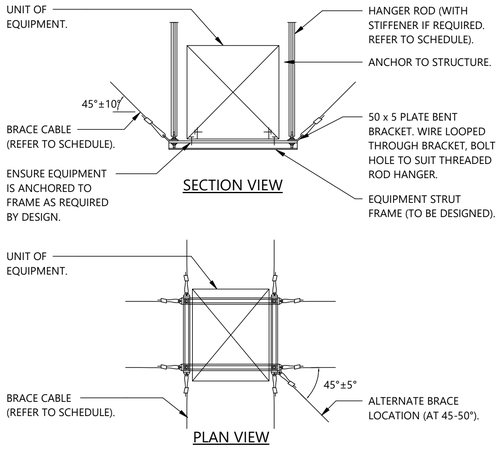
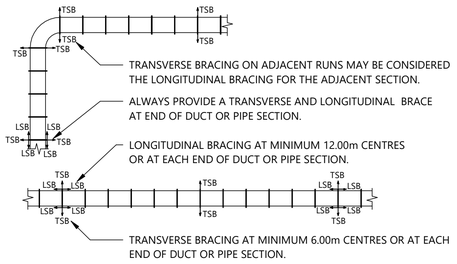


RECTANGULAR UNITS OF EQUIPMENT

NOT TO SCALE
FOR INFORMATION ONLY



TYPICAL DUCTWORK PLAN SHOWING BRACING REQUIREMENT

(PIPE WORK RUNS TO BE BRACED IN A SIMILAR WAY)

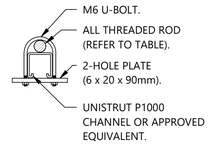
NOT TO SCALE
FOR INFORMATION ONLY

LSB - LONGITUDINAL SEISMIC BRACING DESIGNED AND INSTALLED TO RESIST MOVEMENT IN THE DIRECTION PARALLEL TO THE PIPING OR DUCT RUN.

TSB - TRANSVERSE SEISMIC BRACING DESIGNED AND INSTALLED TO RESIST MOVEMENT PERPENDICULAR TO THE PIPING OR DUCT RUN.

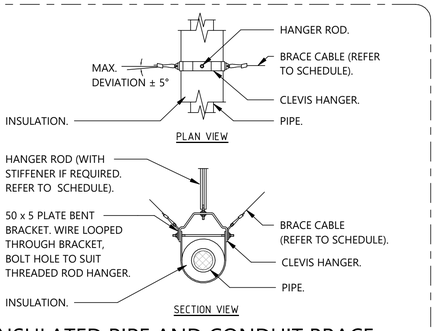
NOTE: ALL RUNS TO HAVE A MINIMUM OF TWO TRANSVERSE AND ONE LONGITUDINAL BRACES.

ROD DIA.	MAX. COMPRESSION FORCE	U-BOLT SPACING
12mm	5.0 kN	300mm
16mm	8.0 kN	400mm
20mm	12.0 kN	500mm
24mm	17.0 kN	600mm



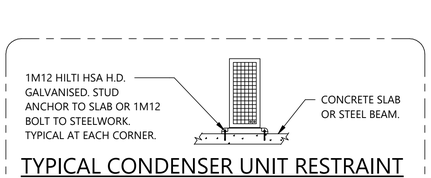
HANGER ROD STIFFENING DETAIL

NOT TO SCALE
FOR INFORMATION ONLY



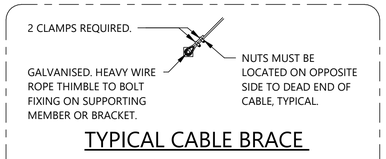
INSULATED PIPE AND CONDUIT BRACE (TRANSVERSE BRACE WITH CLEVIS HANGER)

