QLDC ASBUILT PLAN SPECIFICATION REQUIREMENTS

APRIL 2010

Contents

In 2008 QLDC introduced Hansen as its Asset Management System and converted all Geographic Information System (GIS) data from New Zealand Map Grid to New Zealand Transverse Mercator. Hansen has strict requirements for the assets' attributes, field names field types. As a result it has become necessary to update the Asbuilt Plan Specification Requirements with the requirements stated in this standard.

The aim of this standard is to create electronic drawings that are consistent irrespective of their source, and from which, underground service information can be easily incorporated into QLDC's GIS and Asset Management System.

SECTION 1

1.1 ACCURACY OF SURVEY

The following horizontal accuracy is required:

- X & Y coordinates ± 300mm (Northing & Easting)

The vertical accuracy requirements depend on the grade the asset is laid at. A high vertical accuracy is required for drainage and sewer assets laid at grades flatter than 0.55% (1:180).

- High vertical accuracy requirement: Z coordinates ± 20 mm (Lid & Invert levels etc)
- Normal vertical accuracy requirement: Z coordinates ± 40 mm (Lid & Invert levels etc).

Appropriate methods and measurement techniques should be chosen to ensure the required level of accuracy is achieved. Some methodologies (such as standard GPS techniques) will not achieve the high vertical accuracy requirement.

1.2 COORDINATE SYSTEM

- All files to be provided in terms of **New Zealand Transverse Mercator 2000** (NZTM2000) projection; New Zealand Geodetic Datum 2000 (NZGD2000).
- All levels to be provided in terms of metres above **Mean Sea Level,** (MSL; Dunedin Vertical Datum 1958).

1.3 FORMAT & MEDIA

All Asbuilt files shall be supplied in digital format compatible with AutoCAD 2000 and later versions (acceptable formats .dxf, .dwg) or ESRI shapefiles (.shp). An Adobe .pdf format of the completed plan (displaying the relevant detail listed in Section 2) must be supplied with the digital data package.

A hardcopy plan must also be supplied to: Principal Engineering, Lakes Environmental, 74 Shotover Street, Private Bag 50077, Queenstown. For plans larger than A3 size, Lakes Environmental may request additional copies to be supplied (after checking).

SECTION 2

FILE STRUCTURE

- Use the relevant Resource Consent number as the file name, e.g. RM010854.dwg
- Include only the following layers in the drawing:
  - Title block
  - Parcel
  - Roading
  - **Drainage (create features in green)**
  - **Water (create features in blue)**
  - **Sewer (create features in red)**
  - Benchmark (include source of levels or site benchmark blocks)
  - Features (Power, Telephone, Streetlights, Trees etc)
- Create an identification number / code (ID) for each point and pipe feature.
- Draw pipelines in **flow directions** (i.e. start drawing the line from the source node and end at the destination node) – the flow direction detailing in GIS is based on this.
- Pipelines should be **split** at Nodes and Manholes. Everywhere else use AutoCAD **snapping** tools to connect pipelines. Pipelines should not stop short of connecting to make room for the Node or Manhole symbol.
- All lines shall be **continuous** from node to node (no dashed lines).
- Use **AutoCAD Blocks** to create points and include all the required attributes in the blocks.
- All offset text to be included on the Title block layer. (i.e. Offset dimension text from boundaries to toby and lateral ends)
- Please show **all** pipes and nodes (including house connections, existing pipelines & manholes). Also detail any pipelines made redundant or removed. Mark existing, redundant or removed pipes in the comment field (SPECINST) accordingly.
- Please ensure **all relevant attributes** such as diameters, materials and levels are **clearly** shown for each pipe and point feature.
- Please ensure that all Asbuilt plans have a Title, Reference number (resource consent or contract number), Key (of symbols & abbreviations), Scale, Date, North Arrow, Surveyor's certification and signature of approval.

