ON THE STRUCTURAL DRAWINGS SHALL BE MADE IN CONCRETE MEMBERS WITHOUT THE APPROVAL OF THE ENGINEER.

CAST INSITU SLABS AND BEAMS SHALL BE GIVEN A POSITIVE UPWARD CAMBER OF 2mm PER 1000mm OF SPAN. CONSTRUCTION JOINTS SHALL BE PROPERLY FORMED AND USED ONLY WHERE SHOWN OR SPECIFICALLY APPROVED BY THE ENGINEER.

ALL CONCRETE IS TO BE MECHANICALLY VIBRATED AND CAREFULLY WORKED AROUND THE REINFORCEMENT AND INTO THE CORNERS OF THE FORM WORK

THE SPECIFIED COMPRESSIVE STRENGTHS OF CONCRETE AT 28 DAYS SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE:

- ONGRADE SLABS 25MPa (DUE TO 'COASTAL FRONTAGE' ZONE)
- SUSPENDED SLABS 25MPa
- PRECAST 45MPa
- SITE CONCRETE 10MPa

CLEAR COVER REQUIREMENTS, INCLUDING TIES, STIRRUPS ETC SHALL BE AS FOLLOWS UNLESS NOTED OTHERWISE ON THE DRAWING.

CONCRETE COVER REQUIREMENTS			
ELEMENT	DESCRIPTION	INSITU COVER	PRECAST COVER
CAST EXPOSED & PERMANENTLY EXPOSED TO EARTH		75	-
ABOVE GROUND EXTERIOR ENVIRONMENTS - 'COASTAL FRONTAGE' TO NZS 3101:2006 PART 1			
SLABS	24mm TO 40mm BARS	50	50
	20mm & LESS BAR/WIRES	50	40
INTERIOR OR PROTECTED ENVIRONMENTS			
SLABS	40mm & LARGER BARS	50	45
	24mm TO 32mm BARS	40	35
	20mm & LESS BARS	30	25

REINFORCEMENT

ALL REINFORCEMENT SHALL CONFORM TO AS/NZS 4671. ALL HOOK LAPS AND BENDS SHALL BE MADE WITHOUT FRACTURE IN ACCORDANCE TO NZS 3101. GRADE 300 BARS MAY BE REBENT ONCE ONLY.

ALL REINFORCEMENT HAS BEEN DESIGNATED AS FOLLOWS:
 500 DEFORMED HD20
 300 DEFORMED D20

REINFORCEMENT IS REPRESENTED DIAGRAMMATICALLY AND NOT NECESSARILY IN TRUE PROJECTION.

SPICES IN REINFORCEMENT SHALL BE MADE ONLY IN THE POSITION SHOWN ON THE DRAWINGS OR AS OTHERWISE APPROVED BY THE ENGINEER.

ALL REINFORCEMENT SHALL BE FIXED AND TIED WHERE NECESSARY IN ITS SPECIFIED POSITION.

LAP LENGTHS FOR DEFORMED BARS IN TENSION SHALL BE NO LESS THAN THE FOLLOWING:

DEFORMED BAR DIA	10	12	16	20	25	28
CONCRETE STEEL-300	400	450	600	750	900	1000
CONCRETE STEEL-500	600	750	1000	1200	1500	1700

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A	15/1/08	FOR INFORMATION ONLY	MJ	PF

client
DEVAN TANKS LIMITED

project
**UNDERGROUND TANK INSTALLATION
 UNDER COMMERCIAL DRIVEWAY
 120kN AXLE LOAD OR LESS**

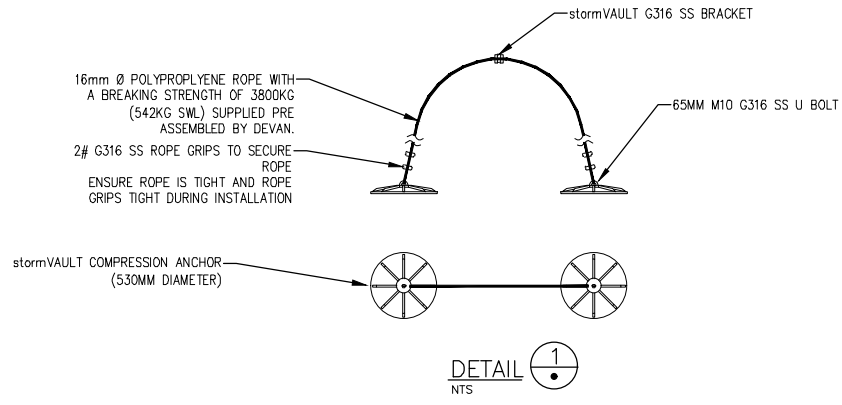
drawing title
**StormVAULT INSTALLATION
 GENERAL STRUCTURAL
 SPECIFICATION**

