REQUEST FOR PROPOSALS

to Design and Build the

I-65/I-70 North Split Project

through a Public Private Agreement

VOLUME II

TECHNICAL PROVISIONS ATTACHMENTS

a Project of the

INDIANA DEPARTMENT OF TRANSPORTATION

ISSUED OCTOBER 11, 2019

ADDENDUM #1 ISSUED: DECEMBER 10, 2019

ADDENDUM #2 ISSUED: FEBRUARY 6, 2020

ADDENDUM #3 ISSUED: FEBRUARY 25, 2020

Indiana Department of Transportation
100 North Senate Avenue, IGCN 758
Indianapolis, Indiana 46204

Attachments

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1-2: Planned ROW Limits
1-3: GPS Rover RSP
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ATTACHMENT 1-1

UNIQUE SPECIAL PROVISIONS:

General Scope of Work

PROGRESS MEETINGS

Weekly progress meetings shall be held at the project field office on a weekly basis, or at a frequency as agreed upon with INDOT, or other mutually agreed upon location. The Design-Build Contractor shall document the Progress Meetings with meeting minutes and distributed to INDOT within three days after the Progress Meetings. At a minimum, Progress Meetings shall be attended by the Key Personnel, the additional personnel listed in Section 1.3.1.2 of the Technical Provisions, and shall include the INDOT personnel listed in Section 2.3 (Submittal and Electronic Posting Requirements) and Section 5 (Public Involvement). Other personnel for both Design-Build Contractor and INDOT will be invited on an as-needed basis.

The Design-Build Contractor shall provide a four week look-ahead schedule at the progress meetings, including the number of Work crews, Work hours, delineation of day time and night time Work and the specific portions of the Work to be performed during the four week period. The Design-Build Contractor shall also discuss the status of the overall project schedule, including critical operations and potential problems. Design-Build Contractor shall provide a Progress Report to INDOT documenting the design and construction progress on a monthly basis.

Design-Build Contractor shall provide a Progress Report to INDOT on a monthly basis documenting the design and construction progress. Content of the Progress Report shall include, at a minimum:

1. Executive Summary
   a. Overall summary
   b. Critical issues/significant events
2. Progress Summaries
   a. PMP
   b. Design
   c. Construction
   d. Railroads
   e. Utilities
   f. Environmental
3. Quality
4. Safety
5. DBE and EEO Compliance
6. Change Management
   a. Deviations
   b. Change Orders
   c. Claims

7. Public Coordination and Communication
8. Schedule
   a. Major Milestone Tracking
   b. Upcoming Activities
   c. TMP/Closures
9. Progress Photography

COORDINATION WITH ADJACENT PROJECTS

The Design-Build Contractor shall coordinate all final design, drainage, maintenance of traffic, incident management, and construction activities with the following projects in accordance with Standard Specification 105.07:

1. City of Indianapolis, 12th Street Concrete Pavement Rehabilitation Project, anticipated letting Fall 2019, anticipated completion Fall 2020 (Project No. ST-19-091)

2. City of Indianapolis, Pine Street Concrete Pavement Rehabilitation Project, anticipated letting Fall 2019, anticipated completion Fall 2020 (Project No. ST-19-092)

3. Citizen's Energy Group, Deep Tunnel Project, under construction, anticipated completion date December 2021, Pine Street will be closed between Washington and Market Streets until completion

4. INDOT, Rural Street and Massachusetts Avenue Railroad Crossing Improvement Project, anticipated letting date

5. City of Indianapolis, Monon Trail Improvement Project, letting November 14, 2019, intermediate completion date September 15, 2020, completion date June 15, 2021 (Contract No. R-38050-A, Des. No. 1404733)

6. I-69 Section 6 Best Value Design-Build Contract, anticipated contract award October/November 2020 (Contract R-41536, Des. No. 1801695)

7. INDOT ITS Contract, Fiber line Installation, I-65 from MM 106 to MM 112 and I-70 from MM 79.5 to MM 80.7, letting May 2020, estimated completion November 2020(Contract R-42596, Des. No. 1802794)

Information on INDOT projects is available on the contract letting page and the 18-month letting list on INDOT website at:

http://www.in.gov/indot/div/lettings/18MonthsConstLettingDetails_Ext.pdf.

The Design-Build Contractor is required to become fully informed of the conditions relating to construction of this and any other contracts under which the Work will be or is now being performed, and the Design-Build Contractor shall employ, as far as possible, such methods and means in carrying out of work as will not cause any interruption or interference with any other contractor or agency.

The Design-Build Contractor shall coordinate access to their job site with the other contractor(s) as other contractors will be required. The Design-Build Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their Work, and shall properly integrate, incorporate, and/or coordinate its Work with theirs. The Design-Build Contractor shall take due account of all such Work and shall arrange its methods of operation and storage of materials and

equipment so as to cause a minimum of interferences with the Work to be performed by other contractors, utilities, or any public authority.

If any part of the Design-Build Contractor's Work depends on proper execution or results on the Work of any other contractor, the Design-Build Contractor shall promptly report to INDOT any defect in Work by another contractor which renders it unsuitable for such proper execution and results. The Design-Build Contractor's failure to inspect and report such defects shall constitute an acceptance of the other contractor's Work as fit and proper for the integration or incorporation of its Work, except as to defects which may develop in the other contractor's Work after the execution of the Design-Build Contractor's Work.

Wherever Work being done by other contractors is in conflict, the respective rights of the various interests involved shall be established by INDOT, in order to secure the completion of the various portions of the Work in general harmony.

The Design-Build Contractor shall properly coordinate and expedite its Work in such a manner as to cause the least amount of conflict and interference between its operation and those of all others affected by its operations. Any or all damages or claims resulting from the improper or insufficient notification of all others affected by its operations shall be the responsibility of the Design-Build Contractor. Design-Build Contractor coordination and cooperation shall include, but is not limited to the following:

1. Transportation of construction materials through an adjacent Work zone

2. Construction activities to adjacent construction contracts

3. Maintenance of traffic operations along I-65, I-70, ramps and local streets within project limits

4. Placement of temporary erosion control items

No claims for additional compensation or adjustments will be allowed on account of delay or failure of others to complete the above Work as anticipated.

CRITICAL PATH METHOD SCHEDULE

The Standard Specifications are revised as follows:
SECTION 108, AFTER LINE 171, INSERT AS FOLLOWS:

108.04.1 Critical Path Method Schedule

(a) General Requirements

The Design-Build Contractor shall provide a project schedule using the critical path method, CPM, in place of the bar graph type schedule required in accordance with 108.04. In addition to the submittals required herein, the CPM schedule shall be used to develop all schedules provided by the Design-Build Contractor at scheduling meetings held in accordance with 108.04.

The CPM schedule shall show the various activities of work in sufficient detail to demonstrate a reasonable and workable plan to complete the work in the specified contract time.

The Design-Build Contractor shall be responsible for ensuring that all work sequences are logical and that the schedule reflects a coordinated plan. The CPM schedule shall indicate the order and interdependence of activities and the sequence for accomplishing the work.

The CPM schedule shall include sufficient detail to allow INDOT to readily identify the work and evaluate the progress of each activity. The CPM schedule shall include activities for all work to be performed by the Design-Build Contractor and subcontractors. The schedule shall also include activities specific to the project to be performed by INDOT, other units of government, regulatory agencies, utilities and any other parties necessary to complete the work. The schedule shall reflect the scope of work, construction phasing, maintenance of traffic requirements, environmental requirements, utility and railroad coordination, coordination with other contractors, and any other work included in the contract. The schedule shall include activities for working and shop drawing preparation, Design-Build Contractor submittals, submittal review time by INDOT, material procurement and fabrication, and the delivery of materials, plant, and equipment and other similar activities.

Failure by the Design-Build Contractor to include any element of work or to accurately reflect the relationships among the work activities required for performance of the Contract does not excuse the Design-Build Contractor from completing all required work within the specified time.

(b) Definitions

The following definitions shall be applied to the terms used in this specification and shall not be taken to modify in any way the definitions in 101.02 through 101.74.

***Activity** – A discrete, identifiable task or operation that takes time, has a definable start and stop date, furthers the work's progress, and can be used to plan, schedule, and monitor a project.*

***Activity Calendar** – A set of days assigned to a specific activity on which work for the activity may be scheduled.*

***Activity Calendar Day** – A day on which work is scheduled to be performed on a specific activity.*

***Activity Identification (ID) Number** – A unique, alphanumeric identification code assigned to a specific activity.*

***Activity Network Diagram** – A graphic representation of a CPM schedule, including a timescale, which shows the relationships among activities.*

***Bar Chart** – A graphic representation of a schedule without relationship lines displayed. A timescale appears along the horizontal axis.*

***Calendar ID** – An alphanumeric identification code assigned to an activity calendar.*

Closure Period *– The original or revised maximum duration specified in the contract for the closure of a road, ramp, bridge, or other facility.*

Constraint *– A restriction imposed on the start or finish dates of an activity that modifies or overrides the activity's logic relationships.*

Contract Completion Date *– The original date or revised date specified in the contract for completion of the project.*

Controlling Activity *– The first incomplete activity on the Critical Path.*

Critical Activity *– Any activity on the critical path.*

Critical Path *– Has the meaning set forth in Exhibit 1 of the PPA.*

Data Date *– The first day in a Project Baseline Schedule or the first day for performance of the remaining work in a Project Status Schedule. For an Final Schedule, it is the date that the last activity was completed.*

Delayed Start Date *– The original or revised date specified in the contract prior to which work on the project is prohibited.*

Final Schedule *– The last CPM schedule containing actual start and finish dates for every activity.*

Free Float *– The amount of time an activity can be delayed and not delay a successor.*

Milestone *– An activity with no duration that is typically used to represent the beginning or end of the project or an interim phase. Includes, but is not limited to, intermediate completion dates and the contract completion date.*

Project Status Schedule *– A CPM schedule produced by incorporating the project's actual progress into the last accepted Submittal.*

Open End *– The condition that exists when an activity has either no predecessor or no successor, or when an activity's only predecessor relationship is a finish-to-finish or only successor relationship is a start-to-start.*

Original Duration *– The estimated time, expressed in activity calendar days, required to perform an activity.*

Predecessor *– An activity that is defined by schedule logic to precede another activity. A predecessor may control the start or finish date of its successor.*

Project Baseline Schedule *– An accepted CPM schedule showing the original plan to complete the entire project.*

Relationship *– The interdependence among activities. Relationships link an activity to predecessors and successors.*

Remaining Duration *– The estimated time, expressed in activity calendar days, required to complete an activity.*

Schedule *– Activities organized by relationships to depict the plan for execution of a project.*

Scheduled Completion Date *– The completion date forecast by the CPM schedule. The schedule may also forecast intermediate completion dates or durations for milestones, phases, or other portions of the project.*

Successor *– An activity that is defined by schedule logic to succeed another activity. The start or finish date of a successor may be controlled by its predecessor.*

Total Float *– The amount of time an activity can be delayed and not delay the Substantial Completion Date.*

(c) Required Schedule Submissions

1. Project Baseline Schedule

The Project Baseline Schedule Submittal shall consist of a schedule in accordance with 108.04.1(d) and a narrative report in accordance with 108.04.1(e). The Project Baseline Schedule data date shall be the date of the notice to proceed and the schedule shall not include any actual start or actual finish dates for any activity. The Project Baseline Submittal Schedule shall be made in accordance with Section 1.4 of the Technical Provisions.

2. Project Status Schedule

The Project Status Schedule Submittal shall consist of a CPM schedule in accordance with 108.04.1(d) and a narrative report in accordance with 108.04.1(e). The first monthly Project Status Schedule shall be submitted by the 7th of the month following acceptance of the Project Baseline Schedule. Each succeeding Project Status Schedule shall be submitted by the 7th of each succeeding month. The Project Status Schedule data date shall be the last date of the month prior to Submittal. The Project Status Schedule shall not include any actual start or actual finish dates later than the data date for any activity. If the 7th day of an individual month is a Saturday, Sunday, or a Holiday on which work has been suspended, the monthly Project Status Schedule shall be submitted by the first business day following the 7th.

If the Design-Build Contractor fails to submit a Project Status Schedule by the required date, INDOT will withhold progress estimates until the Project Status Schedule submittal is made.

3. Final Schedule

The Final Schedule shall consist of a CPM schedule in accordance with 108.04.1(d). The Final Schedule shall be submitted no later than 30 calendar days after final acceptance. The Final Schedule shall depict the actual start and finish dates for each activity. The data date of the Final Schedule shall be the date of final acceptance. If the Design-Build Contractor fails to submit the Final Schedule by the required date, INDOT will withhold progress estimates until the Final Schedule is submitted.

4. Acceptance of Schedules

INDOT will provide written notice within 14 calendar days of receipt of a baseline, project status, or final schedule that the schedule is either accepted or rejected. If the notice indicates that a schedule is rejected, the contractual basis for rejection will be identified. If INDOT does not respond in writing to the submittal of a schedule within the allotted time, the schedule shall be considered to be accepted.

INDOT's written notice of acceptance or rejection may include questions, comments, or request additional information. The next schedule submittal's narrative report shall address all questions, comments, or additional information requested by INDOT.

Rejected Baseline Schedules shall be resubmitted until accepted by INDOT.

A rejected Project Status Schedule which immediately follows an accepted baseline or status schedule will not require resubmittal. Project Status Schedules that are rejected for a second consecutive month shall be resubmitted within 14 days of the date of the rejection notification. Subsequent rejections will require additional submittals until acceptance. If the Design-Build Contractor fails to submit a Project Status Schedule requiring resubmittal by the required date, INDOT will withhold progress estimates until the Project Status Schedule is submitted.

Rejected Final Schedules shall be resubmitted until accepted by INDOT. Resubmittal of an Final Schedule shall be made within 14 calendar days of receipt of rejection notification. If the Design-Build Contractor fails to resubmit a rejected Final Schedule by the required date, INDOT will withhold progress estimates until the Final Schedule is submitted.

INDOT's review of a submitted schedule will be for compliance with the specifications. Acceptance by INDOT does not relieve the Design-Build Contractor of responsibility for the accuracy or feasibility of the schedule. Acceptance of a schedule does not constitute a modification of the contract or endorsement or validation of the Design-Build Contractor's logic, activity durations, or assumptions in creating the schedule. Acceptance of a schedule does not guarantee that the project can be performed or completed as scheduled. Omissions and errors in a schedule shall be corrected in the next schedule submittal and will not entitle the Design-Build Contractor to a contract adjustment.

5. Float and Scheduled Completion

Total float belongs to the project and shall be a shared commodity between the Design-Build Contractor and INDOT. Float is not for the exclusive use or benefit of either party. Either party has full use of float until is it depleted.

Float generated during the course of the project due to the efficiencies of either party shall be considered to be part of total float.

Float generated during the course of the project due to favorable weather within a calendar month, where the number of days of inclement weather is less than the normal inclement weather days for the month, shall be considered to be part of total float.

Negative float generated during the course of the project due to factors within the control of the Design-Build Contractor will not be a basis for requesting time extensions. Time extension requests shall be developed in accordance with 108.04.1(f).

A schedule may indicate a scheduled completion date in advance of the Substantial Completion Date. However, INDOT shall not be liable in any way for the Design-Build Contractor's failure to complete the project prior to the Substantial Completion Date or complete work associated with any intermediate contract date or period prior to the original or revised date or period. Any costs incurred by the Design-Build Contractor as a result of such a failure shall be the responsibility of the Design-Build Contractor. The Design-Build Contractor will not be entitled to claim or recover any such cost from INDOT.

An accepted schedule that indicates a scheduled completion date in advance of the Substantial Completion Date will be considered to have total float equal to the time between the scheduled completion date and the Substantial Completion Date.

(d) CPM Schedule Technical Requirements

Prepare the CPM schedule using Primavera Project Management software .

Each CPM schedule submittal shall include the following:

1. *A letter of transmittal identifying the schedule submittal and contents.*

2. A narrative report in accordance with 108.04.1(e). No narrative report is required for the Final Schedule.

3. An electronic file of the schedule in Primavera .XER format that is completely compatible with and may be directly imported without any loss or modification of data or need for any conversion or other software. Any electronic schedule file submitted by the Design-Build Contractor that is not completely compatible with INDOT's Primavera software will be rejected.

4. A copy of the critical path Gantt chart, including lines representing relationships between activities, measuring 11" x 17" or larger. This item is not required for an Final Schedule.

The schedule shall meet the following requirements:

1. The first activity on a schedule shall be a milestone for the notice to proceed (NTP). The last activity on a schedule shall be a milestone for the Substantial Completion Date and shall reflect the date of notice of presumptive completion of the entire contract in accordance with 105.15(b). The schedule shall not include activities related to the final inspection, performance of punchlist work, or removal of construction signs.

2. All intermediate completion dates or I/D dates shall be shown in the schedule as milestones.

3. Project Baseline Schedules shall indicate that milestones associated with the contract completion date, all intermediate completion dates, all I/D dates, and all closure periods meet contract requirements.

4. Project Status Schedules shall indicate that milestones associated with the contract completion date, all intermediate completion dates, all I/D dates, and all closure periods meet contract requirements unless the narrative report indicates that there is an unresolved delay situation which is beyond the control of the Design-Build Contractor.

5. Codes for phase, location and responsibility shall be assigned for each activity. Additional activity codes may be used if approved by INDOT.

6. Activities associated with work performed on a closed facility during a closure period shall be assigned a distinct activity phase code to allow a comparison of the scheduled closure period to the contract closure period.

7. Each activity shall have a unique description and activity identification number which shall not be modified or re-assigned after acceptance of the Project Baseline Schedule.

8. Each activity description shall generally describe the work type and location and shall be associated with only one operation.

9. Each construction related activity shall have an original duration not to exceed 20 activity calendar days unless approved by INDOT. It is permissible for activities related to fabrication, utility relocation, permit acquisition, and other non-construction activities to have longer original durations.

10. Activities for submittal reviews by INDOT shall allow reasonable durations, but in no case less than 14 calendar days unless otherwise specified or approved by INDOT.

11. Each activity, except the first activity, shall have at least one predecessor.

12. Each activity, except the last activity, shall have at least one successor.

13. No start-to-finish activity relationships shall be used. Activity finish-to-start relationships shall include no lags. Finish-to-finish or start-to-start activity relationships may use lags that include fewer days than the original duration of the predecessor activity.

14. The use of lags with a negative value shall not be used for any activity relationship type.

15. All activities shall have their start and finish tied to the logic of the schedule.

16. Activities shall not be constrained unless noted herein or approved by INDOT. The contract

completion date, intermediate completion dates, and I/D dates shall be constrained using a finish on or before constraint. Delayed start dates shall be constrained using a start on or after constraint.

17. Each activity shall be assigned to an activity calendar. A schedule may utilize more than one activity calendar, but only one activity calendar shall be assigned to each activity. All activity calendars shall be project calendars as classified by Primavera.

18. Activity calendars associated with construction activities shall include a minimum number of non-work days for the months of April through November, inclusive, equal to the number of above normal inclement weather days shown in 101.02. However, the number of non-work days included in calendars associated with bridge, traffic, and road construction activities shall be equal to or greater than the tabulated value related to B, T, or R contracts respectively, regardless of the type of contract involved.

19. Activity calendars for non-work activities, including but not limited to submittals, reviews, procurement, fabrication, cure times, and utility relocations performed by others shall not show any non-work days.

20. Seasonal weather conditions and Design-Build Contractor scheduled shut down periods shall be considered and included in the activity calendars for all work scheduled from December 1 through March 31.

21. Schedule calculations shall be performed using the following settings: retained logic; contiguous activity durations for individual activities; critical path based on longest path; and total float based on activity finish dates.

22. Cost- and resource-load the Schedule as the basis to administer the payments to the Design-Build Contractor and track production. Utilize cost accounts reflective of Schedule of Values, and assign applicable cost-loaded activities to respective cost accounts. The costs assigned to Schedule activities roll up to equal the price for each item identified in the Schedule of Values. The total cost of all Schedule activities equals the Contract Price

23. Resource-load the Schedule to include a reasonable estimate of either a commodity or labor hour upon which value or production is based.

24. The cost assigned to individual Schedule activities may not artificially inflate, imbalance, or front-load the items. Substantiate an activity if INDOT questions the definition, costs, or production rate of it.

25. Provide two user-defined fields to identify Start Station and End Station for each construction activity.

(e) Narrative Reports

The Design-Build Contractor shall submit a narrative report with each baseline and status schedule submittal to describe and elaborate on the work identified in the schedule. Conflicting information between the narrative report and associated schedule will be cause for rejection of a baseline or status schedule.

Information included in narrative reports will not be considered to meet the requirements for contractual notice of a changed condition in accordance with 105.16 or requests for additional contract time in accordance with 108.04.1(f). Separate correspondence meeting the applicable requirements shall be submitted by the Design-Build Contractor to serve as notice of a changed condition or a request for additional contract time.

For the Project Baseline Schedule submittal, the narrative report shall include the following:

1. An explanation of the overall plan to complete the project, including where the work will begin and how the work will progress through the project.

2. Statements comparing the scheduled completion date or duration to the Substantial Completion Date, all intermediate completion dates, all I/D dates, and all closure periods.

3. An explanation of the planned work schedule, including the planned number of workdays per week, planned number of shifts per day, whether night shifts are planned, number of hours planned per shift, holidays planned to be observed, extent of work planned for the winter months, and how the schedule calendars accommodate the required number of adverse weather days for each month. If multiple crews are planned, the above information shall be provided for each crew.

4. Description of the work to be completed each construction season and during each winter for multi-year projects.

5. A detailed description of any unresolved actual or anticipated problems or issues. If a contractual notice of a changed condition or a claim in accordance with 105.16 has been submitted and INDOT response is pending, the description shall indicate dates associated with each Design-Build Contractor submittal.

6. A description of any unresolved actual or anticipated delays, including identification of the type of delay, the cause of the delay, responsibility for the delay, identification of all delayed critical activities, the effect of the delay on other activities and project milestones and identification of actions required to mitigate the delay. If the Design-Build Contractor has submitted a request for additional contract time in accordance with 108.04.1(f) and INDOT response is pending, the description shall indicate the date of the Design-Build Contractor submittal.

7. A detailed description of the critical path.

8. An explanation of the use of any constraints, including the reason and purpose for each constraint.

9. A statement describing the status of any required permits.

10. A statement describing the reason for the use of each lag.

11. A list of all proposed exceptions to this specification included in the schedule that require approval by INDOT along with an explanation of why the exception is appropriate.

For each Project Status Schedule submittal, the narrative report shall include the following:

1. A statement comparing the scheduled completion date to the Substantial Completion Date and any change in the scheduled completion date from the previous accepted submittal and an explanation of time gained or lost to each intermediate completion date and the Substantial Completion Date.

2. An explanation if the scheduled completion date is projected to occur after the Substantial Completion Date.

3. A statement comparing the scheduled completion of work associated with each I/D date, or closure period in the contract as well as any changes in these scheduled dates or closure periods from the previous accepted submittal.

4. An explanation if work associated with any contract milestone date or closure period is projected to occur after the dates or projected to require a longer duration than set out in the contract.

5. A list of activities that have been added or deleted from the schedule since the last accepted submittal and an explanation for the addition or deletion.

6. A list of all changes in activity relationships, predecessors, or successors since the last accepted submittal and an explanation for each change.

7. A list of activities with original durations that have been changed since the last accepted submittal along with an explanation regarding how the change is planned to be accomplished.

8. A description of the work performed since the last accepted submittal.

9. A description of and explanation for any changes between the work performed since the last accepted submittal and the work planned at the time that submittal was made.

10. A detailed description of any unresolved problems that are anticipated or that have been encountered. If a contractual notice of a changed condition or a claim in accordance with 105.16 has been submitted and INDOT response is pending, the description shall indicate the date of the notice or claim submittal.

11. A statement that identifies any unresolved actual and anticipated delays. The statement should include identification of the delayed activity, the party apparently responsible for the delay, the type of delay, the cause of the delay, the effect of the delay on other activities and project milestones and identification of actions required to mitigate the delay. If the Design-Build Contractor has submitted a request for additional contract time in accordance with 108.04.1(f) and INDOT response is pending, the statement shall indicate the date of the Design-Build Contractor request.

12. A detailed description of the critical path.

13. A list of activities which have become critical since the last accepted submittal.

(f) Extension of Contract Time

If the Design-Build Contractor believes work on the contract has been delayed for reasons beyond its control, a written request for extension of contract time may be submitted in accordance with 108.08. The Design-Build Contractor's request for extension of time shall be submitted in conjunction with the first Project Status Schedule submittal that is made after the delay mitigation work is complete. A Project Status Schedule which accompanies a time extension request shall utilize a data date which is the date that the delay mitigation work is complete.

The determination of contract time extension will be based solely on INDOT's comparison of the Project Status Schedule submittal associated with the time extension request and the last accepted schedule prior to the beginning of the delay event.

Delays or suspensions of work due to the Design-Build Contractor's failure to comply with the specifications will not be cause for additional compensation or extension of contract time.

105-C-235 GPS ROVER FOR USE BY PROJECT PERSONNEL

(Adopted 09-19-13)

Description

This work shall consist of providing a GPS rover and cellular modem for use by the Engineer for the duration of the contract.

Materials

Materials shall be in accordance with the following:

The Global Positioning System, GPS, rover shall consist of a GPS receiver antenna, data collector and a survey-grade rod with a rod mounted adaptor for the data collector. The GPS rover shall be a survey-grade unit with vertical and horizontal precision of 0.1 ft. mounted on a bi-pod.

Software to analyze the data shall be provided to the Engineer. The software shall be capable of calculating earthwork volumes, determining stations and offsets and calculating the area and volumes of an irregular shape. The data collector shall be capable of exporting collected data in its native format and also in an ASCII format for processing in other software packages. The Contractor shall provide a project surface model, if available, consisting of the design surface, roadway alignment and associated horizontal line work.

The rover, data collector and accompanying software provided to the Department shall be compatible with equipment used by the Contractor.

The GPS rover shall be capable of communicating with the INDOT Continuously Operating Reference Stations, InCORS, network. The GPS rover shall be capable of using GPS and Glonass satellites.

If the cellular modem service does not provide a sufficient signal at the project site to communicate effectively, as determined by the Engineer, the Contractor shall provide a base station in lieu of the cellular modem. The base station shall be survey grade and compatible with the rover. The Contractor shall provide sufficient control throughout the project limits for the base station setup.

The materials provided shall be for the exclusive use by the Engineer for the duration of the contract, and shall remain the property of the Contractor.

Construction Requirements

The Contractor shall provide a contact to the Engineer in the event technical difficulties are encountered. The Contractor shall provide operators manuals for the equipment furnished. The Contractor shall provide up to 16 hours of training in the use of the equipment to the Engineer. Training will be scheduled at mutually agreeable times.

The Contractor shall not be responsible for providing training on any software or equipment used by the Department that is not provided by the Contractor or any of its subcontractors.

Up to an additional eight hours of training shall be provided if a base station is provided. The Contractor shall be responsible for

daily set up of the base station, at a location approved by the Engineer, until all training has been provided.

If the equipment becomes unusable for any reason, the Contractor shall repair or replace it within four business days of being notified.

Method of Measurement

Construction Engineering, GPS Rover will not be measured for payment.

Basis of Payment

Construction Engineering, GPS Rover will be paid at the contract unit price per lump sum. If a base station is provided, payment will be in accordance with 109.05.

Payment will be made under:

Pay Item	**Pay Unit Symbol**
Construction Engineering, GPS Rover	LS

The cost of the equipment, use of the equipment for up to 60 days beyond final acceptance, training, technical assistance, manuals, software and all other necessary incidentals shall be included in the cost of the pay item. Payment for additional equipment to replace any damaged due to the Department’s negligence, will be paid in accordance with 104.03.

If contract time is extended by more than 30 days, a prorated additional payment will be made.

ATTACHMENT 3-1
APPLICABLE STANDARDS

3-1.1 Introduction

Design-Build Contractor shall design and construct the Work in accordance with the relevant requirements of the Project Standards listed in Table 3-1 of this Attachment 3-1. In some instances, only specific sections of the referenced standard apply, as specified in these Technical Provisions. Section 1.3 of the PPA defines the order of precedence for the PPA documents. Section 1.3.4 and 1.3.5 of the PPA provides requirements regarding irreconcilable conflicts, ambiguities or inconsistencies among the Project Standards.

In accordance with Section 2.1.2.5 of the PPA, Design-Build Contractor shall use the most current version of each standard or reference listed in Table 3-1 as of the Setting Date, unless expressly stated otherwise in the PPA Documents.

Any standards, manuals and guidelines that are not included within the definition of Project Standards must be approved by INDOT prior to use by Design-Build Contractor. Any manuals or documents other than those reflected herein or elsewhere in the PPA Documents require INDOT's prior approval before use in the Work. Design-Build Contractor shall obtain advance prior written approval from INDOT for any Deviation from the Project Standards, in addition to complying with any other requirements regarding requested Deviations set forth in the PPA Documents.

Design-Build Contractor shall be responsible to communicate with the applicable Utility Owner to determine the applicable Adjustment Standards for any Adjustment Work.

3-1.2 Modifications to INDOT Standards

The following notes apply to the INDOT standards used on the Project:

1. Certain standards have been created as internal guidance documents and not as mandatory requirements. However, for purposes of this Project, all provisions of standards, including the figures and tables, are mandatory, and guidelines are to be applied as requirements. All words such as "should," "may," "must," "might," "could," and "can" shall mean "shall" unless the context requires otherwise, as determined in the sole discretion of INDOT. Design-Build Contractor shall disregard qualifying words such as "usually," "normally," and "generally." References to INDOT practices and policies shall be construed to be mandatory requirements unless the context requires otherwise. It shall be in INDOT's sole discretion to determine when the context does not require a provision to be mandatory.

2. In accordance with Sections 2.1.2.5 of the PPA, if the INDOT standard expires during the course of this Project, Design-Build Contractor shall contact INDOT to determine whether the standard shall continue to be used or will be replaced.

3. When a reference to "Engineer" relates to design responsibilities or other technical issues, "Engineer" shall mean Design-Build Contractor's Design Manager or Designer. When a reference to "Engineer" relates to administrative issues, "Engineer" shall mean INDOT. It shall be in INDOT's sole discretion to determine whether the context refers to

technical or administrative responsibilities. All references to INDOT offices and personnel shall mean Design-Build Contractor's similar offices and personnel.

4. All references related to measurement for payment, method of measurement, basis of payment, extra work, contract adjustments, adjustment of unit prices, or similar phrases shall be disregarded by Design-Build Contractor, with the exception of the following:

    a. Quality adjustments in accordance with Section 109.05.1 of the Standard Specifications

    b. Quality adjustments for CRCP shall be in accordance with Attachment 9-1 (USP-Pavement)

5. References to "additional work," "adjustment to compensation," "extra work," "pay extra," "at the expenses to the Department," or similar phrases shall be disregarded, with the exception of smoothness and quality pay adjustment factors for pavement. Payment, and adjustments thereto, as more fully described in Section 12 of the PPA, will be full compensation for all Work performed pursuant to the PPA Documents unless specific provisions for additional payments are contained in the PPA Documents.

6. No changes have been made to provisions in any standards that do not apply to this Project, but that provide general information (e.g., descriptions of INDOT divisions and their duties, descriptions of legal authority, or descriptions of internal INDOT procedures); however, in some cases it may not be clear whether rights or responsibilities are applicable to Design-Build Contractor. In accordance with Sections 1.5 of the PPA, if it is unclear whether specific provisions in the standards are applicable to Design-Build Contractor, Design-Build Contractor shall notify INDOT and INDOT shall make that determination in its sole discretion.

7. Design-Build Contractor shall disregard the paragraphs within the standards relating to questions. All questions shall be taken to INDOT.

8. When a standard refers to items that will be performed or provided by INDOT or by a division or employee of INDOT, Design-Build Contractor shall construe the requirements as applying to Design-Build Contractor unless otherwise specified in the PPA Documents, or unless the context requires otherwise. It shall be in INDOT's sole discretion to determine when the context requires otherwise.

9. When a standard refers to an action being necessary or needed, Design-Build Contractor shall construe the action as required, unless the context requires otherwise, as determined in the sole discretion of INDOT.

10. Phrases relating to item(s) or activity(ies) that "will be" conducted, that are "most easily accomplished by," that "are recommended," that are "desired," that are "usually necessary," that "should preferably be" done, that "might require," that are "necessary" or "as necessary", and that are "required" or "done" shall be construed to be mandatory requirements unless the context requires otherwise, as determined in the sole discretion of INDOT. Phrases relating to activity(ies) that should not be conducted, such as "is not normally used," "is not good practice," "should never be done," "cannot be used," or "should be avoided," shall be construed as prohibited. It shall be in INDOT's sole discretion to determine when the context either requires or does not require a provision to be mandatory.