SECTION 3

REQUIRED FEATURES

Below are lists of possible feature types. Features in the drawing layers must be recorded and identified with the respective **UNITTYPE**. Please note that importing features is a semi automated procedure so it is important that spelling and case of UNITTYPEs and attributes are exactly as specified in this standard. The attributes that are required for each feature type are defined in the following section of this document. The field 'Feature Type' is not required as an attribute.

Possible Feature types:

1. Water Reticulation Layer

Point Features

Feature Type	UNITTYPE	Description
Hydrant	HYDRANT	Fire hydrants
Meter	FLOW	Bulk flow meters on mains
Meter	DOMESTIC	Domestic water meter located at Toby location on lateral
Node	JUNCTION	General pipe junction (Tee, Y, etc)
Node	END	End cap
Node	SAMPLE	Water quality sampling point
Node	MISC	Other nodes, fittings, outlet, bore etc
Valve	VALVE	Ball, Gate, Sluice etc
Valve	AIR	Air valve
Valve	NON RETURN	Non return
Valve	PRESSURE	Pressure reducing, sustaining
Valve	TOBY	Toby (on lateral)
Pump Station	BOOSTER	Booster pump station site
Pump Station	INTAKE	Raw water intake pump station site
Pump Station	TRANSFER	Transfer pump station
Treatment Plant	WATERTREAT	Water treatment plant site (including tanks, pumps etc)
Reservoir	WATERTANK	Water reservoir site (including tanks, telemetry, valves etc)

Line Features

Feature Type	UNITTYPE	Description
Main	MAIN	Water main
Main	FALL	Falling main (reservoir to watermain). No laterals
Main	RIDER	Small pipe feeding laterals from main
Main	RISING	Rising main (line out of pump station). No laterals
Main	RACE	Water race
Lateral	LATERAL	House connection (service line)

2. Sewer Reticulation Layer

Point Features

Feature Type	UNITTYPE	Description
Manhole	**MANHOLE**	Standard manhole
Manhole	**CHAMBER**	Chamber box
Manhole	**LAMPHOLE**	Small manhole / inspection point
Manhole	**PRESSURE**	Pressurised junction
Node	**JUNCTION**	General pipe junction (Tee, Y, etc)
Node	**BEND**	Pipe bend
Node	**END**	End cap
Node	**WEIR**	Weir
Node	**MISC**	Other nodes (outlet etc)
Valve	**VALVE**	Ball, Gate, Sluice etc
Valve	**AIR**	Air valve
Valve	**NON RETURN**	Non return valve
Pump Station	**SEWERPUMP**	Sewer pump station
Treatment Plant	**SEWERTREAT**	Sewer treatment plant site (including tanks, pumps etc)

Line Features

Feature Type	UNITTYPE	Description
Main	**SEWER**	Sewer main (gravity line)
Main	**TRUNK**	Main sewer line (large diameter). No laterals
Main	**RISING**	Pressurised rising main (line out of pump station)
Main	**OUTFALL**	Sewer Outfall
Lateral	**LATERAL**	House connection (service line)

3. Drainage Reticulation Layer

Point Features

Feature Type	UNITTYPE	Description
Manhole	MANHOLE	Standard manhole
Manhole	CHAMBER	Chamber box
Manhole	LAMPHOLE	Small manhole / inspection point
Meter	FLOW	Stormwater flow meter (Gauge)
Node	JUNCTION	General pipe junction (Tee, Y, etc)
Node	END	End cap
Node	MISC	Other nodes
Valve	VALVE	Gate valve etc
Inlet	MUDTANK	Cesspit, sump, mudtank, catchpit
Inlet	SOAKPIT	Soak pit (typically from mudtank)
Structure	INTAKE	Inlet to pipe network (headworks etc)
Structure	INTERCEPT	Pollution interceptor
Structure	OUTLET	Outlet from pipe network (distilling basin, soakage area) etc)
Storage Basin	BASIN	Storage/Retention basin
Pump Station	PUMP STATION	Stormwater Pump Station (future)