Scale
 AS SHOWN
 File Number
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 2076-C9000-411
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NOTES:
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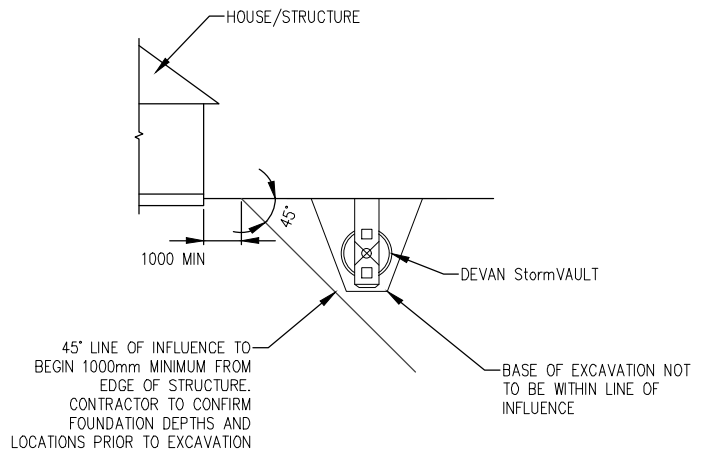
EXCAVATION CLEARANCE:
 CONTRACTOR TO ENSURE A MINIMUM OF 200MM BETWEEN EDGE OF TANK AND EDGE OF EXCAVATION WALL AT THE NARROWEST LOCATION.

SOIL CONDITIONS:
 THIS DESIGN ASSUMES SITE SOILS WILL MEET THE REQUIREMENTS OF NZS3604:2011 CLASSIFICATION OF 'GOOD GROUND'. CONTRACTOR TO SEEK ADVICE FROM A CHARTERED PROFESSIONAL ENGINEER FOR INSTALLATION IN SOILS THAT DO NOT MEET 'GOOD GROUND' CRITERIA.

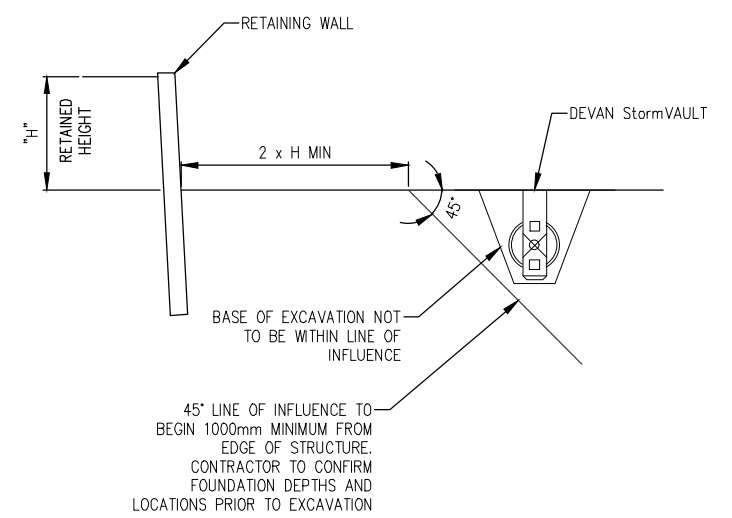
BACKFILL AND BASECOURSE:
 BACKFILL AND BASECOURSE MATERIAL TO BE EITHER:
 CRUSHED STONE OR GRAVEL: WASHED, WITH ANGULAR PARTICLE SIZES NO LARGER THAN 13.2MM WITH NO MORE THAN 5% PASSING A 2.36MM SIEVE. DRY DENSITY MUST NOT BE LESS THAN 1500KG/CUBIC METRE.
 APPROVED BACKFILL SHOULD NOT BE MIXED WITH SAND OR NATIVE SOILS AND SHOULD ALWAYS BE BROUGHT UP TO AT LEAST THE TANK CROWN LEVEL. THE USE OF NON-SPECIFIED BACKFILL MATERIAL COULD RESULT IN TANK FAILURE. (I.E. GAP10)
 OR IF CRUSHED STONE/GRAVEL NOT AVAILABLE, SPECIFIC QUARRY AGGREGATE MIX REQUIRED AS BELOW:
 NATURALLY ROUNDED GRAVEL: CLEAN NATURALLY-ROUNDED AGGREGATE WITH PARTICLE SIZES NO LARGER THAN 19MM WITH NO MORE THAN 5% PASSING A 2.36MM SIEVE. DRY DENSITY MUST NOT BE LESS THAN 1500KG/CUBIC METRE.

