Wellington Central Library

Concept Strengthening for Pricing – BI Solution

Base Isolation Solution

24m x 2.5m x 2.0m Deep
Pile Cap (100kg/m^3)
w/ 323dia x 12.7CHS
Screw piles w/2-900mm
dia Helix’s x 15m Long

1500x1500 Reinforced
Concrete Column
(175-200kg/m^3)

250mm Retaining wall
(100kg/m^3)

200mm slab on grade
over DPM on 20mm Sand
Blinding over 150mm hardfill

Note:
• Allowance to be made for the
seismic restraint to Existing and
New services, ceilings, partitions
etc. All restraints to comply with
the current Standards for new
installations.

FOUNDING DEPTH AND
DESIGN OF SCREWPILES
SUBJECT TO FURTHER
DETAILED GEOTECHNICAL
INVESTIGATIONS. LATERAL
LOAD TAKEOUT OF BASE
SHEAR ASSUMED TO
PRINCIPALLY BE THROUGH
PASSIVE PRESSURE ON
THE GROUND BEAMS AND
RETAINING WALLS. THIS
ASSUMPTION IS SUBJECT
TO FURTHER
INFORMATION ON THE
LIQUEFACTION RISK.

EXISTING RETAINING WALL
STABILITY OF EXISTING SLAB-ON-GRADE IN REGARDS TO POTENTIAL LIQUEFACTION UNKNOWN. (STUDIES REGARDING CIVIC SQUARE BY OTHERS ONGOING)

ALL NEW PILE CAPS TO BE TIED INTO EXISTING SLAB-ON-GRADE AND GROUND BEAMS. WATER-PROOFING/TANKING TO BE REINSTATED.

BASED ON THE POTENTIAL LIQUEFACTION RISK AND REMOVAL OF SUPPORT AT THE TOP OF THE RETAINING WALLS INSTALLATION OF STEEL SHS BRACES REQUIRED. REFER SK-BI-27 FOR TYPICAL RETAINING WALL DETAIL. (STUDIES REGARDING CIVIC SQUARE BY OTHERS ONGOING)

Note:
- Allowance to be made for the seismic restraint to Existing and New services, ceilings, partitions etc. All restraints to comply with the current Standards for new installations.
Note:
- Allowance to be made for the seismic restraint to Existing and New services, ceilings, partitions etc. All restraints to comply with the current Standards for new installations.

**Base Isolation Solution**

- **17 ~ 1260mm dia Lead Rubber Bearing (LRB)**
- **14 ~ 1550mm dia Lead Rubber Bearing (LRB)**
- **60 x 2000x2000mm Slider Plates** (support existing columns)
- **29 x 1800x1800mm Slider Plates** (support beams over existing retaining walls)

**KEY**

- 800HCBC264 – 600HCB199 – 800HCBC264 (haunch at both ends)
- 800HCBC264 – 600HCB199 (haunch at one end)
- 600HCB199
- 600HCB128
- Seismic Frame (REFER SK-BI-(11-20))
- Comflor80 x 1.2mm, 125mm Topping w/SE815 Mesh HD12 at 200c/s x 3.0m Saddle and Starter bars, typ
- 460UB67 Gravity Beam

**CONCEPT – FOR PRICING**

**PROJECT**
Wellington Central Library

**TITLE**
Concept Strengthening for Pricing – BI Solution

**Ground Floor Plan**

**DESIGNED**
T. Holden

**DRAWN**
T. Holden

**PROJECT No.**
253216

**SIZE**
-

**SCALE**
NTS

**DATE**
10-02-2020

**SKETCH No.**
SK-BI-03

**REV**
A

**Note:**
- Existing ground floor slab and floor beams to be removed. Temporary shoring required to support lateral and vertical loads while base isolation system installed.
Concept Strengthening for Pricing – BI Solution
Mez Floor Plan

T. Holden - 253267
NTS 10-02-2020
T. Holden - SK-BI-04

Hollowcore Support
(200x150x9RHS - REFER SK-MR-24)

Alpha-Slab Support
(250UC89/410UB59 + 100x6SHS -
REFER SK-MR-25)

Double-T Seating Support
(200x150x9RHS)

Column Restraint Tie
(RB32 Reid Bar -
REFER SK-MR-23)

Seismic Frame
(REFER SK-BI-(11-20))

Diaphragm strengthening
Tyfo SCH-41 FRP

KEY

Note:
- Allowance to be made for the seismic restraint to Existing and New services, ceilings, partitions etc. All restraints to comply with the current Standards for new installations.
- Where required rebate floor 12mm to allow FRP sheet installation. Contractor to apply levelling compound to meet existing levels.