Line Features

Feature Type	UNITTYPE	Description
Main	STORM	Stormwater main
Main	DRAINCOIL	Perforated subsoil drain
Main	MUDTANK	Mudtank (sump) connection
Channel	CULVERT	Culvert
Channel	CHANNEL	Formed watercourse
Channel	IRRIGATION	Irrigation channel
Lateral	LATERAL	House connection (service line)

SECTION 4

4.1 FEATURE ATTRIBUTES

- For **pipes**, attributes should be attached via the use of an AutoCAD Block, inserted on the midpoint of each line or at the midpoint of any-one section of a line. The number of Blocks containing pipe IDs should be the same as the number of lines representing pipes.
- The requested **point attributes** shown on the following tables should be recorded in AutoCAD blocks, inserted in the centre of the point feature.

The attributes required per feature depend on the Feature Type. All point and pipe features have the same common attributes. Some Feature Types require further more specific attributes. The attributes required per Feature Type are listed in the tables below. The attributes required in addition to the common attributes are shown in purple. The underline attributes need to be populated by predefined values (look up values). Those values are listed in section 5 of this document.

4.1.1 COMMON ATTRIBUTES FOR ALL FEATURES

Common Attributes for all Features

Name	Field Type	Field Length	Description
UNITDESC	Text	300	Common Name
ZCOORD	Double		Elevation, Lid-Level (Point assets only)
CONDITION	Double		Condition assessment (1-5)
SPECINST	Text	254	Comments
INSTDATE	Date		Installation Date
ASBUILT*	Text	10	Resource Consent or Contract No.
OWN	Text	10	Ownership
SERVSTAT	Text	10	Lifecycle Status
UNITTYPE	Text	10	Asset (feature) subtype
COMPTYPE	Long Integer		Type Code

*Consent numbers should be in the format RM012345

The following features require only the common attributes:
- Drainage: **INLET, STRUCTURE, PUMP STATION, STORAGE BASIN**
- Sewer: **PUMP STATION, TREATMENT PLANT**
- Water: **HYDRANT, NODE, RESERVOIR, PUMP STATION, TREATMENT PLANT**

4.1.2 ATTRIBUTES FOR POINTS

Attributes for Drainage & Water METER

Name	Field Type	Field Length	Description
UNITDESC	Text	300	Common Name
ZCOORD *	Double		Elevation, Lid-Level
CONDITION	Double		Condition assessment (1-5)
SPECINST	Text	254	Comments
INSTDATE	Date		Installation Date
ASBUILT	Text	10	Resource Consent or Contract No.
OWN	Text	10	Ownership
SERVSTAT	Text	10	Lifecycle Status
UNITTYPE	Text	10	Asset (feature) subtype
COMPTYPE	Long Integer		Type Code
SERNO	Text	20	Meter Serial Number
METERSZ	Double		Nominal Diameter (mm)
MFG	Text	20	Manufacturer
MODELNO	Text	20	Model Number

* Not required for DOMESTIC water meters

Attributes for Drainage & Sewer MANHOLE

Name	Field Type	Field Length	Description
UNITDESC	Text	300	Common Name
ZCOORD	Double		Elevation, Lid-Level
CONDITION	Double		Condition assessment (1-5)
SPECINST	Text	254	Comments
INSTDATE	Date		Installation Date
ASBUILT	Text	10	Resource Consent or Contract No.
OWN	Text	10	Ownership
SERVSTAT	Text	10	Lifecycle Status
UNITTYPE	Text	10	Asset (feature) subtype
COMPTYPE	Long Integer		Type Code
CVRDIAM	Double		Lid Diameter (mm)
BARLDIAM *	Double		Manhole Size (mm)
HYDIST *	Double		Invert Level (amsl) (m)
WALLTYPE *	Text	10	Manhole Material
MHDEPTH *	Double		Manhole Depth (m)
MH_SHAPE	Text	9	Manhole Shape (Circle/Rectangle)