11. Where the notes refer to items that are indicated in the Plans or special provisions or required in the Plans or special provisions, “plans or special provisions” shall mean Design-Build Contractor’s Plans or special provisions.

12. References to approved products or materials shall mean such products or materials approved by INDOT.

13. Design-Build Contractor shall use forms as required to report the same information and in the same format as the INDOT forms shown in the standards.

14. If Design-Build Contractor believes that an item in the standards is unclear, Design-Build Contractor shall notify INDOT. Regardless of whether Design-Build Contractor notifies INDOT, INDOT shall always have the right to notify Design-Build Contractor if Design-Build Contractor is interpreting a requirement incorrectly.

15. All references to “you” or “your” shall mean Design-Build Contractor unless otherwise directed by INDOT.

16. When a standard refers to items that will be performed or provided by INDOT or by a division or employee of INDOT, Design-Build Contractor shall construe the requirements as applying to Design-Build Contractor unless otherwise specified in the PPA Documents, or unless the context requires otherwise. It shall be in INDOT’s sole discretion to determine when the context requires otherwise.

17. The following sections of Standard Specifications Section 100 – General Provisions are deleted as they are superseded by the PPA: Sections 102, 103.04, 103.05, 104.01, 104.02, 104.03, 105.02, 105.05, 105.06, 105.15, 105.16, 107.06, 107.17, 107.19, 107.22, 107.23, 107.24, 107.25, 108.02, 108.03, 108.08, 108.09, 108.10, 108.11, 108.12, 109 (excepting language specific to pay factors as noted above for item 4), 110, 111, and 113.

18. Section 108.01 of the Standard Specifications is revised to read: “The subcontractor shall be in accordance with the requirements of 105 IAC 11-2-10, Subcontractors.”

3-1.3 List of Project Standards

Table 3-1: Standards and References

The Applicable Standards shall be, but not limited to, those listed below, with approval of other standards at INDOT's sole discretion.

IS: Industry standard, Design-Build Contractor's responsibility to acquire.

W: Standard available online at Author/Agency's website, Design-Build Contractor's responsibility to acquire. (Web sites are listed for some of the standards listed below for information only. The Web sites listed are not guaranteed to be correct. It is ultimately Design-Build Contractor's responsibility to locate the required standard and to determine if the standard has been modified pursuant to this RFP.)

Author/Agency	Title	Availability
INDOT	Standard Specifications http://www.in.gov/dot/div/contracts/standards/book/index.html	W
INDOT	Recurring Special Provisions & Plan Details http://www.in.gov/dot/div/contracts/standards/rsp/index.html	W
INDOT	INDOT Standard Drawings http://www.in.gov/dot/div/contracts/standards/drawings/index.html	W
INDOT	INDOT Design Memos https://www.in.gov/dot/div/contracts/standards/memos/memos.html	W
INDOT	INDOT Directives https://www.in.gov/indot/div/mt/directives/directives.htm	W
INDOT	Design Manual (IDM) including Design Memoranda http://www.in.gov/indot/design_manual/design_manual_2013.htm	W
INDOT	Approved Materials List http://www.in.gov/indot/div/mt/appmat/appmat.htm	W
INDOT	Indiana Manual on Uniform Traffic Control Devices (IMUTCD) http://www.in.gov/dot/div/contracts/design/mutcd/mutcd.html	W

Author/Agency	Title	Availability
INDOT	Traffic Management Strategic Deployment Plan http://www.in.gov/indot/3045.htm	W
INDOT	Work Zone Safety Mobility Policy http://www.in.gov/dot/div/contracts/standards/	W
INDOT	Professional Services Contract Administration Manual http://www.in.gov/indot/2733.htm	W
INDOT	Construction Memorandums http://www.in.gov/dot/div/contracts/conmemo/con_memo.htm	W
INDOT	Geotechnical Design Manual, Guidelines, Memoranda, Forms, and Approved Contractors, Consultants, & Materials http://www.in.gov/indot/2804.htm	W
INDOT	Public Involvement Policies and Procedures Manual http://www.in.gov/indot/2366.htm	W
INDOT	Total Storm Management Manual http://docs.lib.purdue.edu/cgi/viewcontent.cgi?article=1000&context=jtrpdocs	W
INDOT	Utility Accommodation Policy http://www.in.gov/indot/3787.htm	W
INDOT	Utility Facility Relocations on Construction Contracts (105 IAC 13) http://www.in.gov/indot/3787.htm	W
INDOT	Interstate Highway Congestion Policy http://www.in.gov/indot/3383.htm	W
INDOT	Bridge Inspection Manual http://www.in.gov/dot/div/contracts/standards/bridge/bridgeinspect.htm	W

Author/Agency	Title	Availability
INDOT	Manual for Frequency of Sampling and Testing and Basis for Use of Materials http://www.in.gov/indot/2736.htm	W
INDOT	Traffic Noise Analysis Procedure https://www.in.gov/indot/files/2017%20INDOT%20Noise%20Policy.pdf	W
INDOT	Real Estate Manuals http://www.in.gov/indot/2493.htm	W
INDOT	Right-of-Way Engineering Manual, and Revisions http://www.in.gov/indot/2731.htm	W
INDOT	Site Assessment & Management Manual https://www.in.gov/indot/files/Site%20Assessment%20%20Management%20Manual.pdf	W
INDOT	Cost Estimation System (CES) – Designer Instructions http://www.in.gov/dot/div/contracts/CES%20Designer%20Instructions.pdf	W
AASHTO	T88, T194 and T289	IS
AASHTO	A Guide for Transportation Landscape and Environmental Design	IS
AASHTO	Guide for the Planning, Design, and Operation of Pedestrian Facilities	IS
AASHTO	Guide for the Development of Bicycle Facilities	IS
AASHTO	A Guide for Achieving Flexibility in Highway Design	IS
AASHTO	A Policy on Geometric Design of Highways and Streets	IS
AASHTO	Roadside Design Guide	IS
AASHTO	A Policy on Design Standards – Interstate System	IS

Author/Agency	Title	Availability
AASHTO	Highway Safety Design and Operations Guide	IS
AASHTO	Roadway Lighting Design Guide	IS
AASHTO	LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals	IS
AASHTO	An Informational Guide for Roadway Lighting	IS
AASHTO	Standard Specifications for Transportation Materials and Methods of Sampling and Testing	IS
AASHTO	Guide Specifications for Structural Design of Sound Barriers	IS
AASHTO	LRFD Bridge Design Specifications	IS
AASHTO	Standard Specifications for Highway Bridges	IS
AASHTO	Manual for Bridge Evaluation	IS
AASHTO	Guide Design Specifications for Bridge Temporary Works	IS
AASHTO	LRFD Guide Specifications for Accelerated Bridge Construction	IS
AASHTO	LRFD Bridge Construction Specifications	IS
AASHTO	Bridge Security Guidelines	IS
AASHTO	Manual on Subsurface Investigations	IS
AASHTO	Manual for Assessing Safety (MASH)	IS
AASHTO/AWS	D1.5M/D1.5:2010 Bridge Welding Code	IS
AASHTOWare	Bridge Rating (BrR) Tool for Rating Bridge Superstructures	IS
AISC	American Institute of Steel Construction – Steel Construction Manual	IS
City of Indianapolis	Right-of-Way Permit http://www.indygov.org/eGov/City/DCE/Permits/Right_of_Way/Pages/home.aspx	W

Author/Agency	Title	Availability
City of Indianapolis	Public Works Specifications and Manuals https://www.indy.gov/activity/public-works-specifications-and-manuals	W
FAA	Notice of Proposed Construction or Alteration https://oeaaa.faa.gov/oeaaa/external/portal.jsp	W
FHWA	Flexibility in Highway Design http://www.fhwa.dot.gov/environment/publications/flexibility/	W
FHWA	Code of Federal Regulations, Title 23 (Highways), Chapter 1, Part 752 Landscape and Roadside Development http://www.fhwa.dot.gov/legsregs/directives/cfr23toc.htm	W
FHWA	FHWA-RD-03-031: Distress Identification Manual for the Long-Term Pavement Performance Program https://www.fhwa.dot.gov/publications/research/infrastructure/pavements/ltpp/reports/03031/03031.pdf	W
FHWA	FHWA-NHI-016-072 - Geotechnical Engineering Circular No. 5: Geotechnical Site Characterization https://www.fhwa.dot.gov/engineering/geotech/library_listing.cfm?TitleStart=G	W
FHWA	FHWA-NHI-16-009 & 010 - Geotechnical Engineering Circular No. 12: Design and Construction of Driven Pile Foundations, Volumes I & II https://www.fhwa.dot.gov/engineering/geotech/library_listing.cfm?TitleStart=G	W
FHWA	Manual on Uniform Traffic Control Devices (MUTCD) http://mutcd.fhwa.dot.gov/	W
FHWA	Indiana Manual of Uniform Traffic Control Devices (IMUTCD) https://www.in.gov/dot/div/contracts/design/mutcd/2011rev1MUTCD.htm	W
FHWA	Roadway Lighting Handbook http://safety.fhwa.dot.gov/roadway_dept/night_visib/lighting_handbook/	W

Author/Agency	Title	Availability
FHWA	FHWA-NHI-14-007 - Geotechnical Engineering Circular No. 7: Soil Nail Walls https://www.fhwa.dot.gov/engineering/geotech/library_listing.cfm?TitleStart=G	W
FHWA	FHWA-IF-99-015 - Geotechnical Engineering Circular No. 4: Ground Anchors and Anchored Systems https://www.fhwa.dot.gov/engineering/geotech/library_listing.cfm?TitleStart=G	W
FHWA	FHWA-IF-02-054 – Geotechnical Engineering Circular No. 6: Shallow Foundations https://www.fhwa.dot.gov/engineering/geotech/library_listing.cfm?TitleStart=G	W
FHWA	FHWA-NHI-10-016 - Geotechnical Engineering Circular No. 10: Drilled Shafts: Construction Procedures and LRFD Design Methods Manual https://www.fhwa.dot.gov/engineering/geotech/library_listing.cfm?TitleStart=G	W
FHWA	FHWA-NHI-10-024 - GEC 11 Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Volume 1 https://www.fhwa.dot.gov/engineering/geotech/library_listing.cfm?TitleStart=G	W
FHWA	FHWA-NHI-10-025 - GEC 11 Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Volume II https://www.fhwa.dot.gov/engineering/geotech/library_listing.cfm?TitleStart=G	W
FHWA	FHWA-NHI-16-027 & 028 - Geotechnical Engineering Circular No. 13 Ground Modification Methods Reference Manual - Volumes I & II	W
FHWA	Technical Manual for Design and Construction of Road Tunnels – Civil Elements, Report No. FHWA – NHI-10-034 http://www.fhwa.dot.gov/bridge/tunnel/pubs/nhi09010/foreward.cfm	W

Author/Agency	Title	Availability
FHWA	Program Guide Utility Relocation and Accommodation http://www.fhwa.dot.gov/reports/utilguid/	W
FHWA	Highway Performance Monitoring System (HPMS) Field Manual http://www.fhwa.dot.gov/ohim/hpmsmanl/hpms.cfm	W
FHWA	Railroad-Highway Grade Crossing Handbook http://safety.fhwa.dot.gov/xings/com_roaduser/07010/	W
ADA	Americans with Disabilities Act Accessibility Guidelines	IS
ANSI A300 (Part 1)	Tree Care Operations – Tree, Shrub and Other Woody Plant Maintenance – Standard Practices	IS
ANSI A300 (Part 2)	Tree Care Operations – Tree, Shrub and Other Woody Plant Maintenance – Standard Practices – Part 2 – Fertilization	IS
ANSI A300 (Part 3)	Tree Care Operations – Tree, Shrub and Other Woody Plant – Standard Practices – Part 3 – Tree Support Systems	IS
ANSI Z60.1	American Standard for Nursery Stock	IS
ANSI Z133.1	Safety Requirements for Pruning, Trimming, Repairing, Maintaining, and Removing Trees, and for Cutting Brush	IS
ANSI/IESNA RP-8-00	American National Standard Practice for Roadway Lighting	IS
ANSI/EIA/TIA	American National Standards Institute/Electronic Industries Alliance/Telecommunications Industry Association (ANSI/EIA/TIA) – 222-G Structural Standards for Antenna Supporting Structures and Antennas 568A 568B.3 Optical Fiber Cabling Components Standards 606 Administration Standard for Telecommunications Infrastructure	IS
TIA/EIA	The Telecommunications Industry Association & Electronic Industries Alliance Standards	IS

Author/Agency	Title	Availability
ASTM	Annual Books of Standards	IS
Hortus Third	A Concise Dictionary of Plants Cultivated in the United States and Canada (L. H. Bailey Hortorium, 1976)	IS
IDEM	Indiana Storm Water Quality Manual http://www.in.gov/idem/stormwater/2363.htm	W
IDEM	Rule 5 Permit https://www.in.gov/idem/stormwater/2331.htm	W
IDEM	Section 401 Water Quality Certification https://www.in.gov/idem/wetlands/2344.htm	W
IDEM	Isolated Wetlands Permit https://www.in.gov/idem/wetlands/2343.htm	W
IDNR	Indiana Drainage Handbook http://www.in.gov/dnr/water/4893.htm	W
IDNR	Guidelines for the Hydrologic-Hydraulic Assessment of Floodplains in Indiana http://www.in.gov/dnr/water/5710.htm	W
IEEE	National Electric Safety Code	IS
IES	Roadway Lighting Handbook, RP-8, Addendum: “Designing the Lighting System – Using Roadway Lighting”	IS
IES	DG-5-94, Recommended Lighting for Walkways and Class 1 Bikeways	IS
IES	RP-8-00, American National Standards for Roadway Lighting	IS
IHPC	Certificate of Appropriateness https://www.indy.gov/activity/historic-preservation-certificate-of-appropriateness	W
INDOT Aviation	Indiana Tall Structure Permit https://www.in.gov/indot/2808.htm	W
CIE	International Lighting Commission – CIE 127-2007, Technical Report: Measurement of LEDS	IS
Motorola	R56 Standards and Guidelines for Communication Sites	IS

Author/Agency	Title	Availability
NTCIP	National Transportation Communication for ITS Protocol Standards	IS
IGGA	Guide Specification - Next Generation Concrete Surface (NGCS) Construction on Newly Constructed Roadways http://igga.net/resources/specifications	W
ITE	Manual of Transportation Engineering Studies	IS
ITE	Traffic Engineering Handbook	IS
ITE	Preemption of Traffic Signals Near Railroad Crossings: An ITE Recommended Practice	IS
ITE	Equipment and Material Standards	
NCHRP	NCHRP Report 480, A Guide to Best Practices for Achieving Context Sensitive Solutions	IS
NEMA	National Electrical Manufacturer Association	IS
NFPA	NFPA 70 - National Electric Code	IS
NFPA	National Electric Safety Code	IS
NFPA	502-Standard for Road Tunnels, Bridges and Other Limited Access Highways	IS
NFPA	Standard for the Installation of Lightning Protection Systems, NFPA 780	IS
NECA	National Electrical Contractors Association Standard of Installation	IS
NETA	International Electrical Testing Association Standard ATS	IS
UL	Underwriters Laboratories, Inc., Lightning Protection Components, UL 96 and UL 96A	IS
USACE	Section 404 Permit https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/Obtain-a-Permit/	W
Telcordia	GR 196 Core Issue 2, Generic Requirements for Optical Time Domain Reflectometer (OTDR)	IS
TRB	Highway Capacity Manual	IS

Author/Agency	Title	Availability
TRB	NCHRP Report 529, Guideline and Recommended Standard for Geofoam Application in Highway Embankments	IS
Bellcore	Technical Advisories and Technical Requirements	IS
AREMA	Manual for Railway Engineering	IS
CSX	Bridge and Track Design Criteria, Specifications, and Standard Drawings	IS
PCI	Bridge Design Manual Volume I & II	IS
PCI	Design Handbook	IS
PCI	Full Depth Deck Panel Guidelines, For Accelerated Bridge Deck Replacement or Construction http://www.pcine.org/cfcs/cmsIT/baseComponents/fileManagerProxy.cfc?method=GetFile&fileID=2D90746A-F1F6-B13E-82A745AB150E0E16	W
CRSI	Concrete Reinforcing Steel Institute Manual of Standard Practice	IS
Access Board	Public Rights-of-Way Accessibility Guidelines (PROWAG) https://www.access-board.gov/guidelines-and-standards/streets-sidewalks/public-rights-of-way	W
Indiana DNR	Guidebook for Indiana Historic Sites and Structures Inventory – Archaeological Sites https://www.in.gov/dnr/historic/files/hp-archaeology_guidebook.pdf	W
Strategic Highway Research Program (SHRP)	Innovative Bridge Designs for Rapid Renewal – ABC Toolkit http://onlinepubs.trb.org/onlinepubs/shrp2/SHRP2prepubR04ABCToolkit.pdf	W

INERTIAL PROFILER FOR PCCP

The Standard Specifications are revised as follows:

SECTION 501, DELETE LINES 375 THROUGH 483.

SECTION 501, AFTER LINE 483, INSERT AS FOLLOWS:

501.25 Pavement Smoothness

Pavement smoothness will be accepted by means of an inertial profiler, a 16 ft long straightedge, or a 10 ft long straightedge as described below.

(a) Inertial Profiler

When a pay item for Inertial Profiler, PCCP is included in the contract, the Contractor shall furnish, calibrate, and operate an approved inertial profiler in accordance with ITM 917 for the acceptance of longitudinal smoothness on the mainline traveled way and ramps, including adjacent acceleration or deceleration lane, where both of the following conditions are met:

1. *The design speed is greater than 45 mph.*

2. *The traveled way or ramp lane width and slope are constant and is 0.1 mi in length or longer.*

The profiles International Roughness Index, IRI, results including smoothness histograms and areas of localized roughness, and fixed interval IRI results shall become the property of the INDOT. The inertial profiler shall remain the property of the Contractor.

The paving exceptions and areas exempt from inertial profiler operation will be in accordance with ITM 917.

If the posted speed limit for an entire smoothness section is less than or equal to 45 mph, the section will be exempt from inertial profiler operation and the smoothness within the section will be accepted by a 16 ft straightedge.

If the posted speed limit is greater than 45 mph for a portion of a smoothness section and is less than or equal to 45 mph for the remainder, the section smoothness acceptance will be as follows:

1. *By inertial profiler for the portion of the section with a posted speed limit greater than 45 mph.*

2. *In accordance with 501.25(c) for the portion of the section with a posted speed limit less than or equal to 45 mph.*

At locations where the inertial profiler is required, all high or low point deviations with an IRI greater than 150 in./mile, utilizing a 25 ft window, shall be corrected. Corrections shall be made in accordance with 501.25(d).

(b) Blank

(c) 16 ft Straightedge and 10 ft Straightedge

The Department will furnish and operate 16 ft and 10 ft straightedges as described below. The 16 ft straightedge is used to accept smoothness along the direction of mainline traffic and the 10 ft straightedge is used to accept smoothness transverse to the direction of mainline traffic. This includes longitudinal smoothness on public road approaches and median crossovers.

For contracts which include the Inertial Profiler, PCCP pay item, the 16 ft long straightedge will be used to accept longitudinal smoothness at the following locations:

1. *All mainline traveled way lanes shorter than 0.1 mi.*
2. *All mainline traveled way lanes at locations exempted from inertial profiler operation in accordance with ITM 917.*
3. *All tapers.*
4. *All turn lanes, including bi-directional left turn lanes shorter than 0.1 mi.*
5. *All acceleration and deceleration lanes associated with ramps with design speeds of 45 mph or less and shorter than 0.1 mi.*
6. *All shoulders.*

For contracts where the inertial profiler is not used for smoothness acceptance, the 16 ft straightedge will be used to accept longitudinal smoothness at the above locations and on all mainline traveled way lanes and ramps with design speeds greater than 45 mph. Smoothness acceptance on ramp acceleration or deceleration lanes will also be based on the 16 ft straightedge.

The 10 ft long straightedge shall be used for transverse slopes, approaches, and crossovers.

As soon as the PCCP has cured sufficiently, the smoothness may be checked. INDOT may direct that the pavement profile be evaluated within 24 h following placement. When profile testing is consistently outside pavement surface tolerances the paving operation shall be discontinued until an amended QCP is submitted.

(d) Smoothness Correction

Pavement smoothness variations outside specified tolerances shall be corrected by grinding with a groove type cutter or by replacement. Grinding will not be allowed until the PCCP is 10 days old or the flexural strength test is 550 psi or greater. The grinding of the pavement to correct the profile shall be accomplished in either the longitudinal or the

transverse direction. The PCCP texture after grinding shall be uniform. If the grinding operation reduces the tining grooves to a depth of less than 1/16 in. and the longitudinal length of the removal area exceeds 15 ft, or two or more areas are within 30 ft of each other, the PCCP shall be re-textured in accordance with 504.03.

At locations where the inertial profiler is used, all areas having a localized roughness in excess of 150 in./mi. in 25 ft window shall be corrected. The width of the corrected area may be partial or full lane width, depending on the respective wheel path profiles. After the corrective action is complete, the inertial profiler shall be operated throughout the entire affected smoothness section to verify the adequacy of the corrective action.

At locations where the 16 ft straightedge is used, the pavement variations shall be corrected to 1/4 in. or less. At locations where the 10 ft straightedge is used, the pavement variations shall be corrected to 1/8 in. or less.

SECTION 501, DELETE LINES 619 THROUGH 648.

SECTION 501, AFTER LINE 648, INSERT AS FOLLOWS:

(e) Smoothness

The Contractor shall produce a finished profile that has an average International Roughness Index (IRI) of 60 in./mi. or less for each pavement section of 300 feet. Depressed pavement areas due to subsidence or other localized causes are excluded from the smoothness requirements. These areas will be reviewed and approved by the Engineer. Corrections shall be made in accordance with 501.25(d).

SECTION 501, BEGIN LINE 716, DELETE AND INSERT AS FOLLOWS:

501.31 Basis of Payment

The accepted quantities of QC/QA-PCCP will be paid for at the contract unit price per square yard for the thickness specified, complete in place.

Payment for furnishing, calibrating, and operating the ~~profilograph~~*inertial profiler*, and furnishing ~~profile~~*IRI* information will be made at the contract lump sum price for ~~profilograph~~*inertial profiler*, PCCP.

SECTION 501, BEGIN LINE 743, DELETE AND INSERT AS FOLLOWS:

~~Profilograph~~*Inertial Profiler*, PCCP .....LS

SECTION 501, BEGIN LINE 749, DELETE AND INSERT AS FOLLOWS:

The price of ~~profilograph~~*Inertial Profiler*, PCCP will be full compensation regardless of how often the ~~profilograph~~*inertial profiler* is used or how ~~many profilograms are produced~~*often the IRI is determined*.

SECTION 502, BEGIN LINE 364, DELETE AND INSERT AS FOLLOWS:

502.20 Pavement Smoothness

~~Pavement smoothness will be in accordance with 501.25 except profilograph requirements will not apply.~~ *A straightedge in accordance with 508.09(d) and (e) will be used to determine smoothness. The 16 ft straightedge will be used to accept smoothness along the direction of mainline traffic and the 10 ft straightedge will be used to accept*

smoothness transverse to the direction of mainline traffic. Smoothness correction shall be in accordance with 501.25(d).

QC/QA, SOIL EMBANKMENT AND SUBGRADE

Description

This Work shall consist of the construction of a soil embankment and subgrade in accordance with 105.03, 203, 207, and 215. Design-Build Contractor shall develop and implement a Quality Control Plan (QCP) and perform quality control testing.

Quality Control

Design-Build Contractor shall submit a QCP in accordance with ITM 803. Embankment operations shall not begin before the QCP has been accepted. INDOT may require the replacement of ineffective or unqualified equipment or quality control personnel. Construction operations may be required to stop until appropriate corrective actions are taken.

The testing facility shall be located on Site so that quality control test results are provided to the Design-Build Contractor in a timely manner.

Proofrolling prior to placement of the first lift of embankment shall be conducted in accordance with 203.26 to identify weak locations.

Proofrolling of the completed subgrade shall be completed in accordance with 203.26. The proofrolling shall completely cover the subgrade from shoulder break to shoulder break. INDOT may require additional proofrolling passes if rutting or pumping is evident. Any rut greater than ½ in. shall be corrected.

Soil management shall be in accordance with ITM 803. Adjustments shall be made to compaction procedures when soil type changes.

Chemically modified soils for subgrade, including grade preparation, pulverization, spreading, mixing, and compaction shall either be in accordance with 215 or unique special provisions.

Design-Build Contractor shall provide documentation in accordance with ITM 803 at the completion of soil operations each day.

The quality control technician shall be qualified in accordance with Directive 107 for ITM 506, ITM 508, ITM 509, and ITM 512. In addition to the requirements of Directive 107, comparison testing is required for each of these test methods. Comparison testing results between the independent assurance technician and the QC/QA soils technician shall be within ±10.0% for ITM 508 and ITM 509 when the tests are performed two feet or less apart. Comparison testing results shall be within ±1.0% for ITM 506 when the tests are performed two feet or less apart. Comparison testing may be performed on first of embankment construction for ITM 509 and ITM 506 whereas comparison of ITM 508 may be performed when aggregate subgrade or subbase is constructed.

Quality Control testing shall be performed in accordance with ITM 803 Section 14.6 for embankment and non-chemically modified soils, and ITM 803 Section 14.7 for chemically modified soils.

Acceptance of Soil Compaction

Acceptance of the compaction of the soil embankment or subgrade will be determined on the basis of tests performed by INDOT.

Test sections shall be constructed in the presence of INDOT with the available equipment of the Design-Build Contractor for non-chemically modified soils in accordance with 203, ITM 513 and ITM 803. The soil in the test section shall meet the requirements of 203.09, 207, and 215. Design-Build Contractor may request additional test sections.

The moisture content and compaction acceptance of embankment will be determined in accordance with 203.23. The moisture content and compaction acceptance of chemically modified soils will be determined in accordance with 215 or 203.24 (b). Testing will be performed at the frequency described in the Frequency Manual.

Deficiencies

Individual locations that do not meet the DCP or moisture requirements and all locations exhibiting pumping or rutting as determined by INDOT will be considered deficient.

Chemically modified subgrade shall meet the requirements of 215 or 203.24(b). Proofrolling shall cover the complete surface area. No deficient area is permitted in subgrade or top five feet of embankment.

When a deficiency is identified in embankment at the random location, Design-Build Contractor shall investigate and correct the deficiency in accordance with compaction acceptance of deficiencies tables. INDOT will subsequently randomly select two additional locations within the remaining construction area for sampling in accordance with ITM 802. DCP testing in accordance with 203.23 or LWD testing in accordance with 203.24(b) will be performed. If any additional locations fail to meet DCP or LWD criteria, then the entire area shall be evaluated by Design-Build Contractor in accordance with the QCP and reworked as necessary before acceptance testing is resumed in that area.

In accordance with the compaction acceptance of deficiencies tables, embankment locations requiring rework will be accepted if the tests conducted by Design-Build Contractor of each reworked deficiency indicate that the DCP, moisture content values, and proofrolling meet the required acceptance criteria. Locations where rework is not required may still be reworked at the Contractor’s option in accordance with the QCP. Reworked areas are subject to further review for excessive pumping or rutting at the discretion of INDOT.

Compaction Acceptance of Deficiencies			
Construction Areas For ≤ 6 inch Lift (ft^2)	**Deficient Area DCP or %Moisture (ft^2)**	**Excessive Pumping Or Rutting?**	**Rework Required?**
15,000 to 75,600	≥1500	Yes	Yes
		No	Yes
	<1500	Yes	Yes
		No	No-Optional
5,000 to <15,000	≥750	Yes	Yes
		No	Yes
	<750	Yes	Yes
		No	No-Optional
<5,000	≥100	Yes	Yes
		No	Yes
	<100	Yes	Yes
		No	No-Optional

Final Surface of Embankment - Compaction Acceptance of Deficiencies			
Construction Areas (ft^2)	**Deficient Area DCP or %Moisture (ft^2)**	**Excessive Pumping Or Rutting?**	**Rework Required?**
5,000 to 75,600	≥250	Yes	Yes
		No	Yes
	<250	Yes	Yes
		No	No-Optional
<5,000	≥100	Yes	Yes
		No	Yes
	<100	Yes	Yes
		No	No-Optional

Basis of Item

QC/QA soil embankment will be measured in accordance with 203.27 and QC/QA Soil for chemically modified subgrade will be measured in accordance with 215.10.

The QC/QA soil process shall be included in the soil pay items. This includes all other equipment required for the QC/QA soil process, all quality control procedures including the QC Plan, GPS systems manufacturer representative support, on-site training, testing facility, construction of test sections, and quality control testing and inspection.

ATTACHMENT 6-1
NORTH SPLIT
AESTHETIC DESIGN GUIDELINES

NORTH SPLIT UPGRADES DRIVING PROGRESS

INDIANA DEPARTMENT OF TRANSPORTATION
I-65/I-70 NORTH SPLIT PROJECT
FEBRUARY 25, 2020

Request for Proposals
Technical Provisions
Addendum #3

Revised 02-25-2020: Revised Heading

TABLE OF CONTENTS

DESIGN GUIDELINES

COLOR

CHART:

APPLICATION:

Color A1: RGB: 128, 128, 128

Color A2: RGB: 204, 204, 204

Color A3: RGB: 240, 240, 240

CONCRETE (A)

- Bridge Monuments, Piers & Caps
- Bridge Rails & Parapets
- Sign Structure Supports
- Retaining Walls
- Bridge Abutment Walls

Color B1: RGB: 187, 179, 159

Color B2: RGB: 252, 219, 181

CONCRETE (B)

- Noise Barrier Panels, Caps & Posts

Color C: RGB: 55, 95, 95

CONCRETE & STEEL (C)

- Bridge Beam/Girder (Color shall be applied at locations where metallizing is not required)

Color D: RGB: 65, 64, 66

METALS (D)

- Ornamental Lights
- Sign Lettering
- Noise Barrier Posts

Color E: RGB: 219, 195, 135

ACCENT (E)

- Wall Detailing
- Corner Monument Detailing
- Relief Texture

RGB STANDS FOR:
RED (R)
GREEN (G)
BLUE (B)

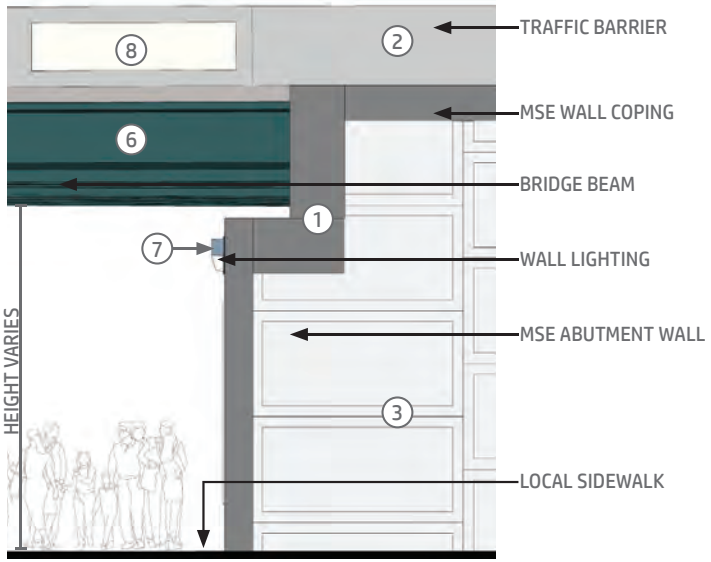
Revised 02-25-2020: Eliminated Decorative Column Light, Art Installation Panels Text

STANDARD ABUTMENT

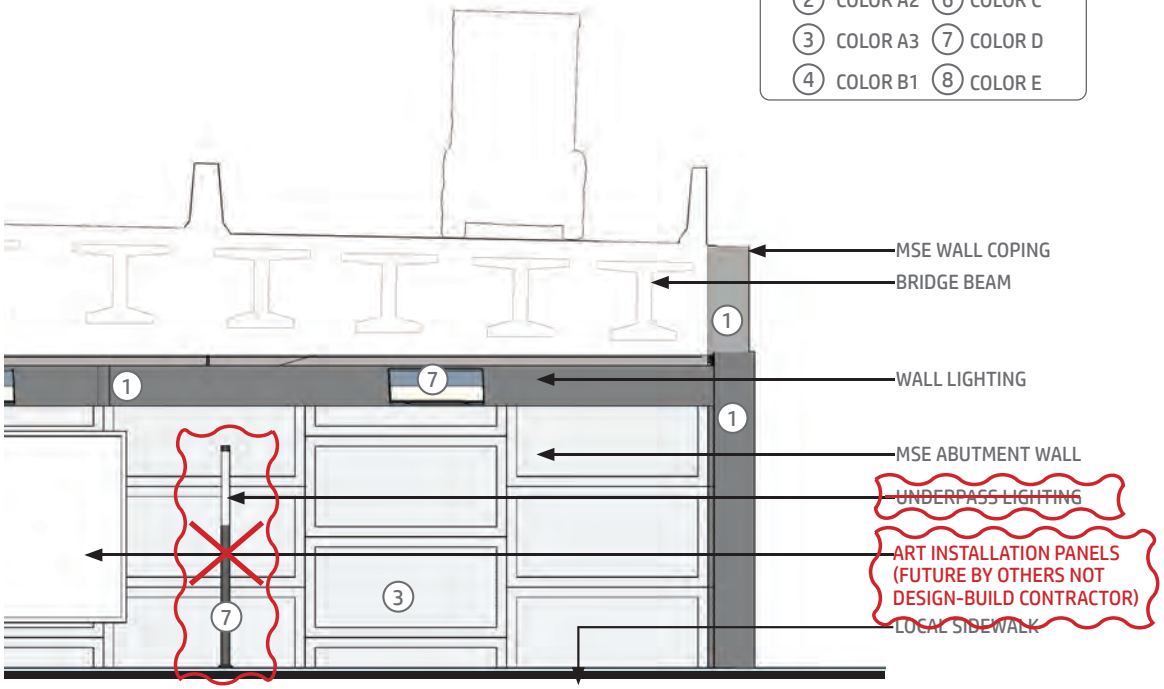
NOTE: Number of down-lighting and column lighting shall be determined in accordance with the technical provisions and project standards.