NOT TO SCALE
FOR INFORMATION ONLY



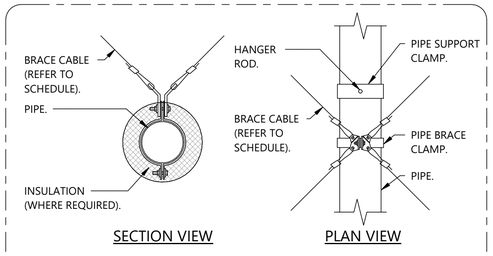
TYPICAL CONDENSER UNIT RESTRAINT

NOT TO SCALE
FOR INFORMATION ONLY



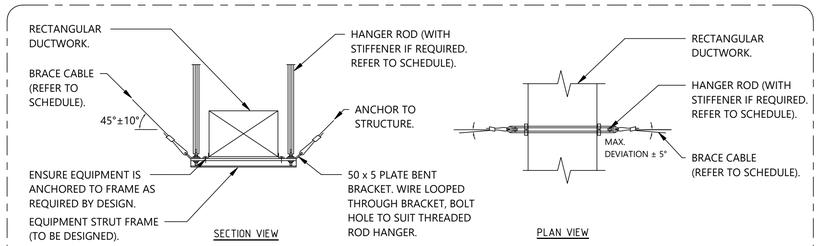
TYPICAL CABLE BRACE FIXING USING WIRE ROPE CLAMPS

NOT TO SCALE
FOR INFORMATION ONLY



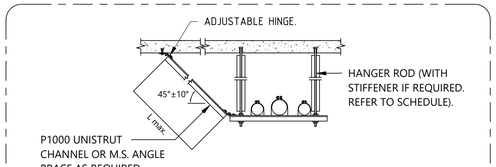
PIPE AND CONDUIT - 4 WAY BRACE

NOT TO SCALE
FOR INFORMATION ONLY



RECTANGULAR DUCTWORK - TRANSVERSE BRACE

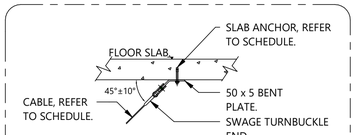
NOT TO SCALE
FOR INFORMATION ONLY



TRAPEZE BRACE - STEEL STRUT ALTERNATIVE

(CABLE TRAY SIMILAR)

NOT TO SCALE
FOR INFORMATION ONLY



TYPICAL CONNECTION TO SLAB

NOT TO SCALE
FOR INFORMATION ONLY

COMPONENT CONNECTION SIZE SCHEDULE IL3 BUILDING, De SITE SUB-SOIL CLASS,					COMPONENT FIXED < 10m ABOVE STRUCTURAL BASE		
ITEM BEING BRACED	MAX. WEIGHT	CABLE BRACE	BRACE ANGLE (*)	GRIPPLE BRACE	UNISTRUT BRACE (*)	ROD HANGER	ANCHOR TO SLAB (MIN. 100mm EDGE DISTANCE, 150mm SPACING)
TRANSVERSE BRACING FOR RECTANGULAR DUCTS UP TO 1300 x 1300mm	80 kg/m	6mm GALVANISED. 7 x 19 WIRE	50 EA 5.0 up to 2400mm long	GS19	P1000 up to 2400mm long	16mm no stiffener required	POWERS GALVANISED M12 x 75mm BLUETIP SCREW BOLT OR EQUIVALENT APPROVED
CIRCULAR DUCTWORK UP TO 500mm DIAMETER	80 kg/m	6mm GALVANISED. 7 x 19 WIRE	50 EA 5.0 up to 2400mm long	GS19	P1000 up to 2400mm long	16mm no stiffener required	
MULTIPLE PIPES ON A TRAPEZE	80 kg/m	6mm GALVANISED. 7 x 19 WIRE	50 EA 5.0 up to 2400mm long	GS19	P1000 up to 2400mm long	16mm no stiffener required	
UNIT AND EQUIPMENT (NOT ON A FLEXIBLE MOUNTING)	300 kg	3mm GALVANISED. 7 x 19 WIRE	50 EA 5.0 up to 4000mm long	GS10	P1000 up to 2700mm long	16mm no stiffener required	
(*) NOTE: IF USING ANGLES OR UNISTRUT BRACING ENSURE VIBRATION IS NOT TRANSMITTED TO THE STRUCTURE.							

