NorthLink WA - Stage 2 project

Revegetation and landscaping works

Brayden Hill

GHEMS revegetation environmental
NorthLink WA: project overview

- $1.02b - value of project, funding by both Australian ($821m) & State Governments ($204m)
- 37 km of road link from between Morley and Muchea
- Constructed in three sections, Southern, Central and Northern section
- Central section from Reid and Tonkin highway interchange to Ellenbrook
Revegetation and landscaping scope of work

- Largest revegetation delivery undertaken by Main Roads to date - 1.7 million plants & 750 kg of native seed
- GHEMS scope of works for Central section (largest of the three sections), included:
  - 120 Ha & 500 kg of seeding
  - 1,176,880 native tubestock install
  - 1446 mature trees install
Performance criteria

Specific performance criteria included:

- General:
  - “supply planting teams...to achieve a minimal installation of 20,000 cell/tubes/units per dayshift”
  - “supply a Supervisor...for each planting team”
  - “maintain plants in an offsite storage area...sufficient for holding 6 days worth of planting stock (i.e. 120,000 plants)...with provision for watering”

- Direct seeding:
  - “seed will be pre-treated...batched as per species mix design...with carrier-bulking agent”
  - “broadcasting undertaken by hand”
  - “sown uniformly in overlapping passes...for complete seed coverage”
Performance criteria (cont.)

- Specific performance criteria for scope of works:
  - Planting:
    - “batched according to daily programme of works...not transported in uncover trailers”
    - “carry out planting as specified...using best industry practices and equipment”
    - “planting in accordance with the spacing, layout and setbacks as specified”
    - “removed from containers to minimise damage to leaves”
    - “plants installed centre and plumb...with fertilizer tablet...surrounding soil compacted to form a dish”
  - Completion criteria:
    - “complete daily docket of work completed (e.g. container size and units planted)...confirming acceptance criteria has been met (industry best standards, as per specified design, etc.)
  - And, of course, according to WHS requirements
Seeding
Surface preparation
Surface preparation

- Topsoil and mulch spreading
- Ripping, harrowing
- Site decompaction
Seeding
Seed preparation
Seed preparation

- Mix of ~150 different species of plants
- Multiple suppliers, 500 kg of seed for GHEMS portion.
- 40 separate seed mixes
Seeding

Direct seeding
Direct seeding

- Seed rate for area measured on site
- Mixed with carrier-bulking agent
Planting
Offsite holding nursery
Planting
Tubestock install
Tubestock install

- Nursery holding yard - adequate for truck deliveries from 3 nurseries
- Timing - construction schedules drive logistics and resourcing (scheduling of nursery deliveries, planting crews)
- 53 different planting mixes
- 150 different plant species
Tubestock install

- Timing constraints - time to complete the works with start date 21 June 2019:
  - 52 weekdays
  - Averaged 20,600 plants/day

4. Programme

The following Schedule is indicative only; the Subcontractor must confirm access with GNC prior to mobilising to the Project Site.

<table>
<thead>
<tr>
<th>Item</th>
<th>Establishment / Commencement Date (estimate)</th>
<th>Completion Date (estimate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seeding</td>
<td>13th May 2019*</td>
<td>1st September 2019*</td>
</tr>
<tr>
<td>Mature Tree Stock</td>
<td>27th May 2019*</td>
<td>1st September 2019*</td>
</tr>
<tr>
<td>Cells and Tubestock</td>
<td>10th June 2019*</td>
<td>1st September 2019*</td>
</tr>
</tbody>
</table>
Wildflower Mixes – 3 plants/m² & 3kg/ha of seed
Low mix - 1 plant/m²
Edge mix - 0.5 plants/m² & 4.5kg/ha of seed
Batter mix - 0.5 plants/m² & 4.5kg/ha of seed
Drainage mix - 1 plant/m²
Riparian Drainage mix - 6 plants/m²
Parkland Tree mix - 1 plant/16m²
<table>
<thead>
<tr>
<th>Features</th>
<th>Shrubs or Ground Covers</th>
<th>Trees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual use paths</td>
<td>1 m</td>
<td>3 m</td>
</tr>
<tr>
<td>Boundary fence/basin fence</td>
<td>3 m</td>
<td>5 m</td>
</tr>
<tr>
<td>Urban Area with barrier (setback from laterite gravel edge)</td>
<td>0.5 m</td>
<td>3 m</td>
</tr>
<tr>
<td>Urban Area without barrier (setback from laterite gravel edge)</td>
<td>0.5 m</td>
<td>10 m</td>
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<td>Rural Area with barrier (setback from laterite gravel edge)</td>
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Acknowledgements

GHEMS TEAM -
Hodge, Sam, Tegan, Wingy, Glen, Matt, Drewey, Jac, Claire, Simmo, Jason, Kirk, Dave, Dan, Luke, Tilly, Katie, Phil, Chooka, Maddi, Shai, Robyn, Nigel, Josh, Dylan, Elea, Jack, Ricardo, Tim, Patrick & Dillon.

GNC/OES PROJECT TEAM -
Matt M, Jayden, Campbell & Matt O.