

SCOPE

THIS DOCUMENT IS INTENDED TO PROVIDE GUIDANCE FOR THE DESIGN AND CONSTRUCTION OF CONCRETE SLEEPER RETAINING WALLS IN A RESIDENTIAL LANDSCAPING SETTING AND SHALL NOT BE USED WHERE DESIGN OR CONSTRUCTION EXCEEDS ANY OF THE FOLLOWING LIMITS OR EXCLUSIONS

WHERE THERE IS ANY VARIATION TO THE LIMITATIONS STATED IN THESE DRAWINGS INCLUDING MATERIALS, SOIL CONDITIONS, DRAINAGE, SURCHARGE (ADDITIONAL LOADS) OR GEOMETRY OF THE RETAINING WALL, A STRUCTURAL/ GEOTECHNICAL ENGINEER SHOULD BE ENGAGED TO DESIGN THE WALL

LOCAL AUTHORITIES SHALL BE CONSULTED TO DETERMINE IF ANY BUILDING APPROVAL OR APPLICATION IS REQUIRED TO ERECT A RETAINING WALL

IN QUEENSLAND' BUILDING WORK FOR A RETAINING WALL IS PRESCRIBED/ALLOWED IE-

- (A) THERE IS NO SURCHARGE LOADING OVER THE ZONE OF INFLUENCE FOR THE WALL (IE: NO LOADING WITHIN 2.5 TIMES THE WALL HEIGHT HORIZONTALLY) AND
- (B) THE TOTAL HEIGHT OF THE WALL AND OF THE FILL OR CUT RETAINED BY THE WALL IS NO MORE THAN 1m ABOVE THE WALL'S NATURAL GROUND SURFACE: AND
- (C) THE WALL IS NO CLOSER THAN 1.5m TO A BUILDING OR ANOTHER RETAINING WALL

DESPITE THE ITEMS ABOVE, THE BUILDING WORK IS NOT PRESCRIBED IF IT IS FOR A RETAINING WALL THAT FORMS PART OF THE FENCING FOR A REGULATED POOL AND A FORMAL BUILDING APPLICATION WITH THE LOCAL AUTHORITY WILL BE REQUIRED.

1. SLOPING GROUND

IF THE FINISHED SURFACE LEVEL IN FRONT OF THE WALL IS SLOPING, THEN FULL GROUND SUPPORT CANNOT BE RELIED UPON AND LARGER POSTS OR FOOTINGS WITH ADDITIONAL EMBEDMENT WILL HAVE TO BE USED.

IF THE SLOPE IS STEEPER THAN 10° (1 VERTICAL TO 6 HORIZONTAL) THEN A SPECIAL DESIGN IS REQUIRED. AND THE TABLES HEREIN SHALL NOT BE USED.

INCLINING THE GROUND BEHIND THE WALL (BACKFILL) INCREASES VERTICAL LOADS DUE TO THE WEIGHT OF THE BACKFILL. THIS RESULTS IN INCREASED HORIZONTAL LOADS (HORIZONTAL LOADS DERIVING FROM VERTICAL LOADS). IF THE GROUND BEHIND THE WALL (BACKFILL) HAS A SLOPE STEEPER THAN 14° (1 VERTICAL TO 4 HORIZONTAL) THE DESIGN TABLES ARE NOT APPLICABLE DUE TO RESULTING INCREASED GRAVITY AND LIVE LOADS THAT WILL EXCEED THE DESIGN LOADS ASSUMED FOR THE TABLES.

2. PERMANENT STRUCTURES (EXISTING OR FUTURE)

THE HORIZONTAL COMPONENT OF THE VERTICAL LOADS OF PERMANENT STRUCTURES CAN HAVE SIGNIFICANT IMPACT ON THE PERFORMANCE OF RETAINING STRUCTURES.

PERMANENT STRUCTURES INCLUDE (BUT ARE NOT LIMITED TO);

BUILDINGS, POOLS, ROADS, PARKING AREAS, WATER TANKS, GENERAL STORAGE AREAS.

IF ANY SUCH STRUCTURES WILL IMPACT WITHIN A HORIZONTAL DISTANCE OF THE MINIMUM OF 1.5m OR 2.5 TIMES THE HEIGHT OF THE WALL. THE RETAINING WALL DESIGN SHOULD BE REFERRED TO A STRUCTURAL/GEOTECHNICAL ENGINEER. FENCES OF LIGHTWEIGHT MATERIALS (TIMBER, METAL ETC) CONSTRUCTED ON OR ABOVE THE WALL DO NOT IMPACT ON THE DESIGN OF THE WALLS. IF THE RETAINING WALL IS TO FORM PART OF OF A POOL FENCE, ENGINEERING DESIGN SHOULD BE SOUGHT.