COLOR LEGEND: *SEE COLOR SECTION*

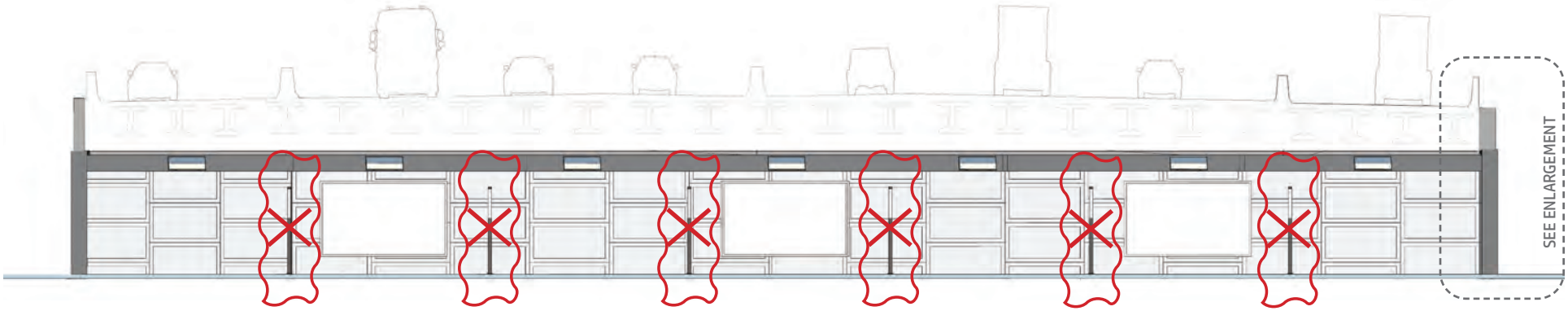
1 COLOR A1	5 COLOR B2
2 COLOR A2	6 COLOR C
3 COLOR A3	7 COLOR D
4 COLOR B1	8 COLOR E



END ELEVATION (TYPICAL)



CROSS SECTION ENLARGEMENT (TYPICAL)



CROSS SECTION ELEVATION (TYPICAL)

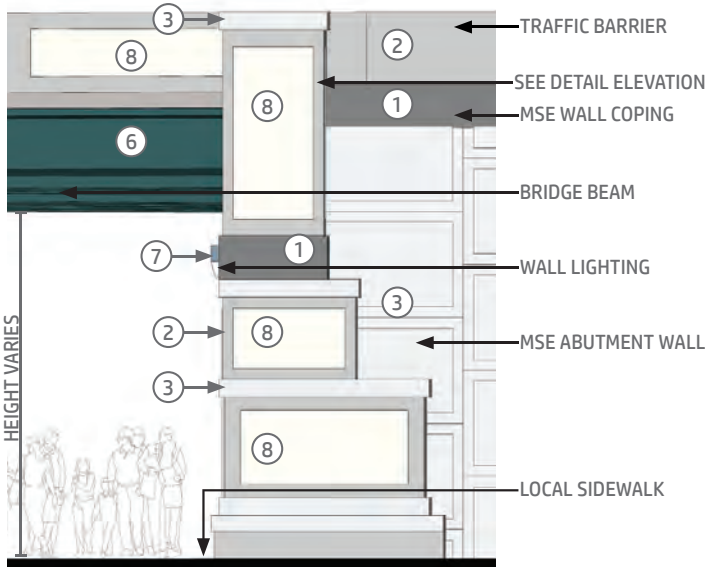
Revised 02-25-2020: Eliminated Decorative Column Light, Art Installation Panels Text

MINOR MONUMENT ABUTMENT

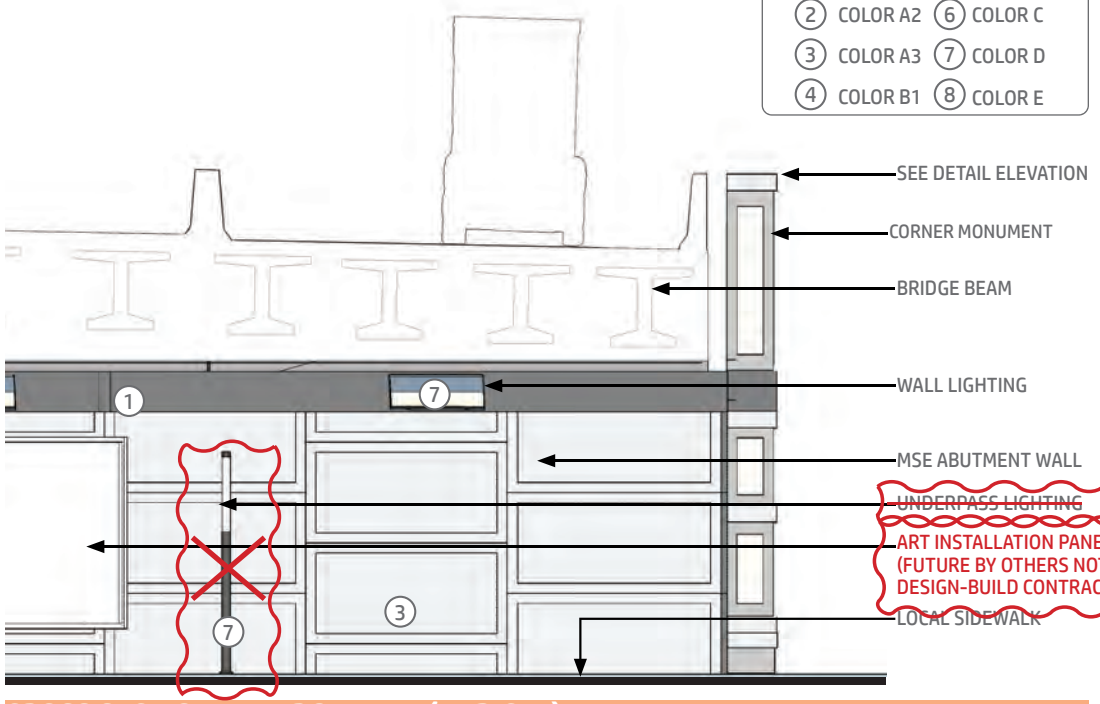
NOTE: Number of down-lighting and column lighting shall be determined in accordance with the technical provisions and project standards.

COLOR LEGEND: *SEE COLOR SECTION*

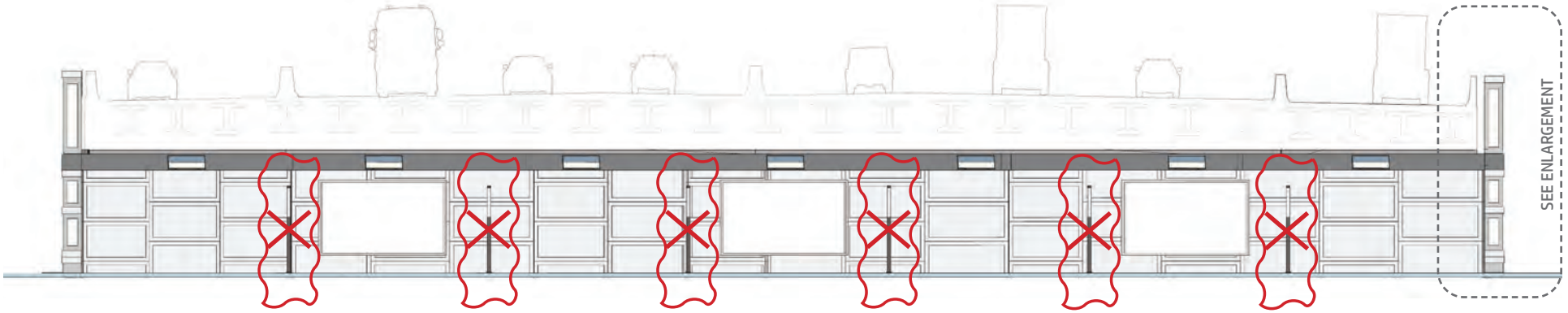
1 COLOR A1	5 COLOR B2
2 COLOR A2	6 COLOR C
3 COLOR A3	7 COLOR D
4 COLOR B1	8 COLOR E



END ELEVATION (TYPICAL)



CROSS SECTION ENLARGEMENT (TYPICAL)



CROSS SECTION ELEVATION (TYPICAL)

Revised 02-25-2020: Added dimensions to block caps

SCHEMATIC DETAILS

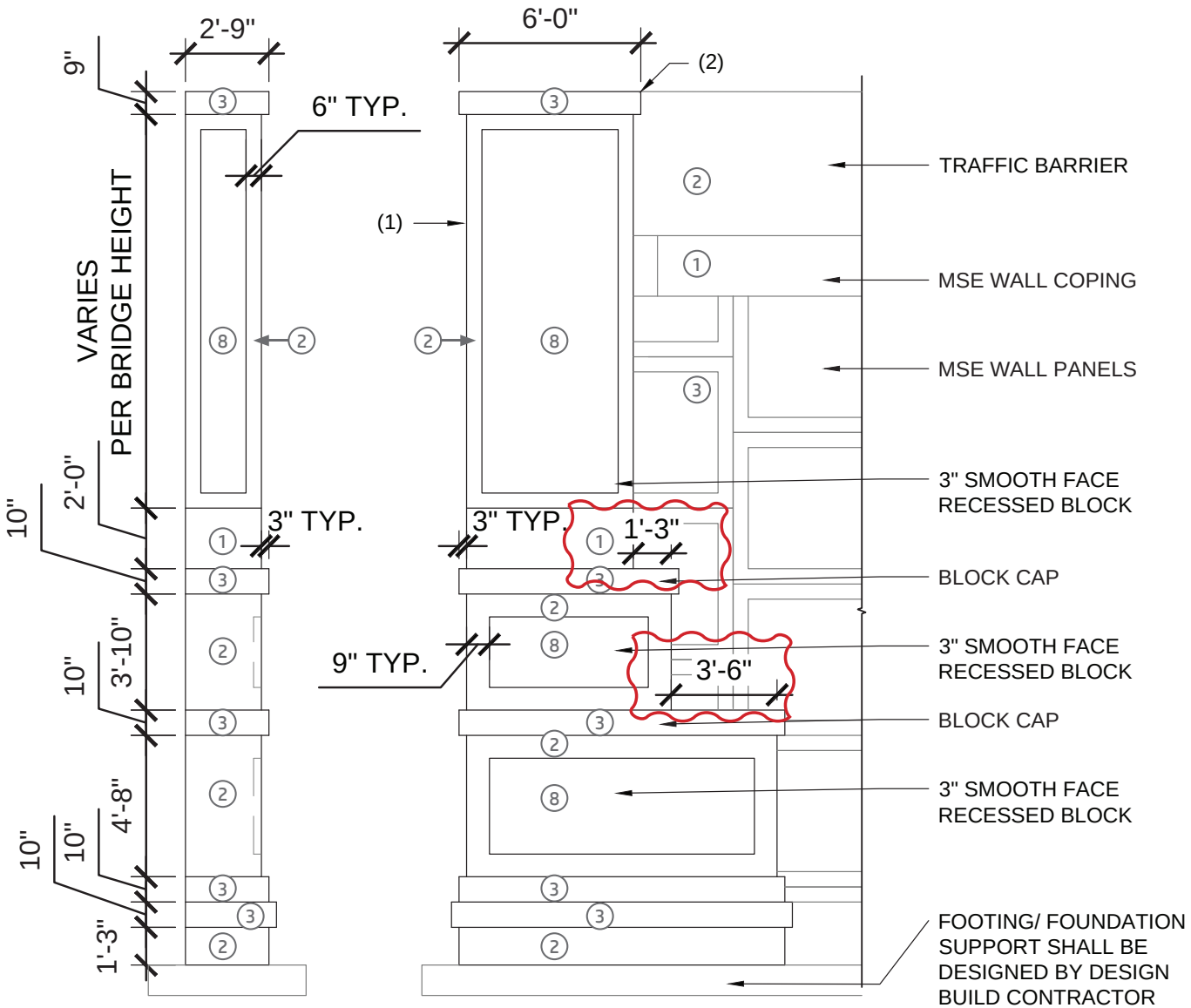
MINOR MONUMENT ABUTMENT

COLOR LEGEND: *SEE COLOR SECTION*

(1) COLOR A1	(5) COLOR B2
(2) COLOR A2	(6) COLOR C
(3) COLOR A3	(7) COLOR D
(4) COLOR B1	(8) COLOR E

LEGEND:
(1) MONUMENT FACE SHALL BE FLUSH WITH FRONT FACE OF MSE ABUTMENT WALL PRECAST COPING
(2) CAP SHALL BE FLUSH WITH TRAFFIC BARRIER.

NOTE: STRUCTURAL CONCRETE AND REINFORCING DESIGN AND DETAILING REQUIREMENTS SHALL BE THE RESPONSIBILITY OF THE DESIGN-BUILD CONTRACTOR IN ACCORDANCE WITH THE TECHNICAL PROVISIONS AND PROJECT STANDARDS.



DETAIL ELEVATION (TYPICAL)

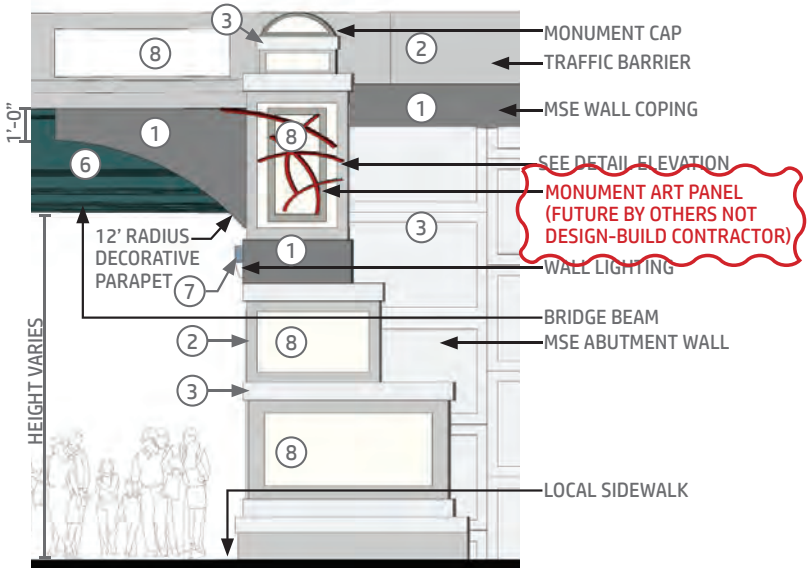
Revised 02-25-2020: Eliminated Decorative Column Light, Monument Art Panels & Art Installation Panels Text

MAJOR MONUMENT ABUTMENT

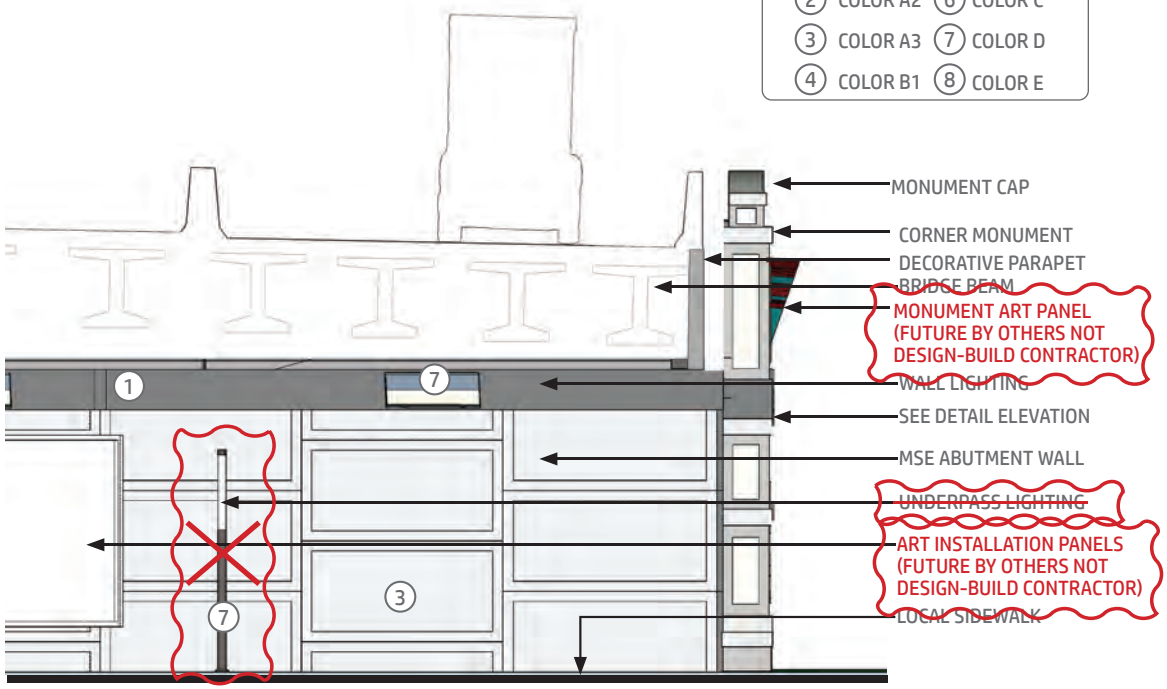
NOTE: Number of down-lighting and column lighting shall be determined in accordance with the technical provisions and project standards.

COLOR LEGEND: *SEE COLOR SECTION*

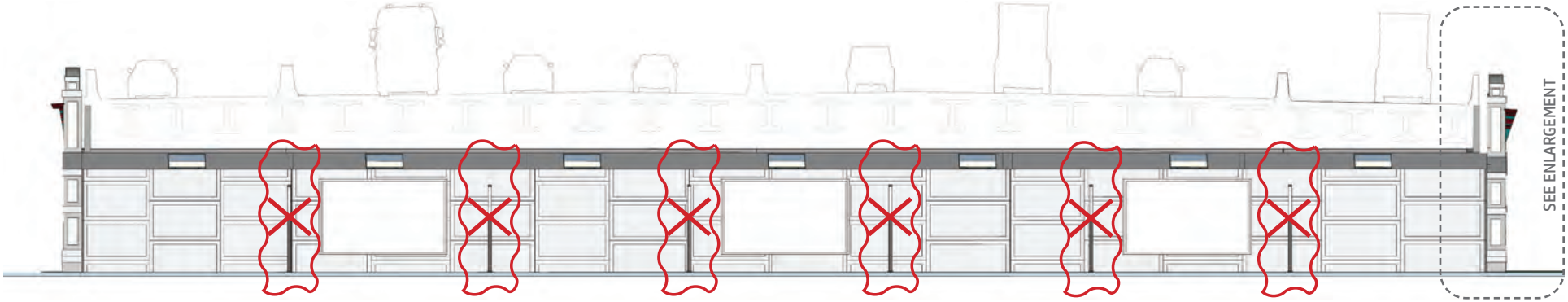
1 COLOR A1	5 COLOR B2
2 COLOR A2	6 COLOR C
3 COLOR A3	7 COLOR D
4 COLOR B1	8 COLOR E



END ELEVATION (TYPICAL)



CROSS SECTION ENLARGEMENT (TYPICAL)



CROSS SECTION ELEVATION (TYPICAL)

Revised 02-25-2020: Added dimensions to block, Monument Art Panels Text

SCHEMATIC DETAILS

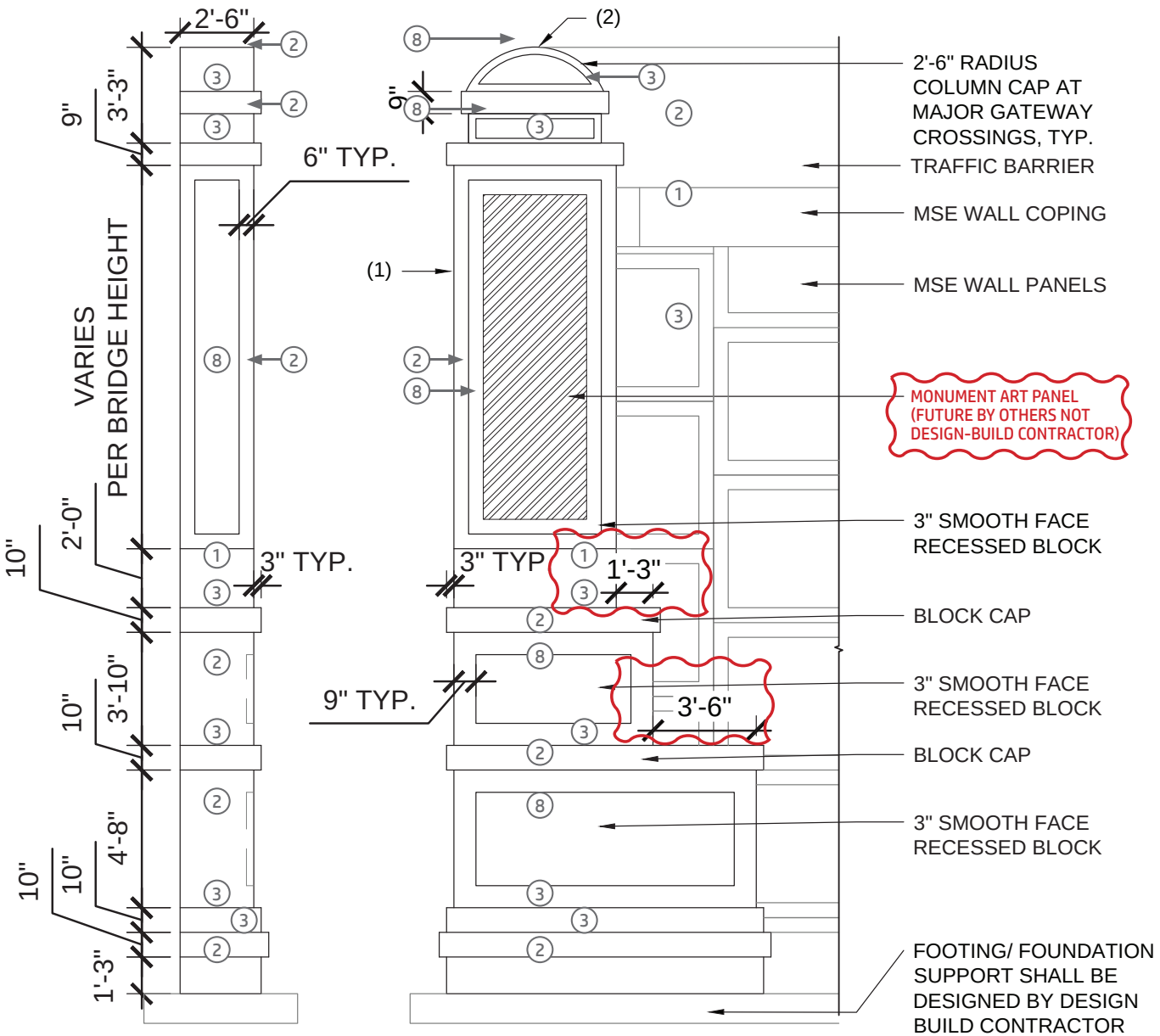
MAJOR MONUMENT ABUTMENT

COLOR LEGEND: *SEE COLOR SECTION*

(1) COLOR A1	(5) COLOR B2
(2) COLOR A2	(6) COLOR C
(3) COLOR A3	(7) COLOR D
(4) COLOR B1	(8) COLOR E

LEGEND:
(1) MONUMENT FACE SHALL BE FLUSH WITH FRONT FACE OF MSE ABUTMENT WALL PRECAST COPING.
(2) CAP SHALL BE FLUSH WITH TRAFFIC BARRIER.

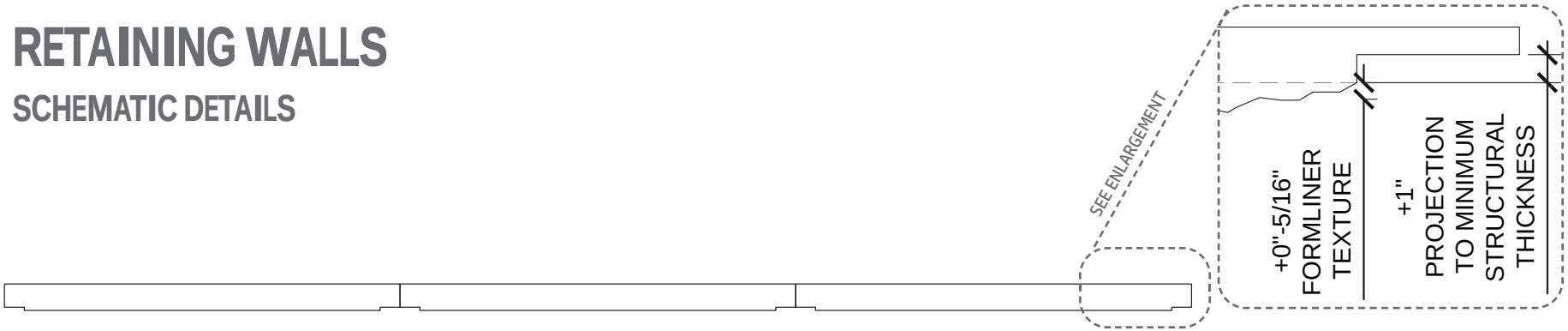
NOTE: STRUCTURAL CONCRETE AND REINFORCING DESIGN AND DETAILING REQUIREMENTS SHALL BE THE RESPONSIBILITY OF THE DESIGN-BUILD CONTRACTOR IN ACCORDANCE WITH THE TECHNICAL PROVISIONS AND PROJECT STANDARDS.



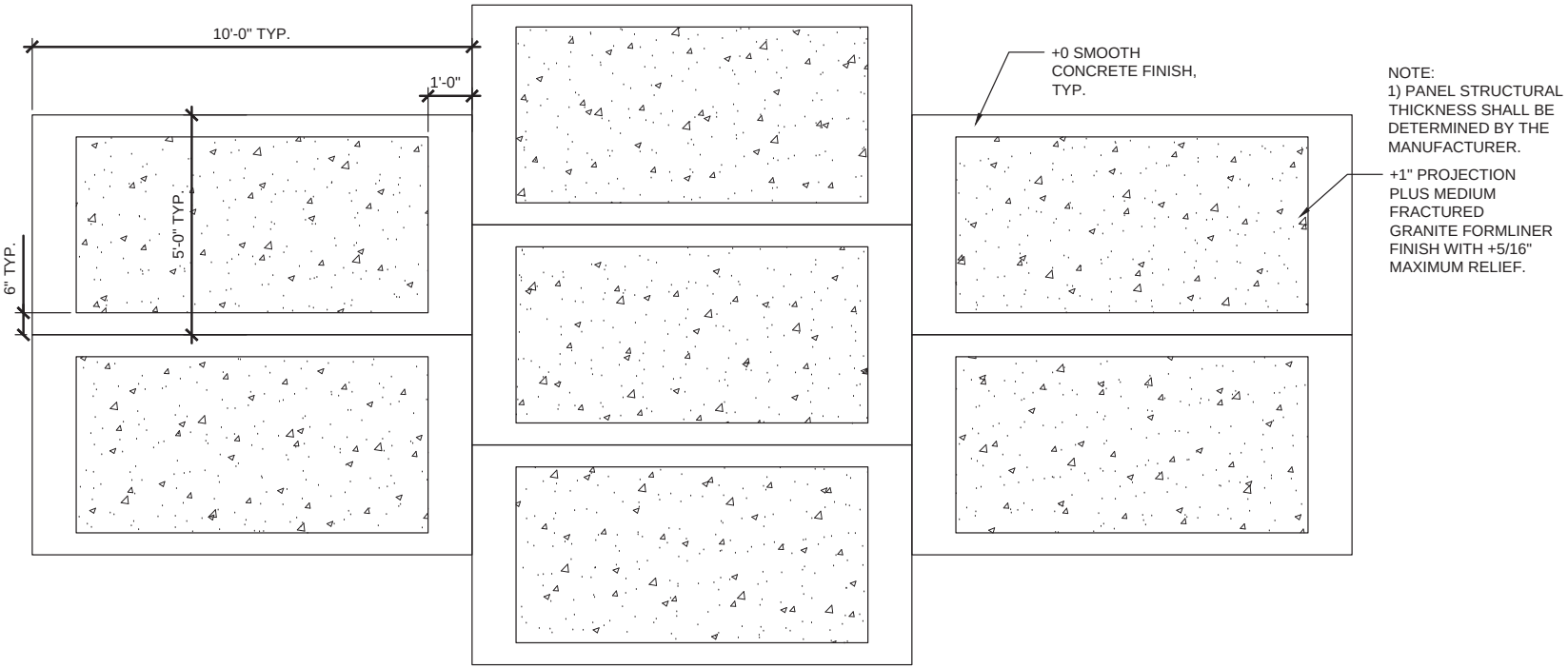
DETAIL ELEVATION (TYPICAL)

RETAINING WALLS

SCHEMATIC DETAILS



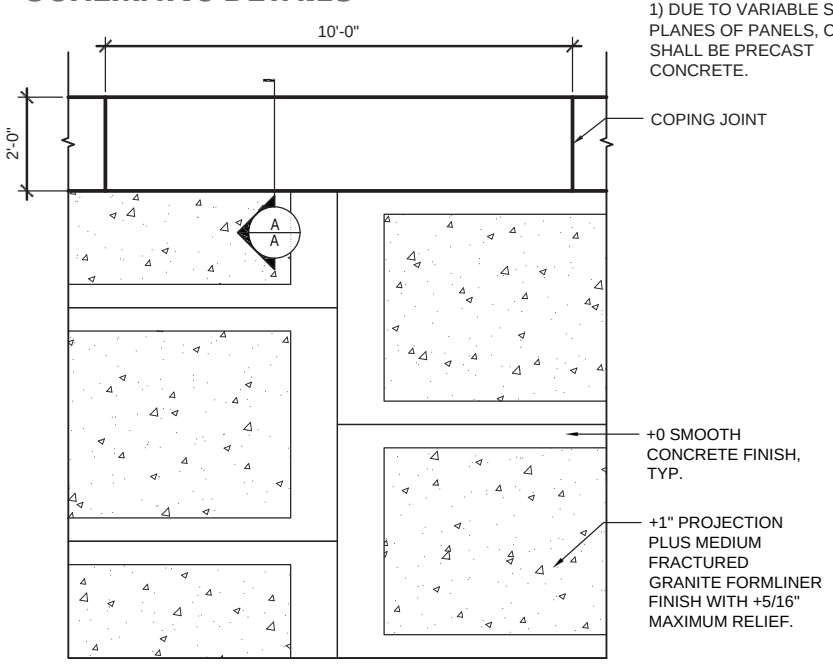
PLAN (TYPICAL)



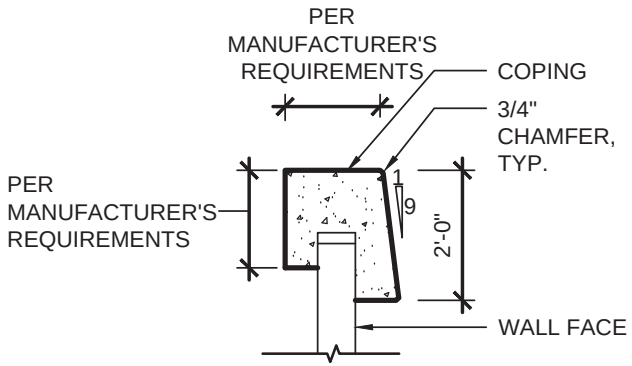
ELEVATION (TYPICAL)