CONTRACTOR TO WORK IN MAXIMUM BACKFILL LIFTS OF 300MM. AFTER EACH LIFT, CONTRACTOR TO USE LONG HANDLED PROBE TO WORK THE BACKFILL MATERIAL UNDER THE ENTIRE LENGTH OF THE TANK AND WITHIN ANY RIBS. ALL VOIDS AND SPACES SHOULD BE FILLED TO ENSURE ADEQUATE SUPPORT OF TANK.

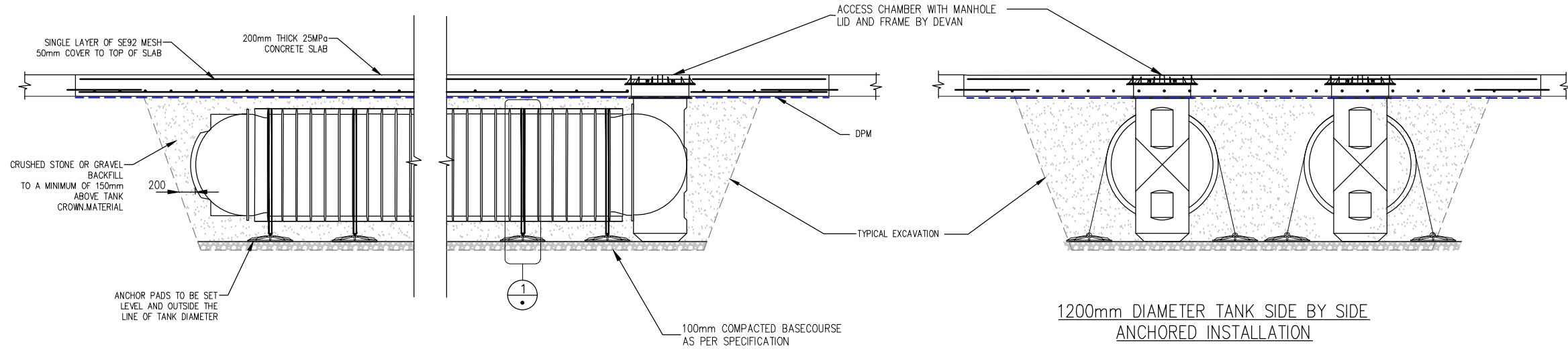
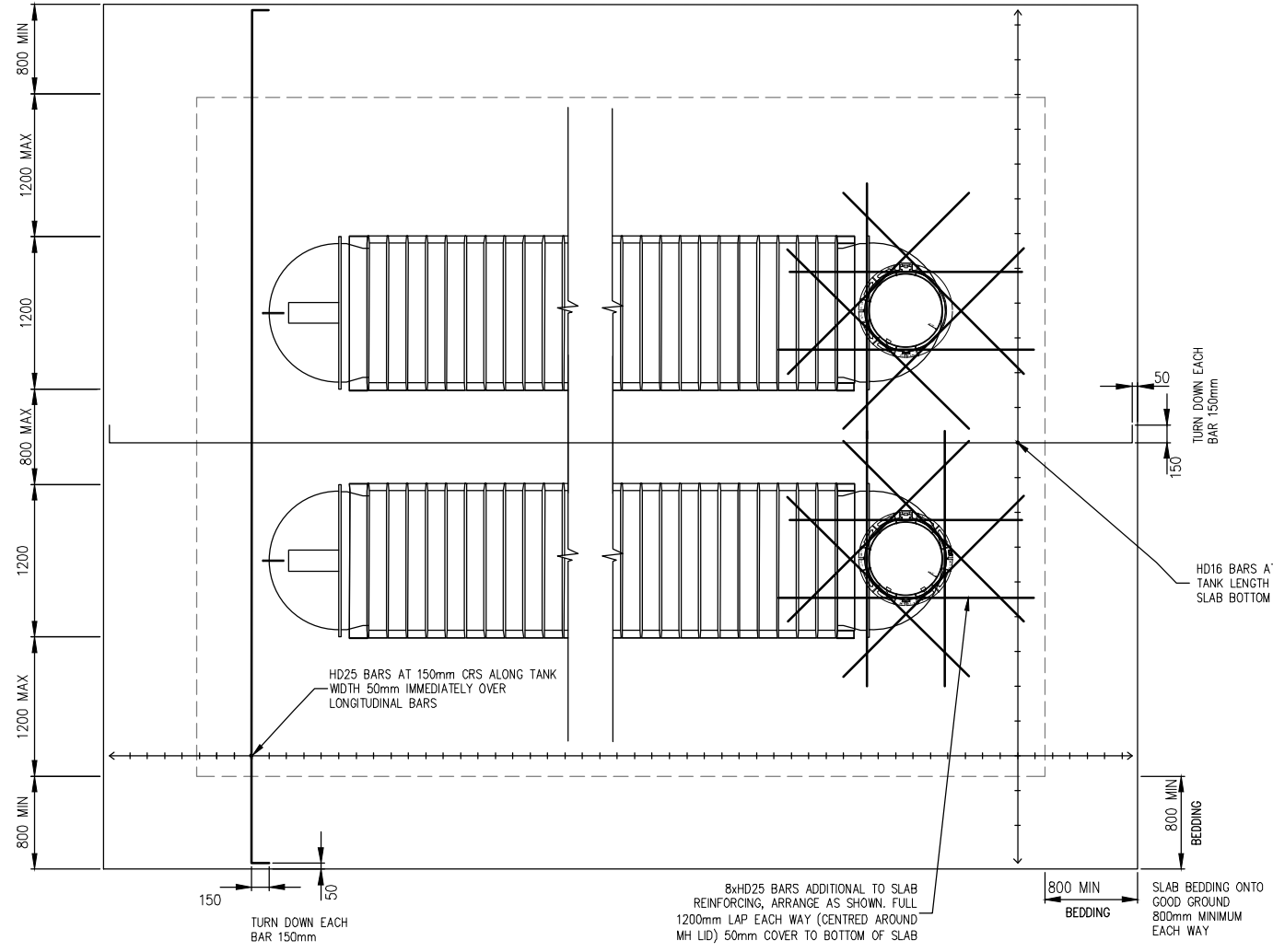
DEVAN AND TANK OWNER TO ENSURE TANK POSITION DOES NOT EXPOSE THE TANK TO LOADS GREATER THAN SPECIFIED IN THESE DRAWINGS FOR THE DESIGN LIFE OF THE UNIT