3. DRIVEWAYS, ROADS AND RAILWAYS

DRIVEWAYS, ROADS AND RAILWAYS AND AREAS ADJACENT ARE REQUIRED TO BE DESIGNED FOR LOADS TO ACCOMMODATE THE INFRASTRUCTURE AND THE VEHICLES OVER (TRAINS_TRUCKS ETC) THESE LOADS ARE SIGNIFICANTLY LARGER THAN THOSE ALLOWED FOR IN THE DESIGN TABLES PRESENTED IN THESE DRAWINGS AND THEREFORE THE DESIGNS PRESENTED SHALL NOT BE USED IN THESE SITUATIONS

4. MULTIPLE RETAINING (TERRACED) **STRUCTURES**

A RETAINING STRUCTURE CONSTRUCTED WITHIN THE ZONE OF INFLUENCE OF ANOTHER RETAINING STRUCTURE WILL APPLY ADDITIONAL LOADS TO THE LOWER WALL. THIS INCLUDES INSTALLING A NEW RETAINING WALL ABOVE OR BELOW AN EXISTING RETAINING STRUCTURE THE ATTACHED TABLES SHOULD NOT BE USED FOR DESIGNING ANY RETAINING STRUCTURE WITH AN EXISTING OR FUTURE RETAINING STRUCTURE ABOVE OR BELOW SUCH THAT THE UPPER WALL IMPACTS WITHIN THE ZONE OF INFLUENCE OF THE LOWER.

5. SERVICES

RETAINING STRUCTURES CONSTRUCTED IN LOCATIONS NEAR SERVICES (EG. SEWER AND/OR STORMWATER PIPES) REQUIRE PARTICULAR ATTENTION. THE WALLS ARE REQUIRED TO BE DESIGNED TO IMPART NO LOAD ON THE SERVICES AND WILL REQUIRE SPECIFIC ENGINEERING DESIGN TO BE SITED BY A QUALIFIED SURVEYOR. LOCAL AUTHORITIES (COUNCIL'S & STATE GOVERNMENTS) HAVE SPECIFIC REQUIREMENTS FOR DIFFERENT TYPES OF SERVICES. INCLUDING MINIMUM CLEARANCES. RETAINING WALLS TO BE CONSTRUCTED NEAR SERVICE LOCATIONS SHOULD BE REFERRED TO THE RELEVANT LOCAL AUTHORITY

6. DRAINAGE

DRAINAGE OF BOTH THE LOCALIZED WALL AREA AND THE SURROUNDING TOPOGRAPHY SHOULD BE CONSIDERED DURING THE PLANNING PROCESS. DRAINAGE INVESTIGATIONS SHOULD ESTABLISH THE LOCAL GROUNDWATER LEVELS INCLUDING SOURCES, DIRECTIONS OF LATERAL FLOW AND SEASONAL OR TIDAL VARIATIONS. THE POSSIBILITY OF SEEPAGE OR SURFACE RUN OFF SHOULD ALSO BE EXAMINED. INADEQUATE DRAINAGE CAN RESULT IN OVERLOADING OF THE WALL OR

SCOURING OF THE FOOTINGS, EITHER OF WHICH MAY LEAD TO WALL FAILURE. WHERE DOUBT EXISTS, A STRUCTURAL/GEOTECHNICAL ENGINEER SHOULD BE CONSULTED.

7. POOR FOUNDATION MATERIAL

THE FOUNDATION MATERIAL ASSUMED IN DESIGN FOR THIS DATA SHEET AND ATTACHED TABLES IS STIFE CLAY, STIFE CLAY IS UNABLE TO BE MOLDED, IT IS ABLE TO BE INDENTED ONLY WITH STRONG DOWNWARD PRESSURE OF THUMB. ACCEPTABLE ALTERNATIVE FOUNDATION MATERIALS ARE: • WEATHERED ROCK (EG SHALE) DENSE SAND / GRAVEL IF THE FOUNDATION MATERIAL IS NOT WITHIN THIS RANGE, THE TABLES

IN THESE DRAWINGS SHALL NOT BE USED.

8. POOR BACKFILL MATERIAL

THE ATTACHED TABLES INCLUDE THREE OPTIONS FOR BACKFILL MATERIALS. THESE ARE: SAND, SANDY GRAVEL AND GRAVEL. ALTERNATIVE MATERIALS MAY RESULT IN WALL FAILURE DUE TO SWELLING OF BACKFILL OR LACK OF DRAINAGE. IF THE BACKFILL MATERIAL IS NOT WITHIN THE ABOVE RANGE. THE TABLES SHALL NOT BE USED. ALTERNATIVE BACKFILL MATERIAL SHOULD BE REFERRED TO A STRUCTURAL/GEOTECHNICAL ENGINEER

9. STRUCTURAL CLASSIFICATION

THE DESIGNS CONTAINED IN THESE DRAWINGS ASSUME A STRUCTURAL CLASSIFICATION OF 3 AS PER AS 4678. THAT IS - WHERE FAILURE WOULD RESULT IN MINIMAL DAMAGE AND LOSS OF ACCESS AND WHERE THE WALL HEIGHT DOES NOT EXCEED 1.5M', FOR WALLS UNDER 1.5M. IF THE PROPOSED RETAINING WALL LOCATION HAS ADJACENT STRUCTURES OR FACILITIES WITH POST DISASTER FUNCTIONS OR FAILURE OF THE WALL MAY RESULT IN SIGNIFICANT DAMAGE OR RISK OF LIFE. A STRUCTURAL/GEOTECHNICAL ENGINEER SHOULD BE CONSULTED

CONCRETE NOTES:

C 1 THE ORDINANCES OF THE RELEVANT LOCAL AUTHORITY C 2 CONCRETE SPECIFICATION

ELEMENT	GRADE	MAX. SLUMP (mm)	MAX. AGGREGATE SIZE (mm)	MIN. COVER (mm)	
CONCRETE SLEEPERS	N50	80 (+20/-10)	20	35	
PIERS	N25	100 (+20/-10)	20	50	

STRICT ACCORDANCE WITH THE REQUIREMENTS OF AS 1012. OF THE MANUFACTURERS QUALITY ASSURANCE PROGRAM. CAST ON ANY GIVEN DAY FOR EACH STRENGTH GRADE

STEELWORK NOTES:

- S.1. AS 4100 - STEEL STRUCTURES AS 2312 - GUIDE TO THE PROTECTION OF IRON AND STEEL AS 1214 - HOT DIP GALVANISING OF THREADED FASTENERS
- S.2.
- 53 CORROSION PROTECTION AND COLD GAL SPRAYED
- S 4 12mmØ COMMERCIAL BOLT SNUG TIGHT)
- S.5. SECTION 4) S 6

REINFORCEMENT NOTES:

- R 1 R 2
- PROJECTION R.3.
- THAN 900mm SPACINGS). REINFORCEMENT SYMBOLS: N GRADE 500 MPa DEFORMED BAR
- SL GRADE 500 MPa DEFORMED SLAB MESH
- GRADE 410 MPa DEFORMED BAR

PROJEC

DRAWING TITLE

GRADE 250 MPa PLAIN BAR

REV	DATE	DESCRIPTION	вү	СНКД	DRAWING	DETAILS	SCALE	APPROVED	Barlo
	01-07-20	PRELIMINARY FOR COMMENT	DK	DK					
2	06-08-20	CONSTRUCTION	DK	DK	DATUM				
3	13-08-20	ADDED 900mm SLEEPER SPECIFICATION	DK	DK	DESIGN	DK			
					DRAWN	DK		DANIEL KENNA (RPEQ 15522)	
			_		DESIGN CHECK	DK		DRAWING STATUS	5 P 07 5443 8285
					DATE	01-07-20	This drawing is not to be copied or amended without written permission from Barlow Shelley Consulting Engineers	CONSTRUCTION	a PO Box 899 Maroochydore 4558 ABN 89 215 591 0

ALL WORKMANSHIP AND MATERIALS SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT CURRENT AUSTRALIAN STANDARD CODES (AS 3600, AS 2870 & AS 1379), BUILDING BY-LAWS AND

ALL CONCRETE TESTING IS TO BE CARRIED OUT BY A NATA REGISTERED LABORATORY, IN

THE FOLLOWING TESTING SCHEDULE IS TO BE ADOPTED IN ADDITION TO THE REQUIREMENTS

A MINIMUM OF ONE TEST (3 CYLINDERS) TO BE TAKEN FROM EACH 50m3 OR PART THEREOF

C.4. NO CONCRETE TO BE POURED WHEN SITE TEMPERATURE EXCEEDS 35° C OR FALLS BELOW 5°C

ALL STEELWORK SHALL COMPLY WITH THE REQUIREMENTS OF:

PLATES, CLEATS, BRACES AND ALL OTHER HOT ROLLED SECTIONS SHALL BE GRADE 300 MATERIAL U.N.O. AND POWER BRUSHED TO ST2 AND PRIMED WITH AN APPROVED METAL PROTECTIVE COATING.

ALL STEEL POSTS TO BE HOT DIPPED GALVANISED - GRADE 350, ALL PENETRATIONS IN POST TO BE SELF TAPPING SCREWS ONLY. ANY RE-DRILLED HOLES TO BE COATED WITH ZINC OR COPPER BASED PRIMER FOR

BOLTS NOMINATED BY DIAMETER, ULTIMATE STRENGTH AND METHOD OF TIGHTENING (EG M12 4.6/S =

ALL BOLTS TO BE INSTALLED WITH ONE HARDENED WASHER UNDER THE TURNED PART. (SEE AS 1720.1

ALL EXTERNAL STEEL MEMBERS AND COMPONENTS INCLUDING BOLTS AND WASHERS TO BE HOT DIPPED GALVANISED OR S/S 316 AS NOMINATED. DIS-SIMLAR METALS TO BE SEPARATED.

ALL STEEL REINFORCEMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE RELEVANT CURRENT AUSTRALIAN STANDARD CODES (AS 3600 & AS 4671). REINFORCEMENT IS PRESENTED DIAGRAMMATICALLY. IT IS NOT NECESSARILY SHOWN IN TRUE

SPACEMENT OF SUFFICIENT "STOOLS" UNDER MAIN REINFORCEMENT BAR(S) AND TOP CROSS BAR IN SLABS TO ALLOW ADEQUATE SUPPORT IN CORRECT POSITION DURING CONCRETING (BUT NOT GENERALLY GREATER

GRADE 250 MPa DEFORMED BAR - POOLS CONSTRUCTION







CORNER FOOTING

Ø450mm BORED PIER FOOTING DEPTH - D (m) WITH LEVEL BACKSLOPE								
WALL HEIGHT-H (m)	POST SPACING (m)							
	2.0	1.5	1.2	0.9				
1.0	1.6	1.4	1.3	1.2				
0.8	1.4	1.2	1.1	1.0				
0.7	1.2	1.1	1.0	0.9				
0.2-0.6	1.1	0.9	0.8	0.7				

