Future of Digital Boundaries

3D QLD TASKFORCE

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SSSI REPRESENTATIVE   18-10-2018

Navisworks

BIM

IFC

Reshaper

Revit

Maximo

Topics to be covered

- **Recap**
  - Vision
  - Team
  - Phases

- **Phase A Highlights**

- **Phase B Roadmap**

- **Future Concepts**

Vision

"To modernise the existing Cadastral framework into an efficient 3D cadastral system that will enable better integration of 3D design and facilitate simpler data extraction to support the growth of the Digital Built Environment"

3D QLD Team 2013

- **Peter Sippel** (Past Chair Surveyors Board QLD)

- **Steve Jacoby** (Executive Director Land and Spatial Information DNRME)

- **Russell Priebbenow** (Director of Surveys DNRME)

- **Elizabeth Dann** (Registrar of Titles DNRME)

- **Richard Statham** (Principal surveyor DNRME)

- **Andrew Curthoys** (Director Infrastructure Policy, Environmental & Taskforce BIM Implementation)

- **Lee Hellen** (SIBA Representative)

- **Chris Swane** (SSSI Representative)

- **Ken Cross** (AIMS Representative)

- **Alasdair Begley** (QSSA Representative)

Consultant Project Team

- **Alan Smart** (ACIL Allen Consulting)

- **Michael Haines** (Vanzi)

- **George Havakis** (GISSA)

- **Haydn Read** (NZ based consultant)

- **Peter Murphy** (Brazzier Motti)

- **Prof. Abbas Rajabifard** (Department of Infrastructure and Engineering)

- **Alan Hobson** (Cross River Rail)

- **Jim Plume** (BuildingSMART International)

PHASES

- **Phase A Report (February 2017)**

  - Justified Economic and Community Benefit   (refer www.3dqld.org)

- **Phase B report (August 2018)**

  - Development of Roadmap to Implementation

- **Phase C**

  - Pilot Projects and Recommendations

Phase A Highlights

- **Delivered in February 2017 - ACIL Allen Consulting Team**

- **Key Findings – Pressures on government and industry**

  o Demand for greater 3D positional and dimensional accuracy in the Cadastre;

  o Changes in technology, including increasing access to precise positioning;

  o Increasing demand for government data (such as the Cadastre) to be in digital form;

  o The impending modernisation of the Australian Datum;

  o Development of 3D databases in the private sector and by major cities;

  o Development of open data policies

  o The need to increase collaboration between government and industry in the use and exchange of digital cadastral and other land related data

  o The potential for further major productivity improvement in the construction and infrastructure sectors

  o The use of spatial data in support of data analytics in many areas including insurance and hazard risk management.

Mining
- Mining tenure
- 3D mine mapping
- 3D mapping of abandoned mines

3D Imagery
- State wide
- City
- Maps

Physical
- Topography
- Land cover
- Geology
- Coast geography

BIM
- Buildings
- Construction
- infrastructure

Utilities
- Electricity
- Natural gas
- Water
- Telecommunications

3D Digital Cadastre (freehold, leasehold, mining, RRR)

DCDB/Statutory
- Place Names
- Admin Boundaries
- ABS Data

Emergency/ Disaster
- Flooding
- Fire
- Landslip
- SES

Government Spatial Data Registries
- Roads
- Place names
- Topography
- Admin boundaries
- ABS boundaries
- Land cover
- Emergency services
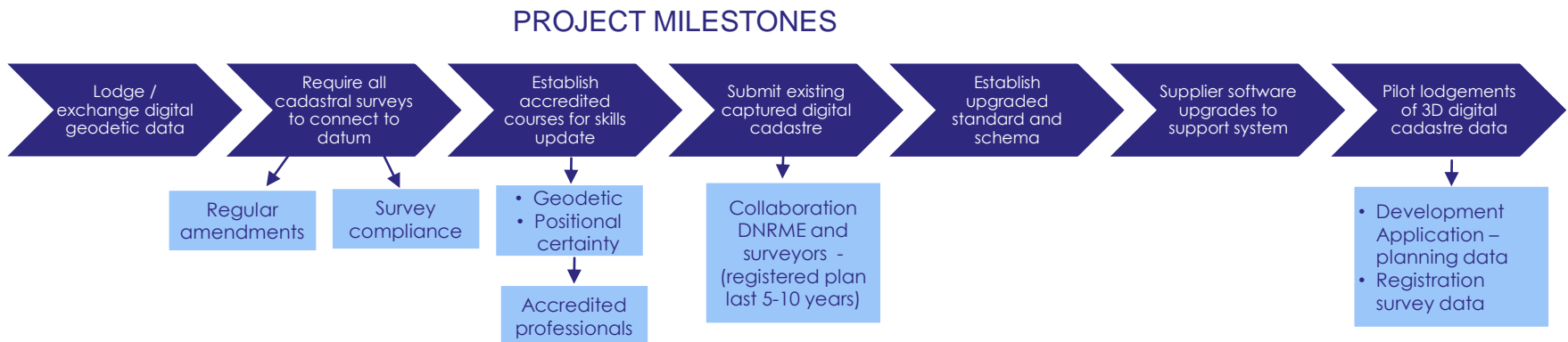- Mapping and other data