TANK POSITION NEAR STRUCTURE



TANK POSITION NEAR RETAINING WALL



1200mm DIAMETER TANK SIDE BY SIDE ANCHORED INSTALLATION

no	date	issue/revision detail	by	chk
B	28/9/21	UPDATED COMPRESSION ANCHOR DETAILS	BH	APT
A	15/1/08	FOR INFORMATION ONLY	MJ	PF

client
DEVAN TANKS LIMITED

project
UNDERGROUND TANK INSTALLATION UNDER COMMERCIAL DRIVEWAY 120KN AXLE LOAD OR LESS

drawing title
StormVAULT INSTRUCTIONS SIDE BY SIDE WITH ANCHORS

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2076-C9000-412
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B



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NOTE: THIS SHEET IS FOR THE INSTALLATION OF TANKS ABOVE MAXIMUM POSSIBLE WATER TABLE LEVELS. SITE SPECIFIC REPORTS OR WATER TABLE INFORMATION MUST PROVE THE WATER LEVEL CAN NOT POSSIBLY RISE ABOVE THE BOTTOM OF THE EXCAVATION. IF THIS INFORMATION CAN NOT BE PROVIDED, REFER TO SHEETS TU12 AND TU13. IT IS THE RESPONSIBILITY OF THE CONTRACTOR AND OWNER TO ENSURE CORRECT TANK INSTALLATION IN ACCORDANCE WITH THE DEVAN INSTALLATION GUIDES AND DRAWINGS