Ø450mm BORED PIER FOOTING DEPTH - D (m) WITH 1V:4H BACKSLOPE								
WALL HEIGHT-H (m)	POST SPACING (m)							
	2.0	1.5	1.2	0.9				
1.0	1.6	1.5	1.4	1.4				
0.8	1.5	1.4	1.2	1.1				
0.7	1.4	1.2	1.1	1.0				
0.2-0.6	1.2	1.1	1.0	0.9				







CONCRETE POST SPACING DIAGRAM SCALE 1:20

RE	/ DATE	DESCRIPTION	BY	СНКД	DRAWING	DETAILS	SCALE	APPROVED	1	Barlow	PROJECT: CONCRETE SLE
1	01-07-20	PRELIMINARY FOR COMMENT	DK	DK					8		LANDSCAPE W
2	06-08-20	CONSTRUCTION	DK	DK	DATUM						GUMNUT CONCRET
3	13-08-20	ADDED 900mm SLEEPER SPECIFICATION	DK	DK	DESIGN	DK	0 0.2 0.4 0.6 0.6 1.0	"			GOMMOT CONCRE
5								DANIEL KENNA			DRAWING TITLE:
					DRAWN	DK	SCALE 1:20 A2	(RPEQ 15522)		CONSULTING ENGINEERS	FOOTINGS & SI
4 2					DESIGN CHECK	DK	SCALE 1.20 AS	DRAWING STATUS	5	<i>p</i> 07 5443 8285	
			1		DATE	01-07-20	This drawing is not to be copied or amended without written permission from Barlow Shelley Consulting Engineers	CONSTRUCTION	3	a PO Box 899 Maroochydore 4558 ABN 89 215 591 077	

CONCRETE POST MAXIMUM								
SPACING								
WALL HEIGHT-H (m)	POST SPACING (m)	BACKSLOPE						
0.8	0.9	1V:4H						
0.7	1.2	1V:4H						
0.6	1.5	1V:4H						
0.2 - 0.5	2	1V:4H						
1.0	0.9	FLAT						
0.8	1.2	FLAT						
0.7	1.5	FLAT						
0.2-0.6	2.0	FLAT						

TABLE ABOVE BASED ON 200x75 N50 CONCRETE POST WITH 2/N12 CENTRAL REINFORCING. CAST POST 600mm MIN. INTO FOOTING TYPICAL.





WORKPLACE HEALTH & SAFETY NOTES

THESE WORK HEALTH & SAFETY NOTES MUST BE PROVIDED TO ALL OWNERS, BUILDING CONTRACTORS, SUB-CONTRACTORS, CONSULTANTS, RENOVATORS, OPERATORS, MAINTENANCE PERSONNEL, DEMOLITION CONTRACTORS, & ALL OTHERS ASSOCIATED WITH PERFORMING WORK ON/OR WITHIN THE BUILDING & SURROUNDS. THE WORK HEALTH & SAFETY NOTES ARE TO BE FULLY READ & UNDERSTOOD BY ALL PERSONS PRIOR TO COMMENCING ANY WORK.

1. FALLS, SLIPS, TRIPS

A. WORKING AT HEIGHTS DURING CONSTRUCTION

WHEREVER POSSIBLE. COMPONENTS FOR THIS BUILDING SHOULD BE PREFABRICATED OFF-SITE OR AT GROUND LEVEL TO MINIMISE THE RISK OF WORKERS FALLING MORE THAN TWO METRES. HOWEVER, CONSTRUCTION OF THIS BUILDING WILL REQUIRE WORKERS TO BE WORKING AT HEIGHTS WHERE A

FALL IN EXCESS OF TWO METRES IS POSSIBLE & INJURY IS LIKELY TO RESULT FROM SUCH A FALL. THE BUILDER SHOULD PROVIDE A SUITABLE BARRIER WHEREVER A PERSON IS REQUIRED TO WORK IN A SITUATION WHERE FALLING MORE THAN TWO METRES IS A POSSIBILITY.

DURING OPERATION OR MAINTENANCE

CLEANING & MAINTENANCE OF WINDOWS, WALLS, ROOF OR OTHER COMPONENTS OF THIS BUILDING WILL REQUIRE PERSONS TO BE SITUATED WHERE A FALL FROM A HEIGHT IN EXCESS OF TWO METRES IS POSSIBLE. WHERE THIS TYPE OF ACTIVITY IS REQUIRED, SCAFFOLDING, LADDERS OR TRESTLES SHOULD BE USED IN ACCORDANCE WITH RELEVANT CODES OF PRACTICE, REGULATIONS OR LEGISLATION. WHERE CLEANING & MAINTENANCE OF ANY COMPONENTS OF/OR INSTALLATIONS WITHIN THIS BUILDING MEANS THAT THE USE OF LADDERS OR TRESTLES ARE NOT APPROPRIATE, SCAFFOLDING, FALL BARRIERS OR PERSONAL PROTECTIVE EQUIPMENT (PPE) SHOULD BE USED IN ACCORDANCE WITH RELEVANT CODES OF PRACTICE. REGULATIONS & LEGISLATION. ANCHORAGE POINTS FOR PORTABLE SCAFFOLD OR FALL ARREST DEVICES ARE TO BE INSTALLED ON/WITHIN THE BUILDING FOR USE BY MAINTENANCE WORKERS. ANY PERSONS ENGAGED TO WORK ON THE BUILDING AFTER THE COMPLETION OF CONSTRUCTION WORK SHOULD BE INFORMED ABOUT THE ANCHORAGE POINTS.