* Not required for LAMPHOLES

Attributes for Drainage & Sewer NODE

Name	Field Type	Field Length	Description
UNITDESC	Text	300	Common Name
ZCOORD *	Double		Elevation, Lid-Level
CONDITION	Double		Condition assessment (1-5)
SPECINST	Text	254	Comments
INSTDATE	Date		Installation Date
ASBUILT	Text	10	Resource Consent or Contract No.
OWN	Text	10	Ownership
SERVSTAT	Text	10	Lifecycle Status
UNITTYPE	Text	10	Asset (feature) subtype
COMPTYPE	Long Integer		Type Code
INV_LEVEL *	Double		Invert Level (m)

* Not required for END BEND or JUNCTION

Attributes for Drainage & Sewer VALVE

Name	Field Type	Field Length	Description
UNITDESC	Text	300	Common Name
ZCOORD	Double		Elevation, Lid-Level
CONDITION	Double		Condition assessment (1-5)
SPECINST	Text	254	Comments
INSTDATE	Date		Installation Date
ASBUILT	Text	10	Resource Consent or Contract No.
OWN	Text	10	Ownership
SERVSTAT	Text	10	Lifecycle Status
UNITTYPE	Text	10	Asset (feature) subtype
COMPTYPE	Long Integer		Type Code
RIMELEV	Double		Invert level (m)
SERNO	Text	20	Valve Serial Number
VALVESZ	Double		Nominal Diameter (mm)
MFG	Text	20	Manufacturer
VALVESTAT	Text	10	Valve Default Status (Open/ Closed)
MODELNO	Text	20	Model Number
VLVFUNCTIO	Text	15	Valve Function

Attributes for Water VALVE

Name	Field Type	Field Length	Description
UNITDESC	Text	300	Common Name
ZCOORD	Double		Elevation, Lid-Level
CONDITION	Double		Condition assessment (1-5)
SPECINST	Text	254	Comments
INSTDATE	Date		Installation Date
ASBUILT	Text	10	Resource Consent or Contract No.
OWN	Text	10	Ownership
SERVSTAT	Text	10	Lifecycle Status
UNITTYPE	Text	10	Asset (feature) subtype
COMPTYPE	Long Integer		Type Code
SERNO	Text	20	Valve Serial Number
VALVESZ	Double		Nominal Diameter (mm)
MFG	Text	20	Manufacturer
VALVESTAT *	Text	10	Valve Default Status (Open/ Closed)
MODELNO	Text	20	Model Number
VLVFUNCTIO *	Text	15	Valve Function
HIGHPRES *	Float		High Pressure Setting (m)
LOWPRES *	Float		Low Pressure Setting (m)

* Not required for Toby valve

4.1.3 ATTRIBUTES FOR PIPES

ATTRIBUTES FOR WATER MAIN

Name	Field Type	Field Length	Description
UNITDESC	Text	300	Common Name
CONDITION	Double		Condition assessment (1-5)
SPECINST	Text	254	Comments
INSTDATE	Date		Installation Date
ASBUILT	Text	10	Resource Consent or Contract No.
OWN	Text	10	Ownership
SERVSTAT	Text	10	Lifecycle Status
UNITTYPE	Text	10	Asset (feature) subtype
COMPTYPE	Long Integer		Type Code
PIPEDIAM	Double		Nominal Diameter (mm)
MFG	Text	20	Manufacturer
PIPETYPE	Text	10	Material
JTTYPE	Text	10	Joint Type
DPTH	Double		Typical cover depth to pipe (mm)

Attributes for Drainage & Sewer MAIN

Name	Field Type	Field Length	Description
UNITDESC	Text	300	Common Name
CONDITION	Double		Condition assessment (1-5)
SPECINST	Text	254	Comments
INSTDATE	Date		Installation Date
ASBUILT	Text	10	Resource Consent or Contract No.
OWN	Text	10	Ownership
SERVSTAT	Text	10	Lifecycle Status
UNITTYPE	Text	10	Asset (feature) subtype
COMPTYPE	Long Integer		Type Code
UPSELEV *	Double		Upstream Invert RL (m)
DWNELEV *	Double		Downstream Invert RL (m)
PIPEDIAM	Double		Nominal Diameter (mm)
MFG	Text	20	Manufacturer
PIPETYPE	Text	10	Material
JTTYPE	Text	10	Joint Type
UPSDEPTH *	Double		Upstream Cover Depth (mm)
DWNDPTH *	Double		Downstream Cover Depth (mm)

