PRECAST APPROACH SLAB NOTES

① GUIDELINES

THESE GUIDELINE DRAWINGS REPRESENT TYPICAL DETAILS FOR THE DESIGN AND DETAILING OF PRECAST CONCRETE APPROACH SLABS.

THESE SHEETS ARE INCLUDED TO PROVIDE AN EXAMPLE OF THE DRAFTING LAYOUT OF TYPICAL PRECAST APPROACH SLAB. TWO DIFFERENT APPROACH SLAB SYSTEMS ARE SHOWN:
- SURFACE APPROACH SLABS: SLABS THAT ARE PLACED WITH THE TOP SURFACE AT OR NEAR THE ROADWAY SURFACE
- SUB-SURFACE APPROACH SLABS: SLABS THAT ARE PLACED WITH THE TOP SURFACE BELOW GRADE.

REFER TO STATE STANDARDS FOR THE APPROPRIATE TYPE FOR EACH BRIDGE.

THE DETAILS INCLUDE INTEGRAL CONCRETE BARRIERS. THIS CONFIGURATION IS NOT COMMON IN THE NORTHEAST; HOWEVER THE PCI BRIDGE TECHNICAL COMMITTEE HAS DEEMED THESE DETAILS WORTHY OF CONSIDERATION. THE DETAILS CAN BE EASILY MODIFIED TO ELIMINATE THESE BARRIERS.

DETAILS AND REINFORCEMENT SHOWN ARE SCHEMATIC. DESIGN AND DETAIL EACH APPROACH SLAB ACCORDING TO THE SPECIFIC REQUIREMENTS OF EACH BRIDGE.

DETAILS ARE SHOWN FOR EXPANSION JOINTS AT THE ABUTMENT END AND THE SLEEPER SLAB END. THESE DETAILS CAN BE ADJUSTED TO MATCH INDIVIDUAL STATE STANDARD DETAILS.

DETAILS ARE SHOWN FOR APPROACH SLABS WITH AND WITHOUT SLEEPER SLABS. DETAIL SLABS ACCORDING TO STATE STANDARDS.

RECOMMENDED MAXIMUM SIZES OF ELEMENTS:
- WIDTH: THE MAXIMUM WIDTH OF THE ELEMENT INCLUDING ANY PROJECTING REINFORCING SHOULD BE KEPT BELOW 12FT FOR SHIPPING REASONS.
- WEIGHT: THE MAXIMUM WEIGHT OF EACH ELEMENT SHOULD BE KEPT TO LESS THAN 100KIP.

② IMPLEMENTATION

IT IS THE DESIGNER'S RESPONSIBILITY TO:

DESIGN AND DETAIL ALL APPROACH SLAB ELEMENTS, INCLUDING BUT NOT LIMITED TO, COMPONENTS SUCH AS SLABS, SLEEPER SLABS, ABUTMENT CONNECTIONS AND WINGWALL DETAILS.

DESIGN AND CHECK THE ELEMENTS FOR ALL ANTICIPATED LOADS.

DETAIL DIMENSIONS OF ALL ELEMENTS INCLUDING INTERNAL REINFORCING.

SPECIFY AND DETAIL TOLERANCES FOR BOTH FABRICATION AND INSTALLATION OF ALL ELEMENTS. SEE TOLERANCE NOTES AND DETAILS.

CALCULATE ELEVATIONS OF TOP OF ALL PRECAST ELEMENTS. ELEVATIONS TO BE INCLUDED ON ALL DETAILS.

DETERMINE THE GEOTECHNICAL REQUIREMENTS OF THE SITE AND PLACE THE APPLICABLE INFORMATION ON THE PLANS.

PLACE APPLICABLE GENERAL NOTES ON THE PLAN SET.

ENSURE SUFFICIENT DETAIL IS ADDED TO THE DESIGN PLANS TO ENSURE PROPER FIT UP OF PRECAST ELEMENTS IN THE FIELD. TOLERANCE DETAIL SHEETS DEPICT A WORKING METHOD FOR ACHIEVING PROPER FIT UP.

③ GENERAL NOTES

DESIGN PRECAST CONCRETE APPROACH SLAB ELEMENTS IN ACCORDANCE WITH THE LATEST EDITION OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS EXCEPT AS NOTED OTHERWISE.

THE CONTRACTOR MAY SUBSTITUTE ALTERNATE LEVELING DEVICES PROVIDED THEY CAN PRODUCE A STRUCTURE WITHIN THE SPECIFIED ERECTION TOLERANCES.

CHAMFER ALL EXPOSED EDGES AND CORNERS $^{3}/_{4}$".

SHOW ESTIMATED SHIPPING WEIGHTS FOR ALL PRECAST ELEMENTS ON CONTRACT DRAWINGS.

MILD REINFORCEMENT TYPE AND COVER REQUIREMENTS AS PER STATE SPECIFICATIONS UNLESS OTHERWISE NOTED.

④ TOLERANCES

ALL PRECAST CONCRETE ELEMENTS ARE FABRICATED TO THE SPECIFIED DIMENSIONS WITHIN ACCEPTABLE INDUSTRY TOLERANCES. THE DETAILING AND LAYOUT OF PRECAST ELEMENTS SHOULD ACCOUNT FOR THE FABRICATION AND ERECTION TOLERANCES.

