ASC Competition Commercial, Region 7



REQUEST FOR INFORMATION

FOR

R.F.I.. NO:

ISSUING SCHOOL:

ANSWER

PHX Sky Train - Stage 2

HENSEL PHELPS
Plan. Build. Manage.

SHEETS: DETAILS / SECTIONS: SPECIFICATIONS REF: B02-GWSG0801 2/GWSG0801

TITLE OR SECTION OF WORK:

DRILLED SHAFTS VERTICAL REINFORCEMENT AND MIX DESIGN CONFIRMATION

PERTENENT PROBLEM SECTION: ISSUED BY: ANSWER

QUALITY CONTROL DATE:

WRITTEN DESCRIPTION OF PROBLEM - ATTACH SKETCHES AS REQUIRED:

Per B02-GWSG0003, the concrete material to be used for the drilled shafts is to be 4,000 psi (see SK-01). However due to availability upon the pouring of the drilled shafts, 4500 psi was used to for DS54A thru DS62.

1. Please confirm it is structurally acceptable to use 4500 psi concrete to pour drilled shafts DS54A thru DS62.

In addition, detail 2 on GWSG0801 notes the dowels from the drilled shaft to column are to have "Class C" lap splice. Per Bar Splice table on B02-GWSG0003, the lap splice required is 101", however 141" splice has been provided (see SK-01 thru 02).

2. Please confirm it is structurally acceptable for the vertical shaft dowels to have a 141" lap splice with column reinforcement.

A/E RESPONSE:	

BY: DATE:

DISTRIBUTION:

A. SPECIFICATIONS

A1.CONSTRUCTION: PHX SKY TRAIN SPECIFICATIONS.

DESIGN: AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES", 17TH EDITION, 2002.

B. LOADINGS

ALL LOADINGS SHALL BE IN ACCORDANCE WITH THE "AUTOMATED TRAIN PROJECT DESIGN CRITERIA MANUAL FACILITIES DESIGN, REV 3, APRIL 2017", INCLUDING ALL UPDATES. SEE DETAIL 1 THIS SHEET FOR VEHICLE LOADS.

B2.	SIP METAL FORMS	15 psf (MIN) TO 25 psf (MA)
	UTILITIES	450 pl
	LIGHTING & SIGNALS	10 pl
	EMERGENCY WALKWAY	O plf (MIN) TO 150 plf (MA)
	PST RUNNING SURFACE (EACH)	800 plf (MIN) TO 1200 plf (MAX
	SWITCH LOAD	3500 pl
	FUTURE SUPERIMPOSED DEAD LOADS	10 psf (MIN

C. MATERIALS

C1. CONCRETE (MIN. 28-DAY STRENGTHS):

PIER CAPS AND PIER COLUMNS:	f'c = 4,000 psi (CLASSAA)
DRILLED SHAFTS:	f'c = 4,000 psi (CLASS AA)
ABUTMENTS, FOOTINGS, WALLS:	f'c = 4,000 psi (CLASS AA)
PRECAST U-BEAMS:	f'c = 7,000 psi (CLASS AAA)
DECKS, DIAPHRAGMS AND CURBS:	f'c = 4,500 psi (CLASS AA

NOTE: REDUCED COARSE AGGREGATE SIZE IS ALLOWED IN BEAMS, DECKS, DIAPHRAGMS AND CURBS TO FACILITATE PLACING AND PROPER CONSOLIDATION

- C2. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4", UNLESS SHOWN OTHERWISE.
- CONSTRUCTION JOINTS SHALL BE MADE WHERE SHOWN ON THE PLAN. ADDITIONAL JOINTS SHALL BE MADE ONLY WITH THE APPROVAL OF THE PROGRAM/PROJECT
- REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE GRADE 60 (BLACK BAR) CONFORMING TO ASTM A615, WITH fs = 24,000 psi.

