

PRECAST ELEMENT NOTES:

1. DESIGN PLANS / WORKING DRAWINGS
INFORMATION PERTAINING TO THE PRECAST REINFORCED CONCRETE **BOX CULVERT or RIGID FRAME or ARCH** AND WINGWALL SECTIONS IS INTENDED TO SERVE AS AN INDICATION OF THE TYPE OF CONSTRUCTION ACCEPTABLE FOR USE. THE CONTRACTOR WILL BE REQUIRED TO PREPARE AND SUBMIT FOR APPROVAL. A COMPLETE SET OF DETAILED SHOP DRAWINGS FOR THE PRECAST CONCRETE UNITS THEY PROPOSE TO FURNISH. THE SHOP DRAWINGS SHALL INCLUDE:
 - A. AN OVERALL PLAN SHOWING ALL UNITS TOGETHER AND DETAILS OF EACH TYPE OF UNIT.
 - B. A PLAN VIEW OF REINFORCEMENT FOR ANY IRREGULAR SHAPED SECTIONS (SKEWED, CURVED, ETC.).
 - C. REINFORCING BAR LIST
 - D. BILL OF MATERIALS INCLUDING ALL ACCESSORIES
 - E. METHOD AND SEQUENCE OF POST-TENSIONING
2. PRECAST ELEMENTS, ACCESSORIES AND INSTALLATION
PAYMENT FOR ITEM **602736 - PRECAST CONCRETE CULVERT or 602739 - PRECAST CONCRETE RIGID FRAME or 602737 - PRECAST CONCRETE ARCH** AND ITEM **602738 - PRECAST CONCRETE RETAINING WALL or 602755 - PRECAST CONCRETE WINGWALLS FOR CONCRETE ARCH** SHALL INCLUDE:
 - A. ALL PRECAST ELEMENTS FOR THE RESPECTIVE ITEM (**BOX CULVERT or RIGID FRAME or ARCH**, FOOTERS, TOEWALLS UNDER ITEM 6027xx AND WINGWALLS UNDER ITEM 6027xx).
 - B. ALL ASSOCIATED REINFORCEMENT.
 - C. ALL ACCESSORIES (INCLUDING, BUT NOT LIMITED TO, WEEP HOLES, CONCRETE FINISH, POST-TENSIONING TENDONS, CONNECTION PLATES, GROUT, JOINT WRAP, THREADED INSERTS) MENTIONED IN THE FOLLOWING NOTES UNLESS NOTED OTHERWISE.
 - D. DELIVERY AND INSTALLATION OF ALL PRECAST ELEMENTS AND ALL ACCESSORIES
3. WEEP HOLES (if applicable)
APPROXIMATE LOCATIONS OF WEEP HOLES ARE DETAILED IN THE PLANS. EXACT LOCATION SHALL BE DETERMINED BY THE LOCATION OF JOINTS IN THE PRECAST CULVERTS (MIN. 1'-0" FROM A JOINT). ELEVATIONS SHALL REMAIN AS DETAILED ON THE PLANS. WEEP HOLES SHALL BE 4" PVC PIPE, EXTEND 3" BEYOND THE INSIDE FACE OF THE CULVERT AND HAVE 2" FALL FROM BACK TO FRONT. ALTERNATELY, THE PRECASTER MAY PROVIDE A 6" SLEEVE FOR FIELD INSTALLATION OF WEEP HOLES. THE SLEEVE SHALL BE FILLED WITH NON-SHRINK GROUT.
4. MISCELLANEOUS CONCRETE NOTES
 - A. ALL EXPOSED SURFACES SHALL BE PROTECTED WITH A WATER MISCIBLE, PENETRATING SILANE SEALER.
 - B. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4" UNLESS OTHERWISE NOTED.
5. **BOX CULVERT or RIGID FRAME or ARCH POST-TENSIONING**
THE PRECAST **BOX CULVERT or RIGID FRAME or ARCH** SECTIONS SHALL BE POST-TENSIONED TOGETHER WITH A MINIMUM OF FOUR POST-TENSIONING TENDONS. THE **BOX CULVERT or RIGID FRAME or ARCH** SHALL BE POST-TENSIONED SUCH THAT THE NEOPRENE GASKETS ARE COMPRESSED ALL AROUND AND THERE IS A 1/2" MAXIMUM GAP BETWEEN SECTIONS. MAXIMUM POST-TENSIONING FORCE SHALL BE 28,900 lbs. POST-TENSIONING DETAILS (PLACEMENT, SEQUENCE OF TENSIONING, etc.) SHALL BE SHOWN IN THE SUBMITTED SHOP DRAWINGS. ALL POCKETS AND DUCTS FOR POST-TENSIONING SHALL BE FILLED WITH NON-SHRINK GROUT.
6. WINGWALL CONNECTIONS
 - A. THE PRECAST WINGWALL SECTIONS SHALL BE POST TENSIONED TOGETHER AND POSITIVELY CONNECTED TO THE BOX CULVERT WITH A MINIMUM OF TWO POST-TENSIONING TENDONS. POST-TENSIONING SHALL BE AS PER NOTE 5.
 - B. AT LOCATIONS WHERE POST TENSIONING OF THE WINGWALLS IS NOT FEASIBLE, A BOLTED CONNECTION MAY BE USED. BOLTED CONNECTION DETAILS SHALL BE SHOWN IN THE SUBMITTED SHOP DRAWINGS. THE BOLTED CONNECTION MUST CONSIST OF A MINIMUM OF TWO 3'-0" WIDE x 2'-0" TALL x 1/4" THICK PLATES PER JOINT WITH AT LEAST FOUR 3/4" BOLTS PER PLATE. ANGLED PLATES SHALL HAVE 8 BOLTS. SLOTTED HOLES IN THE PLATE SHALL NOT BE PERMITTED. HOLES FOR ANCHOR BOLTS MAY BE FIELD DRILLED.
7. JOINTS BETWEEN PRECAST SECTIONS
 - A. NEOPRENE GASKETS SHALL BE PROVIDED AT THE JOINTS BETWEEN ALL PRECAST UNITS IN ORDER TO MAKE THE JOINTS WATERTIGHT. AFTER INSTALLATION, THE GASKETS SHALL BE COMPRESSED SUCH THAT GAPS ARE NOT VISIBLE.
 - B. **ALL JOINTS BETWEEN PRECAST BOX CULVERT SECTIONS SHALL BE TONGUE AND GROOVE or ALL JOINTS BETWEEN RIGID FRAME SECTIONS SHALL HAVE A SHEAR KEY ALL AROUND.**
 - C. ALL WINGWALL TO WINGWALL AND WINGWALL TO **BOX CULVERT or RIGID FRAME or ARCH** JOINTS SHALL HAVE A SHEAR KEY.
 - D. THE LOCATIONS OF THE JOINTS IN THE **BOX CULVERT or RIGID FRAME or ARCH** SHALL BE DETERMINED BY THE PRECASTER AND SUBMITTED IN THE SHOP DRAWINGS FOR APPROVAL.