THE DESIGNER SHOULD SPECIFY AND DETAIL ELEMENT FABRICATION TOLERANCES, ELEMENT ERECTION AND INSTALLATION TOLERANCES (BOTH HORIZONTAL AND VERTICAL), AND PILE DRIVING TOLERANCES (IF APPLICABLE).

RECOMMENDED ELEMENT FABRICATION TOLERANCES ARE SHOWN ON SHEET 5. THESE ARE BASED ON INDUSTRY PRACTICE AND SHOULD ONLY BE REDUCED AFTER CONSULTATION WITH FABRICATORS. IF PRECAST ELEMENTS ARE TO BE CONNECTED TO CAST-IN-PLACE CONCRETE, COORDINATE TOLERANCES BETWEEN SHOP AND FIELD PERSONNEL.

RECOMMENDED ELEMENT ERECTION TOLERANCES ARE SHOWN ON VARIOUS DETAILS WITHIN THESE GUIDE DETAILS. HORIZONTAL ERECTION TOLERANCES ARE ALWAYS BASED ON MEASUREMENTS FROM A COMMON WORKING POINT OR LINE. ERECTION OF ELEMENTS BASED ON CENTER TO CENTER SPACING SHOULD NOT BE USED AS THIS COULD LEAD TO BUILD UP OF ERECTION ERRORS.

THE WIDTH OF JOINTS BETWEEN ELEMENTS ARE A FUNCTION OF ELEMENT TOLERANCES, ERECTION TOLERANCES, AND PLACEMENT OF FILL MATERIALS. THE WIDTH OF JOINTS SHOWN IN THESE GUIDE DETAILS SHOULD NOT BE REDUCED WITHOUT CAREFUL CONSIDERATION OF TOLERANCES.

VERTICAL ERECTION TOLERANCES SHOULD BE MEASURED DURING ERECTION AT THE TOP OF EACH ELEMENT AS SHOWN ON THE GUIDE DETAILS. HORIZONTAL JOINTS ARE PROVIDED TO ACCOMMODATE ELEMENT HEIGHT TOLERANCES DURING ERECTION.

⑤ CONCRETE NOTES

PRECAST CONCRETE:
IN GENERAL, DESIGNERS SHOULD SPECIFY CONCRETE WITH A MINIMUM COMPRESSIVE STRENGTH OF 5000 PSI. THE MIX DESIGN OF THE PRECAST CONCRETE SHOULD NORMALLY BE DEVELOPED BY THE PRECAST FABRICATOR AND APPROVED BY THE OWNER.

SITE CAST CONCRETE AND GROUT:
THE DESIGNER SHALL SPECIFY THE MINIMUM CONCRETE PROPERTIES FOR THE FINAL CONSTRUCTION (STRENGTH, CURE TIME, ETC.). THE ENGINEER RESPONSIBLE FOR THE ASSEMBLY PLAN SHALL SPECIFY THE REQUIRED CONCRETE STRENGTHS FOR VARIOUS STAGES OF THE ASSEMBLY BASED ON CALCULATIONS DEVELOPED FOR THE ASSEMBLY PLAN. FOR EXAMPLE: THE ASSEMBLY PLANS COULD SPECIFY A CONCRETE STRENGTH IN A CLOSURE POUR OF 2000 PSI FOR A CERTAIN STAGE OF CONSTRUCTION, PROVIDED THAT THE CONCRETE GAINS THE FULL DESIGN STRENGTH PRIOR TO OPENING THE BRIDGE TO TRAFFIC.

RECOMMENDATIONS FOR SITE CAST CONCRETE CONCRETE MIXES:
MOST STATES HAVE STANDARD CONCRETE MIXES FOR BRIDGE CONSTRUCTION USING CONVENTIONAL CONSTRUCTION. ACCELERATED BRIDGE CONSTRUCTION PROJECTS OFTEN REQUIRE CONCRETE THAT CAN GAIN STRENGTH AND CURE IN A RAPID MANNER. MATERIAL PERFORMANCE SPECIFICATIONS ARE RECOMMENDED IN LIEU OF RIGID PRESCRIPTIVE SPECIFICATIONS. THE FOLLOWING CONCRETE STRENGTH PARAMETERS ARE SUGGESTED FOR USE ON PREFABRICATED BRIDGE PROJECTS.
- VERY EARLY STRENGTH CONCRETE: CONCRETE THAT WILL ATTAIN THE DESIGN STRENGTH IN LESS THAN 12 HOURS
- EARLY STRENGTH CONCRETE: CONCRETE THAT WILL GAIN THE DESIGN STRENGTH IN LESS THAN 24 HOURS
- NORMAL CONCRETE: CONCRETE THAT WILL GAIN THE DESIGN STRENGTH IN LESS THAN 7 DAYS

SHRINKAGE OF EARLY STRENGTH CONCRETE CAN LEAD TO CRACKING. FOR THIS REASON, SHRINKAGE COMPENSATING ADMIXTURES SHOULD BE CONSIDERED. LIQUID ADMIXTURES SHOULD BE USED IN LIEU OF EXPANSIVE METALLIC POWDERS.

IT IS RECOMMENDED THAT THE STATES WORK WITH LOCAL READY MIX PRODUCERS TO DEVELOP ACCEPTABLE MIX DESIGNS THAT CAN MEET THE REQUIRED PARAMETERS. IDEALLY, THESE MIXES SHOULD BE DEVELOPED PRIOR TO BIDDING AN ACCELERATED BRIDGE CONSTRUCTION PROJECT.