Core Spatial Data Maintained by Government
- Land parcels
- Mining register
- Addresses
- Property identifiers
- 3D co-ordinates

Business Controlled Spatial Data Registries
- Utilities
- Mining
- Surveying and mapping
- Planning and construction
- 3D city and building models
- Intelligent transport data
- Hazard mapping (insurance sector)

Phase B Roadmap – August 2018

- **The Cadastre QLD Transformation (CQT) is a DNRME initiative and part of the systems review process**

- **The project commenced 2018 and is due to conclude 2023**

- **Collaboration with the Department as part of the CQT process is vital and will involve establishing:**

  - Joint steering committees

  - Working groups

  - Trial projects; and

  - Development of standards / regulations

PROJECT MILESTONES

Lodge / exchange digital geodetic data	Require all cadastral surveys to connect to datum	Establish accredited courses for skills update	Submit existing captured digital cadastre	Establish upgraded standard and schema	Supplier software upgrades to support system	Pilot lodgements of 3D digital cadastre data

| Regular amendments | Survey compliance | • Geodetic
• Positional certainty | Collaboration DNRME and surveyors - (registered plan last 5-10 years) | | | • Development Application – planning data
• Registration survey data |

Accredited professionals

- **Final objective will be to establish an interface between the digital future and a digital numeric cadastre to facilitate:**

  - Accurate foundation co-ordinate framework

  - Digital Built Environment (DBE)

www.3dqld.org

Phase B in Detail

Initial Actions

- Conduct industry briefings to explain the Roadmap and objectives

- Establish working groups for the land and property, infrastructure and mining sectors

- Commence collaborative processes by establishing a user register

- Commence an audit of existing data

Short Term Actions

- Back capture of paper based and digital survey data

- Development of a numeric cadastre as a precursor to establishing the 3D digital cadastre

- Development of geodetic and positioning infrastructure

- Development of a new address management framework

- Development and implementation of pilot projects to demonstrate and test applications

Longer Term Actions

- State wide implementation of dynamic datum

- Development of digital lodgement and a pre-titles registration cadastre

- Develop business intelligence capability tools

- Workshops to review the data audit and 3D cadastre arrangements

- Assessment of the need for and conduct training programs

- Establish a platform Rights, Responsibilities & Restrictions - RRR (ICSM2034)

- Research into and development of a business case for integrated 3D models and of the digital built environment (DBE)