B. SLIPPERY OR UNEVEN SURFACES

FLOOR FINISHES

SPECIFIED FINISHES MUST BE SELECTED TO MINIMISE THE RISK OF FLOORS & PAVED AREAS BECOMING SLIPPERY WHEN WET OR WHEN WALKED ON WITH WET SHOES/FEET. ANY CHANGES TO THE SPECIFIED FINISH SHOULD BE MADE IN CONSULTATION WITH THE DESIGNER OR JE THIS IS NOT PRACTICAL SURFACES WITH AN EQUIVALENT OR BETTER SLIP RESISTANCE SHOULD BE USED. THE OWNER IS RESPONSIBLE FOR THE SELECTION OF SURFACE FINISHES IN THE PEDESTRIAN TRAFFICABLE AREAS OF THIS BUILDING. SURFACES SHOULD BE SELECTED IN ACCORDANCE WITH AS HB 197:1999 & AS/NZ 4586:2004.

STEPS. LOOSE OBJECTS & UNEVEN SURFACES

DUE TO DESIGN RESTRICTIONS FOR THIS BUILDING, STEPS &/OR RAMPS ARE INCLUDED IN THE BUILDING WHICH MAY BE A HAZARD TO WORKERS CARRYING OBJECTS OR OTHERWISE OCCUPIED. STEPS SHOULD BE CLEARLY MARKED WITH BOTH VISUAL & TACTILE WARNINGS DURING CONSTRUCTION MAINTENANCE, DEMOLITION & AT ALL TIMES WHEN THE BUILDING OPERATES AS A WORKPLACE. BUILDING OWNERS & OCCUPIERS SHOULD MONITOR THE PEDESTRIAN ACCESS WAYS & IN PARTICULAR, ACCESS TO AREAS WHERE MAINTENANCE IS ROUTINELY CARRIED OUT TO ENSURE THAT SURFACES HAVE NOT MOVED OR CRACKED SO THAT THEY BECOME UNEVEN & PRESENT A TRIP HAZARD. SPILLS, LOOSE MATERIAL, STRAY OBJECTS OR ANY OTHER MATTER THAT MAY CAUSE A SLIP OR TRIP HAZARD SHOULD BE CLEANED OR REMOVED FROM ACCESS WAYS. CONTRACTORS SHOULD BE REQUIRED TO MAINTAIN A TIDY WORK SITE DURING CONSTRUCTION. MAINTENANCE OR DEMOLITION TO REDUCE THE RISK OF TRIPS & FALLS IN THE WORKPLACE. MATERIALS FOR CONSTRUCTION OR MAINTENANCE SHOULD BE STORED IN DESIGNATED AREAS AWAY FROM ACCESS WAYS & WORK AREAS.

2. FALLING OBJECTS

LOOSE MATERIALS OR SMALL OBJECTS

CONSTRUCTION, MAINTENANCE OR DEMOLITION WORK ON OR AROUND THIS BUILDING IS LIKELY TO INVOLVE PERSONS WORKING ABOVE GROUND LEVEL OR ABOVE FLOOR LEVELS. WHERE THIS OCCURS ONE OR MORE OF THE FOLLOWING MEASURES SHOULD BE TAKEN TO AVOID OBJECTS FALLING FROM

- THE AREA WHERE THE WORK IS BEING CARRIED OUT OVER PERSONS BELOW. PREVENT OR RESTRICT ACCESS TO AREAS BELOW WHERE THE WORK IS BEING CARRIED OUT
- PROVIDE TOEBOARDS TO SCAFFOLDING OR WORK PLATFORMS.
- PROVIDE PROTECTIVE STRUCTURES BELOW THE WORK AREA.
- ENSURE THAT ALL PERSONS BELOW THE WORK AREA HAVE PERSONAL 4 PROTECTIVE FOUIPMENT

BUILDING COMPONENTS

DURING CONSTRUCTION, RENOVATION OR DEMOLITION OF THIS BUILDING, PARTS OF THE STRUCTURE INCLUDING FABRICATED STEELWORK, HEAVY PANELS & MANY OTHER COMPONENTS WILL REMAIN STANDING PRIOR TO OR AFTER SUPPORTING PARTS ARE IN PLACE. CONTRACTORS SHOULD ENSURE THAT TEMPORARY BRACING OR OTHER REQUIRED SUPPORT IS IN PLACE AT ALL TIMES WHEN COLLAPSE WHICH MAY INJURE PERSONS IN THE AREA IS A POSSIBILTY. MECHANICAL LIFTING OF MATERIALS & COMPONENTS DURING CONSTRUCTION. MAINTENANCE OR DEMOLITION PRESENTS A RISK OF FALLING OBJECTS. CONTRACTORS SHOULD ENSURE THAT APPROPRIATE LIFTING DEVICES ARE USED, THAT LOADS ARE PROPERLY SECURED & THAT ACCESS TO AREAS BELOW THE LOAD IS PREVENTED OR RESTRICTED.