*Not required for mudtank mains

Attributes for LATERAL (all three services)

Name	Field Type	Field Length	Description
UNITDESC	Text	300	Common Name
CONDITION	Double		Condition assessment (1-5)
SPECINST	Text	254	Comments
INSTDATE	Date		Installation Date
ASBUILT	Text	10	Resource Consent or Contract No.
OWN	Text	10	Ownership
SERVSTAT	Text	10	Lifecycle Status
UNITTYPE	Text	10	Asset (feature) subtype
COMPTYPE	Long Integer		Type Code
PIPEDIAM	Double		Nominal Diameter (mm)
MFG	Text	20	Manufacturer
PIPETYPE	Text	10	Material
SRVTYPE	Text	10	Connection Type
METERED *	Text	1	Boundary Meter on Lateral? (Y/N)
TOBY *	Text	1	Boundary Toby on Lateral? (Y/N)

* Water laterals only

Attributes for Drainage CHANNEL

Name	Field Type	Field Length	Description
UNITDESC	Text	300	Common Name
CONDITION	Double		Condition assessment (1-5)
SPECINST	Text	254	Comments
INSTDATE	Date		Installation Date
ASBUILT	Text	10	Resource Consent or Contract No.
OWN	Text	10	Ownership
SERVSTAT	Text	10	Lifecycle Status
UNITTYPE	Text	10	Asset (feature) subtype
UPSELEV	Double		Upstream Invert RL (m)
DWNELEV	Double		Downstream Invert RL (m)
CONMATL	Text	10	Construction Material
COMPTYPE	Long Integer		Type Code
CHANSHAPE	Text	10	Channel Shape

SECTION 5

PREDEFINED ATTRIBUTE VALUES (LOOK UP VALUES)

Some of the Fields require predefined value inputs. The following tables list the inputs that are to be used in upper case.

COMPTYPE   Points – Feature Type

W	S	D	Value	Description
☑			12	Water Hydrant
☑			42	Water Meter
☑			43	Water Node
☑			46	Water Valve
☑			78	Water Pump Station
☑			99	Water Treatment Plant
☑			86	Water Reservoir
	☑		22	Sewer Manhole
	☑		24	Sewer Node
	☑		35	Sewer Valve
	☑		15	Sewer Pump (Lift) Station
	☑		98	Sewer Treatment Plant
		☑	30	Drainage Manhole
		☑	32	Drainage Node
		☑	29	Drainage Inlet
		☑	49	Drainage Valve
		☑	88	Drainage Meter
		☑	72	Drainage Structure (Miscellaneous)
		☑	77	Drainage Pump (Lift) Station
		☑	108	Drainage Storage Basin

COMPTYPE   Pipes – Feature Type

W	S	D	Value	Description
☑			41	Water Main
☑			45	Water Lateral
	☑		21	Sewer Main
	☑		26	Sewer Lateral
		☑	31	Drainage Main
		☑	28	Drainage Channel
		☑	33	Drainage Lateral

CONDITION

W	S	D	Value	Description
☑	☑	☑	1	Very good condition
☑	☑	☑	2	Minor defects only i.e. minor maintenance required 5%)
☑	☑	☑	3	Maintenance required to return to accepted level of service i.e. significant maintenance required (10-20%)
☑	☑	☑	4	Requires renewal i.e. significant renewal/ upgrade required (20-40%)
☑	☑	☑	5	Asset unserviceable i.e. over 50% of asset requires replacement

CONMATL

W	S	D	Value	Description
		☑	CONC	Concrete Lined
		☑	TIMBER	Timber Lined
		☑	EARTH	Earth
		☑	GRASS	Grass (Storm flow)

