

20 July 2018

151903

Urbis
Tower 2, Level 23
Darling park
201 Sussex St
Sydney 2000

Attention: Jonathan Bryant

Sandstones Precinct – S4.55 Demolition and Excavation

Structural Certificate

Dear Jonathan,

We certify that we have prepared the structural design of the demolition and excavation works at the Education Building at George St, Sydney as shown on the drawings attached in accordance with the following Australian Standards:

AS 3600 Concrete Structures

AS 4100 Steel Structures

AS3700 Masonry Structures

And confirm that these works will not impact on the structural integrity of the existing building structure.

Yours faithfully

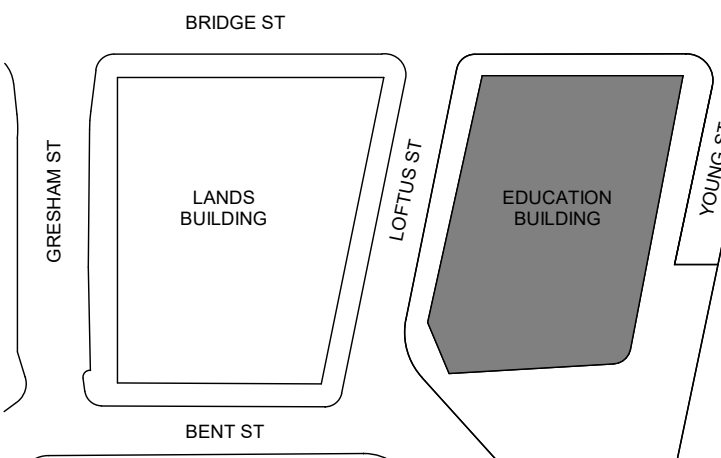
TAYLOR THOMSON WHITTING (NSW) PTY LTD



Martin Rogers BSC(Hons), MIEAust, CPEng, NER, APEC Engineer, IntPE(Aus)
Technical Director

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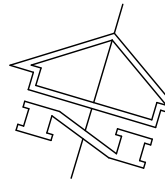
KEY PLAN



DRAWING TO BE PRINTED IN COLOUR

RISKS AND UNKNOWNNS		
LOWER GROUND / FOUNDATIONS		
1	T-CC AND T-SC1	PILE LENGTH NEEDS TO BE DETERMINED FOLLOWING GEOTECHNICAL INVESTIGATION AND REPORT
1.1		PILE DIAMETER AND EXTENT OF TOWER CROSS BRACING AND/OR EXCAVATION SEQUENCING WITHIN THE 4 PILES NEEDS TO BE DETERMINED TAKING INTO ACCOUNT OF BUILDABILITY REQUIREMENTS TO OPERATE AN EXCAVATOR UNDER T-SB1. GEOTECHNICAL INPUT IS REQUIRED. THIS WILL AFFECT THE STEEL TONNAGES OF THE TOWER ABOVE AND THE PILE DIAMETER AND DEPTH
2	T-PF1 ALONG EASTERN BOUNDARY	ALL FOUNDATION SIZES TBC FOLLOWING GEOTECHNICAL INVESTIGATION AND REPORT. THIS IS ESPECIALLY CRITICAL AT THE EASTERN BOUNDARY WHICH IS ABOVE THE GPO FAULT AND CLOSE TO THE GPT BASEMENT. LOADING UP THIS AREA NEEDS CAREFUL CONSIDERATION AND GEOTECHNICAL INPUT. AT WORSE CASE THESE FOUNDATIONS WOULD NEED TO BE PILED
3	T-PF3 AND T-SB8	THESE ARE AN ALLOWANCE TO LATERALLY SUPPORT THE PERIMETER RETAINING WALL (MOAT) WHILE THE GROUND FLOOR SLAB IS PARTIALLY DEMOLISHED. FURTHER INVESTIGATION INTO THE GROUND FLOOR STRUCTURE AND HOW IT IS CONNECTED TO THE MOAT IS REQUIRED TO CONFIRM THE DETAIL OF THESE STRUTS. GEOTECHNICAL INVESTIGATION AND REPORT IS REQUIRED TO DESIGN THE PAD FOOTINGS
4	T-SB1	THE LEVEL OF THESE STRUTS NEEDS TO BE CONFIRMED BY THE GEOTECHNICAL ENGINEER TO ENSURE THEY ARE STRUTTING ONTO GOOD QUALITY ROCK AT THE EXCAVATION FACE. IF GOOD QUALITY ROCK IS FOUND TO BE LOWER THAN EXPECTED THESE STRUTS WILL NEED TO BE LOWERED WHICH WILL RESULT IN THE TOWER STEELWORK WEIGHTS INCREASING.
4.1		A JACKING DETAIL IS REQUIRED BETWEEN THE STRUT (T-SB1) AND THE COLUMN (T-SC1) TO ALLOW FOR ROCK RELAXATION DURING THE EXCAVATION OF THE BASEMENTS. GEOTECHNICAL INPUT IS REQUIRED TO DESIGN AND DETAIL THIS JACKING SYSTEM
4.2		THESE ARE CRITICAL ELEMENTS OF THE DESIGN WHICH NEED TO BE ROBUST ENOUGH TO TAKE AN IMPACT FROM AN EXCAVATOR ETC. CURRENTLY THEY HAVE NOT BEEN DESIGN FOR SUCH AN IMPACT SO THEY WILL NEED TO INCREASE IN SIZE AND WEIGHT TO ALLOW FOR THIS
5	COLUMN STRENGTHENING	COLUMN STRENGTHENING IS HIGHLY DEPENDANT ON THE POOL DESIGN (WEIGHT AND LOCATION OF THE POOL). CHANGING THE POOL SIZE WILL AFFECT THE COLUMN STRENGTHENING.
6	HERITAGE WALL TO BE KEPT AT NORTH WEST	THE REQUIREMENT TO KEEP THE HERITAGE WALL (FROM LOWER GROUND TO THE UNDERSIDE OF LEVEL 1) TO THE NORTH WEST OF THE BUILDING HAS RESULTED IN THE BASEMENT NEEDING TO REDUCE IN SIZE (TO AVOID VERY DIFFICULT IF NOT IMPOSSIBLE 3 STOREY UNDERPINNING). THE BASEMENT REDESIGN HAS NOT BEEN COMPLETED, IF THE REDESIGN IS NOT FEASIBLE IT WILL HAVE A BIG IMPACT ON THE TEMPORARY SUPPORT TO THIS WALL