Pilot Projects and Review Framework
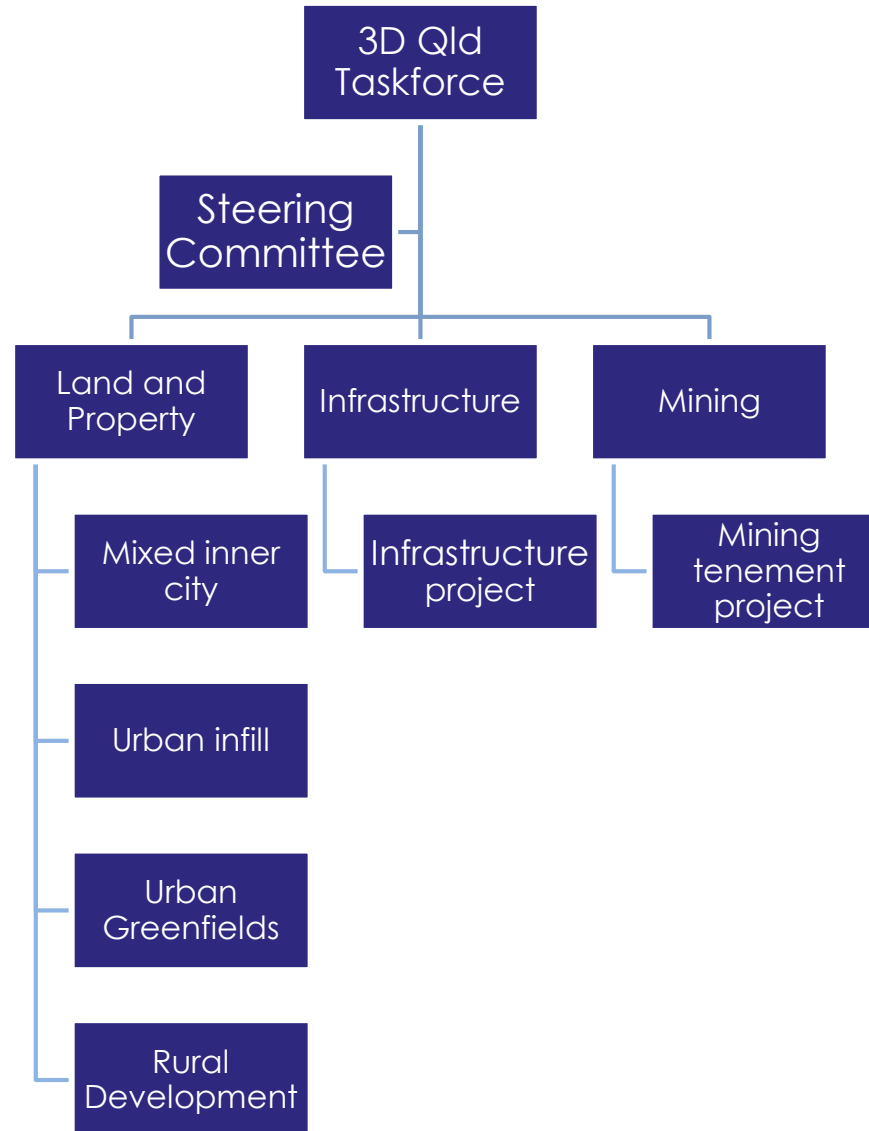
Actions and Timeframes

Activity	Responsibility	Commencement Date	Conclusion Date
Immediate imperatives			
Industry briefings	3D Qld Task Force	3Q 2018	4Q 2018
Establish 3 working groups - land and property, infrastructure and mining	3D Qld Task Force	4Q 2018	1Q 2019
Collaboration arrangements	DNRME/ 3D Qld Task Force		
– Establish user register		3Q 2018	2Q 2019
– Formalise the digital collaborative environment		4Q 2019	2Q 2023
Audit existing data	3DQld Task Force, Working Groups	3Q 2018	2Q 2020
Action to be commenced in the short term			
Prepare 3D digital data including back capture of paper based and digital survey data	DNRME/3DQld Task Force	3Q 2018	2Q 2023
Develop cadastral data sets	DNRME/3D Qld Task force		
– numeric cadastre		3Q 2018	3Q 2020
– 3D and 4D enabled cadastre		4Q 2020	2Q 2022
Establish Geodetic and Positioning infrastructure (GDA2020)	DNRME/Geoscience Australia	3Q 2018	2Q 2021

Actions and Timeframes (continued)

Activity	Responsibility	Commencement Date	Conclusion Date
Develop a new address management framework and technology	DNRME/Local Government/#D Qld Task Force	3Q 2018	2Q 2020
Formulate and implement pilot projects including a proof of concept project if judged necessary	3D Qld Task Force, Working Groups	3Q 2019	4Q 2021
Longer term actions			
State wide implementation of dynamic datum	DNRME/ICSM	3Q 2021	2Q 2023
Digital lodgement and pre-titles registration cadastre	DNRME, 3D Qld Task Force		
– digital lodgement tools and processes		4Q 2019	2Q 2023
– pre-titles registration cadastre		3Q 2021	2Q 2023
Develop business intelligence capability tools	3D Qld Task Force, DNRME	4Q 2019	2Q 2023
Workshops	3D Qld Task Force		
– Review data audit and discuss 3D Cadastre arrangements		4Q 2020	1Q 2021
– Integrating DBE models with 3D Cadastre		3Q 2022	4Q 2022
Training programs	3D Qld Task Force, SSSI, SIBA, education institutions		
Assessment of training needs in numeric cadastre processes and digital lodgement		3Q 2019	2Q 2020
Conduct training programs according to needs		3Q 2021	2Q 2022
Establish platform for RRR		3Q 2022	2Q 2023
Research into capturing BIM models and development of DBE models including cyber security	3D Qld Task Force, Working Groups, Industry, research institutions, CERT Australia	1Q 2021	4Q 2022
Develop business models for DBE and business intelligence	3D Qld Task Force/ industry	1Q 2023	Ongoing

Note: Initial actions can be commenced prior to Qld Government decision on funding for the CQT. Timing of subsequent actions depends on approval of the CQT program.