JTTYPE

W	S	D	Value	Description
	☑	☑	CERAMIC	Ceramic Portar
☑	☑	☑	RRJ	Rubber Ring
☑	☑	☑	WELD	Fusion Welded
☑			SOLVENT	Solvent
☑			LEAD	Lead
	☑	☑	BUTT	Butt
☑	☑		GIBAULT	Gibaulted
☑			ZLOCK	Z-Lock (for DI)
☑	☑		FLANGE	Flange Bolted

OWN

W	S	D	Value	Description
☑	☑	☑	QLDC	Queenstown Lakes District Council
☑	☑	☑	REGION	Otago Regional Council
☑	☑	☑	PRIVATE	Private Ownership

PIPETYPE

W	S	D	Value	Description
☑	☑	☑	AC	Asbestos Cement
☑	☑	☑	ALK	Alkathene
☑	☑	☑	CI	Cast Iron
☑	☑	☑	CLSTEEL	Concrete Lined Steel
☑			CLDI	Concrete Lined Ductile Iron
☑	☑	☑	CONC	Concrete
☑			COP	Copper
☑	☑		DI	Ductile Iron
	☑		EPOXY	Epoxy Lined
	☑	☑	EW	Earthenware
☑			GI	Galvanised Iron
		☑	NOVA	Drain Coil
☑	☑	☑	HDPE	Polyethylene (High Density)
☑	☑	☑	MDPE	Polyethylene (Medium Density)
☑	☑	☑	MPVC	M-Polyvinyl Chloride
☑			PP	Polypropylene
☑	☑	☑	PVC	Polyvinyl Chloride
☑			PVCo	Polyvinyl Chloride (Orientated)
☑	☑	☑	STEEL	Steel
☑	☑	☑	SRSTEEL	Spiral Riveted Steel
☑			SSTEEL	Stainless Steel
☑	☑	☑	UPVC	U-Polyvinyl Chloride

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SERVSTAT

W	S	D	Value	Description
☑	☑	☑	PROPOSED	Proposed
☑	☑	☑	ACTIVE	Active (In Use or for a new subdivision)
☑	☑	☑	INACTIVE	Out of Service (Not in Use)
☑	☑	☑	ABANDONED	Abandoned
☑	☑	☑	REDRAWN	Old data retired and redrawn

CHANSHAPE

W	S	D	Value	Description
		☑	NATURAL	Natural Channel / Watercourse
		☑	BOX	Box Channel
		☑	TRAP	Trapezoidal
		☑	DISH	Dished Channel
		☑	COMB	Combination

SRVTYPE

W	S	D	Value	Description
☑	☑	☑	RESSTD	Standard Residential
☑	☑	☑	RESMULTI	Residential (Multi-unit)
☑	☑	☑	RESRURAL	Rural Residential
☑	☑	☑	VISITOR	Visitor Accommodation
☑	☑	☑	COMIND	Commercial / Industrial
☑	☑		FARM	Farm (with stock)
☑			SEWERPS	Sewer Pump Station
☑	☑		TOILET	Public Toilet
☑			PARKS	Parks
☑	☑		HOSPITAL	Hospital
☑	☑	☑	SCHOOL	School
☑	☑	☑	OTHCOM	Other Community (Church etc)
☑		☑	POOL	Swimming Pool
☑			FIRE	Fire Fighting
☑			DIALYSIS	Dialysis Connection

VLVFUNCTION

W	S	D	Value	Description
☑			BOUNDARY	Boundary (Zone) Valve
☑	☑	☑	LINE	Line Valve
☑			INLET	Inlet Valve
☑			OUTLET	Outlet Valve
☑			INTERCONNECT	Interconnection Valve
☑			SURGE	Surge Valve
☑			WASHOUT	Washout Valve

WALLTYPE

W	S	D	Value	Description
	☑	☑	CONC	Concrete
	☑	☑	STEEL	Steel
☑			GRAVEL	Gravel ponds