CONTROLLED DENSITY FILL (FLOWABLE FILL):
CONTROLLED DENSITY FILL CAN BE USED TO FILL VOIDS THAT ARE NOT SUBJECTED TO HIGH UNIT STRESSES AND ARE NOT REINFORCED. CONTROLLED DENSITY FILLS ARE FLOWABLE AND ARE LESS EXPENSIVE THAN FLOWABLE GROUTS. THIS WILL NORMALLY INCLUDE AREAS THAT ARE USED TO SEAT FOOTINGS AND SLABS. TYPICAL AREAS INCLUDE VOIDS UNDER FOOTINGS AND APPROACH SLABS. CONTROLLED DENSITY FILLS HAVE RELATIVELY SLOW SET SET TIMES. USE GROUT TO FILL VOIDS IF FAST SET TIMES ARE REQUIRED.

GROUT:
GROUT SHOULD ONLY BE USED FOR SMALL VOID GROUTING. THE REQUIRED STRENGTH OF THE GROUT SHOULD BE DETERMINED AND SPECIFIED BY THE DESIGN ENGINEER. NORMALLY THE DESIGN STRENGTH IS THE SAME STRENGTH AS THE SURROUNDING CONCRETE.

FLOWABLE GROUT SHOULD BE SPECIFIED IN AREAS THAT REQUIRE SIGNIFICANT HORIZONTAL FLOW OF THE GROUT IN ORDER TO FILL THE VOID. THIS WOULD NORMALLY INCLUDE BEAM HAUNCHES AND HORIZONTAL JOINTS BETWEEN VERTICAL ELEMENTS.

FOR COMPLEX VOIDS, THE ENGINEER MAY SPECIFY A TEST MOCK-UP GROUT POUR PRIOR TO THE ACTUAL CONSTRUCTION. THE MOCK-UP SHOULD BE SIMILAR TO THE FINAL CONFIGURATION. THE CONTRACTOR SHOULD BE REQUIRED TO DEMONSTRATE THAT THE GROUT CAN BE PLACED WITHOUT VOIDS. THIS CAN BE PROVEN BY DISMANTLING OF THE MOCK-UP AFTER GROUT CURING.

⑥ INDEX OF SHEETS

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PRECAST/PRESTRESSED CONCRETE INSTITUTE NORTHEAST

SUGGESTED GUIDE DETAILS PRECAST APPROACH SLABS

APPROACH SLAB NOTES

SHEET: APP-1

ISSUE DATE: 10-25-12

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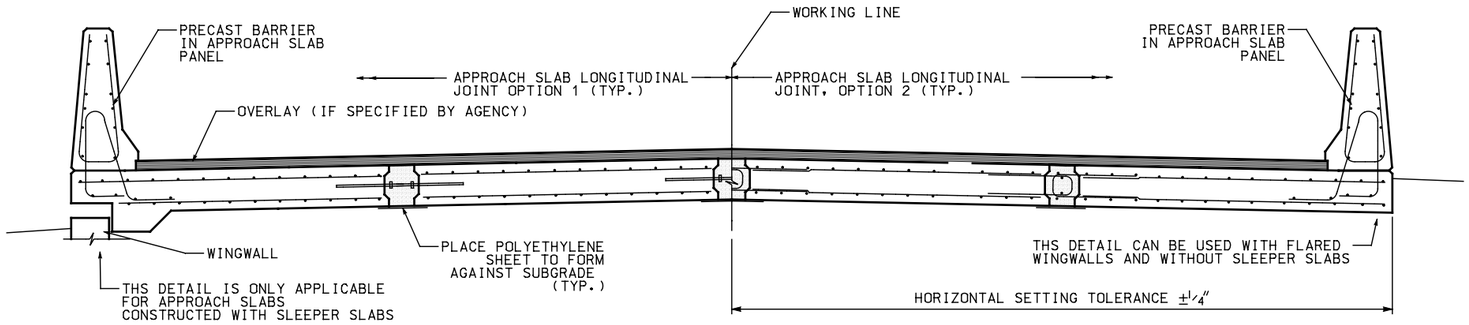
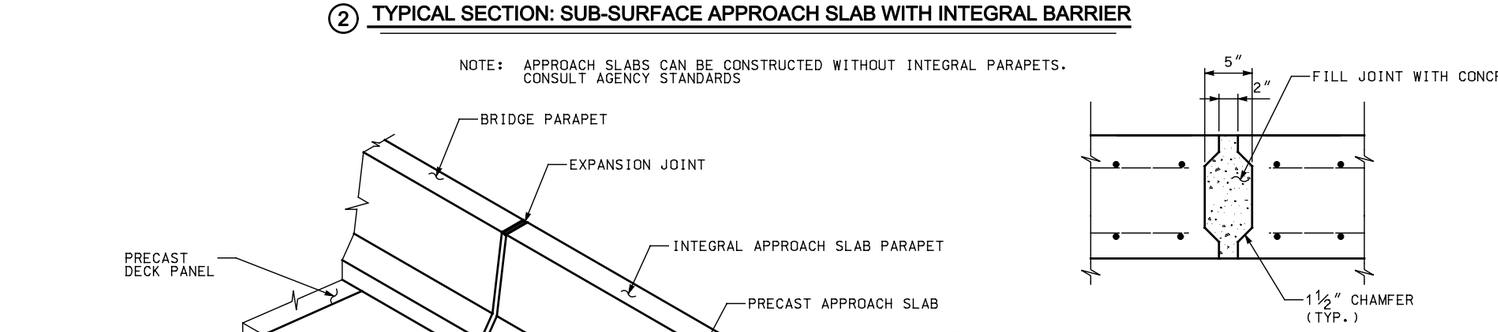
NO.	DATE	DESCRIPTION
1	6/13	ADDED DETAIL NUMBERS