- ALL REINFORCING STEEL SHALL HAVE 2" CLEAR COVER FOR PRIMARY REINFORCEMENT AND 11/2" FOR STIRRUPS, TIES, AND SPIRALS, UNLESS OTHERWISE NOTED. PROVIDE 3" COVER FOR SURFACES CAST AGAINST THE GROUND.
- C6. ALL BEND DIMENSIONS FOR REINFORCING STEEL SHALL BE OUT—TO—OUT OF BARS. ALL PLACEMENT DIMENSIONS SHALL BE TO THE CENTER OF BARS, UNLESS
- C7. FIELD ADJUSTMENTS OF REINFORCING STEEL SHALL BE MADE ONLY WITH APPROVAL OF THE PROGRAM/PROJECT MANAGER. CUT BARS MUST HAVE ACCOMPANYING BARS OF THE SAME SIZE WITH THE APPROPRIATE LAP ACROSS THE CUT LOCATION. THE SHOP DRAWINGS SHALL INCLUDE ADDITIONS OR REARRANGEMENT OF REINFORCING STEEL FROM THAT SHOWN ON THE PLANS.
- C8. BAR LAPS, HOOKS AND BENDS SHALL HAVE A MINIMUM LENGTH IN ACCORDANCE WITH AASHTO, OR AS SHOWN ON THE PLANS. SEE SPLICE TABLE ON SHEET GWSG005 FOR TYPICAL LAP SPLICES AND EMBEDMENT LENGTHS.

D. PRESTRESSING AND POST-TENSIONING CONCRETE

D1. REFER TO PLANS FOR NOTES

DRAINAGE

DRAINAGE PIPES AND OUTFALLS SHALL BE AS LOCATED AND DETAILED ON THE PLANS AND SPECIFICATIONS.

F. MISCELLANEOUS NOTES

- F1. FALSEWORK SHORING SHALL BE DESIGNED IN ACCORDANCE WITH SECTION 601-3.02 OF THE ADOT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," 2008, AND THE AASHTO "GUIDE DESIGN SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS," 2017.
- ALL DIMENSIONS SHOWN ON THE PLANS ARE MEASURED HORIZONTALLY OR VERTICALLY UNLESS OTHERWISE NOTED. DIMENSIONS SHALL NOT BE MEASURED
- F3. STRUCTURE ELEVATIONS SHOWN ON THE PLANS ASSUME THE PROFILE GRADE LINE IS 5'-0" ABOVE TOP OF THE STRUCTURAL DECK.
- THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UTILITY LINES AND NOTIFY THE RESPECTIVE OWNERS BEFORE COMMENCING EXCAVATION. ANY AND ALL DAMAGE WHICH MIGHT RESULT FROM FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- PRECAST BEAMS SHALL BE ADEQUATELY SUPPORTED DURING CONSTRUCTION TO ENSURE STABILITY.
- VERIFY ALL DIMENSIONS AND GEOMETRY OF EXISTING STRUCTURES IN THE FIELD AS NECESSARY TO ENSURE PROPER FIT OF THE PROPOSED CONSTRUCTION.

PROVIDE ELECTRICAL GROUNDING OF THE STRUCTURE IN ACCORDANCE WITH THE **SPECIFICATIONS**

F8. GUIDEWAY EGRESS REVIEW:

THE FOLLOWING SECTIONS FROM NFPA 130-2017 "STANDARD FOR FIXED GUIDEWAY TRANSIT AND PASSENGER RAIL SYSTEMS" WERE REVIEWED:

6.2.3.2.1 ACCESS TO THE TRAINWAY SHALL BE FROM STATIONS OR BY MOBILE LADDER EQUIPMENT FROM ROADWAYS ADJACENT TO THE TRACKWAY. COMPLIANT.

6.2.3.2.2 IF NO ADJACENT OR CROSSING ROADWAYS EXIST, ACCESS ROADS AT A MAXIMUM OF 762m (2500 ft) INTERVALS SHALL BE REQUIRED. COMPLIANT; ADJACENT CROSSING ROADWAYS EXIST AT INTERVALS LESS THAN 2500 FEET.

