### Drainage Symbols

For NetMaps, LiteSpatial (desktop), LiteSpatial Android and myWorld

<table>
<thead>
<tr>
<th>NetMaps</th>
<th>LiteSpatial (desktop)</th>
<th>LiteSpatial Android</th>
<th>myWorld</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Drainage</strong> – composite layer see NetMaps index for components with differences noted for this application where applicable.</td>
<td></td>
<td></td>
<td></td>
</tr>
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<td><strong>Drainage</strong> – composite layer see NetMaps index for components. All assets listed may not be available in all applications.</td>
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aquaDOC number
Manhole
An access point to Drainage pipes.
A standard access chamber is indicated by a filled circle and attached to an access chamber information box, which is round when indicating trafficable/heavy duty and square for medium duty.

- Access Chamber number
- Type and material
- Top (Reduced) Level
- F- from, the distance at right angles from a boundary.
- A- along, the distance along a boundary from an intersection of boundaries.

- Access Chambers located in open areas can be placed by coordinates. The abbreviations COORD is displayed.
- Any Access Chamber that has been scaled from a plan has an asterisk (*) in front of the distance and will be displayed in yellow.
- Any Access Chamber that is unsurveyed and has been plotted from design has APPROX displayed.

Types
- A- pipe size up to 900mm into MH
- B- pipe sizes from 1050mm to 1500mm into MH
- O- oversized
- S- special MHs with unusual size chamber

Bridge
A drain crossing, can be:
- OBR -Occupational crossing or footbridge
- RBR -Road Bridge

- The type is displayed in the information triangle, along with structure identification number and material type, with the Functional Location number below.

Construction material:
- BK- Brick

Owner can be:
- E- western power
Cathodic Protection
Cathodic Protection is for corrosion protection, by electrical charge, of steel pipes.

<table>
<thead>
<tr>
<th>Owners of Groundbeds can be:</th>
<th>Features are:</th>
</tr>
</thead>
<tbody>
<tr>
<td>WANG</td>
<td>Cathodic Anode</td>
</tr>
<tr>
<td>BP Oil</td>
<td>Cathodic Interference Test Point</td>
</tr>
<tr>
<td>Western Power</td>
<td>Cathodic Polarisation Probe</td>
</tr>
<tr>
<td>Alinta Gas</td>
<td>Cathodic Test Point</td>
</tr>
<tr>
<td>Telstra</td>
<td>Cathodic Transformer Rectifier</td>
</tr>
<tr>
<td>Water Corporation</td>
<td></td>
</tr>
</tbody>
</table>

Change Indicator
Displayed where there is a change in pipe type, size, grade, joint, bedding or open channel type.

Compensation Basin
Drainage storage basin.

Features can be:
- TWL - Top Water Level
- LWL - Low Water Level
- TB - Top of Bank level
- TOE - Bottom of Bank level

Types are:
- Dry basin
- Fenced, fully excavated, with low flow channel
- Fenced, fully excavated, without low flow channel
- Fenced, partially excavated, with comp basin
- Fenced, partially excavated, with open drain
- Flood plain
- Fully excavated, with low flow channel
- Natural lake
- Ornamental
- Ornamental pond
- Partially excavated, with low flow channel
- Soakaway
- Unfenced, fully excavated, with low flow channel
- Unfenced, fully excavated, without low flow channel
- Unfenced, partially excavated, with comp basin
- Unfenced, partially excavated, with open drain

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Culvert
A drain crossing which is a pipe or a series of pipes. The type is displayed in the information triangle, along with structure identification number and material type.

Types are:
- BPC- bank access culvert
- OBC- occupational box culvert
- OPC- occupational culvert
- RBC- road box culvert
- RPC- road culvert
- SYP- syphon

Materials can be:
- A- asbestos
- BK- brick
- CI- cast iron
- CM- concrete monier
- CTL- concrete tunnel
- CV- concrete voussoirs
- ECC- enclosed concrete channel
- ECCB- enclosed concrete channel bridge
- FRC- fibre reinforced concrete
- GB- glazed brick
- GRP- glass reinforced plastic
- HCAL- HEL-COR aluminium
- HCMS- HEL-COR galvanised mild steel
- MC- mass concrete
- MF- geofabrics megaflow
- P- polyvinyl chloride
- POLY- polyethylene
- RC- reinforced concrete
- RCBC- reinforced concrete box culvert
- S- steel
- VC- vitrified clay
- W- wood

Owner can be:
- E- western power
- G- alinta gas
- L- local authority
- M- main roads department
- P- private
- R- westrail
- S- SECWA
- W- water corporation

Direction of Flow
Indicates direction of flow for gravity pipes and open channels.

