1. INTRODUCTION AND OVERVIEW

INTRODUCTION

DCE has been engaged to undertake the Functional Design of the Moonee Valley Redevelopment.

Key elements of the Functional Design are as follows:
- Investigation into vertical alignment of the track as proposed against title boundaries.
- Access to and from track for horse movements, i.e. level control from stables to track via tunnel.
- Vehicular access from both adjoining roads and level control adjacent to Wilson and Dean Streets.
- Level control of track adjacent to the Freeway.
- General access issues relating to horse movements, maintenance etc.
- Liaison with Architects regarding building footprints and track levels.
- Determination of possible retaining walls.
- Possible layout for centre of track for horse movements from floats to stalls.
- Preliminary investigation into hydrological issues for water capture.
## 2. PROJECT

### CONTACTS

<table>
<thead>
<tr>
<th>Company</th>
<th>Name</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVRC</td>
<td>Michael Browell</td>
<td>(03) 9373 2222</td>
<td><a href="mailto:CEO@mvrc.net.au">CEO@mvrc.net.au</a></td>
</tr>
<tr>
<td>DCE</td>
<td>Shane Dalton</td>
<td>(03) 9886 6866</td>
<td><a href="mailto:shane@dcepofile.com">shane@dcepofile.com</a></td>
</tr>
<tr>
<td>DCE</td>
<td>Ross Mason</td>
<td>(03) 9886 6866</td>
<td><a href="mailto:ross@dcepofile.com">ross@dcepofile.com</a></td>
</tr>
<tr>
<td>DCE</td>
<td>Paul O'Callaghan</td>
<td>(03) 9886 6866</td>
<td><a href="mailto:pauloc@dcepofile.com">pauloc@dcepofile.com</a></td>
</tr>
<tr>
<td>Charter Keck Cramer</td>
<td>Charles Windeyer</td>
<td>(03) 9425 5150</td>
<td><a href="mailto:charles.windeyer@charterkc.com.au">charles.windeyer@charterkc.com.au</a></td>
</tr>
<tr>
<td>Plus Architecture</td>
<td>Craig Yelland</td>
<td>(03) 8696 3899</td>
<td><a href="mailto:cyelland@plusarchitecture.com.au">cyelland@plusarchitecture.com.au</a></td>
</tr>
<tr>
<td>Plus Architecture</td>
<td>James Hart</td>
<td>(03) 8696 3899</td>
<td><a href="mailto:jhart@plusarchitecture.com.au">jhart@plusarchitecture.com.au</a></td>
</tr>
<tr>
<td>Plus Architecture</td>
<td>Chris Harty</td>
<td>(03) 8696 3899</td>
<td><a href="mailto:charty@plusarchitecture.com.au">charty@plusarchitecture.com.au</a></td>
</tr>
<tr>
<td>Bosco Jonson (Survey)</td>
<td>Greg Williams</td>
<td>(03) 9699 1400</td>
<td></td>
</tr>
<tr>
<td>VicRoads</td>
<td>Don Purgue</td>
<td>(03) 9313 1179</td>
<td><a href="mailto:don.purue@roads.vic.gov.au">don.purue@roads.vic.gov.au</a></td>
</tr>
<tr>
<td>VicRoads</td>
<td>Mike Smith</td>
<td>0418 384 717</td>
<td></td>
</tr>
<tr>
<td>Melbourne Water</td>
<td>Peter Douglas</td>
<td>(03) 9235 7276</td>
<td><a href="mailto:Peter.Douglas@melbournewater.com.au">Peter.Douglas@melbournewater.com.au</a></td>
</tr>
<tr>
<td>CityLink</td>
<td>Robert Bartlett</td>
<td>(03) 8656 8693</td>
<td><a href="mailto:rbartlett@transurban.com">rbartlett@transurban.com</a></td>
</tr>
<tr>
<td>CityLink</td>
<td>Graham Widger</td>
<td>(03) 8658 8089</td>
<td><a href="mailto:gwidger@transurban.com">gwidger@transurban.com</a></td>
</tr>
<tr>
<td>City West Water</td>
<td>Joe Vassallo</td>
<td>(03) 9313 8431</td>
<td><a href="mailto:jvassallo@citywestwater.com.au">jvassallo@citywestwater.com.au</a></td>
</tr>
</tbody>
</table>
3. EXISTING CONDITIONS

EXISTING SURVEY

Dalton Consulting Engineers surveyor, Bosco Jonson, supplied feature and level survey of the Moonee Valley Racecourse and the surrounding Dean and Wilson Streets. The Boundary Re-establishment survey has also been completed.