3. TRAFFIC MANAGEMENT

MAJOR ROAD, NARROW ROAD, OR STEEPLY SLOPING ROAD WHEREVER POSSIBLE. COMPONENTS FOR THIS BUILDING SHOULD BE PARKING OF VEHICLES OR LOADING/UNLOADING OF VEHICLES ON THIS ROADWAY MAY CAUSE A TRAFFIC HAZARD. DURING CONSTRUCTION, MAINTENANCE OR DEMOLITION OF THIS BUILDING DESIGNATED PARKING FOR WORKERS & LOADING AREAS SHOULD BE PROVIDED. TRAINED TRAFFIC MANAGEMENT PERSONNEL SHOULD BE RESPONSIBLE FOR THE SUPERVISION OF THESE AREAS

RESTRICTED ON-SITE LOADING/UN-LOADING

CONSTRUCTION OF THIS BUILDING WILL REQUIRE LOADING & UNLOADING OF MATERIALS ON THE ROADWAY. DELIVERIES SHOULD BE WELL PLANNED TO AVOID CONGESTION OF LOADING AREAS & TRAINED TRAFFIC MANAGEMENT PERSONNEL SHOULD BE USED TO SUPERVISE LOADING/UNLOADING AREAS. BUSY CONSTRUCTION & DEMOLITION SITES PRESENT A RISK OF COLLISION WHERE DELIVERIES & OTHER TRAFFIC ARE MOVING WITHIN THE SITE. A TRAFFIC MANAGEMENT PLAN SUPERVISED BY TRAINED TRAFFIC MANAGEMENT PERSONNEL SHOULD BE ADOPTED FOR THE WORK SITE.

4. SERVICES

RUPTURE OF SERVICES DURING EXCAVATION OR OTHER ACTIVITY CREATES A VARIETY OF RISKS INCLUDING RELEASE OF HAZARDOUS MATERIAL. EXISTING SERVICES ARE LOCATED ON OR AROUND THIS SITE. WHERE KNOWN, THESE ARE IDENTIFIED ON THE PLANS BUT THE EXACT LOCATION & EXTENT OF SERVICES MAY VARY FROM THAT INDICATED. SERVICES SHOULD BE LOCATED USING AN APPROPRIATE SERVICE (SUCH AS DIAL BEFORE YOU DIG) APPROPRIATE EXCAVATION PRACTICE SHOULD BE USED &, WHERE NECESSARY, SPECIALIST CONTRACTORS SHOULD BE USED.

SITES WITH UNDERGROUND POWER

UNDERGROUND POWER LINES ARE LOCATED IN OR AROUND THIS SITE. ALL UNDERGROUND POWER LINES MUST BE DISCONNECTED OR CAREFULLY LOCATED & ADEQUATE WARNING SIGNS USED PRIOR TO ANY CONSTRUCTION, MAINTENANCE OR DEMOLITION COMMENCING.

SITES WITH OVERHEAD POWER LINES

OVERHEAD POWER LINES ARE NEAR OR ON THIS SITE. THESE POSE A RISK OF ELECTROCUTION IF STRUCK OR APPROACHED BY LIFTING DEVICES OR OTHER PLANT & PERSONS WORKING ABOVE GROUND LEVEL. WHERE THERE IS A DANGER OF THIS OCCURING, POWER LINES SHOULD BE, WHERE PRACTICAL DISCONNECTED OR RELOCATED. WHERE THIS IS NOT PRACTICAL ADEQUATE WARNING IN THE FORM OF BRIGHT COLOURED TAPE OR SIGNAGE SHOULD BE USED OR A PROTECTIVE BARRIER PROVIDED.

5. MANUAL TASKS

COMPONENTS WITHIN THIS DESIGN WITH A MASS IN EXCESS OF 25KG SHOULD BE LIFTED BY TWO OR MORE WORKERS OR BY MECHANICAL LIFTING DEVICE. WHERE THIS IS NOT PRACTICAL. SUPPLIERS OR FABRICATORS SHOULD BE REQUIRED TO LIMIT THE COMPONENT MASS. ALL MATERIAL PACKAGING, BUILDING & MAINTENANCE COMPONENTS SHOULD CLEARLY SHOW THE TOTAL MASS OF PACKAGES & WHERE PRACTICAL ALL ITEMS SHOULD BE STORED ON SITE IN A WAY WHICH MINIMISES BENDING BEFORE LIFTING. ADVICE SHOULD BE PROVIDED ON SAFE LIFTING METHODS IN ALL AREAS WHERE LIFTING MAY OCCUR, CONSTRUCTION, MAINTENANCE & DEMOLITION OF THIS BUILDING WILL REQUIRE THE USE OF PORTABLE TOOLS & EQUIPMENT.