Progress

- **3d QLD costs to date $115,000**

- **Pilot Projects – Connection to Datum**
  - Flagstone Large Scale Residential Development
  - Capestone Large Scale Residential Development
  - Back Capture Trial

- **Legislative Response**
  - Survey Mapping & Infrastructure Act
  - Cadastral Survey Requirements
    - Standards for GNSS surveys
    - Large Scale Residential
    - Connection to Datum – 10 lots or more

Flagstone Pilot
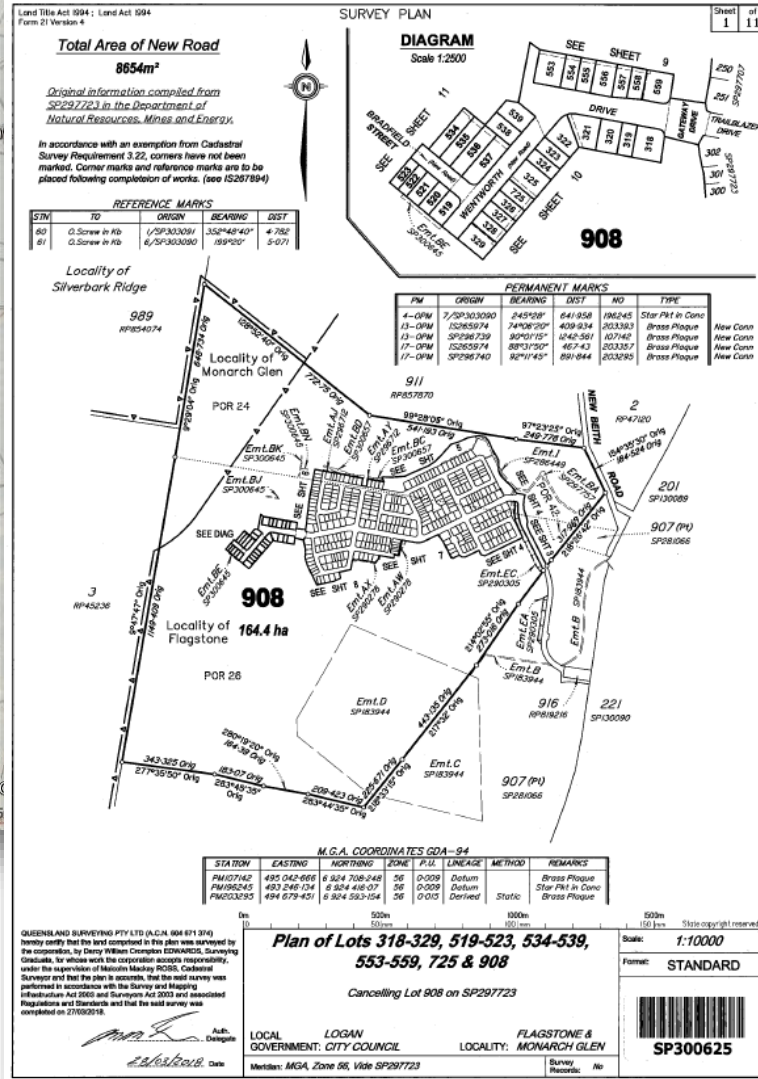
Future

- **Foundational Data Sets – single point of Truth**

- **Geodetic Framework**

- **Digital Numeric Cadastral Data set**

- **Digital Infrastructure Environment (ADAC etc. ……)**