① TYPICAL SECTION: SURFACE APPROACH SLAB WITH INTEGRAL BARRIER

NOTE: APPROACH SLABS CAN BE CONSTRUCTED WITHOUT INTEGRAL PARAPETS. CONSULT AGENCY STANDARDS



② TYPICAL SECTION: SUB-SURFACE APPROACH SLAB WITH INTEGRAL BARRIER

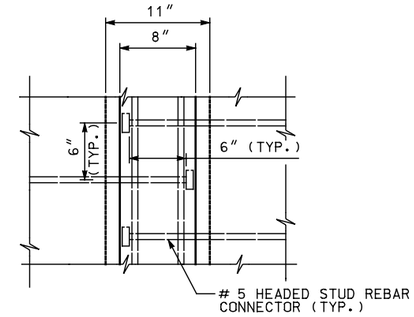
NOTE: APPROACH SLABS CAN BE CONSTRUCTED WITHOUT INTEGRAL PARAPETS. CONSULT AGENCY STANDARDS

③ STANDARD PARAPET END - SURFACE APPROACH SLAB SKEWED ISOMETRIC VIEW

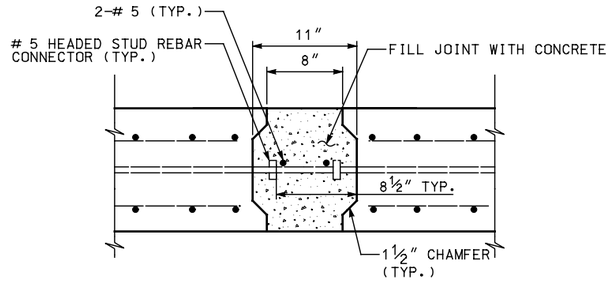
NOTES 1. CONNECTION TO APPROACH SLAB NOT SHOWN
2. SURFACE APPROACH SLAB SHOWN. SUB-SURFACE SLABS SIMILAR

④ OPTION 3: UNREINFORCED LONGITUDINAL JOINT

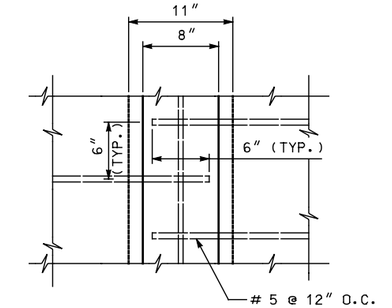
NOTES: 1. DO NOT USE THIS JOINT IN AN APPROACH SLAB WITH AN INTEGRAL BARRIER
2. DO NOT USE THIS JOINT WITH SURFACE APPROACH SLABS