Base Isolation Solution

FOR ALL OTHER DETAILS REFER TO MID-RANGE SOLUTION DOCUMENTATION
Note:
- Allowance to be made for the seismic restraint to Existing and New services, ceilings, partitions etc. All restraints to comply with the current Standards for new installations.
- Where required rebate floor 12mm to allow FRP sheet installation. Contractor to apply levelling compound to meet existing levels.
Base Isolation Solution

**KEY**
- Hollowcore Support (200x150x9RHS - REFER SK-MR-24)
- Alpha-Slab Support (250UC89/410UB59 + 100x6SHS - REFER SK-MR-25)
- Double-T Seating Support (200x150x9RHS)
- Column Restraint Tie (RB32 Reid Bar - REFER SK-MR-23)
- Seismic Frame (REFER SK-BI-(11-20))
- Diaphragm strengthening Tyfo SCH-41 FRP

**Note:**
- Allowance to be made for the seismic restraint to Existing and New services, ceilings, partitions etc. All restraints to comply with the current Standards for new installations.
- Where required rebate floor 12mm to allow FRP sheet installation. Contractor to apply levelling compound to meet existing levels.

For all other details refer to Mid-Range Solution Documentation
Base Isolation Solution

Note:

- Allowance to be made for the seismic restraint to Existing and New services, ceilings, partitions etc. All restraints to comply with the current Standards for new installations.
- Where required rebate floor 12mm to allow FRP sheet installation. Contractor to apply levelling compound to meet existing levels.

FOR ALL OTHER DETAILS REFER TO MID-RANGE SOLUTION DOCUMENTATION
CONCEPT – FOR PRICING

Wellington Central Library

Concept Strengthening for Pricing – BI Solution
4th Floor Plan

T. Holden

253267

NTS 10-02-2020

T. Holden

SK-BI-08

Note:

• Allowance to be made for the seismic restraint to Existing and New services, ceilings, partitions etc. All restraints to comply with the current Standards for new installations.
• Where required rebate floor 12mm to allow FRP sheet installation. Contractor to apply levelling compound to meet existing levels.

FOR ALL OTHER DETAILS REFER TO MID-RANGE SOLUTION DOCUMENTATION

CONCEPT – FOR PRICING

PROJECT
Wellington Central Library

TITLE
Concept Strengthening for Pricing – BI Solution
4th Floor Plan

DESIGNED
T. Holden

DRAWN
T. Holden

PROJECT No.
253267

SIZE
-

SCALE
NTS

DATE
10-02-2020

SKETCH No.
SK-BI-08

REV
A
Base Isolation Solution

KEY

- Hollowcore Support
  (200x150x9RHS - REFER SK-MR-24)
- Alpha-Slab Support
  (250UC89/410UB9 + 100x6SHS - REFER SK-MR-25)
- Double-T Seating Support
  (200x150x9RHS)
- Column Restraint Tie
  (RB32 Reid Bar - REFER SK-MR-23)
- Seismic Frame
  (REFER SK-BI-(11-20))

Diaphragm strengthening
Tyfo SCH-41 FRP

1 layer long. dir
1 layer trans. dir

Note:
- Allowance to be made for the seismic restraint to Existing and New services, ceilings, partitions etc. All restraints to comply with the current Standards for new installations.
- Where required rebate floor 12mm to allow FRP sheet installation. Contractor to apply levelling compound to meet existing levels.

FOR ALL OTHER DETAILS REFER TO MID-RANGE SOLUTION DOCUMENTATION
NEW CONCRETE SLAB WHERE NEW SERVICES TO BE RELOCATED. AREA AND LOCATION TBD. NOMINALLY COMFLOR 80 90MM TOPPING W/ SE815 MESH (HDM) HD12 AT 200C/S X 3.0M SADDLE AND STARTER BARS, TYP

NEW LATERAL BRACING FOR NEW SERVICES. EXTENT AND LOCATIONS TBD.