All survey data that has been taken within the site title boundary has been completed by photogrammetry and the survey of Dean and Wilson Streets been obtained by ground survey.

DCE has also received all triangle data for the survey of Dean and Wilson Streets and photogrammetry, which has formed the base for the functional design.

Spot levels of the roof of the existing grandstand at the request of Plus Architects were also taken. These levels have provided to Plus Architects.
Citylink

DCE held an initial liaison meeting with CityLink.

DCE met with Robert Bartlett (Commercial Affairs Manager) and Graham Widger (Manager, Road Operations) on the 4 May 2010 to initiate conversation and address any concerns that CityLink may have. The below are the outcomes from the meeting:

- CityLink has no major issues with the new track alignment, however cannot provide formal comment at this stage.

- CityLink indicated that the proposed track alignment will restrict any possible option of an off ramp from the Tullamarine Freeway directly into Moonee Valley.

- Once survey levels are available, CityLink requests cross sections of the track interface with the Tullamarine Freeway.

- CityLink will be required to be involved in the detail design phase with items such as Sound Walls, Lighting, Signage, effects on traffic and drainage and the construction methodology. They will also require ground testing of the proposed new track location and existing Tullamarine Freeway in the area in question to ensure the works will not cause any effect to the existing Freeway.

- The existing Wilson and Dean Street Bridge over the Tullamarine Freeway are under the control of VicRoads and will need to be addressed by VicRoads.

- CityLink indicated that their overlay and control area is detailed on the Planning Scheme.
VicRoads

DCE held initial liaison meeting with VicRoads with regards to the new proposed track alignment. DCE met with Don Purgue and Mike Smith of VicRoads on 18 May 2010 to discuss the proposed new track alignment. Below are the initial comments from VicRoads:

- VicRoads have indicated that the Tullamarine Freeway adjoining Moonee Valley is not within their overlay and therefore CityLink will be required to be consulted. City Link has a lease on the Freeway until 2034.

- VicRoads noted that there appears to be no major issues with the new track alignment.

- If a sound wall is required, a minimum 2m set back from the wall will be required for maintenance.

- VicRoads will need to be consulted for any structures that are constructed near the Freeway.

- Detail design items such as sound walls, lighting and access will need to be discussed with VicRoads and CityLink.

- There are restrictions on signage which will need to be adhered to.
functional design report

MASTERPLANNING OVERVIEW
4. MASTERPLANNING OVERVIEW

DCE has completed a Functional design for the Moonee Valley Racecourse Proposed redevelopment.

The functional design investigated existing conditions of the site, existing services, available space and possible options which are available to the Moonee Valley Racing Club.

DCE has prepared a functional layout which achieves the key criteria of the Moonee Valley racing club – being a premier racing facility.

Items that were investigated included:

- Lighting
- Track grade, cross fall, start positions
- Water use
- Stormwater Drainage
- Infield use including Car park
- Race day facilities location
- Horse Movements
- Irrigation requirements
- Tunnels and access Points
- The effect of the surrounding development

DCE has consulted with David Maughan to evaluate and review horse and patron movements and the track infield area perspective.
DRRAINAGE & STORMWATER

Stormwater – Water Sensitive Urban Design

Moonee Valley Racecourse is irrigated from an on course dam. This dam harvests stormwater from adjacent stormwater pipes whose catchment includes the neighbouring residential areas. This enables an almost fully sustainable source which was recently upgraded with the assistance of City West Water funding.

The new track will utilise innovative techniques that will not only harvest water from stormwater pipes from adjacent residential areas, but will also capture all excess irrigation water from the track. The infield areas will be a major catchment source for future stormwater harvesting.