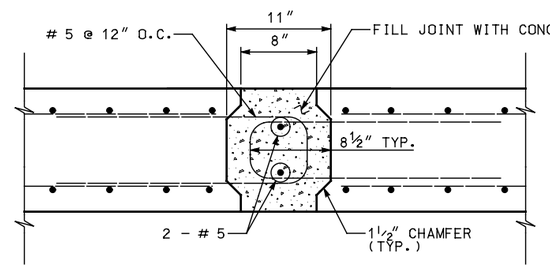
⑤ LONGITUDINAL JOINT PLAN OPTION 1



⑥ SECTION J: LONGITUDINAL JOINT OPTION 1



⑦ LONGITUDINAL JOINT PLAN OPTION 2



⑧ SECTION K: LONGITUDINAL JOINT OPTION 2

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SUGGESTED GUIDE DETAILS PRECAST APPROACH SLABS

GENERAL APPROACH SLAB DETAILS

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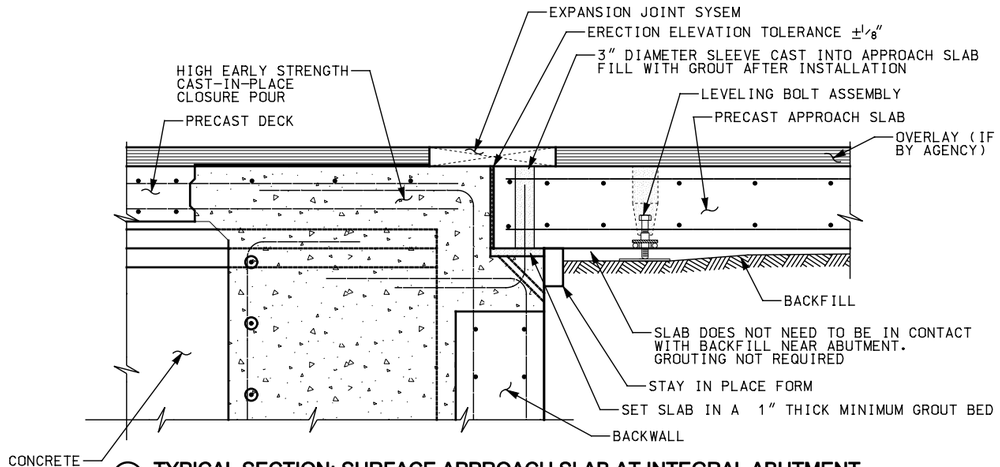
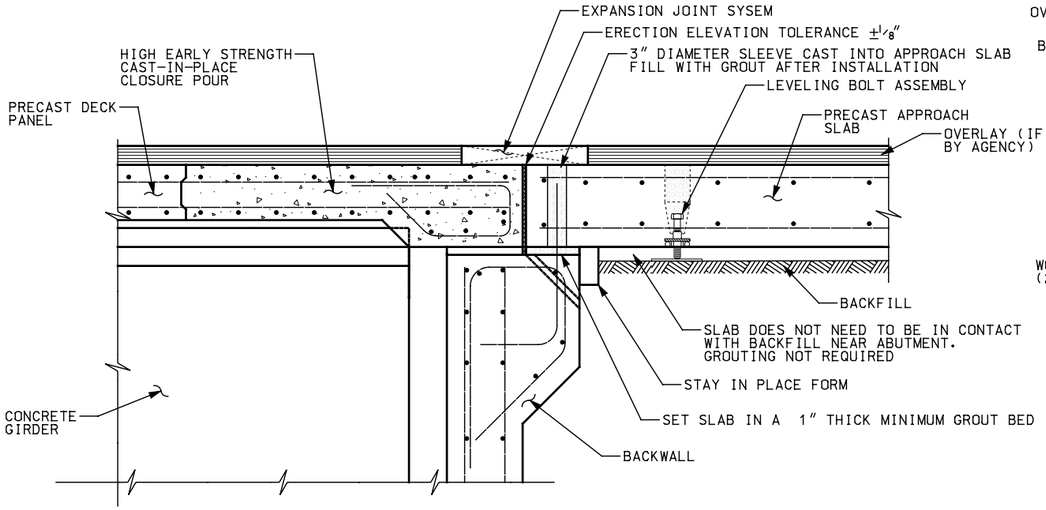


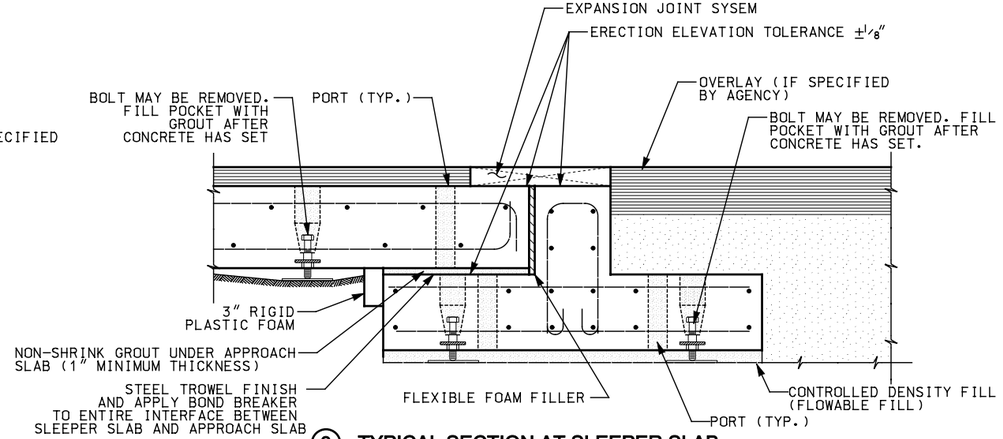
① TYPICAL SECTION: SURFACE APPROACH SLAB AT INTEGRAL ABUTMENT

NOTES: CONCRETE GIRDER SHOWN STEEL BEAM SIMILAR.
SHIMS MAY BE USED IN LIEU OF LEVELING BOLTS (ALLOW ALTERNATES ON PLANS)



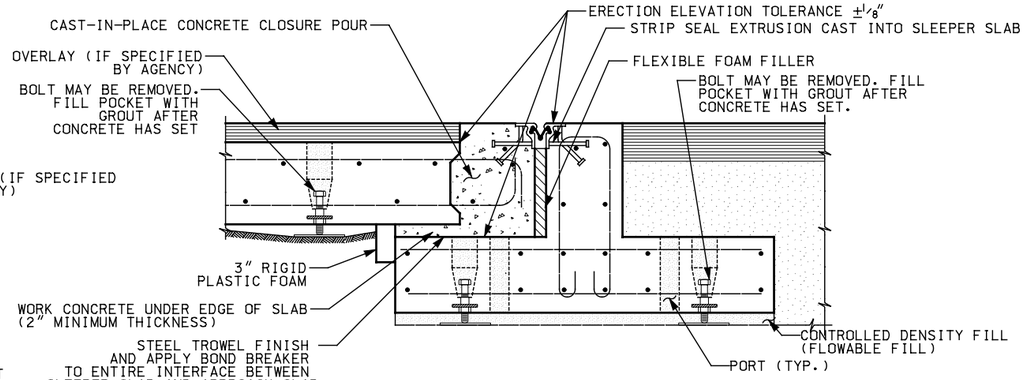
② TYPICAL SECTION: SURFACE APPROACH SLAB AT CANTILEVER ABUTMENT

NOTES: CONCRETE GIRDER SHOWN STEEL BEAM SIMILAR.
SHIMS MAY BE USED IN LIEU OF LEVELING BOLTS (ALLOW ALTERNATES ON PLANS)



