

ACPA 2011 Project Achievement Awards Dimple Dell Tunnel, Sandy, UT

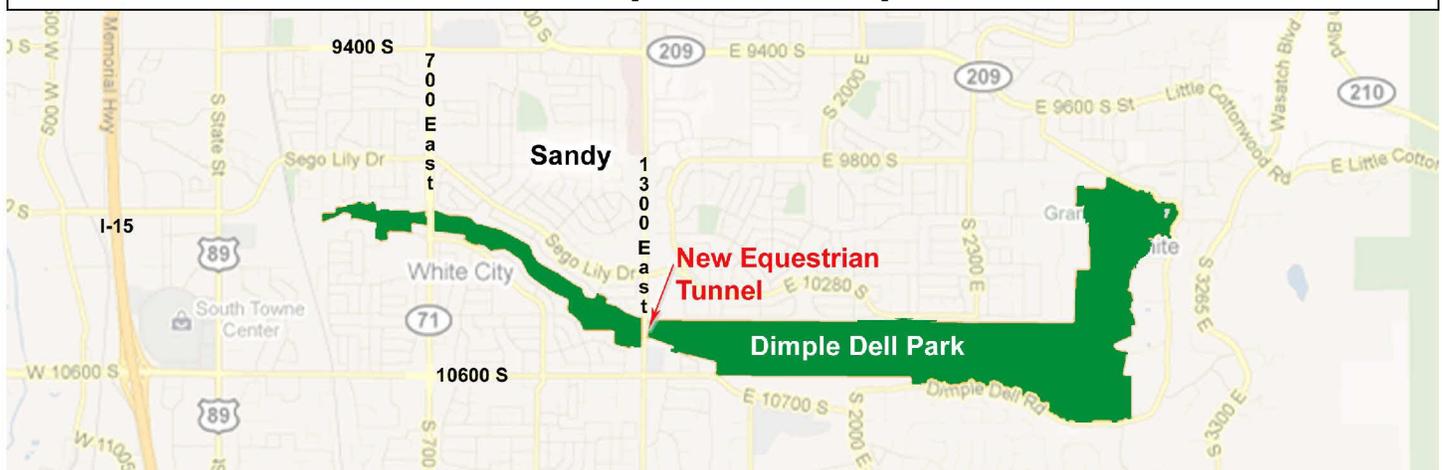


Megabox provides equestrian crossing for major roadway

Dimple Dell Recreational Nature Park is a great place to ride horses, mountain bikes or hike. The 644-acre park is long (with nearly five miles of trail) and narrow. Until now, users had to cross 1300 East (nearly 30,000 cars per day) to get from the east half of the park to the west side. A cooperative project between UDOT, Sandy City and

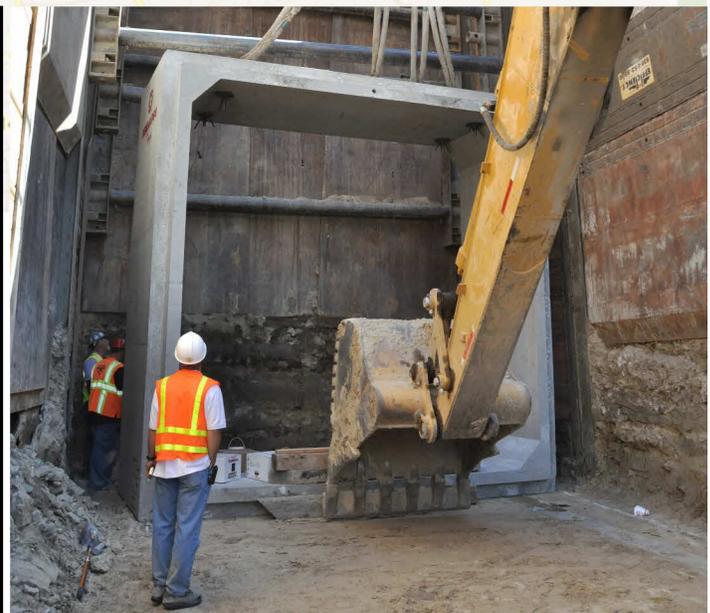
Salt Lake County has created a tunnel under 1300 East. The 14' x 14' tunnel was selected to provide an open feel to the horseback riders, mountain bikers and hikers that will use it. It was also of a size that could allow some emergency vehicle access. The tunnel is part of a \$30 million project to improve traffic safety along 1300 East.

Dimple Dell Map



Dimple Dell Tunnel

- 14' x 14' foot precast concrete megabox culvert (156 feet long)
- 26 box sections with 6' lay lengths
- Box Sections weigh 25 tons each
- 30 feet deep with 15 feet of cover over the box
- Box culvert had to be slid under major water lines that could not be taken out of service



Innovation

To construct project, three major water lines had to be kept in service. These water lines had to be strapped to I-beams for structural support. The Megabox sections were lowered in between the water lines and shoring supports before being slid laterally into place. Concrete skids were used for control. Gasket lubricant was placed on the skids to make sliding the box sections easier. The process became so efficient that the crews typically had time to spare before the next pilot car and truck arrived with a box section.



Environmental Benefits

The 14' x 14' foot tunnel is a critical link for the open space that has been so difficult to preserve. The use of Megabox provided for headroom clearance for an open feel and some access to emergency vehicles. The invert of the tunnel has been filled with soil so that the horses feel more comfortable while going through the tunnel. There was concern that the soil would spill out of the tunnel, so the owner asked Geneva Pipe to sandblast the invert of the sections (it was felt that the concrete was too smooth). Interior lighting for the tunnel was provided through the installation of electrical conduit cast into box culvert.

Use of New Materials/Technology–

Megabox culverts are those that are larger than the standard sizes in ASTM specifications (greater than 12' x 12'). The 14' x 14' box culvert was designed using BOXCAR. Also, Key was the “Thru Pipe” lifting devices which allowed the contractor to lift the concrete structure itself rather than a lifting pin within the concrete. This allowed the 25 Ton structures to be handled with the highest degree of safety. A special SCC Mix Design was used to produce a design strength of 5000 psi in 7 Hours. This allowed the sections to be double cycled or (poured twice a day), to meet the tight delivery schedule to accommodate the lane closures.



Complexity

One lane in each direction needed to be maintained during construction of the tunnel. Half the tunnel was constructed and then a steel plate was used as a bulk head to excavate against from the other side. Precast box sections were placed approximately 30 feet deep, using a new trench box shoring system that provides improved safety for excavations of this size.

Owner:
Utah Department
of Transportation
and Sandy City

Manufacturer:
Geneva Pipe, Salt
Lake City, UT

Contractor:
Geneva Rock

Designers:
URS, Ensign,
PEC