Enlargement
Enlargements are shown when information cannot be represented clearly with standard mapping scales.

Drain Crossing
Where other services cross a Water Corporation drain.

Types are:
- L.A.D.- Local Arterial Drainage
- GAS- Gas Alinta
- SEWER- Sewer
- TELECOM- Telstra
- WATER- Water
- WPOWER- Western Power
- WRAIL- Westrail
### Drain Fittings
Represented by a letter and identification number with a location indicator arrow

**Types**
- E  Extraction Point
- F  Continuously Logged Flow Station
- G  Groundwater Monitoring Site
- I  Industrial Waste Discharge
- M  Maximum Height Indicator
- Q  Water Quality-Sampling Site
- R  Continuously Logged Rain Gauge

### Gate
Indicates a Floodgate. And has the associated Information text box.

### Gauging Station
Flow Control Types:
- Natural
- Other
- Open Channel Control
- Pipe Control
- Weir

### Gravity Pipe
Information displayed on each pipe is type, upstream/downstream invert levels, length, nominal pipe size, pipe material, construction class, type of joint, grade, bedding and excavation detail are shown if available.

**Pipe Types**
- p- Branch or Main Drain
- SS- Subsoil Drain

<table>
<thead>
<tr>
<th>Pipe material</th>
<th>Type of joint</th>
<th>Bedding</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Asbestos</td>
<td>EFJ</td>
</tr>
<tr>
<td>BK</td>
<td>Brick</td>
<td>IFJ</td>
</tr>
<tr>
<td>CI</td>
<td>Cast Iron</td>
<td>RR</td>
</tr>
<tr>
<td>CM</td>
<td>Concrete Monier</td>
<td>SF</td>
</tr>
<tr>
<td>CTL</td>
<td>Concrete tunnel</td>
<td></td>
</tr>
<tr>
<td>CV</td>
<td>Concrete Vousoirs</td>
<td></td>
</tr>
<tr>
<td>ECC</td>
<td>Enclosed Concrete Channel</td>
<td>CF</td>
</tr>
<tr>
<td>ECCC</td>
<td>Enclosed Concrete Channel Bridge</td>
<td>CR</td>
</tr>
<tr>
<td>FRC</td>
<td>Fibre Reinforced Concrete</td>
<td>PB</td>
</tr>
<tr>
<td>HCAL</td>
<td>Hel-Cor Aluminium</td>
<td>PK</td>
</tr>
<tr>
<td>HCMS</td>
<td>Hel-Cor Galvanised Mild Steel</td>
<td>PW</td>
</tr>
<tr>
<td>MC</td>
<td>Mass Concrete</td>
<td>SB</td>
</tr>
</tbody>
</table>
Pipe materials of CV, GB, FRC, CM, RCBC, W, CTL, ECC, ECCB have a second diameter.

Construction class of pipe reinforced concrete only

Grades up to 1:50 shown to the nearest 0.1m.

Grades above 1:50 shown to the nearest whole number. If no grade available the –99.9 is displayed.

**Inlet**

Local Authority or Private connection. (Orange)
Pipe sizes, type and invert level shown.
Local Authority ID and number shown if available

**Meter**

Pitometers will show text with size

**Notes**

**Observation Bore**

There are Observation and Investigation Bores for monitoring purposes. They include a Sample Point

**Open Channel**

Information displayed for each inter-structure section is type of open channel, upstream/downstream invert levels, bottom width of channel, slide slope, grade and length.

Types:

- OA  Landscaped
- OE  Normal Open Earth
- OF  Open channel with flood levee
- OH  Half Pipe
- OL  Lined Channel
- OS  Swale-Shallow Depression
- OW  Natural Water Course

- **Bottom Width of Channel** - 4.5
- **Side Slope of Channel**. –99.9 is displayed if unknown - **1:12.2**
- **Length of Channel** - usually shown directly under Open Channel type – **142.0**
- **Grade** - **418**
Cross Section Levels
- TB - Top of Bank
- TOE - Bottom of Bank
- CL - Centreline
- TL - Top of Lining

Overpass
Where two Drainage pipes cross, but do not join.