RETAINING WALLS

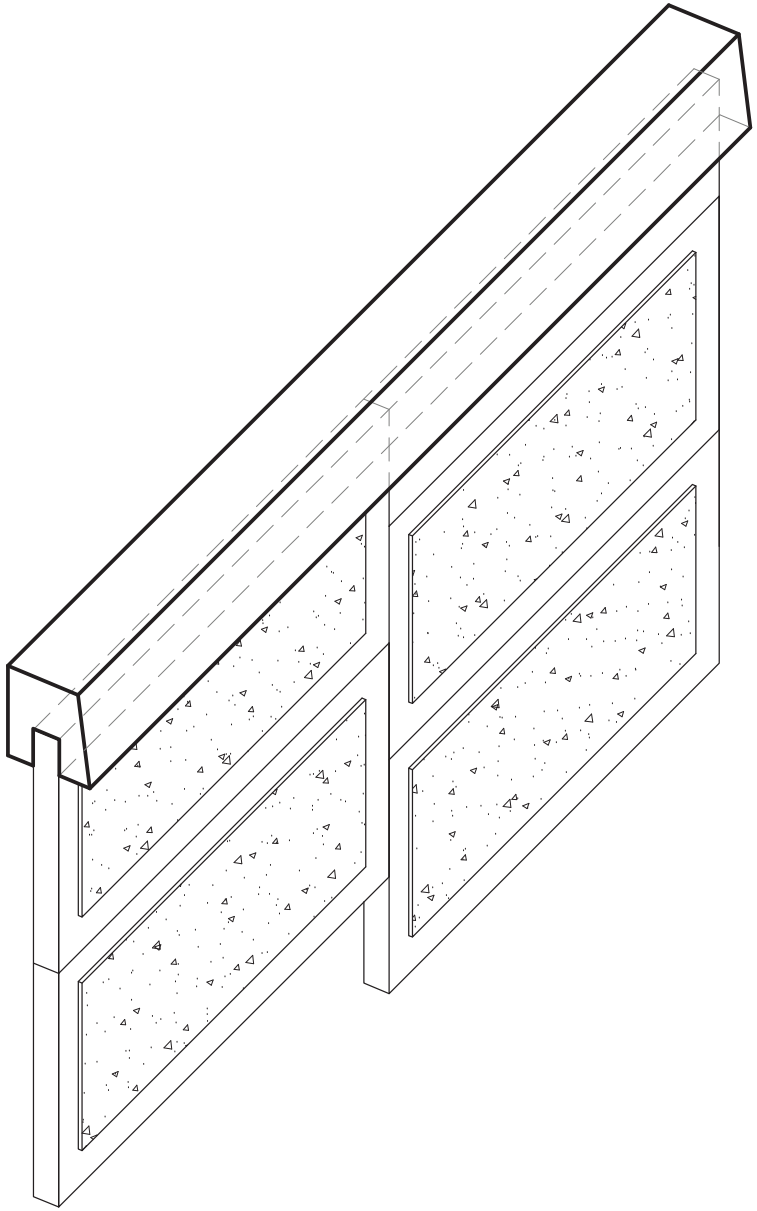
SCHEMATIC DETAILS



ELEVATION COPING WITH PANEL(TYPICAL)



SECTION A- COPING (TYPICAL)

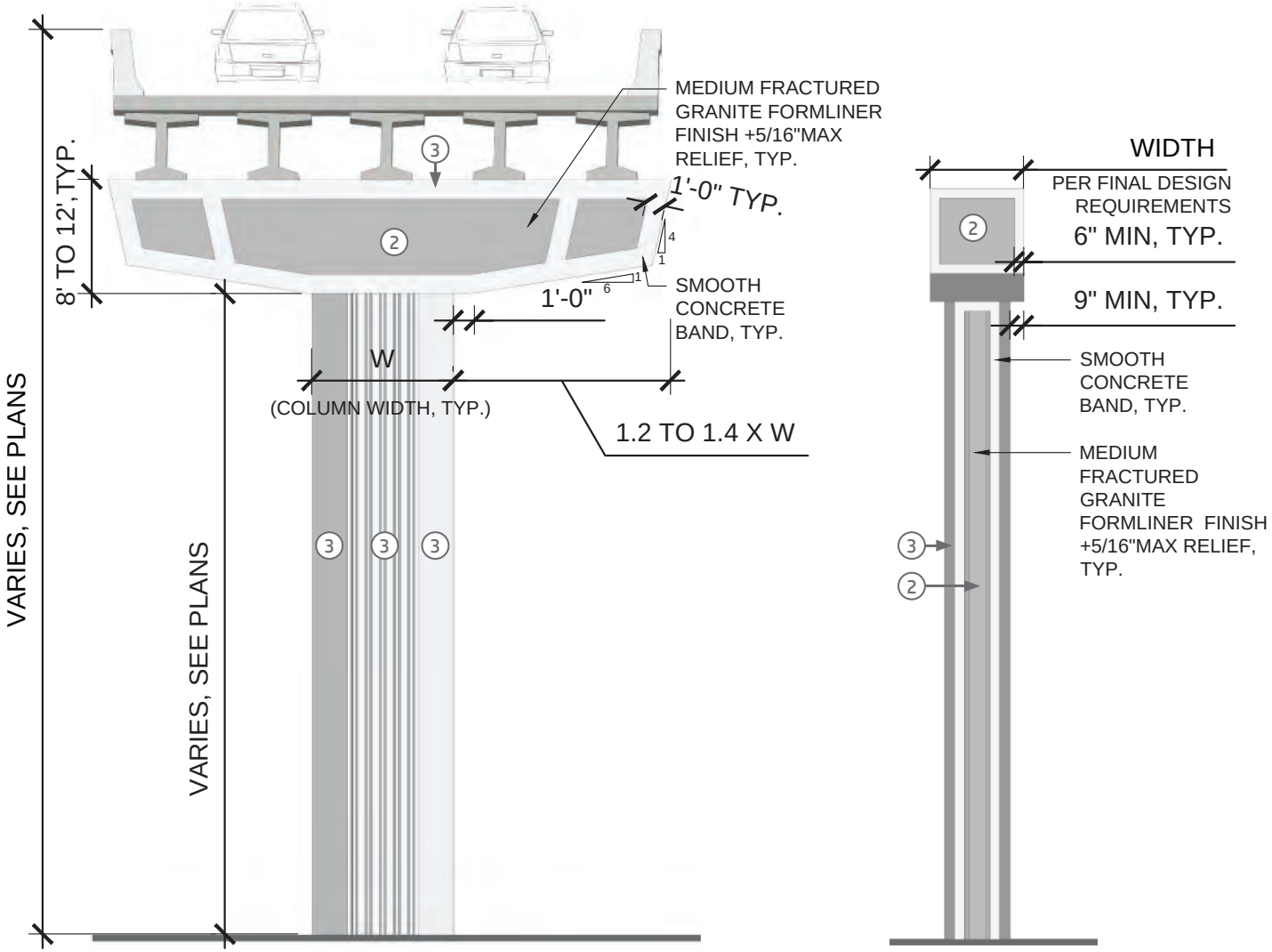


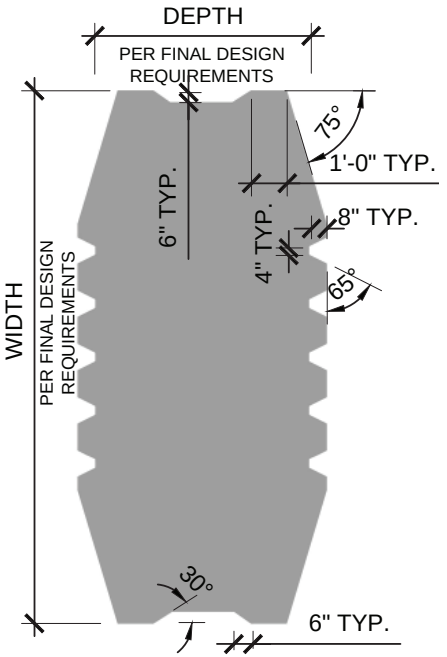
ISOMETRIC-COPING WITH PANEL (TYPICAL)

SINGLE COLUMN

COLOR LEGEND: *SEE COLOR SECTION*

1 COLOR A1	5 COLOR B2
2 COLOR A2	6 COLOR C
3 COLOR A3	7 COLOR D
4 COLOR B1	8 COLOR E

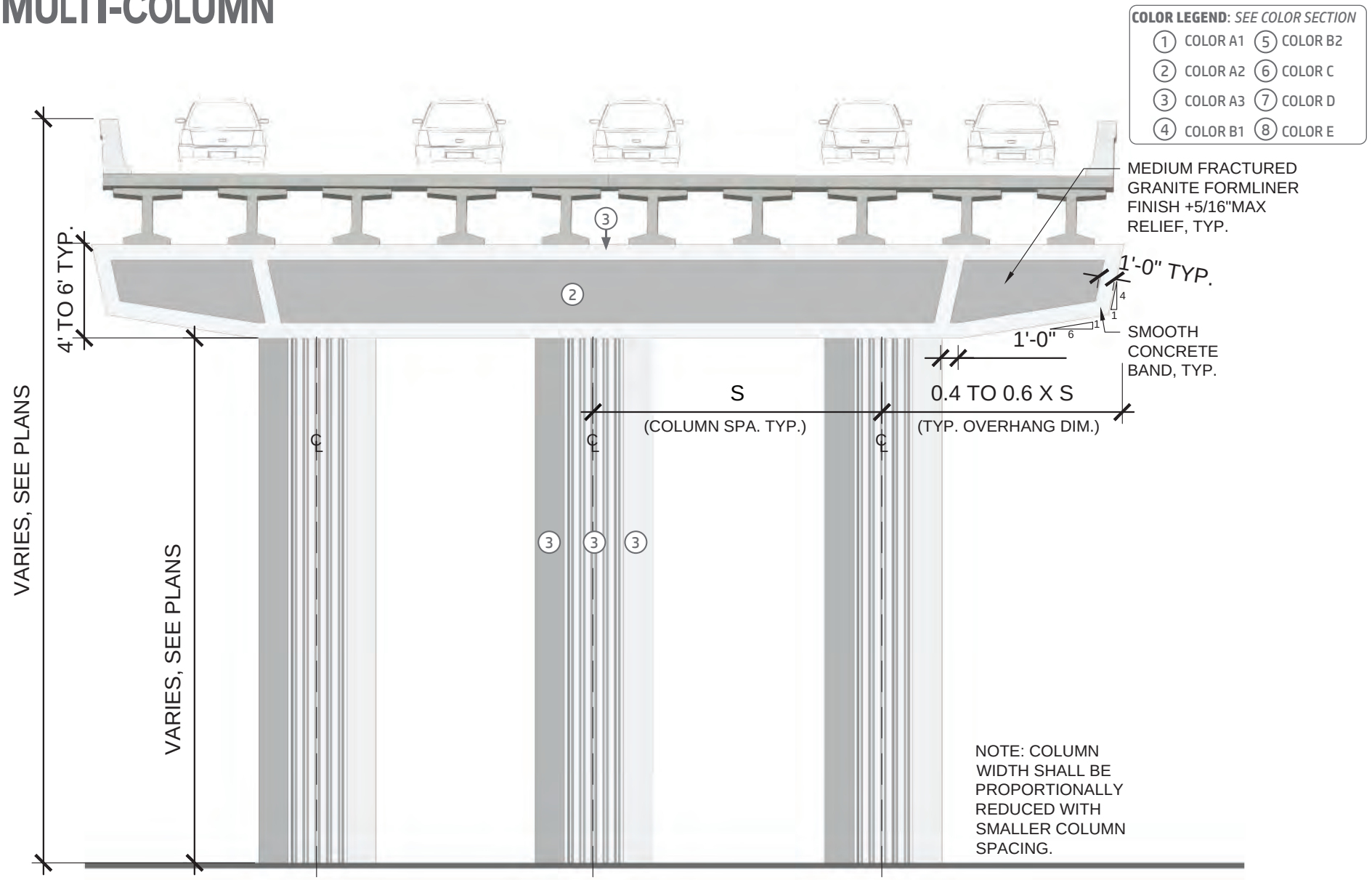




FRONT & SIDE ELEVATION MAXIMUM HEIGHT (TYPICAL)

COLUMN CROSS SECTION (TYPICAL)

MULTI-COLUMN



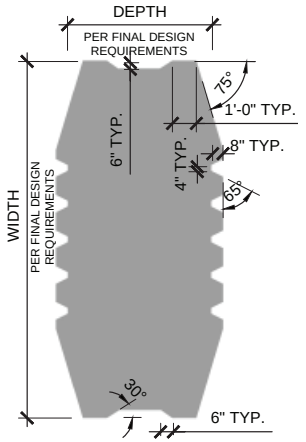
FRONT ELEVATION (TYPICAL)

STRADDLE BENT

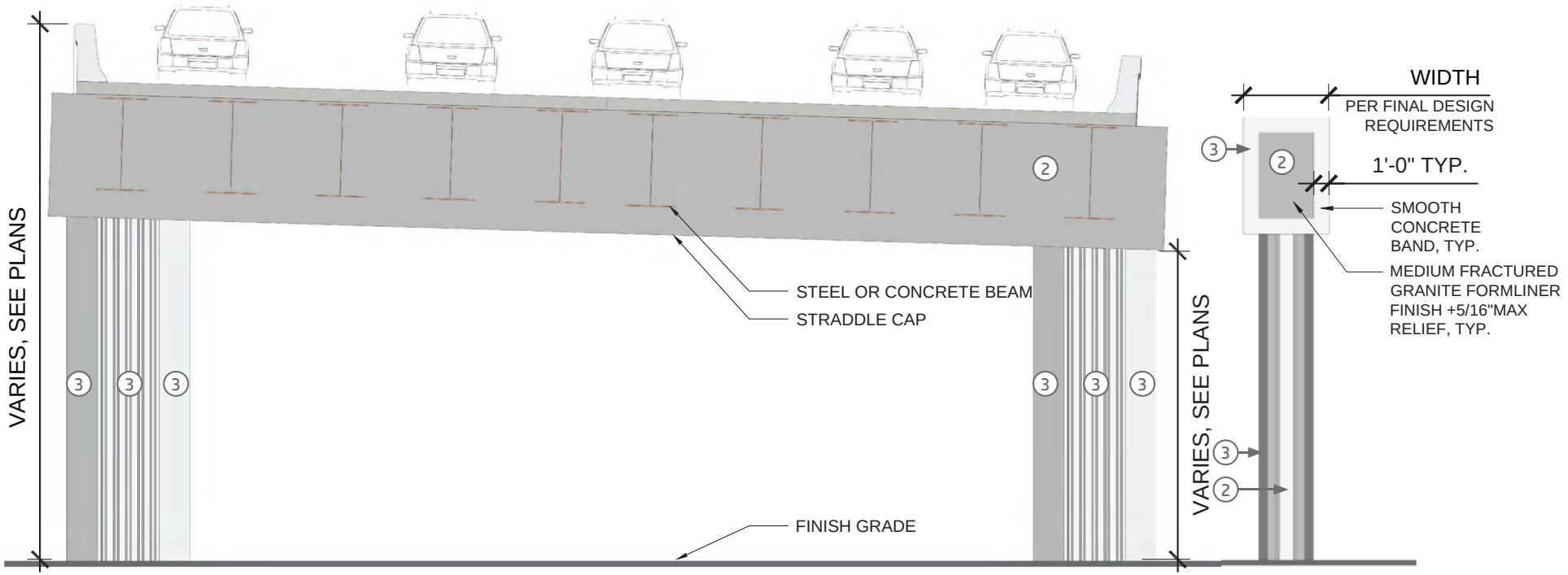
RECTANGULAR

COLOR LEGEND: *SEE COLOR SECTION*

(1) COLOR A1	(5) COLOR B2
(2) COLOR A2	(6) COLOR C
(3) COLOR A3	(7) COLOR D
(4) COLOR B1	(8) COLOR E



COLUMN CROSS SECTION (TYPICAL)

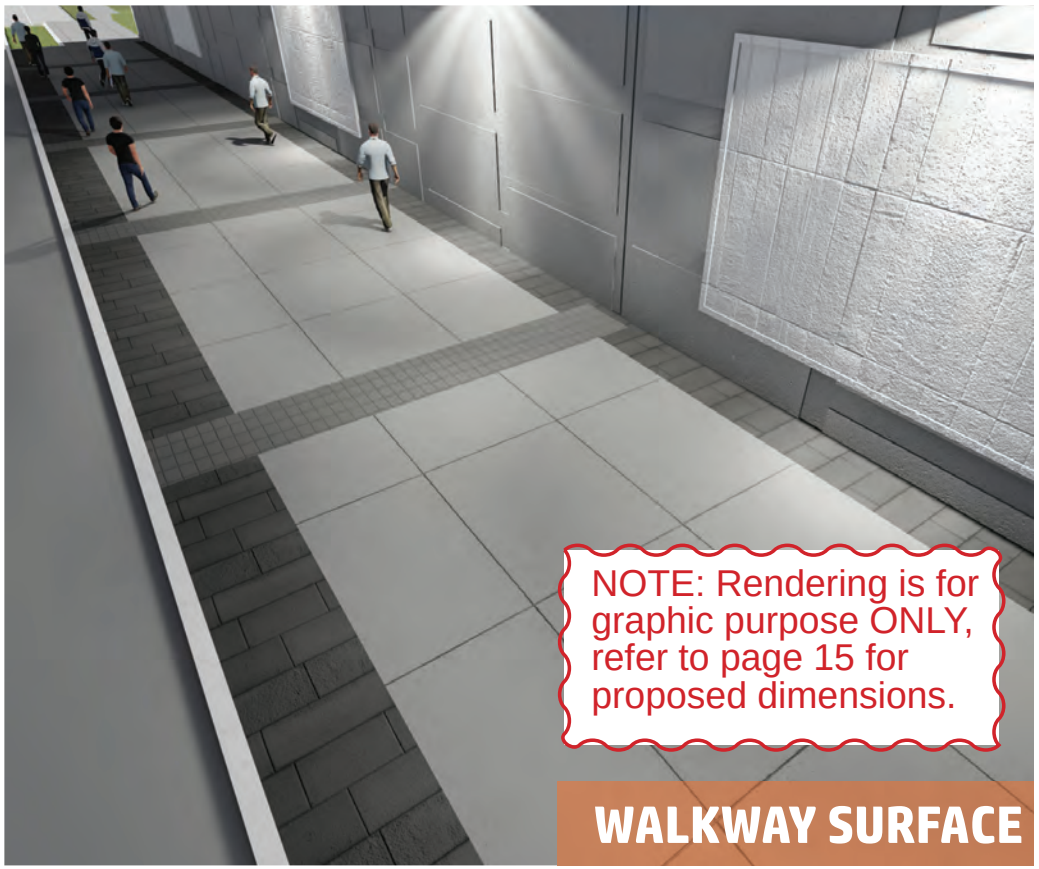


VARIATION 1: FRONT & SIDE ELEVATION (TYPICAL)

Revised 02-25-2020: Eliminated Decorative Column Light; Updated Dimension, Rendering, and Image/Caption

MAJOR GATEWAY SURFACING SUMMARY

- A consistent 3'-0" wide asphalt block paver band shall be constructed immediately adjacent to the back of curb and parallel to the roadway. Materials shall be a "ground finish". Color shall resemble Hanover A80044 or approved equal.
- Asphalt block paver bands (or other vehicular-rated paver type) shall be constructed perpendicular to the roadway. Paver bands are to be 3'-0" wide at 19'-0" O.C. maximum. Materials should be be a "ground finish". Color shall resemble Hanover A80046 or approved equal.
- Standard concrete pavement will separate each perpendicular asphalt paver band. All concrete surfaces shall be scored as indicated on the following drawings and receive a standard broom finish.



NOTE: Rendering is for graphic purpose ONLY, refer to page 15 for proposed dimensions.

WALKWAY SURFACE

TREATMENT PATTERNS

RUNNING BOND PATTERN

SAW CUT JOINTS

COLOR BANDING

ACCENT COLORS

HEAVY DUTY

Revised 02-25-2020: Eliminated Decorative Column Light, Added New York Street, Updated Schematic Detail

MAJOR GATEWAY SURFACING SCHEMATIC DETAILS

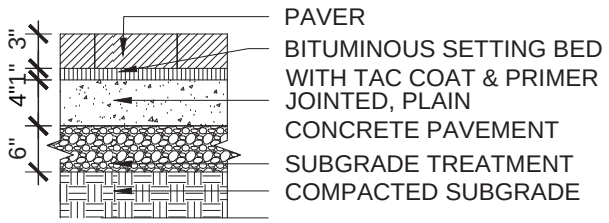
Major Gateway Pedestrian Surfaces

In addition to the Roadway Surfaces and the Minor Gateway and Standard Pedestrian Surfaces, Major Gateway Pedestrian Surface areas utilize both concrete and specialty pavement treatments to highlight and emphasize the pedestrian environment.

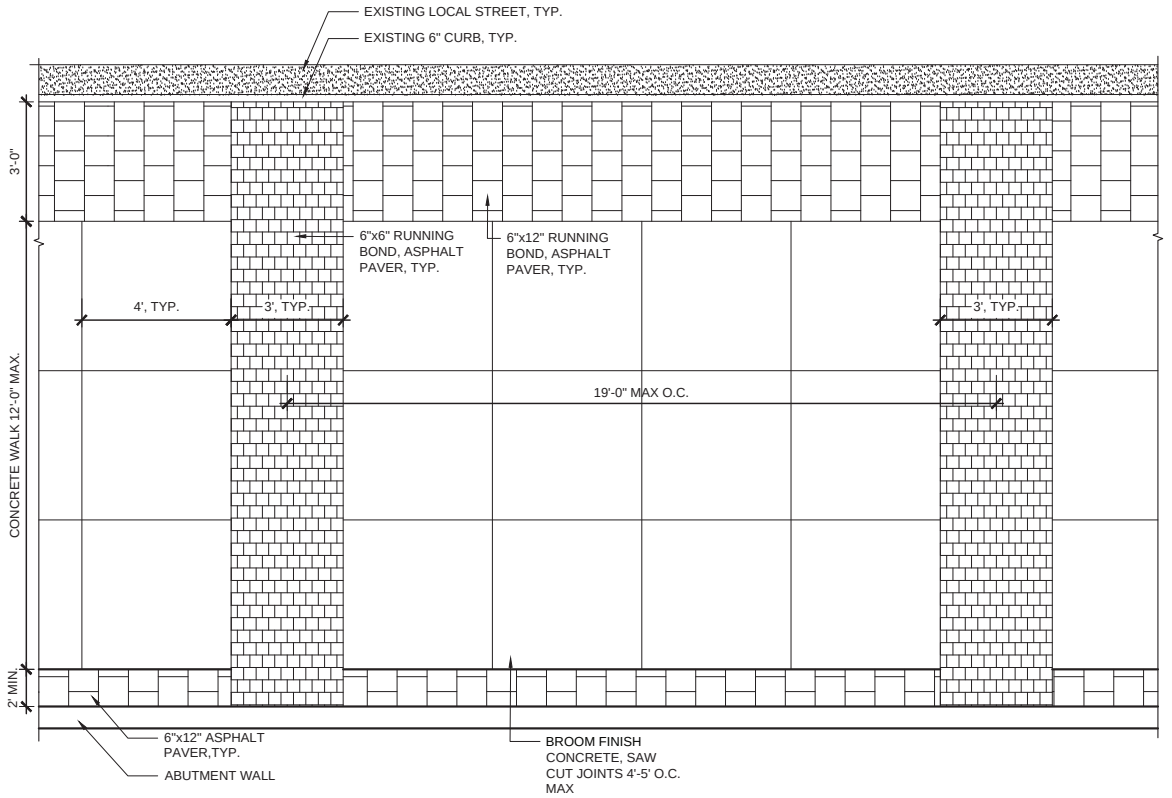
Major Gateway treatments occur at New York Street, Central Avenue, College Avenue, Alabama Street, 10th Street, Commerce Avenue, Michigan Street, and Washington Street.

Major Gateway Pedestrian Surfaces: Recommended Manufacturers

- Hanover Architectural Products
- Belgard Pavers & Hardscapes
- Or Approved Equal



SURFACING SECTION VIEW (TYPICAL)



SURFACING PLAN VIEW (TYPICAL)

Revised 02-25-2020: Eliminated Decorative Column Light

LIGHTING

Design Summary

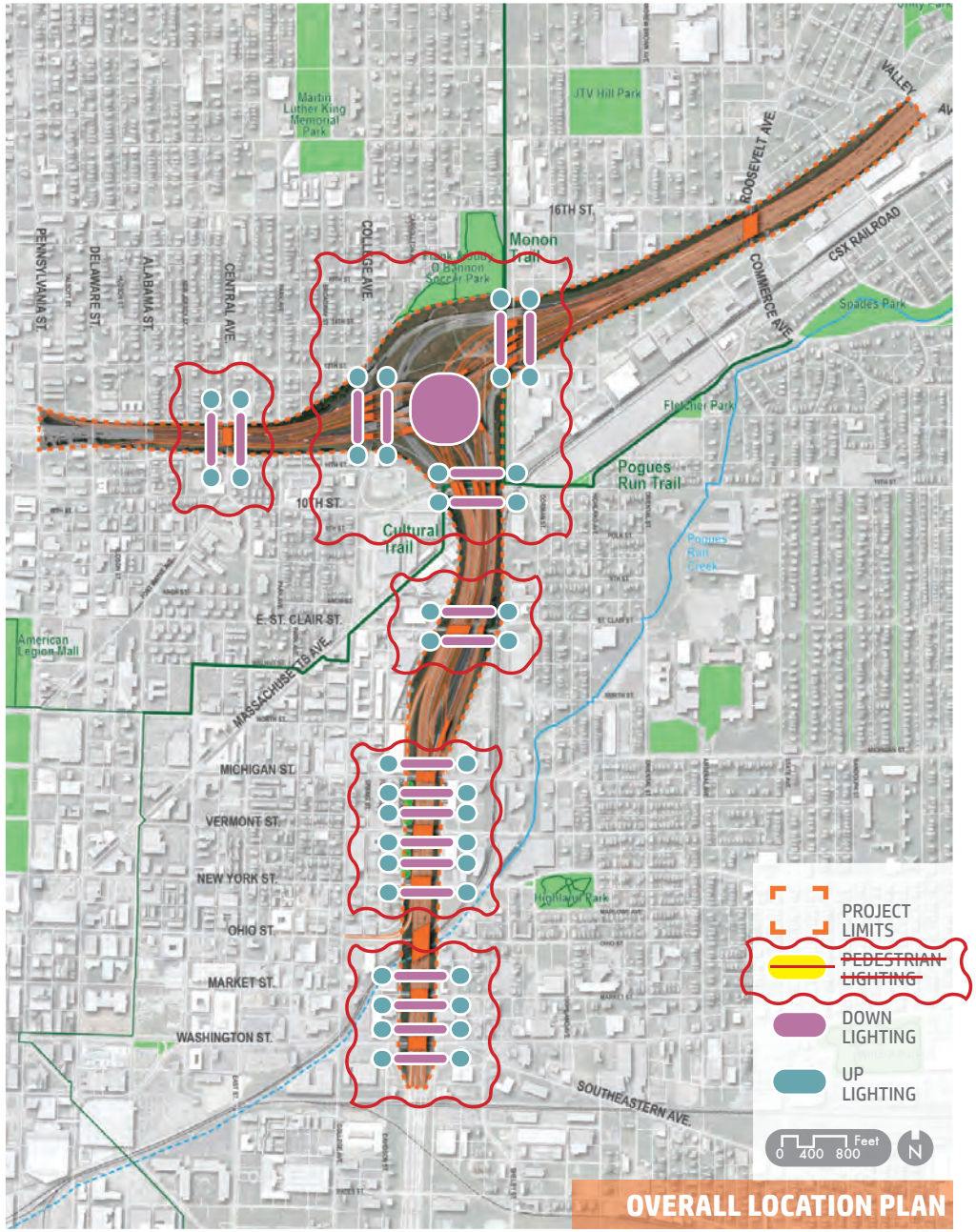
The recommended lighting types include two distinct treatment options that respond to the needs of vehicles, pedestrians, bicyclists and adjacent property owners. These two lighting types shall include:

~~1. Pedestrian Lighting~~

1. Down Lighting

2. Up Lighting

NOTE: Down Lighting in underpasses must meet pedestrian lighting standards.



Revised 02-25-2020: Eliminated Decorative Column Light

PEDESTRIAN LIGHTING

Pedestrian lighting shall be surface mounted and achieve pedestrian level lighting requirements. Mock-up shall be required for approval.

NOTE: *Approved fixtures are provided below. Pending maintenance agreement with The City of Indianapolis, final pedestrian lighting product selection will be coordinated with local officials to ensure compliance with local street lighting standards. The City may recommend selection of a traditional acorn style lighting product consistent with surrounding context.*

APPROPRIATE FIXTURES


STRUCTURA I TANDEM


HESS I CITY ELEMENTS


HESS I SIERRA


BEGA I LINEAR ELEMENT

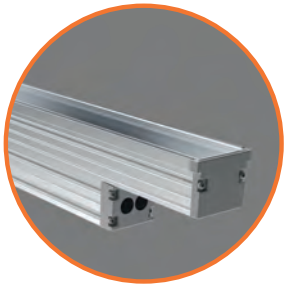

BEGA I LINEAR ELEMENT

DOWN LIGHTING

Wall Mounted:

Bar Style down lighting shall be surface mounted to abutment wall coping to achieve pedestrian level lighting requirements. Mock-up shall be required for approval.

APPROPRIATE FIXTURES



TARGETTI | JEDI
COMPACT IP67 INTEGRAL

BEGA | LED
WALL WASHER

LED LINEAR | XOOLUM
IP67

WALL MOUNTED LIGHT

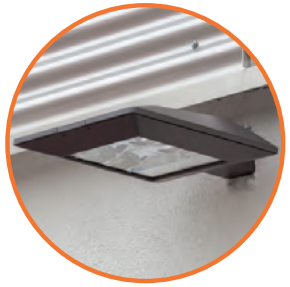
Column Mounted:

Down lighting shall be mounted to the pier cap. Aesthetic light wash shall be directed vertically down the column and horizontally across the bridge underside.

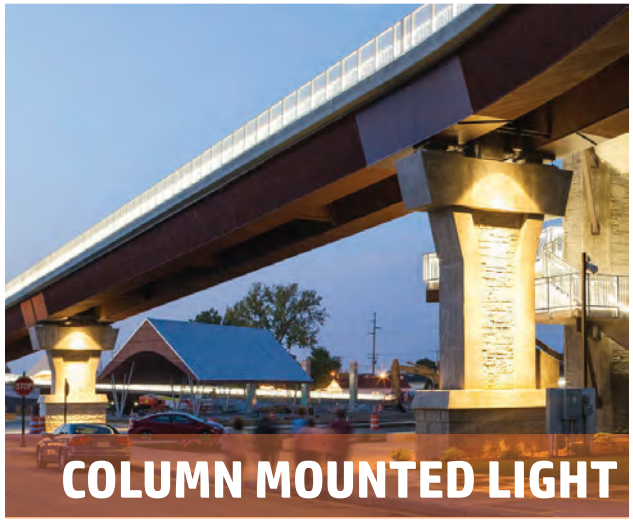
APPROPRIATE FIXTURES

BEGA | LED
WALL WASHER

BEGA | LED
COMPACT FLOOD



SELUX | AVANZA



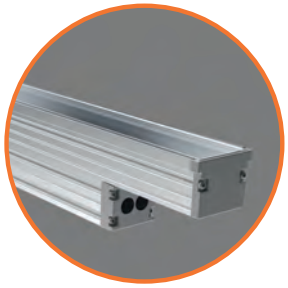
COLUMN MOUNTED LIGHT

UP LIGHTING

BAR LIGHT:

Bar style up lighting shall be recess mounted to monument for tamper resistance and achieve uniform aesthetic lighting wash across entire monument. Mock-up shall be required for approval.

APPROPRIATE FIXTURES



TARGETTI | JEDI
COMPACT IP67 INTEGRAL

BEGA | LED
WALL WASHER

LED LINEAR | XOOLUM
IP67

SPOT LIGHT:

Spot style up lighting shall be ground mounted in a concrete base and achieve focused aesthetic lighting wash at location of future art in upper third of monument. Mock-up shall be required for approval.