- E. THE REINFORCEMENT SHALL HAVE 2" COVER AT THE END OF EACH SECTION AND MEET OR EXCEED THE MINIMUM AREA OF STEEL PER FOOT DENOTED IN THE PLANS.
 - F. ALL JOINT EXTERIORS SHALL BE COVERED WITH A MINIMUM 9" WIDE WRAP CENTERED ON THE JOINT AS PER THE SPECIAL PROVISION FOR ITS RESPECTIVE ITEM.
8. TOEWALLS (if applicable – CULVERTS ONLY)
- A. TOEWALLS SHALL BE PLACED BENEATH THE BOTTOM SLAB OF THE CULVERT AT THE INLET AND OUTLET AND CONNECTED BY DOWELS GROUTED INTO THE BOTTOM SLAB AS SHOWN.
 - B. THE 1' GROUT LEVELING PAD SHALL BE PLACED IMMEDIATELY PRIOR TO PLACEMENT OF THE CULVERT SECTION.
 - C. COARSE AGGEGATE PLACED BENEATH THE CULVERT SHALL BE CONTAINED IN PLACE (BY FORMWORK OR OTHER ACCEPTABLE MEANS) WHILE ADJACENT EXCAVATIONS (i.e. INSTALLATION OF WINGWALLS) ARE COMPLETED. ANY VOIDS BETWEEN THE BOTTOM SLAB OF THE CULVERT AND THE COARSE AGGREGATE SHALL BE FILLED WITH FLOWABLE FILL PRIOR TO ANY BACKFILLING.
9. FACTORED BEARING RESISTANCE (if applicable – ARCHES ONLY)
DESIGN FACTORED BEARING RESISTANCE SHALL NOT EXCEED X.X TSF FOR ARCH AND WINGWALLS.

*****User Note – Highlighted text should be revised as applicable to the specific project*****