

GP:BP
6464-PA-GP01.RPT

19 July 2012

Westfield Design & Construction
GPO Box 4004
SYDNEY NSW 2001

Attention: Mr. Nabil Farag

Dear Sir,

RE: PROPOSED COMMERCIAL & RETAIL DEVELOPMENT
AT: WESTFIELD SHOPPING CENTRE, PARRAMATTA

INTRODUCTION

At your request MPN Group has compiled a summary report of comments and issues related to the structural engineering aspects of the proposed development in response to queries from the town planning consultant and the authorities.

This report is related to the master planning / DA for the centre and is similarly general in nature. Further investigations will be required to determine the precise extent and nature of the structural upgrade / strengthening works. The new development will also require a comprehensive geotechnical review of the existing data and possibly additional geotechnical work. These investigations will be undertaken at the project delivery stage.

The centre was originally constructed in the 1970's and has had a number of alterations and additions over the intervening years. MPN has been involved with the shopping centre since the 1970's and consequently has in its possession the structural documentation and geotechnical reports of these previous projects.

The shopping centre has a predominantly east-west axis with some cross malls. The land slopes down from south to north.

For ease of reference the centre has been divided into a number of separate zones labelled A to F as well as separate structural blocks labelled 1 to 39. Refer to the key diagram in Appendix 1.

GEOTECHNICAL ASPECTS

The geotechnical engineers who have been involved in the various building phases are Douglas Partners. An overview of the site geotechnical and hydrogeological conditions prepared by Douglas Partners is presented in Appendix 2.

STRUCTURAL ASPECTS

A summary of the major structural implications of the proposed development for each zone is as follows:

Zone A:

- Demolition of part Level 6m rooftop carpark and conversion of carpark Level 6 under to retail. New steel roof with skylight to cover the new retail level.
- Strengthening of the Level 6 carpark floor slab for the new retail loading requirements will be required. Lightweight partitions / walls and minimal floor topping is recommended to reduce the additional loads.

Zone B:

- A new commercial tower in lieu of the existing offices is proposed above the retail floors at the corner of Argyle and Church Streets.
- If the existing retail structure in that area is to be retained, all the existing columns and footings will need strengthening. Columns may be “jacketed” with additional reinforced concrete. Piled footings would be strengthened by the addition of extra piles and an appropriate pilecap connecting the new and existing piles. Pad footings would be strengthened by increasing the contact area of the base of the footings by constructing an additional “jacket” of reinforced concrete around and tied into the existing pads.
- Additional lateral bracing would be provided by new reinforced concrete lift and stair walls and other walls as required to cater for the increased lateral (earthquake) loads.
- Alternatively, partial or full demolition of the existing retail floors within the footprint of the proposed commercial tower may be undertaken and a new structure provided.
- No additional basements are planned so there would be no bulk excavation required. Only minor localised excavation for a lift shaft or piers is expected.

Zone C:

- Addition of three new carparking decks at Levels 7, 7m and 8.
- All the existing columns and footings will need strengthening. Columns may be “jacketed” with additional reinforced concrete. Piled footings would be strengthened by the addition of extra piles and an appropriate pilecap connecting the new and existing piles. Pad footings would be strengthened by increasing the contact area of the base of the footings by constructing an additional “jacket” of reinforced concrete around and tied into the existing pads.
- Additional lateral bracing comprising either inclined structural steel members or reinforced concrete walls will be required to cater for the increased lateral (earthquake) loads resulting from the additional vertical loads. This bracing will extend from ground to Level 6.

Zone D:

- Construct a new retail floor at Level 6 with a new steel roof over.
- Some existing columns and footings will need strengthening. This can be achieved in a similar manner as described in the Zone C upgrades.
- Additional lateral bracing extending from Ground to Level 4 as described in the Zone C upgrade will be required.

Zone E:

- Addition of three new carparking decks at Levels 6m, 7, and 7m.
- Some existing columns and footings will need strengthening. This can be achieved in a similar manner as described in the Zone C upgrades.
- Additional lateral bracing extending from ground up through 4 levels as described in the Zone C upgrade will be required.

Zone F:

- Conversion of the existing rooftop carpark at Level 6 to retail.
Two new carparking decks at Levels 7 and 7m.
- Lightweight partitions / walls and minimal floor topping is recommended to reduce the additional loads.
- Some existing columns and footings will need strengthening. This can be achieved in a similar manner as described in the Zone C upgrades.
- Additional lateral bracing extending from Ground to Level 3 as described in Zone C upgrade will be required.

Should the planner or authorities have any further queries related to structural matters please do not hesitate to contact the undersigned.

