



C05 East Garden Grove – Wintersburg Channel

As a condition for the development of Tract 15377 the County of Orange required the developer to improve the northern side of the C05 East Garden Grove – Wintersburg Channel along the property frontage. The construction is to be per the County's 1994's Project Report for East Garden Grove – Wintersburg (C05) and Oceanview (C06) Channels.

The construction of this facility as shown in the County's report consist of driving sheet pile at the ultimate vertical channel wall location and removing the soil within the channel flow area down to the ultimate channel invert. We are required to install the vertical channel liners, and have received approval from the County to allow us to only remove the soil one foot above the ordinary high water level, leaving the soil below that level in tact.

The construction will start with the driving of the sheet pile. As the pile is driven, earth movers will follow behind, removing the soil between the ordinary high water line and the new wall. This operation will continue until the wall is complete. At this time any minor remaining soil will be removed with a back-hoe. At the upstream and downstream ends of this construction, a loose rock fill will be placed to allow for the transition back to the existing earthen trapezoidal channel section.

The equipment we envision the contractor using would consist of a crane to lift the sheet piles into place, the pile driver, the earth movers & back-hoe to move the soil around, and trucks to haul in the rock and other materials. The total length of wall to be constructed is about 7,372 linear feet long, approximately 197,000 c.y. of soil will be removed along with the placement of about 800 cubic yards of loose rock rip-rap.

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Installation of the 120" Diameter Conduit Under the C05 East Garden Grove – Wintersburg Channel

As a condition for the development of Tract 15377 the City of Huntington Beach required the developer to create a new storm drain connection for the storm flows from the north side of the East Garden Grove – Wintersburg Channel to the Slater Channel. This was required because the existing facilities are incapable of carrying the 100-year storm event. To address this requirement, we have proposed a new 120" pipe to cross under the C05 Channel and discharge directly into the Slater pump forebay.

The East Garden Grove – Wintersburg Channel drains a developed urban area of several square miles. In the area of the proposed development it exists as an earthen soft bottom leveed channel. The designed invert elevation is about 2 feet below sea level with the top of the access roads at about elevation 10 with the natural ground on either side at about elevation 0.

During the summer, this channel carries the typical low flow from its drainage basin and since the invert is below sea level, the channel in this area always has water in it. The flow line of the proposed 120" pipe which is proposed to cross under the channel will be installed with an invert flow line of about 16 feet below sea level.

The method used to install this pipe will be an open trench. To create a dry working area we are proposing that the work area be sounded by a temporary coffer dam made from driven sheet piles. Due to the crane's limited reach, the maximum length of the first phase will extend only about one-third of the way across the channel. The bottom of the sheet pile wall will extend well below the bottom of the proposed pipe trench. The area within the sheet pile wall will then be pumped dry. Due to some potential leakage and seepage this pumping will continue during construction.

The equipment that the contractor will be using to make this crossing would consist of a crane to lift the sheet piles and pipe sections, pile driving equipment, a backhoe to remove the soil, trucks to deliver the pipes and reinforcing steel, and concrete trucks to deliver the concrete. The amount of soil that will need to be removed will be approximately 1,300 cubic yards and the amount of gravel and soil used to back fill the trench will amount to about 250 cubic yards.

The construction will be phased as follows; the first third of the crossing will be surrounded with the temporary coffer dam, the area will be pumped out and the excavation will be made. The conduit will then be placed in the trench and the proposed concrete encasement will be poured around it and the remainder of the trench will be then back filled. The crane will be moved to the end of the just installed pipe where it will extend the limits of the sheet piles an additional one-third of the channel. The operation of installing this portion of pipe will be identical to the previous section.

After this, the crane will start to remove the temporary sheet piling from the first reach of pipe installation allowing the dry weather flow to pass through that portion



of the channel. With the sheet piles removed from the first reach the remaining one-third of the channel will be dammed off and pipe installation will continue. At the end of the construction, all of the sheet piles will be removed and the surface will be returned to its existing condition.

This method of construction will allow for at least one-third of the channel's bottom width to carry the summer flows around the work area. During the construction the width of disturbed area will not be much wider than the total width of the actual concrete encasement of the pipe, or about a total width of 14 to 16 feet wide.

The pipe and its encasement will be designed to be heavy enough so that the pipe will not be buoyant. The design will create a continuous conduit that will not be subject to any movement, while having conveyance capacity for the maximum storm event.

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