Pipe Section
Seen as a stipple background to a Pipe, or Open Channel or Rising Main, this is an internal reference link to Asset information.

Penstock
An inlet pipe
Type:
- PS - Penstock
- PSO - Penstock with pipe

Construction material:
- CI - Cast iron
- PVC/SS - Polyvinyl chloride & stainless steel
- S - Steel
- SS - Stainless steel

Rising Main
- The letter R is displayed on the pipe between the pump station and discharge access chamber.
- Nominal pipe size & Pipe material shown above the Rising Main symbol.
- Test Pressure, shown right of Nominal pipe size & pipe material. If not available then –99.9 is displayed.
- Length, is shown below the Rising Main symbol.
- Upstream Invert Level, is shown at discharge manhole, if available

Pipe materials:
- A - Asbestos
- AC - Asbestos Cement
- DI - Ductile Iron
- FRC - Fibre Reinforced Concrete
- MSCL - Mild Steel Cement Lined
- P - Polyvinyl Chloride
- RC - Reinforced Concrete
- S - Steel

Valves on drainage pressure mains

Control valves:
- RV - Reflux
- SV - Sluice Valve
- BV - Butterfly Valve

Non-Control valves:
- DAV - Double Air Valve
- SAV - Single Air Valve
- SC - Scour

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**Structure**

Triangular information symbol attached to each structure type.

Information displayed if available includes:
- Construction Material
- Identification Number
- Top Level
- Ties as per access chamber

Types:
- Chute
- Control/Check
- Drop
- End of Pipe-responsibility ends here
- Flume
- Fuse
- Gully
- Inlet
- Inlet/Outlet
- Junction-Intersection only
- Outlet
- Pit Access
- Protection
- Shaft
- Spillway
- Transition
- Vent
- Weir

**Construction Material**

<table>
<thead>
<tr>
<th>A</th>
<th>Asbestos</th>
<th>SC</th>
<th>Spray Concrete</th>
</tr>
</thead>
<tbody>
<tr>
<td>BK</td>
<td>Brick</td>
<td>LS</td>
<td>Limestone</td>
</tr>
<tr>
<td>CB</td>
<td>Concrete Block</td>
<td>MC</td>
<td>Masonry Chute</td>
</tr>
<tr>
<td>CC</td>
<td>Concrete Chute</td>
<td>MT</td>
<td>Metal</td>
</tr>
<tr>
<td>CR</td>
<td>Concrete Revetment Mattress</td>
<td>RC</td>
<td>Reinforced Concrete</td>
</tr>
<tr>
<td>E</td>
<td>Earth</td>
<td>SB</td>
<td>Sandbag</td>
</tr>
</tbody>
</table>

**Pump Station**

Pump station name, number and planset number is displayed.

**Pipe Protection**

Pipe Protection can be Sleeve or Concrete Encasement on a pipe or Toe Protection on an open drain.

Indicated with a single line alongside the pipe on the away side from the cadastre, with both upstream distances measured from MH or Access Chamber, unless it starts or finishes at ends of drain in which case there is no distance shown.
**Special Features**
Two or more pipelines, large structures are shown in a manner compatible with the above standards.

**Local Authority Structures & Manholes**
Note: Local Authority and Private drainage is shown coloured orange.

**Drainage Hotspot**
Take care!! Coverage shows where the Water Corporation Assets are within 0.5m of Electrical or Gas underground assets.

<table>
<thead>
<tr>
<th>Revisions</th>
<th>Details</th>
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<tbody>
<tr>
<td>10 Mar 2009</td>
<td>Reviewed</td>
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<tr>
<td>18 Mar 2009</td>
<td>Added Gauging Stations</td>
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<tr>
<td>07 Sep 2010</td>
<td>Reviewed and added LiteSpatial view.</td>
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<tr>
<td>18 Feb 2013</td>
<td>Reviewed</td>
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<tr>
<td>18 Dec 2013</td>
<td>Reviewed and reformatted</td>
</tr>
<tr>
<td>25 Aug 2015</td>
<td>Reviewed, updated and reformatted. Added other application indexes</td>
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