Note:
- Allowance to be made for the seismic restraint to Existing and New services, ceilings, partitions etc. All restraints to comply with the current Standards for new installations.

FOR ALL OTHER DETAILS REFER TO MID-RANGE SOLUTION DOCUMENTATION
NEW BEAMS TO BE TIED INTO EXISTING BEAMS AND NEW SLAB. ALLOW FOR SIGNIFICANT BREAKING OUT OF CONCRETE AND CAST-IN/EPOXY CONNECTIONS

REFER SK-MR-21 FOR INDICATIVE NEW TO EXISTING COLUMN CONNECTION
Gridline - 5

NEW BEAMS TO BE TIED INTO EXISTING BEAMS AND NEW SLAB. ALLOW FOR SIGNIFICANT BREAKING OUT OF CONCRETE AND CAST-IN/EPOXY CONNECTIONS

REFER SK-MR-21 FOR INDICATIVE NEW TO EXISTING COLUMN CONNECTION
NEW BEAMS TO BE TIED INTO EXISTING BEAMS AND NEW SLAB. ALLOW FOR SIGNIFICANT BREAKING OUT OF CONCRETE AND CAST- IN/EPOXY CONNECTIONS

REFER SK-MR-21 FOR INDICATIVE NEW TO EXISTING COLUMN CONNECTION
Gridline - 11

NEW BEAMS TO BE TIED INTO EXISTING BEAMS AND NEW SLAB. ALLOW FOR SIGNIFICANT BREAKING OUT OF CONCRETE AND CAST-IN/EPOXY CONNECTIONS

REFER SK-MR-21 FOR INDICATIVE NEW TO EXISTING COLUMN CONNECTION
Gridline - A

NEW BEAMS TO BE TIED INTO EXISTING BEAMS AND NEW SLAB. ALLOW FOR SIGNIFICANT BREAKING OUT OF CONCRETE AND CAST- IN/EPOXY CONNECTIONS

REFER SK-MR-21 FOR INDICATIVE NEW TO EXISTING COLUMN CONNECTION
NEW BEAMS TO BE TIED INTO EXISTING BEAMS AND NEW SLAB. ALLOW FOR SIGNIFICANT BREAKING OUT OF CONCRETE AND CAST-IN/EPOXY CONNECTIONS

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NEW BEAMS TO BE TIED INTO EXISTING BEAMS AND NEW SLAB. ALLOW FOR SIGNIFICANT BREAKING OUT OF CONCRETE AND CAST-IN/EPOXY CONNECTIONS

REFER SK-MR-21 FOR INDICATIVE NEW TO EXISTING COLUMN CONNECTION
Gridline - F

NEW BEAMS TO BE TIED INTO EXISTING BEAMS AND NEW SLAB. ALLOW FOR SIGNIFICANT BREAKING OUT OF CONCRETE AND CAST-IN/EPOXY CONNECTIONS

REFER SK-MR-21 FOR INDICATIVE NEW TO EXISTING COLUMN CONNECTION
NEW BEAMS TO BE TIED INTO EXISTING BEAMS AND NEW SLAB. ALLOW FOR SIGNIFICANT BREAKING OUT OF CONCRETE AND CAST-IN/EPOXY CONNECTIONS

REFER SK-MR-21 FOR INDICATIVE NEW TO EXISTING COLUMN CONNECTION
NEW LEAD RUBBER BEARING (LRB)
~1335mm SQ (1260mm dia LRB)
~1625mm SQ (1550mm dia LRB)

NOTE:
• LATERAL SUPPORT TO COLUMNS TO BE PROVIDED PRIOR TO REMOVAL OF THE EXISTING FLOOR BEAMS. TEMPORARY BRACES TO BE FOUND ON EXISTING GROUND BEAMS.
• NEW PILES AND FOUNDATIONS TO BE INSTALLED PRIOR TO REMOVAL OF GRAVITY SUPPORT. HYDRAULIC JACKS AND TEMPORARY SUPPORTS TO BE FOUND ON SPREADER BEAMS CAPABLE OF TRANSFERRING LOADS TO NEW AND EXISTING PILES.
• WORKS SHOULD BE COMPLETED SEQUENTIALLY AT EACH COLUMN LOCATION.
• CONTRACTOR TO PROVIDE FULL DETAILS ON TEMPORARY WORKS INCLUDING LATERAL AND GRAVITY SUPPORT.
**NOTE:**