1 ON PLAN DENOTES RISKS AND UNKNOWNNS AS STATED IN TABLE ABOVE.



LOWER GROUND FLOOR TEMPORARY WORKS / DEMOLITION PLAN

SCALE 1:100

TEMPORARY WORKS / DEMOLITION LEGEND

- HATCH DENOTES EXISTING STRUCTURE TO BE DEMOLISHED DURING EARLY WORKS / STAGE 1 DEMOLITION
- HATCH DENOTES PENETRATION IN EXISTING SLAB FOR NEW COLUMNS. TO BE DONE IN A PROPPING SEQUENCE AS THE CONCRETE COLUMNS ARE BUILT.
- 1-EB ON PLAN DENOTES EXISTING BEAM TO BE DEMOLISHED
- 1-EC ON PLAN DENOTES EXISTING COLUMN TO BE DEMOLISHED
- EC DENOTES EXISTING COLUMN REQUIRING STRENGTHENING WORKS. BREAK OFF EXISTING CONCRETE ENCASEMENT AND RE-POUR NEW CONCRETE COLUMN WITH NEW REINFORCEMENT. SIZE OF NEW CONCRETE TO MATCH EXISTING.

TEMPORARY WORKS COLUMN SCHEDULE			
MARK	SIZE	COMMENTS	TENSION LOAD (SERVICE)

TEMPORARY WORKS STEEL MEMBER SCHEDULE		
MARK	TYPE	SIZE

TEMPORARY WORKS PAD FOOTING SCHEDULE					
MARK	LENGTH	WIDTH	DEPTH	COMMENTS	TENSION LOAD (SERVICE)
PF1			700		

NOTE
DRAWINGS UPDATED FOR CO-ORDINATION OF
EXTENT OF DEMOLITION. TEMPORARY STEELWORK,
FOUNDATIONS AND CORBEL/BALCONY SUPPORTS ARE
STILL IN DEVELOPMENT.