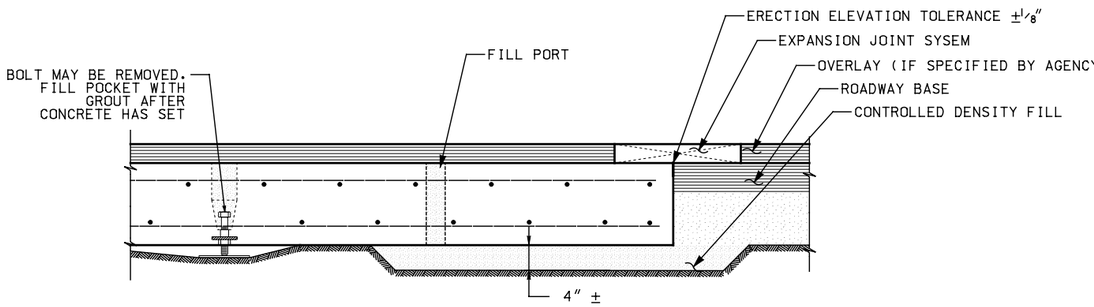
③ TYPICAL SECTION AT SLEEPER SLAB

NOTES: CONTRACTOR TO DETERMINE SIZE AND SPACING OF GROUT PORTS BASED ON FLOWABLE FILL PROPERTIES
SHIMS MAY BE USED IN LIEU OF LEVELING BOLTS (ALLOW ALTERNATES ON PLANS)



④ TYPICAL SECTION AT SLEEPER SLAB STRIP EXPANSION JOINT

NOTES: CONTRACTOR TO DETERMINE SIZE AND SPACING OF GROUT PORTS BASED ON FLOWABLE FILL PROPERTIES
SHIMS MAY BE USED IN LIEU OF LEVELING BOLTS (ALLOW ALTERNATES ON PLANS)



⑤ TYPICAL SECTION: APPROACH SLAB END WITHOUT SLEEPER SLAB

NOTES:
1. EXCAVATE TRENCH UNDER END OF APPROACH SLAB END PRIOR TO INSTALLATION. THE WIDTH OF EXCAVATION TO BE BASED ON ALLOWABLE SOIL BEARING VALUES.
2. SET APPROACH SLAB ON GRADE. ADJUST ELEVATION USING LEVELING DEVICE. SHIMS MAY BE USED IN LIEU OF LEVELING BOLTS (ALLOW ALTERNATES ON PLANS)
3. FILL VOID UNDER SLAB END WITH CONTROLLED DENSITY FILL THROUGH EXCAVATION AND PORTS IN SLAB.
4. CONSTRUCT APPROACH ROADWAY AND OVERLAY (IF REQUIRED)

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SUGGESTED GUIDE DETAILS PRECAST APPROACH SLABS

SURFACE APPROACH SLAB DETAILS

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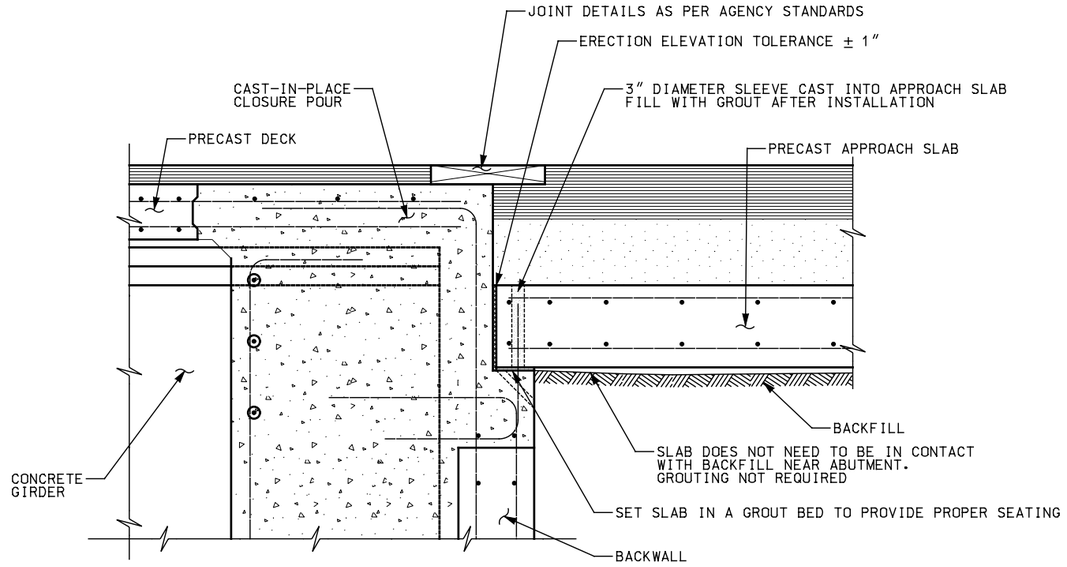
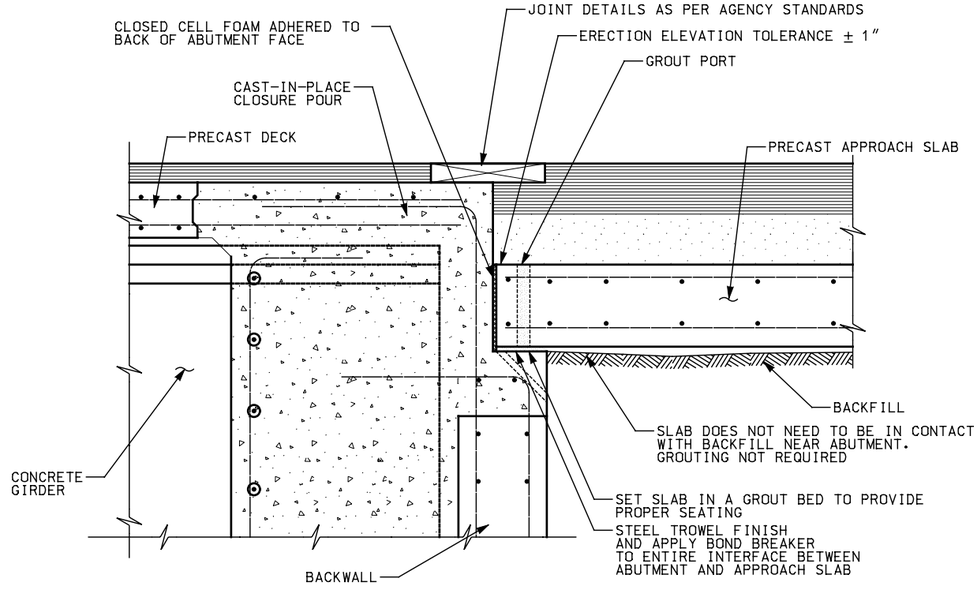