Yours faithfully

MPN GROUP PTY LIMITED



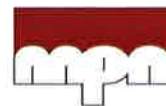
GEORGE PERL

Director

BSc, BE(Hons), MEngSc, MIEAust,
CPEng, NPER (Struct)

Appendix 1 – Key Diagram

Appendix 2 – Geotechnical and Hydrogeological overview by Douglas Partners



APPENDIX 1

NOTE:
KEY DIAGRAM COMPLETE FROM
MPN JOB No. 0001 TO 10032

REFER TO MPN
JOB No. 1071

REFER TO MPN
JOB No. 6808

REFER TO MPN
JOB No. 5261

REFER TO MPN
JOB No. 9000

CIVIL WORKS REFER TO MPN JOB No. 6807

MISCELLANEOUS JOBS WHERE DRAWINGS
OF ALTERATIONS/ADDITIONS NOT FOUND.

STAGE 1 (1076)
3216
3490
3690
4035
4306
4416

STAGE 3 ((6808))
7389
7700 - CINEMA
7701 - SHOP 2010A

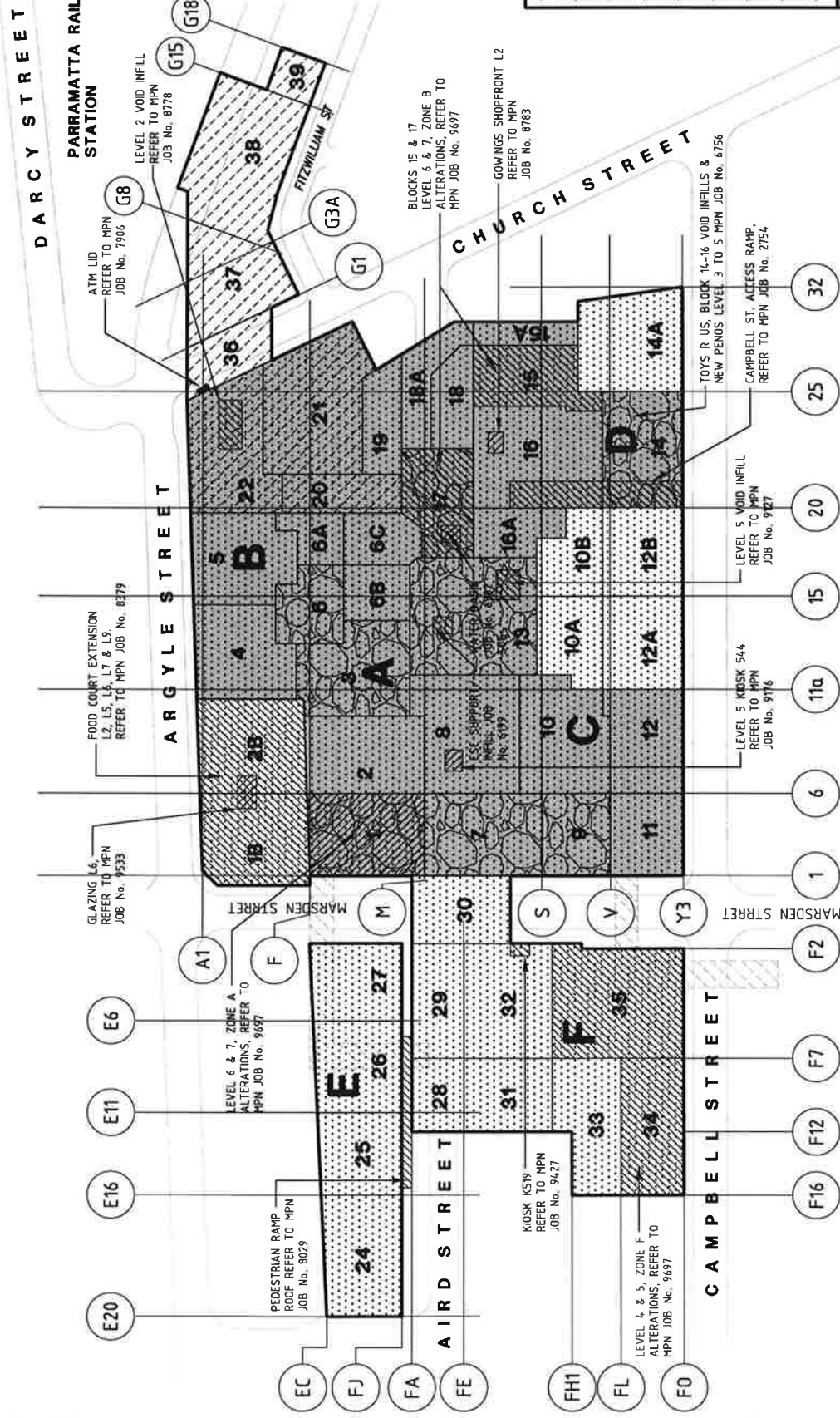
STAGE 4 (9000)
9291 - BAY SWISS
9299 - CINEMAS
9319 - NRMA
9520
9705
9835

STAGE 2 (5261)
5630
6326
6486
8456
8501 - SHOP 3006
8952
8973

9939-KMART AUTO
9971
9981

MISCELLANEOUS JOBS WHERE DRAWINGS
FOUND BUT LOCATION OF ALTERATIONS/
ADDITIONS UNKNOWN.