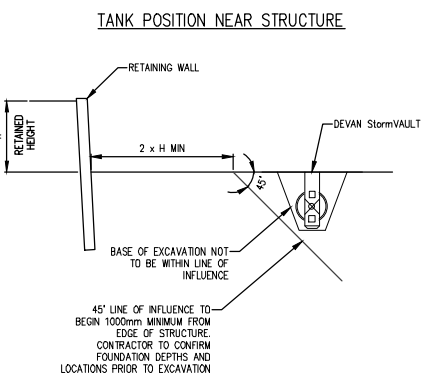
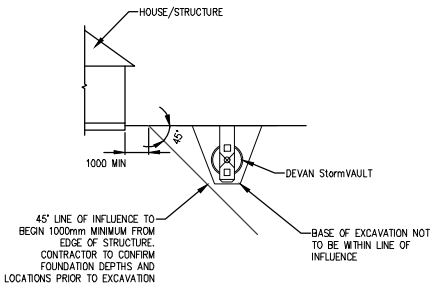
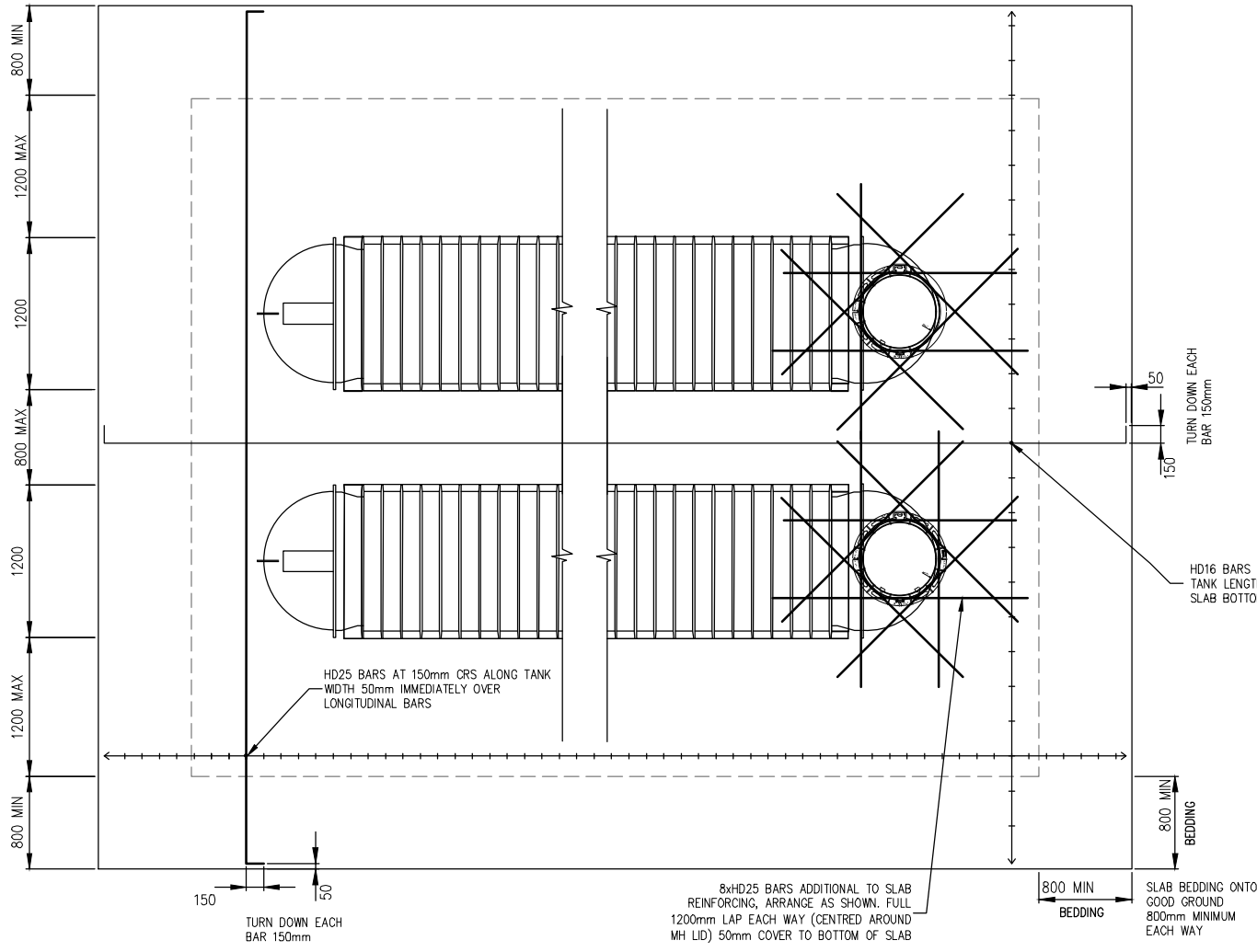
TANK LOCATION - PROXIMITY TO NEARBY STRUCTURES:
 THE LOCATION OF THE TANK EXCAVATION IS THE RESPONSIBILITY OF THE CONTRACTOR AND THE TANK OWNER. THE CONTRACTOR IS TO FOLLOW THE LIMITATIONS OF THE DIAGRAMS SHOWN OR NOTIFY A CHARTERED PROFESSIONAL ENGINEER FOR A SITE SPECIFIC CONSULTATION CONTRACTOR TO ENSURE NEARBY FOUNDATIONS OF NEW AND/OR EXISTING STRUCTURES ARE NOT UNDERMINED BY THE EXCAVATION FOR THE TANK.