- LATERAL SUPPORT TO COLUMNS TO BE PROVIDED PRIOR TO REMOVAL OF THE EXISTING FLOOR BEAMS. TEMPORARY BRACES TO BE FOUNDED ON EXISTING GROUND BEAMS.
- NEW PILES AND FOUNDATIONS TO BE INSTALLED PRIOR TO REMOVAL OF GRAVITY SUPPORT. HYDRAULIC JACKS AND TEMPORARY SUPPORTS TO BE FOUNDED ON SPREADER BEAMS CAPABLE OF TRANSFERING LOADS TO NEW AND EXISTING PILES.
- WORKS SHOULD BE COMPLETED SEQUENTIALLY AT EACH COLUMN LOCATION.
- CONTRACTOR TO PROVIDE FULL DETAILS ON TEMPORARY WORKS INCLUDING LATERAL AND GRAVITY SUPPORT.

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**EXCEPTING COLUMN**

**NEW SLIDER PLATE**

**GROUND**

- 2000x2000 STIFFENED BEAM COLUMN JOINT. CONCRETE FILLED
- 600HCB (REFER TO PLAN)
- TAPERED 800HCBC (REFER TO PLAN)
- NEW 2000x2000 SLIDER PLATE
- EXISTING COLUMN
- STRUCTURAL STEEL COLLAR ATTACHMENT. GROUT FILLED

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**CONCEPT – FOR PRICING**

**Wellington Central Library**

**Concept Strengthening for Pricing – BI Solution**

Cross Section - Base Isolation Plane
CONCEPT – FOR PRICING

Wellington Central Library

Cross Section - Base Isolation Plane

Concept Strengthening for Pricing – BI Solution

NEW 1800x1800 SLIDER PLATE

EXISTING COLUMN

STRUCTURAL STEEL COLLAR ATTACHMENT. GROUT FILLED

NEW SLIDER PLATE

GROUND

EXISTING COLUMN

NEW 1800x1800 SLIDER PLATE

~2000x2000 STIFFENED BEAM COLUMN JOINT. CONCRETE FILLED

600HCB (REFER TO PLAN)

NOTE:

• LATERAL SUPPORT TO COLUMNS TO BE PROVIDED PRIOR TO REMOVAL OF THE EXISTING FLOOR BEAMS. TEMPORARY BRACES TO BE FOUND ON EXISTING GROUND BEAMS.

• NEW PILES AND FOUNDATIONS TO BE INSTALLED PRIOR TO REMOVAL OF GRAVITY SUPPORT. HYDRAULIC JACKS AND TEMPORARY SUPPORTS TO BE FOUND ON SPREADER BEAMS CAPABLE OF TRANSFERING LOADS TO NEW AND EXISTING PILES.

• WORKS SHOULD BE COMPLETED SEQUENTIALLY AT EACH COLUMN LOCATION.

• CONTRACTOR TO PROVIDE FULL DETAILS ON TEMPORARY WORKS INCLUDING LATERAL AND GRAVITY SUPPORT.
EXISTING SUPERSTRUCTURE

EXISTING FOOTING TO BE REMOVED AND PILE CUT DOWN TO BASEMENT LEVEL. LONITUDINAL BARS RETAINED TO TIE INTO NEW FOOTING

NEW REINFORCED CONCRETE PLINTH

NEW 250mm REINFORCED CONCRETE RETAINING WALL

NEW SLAB ON GRADE. TIE INTO EXISTING FOOTING

NEW REINFORCED CONCRETE FOUNDATION AND PILES

NOTE:
• REFER TO NOTES ON SK-BI-21 FOR TEMPORARY PROPPING REQUIREMENTS

Issue with potential encroachment into Victoria Street to be resolved.

800

NEW COVER PLATE

NEW LEAD RUBBER BEARING (LRB)

NEW SLIDER PLATE ABOVE EXISTING WALL

TOP PORTION OF EXISTING WALL REMOVED

STRUCTRUAL STEEL COLLAR ATTACHMENT. GROUT FILLED

EXCAVATED AREA. TEMPORARY SHORING REQUIRED

EXISTING RETAINING WALL. REFER TO SK-BI-27 FOR NEW LATERAL BRACING

GROUND

BASEMENT

GROUT FILLED EXCAVATED AREA.