THESE SHOULD BE FULLY MAINTAINED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS & NOT USED WHERE FAULTY OR (IN THE CASE OF ELECTRICAL FOUIPMENT) NOT CARRYING A CURRENT ELECTRICAL SAFETY TAG. ALL SAFETY GUARDS OR DEVICES SHOULD BE REGULARLY CHECKED & PERSONAL PROTECTIVE EQUIPMENT SHOULD BE USED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATION.

6. HAZARDOUS SUBSTANCES **ASBESTOS IN EXISTING BUILDINGS**

BUILDING CONSTRUCTED PRIOR TO 1990

WHEREVER POSSIBLE, COMPONENTS FOR THIS BUILDING SHOULD BE PARKING IF THIS BUILDING WAS CONSTRUCTED PRIOR TO 1990 & THEREFORE MAY CONTAIN ASBESTOS FITHER IN CLADDING MATERIAL OR IN FIRE RETARDENT INSULATION MATERIAL. THE BUILDER SHOULD CHECK &, IF NECESSARY, TAKE APPROPRIATE ACTION BEFORE DEMOLISHING. CUTTING, SANDING, DRILLING OR OTHERWISE DISTURBING THE EXISTING STRUCTURE.

BUILDING CONSTRUCTED PRIOR TO 1986

IF THIS BUILDING WAS CONSTRUCTED PRIOR TO 1986 & THEREFORE IS LIKELY TO CONTAIN ASBESTOS EITHER IN CLADDING MATERIAL OR IN FIRE RETARDENT INSULATION MATERIAL. THE BUILDER SHOULD CHECK &, IF NECESSARY, TAKE APPROPRIATE ACTION BEFORE DEMOLISHING, CUTTING, SANDING, DRILLING OR OTHERWISE DISTURBING THE EXISTING STRUCTURE.

POWDERED MATERIALS

MANY MATERIALS USED IN THE CONSTRUCTION OF THIS BUILDING CAN CAUSE HARM IF INHALED IN POWDERED FORM. PERSONS WORKING ON OR IN THE BUILDING DURING CONSTRUCTION. OPERATIONAL MAINTENANCE OR DEMOLITION SHOULD ENSURE GOOD VENTILATION & WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING PROTECTION AGAINST INHALATION WHILE USING POWDERED MATERIAL OR WHEN SANDING, DRILLING, CUTTING OR OTHERWISE DISTURBING OR CREATING POWDERED MATERIAL

TREATED TIMBER

THE DESIGN OF THIS BUILDING INCLUDES PROVISION FOR THE INCLUSION OF TREATED TIMBER WITHIN THE STRUCTURE. DUST OR FUMES FROM THIS MATERIAL CAN BE HARMFUL. PERSONS WORKING ON OR IN THE BUILDING DURING CONSTRUCTION, OPERATIONAL MAINTENANCE OR DEMOLITION SHOULD ENSURE GOOD VENTILATION & WEAR PERSONAL PROTECTIVE EQUIPMENT INCLUDING PROTECTION AGAINST INHALATION OF HARMFUL MATERIAL WHEN SANDING, DRILLING, CUTTING OR USING TREATED TIMBER IN ANY WAY THAT MAY CAUSE HARMFUL MATERIAL TO BE RELEASED. DO NOT BURN TREATED TIMBER

VOLATILE ORGANIC COMPOUNDS

MANY TYPES OF GLUE, SOLVENTS, SPRAY PACKS, PAINTS, VARNISHES & SOME CLEANING MATERIALS HAVE DANGEROUS EMISSIONS. AREAS WHERE THESE ARE USED SHOULD BE KEPT WELL VENTILATED WHILE THE MATERIAL IS BEING USED & FOR A PERIOD AFTER INSTALLATION. PERSONAL PROTECTIVE EQUIPMENT MAY ALSO BE REQUIRED. THE MANUFACTURER'S RECOMMENDATIONS FOR USE MUST BE CAREFULLY CONSIDERED AT ALL TIMES.

SYNTHETIC MINERAL FIBRES

FIBREGLASS, ROCKWOOL, CERAMIC & OTHER MATERIAL USED FOR THERMAL OR SOUND INSULATION MAY CONTAIN SYNTHETIC MINERAL FIBRE WHICH MAY BE HARMFUL IF INHALED OR IF IT COMES IN CONTACT WITH THE SKIN, EYES OR OTHER SENSITIVE PARTS OF THE BODY. PERSONAL PROTECTIVE EQUIPMENT INCLUDING PROTECTION AGAINST INHALATION OF HARMFUL MATERIAL SHOULD BE USED WHEN INSTALLING, REMOVING OR WORKING NEAR BULK INSULATION MATERIAI

TIMBER FLOORS

THIS BUILDING CONTAINS TIMBER FLOORS WHICH HAVE AN APPLIED FINISH. AREAS WHERE FINISHES ARE APPLIED SHOULD BE KEPT WELL VENTILATED DURING SANDING & APPLICATION. & FOR A PERIOD AFTER INSULATION. PERSONAL PROTECTIVE EQUIPMENT MAY ALSO BE REQUIRED. THE MANUFACTURER'S RECOMMENDATIONS FOR USE MUST BE CAREFULLY CONSIDERED AT ALL TIMES.