APPROPRIATE FIXTURES

TERON CIMMARON LED

HOLOPHANE PSLED

BEGA | LED COMPACT
FLOOD

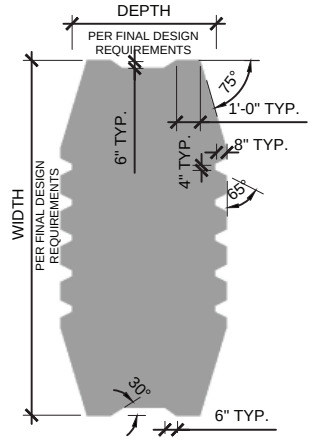
MONUMENT UPLIGHTING

Revised 02-25-2020: Revised Min. Width

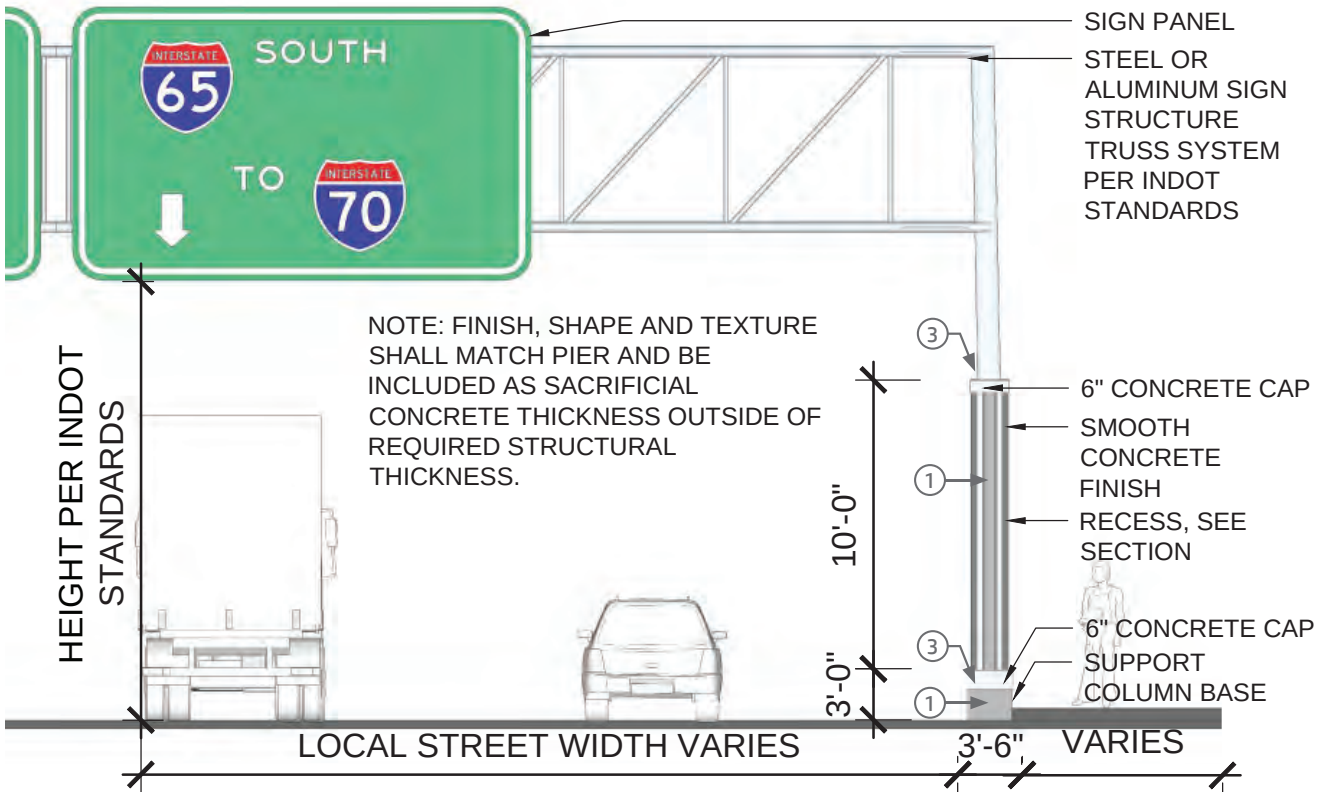
OVERHEAD BOX TRUSS SIGN ON LOCAL STREETS

COLOR LEGEND: *SEE COLOR SECTION*

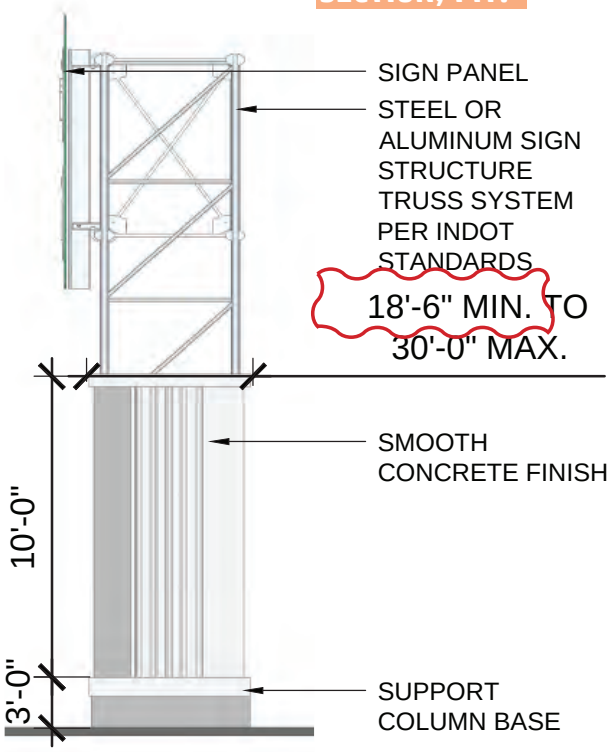
1 COLOR A1	5 COLOR B2
2 COLOR A2	6 COLOR C
3 COLOR A3	7 COLOR D
4 COLOR B1	8 COLOR E



SECTION, TYP.



FRONT ELEVATION (TYPICAL)

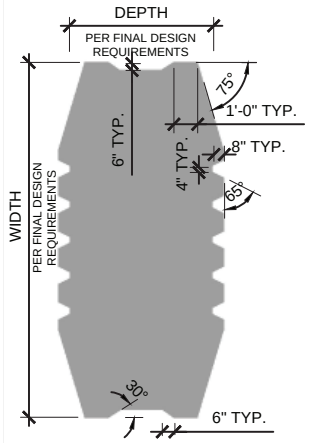


SIDE ELEVATION (TYPICAL)

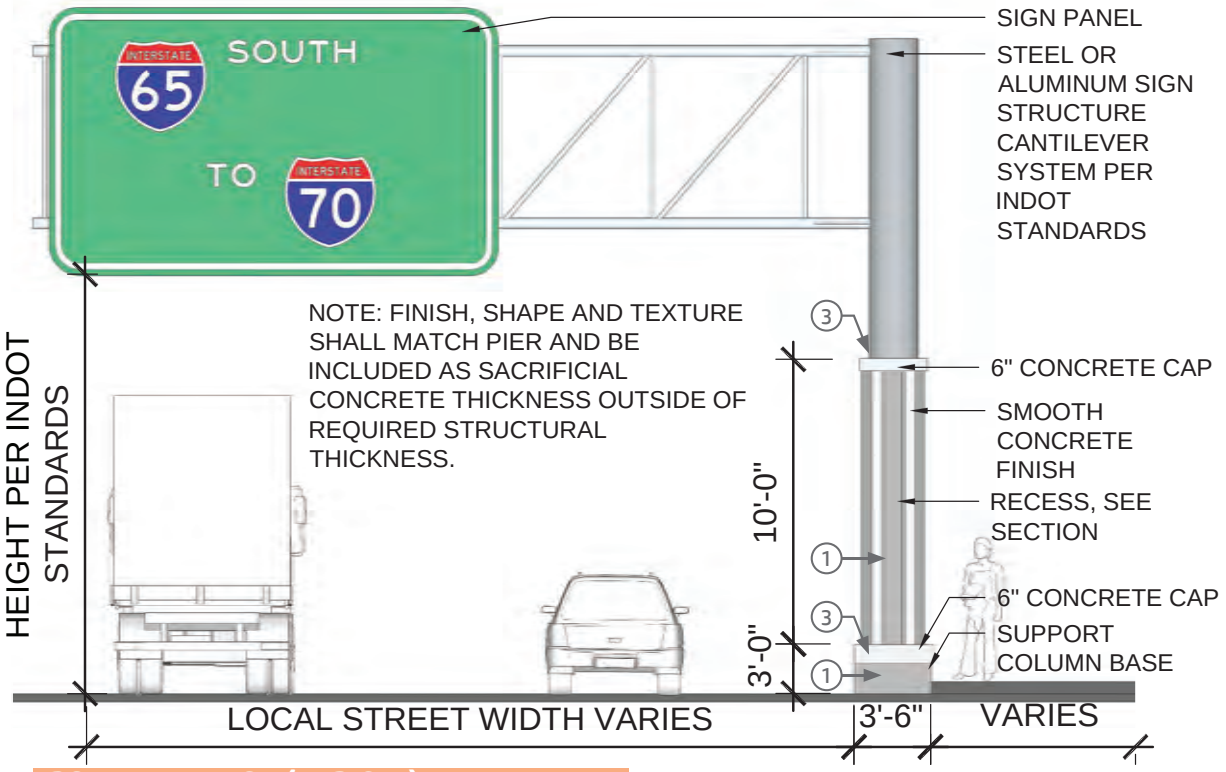
OVERHEAD CANTILEVER SIGN ON LOCAL STREETS

COLOR LEGEND: *SEE COLOR SECTION*

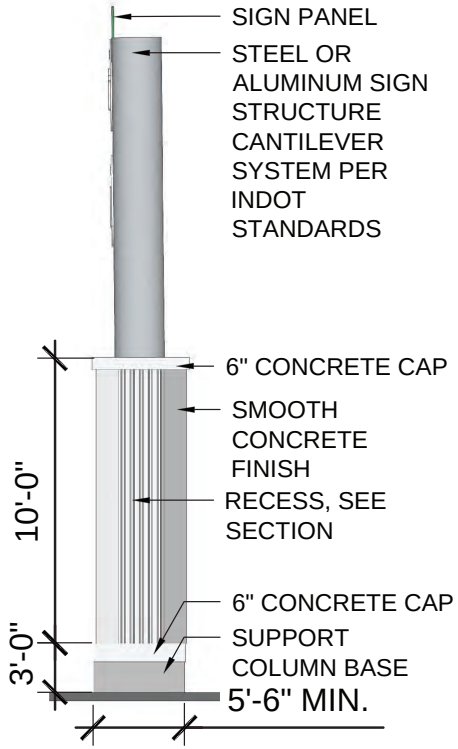
1 COLOR A1	5 COLOR B2
2 COLOR A2	6 COLOR C
3 COLOR A3	7 COLOR D
4 COLOR B1	8 COLOR E



COLUMN CROSS SECTION, TYP.



FRONT ELEVATION (TYPICAL)

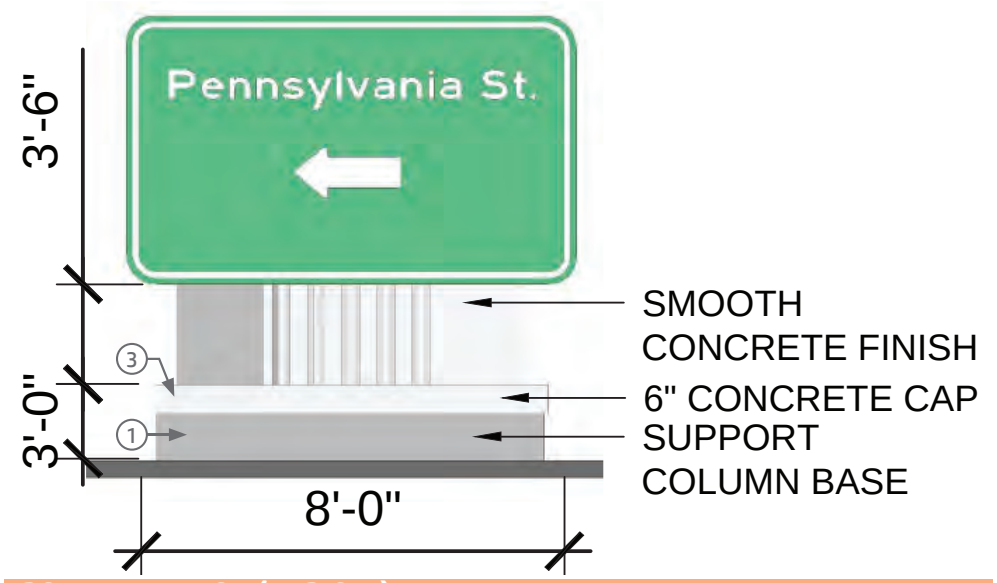


SIDE ELEVATION (TYPICAL)

GROUND- MOUNTED PANEL SIGN AT LOCAL STREETS

COLOR LEGEND: *SEE COLOR SECTION*

(1) COLOR A1	(5) COLOR B2
(2) COLOR A2	(6) COLOR C
(3) COLOR A3	(7) COLOR D
(4) COLOR B1	(8) COLOR E



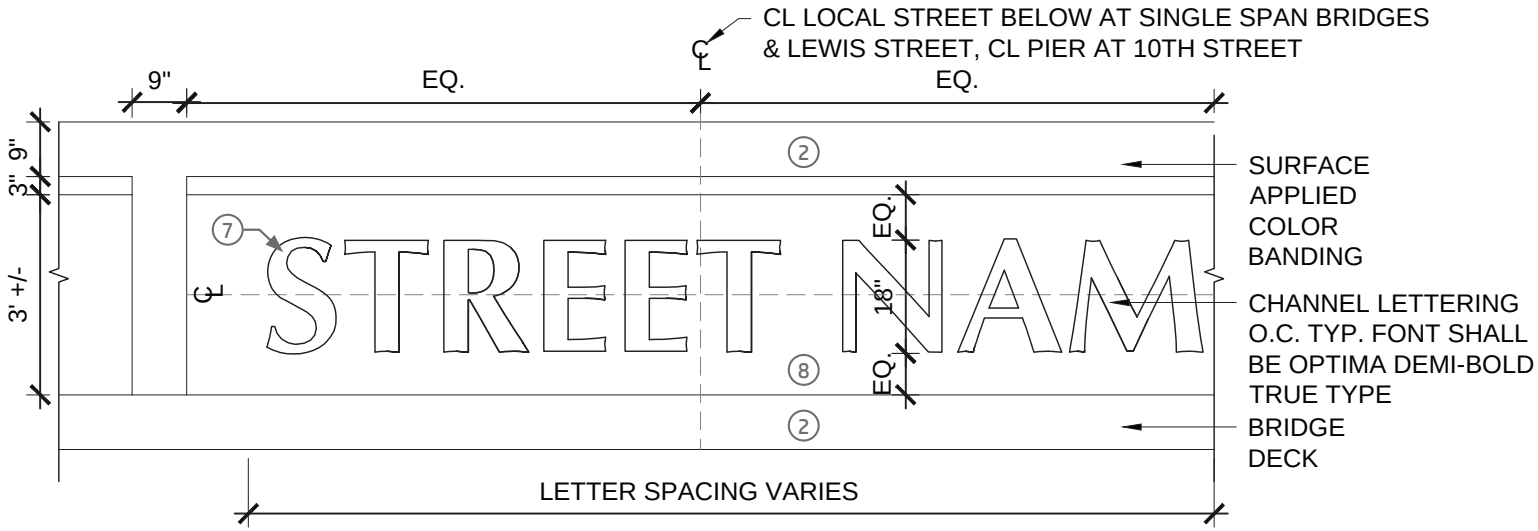
FRONT ELEVATION (TYPICAL)

Revised 02-25-2020: Revised Depth of Standoffs from 1” to 2”

TRAFFIC BARRIERS

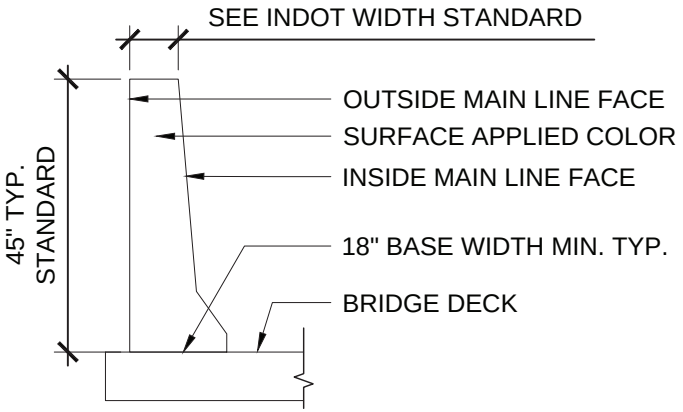
COLOR LEGEND: *SEE COLOR SECTION*

(1) COLOR A1	(5) COLOR B2
(2) COLOR A2	(6) COLOR C
(3) COLOR A3	(7) COLOR D
(4) COLOR B1	(8) COLOR E

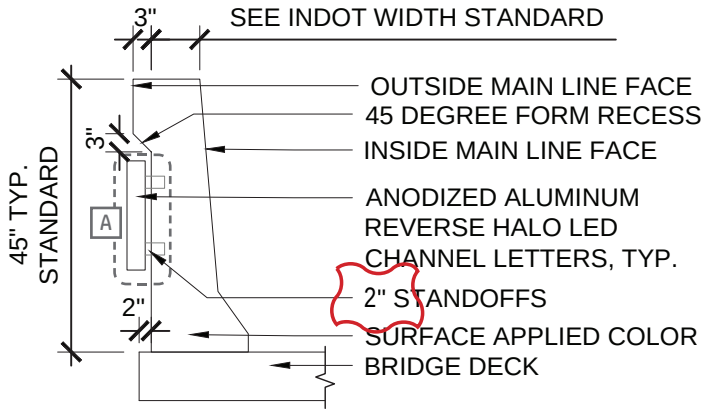


OUTSIDE FACE ELEVATION (TYPICAL)

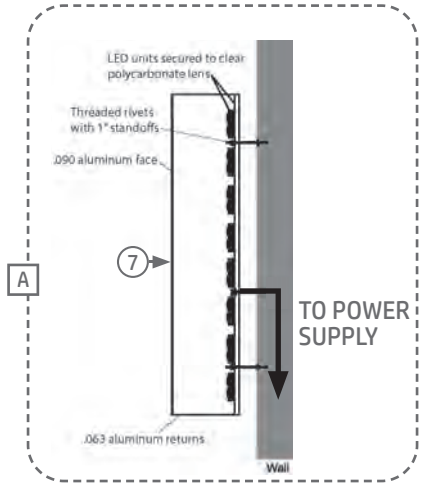
NOTE: *STRUCTURAL DESIGN OF LETTERING CONNECTION TO BARRIER SHALL BE THE RESPONSIBILITY OF THE DESIGN-BUILD CONTRACTOR IN ACCORDANCE WITH THE TECHNICAL PROVISIONS AND PROJECT STANDARDS.*



STANDARD BARRIER CROSS SECTION (TYPICAL)



SIGN BARRIER CROSS SECTION (TYPICAL)

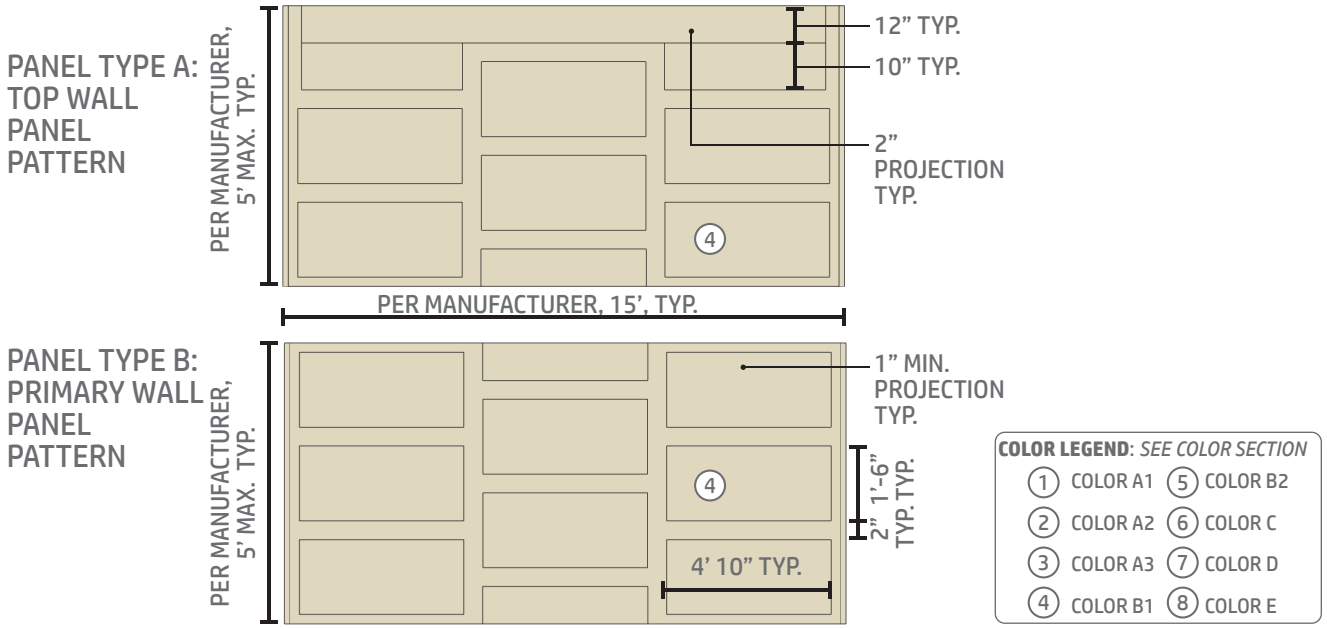


REVERSE HALO CHANNEL LETTER

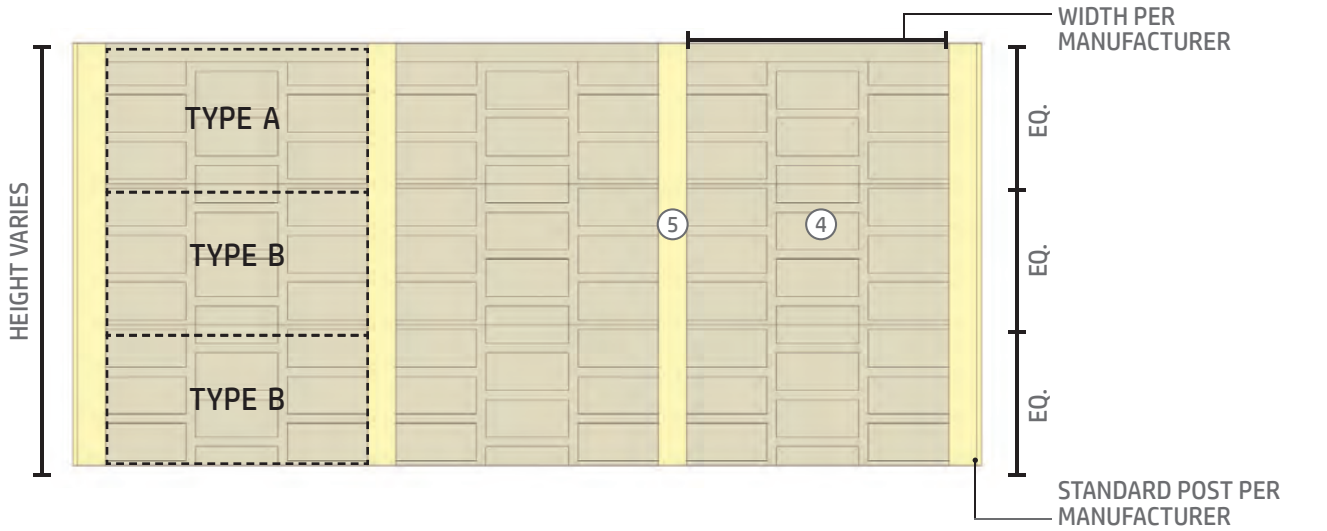
SOUND BARRIERS

Characteristics

- Panel patterns shall be proportionally scaled to meet manufacturer's requirements.
- Panel textures, colors and patterns shall be visually consistent with MSE walls.



SOUND BARRIER PANEL TYPES (TYPICAL)

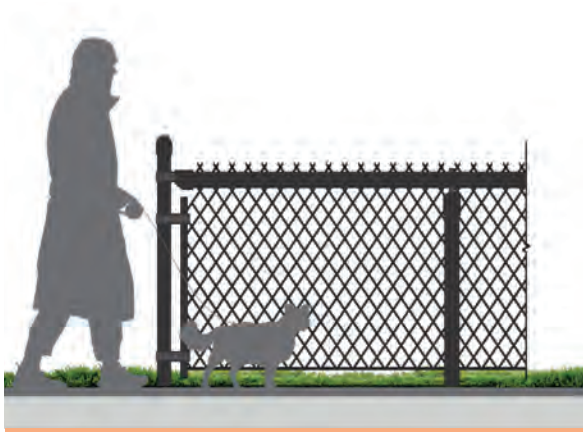


SOUND BARRIER FRONT ELEVATION (TYPICAL)

FENCING

Fencing shall be chain-link with black vinyl coating and meet height requirements between 4’ and 6’, with 6’ fencing used adjacent to the Monon Trail.

6’ Black Vinyl-Coated Chain Link Fence



4’ Black Vinyl-Coated Chain Link Fence

Fencing Setback from Walkways

BRIDGES OPENINGS

Overview:

With the reconstruction of the I-65/I-70 North Split interchange, the bridges that pass over local city streets will be replaced as part of this project. Thirteen downtown city streets are directly affected by the project. When the project is complete, all existing streets will still function as through streets with the interstate remaining elevated, bridging over the local streets.

The proposed design of the bridge opening infrastructure provides wider underpass openings, creating a safer and more inviting environment for accommodating pedestrians and vehicles.

Bridge Opening Types

Three bridge opening types were developed for local roadway connections. These bridge opening types shall be:

1. **Major Gateway Bridge Openings:** These bridge openings signify the most visible and highly used connections under the interstate. They shall function as neighborhood gateways, arterial street enhancements, and access points to the interstate.
2. **Minor Gateway Bridge Openings:** These bridge openings occur at collector and neighborhood streets and shall be visually similar to the Major Gateway Bridges.
3. **Standard Bridge Openings:** These bridge openings are essentially the base build condition. These bridges are more utilitarian and shall occur at bridges within the interchange, interior bridges sandwiched between a set of Major or Minor Bridges, or other areas where there is little or no pedestrian activity.

The bridge opening types shall contain a basic level of design enhancements proposed as part of the project, including wider sidewalks to encourage pedestrian connectivity, bridge abutment walls to reduce sidewalk edge encampment and loitering, traffic barriers with place making and wayfinding elements, and enhanced underpass lighting and visibility. The structural bridge components shall be designed to highlight the engineering and materials of the bridge components, allowing the engineering design to add to the overall visual interest of the underpass. While not overly detailed, integrating this level of ornamentation at the bridge openings enhances the character and overall visual impact to the infrastructure.

With the exception of only a few locations, all bridge openings cross over a local roadway. In the instance where a bridge opening crosses over a shared use trail, rail line, or on-ramp, the bridge structure aesthetic enhancements shall be applied while the ground plane enhancements shall not be applied due to varying conditions.

Revised 02-25-2020: Added New York as a Major Gateway Bridge

MAJOR GATEWAY BRIDGES

Design Summary:

Major Gateway Bridges provide crossing of I-65/I-70 over collector and arterial streets. To accomplish this, the following summarize the general characteristics of the Major Gateway Bridges:

- Provide safe, efficient and accommodating pedestrian and bicycle facilities at the local street level to improve connectivity.
- Apply enhanced treatments to abutment corner monuments, and traffic barriers while maintaining visual consistency to the Minor and Standard Underpass Bridges.

Locations:

The major gateway bridges within the project shall be at the following locations, as illustrated on the corridor map:

- 10th Street (double span)
- Central Avenue (single span)
- College Avenue (single span)
- Lewis Street/ Monon Trail (double span)
- New York Street (Single Span)
- Michigan Street (single span)
- Washington Street (single span)

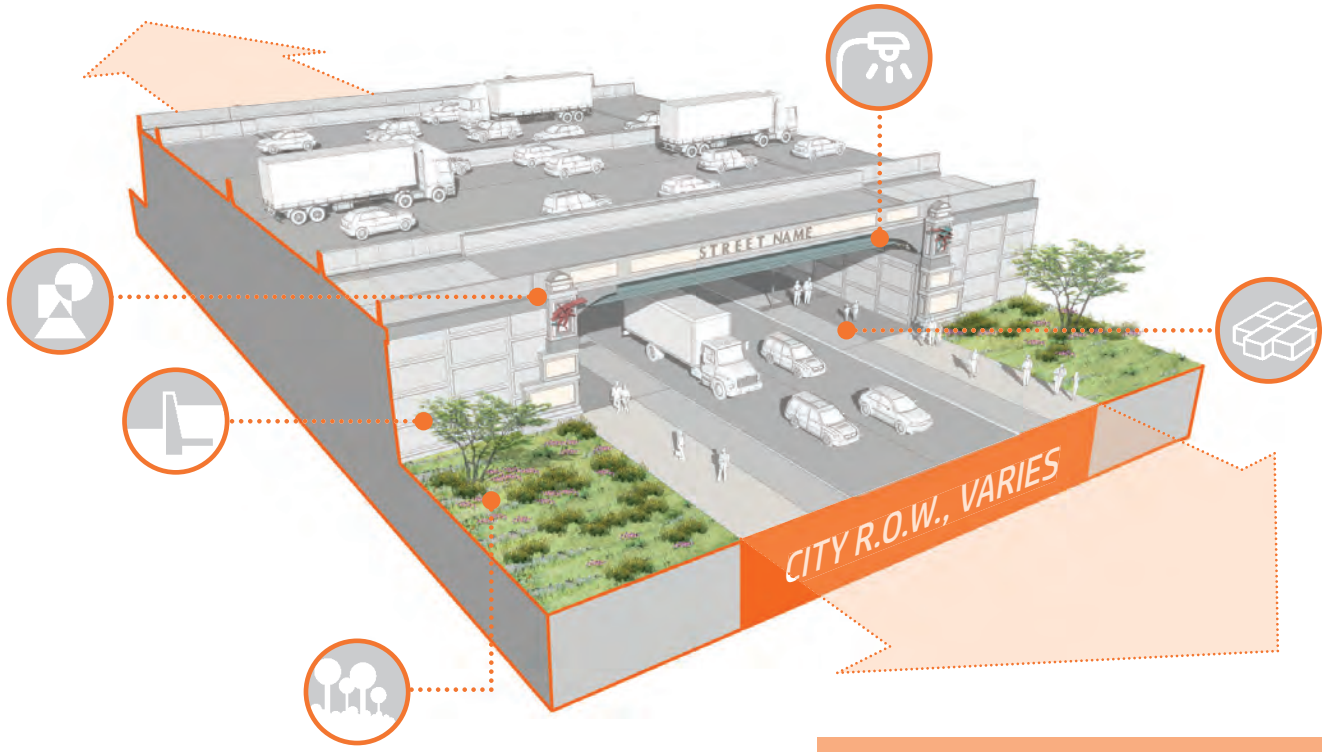
OVERALL LOCATION PLAN

MAJOR GATEWAY BRIDGES

Application Summary:
This bridge type is influenced and inspired by local landmarks, civic identity and historic forms within the context of downtown and surrounding neighborhoods' architecture. The Major Gateway Bridge design builds upon the decorative and detailed character utilizing texture and shapes found in the surrounding context that celebrate the capitol city. It provides an opportunity for the integration of future public art within the public realm.