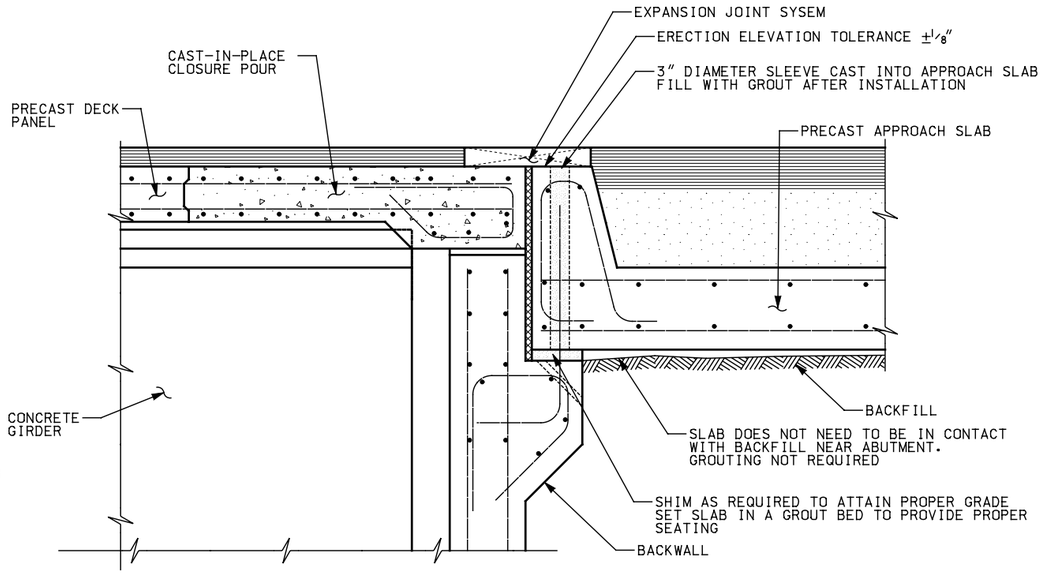
① TYPICAL SECTION: SUB-SURFACE APPROACH SLAB AT INTEGRAL ABUTMENT - PINNED CONNECTION

NOTES: CONCRETE GIRDER SHOWN, STEEL BEAM SIMILAR.
NOT ALL INTEGRAL ABUTMENT DIAPHRAGM REINFORCING SHOWN



② TYPICAL SECTION: SUB-SURFACE APPROACH SLAB AT INTEGRAL ABUTMENT - SLIDING CONNECTION

NOTES: CONCRETE GIRDER SHOWN, STEEL BEAM SIMILAR.
NOT ALL INTEGRAL ABUTMENT DIAPHRAGM REINFORCING SHOWN



③ TYPICAL SECTION: SUB-SURFACE APPROACH SLAB AT CANTILEVER ABUTMENT

NOTE: CONCRETE GIRDER SHOWN
STEEL BEAM SIMILAR.