- **Digital Built Environment (DBE)**
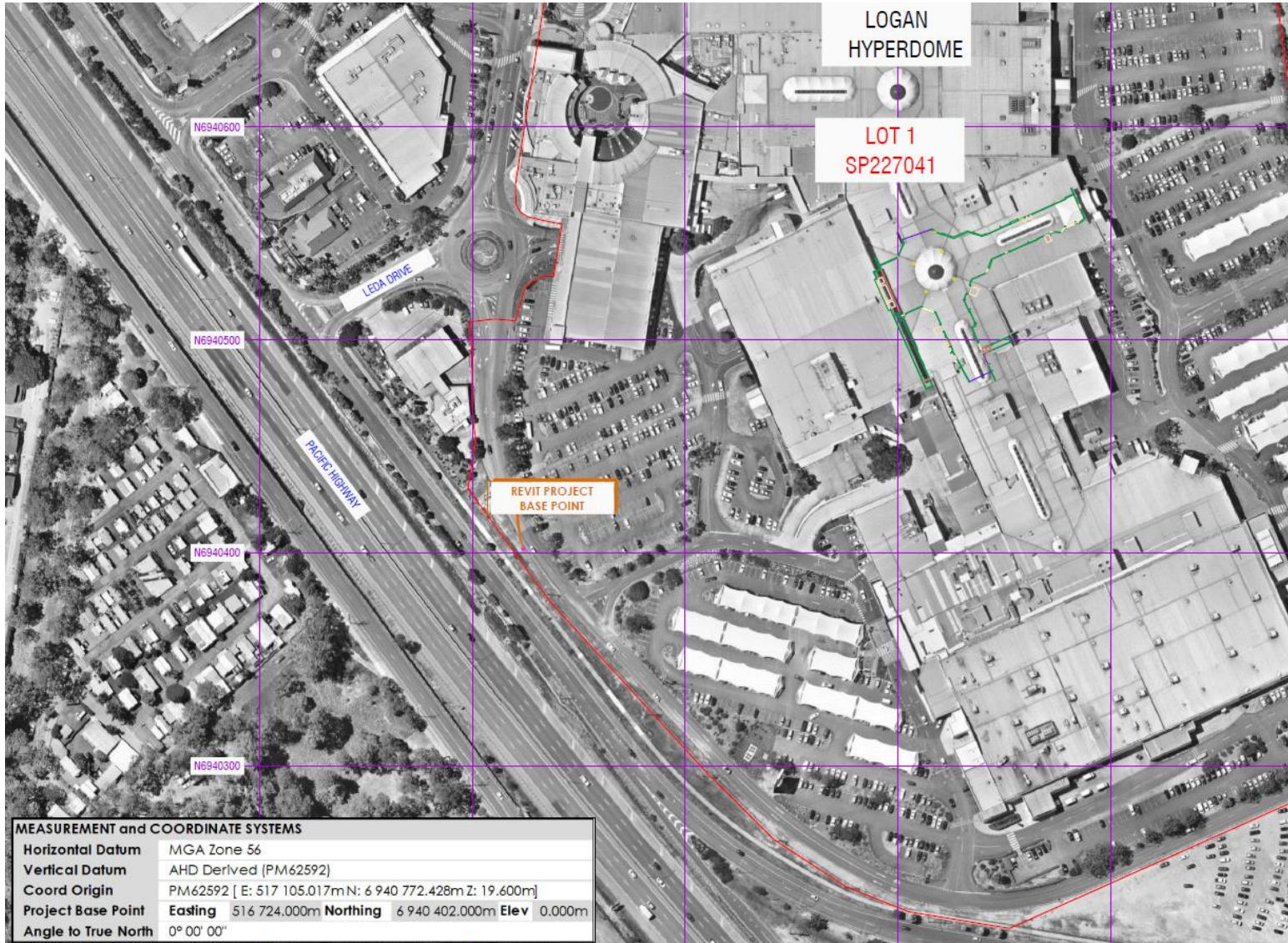
- **Seamless Integration of [Digital Data](#)**

How to be Involved

- **Please send an email to admin.qld.sssi.org.au**

REVIT Base Point

LOGAN HYPERDOME

LOT 1
SP227041

LEDA DRIVE

PACIFIC HIGHWAY

REVIT PROJECT
BASE POINT

N6940600

N6940500

N6940400

N6940300

| MEASUREMENT and COORDINATE SYSTEMS	
Horizontal Datum	MGA Zone 56
Vertical Datum	AHD Derived (PM62592)
Coord Origin	PM62592 [E: 517 105.017m N: 6 940 772.428m Z: 19.600m]
Project Base Point	Easting 516 724.000m Northing 6 940 402.000m Elev 0.000m
Angle to True North	0° 00' 00"