COMPONENT USE:
Design enhancements for Major Gateway Bridges shall include the following:

- Abutment Walls
- Lighting
- Surfacing
- Landscape
- Public Art Spaces



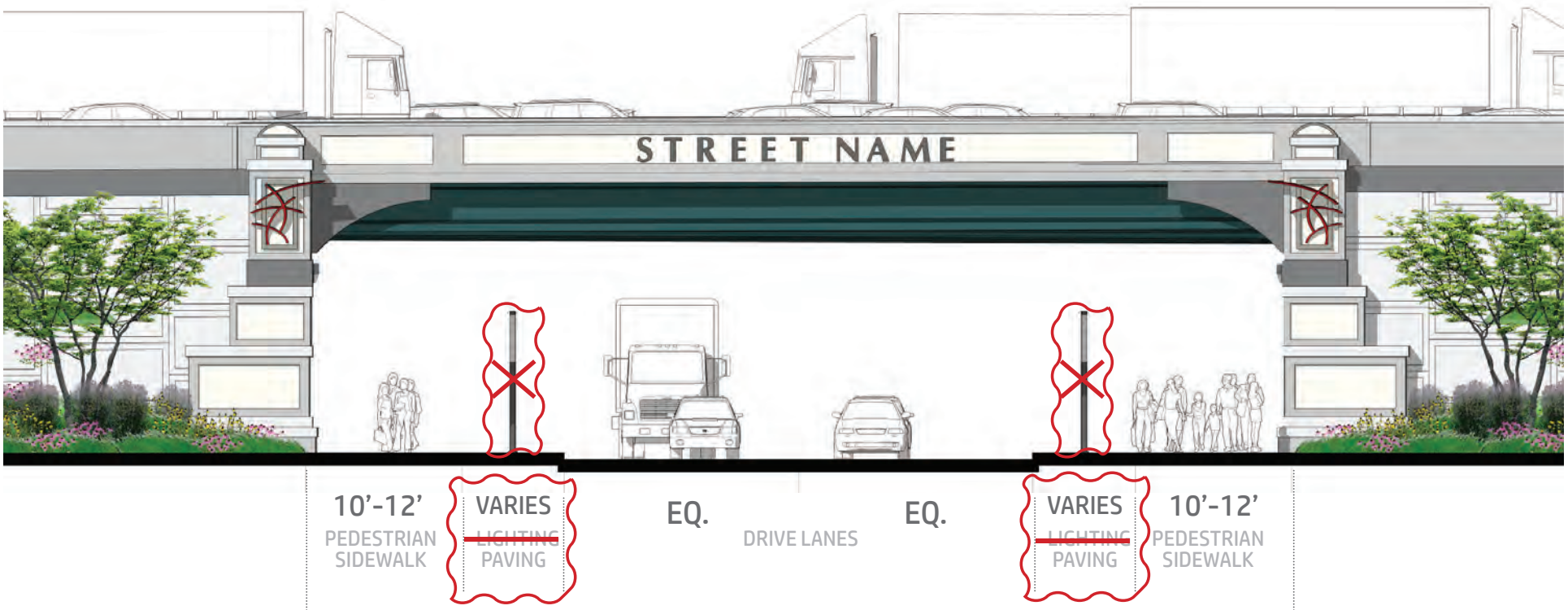
TYPICAL COMPONENT APPLICATION

Revised 02-25-2020: Eliminated Decorative Column Light

MAJOR GATEWAY BRIDGE APPLICATION SINGLE SPAN

NOTES:

1. CORNER MONUMENTS ONLY REQUIRED ON THE OUTSIDE OF EXTERIOR BRIDGES FOR A TOTAL OF 4 PER CROSSING.



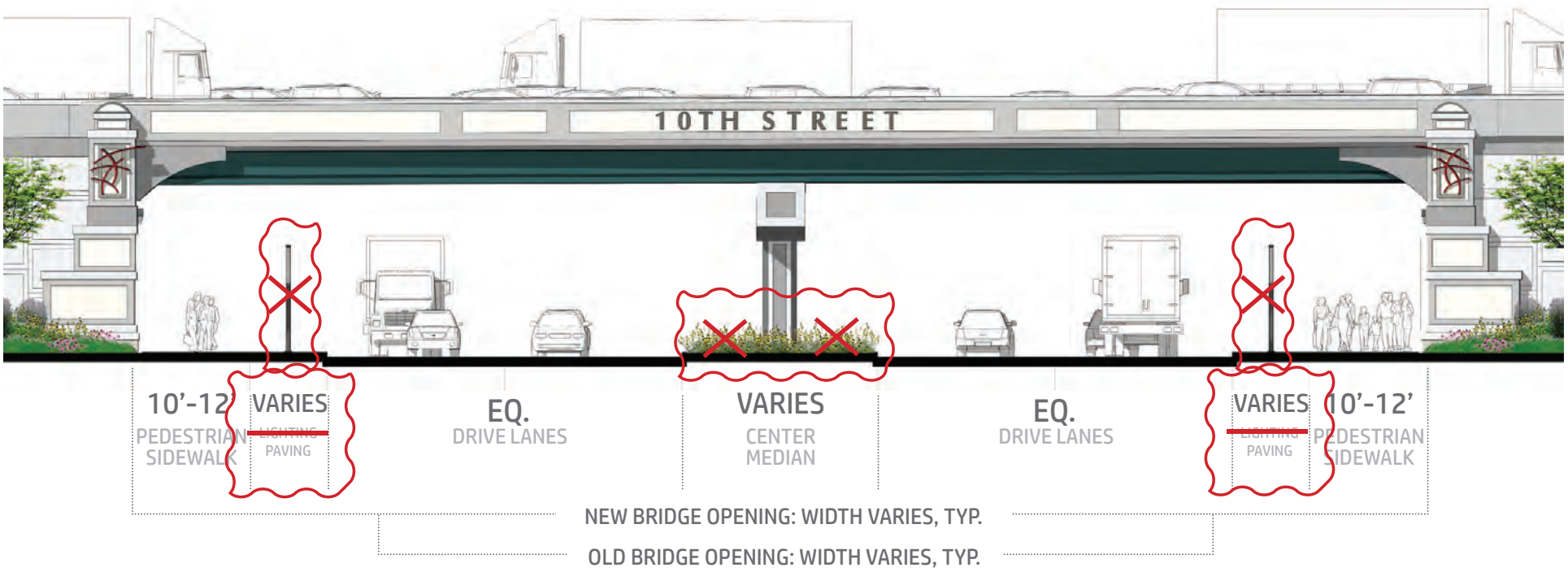
TYPICAL MAJOR GATEWAY BRIDGE ELEVATION

Revised 02-25-2020: Eliminated Decorative Column Light and Median Vegetation

MAJOR GATEWAY BRIDGE APPLICATION DOUBLE SPAN, TYPICAL

NOTES:

1. CORNER MONUMENTS ONLY REQUIRED ON THE OUTSIDE OF EXTERIOR BRIDGES FOR A TOTAL OF 4 PER CROSSING.



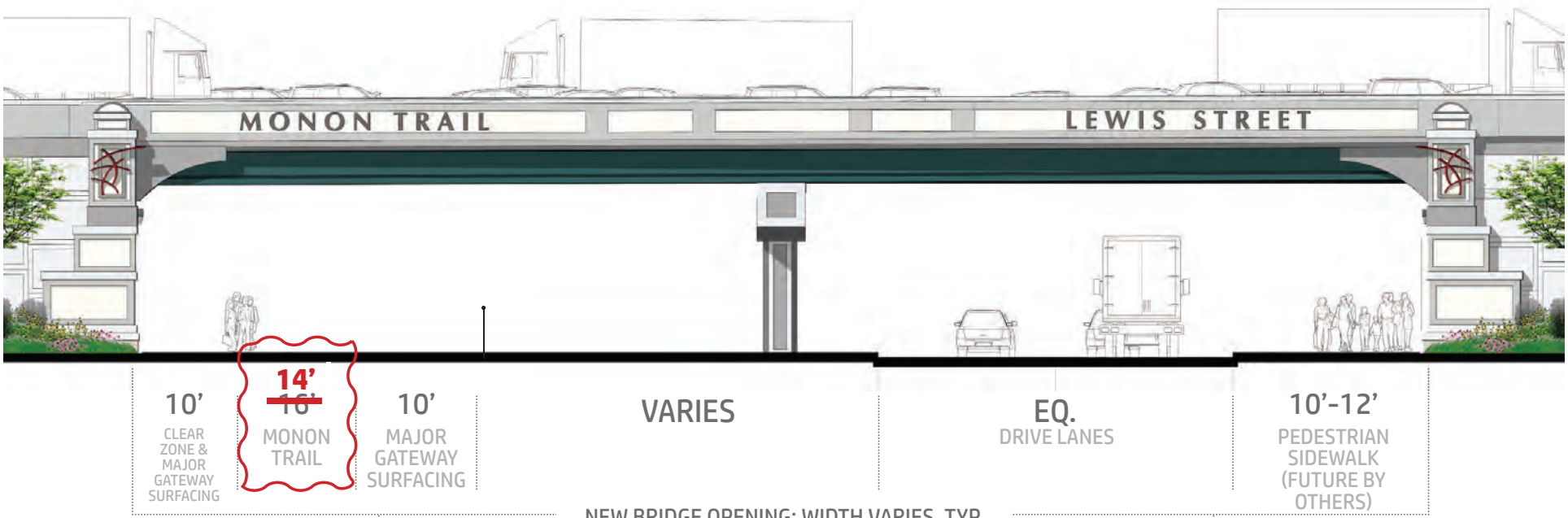
TYPICAL MAJOR GATEWAY BRIDGE ELEVATION

Revised 02-25-2020: Revised Monon Trail Width

MAJOR GATEWAY BRIDGE APPLICATION DOUBLE SPAN AT MONON & LEWIS STREET

NOTES:

1. CORNER MONUMENTS ONLY REQUIRED ON THE OUTSIDE OF EXTERIOR BRIDGES FOR A TOTAL OF 4 PER CROSSING.



TYPICAL MAJOR GATEWAY BRIDGE ELEVATION

Revised 02-25-2020: Eliminated Decorative Column Light

TYPICAL MAJOR GATEWAY UNDERPASS VIEW

Revised 02-25-2020: Eliminated New York Street from Minor Gateway Bridges and Moved to Major Gateway Bridges

MINOR GATEWAY BRIDGES

Design Summary:

Minor Gateway Bridges provide crossing of I-65/I-70 over smaller-scaled less traveled local streets. The following summarizes the general characteristics of the Minor Underpass Bridges:

- Provide safe, efficient and accommodating pedestrian and bicycle facilities through the underpasses at the local street level to improve connectivity.
- Apply simplified treatments to abutment corner monuments, and traffic barriers while maintaining visual consistency to the Major and Standard Underpass Bridges.

Locations:

The bridges identified within the project that shall be considered Minor Gateways, as illustrated on the corridor map:

- Market Street
- ~~New York Street~~
- Vermont Street
- St. Clair Street

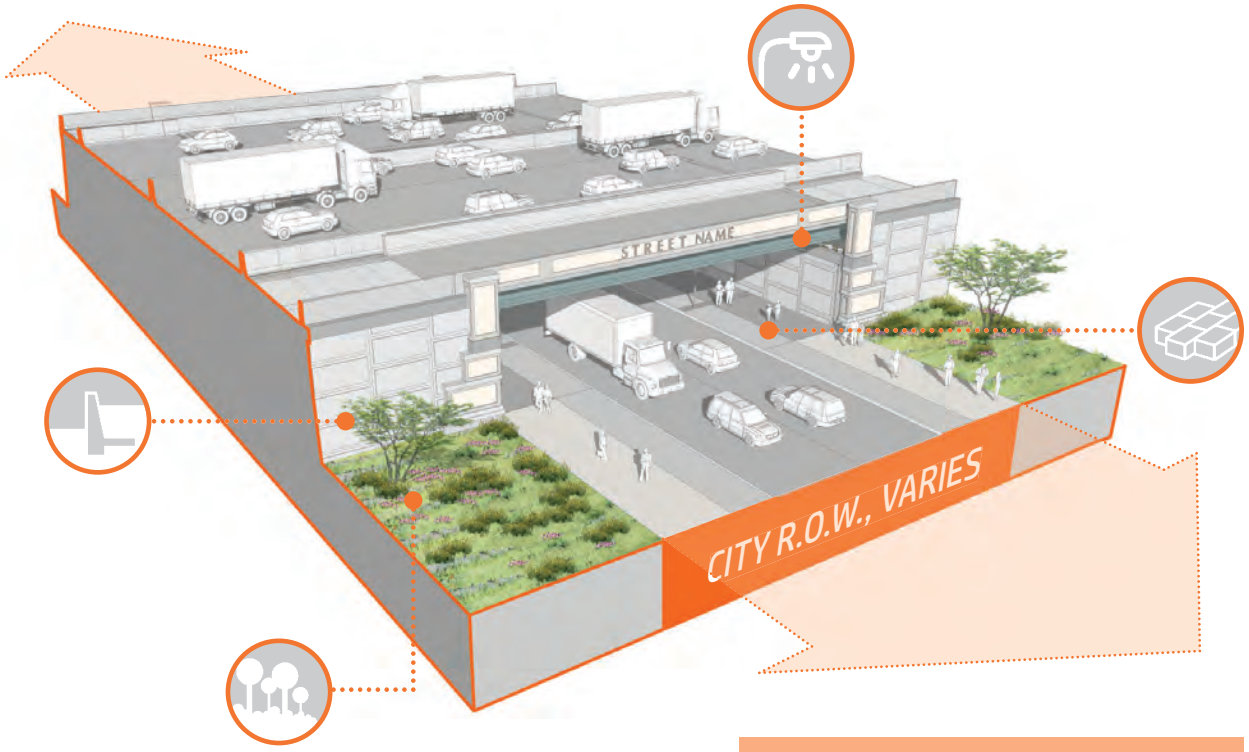
OVERALL LOCATION PLAN

MINOR GATEWAY BRIDGES

Application Summary:
This bridge type is also influenced by landmarks, identity and historic forms within the downtown and surrounding neighborhood context. The Minor Gateway Bridge design simplifies aspects of the major gateway counterpart, while still utilizing texture and shapes found in the surrounding neighborhood that celebrate the capitol city. The consistency in infrastructure features provides for the project's visual uniformity.

COMPONENT USE:
Design treatments for Minor Gateway Bridges shall include the following:

- Abutment Walls
- Lighting
- Surfacing
- Landscape



TYPICAL COMPONENT APPLICATION

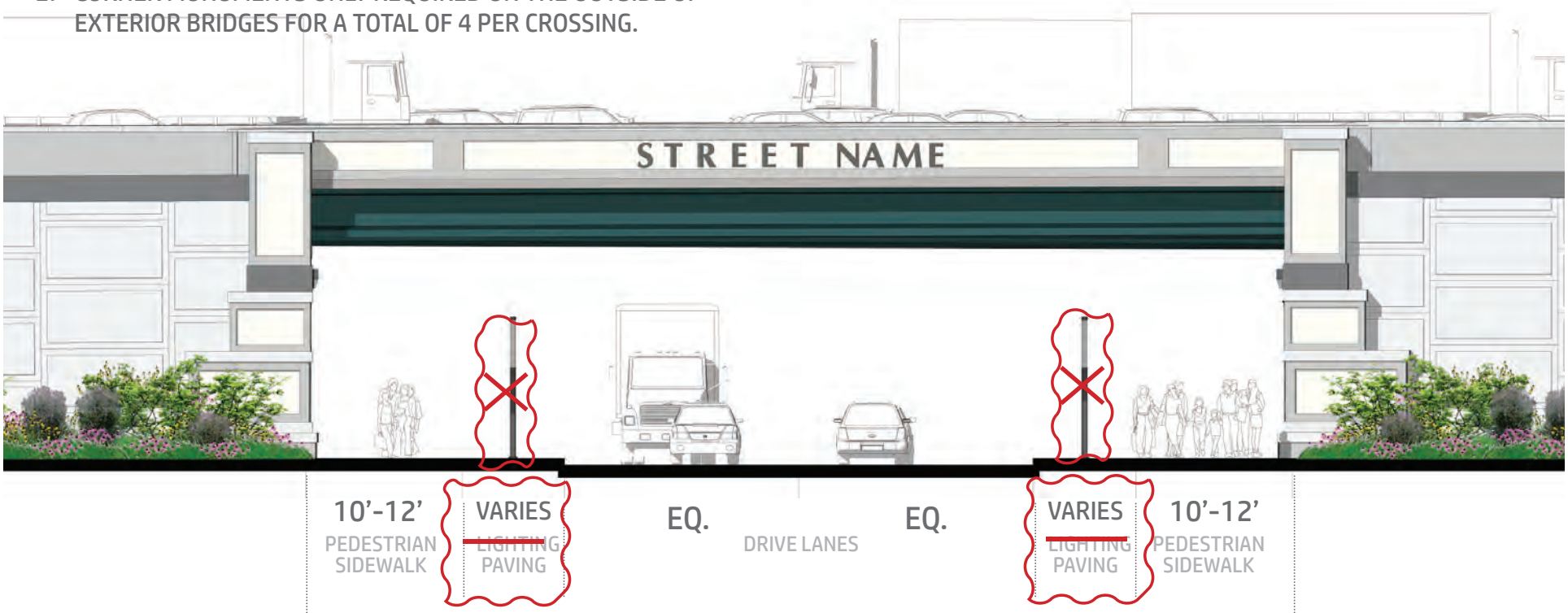
Revised 02-25-2020: Eliminated Decorative Column Light, Revised Note Text

MINOR GATEWAY BRIDGE APPLICATION

NOTES:

1. ~~PLANTING AND LIGHTING BUFFER ZONES ONLY REQUIRED AT ST. CLAIR STREET CROSSING.~~

~~2.~~ CORNER MONUMENTS ONLY REQUIRED ON THE OUTSIDE OF EXTERIOR BRIDGES FOR A TOTAL OF 4 PER CROSSING.



TYPICAL MINOR GATEWAY BRIDGE ELEVATION

Revised 02-25-2020: Eliminated Roosevelt/Commerce and Valley, Revised text

STANDARD UNDERPASS & SURFACES

Design Summary:

Standard Underpass Bridges provide crossing of I-65/I-70 over local streets. The following summarize the general characteristics of the Standard Underpass Bridges:

- Provide safe, efficient and accommodating pedestrian and bicycle facilities at the local street level to improve connectivity.
- Apply simplified treatments with visual consistency to the Major and Minor Underpass Bridges.

Standard Underpass Locations:

The bridges identified within the project that shall receive the standard underpass treatment at the following locations, as illustrated on the corridor map:

- College Avenue (2 internal bridges)
- 10th Street (3 internal bridges)
- Pine Street (1 straddle bent)
- Lewis Street/ Monon Trail (3 internal bridges)
- Ohio Street & CSX Railroad (3 bridges)
- Interchange (all bridge locations)

Treatment Notes:

The Standard Bridge at Alabama Street shall receive surface treatment and standard INDOT down lighting.

The Ohio Street & CSX Railroad and the Pine Street bridges do not include pedestrian lights or surface treatments.

Interchange bridges include down lighting but no pedestrian lighting or surface treatments.

OVERALL LOCATION PLAN

STANDARD UNDERPASS BRIDGES

Application Summary:

This bridge type is a simplified version of the three types. It is to be used in conditions where visibility is less significant or it is less visible, such as between two Major or Minor Gateway Bridges if the bridge span requires multiple bridge decks. This bridge is intended to maintain visual uniformity and continue to enhance the design aesthetic within the project area.

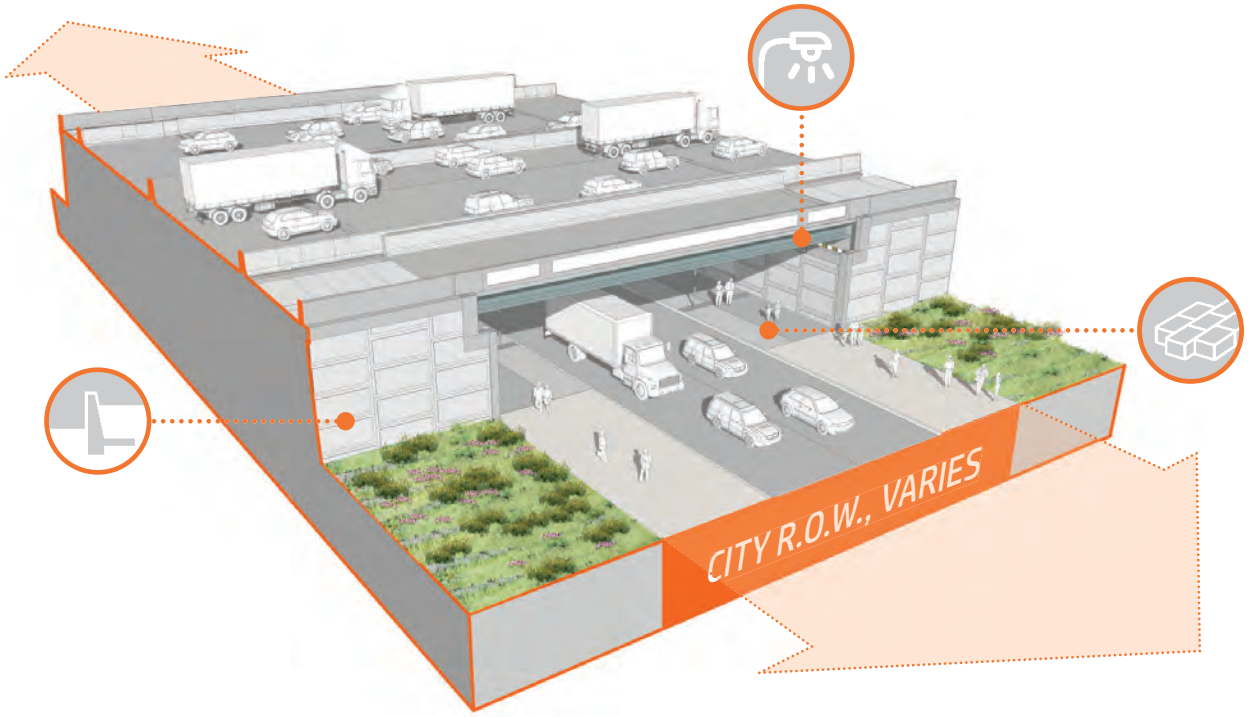
COMPONENT USE:

Standard Bridge treatments shall include the following components:

- Abutment Walls
- Lighting
- Surfacing

NOTE:

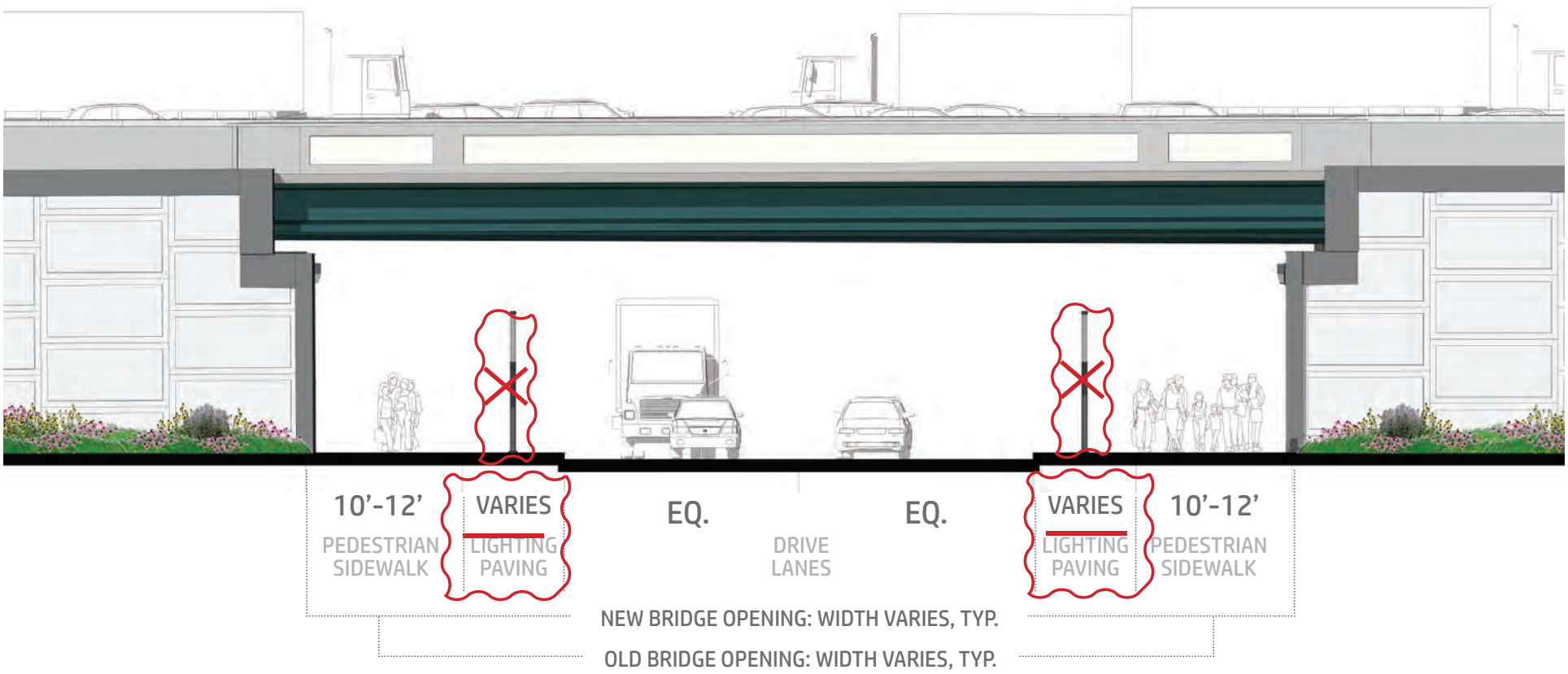
Local level surface treatments will not apply to interchange bridges and ramp bridges where no pedestrian facilities currently exist.



TYPICAL COMPONENT APPLICATION

Revised 02-25-2020: Eliminated Decorative Column Light

STANDARD UNDERPASS BRIDGE APPLICATION



TYPICAL STANDARD BRIDGE ELEVATION

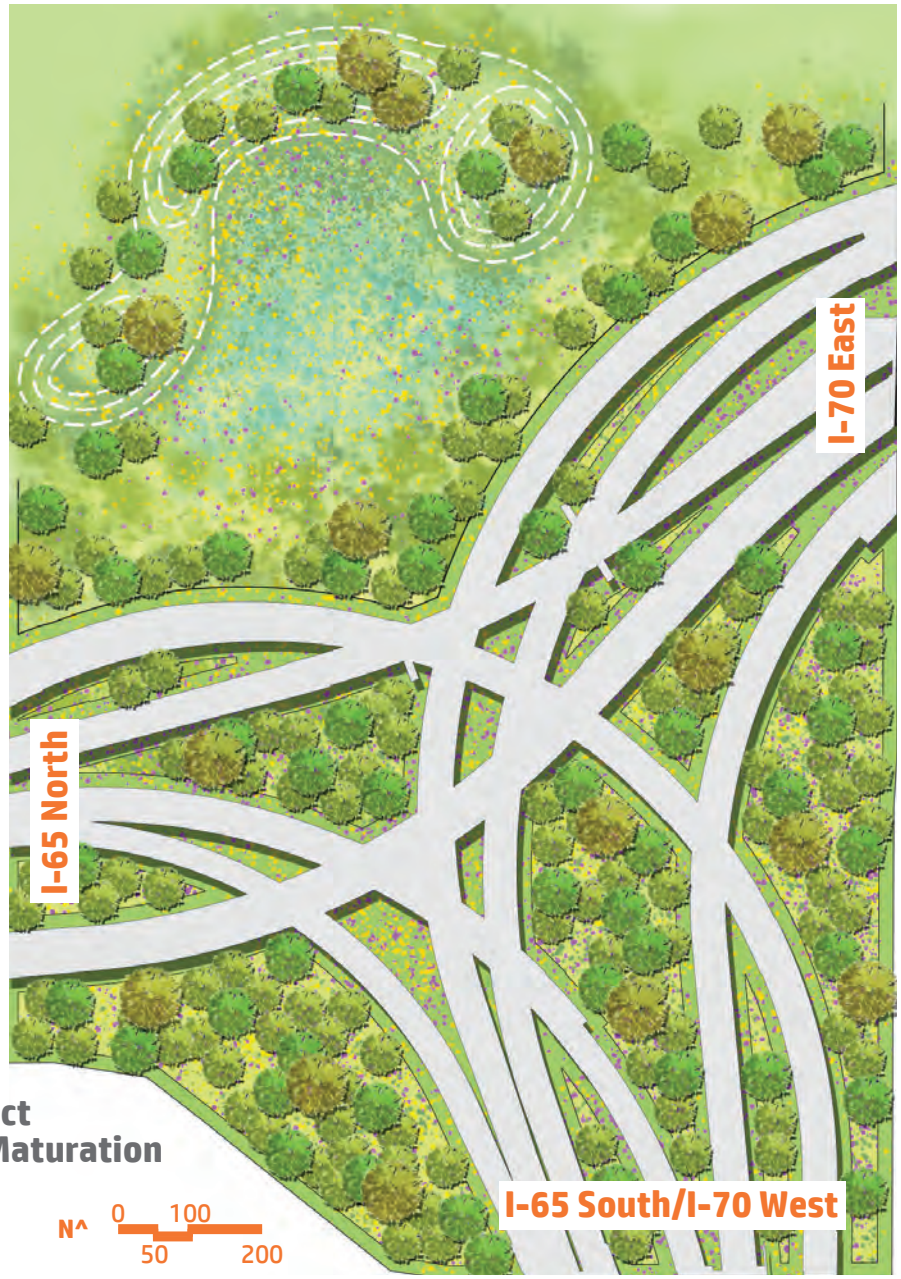
LANDSCAPE INTRODUCTION

Landscape Summary

This section of the North Split Aesthetic Design Guidelines provides direction for landscape form and function, evaluating how vegetative aesthetic treatments can also serve the needs for the INDOT-owned interstate, the City-owned local streets and the surrounding communities.

Information gained from neighborhood workshops and surveys during the Context Sensitive Solutions process of the I-65/I-70 North Split Project indicated that the public preferred a more naturalistic approach to landscape design with many referring to the term “urban forest.” This urban forest concept has been considered as part of the design guidelines - found in *Interchange Plantings* of this section.

This document also recognizes the existence of INDOT standards, as well local groups (such as Keep Indianapolis Beautiful) and resources for achieving the proposed design.



I-65/I-70 North Split Project
Interchange Plantings at Maturation

LANDSCAPE OVERVIEW

Landscape Design Typology

The landscape palette includes a range of treatments that focus primarily on native plant selections to enhance the aesthetic appeal of the interchange. The design concept places plant species within urban conditions that best represent their naturally occuring plant communities. The typologies for the landscape treatment include:

- Tree Preservation Areas as "The Nature Reserve"
- 10' Buffer-Zones as "The Lawn"
- Side Slope Plantings as "The Uplands"
- Screen Plantings as "The Woodlands"
- Interchange Plantings as "The Prairie's Edge"
- Detention Basin Plantings as "The Wetlands"

Typology 1: Tree Preservation

Tree Preservation Areas protect trees that are deemed "significant" to the landscape. Tree preservation areas were determined through the Section 106 Consultation Process and are included in the final "Do Not Disturb" areas for the project site.

Typology 2: 10' Buffer-Zone

The 10' Buffer-Zone is intended to maintain a set-back for plantings so there is no interference between the landscaped areas and roadway functions.

Typology 3: Side Slope Plantings

Plants, rather than extended infrastructure, can be used for erosion control and soil stabilization along the interstate embankments as a cost-effective and less-infrastructure dependent option.

Typology 4: Screen Plantings

Plants can minimize the appearance of sound barriers from adjacent residences.

Typology 5: Interchange Plantings

Plants can give purpose to expansive spaces, within and around the interchange, in a manner that is low-cost and less maintenance intensive, while still providing visual interest.

Typology 6: Detention Basin Plantings

Plants allow for the filtration and infiltration of storm water on site. As such, a heavily planted area for the purpose of stormwater detention - a dry extended detention basin - is favored over a traditional retention pond for the benefits it can offer the urban landscape.