2490 - SPA/POOL
2992 - AC PLATFORM RL 19.574
3905 - TARGET STAIRS



NOTE:
FOR DRAWING REGISTER OF EACH JOB, REFER TO:
FOR STRUCTURAL DRAWINGS
REFER TO F./DRAWING LIST FILES/STRUCTURAL/
FOR CIVIL DRAWINGS
REFER TO F./DRAWING LIST FILES/CIVIL/

MPN GROUP PTY LTD
CONSULTING ENGINEERS - A.C.N. 001568878
LEVEL 4, 118 WALKER STREET, NORTH SYDNEY 2060
N.S.W. AUSTRALIA - TEL. (02) 9629 7144
EMAIL - email@mpn.com.au FAX. (02) 9922 3041



TITLE
**PARAMATTA WESTFIELD
SHOPPINGTOWN KEY DIAGRAM**
PARAMATTA, NEW SOUTH WALES, AUSTRALIA

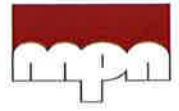
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SCALE
NOT TO SCALE

DATE LAST MODIFIED
01-06-2011 (B.B.)

DWG No.
KD-27

REVISION
A



APPENDIX 2

MPN Group Pty Ltd
Suite 1, Level 4
118 Walker Street
North Sydney NSW 2060

SYD120649
25 June 2012
CF

Attention: Mr George Perl

Email: George.Pperl@MPN.com.au

Dear Sirs

Proposed Upgrade of Westfield Shopping Complex
Argyle and Church Streets, Parramatta

1. Introduction

Following your request, Douglas Partners Pty Ltd (DP) is pleased to provide an overview of geotechnical information relevant to the Westfield Shopping Complex, Argyle and Church Streets, Parramatta, based on data held in DP's archives, for the site.

It is understood that a development application (DA) is currently being prepared for proposed additions to the complex, including additional levels to the existing building in the north-eastern quadrant of main section of the shopping centre. Further, we understand that this overview is required as a supporting document for the DA.

DP has had continuing involvement with extensions and additions in the Westfield Shopping Complex at Parramatta, with 13 geotechnical investigations carried out at the site since 1971. The most recent investigation carried out at the complex included a geotechnical investigation and foundation assessment, reported as follows:

- *Report on Geotechnical Investigation and Foundation Assessment, Proposed Upgrade of Westfield Shopping Centre, Argyle Street, Parramatta* (DP reference 14594F, dated November 2001).

The investigation included a review of boreholes drilled by DP over the site from the previous investigations, the drilling of ten (10) supplementary boreholes, a review of available construction information for the site and an assessment of the adequacy of the existing foundations to cater for the load increases associated with the proposed upgrade project(s).

2. Summary of Geology and Hydrogeology

Reference to the 1:100 000 scale Geological Series Sheet for the Sydney and Penrith regions indicates that the site is underlain by clay over weathered Ashfield Shale of the Wianamta Group of Triassic age. The investigations carried out by DP confirmed the presence of clays and shale beneath the site. The shale has been found to be extremely and highly weathered at the bedrock surface, becoming high strength generally within 3 – 4 m. The shale bedrock has been observed to be shallow at the south-east corner of the site, becoming progressively deeper to the north-west, with deep clay soils up to 15 m depth previously encountered at the corner of Argyle and Church Streets.

Previous investigations and observations of basement excavations have established that an igneous dyke traverses the site approximately diagonally, from the corner of Church and Argyle Streets to the corner of Marsden and Campbell Streets. The dyke may be responsible for sharp local variations in bedrock level and is represented by a deeply weathered zone of limited lateral extent comprising light grey and white clay. The bedrock adjacent to the dyke is typically highly fractured and extremely low or low strength.

Reference to the NSW Department of Environment and Climate Change Acid Sulphate Soils (ASS) risk map indicates that the site is located within an area of “no known occurrence” of ASS.

Long-term groundwater monitoring has not been carried out by DP, and the method of previous drilling carried out has, for the most part, precluded precise identification of the groundwater table. During drilling of two boreholes in the north-east quadrant of the site during the 2001 investigation in the basement loading dock, water was observed flowing out at the slab level. This indicates that a water table was present within the clay overburden in this area, at a level of at least RL +7.0 m with reference to the Australian Height Datum. Given the alluvial nature of the deep soil deposits in the area of the corner of Argyle and Church Streets, significant variations in groundwater could be expected due to climatic, seasonal and other factors.

3. Foundation Construction Information

DP conducted a review of available archived construction records held by Frankipile Australia Pty Ltd during the 2001 investigation. The information indicated that majority of the buildings in the shopping complex are supported by piles founded on the shale bedrock. Some pad footings were used in areas of shallow bedrock (in the south-east of the site), while the Aird Street North carpark was found to be supported on piles founded on very stiff clay, rather than shale.

We trust that this general information satisfies your current requirements. Please do not hesitate to contact either of the undersigned should you have any questions or require anything further.

Yours faithfully
Douglas Partners Pty Ltd



Caltlyn Falla
Geotechnical Engineer

Reviewed By



Bruce McPherson
Principal

Attachments: Notes About this Report