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7. CONFINED SPACES

EXCAVATIONS

CONSTRUCTION OF THIS BUILDING & SOME MAINTENANCE ON THE BUILDING WILL REQUIRE EXCAVATION & INSTALLATION OF ITEMS WITHIN EXCAVATIONS. WHERE PRACTICAL, INSTALLATION SHOULD BE CARRIED OUT USING METHODS WHICH DO NOT REQUIRE WORKERS TO ENTER THE EXCAVATION. WHERE THIS IS NOT PRACTICAL, ADEQUATE SUPPORT FOR THE EXCAVATED AREA SHOULD BE PROVIDED TO PREVENT COLLAPSE. WARNING SIGNS & BARRIERS TO PREVENT ACCIDENTAL OR UNAUTHORISED ACCESS TO ALL EXCAVATIONS SHOULD BE PROVIDED.

ENCLOSED SPACES

ENCLOSED SPACES WITHIN THIS BUILDING MAY PRESENT A RISK TO PERSONS ENTERING FOR CONSTRUCTION, MAINTENANCE OR ANY OTHER PURPOSE. THE DESIGN DOCUMENTATION CALLS FOR WARNING SIGNS & BARRIERS TO UNAUTHORISED ACCESS. THESE SHOULD BE MAINTAINED THROUGHOUT THE LIFE OF THE BUILDING. WHERE WORKERS ARE REQUIRED TO ENTER ENCLOSED SPACES, AIR TESTING EQUIPMENT & PERSONAL PROTECTIVE EQUIPMENT SHOULD BE PROVIDED.

SMALL SPACES

SOME SMALL SPACES WITHIN THIS BUILDING WILL REQUIRE ACCESS BY CONSTRUCTION OR MAINTENANCE WORKERS. THE DESIGN DOCUMENTATION CALLS FOR WARNING SIGNS & BARRIERS TO UNAUTHORISED ACCESS. THESE SHOULD BE MAINTAINED THROUGHOUT THE LIFE OF THE BUILDING. WHERE WORKERS ARE REQUIRED TO ENTER SMALL SPACES THEY SHOULD BE SCHEDULED SO THAT ACCESS IS FOR SHORT PERIODS. MANUAL LIFTING & OTHER MANUAL ACTIVITY SHOULD BE RESTRICTED IN SMALL SPACES.

8. PUBLIC ACCESS

PUBLIC ACCESS TO CONSTRUCTION & DEMOLITION SITES & TO AREAS UNDER MAINTENANCE CAUSES RISK TO WORKERS & PUBLIC. WARNING SIGNS & SECURE BARRIERS TO UNAUTHORISED ACCESS SHOULD BE PROVIDED. WHERE ELECTRICAL INSTALLATIONS, EXCAVATIONS, PLANT OR LOOSE MATERIALS ARE PRESENT THEY SHOULD BE SECURED WHEN NOT FULLY SUPERVISED.

9. OPERATIONAL USE OF BUILDING

RESIDENTIAL BUILDINGS

WHERE THE BUILDING HAS BEEN DESIGNED AS A RESIDENTIAL BUILDING. & AT A LATER DATE IS USED OR INTENDED AS A WORKPLACE, THE PROVISIONS OF THE WORK HEALTH & SAFETY ACT 2011 OR SUBSEQUENT REPLACEMENT ACT SHOULD BE APPLIED TO THE NEW USE.

NON-RESIDENTIAL BUILDINGS - END USE UNKNOWN

THE BUILDING HAS BEEN DESIGNED TO REQUIREMENTS OF THE CLASSIFICATION IDENTIFIED ON THE DRAWINGS. THE SPECIFIC USE OF THE BUILDING IS NOT KNOWN AT THE TIME OF THE DESIGN & A FURTHER ASSESSMENT OF THE WORKPLACE HEALTH & SAFETY ISSUES SHOULD BE UNDERTAKEN AT THE TIME OF FIT-OUT FOR THE END-USER.

NON-RESIDENTIAL BUILDINGS - END USE KNOWN

THIS BUILDING HAS BEEN DESIGNED FOR THE SPECIFIC USE AS IDENTIFIED ON THE DRAWINGS. WHERE A CHANGE OF USE OCCURS AT A LATER DATE A FURTHER ASSESSMENT OF THE WORKPLACE HEALTH & SAFETY ISSUES SHOULD BE UNDERTAKEN.

10. OTHER HIGH RISK ACTIVITY

ALL ELECTRICAL WORK SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE FOLLOWING CODE OF PRACTICE:

MANAGING ELECTRICAL RISKS AT THE WORKPLACE, AS/NZ 3012 & ALL LICENSING REQUIREMENTS.

ALL WORK USING PLANT SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE FOLLOWING CODE OF PRACTICE:

MANAGING RISKS OF PLANT AT THE WORKPLACE.

ALL WORK SHOULD BE CARRIED OUT IN ACCORDANCE WITH THE FOLLOWING CODE OF PRACTICE

MANAGING NOISE & PREVENTING HEARING LOSS AT WORK

DUE TO THE HISTORY OF SERIOUS INCIDENTS IT IS RECOMMENDED THAT PARTICULAR CARE BE EXERCISED WHEN UNDERTAKING WORK INVOLVING STEEL

CONSTRUCTION & CONCRETE PLACEMENT. ALL THE ABOVE APPLIES.