6.2.3.2.3 IF SECURITY FENCES ARE USED ALONG TRACKWAY, ACCESS GATES SHALL BE PROVIDED AS DEEMED NECESSARY BY THE AUTHORITY HAVING JURISDICTION. COMPLIANT: NO SECURITY FENCES ARE INSTALLED.

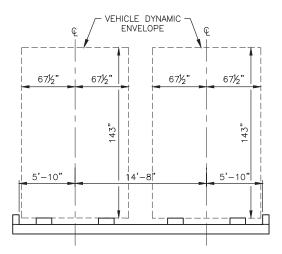
6.2.3.2.4 ADJACENT TO EACH BLUE LIGHT STATION, INFORMATION SHALL BE PROVIDED THAT IDENTIFIES THE ROUTE AND LOCATION OF THE ACCESS. THIS WILL BE INCLUDED IN EACH STATION PLATFORM DESIGN.

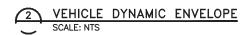
6.2.3.2.5 THE GRAPHICS SHALL BE LEGIBLE FROM THE GROUND LEVEL OUTSIDE THE TRACKWAY. EACH BLUE LIGHT STATION WILL HAVE THE APPROPRIATE EGRESS

F9. CONTRACTOR SHALL EXERCISE CARE DURING THE EXCAVATION AND CONSTRUCTION FOR NEW STRUCTURES TO AVOID DAMAGE TO EXISTING STRUCTURES. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL MEANS AND METHODS REQUIRED FACILITATE CONSTRUCTION OF THE WORK AND ENSURE SAFETY, STABILITY AND INTEGRITY OF ADJACENT STRUCTURES AND FACILITIES

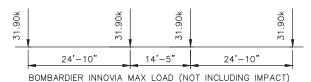
G. BRIDGE AESTHETICS

G1. ALL EXPOSED CONCRETE SURFACES ON THE ELEVATED GUIDEWAY STRUCTURES FROM SPAN 58 THROUGH SPAN 80 SHALL BE PAINTED (EXCLUDING TOP OF GUIDEWAY DECK SURFACE AND INSIDE FACE OF CURBS AND BARRIERS) UNLESS OTHERWISE NOTED ON THE PLANS OR AS DIRECTED BY THE PROGRAM/PROJECT MANAGER IN ACCORDANCE WITH THE SPECIFICATIONS PAINT SHALL BE APPLIED TO THE EXPOSED SURFACES AND EXTEND ONE FOOT BELOW FINISH GRADE ELEVATION. THE PAINT SHALL BE TINTED BEIGE AS DIRECTED BY THE PROGRAM/PROJECT MANAGER. THE CONTRACTOR SHALL PREPARE A CONCRETE TEST SPECIMEN FOR VISUAL INSPECTION AND APPROVAL BY THE PROGRAM/PROJECT MANAGER PRIOR TO APPLICATION OF PAINT MATERIAL ONTO THE NEW STRUCTURES.





NOTE: CONTRACTOR SHALL ENSURE THAT ALL CONCRETE CURBS, CONCRETE PARAPET WALLS AND ORNAMENTAL SECURITY FENCES DO NOT ENCROACH INTO VEHICLE DYNAMIC ENVELOPE





H. DRILLED SHAFT NOTES

- THE CONTRACTOR SHALL LEAVE DRILLED SHAFT EXCAVATIONS, TOP OF DRILLED SHAFTS AND EXPOSED REINFORCING IN A CLEAN UNDAMAGED CONDITION.