With the introduction of more efficient irrigation, a wider source of catchment area and the upgrading of the dam to a treatment pond, the Moonee Valley Racecourse will not only be sustainable for irrigation use, it will be a net exporter of Class B water. This excess irrigation source may be utilised for neighbourhood sports facilities.

Refer to the attached Plan.
Moonee Valley Racecourse is irrigated from an on-course dam. This dam harvests stormwater from adjacent stormwater pipes whose catchment includes the neighbouring residential areas. This enables an almost fully sustainable source which was recently upgraded with the assistance of City West Water funding.

The new track will utilise innovative techniques that will not only harvest water from stormwater pipes from adjacent residential areas, but will also capture all excess irrigation water from the track. The Irrigated areas will be a major catchment source for future stormwater harvesting.

With the introduction of more efficient irrigation, a wider source of catchment area and the upgrading of the dam to a treatment pond, the Moonee Valley Racecourse will not only be sustainable for irrigation use, it will be a net exporter of Class B water. This excess irrigation source may be utilised for neighbourhood sports facilities.
IRRIGATION

Irrigation is a vital to the sustainability of Moonee Valley Racecourse. DCE sort comment from Bernard Peasley (DCE’s irrigation consultant) with regards to constraints and requirements for irrigation of a 30m wide Course Proper.

Comments from Bernard Peasley
(DCE’s Irrigation Consultant)

Beyond ~25m track width the most significant problem is uniformity of coverage. As the width increases from 25m to 30m the radius of the sprinkler needed to cover properly increases from ~27m to 32m. At 32m only one or two of the very largest pop-up sprinkler manufacturers (Rainbird & Toro) make models that can satisfy the radius requirements. These sprinklers are very large, have a high flow rate and a high pressure requirement. They will only just achieve this large radius and do so by high angles of trajectory and high pressures.

- High angles of trajectory and high pressures are required to throw the water stream these large distances. However, when the stream of water is high off the ground and misting due to high pressure, wind becomes a most disruptive influence. Racecourses are plagued by the wind disruption of fixed sprinklers. It happens everywhere and cannot be overcome with fixed sprinklers along the rails.

- Therefore, as track widths increase, uniformity decreases and watering effectiveness declines. Prevailing winds cause ongoing sprinkler pattern distortion in a particular direction and turf growth becomes uneven over time. It does not matter how uniform the theoretical, zero wind, uniformity of a particular sprinkler is; once the wind begins to disrupt water streams that have to be thrown so high, the turf quality will be affected.

- At 25m width, many pop-up systems perform quite well without back systems such as travelling irrigators (e.g. Uptons & Briggs styles). As the width increase to 26m, 27m and beyond to 30m, problems develop that have no convenient solution.
LIGHTING

Below are comments for Dalton Consulting Engineers
Electrical consultant, Dr Richard Dluzeniak

PROPOSED TURF TRACK FLOODLIGHTING
FOR PROPOSED RACECOURSE UPGRADE
AT MOONEE VALLEY RACING CLUB

PROPOSAL FOR LIGHTING OF THE TURF TRACK

1 Lighting Level

The lighting level (illuminance) proposed for the turf track is 1200 lux (maintained constant level) which is that required for good CTV transmission of a race at the distances encountered in filming a gallops race. This level also adequately satisfies the lighting requirements for spectators, jockeys and Stipendiary Stewards.

This 1200 lux level of lighting is slightly higher than that currently installed at the track. Moreover, this level proposed is a maintained constant level throughout the life of the lighting installation which can be achieved by using state of the art electronic lamp control technology.

The 1200 lux recommended is the level of light to the main CTV camera, that is, the vertical lighting on the sides of the horses as they run around the track; the corresponding horizontal level of light on the actual track surface is proposed to be 900 lux (maintained constant level).

2 Lighting System

The lighting system proposed for the track would be similar to the existing system, that is, floodlights would be mounted on fixed steel masts located around the track in positions required to realise the lighting levels to the main CTV camera, Steward’s cameras and photo finish camera. The floodlights would be located in areas as generally shown on Drawing No. LT-01.