K	RE-ISSUE FOR INFORMATION	T.M.	L.C.	11.05.18
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Rev Description Eng Draft Date
Project
SANDSTONE PRECINCT
EDUCATION BUILDING
23-39 Bridge Street, Sydney 2000, Australia

Sheet Subject
LOWER GROUND
TEMPORARY WORKS /
DEMOLITION PLAN
Design Architect

make

Level 2, 36 Carrington St, Sydney NSW 2000

Executive Architect

Ridley

Governor Philip Tower, Level 21, 1 Farrer Pl, Sydney NSW 2000

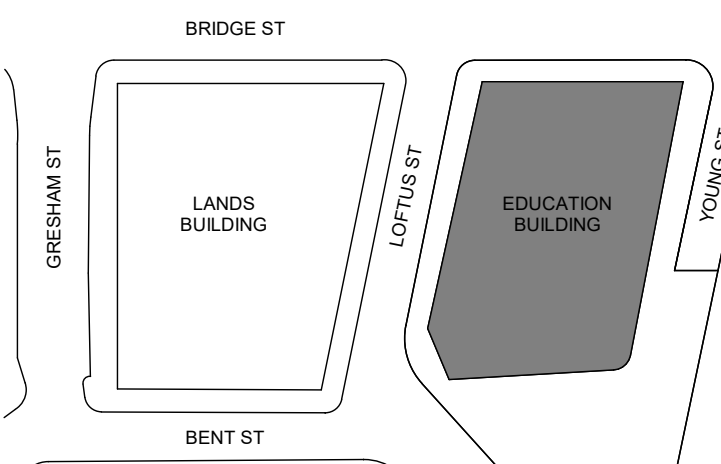
Structural Engineer

TTW Taylor
Thomson
Whitting
612 9439 7288 | 48 Chandos Street St Leonards NSW 2065

Scale : A0	Drawn	Authorised
As indicated	L.C.	B.Y.
Job No	Drawing No	Revision
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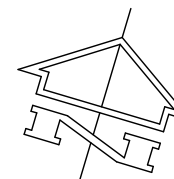
KEY PLAN



DRAWING TO BE PRINTED IN COLOUR

RISKS AND UNKNOWNNS		
GROUND FLOOR		
1	ADDITIONAL DEMOLITION (CIRCLED IN A RED LINE)	ADDITIONAL DEMOLITION HAS BEEN ADDED IN TWO AREA TO ALLOW FOR SETDOWNS IN THE BAR AREA TO THE SOUTH AND RETAIL BATHROOMS TO THE WEST. THIS WILL REQUIRE ADDITIONAL FAÇADE RETENTION WITH STRUCTURAL STEEL OUTSIDE OF THE FAÇADE CLAMPING THROUGH WINDOWS. THIS STEELWORK IS STILL IN DEVELOPMENT
2	COLUMN STRENGTHENING	COLUMN STRENGTHENING IS HIGHLY DEPENDANT ON THE POOL DESIGN (WEIGHT AND LOCATION OF THE POOL). CHANGING THE POOL SIZE WILL AFFECT THE COLUMN STRENGTHENING. GROUND FLOOR COLUMN STRENGTHENING FOR THE MARBLE CLAD COLUMNS AND WITHIN THE HIGH HERITAGE ROOMS NEED TO BE COORDINATED WITH THE HERITAGE CONSULTANT AND HERITAGE COUNCIL. A METHOD STATEMENT NEEDS TO BE DEVELOPED TO ALLOW FOR THE CAREFUL DEMOLITION AND REINSTATEMENT OF THE HIGHLY HERITAGE FABRIC SURROUNDING THESE COLUMNS
3	EXISTING FLOOR STRENGTH	INVESTIGATIONS ARE REQUIRED TO ASCERTAIN THE STRENGTH OF THE EXISTING FLOOR STRUCTURE. THIS WILL ALLOW US TO PROVIDE TEMPORARY LOADING PLANS WHICH THEN DETERMINES WHAT MACHINERY CAN BE USED AND WHAT BACK PROPING IS REQUIRED IN DEMOLISHING THE STRUCTURE. IF THE EXISTING STRUCTURE IS FOUND TO BE WEAK, STRENGTHENING MAY BE REQUIRED FOR BOTH THE PERMINANT AND TEMPORARY DESIGN
4	CONNECTION FROM THE EXISTING FLOOR TO THE FAÇADE	THE TEMPORARY WORKS SCHEME RELIES ON THE ADEQUACE OF THE EXISTING CONNECTION BETWEEN THE FAÇADE AND THE EXISTING FLOOR. WE HAVE NOT BEEN ABLE TO INVESTIGATE THIS CONNECTION SO CAN'T CONFIRM ITS ADEQUACE.
5	FARRER PLACE ENTRANCE SESAME LIFTS	INVESTIGATIONS ARE REQUIRED TO ASCERTAIN THE EXACT CUT LINES AND TEMPORARY SUPPORT TO THE FARRER PLACE ENTRANCE TO ACCOMMODATE THE SESAME LIFT
6	CONNECTION BETWEEN TEMPORARY STEEL TO EXISTING STRUCTURE	WE HAVE SHOW A REASONABLY ROBUST CONNECTION DETAIL BETWEEN THE EXISTING CONCRETE ENCASED STEEL BEAMS AND TEMPORARY STEELWORK. HOWEVER UNTIL INVESTIGATIONS AND A DETAILED SURVEY HAS BEEN COMPLETED THIS CONNECTION CANNOT BE VARIFIED. IF THE EXISTING STRUCTURE IS SIGNIFICANTLY DIFFERENT (OR IN A DIFFERENT LOCATION) TO WHAT WE HAVE ASSUMED THIS CONNECTION WILL NEED TO BE CHANGED