 EXCAVATIONS SHALL BE LEFT IN STABLE CONDITION CAPABLE OF MAINTAINING THAT STABILITY UNDER NORMAL CONSTRUCTION CONDITIONS.
- H2. DIAMETER OF REINFORCED CONCRETE DRILLED SHAFTS SHALL BE AS SHOWN ON THE FOUNDATION PLANS
- H3. FOUNDATIONS ARE DESIGNED IN ACCORDANCE WITH "GEOTECHNICAL DESIGN MEMORANDUM PHX SKY TRAIN STAGE 2- ELEVATED GUIDEWAY",
- H4. THE CONTRACTOR IS RESPONSIBLE FOR SETTING THE LOCATION OF REBAR SPLICES REQUIRED FOR CONSTRUCTION OF DRILLED SHAFTS SUBJECT TO PHYSICAL CONSTRAINTS AT EACH PIER LOCATION.
- H5. FOR ADDITIONAL REQUIREMENTS RELATED TO THE DRILLED SHAFTS, SEE THE SPECIFICATIONS.
- H6. THE ALLOWABLE CAPACITY FOR THE DRILLED SHAFTS SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL DESIGN MEMORANDUM.
- H7. ESTIMATE OF GROUND WATER ELEVATIONS ARE PROVIDED IN THE GEOTECHNICAL MEMORANDUM.
- H8. EXCAVATION OF ADJACENT DRILLED SHAFTS WITHIN 4 SHAFT DIAMETERS MEASURED CENTER TO CENTER WILL NOT BE PERMITTED UNTIL 48 HOURS AFTER THE ADJACENT DRILLED SHAFT HAS BEEN CONCRETED.
- H9. IN THE EVENT A WEAK SOIL LAYER IS ENCOUNTERED (SILT, CLAY, LOOSE SAND ETC.) AT THE RECOMMENDED ELEVATION OF THE SHAFT BOTTOM, THE SHAFT SHALL BE EXTENDED TO BEAR ON FIRM SOIL AS DETERMINED BY THE PROGRAM/PROJECT MANAGER. ALL VARIATIONS OF SOIL CONDITIONS SHALL BE EVALUATED BY PROGRAM/PROJECT MANAGER.
- H10. IF THE BOTTOM OF THE SHAFT IS LOCATED LESS THAN OR EQUAL TO 3'-0" BELOW THE ELEVATION SHOWN ON THE PLANS, THE REINFORCING CAGE NEED NOT BE EXTENDED AND CLEARANCE TO THE BOTTOM OF THE SHAFT MAY BE INCREASED TO 3'-6" MAXIMUM. IF THE BOTTOM OF THE SHAFT IS TO BE LOWERED MORE THAN 3'-0" BELOW THE ELEVATION SHOWN ON THE PLANS A REDESIGN MAY BE REQUIRED THE PROGRAM/PROJECT MANAGER SHALL BE NOTIFIED TO DETERMINE THE EXTENT OF THE MODIFICATION REQUIRED.
- H11. CONSTRUCTION JOINTS OTHER THAN THOSE SHOWN HEREIN ARE NOT PERMITTED IN DRILLED SHAFTS, UNLESS APPROVED BY THE PROGRAM/PROJECT MANAGER.

J. MONITORING NOTES RELATED TO THE EXISTING STRUCTURES

- J1. CONTRACTOR SHALL DEVELOP AND SUBMIT A MONITORING PLAN FOR EXISTING STRUCTURAL ELEMENTS ADJACENT TO WITHIN 100 FT OF THE INSTALLATION OF
- A) CONTRACTOR SHALL MONITOR THE EXISTING STRUCTURAL ELEMENTS ADJACENT TO THE NEW FOUNDATIONS FOR POSSIBLE SETTLEMENT ASSOCIATED WITH THE INSTALLATION OF DRILLED SHAFT FOUNDATIONS.
- A MONITORING PROGRAM WILL CONSIST OF THE TABULATION OF ELEVATION SURVEY SHOTS ON THE EXISTING STRUCTURAL ELEMENTS PRIOR TO CONSTRUCTION OF EACH DRILLED SHAFT. TAKING OF SUBSEQUENT SURVEY SHOTS ON THE SAME LOCATIONS EVERY HOUR DURING THE CONSTRUCTION OPERATION AND FINAL SURVEY SHOT AT THE COMPLETION OF FOUNDATION INSTALLATION.
- C) CONTRACTOR SHALL DEVELOP A SURVEY SHOT LAYOUT AND SUBMIT TO THE PROGRAM/PROJECT MANAGER FOR APPROVAL PRIOR TO COMMENCING THE
- THE MONITORING PROGRAM ACTIVITY WILL BE VERIFIED BY THE GEOTECHNICAL ENGINEER OF RECORD AS PART OF THE SPECIAL INSPECTIONS PROCESS. THE CONTRACTOR IS RESPONSIBLE FOR THE SURVEY DATA.
- E) IF SETTLEMENT OF EXISTING STRUCTURES IS OBSERVED, IMMEDIATELY CEASE ALL DRILLED SHAFT CONSTRUCTION OPERATIONS AND NOTIFY THE PROGRAM/PROJECT MANAGER AND GEOTECHNICAL ENGINEER OF RECORD. NO ADDITIONAL CONSTRUCTION ACTIVITIES ON THE DRILLED SHAFT FOUNDATIONS SHALL BE PERMITTED UNTIL THE PROGRAM/PROJECT MANAGER GIVES HIS PERMISSION TO CONTINUE INSTALLATION.