TEMPORARY SHORING REQUIRED

NEW SLAB ON GRADE. TIE INTO EXISTING FOOTING

NEW REINFORCED CONCRETE FOUNDATION AND PILES

NOTE:
New 200mm reinforced concrete pad \(1200 \times 1200 \times 1000D\) (150kg/m\(^3\))

Existing footing to be removed and pile cut down to bottom of new footing.

Longitudinal bars retained to tie into new footing.

New slider plate above existing wall

300mm slab on grade over DPM on 20mm sand blinding over 150mm hardfill. Tie into existing retaining wall

Cross section - base isolation plane

Issue with potential encroachment into Harris Street to be resolved

New cover plate

Base isolation solution

Structural steel collar attachment. Grout filled

Copy and paste the construction details into a text editor to format them appropriately.
EXISTING SUPERSTRUCTURE

NEW COVER PLATE

NEW 200mm REINFORCED CONCRETE RETAINING NIB

EXCAVATED AREA. TEMPORARY SHORING REQUIRED

TOP PORTION OF EXISTING WALL REMOVED

NEW SLIDER PLATE ABOVE EXISTING WALL

EXISTING RETAINING WALL. REFER TO SK-BI-27 FOR NEW LATERAL BRACING

NOTE:
- REFER TO NOTES ON SK-BI-21 FOR TEMPORARY PROPPING REQUIREMENTS
Top portion of existing wall removed

New cover plate

New slider plate above existing wall

Existing retaining wall

Existing ground beam

Existing superstructure

Ground

Base Isolation Solution

Concept Strengthening for Pricing – BI Solution

Typical Retaining Wall Lateral Bracing

T. Holden - SK-BI-27

CONCEPT – FOR PRICING

Wellington Central Library

NOTE:
- REFER TO NOTES ON SK-BI-21 FOR TEMPORARY PROPPING REQUIREMENTS

Base Isolation Solution
ALTERNATIVE PAVER COVER DETAIL AT SEISMIC MOVEMENT JOINT

LOCATIONS:

• TYPICAL AT BUILDING PARAMETER. POTENTIALLY SOLID PAVERS OR PANELS ALONG TRAFFICABLE INTERFACE WITH VICTORIA AND HARRIS STREETS. LIGHTWEIGHT GRILL OR STEEL OVERPLATE ELSEWHERE.

EXTENT DEPENDENT ON FINAL LEVEL OF NEW GROUND FLOOR AND ACCESS REQUIREMENTS
SEISMIC MOVEMENT JOINT ABOVE GROUND

- TYPICAL AT BUILDING PARAMETER WHERE GROUND FLOOR IS ABOVE PAVEMENT LEVEL.
- SIMILAR DETAIL AT EXTERIOR POOLS

EXTENT DEPENDENT ON FINAL LEVEL OF NEW GROUND FLOOR AND ACCESS REQUIREMENTS
LOCATIONS:

• PEDESTRIAN ACCESS OFF CIVIC SQUARE
• SIMILAR DETAILING REQUIRED FOR PEDESTRIAN ACCESS RAMP ADJACENT TO HARRIS STREET

NORTH AND SOUTH CORE STAIRWELLS
Wellington Central Library
Concept Strengthening for Pricing – BI Solution

Indicative Base Isolation Detailing at Movement Joint

T. Holden

NTS 10-02-2020

SK-BI-31

CONCEPT – FOR PRICING

Base Isolation Solution

INDICATIVE HANGING LIFT PIT DETAILING

RATTLESPACE REQUIRED

NORTH AND SOUTH CORE LIFTS
INDICATIVE SERVICES CONNECTIONS AT SEISMIC JOINT

- Typical Pressure Pipework Flexible Arrangement
  - STORMPLASTICS Φ 150 SWIVEL EXPANSION 'BAZOOKA' JOINT WITH FOUR 15' SWIVEL JOINTS
  - VICTAULIC S/155 STYLE 77 EXPANSION JOINT

- Typical Drainage Pipework Flexible Arrangement
  - EXPECTED DELFLECTION AT MAXIMUM CREDIBLE EARTHQUAKE (MCE) EVENT
  - GALVANISED STEEL PIPE SECTION BETWEEN EXPANSION JOINTS
  - VICTAULIC S/155 STYLE 77 EXPANSION JOINT