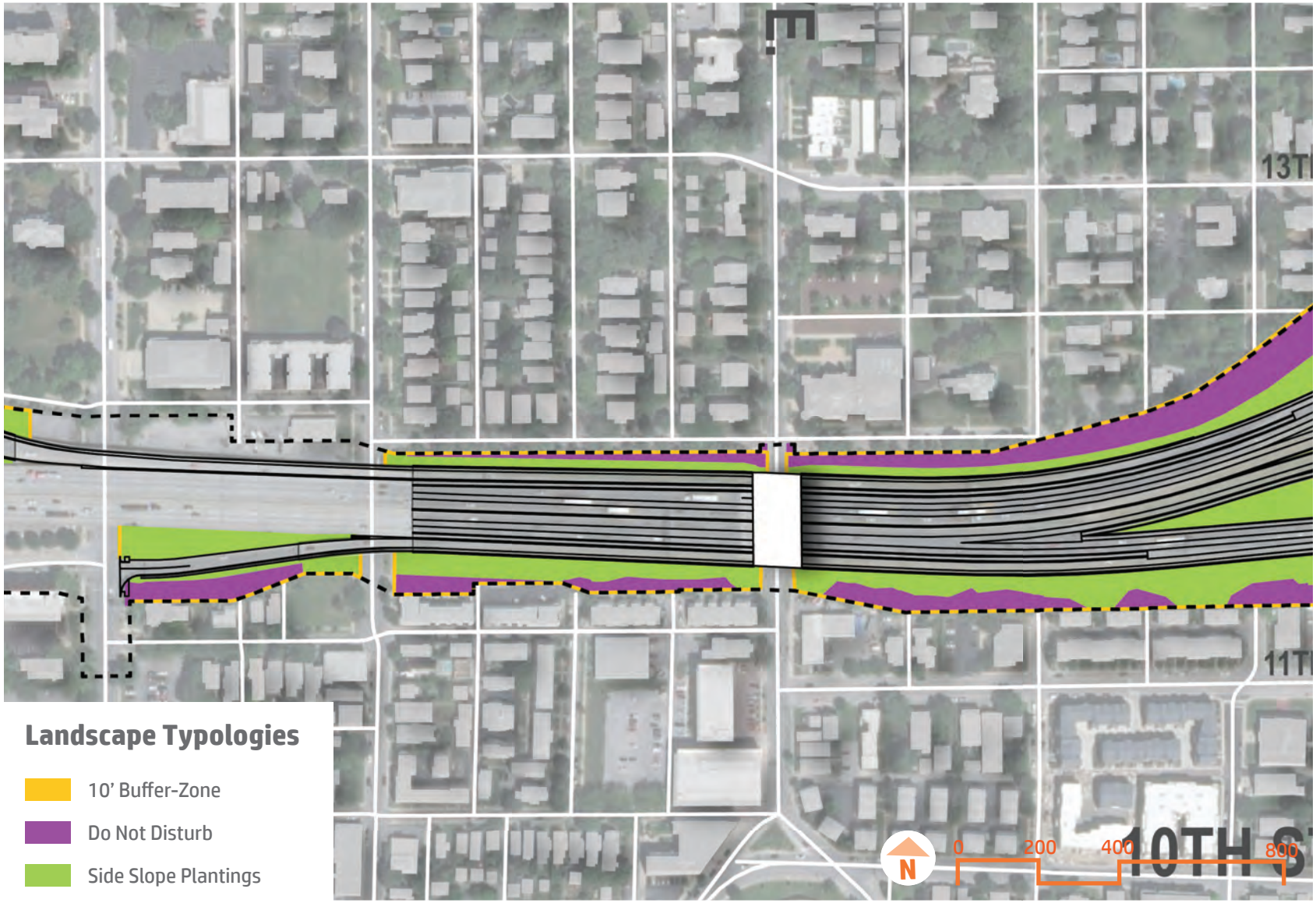
LANDSCAPE OVERVIEW

Design Summary

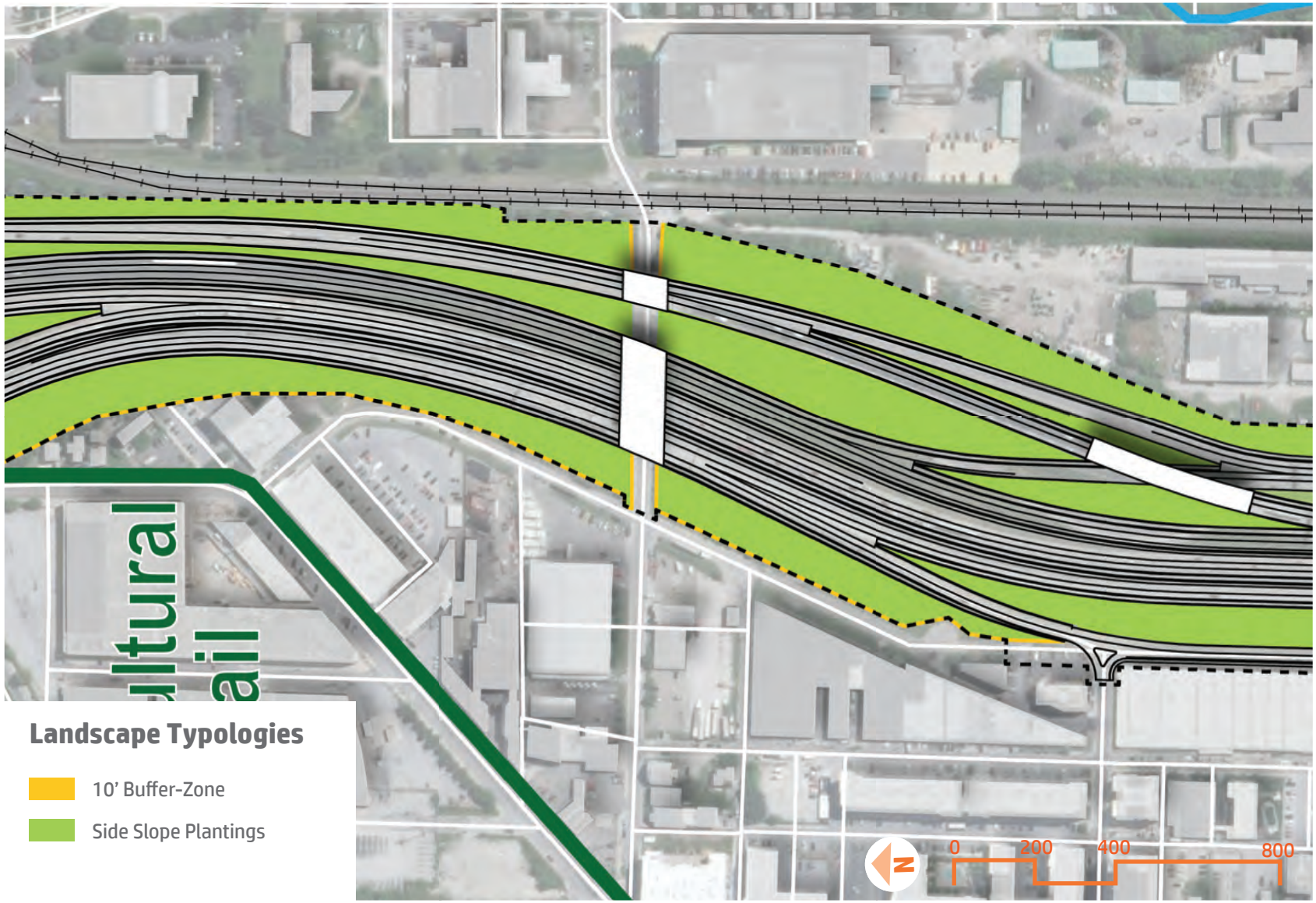
The landscape palette shall utilize a range of treatments that focus on native plant selections to enhance the interchange and overall corridor. The graphic on the right identifies **general** areas of appropriateness for landscape treatment typologies. Final typologies may vary depending on the final engineering considerations of the interstate and associated structures.

Guidelines

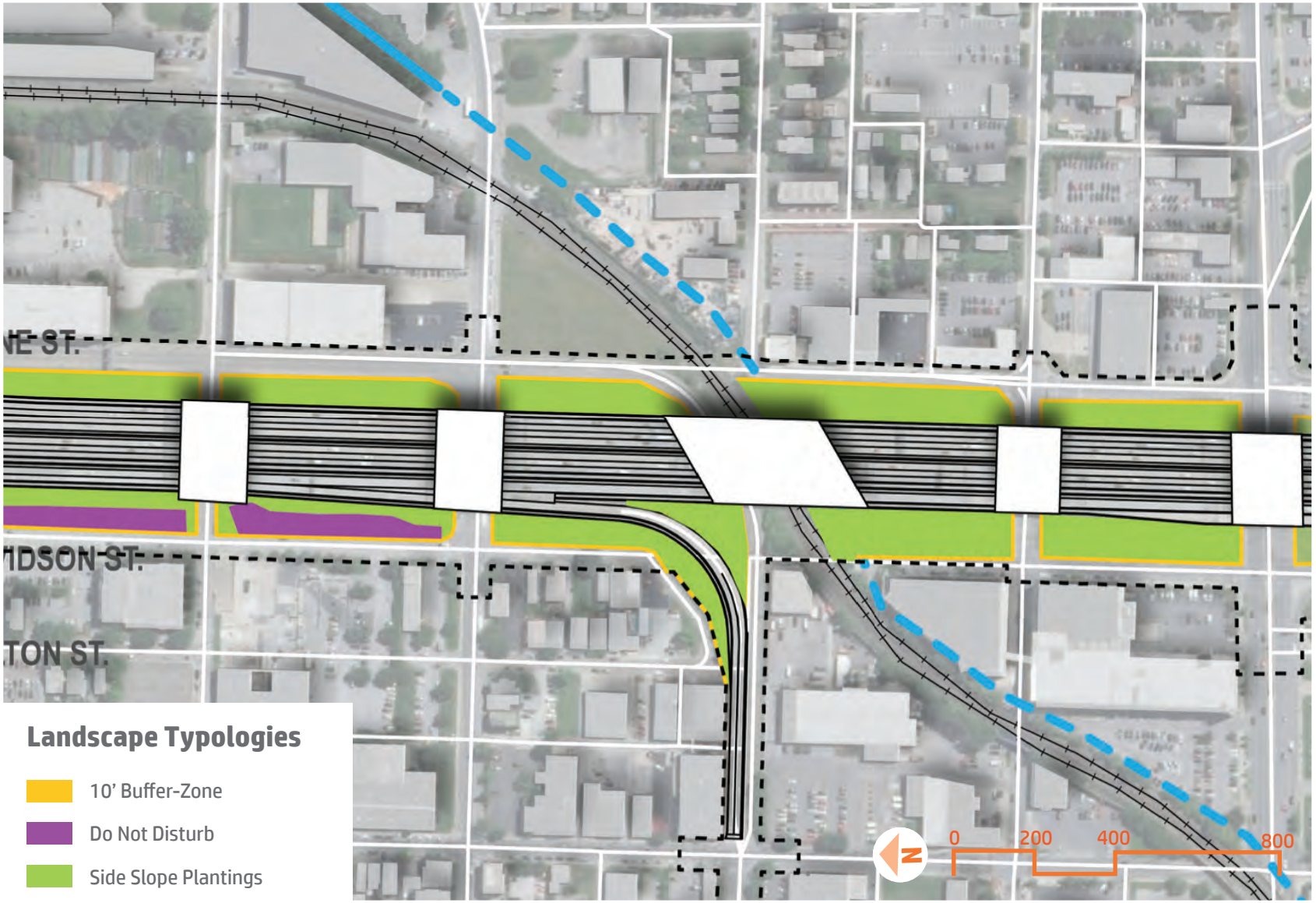
- Use native, low-maintenance plants whenever possible
- Soften urban elements of the corridor with a naturalized placement of plants
- Provide a diverse palette of plants species


13TH
11TH
10TH ST
N
0
200
400
800
Landscape Typologies
10' Buffer-Zone
Do Not Disturb
Side Slope Plantings

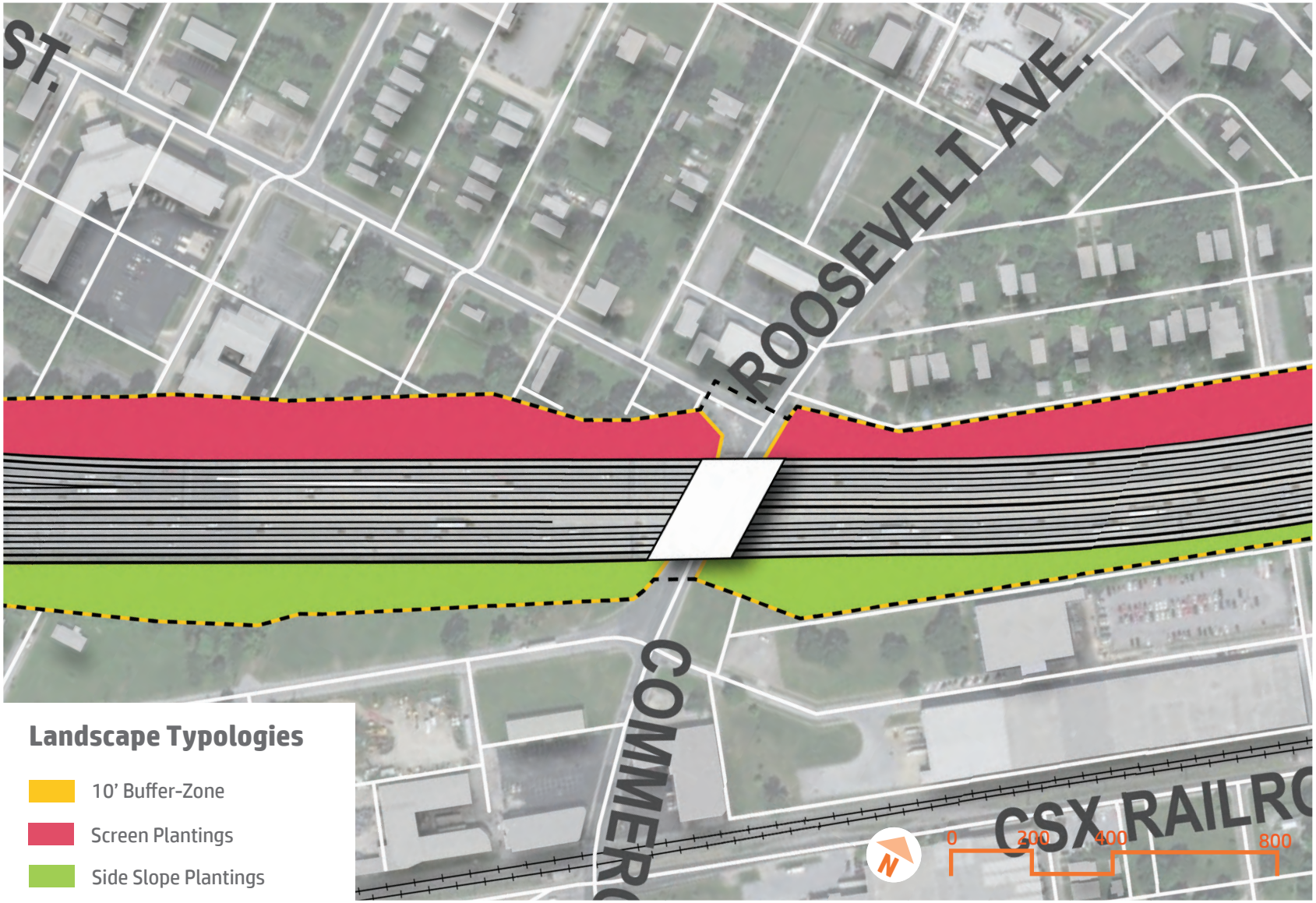
A. WEST LEG



B. SOUTH LEG BETWEEN 10TH STREET AND MICHIGAN STREET



C. SOUTH LEG BETWEEN MICHIGAN STREET AND WASHINGTON STREET


ST.
ROOSEVELT AVE.
COMMER
CSX RAILRO
N
0
200
400
800
Landscape Typologies
10' Buffer-Zone
Screen Plantings
Side Slope Plantings

D. EAST LEG

QUANTITIES FOR COST ESTIMATING

Summary

The information provided outlines the total square feet of each typology and then the square feet of each plant material that makes up the typology. The square footage follows the design guidelines and parameters of placement for all plant material.

Seed coverage and on-center plant spacing are provided, and shall be followed for the unique conditions of each typology.

The plantings will follow Keep Indianapolis Beautiful's (KIB) planting standard of 15' on-center maximum spacing for all deciduous shade and ornamental trees. Evergreen screen trees will differ at a 10' on-center maximum spacing. Small deciduous and evergreen shrubs will be planted at 4' on-center, while large deciduous shrubs will be planted at 8' on-center. Plugs will be planted at 6" on-center.

Typology 1: Tree Preservation Areas Approximate Total Square Feet: 187,300

Typology 2: 10' Buffer-Zone Approximate Total Square Feet: 247,600

NO-MOW, ECO-LAWN SEED MIX **Square Feet of Coverage: 247,600**

Coverage applied at a rate of 220 PLS (Pure Live Seed) pounds per acre.

Typology 3: Side Slope Plantings Approximate Total Square Feet: 1,528,200

SLOPE STABILIZATION SEED **MIX Square Feet of Coverage: 1,528,200**

Coverage applied at a rate of 60 PLS (Pure Live Seed) pounds per acre

NATIVE GRASSES **Square Feet of Coverage: 68,400**

Plugs, Planted 6" On-Center

NATIVE FORBS **Square Feet of Coverage: 68,400**

Plugs, Planted 6" On-Center

SMALL SHRUBS **Square Feet of Coverage: 278,280**

Minimum 3-Gallon Container, Planted 4' On-Center

LARGE, DECIDUOUS SHRUBS **Square Feet of Coverage: 278,280**

Minimum 3-Gallon Container, Planted 8' On-Center

ORNAMENTAL TREES **Square Feet of Coverage: 278,280**

5-6' Tall, Planted at 15' On-Center

SHADE TREES **Square Feet of Coverage: 278,280**

Minimum 2" Caliper, Planted at 15' On-Center

QUANTITIES FOR COST ESTIMATING

Typology 4: Screen Plantings

Approximate Total Square Feet: 378,500

SLOPE STABILIZATION SEED MIX **Square Feet of Coverage: 378,500**

Coverage applied at a rate of 60 PLS (Pure Live Seed) pounds per acre

LARGE, DECIDUOUS SHRUBS **Square Feet of Coverage: 23,655**

Minimum 3-Gallon Container, Planted 8' On-Center

ORNAMENTAL TREES **Square Feet of Coverage: 23,655**

5-6' Tall, Planted at 15' On-Center

COLUMNAR TREES **Square Feet of Coverage: 23,655**

Minimum 2" Caliper, Planted at 10' On-Center

SHADE TREES **Square Feet of Coverage: 23,655**

Minimum 2" Caliper, Planted at 15' On-Center

EVERGREEN TREES **Square Feet of Coverage: 189,250**

Minimum 6' Tall, Ball and Burlap Planted at 10' On-Center

QUANTITIES FOR COST ESTIMATING

Typology 5: Interchange Plantings

Approximate Total Square Feet: 1,476,900

***PRAIRIE SEED MIX* Square Feet of Coverage: 1,476,900**

Coverage applied at a rate of 40 PLS (Pure Live Seed) pounds per acre

***NATIVE WILDFLOWER SEED MIX* Square Feet of Coverage: 1,476,900**

Coverage applied at a rate of 5 PLS (Pure Live Seed) pounds per acre

***ORNAMENTAL TREES* Square Feet of Coverage: 492,300**

5-6' Tall, Planted at 15' On-Center

***SHADE TREES* Square Feet of Coverage: 984,600**

Minimum 2" Caliper, Planted at 15' On-Center

Typology 6: Detention Basin Plantings

Approximate Total Square Feet: 437,700

***STORMWATER SEED MIX* Square Feet of Coverage: 291,800**

Coverage applied at a rate of 35 PLS (Pure Live Seed) pounds per acre

***PRAIRIE SEED MIX* Square Feet of Coverage: 145,900**

Coverage applied at a rate of 40 PLS (Pure Live Seed) pounds per acre

***LARGE, DECIDUOUS SHRUBS* Square Feet of Coverage: 145,900**

Minimum 3-Gallon Container, Planted 8' On-Center

***SHADE TREES* Square Feet of Coverage: 145,900**

Minimum 2" Caliper, Planted at 15' On-Center

Revised 02-25-2020: Revised footer note

TYPOLOGY 1: TREE PRESERVATION AREAS

Design Intent

Tree Preservation Areas protect trees that are deemed "significant" to the landscape. The tree preservation areas are included in the final "Do Not Disturb" areas for the project site.

Further details about tree preservation in the I-65/I-70 North Split Project can be referenced from the Section 106 Consultation Process and should correspond with the final "Do Not Disturb" project limits.

Design Concept 'The Nature Reserve'

Protect trees throughout all phases of construction, keeping valued natural elements existing within the city.

Benefits

- Retain visual interest
- Protect environmental health
- Provide erosion control

Tree Values

Trees provide lifelong environmental and aesthetic benefits that improve community quality of life. Trees add value to their surroundings by preserving water and soil quality, removing pollutants from the air, lowering surface and air temperatures and providing habitat for wildlife. While trees are some of our most valuable urban assets, they are vulnerable to environmental conditions.

Tree Protection

Trees have basic needs for survival and growth. Water and soil nutrients must be managed to maintain their health, safety and appearance. If not properly protected, construction activities such as soil compaction, grading, improper root and limb pruning, bark injury, incorrect storage of construction materials and dumping of waste can cause stress and damage to trees. However, in most cases, trees will survive if separated from construction equipment and materials.

Various professionals are involved in protecting trees throughout the construction process, including arborists, landscape architects, engineers, planners and municipal agencies. Protecting trees takes time, money and communication. All phases of construction should include tree protection procedures.

According to the Penn State Extension's *A Guide to Preserving Trees in Development Projects*, Tree preservation occurs during the entire construction process:

Pre-construction

- Tree inventory
- Planning, design, negotiations
- Removals
- Staking of construction footprints under trees—required limb pruning
- Insect control or other care
- Fencing preserved trees

Construction

- Communication and education
- Protection zones
- Required root pruning
- Maintenance of fencing
- Monitoring tree health
- Tree care

Post-Construction

- Communication and education
- Protecting
- Tree care

*Locations for the tree preservation areas can be found in the map on page 41.

TYPOLOGY 2: 10' BUFFER-ZONES

10' Buffer-Zones

The 10' Buffer-Zones are intended to maintain a set-back for plantings so there is no interference between the landscaped areas and roadway functions, as well as providing unobstructed views.

Design Concept 'The Lawn'

The Buffer-Zones provide a uniform edge around all plantings allowing for a "naturalized" look, while keeping a manicured appearance of turf amongst the urban context. This appearance is created through the use of a "low-to-no-mow" seed mix.

Benefits

- Minimizes costs associated with mowing and maintenance
- Creates a safe, open buffer zone along the roadway
- Provides order to naturalized plantings

Why 10' Buffer-Zones?

The buffer zone is located in the areas between the back-of-curb along all local roadways and plantings, between property owner lines and plantings, and between any trails/walks and plantings. Along roadways, this area helps to increase visibility for drivers at road edges and corners. They are flexible-use spaces offering potential driver and pedestrian amenities, such as street trees and sidewalks, that are dependent upon context conditions. Ten feet was determined an appropriate buffer width, however, this width is able to change with the unique context conditions.

SUGGESTED SEED MIX COMPOSITION:

NO-MOW, ECO-LAWN SEED MIX
The mix shall include, but is not limited to, an equal blend of the following species and be applied at a rate of 220 PLS (Pure Live Seed) pounds per acre.

Shoreline Creeping Red Fescue exhibits both salt tolerance and Rapid Blight resistance, as well as excellent heat and drought tolerance.

Class One Creeping Red Fescue thrives in both sun and shade with little to no irrigation and performs well in high heat and under reduced maintenance.

SR3150 Hard Fescue is among the most heat and drought tolerant of all fine fescues and requires minimal water and fertilization in both sun and shade.

Quatro Sheep Fescue is low growing and establishes rapidly from seed, yet it's one of the slowest growing grasses available. It also exhibits excellent drought and heat tolerance.

Carson Chewings Fescue makes a very high quality turf and is the most competitive of the fine fescues helping to crowd out weeds.

Eco-lawn natural appearance on slope.

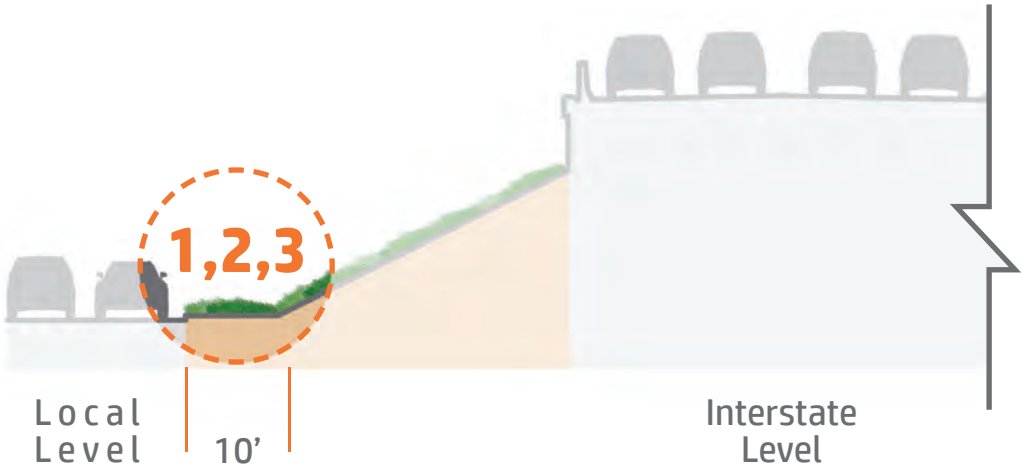
Eco-lawn mown versus natural appearance.

TYPOLOGY 2: 10' BUFFER-ZONES

Standard Condition: Buffer-Zone Lining Local Level Roadway Edges

Potential Condition: Street Tree at Local Level as part of the Buffer-Zone

Potential Condition: Street Tree and Pedestrian Walk at Local Level as part of the Buffer-Zone



Note: The Buffer-Zones also occur in the areas between side slopes and property lines, as well as along the edge of any trails/walks.

10' Mown-Buffer-Zone Scenarios

TYPOLOGY 3: SIDE SLOPE PLANTINGS

Design Intent

Plants, rather than extended infrastructure, can be used for erosion control and soil stabilization along the interstate embankments as a cost-effective and less-infrastructure dependent option.

Design Concept: 'The Uplands'

Species of the upland plant community provide a root system for erosion control measures and adapt to the constructed terrain.

Benefits

- Unifies the east, west and south legs through repetition of plant massing and grouping
- Addresses erosion control concerns with an aesthetic solution
- Minimizes costs associate with mowing and maintenance
- Supports native flora and fauna

SUGGESTED SEED MIX COMPOSITION:

SLOPE STABILIZATION SEED MIX

The seed mix shall include deep-rooted, native species suited for sloped sites and erosion control with the following composition:

Approximately 20% Permanent Grass/ Sedge Species Seed and 80% Temporary Cover Species Seed applied at a rate of approximately 60 PLS (Pure Live Seed) pounds per acre.

This planting application shall be used along the east, west and south interstate leges, in areas where steepness of grade creates erosion control concerns and locations where design can rely on the use of planted slopes rather than built structures for retention of terrain. Tree canopies CANNOT overhang the interstate level roadway.

Side Slope Plantings General Guidelines:

- Plantings (unrelated to seed mixes) should be staggered in mass and placed parallel to contours, dispersing run-off rather than concentrating water flow between plant rows.
- Species with deep and/or wide spreading roots should be incorporated for soil stabilization.
- Broadleaf species should be incorporated to help with impact dispersion of rainfall.
- Protective covering should be used to protect seed from weather and wildlife until maturation - erosion control blankets, vegetated core logs, cover crop, etc.

Cardno Native Plant Nursery
Slope Stabilization Seed Mix

Minnesota Dept. of Transportation
Slope planting - forbs & grasses.

Minnesota Dept. of Transportation
Slope planting - forbs and grasses.

TYPOLOGY 3: SIDE SLOPE PLANTINGS

Suggested Species Summary

The North Split Aesthetic Design Guidelines document provides suggestions for expanded plant palettes, some outside of standard INDOT and KIB plantings, that respond to the design concept of each typology. This is applicable to the suggested mixes and species for all typologies.

SUGGESTED PLANT SPECIES:

Native Grasses
Plugs, Planted 6" On-Center
- Sideoats Grama (*Bouteloua curtipendula*)
- Switchgrass (*Panicum virgatum*)
- Little Bluestem (*Schizachyrium scoparium*)
- Prairie Dropseed (*Sporobolus heterolepis*)

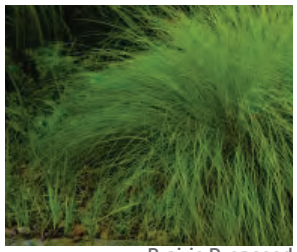
Native Forbs
Plugs, Planted 6" On-Center
- Butterfly Weed (*Asclepias tuberosa*)
- Purple Coneflower (*Echinacea purpurea*)
- New England Aster (*Symphyotrichum novae-angliae*)
- Yellow Coneflower (*Ratibida pinnata*)

Small Evergreen Shrubs
Minimum 3-Gallon Container, Planted 4' On-Center
- Juniper (*Juniperus virginiana* 'Grey Owl')

Small, Deciduous Shrubs
Minimum 3-Gallon Container, Planted 4' On-Center
- Black Chokeberry (*Aronia melanocarpa*)
- New Jersey Tea (*Ceanothus americanus*)
- Virginia Sweetspire (*Itea virginica)*
- Fragrant Sumac (*Rhus aromatica*)


Switchgrass


Little Bluestem


Prairie Dropseed


Asclepias tuberosa


Echinacea Purpurea


New England Aster


Grey Owl Juniper


Chokeberry

TYPOLOGY 3: SIDE SLOPE PLANTINGS

SUGGESTED PLANT SPECIES (continued):

Large, Deciduous Shrubs
Minimum 3-Gallon Container, Planted 8' On-Center

- Winterberry (*Ilex verticillata*)
- Smooth Sumac (*Rhus glabra*)
- Arrowwood Viburnum (*Viburnum dentatum*)

Ornamental Trees
5-6' Tall, Planted at 15' On-Center

- Serviceberry (*Amelanchier x grandiflora*)
- Redbud (*Cercis canadensis*)
- Flowering Dogwood (*Cornus florida*)
- Green Hawthorn (*Crataegus viridis*)

Shade Trees
Minimum 2" Caliper, Planted at 15' On-Center
See "Shade Trees" under *Typology 4: Screen Plantings* section for Appropriate Species


Itea virginica


Fragrant Sumac


Winterberry


Smooth Sumac


Arrowwood Viburnum


Serviceberry

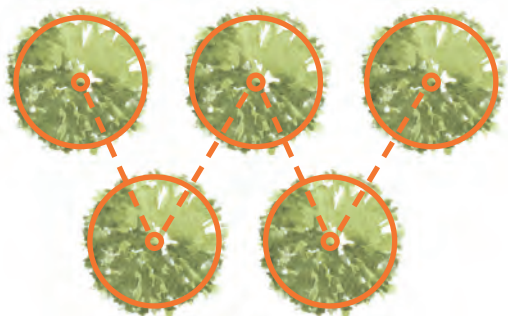

Redbud


Flowering Dogwood

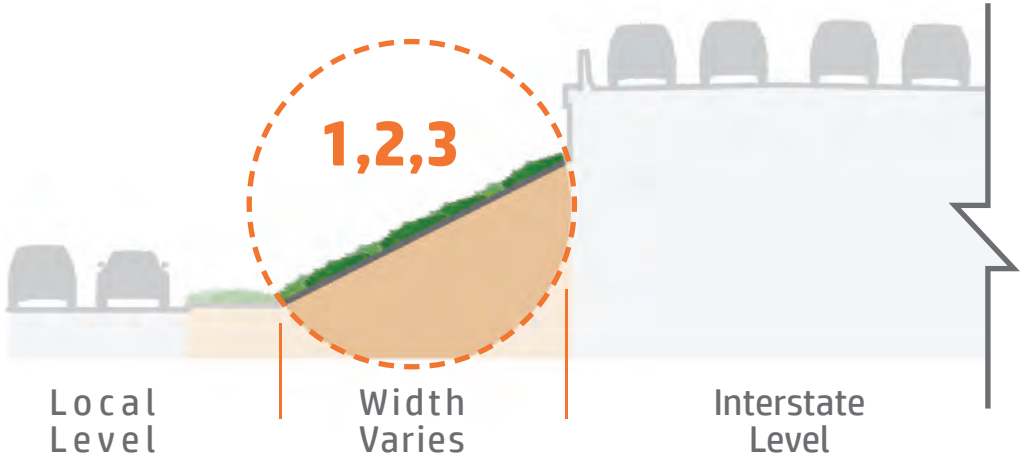

Green Hawthorn

TYPOLOGY 3: SIDE SLOPE PLANTINGS

Deep-rooted, native plants create a fibrous root system for embankment stabilization.



Staggered planting layouts for shrubs & trees assist with erosion control.