SEISMIC BRACING NOTES FOR SERVICES

1. THESE STANDARD DETAILS CANNOT AND DO NOT COVER ALL THE POSSIBLE SEISMIC BRACING REQUIREMENTS ON A PROJECT. THE STRUCTURAL ENGINEER IN CONSULTATION WITH THE SERVICES ENGINEER SHALL DEVELOP PROJECT SPECIFIC DETAILS.
2. THE INFORMATION AND DETAILS ON THIS DRAWING APPLY ONLY TO IMPORTANCE LEVEL 2 AND 3 BUILDINGS AS DEFINED IN THE NATIONAL CONSTRUCTION CODE TO COMPONENTS FIXED < 10m ABOVE THE STRUCTURAL BASE AND ON SITES WITH Ce CLASS SOILS. PROJECT SPECIFIC DESIGN PARAMETERS SHALL BE ESTABLISHED BY THE DESIGN ENGINEER AND THE BRACING DESIGNED ACCORDINGLY.
3. BRACING OF ALL MECHANICAL AND ELECTRICAL PLANT TO BE IN ACCORDANCE WITH THE REQUIREMENTS OF AS1170.4-2007 SECTION 8.
4. THE STRUCTURAL ENGINEER SHALL CHECK THE ADEQUACY OF THE STRUCTURE TO SUPPORT THE SERVICES LOADS, INCLUDING SEISMIC FORCES.
5. THE FOLLOWING DUCTWORK AND PIPING DO NOT REQUIRE SEISMIC BRACING:
   - GAS PIPING LESS THEN 25mm INSIDE DIAMETER.
   - PIPING LESS THEN 32mm INSIDE DIAMETER IN BOILER AND MECHANICAL ROOMS.
   - ALL OTHER PIPING LESS THEN 64mm INSIDE DIAMETER.
   - ALL ELECTRICAL CONDUIT LESS THEN 64mm INSIDE DIAMETER.
   - ALL RECTANGULAR AIR-HANDLING DUCTS LESS THEN 0.40 SQUARE METRES IN CROSS SECTIONAL AREA.
   - ALL ROUND AIR-HANDLING DUCTS LESS THEN 700mm IN DIAMETER.
   - ALL DUCTS AND PIPING SUSPENDED BY INDIVIDUAL HANGERS 300mm OR LESS IN LENGTH FROM THE TOP OF THE PIPE TO THE BOTTOM OF THE SUPPORT FOR THE HANGER.
6. ALL DUCTWORK TO BE SUPPORTED IN ACCORDANCE WITH AS 4254-2002.
7. TRANSVERSE BRACING FOR DUCT SECTIONS TO BE AT 6.00m MAX CENTRES AND AT SECTION ENDS.
8. LONGITUDINAL BRACING FOR DUCT SECTIONS TO BE AT 12.00m MAX CENTRES AND AT SECTION ENDS. TRANSVERSE BRACING ON ADJACENT RUNS MAY BE CONSIDERED THE LONGITUDINAL BRACING FOR THE ADJACENT SECTION.
9. SPACING OF THE BRACING MAY NEED TO BE REDUCED FOR EXAMPLE
   - BRACE BOTH SIDES OF PIPING, CONDUIT OR DUCTWORK AT FLEXIBLE CONNECTIONS;
   - BRACE TO AVOID COLLISION BETWEEN PIPING, CONDUIT OR DUCTWORK AND OTHER NON-STRUCTURAL COMPONENTS;
   - BRACE WITHIN 600mm OF CHANGES IN DIRECTION, WHETHER IT BE HORIZONTAL OR VERTICAL CHANGES;
   - BRACE WHERE COMPONENTS PENETRATE FLOORS OR CEILINGS;
   - BRACE IN BOTH DIRECTIONS AT THE TOP OF ALL RISERS WHERE RISERS EXCEED 900mm;