EXCAVATION CLEARANCE:
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SOIL CONDITIONS:
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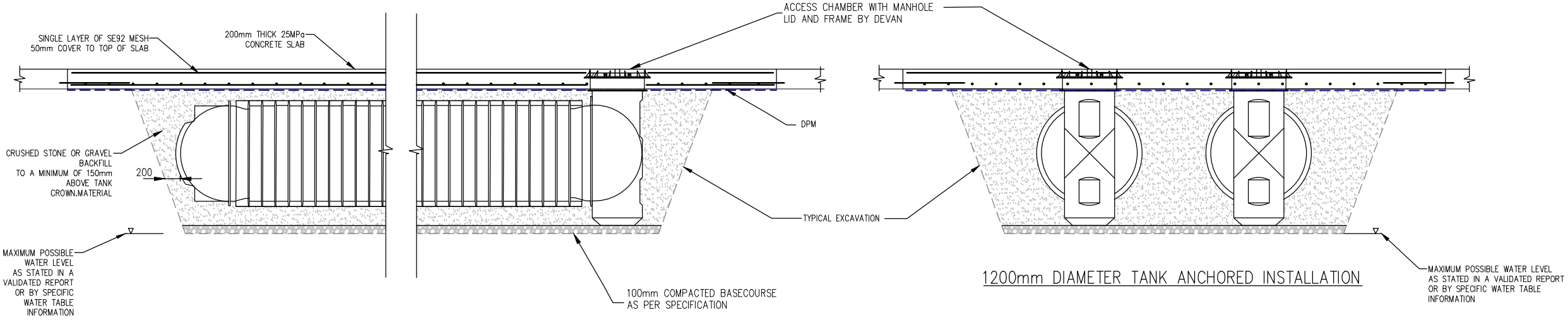
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IF DRIVEWAY IS EXISTING:
 SCABBLE EDGE AND TIE WITH D12 DRILL AND EPOXY STARTERS AT 400mm CRS. 100mm MIN EMBEDMENT DEPTH INTO EXISTING SLAB, LAP 600mm INTO NEW TOPPING SLAB

IF DRIVEWAY IS NEW:
 LAP TANK TOPPING STEEL WITH GENERAL DRIVEWAY REINFORCING. FULL LAP LENGTH REQUIRED (REFER TO SPECIFICATION SHEET)



DEVAN TANKS LIMITED

project
**UNDERGROUND TANK INSTALLATION
 UNDER COMMERCIAL DRIVEWAY
 120kN AXLE LOAD OR LESS**

drawing title
**StormVAULT INSTRUCTIONS
 SIDE BY SIDE
 LOW WATER TABLE**

Scale
 AS SHOWN
 File Number
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A

SIGMA
 Engineers | Architects | Planners
 Sigma Consultants Limited
 115 Hinemoa Street
 PO Box 553, Rotorua, New Zealand
 Phone 07-347 3456, Fax 07-347 3459

client			
project			
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