1 ON PLAN DENOTES RISKS AND UNKNOWNNS AS STATED IN TABLE ABOVE.



GROUND FLOOR TEMPORARY WORKS / DEMOLITION PLAN

SCALE 1:100

TEMPORARY WORKS / DEMOLITION LEGEND

HATCH DENOTES EXISTING STRUCTURE TO BE DEMOLISHED DURING EARLY WORKS / STAGE 1 DEMOLITION

HATCH DENOTES PENETRATION IN EXISTING SLAB FOR NEW COLUMNS TO BE DONE IN A PROPPING SEQUENCE AS THE CONCRETE COLUMNS ARE BUILT.

1-EB ON PLAN DENOTES EXISTING BEAM TO BE DEMOLISHED

1-EC ON PLAN DENOTES EXISTING COLUMN TO BE DEMOLISHED

DENOTES EXISTING COLUMN REQUIRING STRENGTHENING WORKS.
BREAK OFF EXISTING CONCRETE ENCASEMENT AND RE-POUR NEW CONCRETE COLUMN WITH NEW REINFORCEMENT.
SIZE OF NEW CONCRETE TO MATCH EXISTING.

TEMPORARY WORKS COLUMN SCHEDULE

MARK	SIZE	COMMENTS	TENSION LOAD (SERVICE)
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TEMPORARY WORKS STEEL MEMBER SCHEDULE

MARK	TYPE	SIZE
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NOTE
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EXTENT OF DEMOLITION. TEMPORARY STEELWORK,
FOUNDATIONS AND CORBEL/BALCONY SUPPORTS ARE
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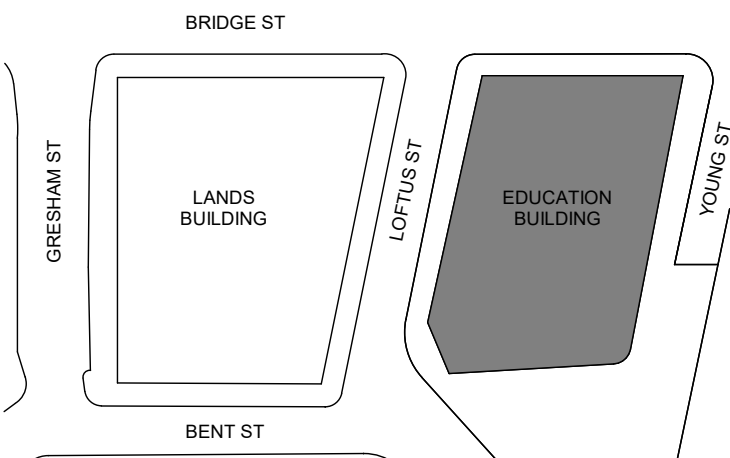
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Job No Drawing No Revision