REVIT Data

Project Name

Project Number   05300

Client Name   QIC

Project Address   PROJECT

Project Architect   XX

Project Phase   DD

Rotation to True North 0.00°

BENNETT + BENNETT
Surveyors + Planners
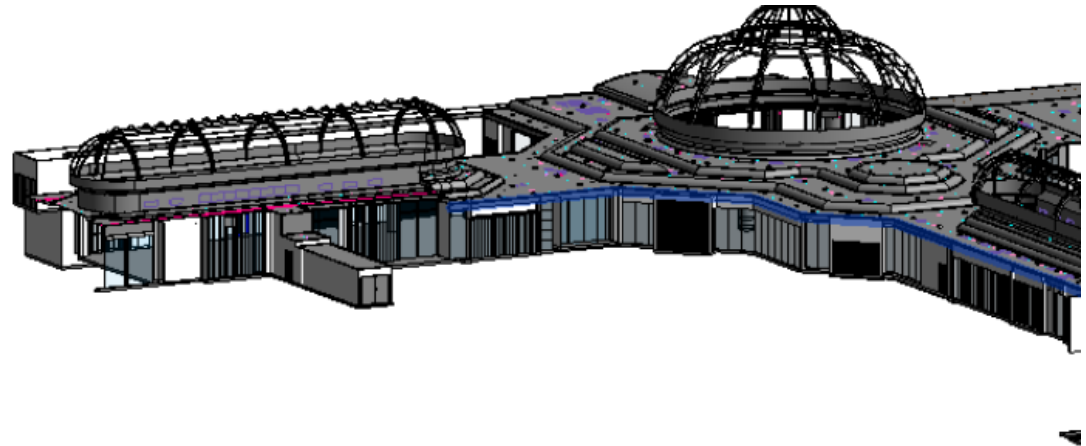
Project Name: HYPERDOME MALL – ZONES 1 TO 4 (HIGH LEVEL OF DETAIL)

Project Number: 05300

Survey Date: 21 – 28 MAY 2016

SURVEY Notes:
- Wall thicknesses are nominal only where scan data is not available.
- Piping and conduits have been modelled to the external surface visible at time of survey;
- Columns, walls and beams sizes are not necessarily structural as they may include cladding that was present at time of survey.
- Slab thicknesses are nominal in situations where a false ceiling existed at the time of survey.
- Additional data may have been captured at time of survey but may not have been modelled as part of this scope.

Typical IFC text file

```
DefaultUserDefinedParameterSets - Notepad

File  Edit  Format  View  Help

#
# User Defined PropertySet Definition File
#
# Format:
#    PropertySet:        <Pset Name>      I[nstance]/T[ype]      <element list separated by ','>
#        <Property Name 1>        <Data type>      <[opt] Revit parameter name, if different from IFC>
#        <Property Name 2>        <Data type>      <[opt] Revit parameter name, if different from IFC>
#        ...
#
# Data types supported: Area, Boolean, ClassificationReference, ColorTemperature, Count, Currency,
#        ElectricalCurrent, ElectricalEfficacy, ElectricalVoltage, Force, Frequency, Identifier,
#        Illuminance, Integer, Label, Length, LinearVelocity, Logical, LuminousFlux, LuminousIntensity,
#        NormalisedRatio, MassDensity, PlaneAngle, PositiveLength, PositivePlaneAngle, PositiveRatio,
#        Power, Pressure, Ratio, Real, Text, ThermalTransmittance, ThermodynamicTemperature, Volume,
#        VolumetricFlowRate
#
# Example property set definition for COBie:
#
#PropertySet:   COBie_Specification      T        IfcElementType
#        NominalLength    Real     COBie.Type.NominalLength
#        NominalWidth     Real     COBie.Type.NominalWidth
#        NominalHeight    Real     COBie.Type.NominalHeight
#        Shape            Text     COBie.Type.Shape
#        Size             Text     COBie.Type.Size
#        Color            Text     COBie.Type.Color
#        Finish           Text     COBie.Type.Finish
#        Grade            Text     COBie.Type.Grade
#        Material         Text     COBie.Type.Material
#        Constituents     Text     COBie.Type.Constituents
#        Features         Text     Cobie.Type.Features
#        AccessibilityPerformance        Text     COBie.Type.AccessibilityPerformance
#        CodePerformance Text     COBie.Type.CodePerformance
#        SustainabilityPerformance       Text     COBie.Type.SustainabilityPerformance
#
```

DCDB Point Identification

Thank You

Please register your interest with Katie