2.1 Front Straight

The floodlights for the front straight lighting would be mounted on both the roof structure and steel masts located along the front straight. All masts would be located well back from the track to preserve the sight lines. The front straight masts would be typically 20-25m in height.

2.2 Back Straight and Turns

All the back straight and turns floodlights would be mounted on steel masts typically 16-18m in height located in the infield. The masts would be typically offset 16m from the rail and spaced 35-45m apart. These nominal mast heights and spacing’s will be reviewed during the preliminary design stage in order to ensure adequate control of spill light and glare as discussed in the next Clause.

3.0 Spill Light and Glare

It is important to note that limiting light spill and glare emanating from the track lighting will be a major lighting design challenge. The close proximity of residential dwellings in Dean Street will be subject to spill light and motorists travelling along the Tullamarine Freeway will be subject to glare.

Spill light considerations will also have to be taken into account in the vicinity of the proposed new residential / commercial development.

The lighting design in these areas will require very special consideration including:
a. Extensive louvring (shielding) installed on the floodlights to limit the spill and glare components.

b. Reduction in mast heights and spacing’s to bring the floodlights closer to the track in order to reduce the visual impact of the floodlights and the aiming angles.

c. Lighting only that part of the track width (the racing band) which will be used for racing.

d. Dimming the lights in between races (Refer to Clause 4).

e. Relaxing the lighting levels in these locations (only as a last resort) to limit the spill light and glare.

Extensive computer modelling and simulation will be necessary and will be carried out by ASC to determine the best solution to this problem.

The permissible amount of spill light and glare emanating from the lighting installation is limited as per the requirements of Australian Standard AS4282:1997 – Control of the Obtrusive Effects of Outdoor Lighting. This is the applicable Standard for obtrusive light and the following limits are prescribed for spill light and glare:

Max spill light Es on residential property boundary Es=10 lux measured normal to boundary

Max spill light Es on residential property at the boundary Es=20 lux of a commercial / residential zone measured normal to boundary

Max glare TI (threshold increment) experienced by a motorist driving a vehicle in the vicinity of the lights TI=20%

These max limits may be negotiated (upwards) with the Responsible Authority at the planning permit stage. Note: the spill light level was determined as 15 lux by the Responsible Authority in the planning permit for the existing track lighting installation at the MVRC.

4 Light Dimming

It is proposed to install state of the art electronic dimming of all the track lights. The dimming system would have the following features:

a. The lights would be dimmed before and after a race meeting and during the interval between races. This results in substantial power and energy (and greenhouse gas emission) savings of typically 30%.

b. The lights would be dimmed to 60% of the design level of 1200 lux, that is 720 lux, hence for most of the race meeting the lighting level is only 720 lux. For a typical night meeting where the lights are on for 5 hours, 4 hours would be at the dimmed level of 720 lux and 1 hour would be at the design level of 1200 lux.

c. All non televised use of the track (eg trials and training) would be lit at the dimmed level.

Apart from the substantial energy savings using dimming, the system also has clear environmental benefits. Both the spill light and glare are reduced by 40% when dimming is used and the full design level is only on for less than 25% of the total time the track lighting is on.
5 Floodlights and Lamps

It is proposed to use modern 2kW compact source metal halide lamps fitted into small projector type floodlights as the lighting source for the track. This type of floodlight/lamp combination is used in the majority of new sports lighting systems in Australia and overseas. It is expected the total number of floodlights required for the complete installation will be in the order of 750.

6 Emergency Track Lighting

It is proposed to connect approximately 150 floodlights around the track onto an emergency supply derived from an on-site diesel generator set operating continuously during the course of a race meeting. This emergency supply will ensure that should the normal power supply fail, the race track and public areas will have sufficient lighting for the safe termination of a race and the safe movement of patrons and officials.

7 Australian Sportsvision Consultants

The approach to the analysis and design of the lighting installation and spill light / glare control for the proposed new track, as described above, will closely follow that adopted earlier by ASC in the successful lighting of the existing track.
5. PLANS