   THE SPACING OF BRACING ALONG A RUN OF PIPING, CONDUIT OR DUCTWORK SHOULD NOT VARY GREATLY IN ORDER TO ENSURE UNIFORM DEFLECTION AND LOADING.
10. EACH UNIT OF EQUIPMENT CONNECTED TO A RUN OF PIPING, CONDUIT OR DUCTWORK SHALL BE INDIVIDUALLY AND INDEPENDENTLY BRACED.
    THERMAL EXPANSION AND CONTRACTION FORCES, WHERE PRESENT, MUST BE CONSIDERED IN THE LAYOUT OF TRANSVERSE AND LONGITUDINAL BRACES.
    FLEXIBILITY SHOULD BE PROVIDED WHERE PIPES PASS THROUGH SEISMIC OR EXPANSION JOINTS OR CONNECT TO EQUIPMENT WITH VIBRATION ISOLATORS.
11. BRACING OF PIPEWORK SHALL BE AT EVERY SECOND SUPPORT BUT NOT EXCEEDING THE SPACING GIVEN FOR DUCTS.
12. SERVICES BRACED IN ACCORDANCE WITH AS 1170.4-2007 SECTION 8 SHALL HAVE A MINIMUM OF 50mm CLEARANCE FROM ALL CEILING HANGERS AND THE CEILING GRID.
13. DO NOT CORE THROUGH, CUT THROUGH OR OTHERWISE DAMAGE STEEL REINFORCEMENT IN CONCRETE SLABS, BEAMS OR COLUMNS WHEN INSTALLING SEISMIC BRACING.
14. FOR FURTHER INFORMATION REFER TO:
    - GRIPPLE SEISMIC INSTALLATION MANUAL.
    - TYCO FLOW CONTROL, 2002, UNISTRUT SEISMIC BRACING SYSTEMS.
    - FEMA E-74, JANUARY 2011, REDUCING THE RISKS OF NONSTRUCTURAL EARTHQUAKE DAMAGE - A PRACTICAL GUIDE.
    - SMACNA SEISMIC RESTRAINT MANUAL, GUIDELINES FOR MECHANICAL SYSTEMS, 1998, SMACNA, SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION.

REV'N	DESCRIPTION	DATE	CHK'D
A	CONSTRUCTION ISSUE	14.01.20	TR

© Copyright Lucid Consulting Australia
13/02/2020 4:44:59 PM

FOR CONSTRUCTION

TO BE PRINTED IN COLOUR

THE PURPOSE OF THIS DOCUMENT IS INTENDED TO BE VIEWED OR PRINTED IN COLOUR FOR THE FULL EXTENT OF THE SCOPE OF WORKS TO BE SHOWN.

CITIFY bfc GEMMA | LEA DESIGN STUDIO

LUCID CONSULTING AUSTRALIA
Level 3/169, Pirie St Adelaide SA 5000
Phone: (08) 8407 9700
Email: adelaide@lucidconsulting.com.au

PROJECT
HYDE PARK PLACE
248 UNLEY ROAD, HYDE PARK
MECHANICAL SERVICES

DRAWING
TYPICAL DETAILS AND SECTIONS SHEET 3

NOT FOR CONSTRUCTION PURPOSES UNLESS STAMPED FOR CONSTRUCTION. VERIFY DIMENSIONS AND LEVELS ON SITE BEFORE SETTING OUT. DO NOT SCALE. REFER TO FIGURED DIMENSIONS - IN mm UNLESS OTHERWISE STATED.

Scale	Design: JD/TC	No. in Set	Date
NTS	Drawn: JD	15 of 15	JAN 2020
	Review: TR		

Orig. Size	Drawing no.	Revision
A1	LCE14462-M302	A