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SUGGESTED GUIDE DETAILS PRECAST APPROACH SLABS

SUB-SURFACE APPROACH SLAB DETAILS

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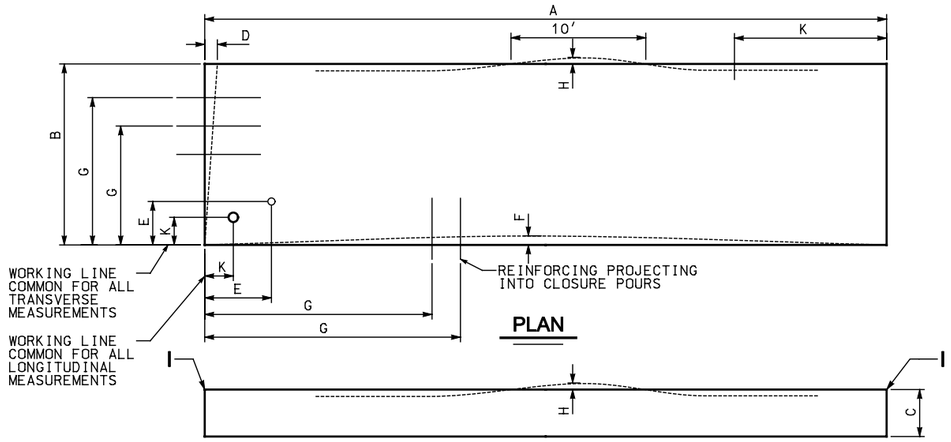
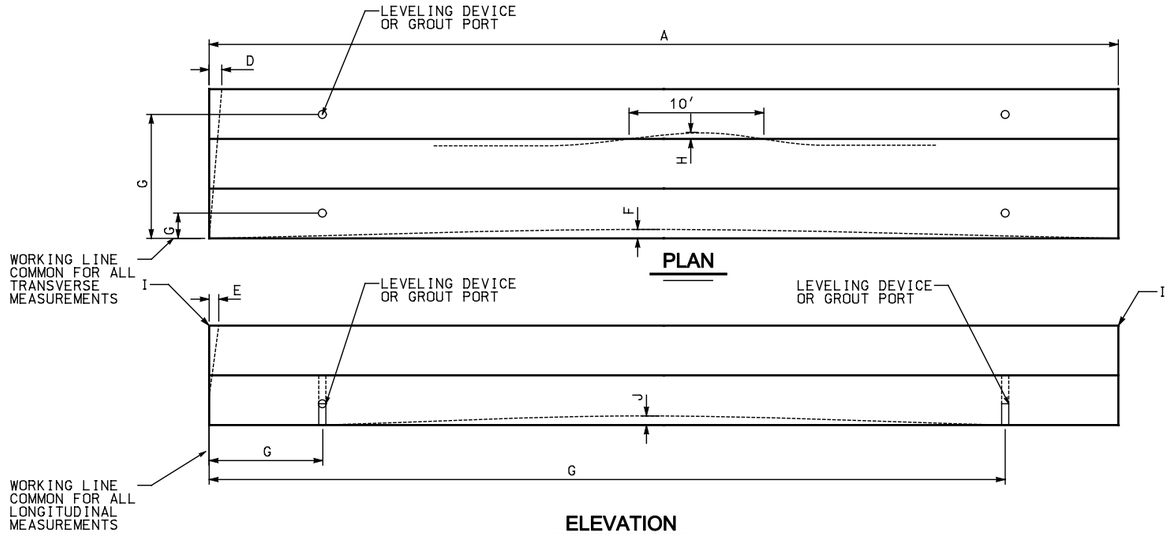
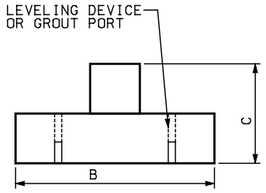


ELEVATION



ELEVATION



SECTION

① APPROACH SLAB TOLERANCES

A	LENGTH	± 1/4″
B	WIDTH (OVERALL)	± 1/4″
C	DEPTH (OVERALL)	± 1/4″
D	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	± 1/2″
E	LOCATION OF LEVELING BOLTS	± 1″
F	SWEEP OVER MEMBER LENGTH:	± 3/8″
G	LOCATION OF PROJECTING REINFORCING MEASURED FROM A COMMON REFERENCE POINT	± 1/2″
H	LOCAL SMOOTHNESS OF ANY SURFACE	± 1/8″ IN 10 FEET
I	ERECTION ELEVATION TOLERANCE (SURFACE APPROACH SLABS ONLY)	± 1/8″
K	LOCATION OF BLOCKOUTS	± 1/2″

② SLEEPER SLAB FABRICATION TOLERANCES

A	LENGTH	± 1/2″
B	WIDTH (OVERALL)	± 1/4″
C	DEPTH (OVERALL)	± 1/4″
D	VARIATION FROM SPECIFIED PLAN END SQUARENESS OR SKEW	± 1/8″ PER 12 INCH WIDTH ± 1/2″ MAXIMUM
E	VARIATION FROM SPECIFIED ELEVATION END SQUARENESS OR SKEW	± 1/8″ PER 12 INCH WIDTH ± 1/2″ MAXIMUM
F	SWEEP OVER MEMBER LENGTH:	± 1/2″
G	LOCATION OF LEVELING DEVICE OR GROUT PORT MEASURED FROM A COMMON REFERENCE POINT	± 2″
H	LOCAL SMOOTHNESS OF ANY SURFACE	± 1/8″ IN 10 FEET
I	ERECTION ELEVATION TOLERANCE	± 1/8″

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PRECAST/PRESTRESSED CONCRETE INSTITUTE NORTHEAST

SUGGESTED GUIDE DETAILS PRECAST APPROACH SLABS

APPROACH SLAB TOLERANCES

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