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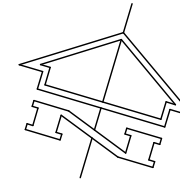
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RISKS AND UNKNOWNNS		
LEVEL 1		
1	EAST AND WEST BALCONIES (FOR SOUTHERN SECTION OF BUILDING)	THE CANTILEVER BALCONIES IN THE FACADE NEED INTRUSIVE INVESTIGATION TO LET US UNDERSTAND HOW THEY ARE CURRENTLY WORKING. THE PROPOSED DEMOLITION WILL AFFECT THESE BALCONIES AND RESULT IN THEM NEEDING TEMPORARY SUPPORT. VARIOUS OPTIONS HAVE BEEN TABLED TO SUPPORT THESE BALCONIES INCLUDING PROPPING THEM ONTO THE HOARDING (WITH STRUCTURAL STEEL COLUMNS AND BEAMS CLOSE TO THE FACADE) AND CANTILEVERING BEAMS OUT FROM THE WINDOW CILL, HOWEVER WITHOUT THE INTRUSIVE INVESTIGATIONS (AND A DETAILED UNDERSTANDING THE EXISTING STRUCTURE) THIS SUPPORT CANNOT BE DESIGNED
2	EASTERN BAY WINDOW (ON GRID LINE 16)	THE BAY WINDOW ON GRID 16 NEEDS INTRUSIVE INVESTIGATION TO LET US UNDERSTAND HOW IS CURRENTLY STRUCTURED. THE PROPOSED DEMOLITION SIGNIFICANTLY WEAKENS THIS BAY RESULTING IN IT NEEDING TEMPORARY SUPPORT. THIS SUPPORT CANNOT BE DESIGNED UNTIL THE INVESTIGATION IS COMPLETE.
3	EXISTING FLOOR STRENGTH	INVESTIGATIONS ARE REQUIRED TO ASCERTAIN THE STRENGTH OF THE EXISTING FLOOR STRUCTURE. THIS WILL ALLOW US TO PROVIDE TEMPORARY LOADING PLANS WHICH THEN DETERMINES WHAT MACHINERY CAN BE USED AND WHAT BACK PROPPING IS REQUIRED IN DEMOLISHING THE STRUCTURE. IF THE EXISTING STRUCTURE IS FOUND TO BE WEAK, STRENGTHENING MAY BE REQUIRED FOR BOTH THE PERMANENT AND TEMPORARY DESIGN
4	CONNECTION FROM THE EXISTING FLOOR TO THE FACADE	THE TEMPORARY WORKS SCHEME RELIES ON THE ADEQUACY OF THE EXISTING CONNECTION BETWEEN THE FACADE AND THE EXISTING FLOOR. WE HAVE NOT BEEN ABLE TO INVESTIGATE THIS CONNECTION SO CAN'T CONFIRM ITS ADEQUACY.
5	ASSESSMENT OF THE INTERACTION BETWEEN THE TEMPORARY STEELWORK AND EXISTING FACADE	THE TEMPORARY STABILITY SYSTEM HAS BEEN DESIGNED TO LIMIT THE LATERAL DEFLECTION ON THE FACADE TO HEIGHT/750 (IN ACCORDANCE WITH THE CIRIA BEST PRACTICE GUIDE FOR RETENTION OF MASONRY FACADES). FOLLOWING THE FACADE INTRUSIVE INVESTIGATIONS (TO ASCERTAIN THE MAKE-UP OF THE FACADE IE. STONE THICKNESS, BRICKWORK THICKNESS AND CAVITY SIZE) A COMPREHENSIVE ANALYTICAL MODEL OF THE FACADE AND STEELWORK WILL BE DEVELOPED. THIS WILL ALLOW US TO PREDICT AREAS WHICH ARE MORE LIKELY TO CRACK. IT SHOULD BE NOTED THAT WHEN UNDERTAKING SUCH MAJOR WORK TO A BUILDING A DEGREE OF CRACKING IS INEVITABLE AND AN ALLOWANCE FOR REPAIR WORK IS REQUIRED
6	CONNECTION BETWEEN TEMPORARY STEEL TO EXISTING STRUCTURE	WE HAVE SHOW A REASONABLY ROBUST CONNECTION DETAIL BETWEEN THE EXISTING CONCRETE ENCASED STEEL BEAMS AND TEMPORARY STEELWORK, HOWEVER UNTIL INVESTIGATIONS AND A DETAILED SURVEY HAS BEEN COMPLETED THIS CONNECTION CANNOT BE VARIFIED. IF THE EXISTING STRUCTURE IS SIGNIFICANTLY DIFFERENT (OR IN A DIFFERENT LOCATION) TO WHAT WE HAVE ASSUMED THIS CONNECTION WILL NEED TO BE CHANGED

① ON PLAN DENOTES RISKS AND UNKNOWNNS AS STATED IN TABLE ABOVE.



LEVEL 1 OUTLINE TEMPORARY WORKS / DEMOLITION PLAN

SCALE 1:100

TEMPORARY WORKS / DEMOLITION LEGEND

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TEMPORARY WORKS COLUMN SCHEDULE			
MARK	SIZE	COMMENTS	TENSION LOAD (SERVICE)

TEMPORARY WORKS STEEL MEMBER SCHEDULE		
MARK	TYPE	SIZE

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