K. HAZARDOUS MATERIALS

- K1. COMPLY WITH THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS WHEN ENCOUNTERING ANY MATERIAL CONTAINING OR SUSPECTED OF CONTAINING HAZARDOUS SUBSTANCES. IN THE EVENT OF A HAZARDOUS MATERIAL SPILL OR A RELEASE OF A HAZARDOUS SUBSTANCE, IMMEDIATELY CONTACT THE AIRPORT COMMUNICATIONS CENTER EMERGENCY NUMBER 602-223-3311
- K2. AN ASBESTOS AND LEAD SURVEY HAS BEEN DONE FOR THIS PROJECT AND IS CURRENT. ASBESTOS AND LEAD BASED PAINT HAS BEEN IDENTIFIED AND WILL NEED TO BE ABATED PRIOR TO DISTURBANCE. PLEASE CONTACT T.J. INIGUEZ TO HAVE THIS DONE AT (602) 571-2638.



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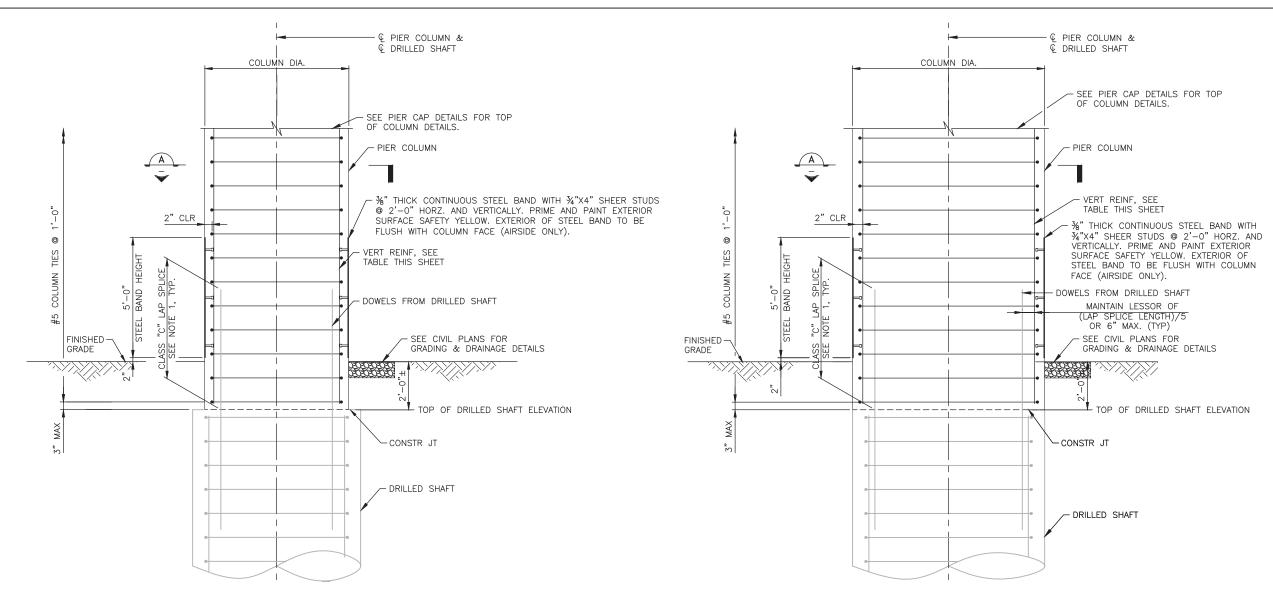
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GUIDEWAY ELEVATED ALIGNMENT GENERAL NOTES - 1

SK-01

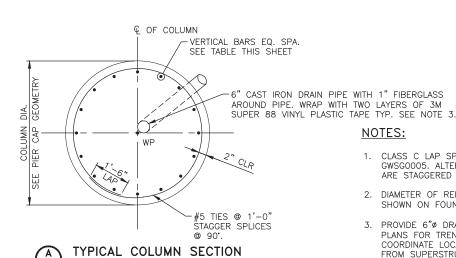
Sheet Reference No: **B02-GWSG0003**



COLUMN REINFORCEMENT- UNEQUAL DIAMETERS SCALE: 1/2" = 1'-0"

COLUMN REINFORCEMENT- EQUAL DIAMETERS SCALE: 1/2" = 1'-0"

SUBSTRUCTURE REINFORCING TABLE		
PIER NUMBER	COLUMN DIA.	COLUMN VERTICAL REBAR
1-6, 24-38, 74, 75	60	20-#11
7	84	56-#11
8	84	48-#11
9, 68-72	84	42-#11
10	84	36-#11
11, 12 14-21, 40-44	72	27-#11
13, 39	72	36-#11
22	60	24-#11
23	60	32-#11
45, 46, 49-58, 60-62, 64, 65	84	36-#11
47, 48, 59, 63, 66, 67,73	96	48-#11

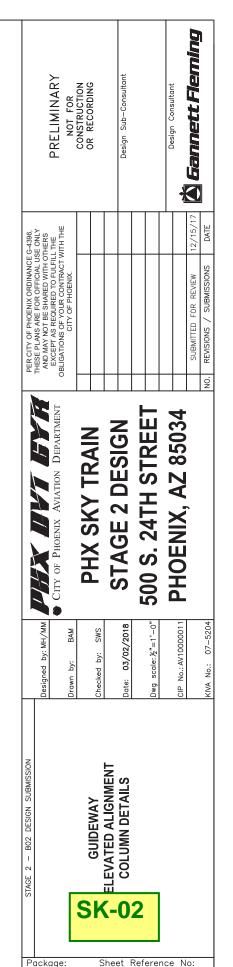


SCALE: 1/2" = 1'-0'

FOR REFERENCE ONLY

NOTES:

- 1. CLASS C LAP SPLICE LENGTH SHALL BE PER BAR SPLICE TABLE ON SHEET GWSG0005. ALTERNATELY, CLASS B LAP SPLICE MAY BE USED IF ALTERNATE BARS ARE STAGGERED BY FULL LAP SPLICE LENGTH.
- 2. DIAMETER OF REINFORCED CONCRETE DRILLED SHAFTS AND COLUMNS SHALL BE AS SHOWN ON FOUNDATION PLANS, "FOUNDATION AND SUBSTRUCTURE SCHEDULE".
- 3. PROVIDE 6"Ø DRAIN PIPES AS INDICATED ON PIER CAP GEOMETRY SHEETS. SEE CIVIL PLANS FOR TRENCH DRAIN AND DRAIN PIPE OUTFALL DETAILS. CONTRACTOR SHALL COORDINATE LOCATION OF DRAIN PIPE INSIDE THE COLUMN TO ACCEPT DRAIN PIPES FROM SUPERSTRUCTURE. VERTICAL PORTION OF DRAIN PIPE IN COLUMN SHALL BE 6" MIN CLEAR OF COLUMN LONGITUDINAL REINFORCEMENT.



B02-GWSG0801