Side Slope Plantings Scenarios

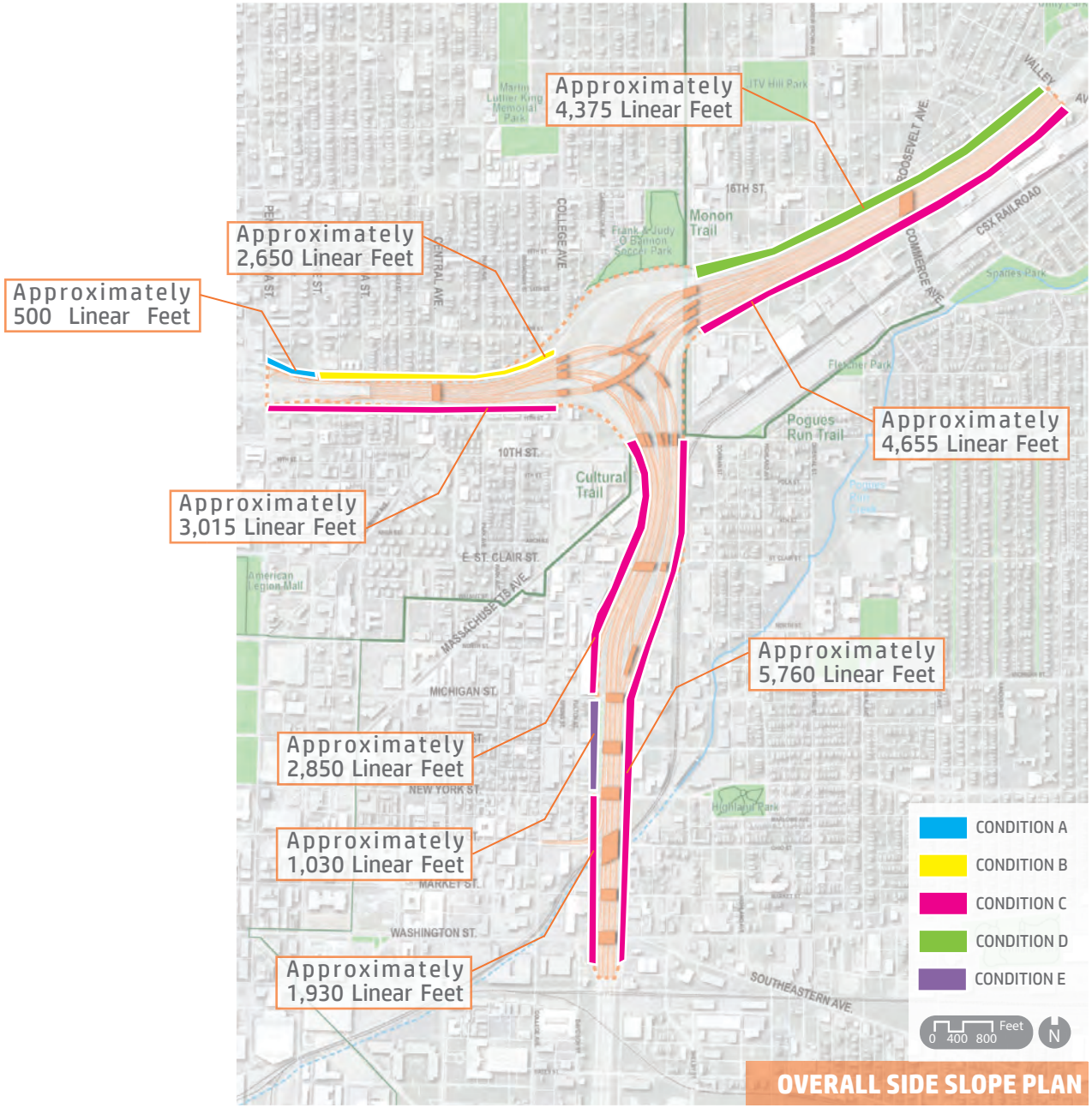
TYPOLOGY 3: SIDE SLOPE PLANTINGS

Interstate Street View Looking North (Approaching I-70 East Leg) of Slope Plantings

TYPOLOGY 3: TYPICAL SIDE SLOPE CONDITIONS

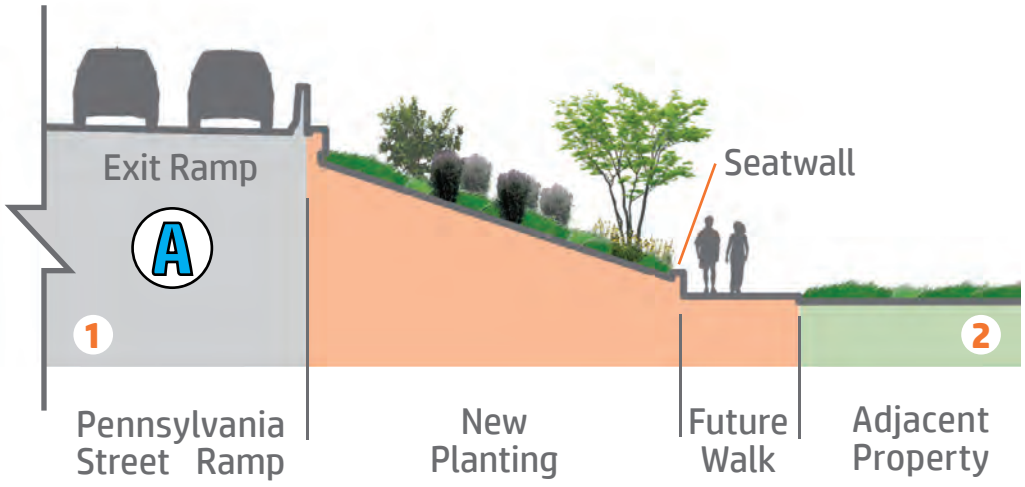
Characteristics of Slopes

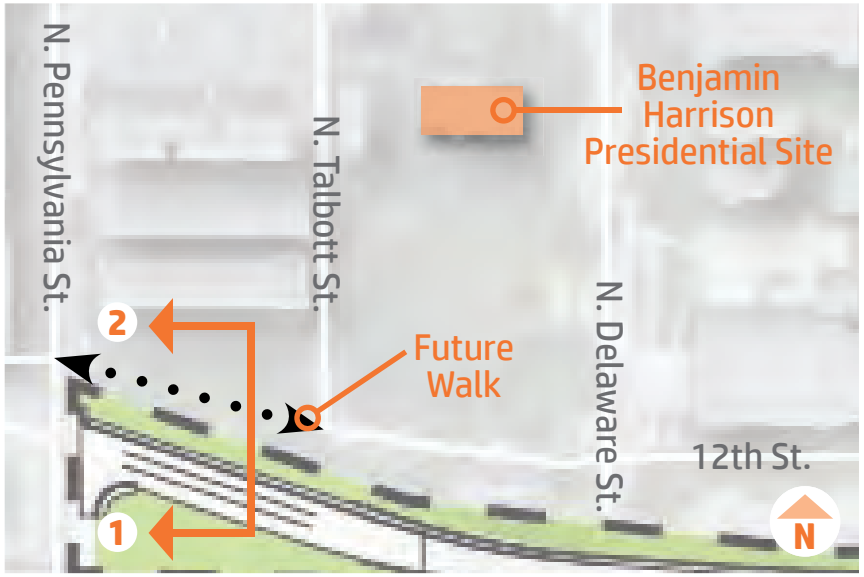
- Integrate landform design, grading, drainage and detention basin configuration with landscaping of interchange
  - Grade embankments to slopes that are safely maintainable and eliminate rip-rap
  - Configure ditches, swales, and detention basins to appear natural



OVERALL SIDE SLOPE PLAN

TYPOLOGY 3, CONDITION A

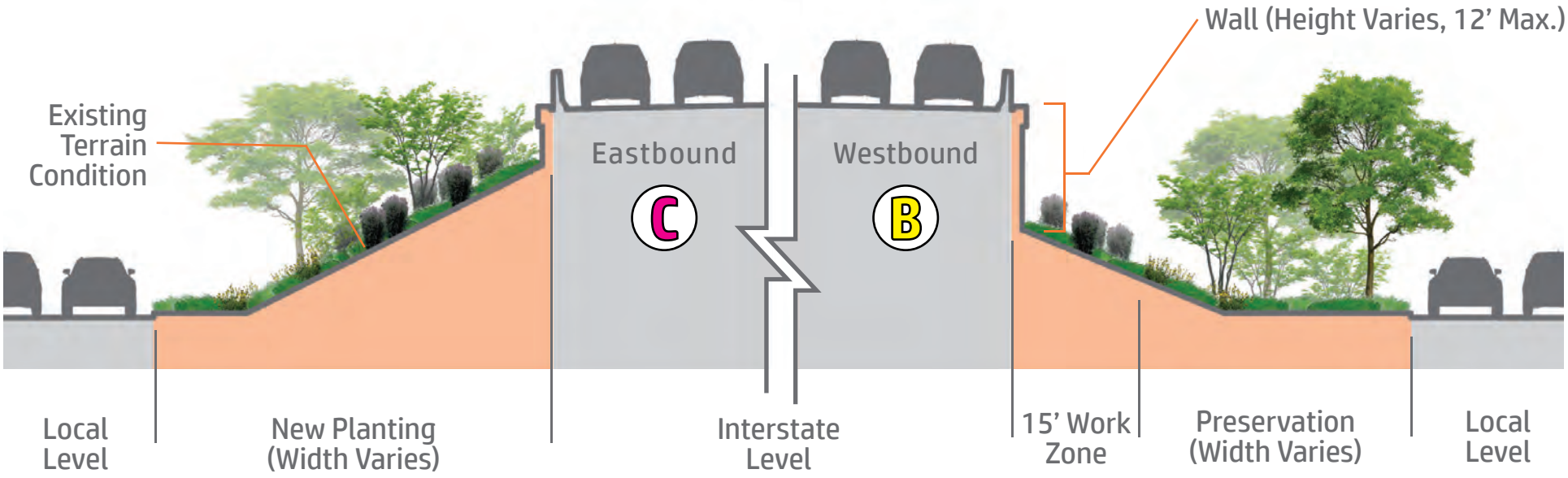


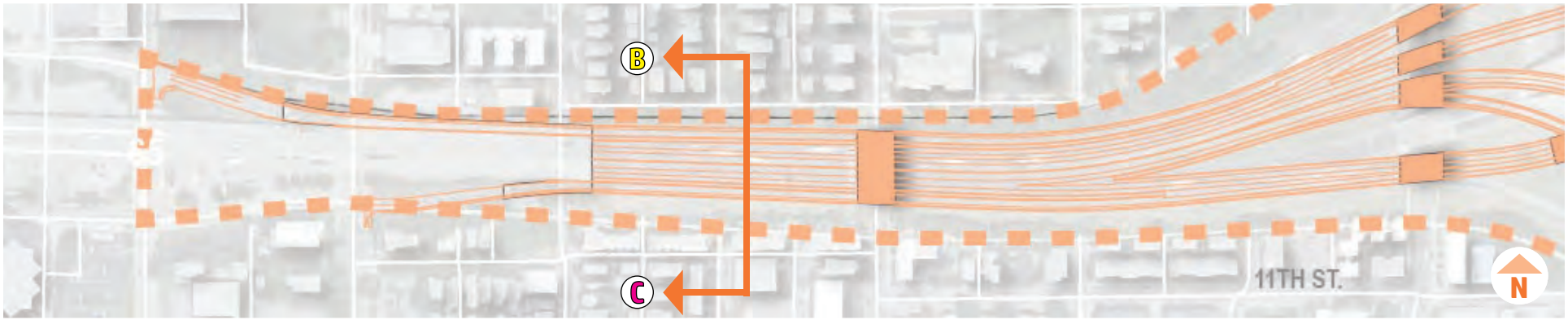


West Leg Pennsylvania Street Ramp Side Slope Conditions (Not to Scale)

*Note: Construction of the future walk will be completed by others, outside of the project Right of Way, and its distance in relation to the seatwall is subject to change.

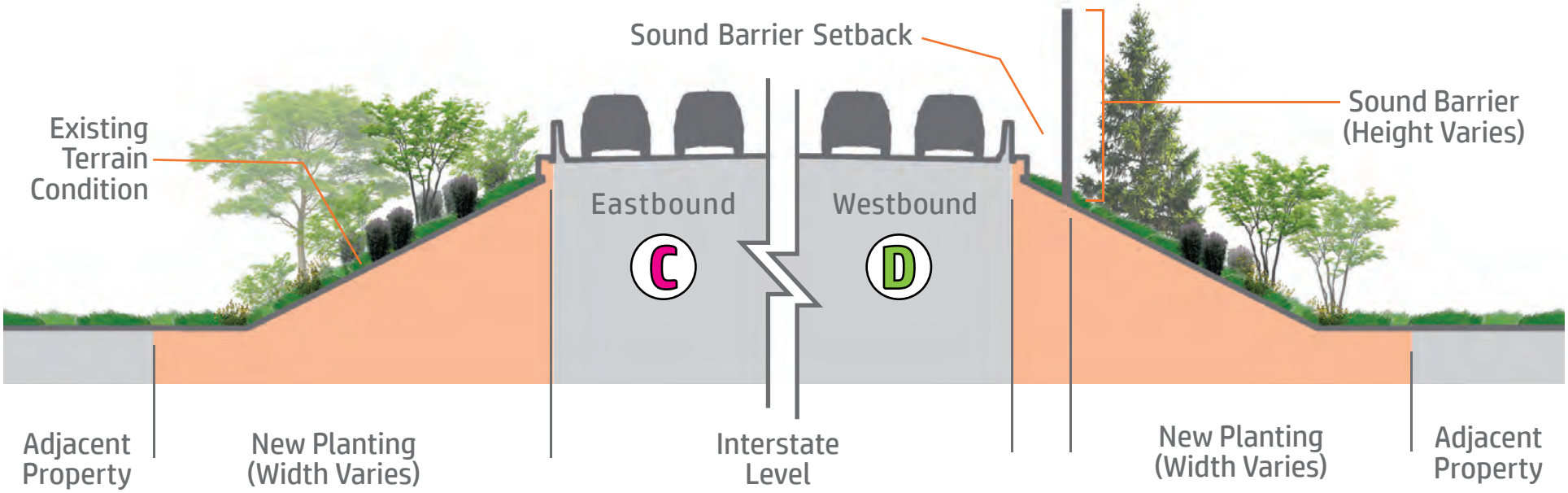
TYPOLOGY 3, CONDITIONS C & B

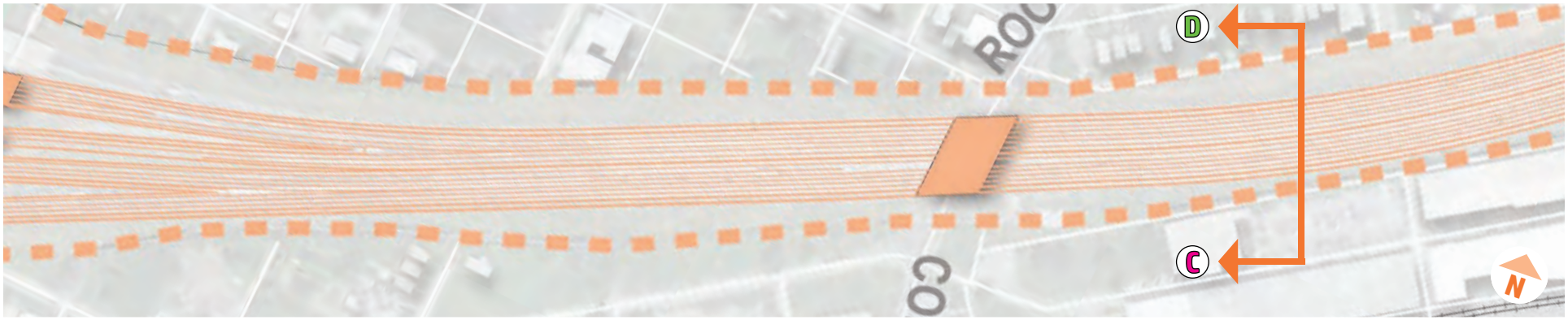




West Leg Slope Conditions (Not to Scale)

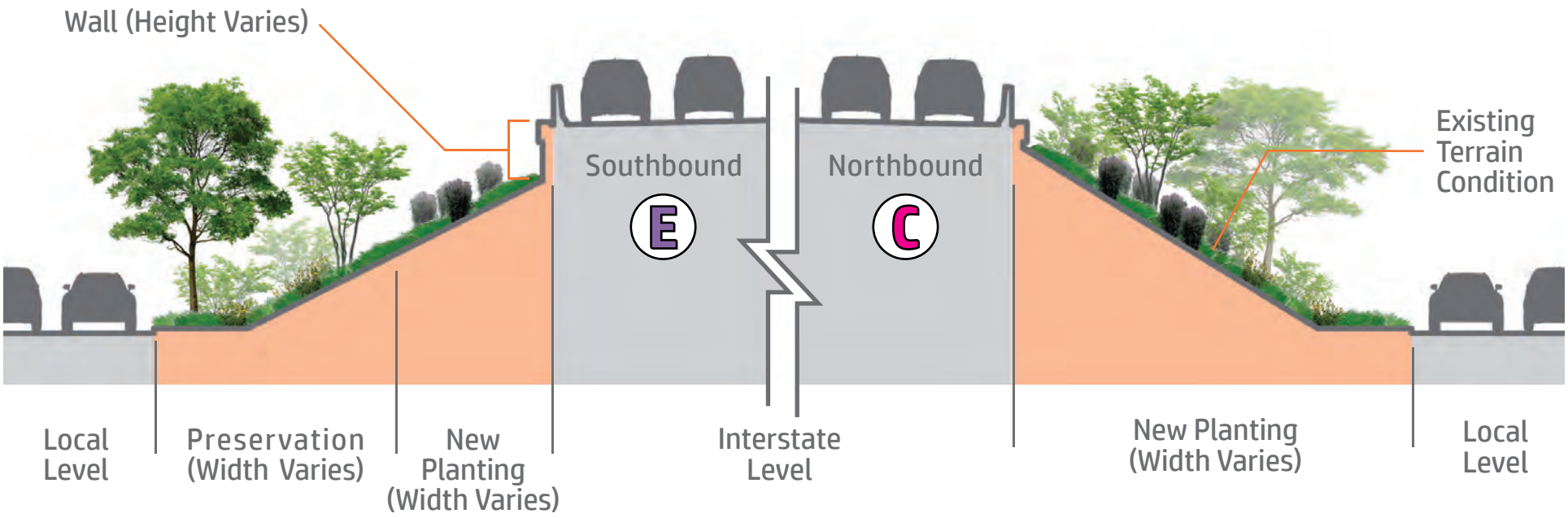
TYPOLOGY 3, CONDITIONS C & D

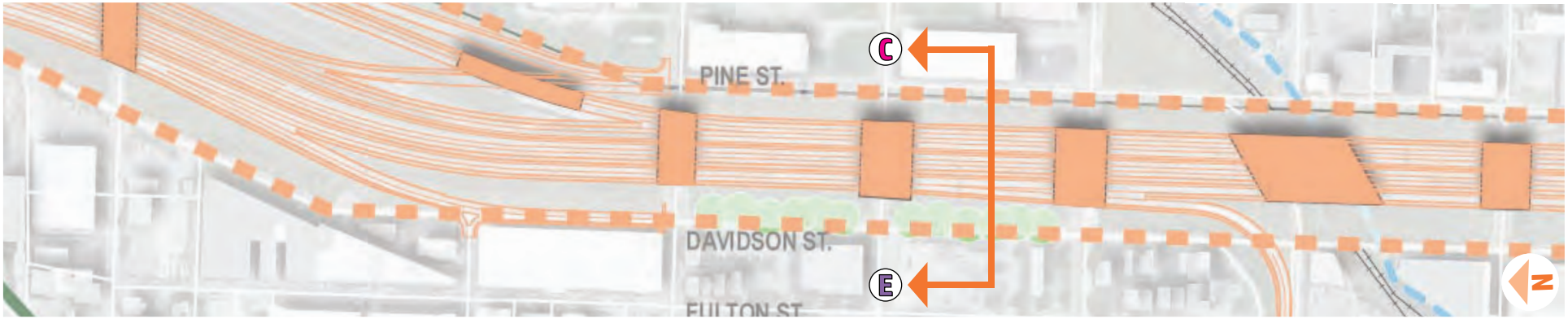




East Leg Slope Conditions (Not to Scale)

TYPOLOGY 3, CONDITION E & C





South Leg Slope Conditions (Not to Scale)

TYPOLOGY 4: SCREEN PLANTINGS

Design Intent

Plants can minimize and soften the appearance of sound barriers.

Design Concept: 'The Woodlands'

The massing of evergreen and deciduous plants at the base of sound barriers can create a natural backdrop that mimics a woodland edge transition, when viewed from adjacent properties.

Benefits:

- Reduces the visual prominence of sound barriers
- Creates a visually interesting buffer and soft edge
- Offers a natural backdrop to neighboring communities

Screen Plantings General Design Guidelines:

- Plantings to screen should be used to mitigate scale between the interstate and neighborhoods.
- Screens need to have a vertical emphasis to provide maximum screening coverage.
- Arrangement should provide pedestrian and vehicular overhead along walks, trails, and roadways - at local street fronts.
- Plantings should include a 2:1 ratio of evergreen to deciduous species, offering year-round screening.
- Species variation is important but may require focus on deciduous varieties that are columnar in form for plants to fit the allotted space.
- Plantings will be placed along side slopes, at the base of sound barriers.

SUGGESTED SPECIES:

Large, Deciduous Shrubs
See "Large, Deciduous Shrubs" under the *Typology 3: Side Slope Plantings* section for Appropriate Species

Ornamental Trees
See "Ornamental Trees" under the *Typology 3: Side Slope Plantings* section for Appropriate Species

Columnar Trees (applicable to narrow locations)
Minimum 2" Caliper, Planted at 15' On-Center

- Sweetgum (*Liquidambar styraciflua* 'Slender Silhouette')
- Pin Oak (*Quercus palustris 'Green Pillar'*)
- Freeman Maple (*Acer x freemanii 'Armstrong'*)
- European Hornbeam (*Carpinus betulus 'Fastigiata'*)


Slender Silhouette Sweetgum


Green Pillar Pin Oak


Freeman Maple


Upright European Hornbeam

TYPOLOGY 4: SCREEN PLANTINGS

SUGGESTED SPECIES (continued):

Shade Trees (applicable along local street front)
Minimum 2" Caliper, Planted at 15' On-Center

- Red Maple (*Acer rubrum*)
- Honey Locust (*Gleditsia triacanthos var. inermis*)
- Red Oak (*Quercus rubra*)
- American Elm (*Ulmus americana* 'Princeton')

Shade Trees Installation Guidelines

- Trees should be placed so that canopies do not overhang the interstate level.
- Trees should be placed to grow together upon maturation.


Red Maple


Red Oak


Honeylocust


American Elm

Evergreen Trees
Minimum 6' Tall, Ball and Burlap Planted at 10' On-Center

- Arborvitae (*Thuja* 'Green Giant')
- Red Cedar (Juniperus virginiana 'Burkii')
- Red Cedar (Juniperus virginiana 'Canaertii')

Evergreen Trees Installation Guidelines

- Trees should be placed so bases do not overhang the buffer-zone.
- Trees should be placed to grow together upon maturation.


Green Giant Arborvitae

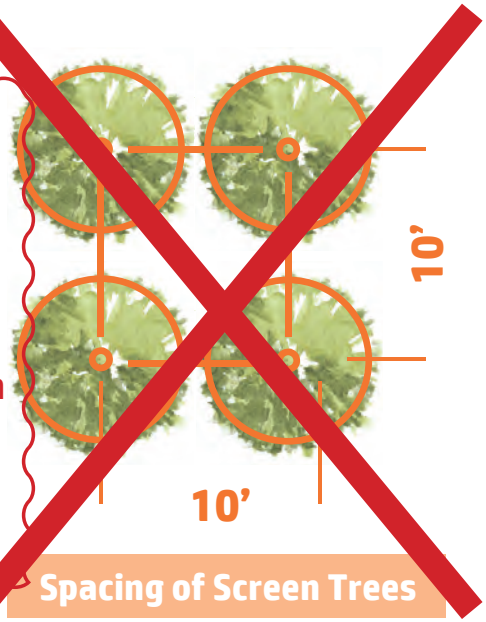

Burkii Eastern Red Cedar


Canaertii Eastern Red Cedar

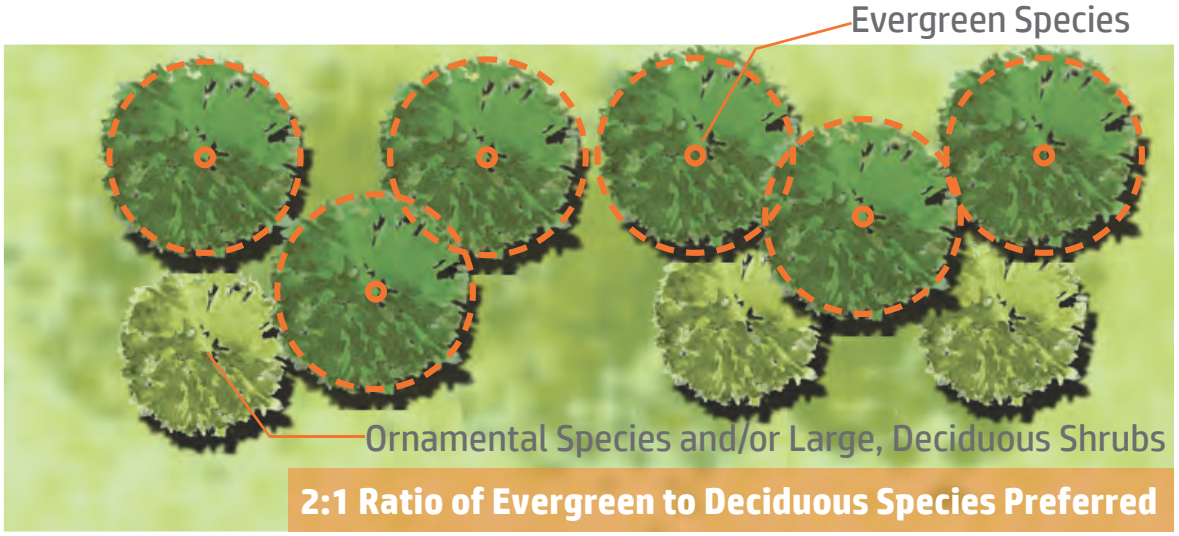
Revised 02-25-2020: Revised spacing text to replace diagram

TYPOLOGY 4: SCREEN PLANTINGS

Spacing between screen tree plantings to be a min. of 10’. Plants should be staggered in placement, as seen in diagram on page 55.

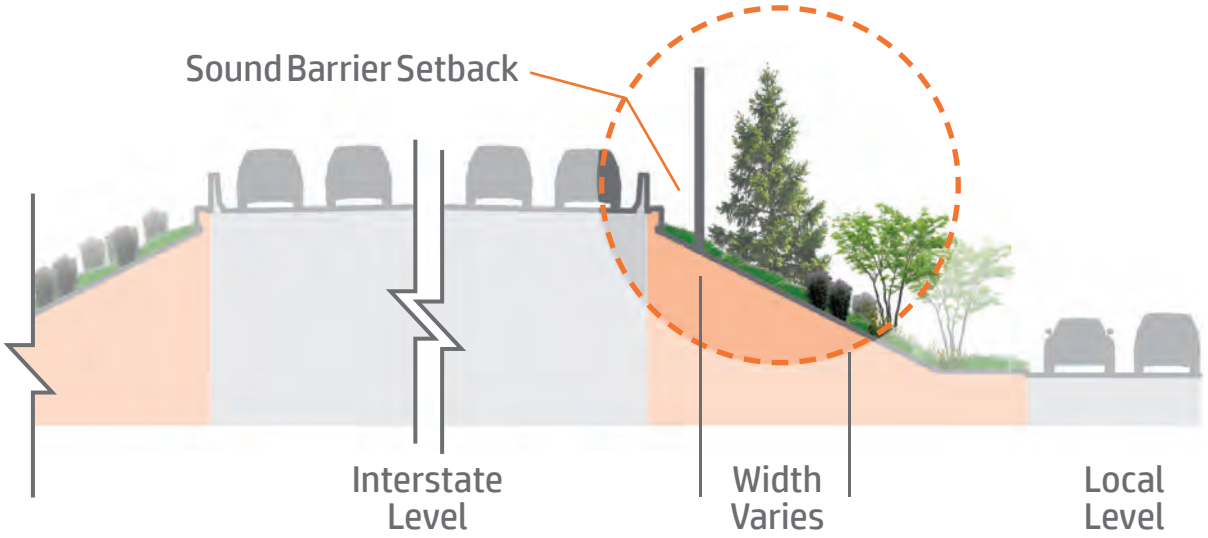


Spacing of Screen Trees



2:1 Ratio of Evergreen to Deciduous Species Preferred

Trees (particularly evergreen species) shall be placed so that they grow together to form a “green wall”. A 2:1 ratio of evergreen to deciduous species is needed in order to achieve this effect as well as a maximum spacing of 10’ on-center. Any location where a sound barrier is implemented, a screen will be used to camouflage and soften the appearance.



Screen Plantings with Sound Barrier

TYPOLOGY 5: INTERCHANGE PLANTINGS

Design Intent

Plants can give purpose to expansive spaces in a manner that is low in cost and required maintenance, but high in visual quality. Over time, the maturation of trees in this area will create a more dense canopy that will begin to take on characteristics of some stakeholder desires to create an "urban forest." This is essentially the heavy massing of trees to create an urban vegetative treatment style.

Design Concept: 'The Prairie's Edge'

The seeding and planting of large, open areas with mixes of native grasses, sedges and forbs, as well as a variety of tree species, responds to the public's desire for a natural-feel landscape juxtaposed against the urban setting.

SUGGESTED SEED MIX COMPOSITION:

PRAIRIE SEED MIX

This planting application shall be used in areas within the interchange.

The mix shall include native prairie grasses, sedges and floweirng species that provide color throughout the growing season and act as food sources for birds, butterflies and insects with the following composition:

Approximately 20% Permanent Grass/Sedge Species Seed, 10% Forb Species Seed and 70% Temporary Cover Species Seed applied at a rate of approximately 40 PLS (Pure Live Seed) pounds per acre.

NATIVE WILDFLOWER SEED MIX

This planting application shall be used to supplement the *Prairie Seed Mix*, offering more color and diversity in blooming species, particularly during prairie establishment.

It shall include quick-blooming, native wildflowers that are beneficial to native bees and pollinators with the following composition:

100% Flowering Forb Species Seed applied at a rate of approximately 5 PLS (Pure Live Seed) pounds per acre.

Seed Mix Installation Guide

- Protective covering shall be used to protect seed from weather and wildlife.
- Installation recommendations from the supplier shall be followed.

Prairie Mix in bloom.

Native Wildflower Seed Mix.

Prairie planting early to late summer.

Prairie planting late summer to early fall.

TYPOLOGY 5: INTERCHANGE PLANTINGS

Benefits

- Softens the road infrastructure with large, plant massing
- Unifies the interchange with the legs in repetition of seed species
- Minimizes costs associated with mowing and maintenance
- Supports native flora and fauna

SUGGESTED SPECIES:

Shade Trees (applicable to the interchange 'urban forest')
Minimum 2" Caliper, Planted at 15' On-Center

- Tulip Tree (*Lirodendron Tulipifera*)
- American Beech (*Fagus grandifolia*)
- Black Gum (*Nyssa sylvatica*)
- American Linden (*Tilia americana*)
- Sugar Maple (*Acer saccharum*)
- Red Maple (*Acer rubrum*)
- Honey Locust (*Gleditsia triacanthos var. inermis*)
- Red Oak (*Quercus rubra*)
- American Elm (*Ulmus americana* 'Princeton')

Ornamental Trees (grouped along the edges of the No-Tree-Buffer-Zones, as shown on the next two pages)
5-6' Tall, Planted at 15' On-Center

- Serviceberry (*Amelanchier x grandiflora*)
- Redbud (*Cercis canadensis*)
- Flowering Dogwood (*Cornus florida*)
- Green Hawthorn (*Crataegus viridis*)

Interchange Tree Installation Guidelines

- Trees should be planted in a grid pattern at a maximum of 15' o.c.
- Trees with messier seeds/fruits are planted further within the interchange.


Tulip Tree

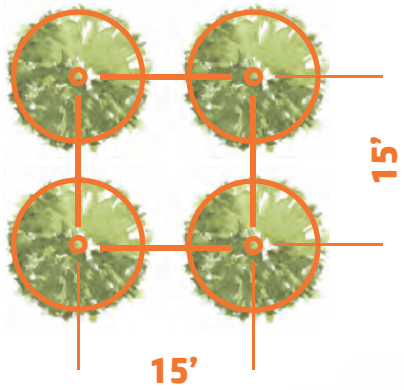

American Beech


Black Gum

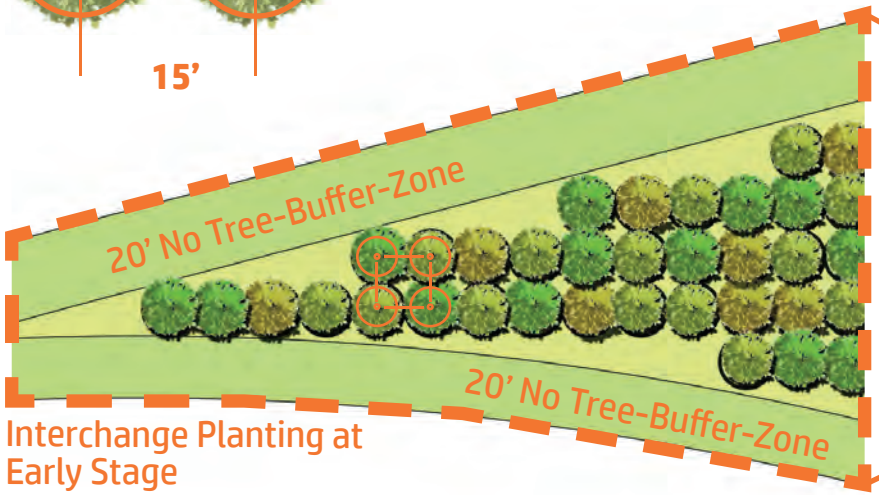

American Linden


Sugar Maple

TYPOLOGY 5: INTERCHANGE PLANTINGS, CANOPY TREES



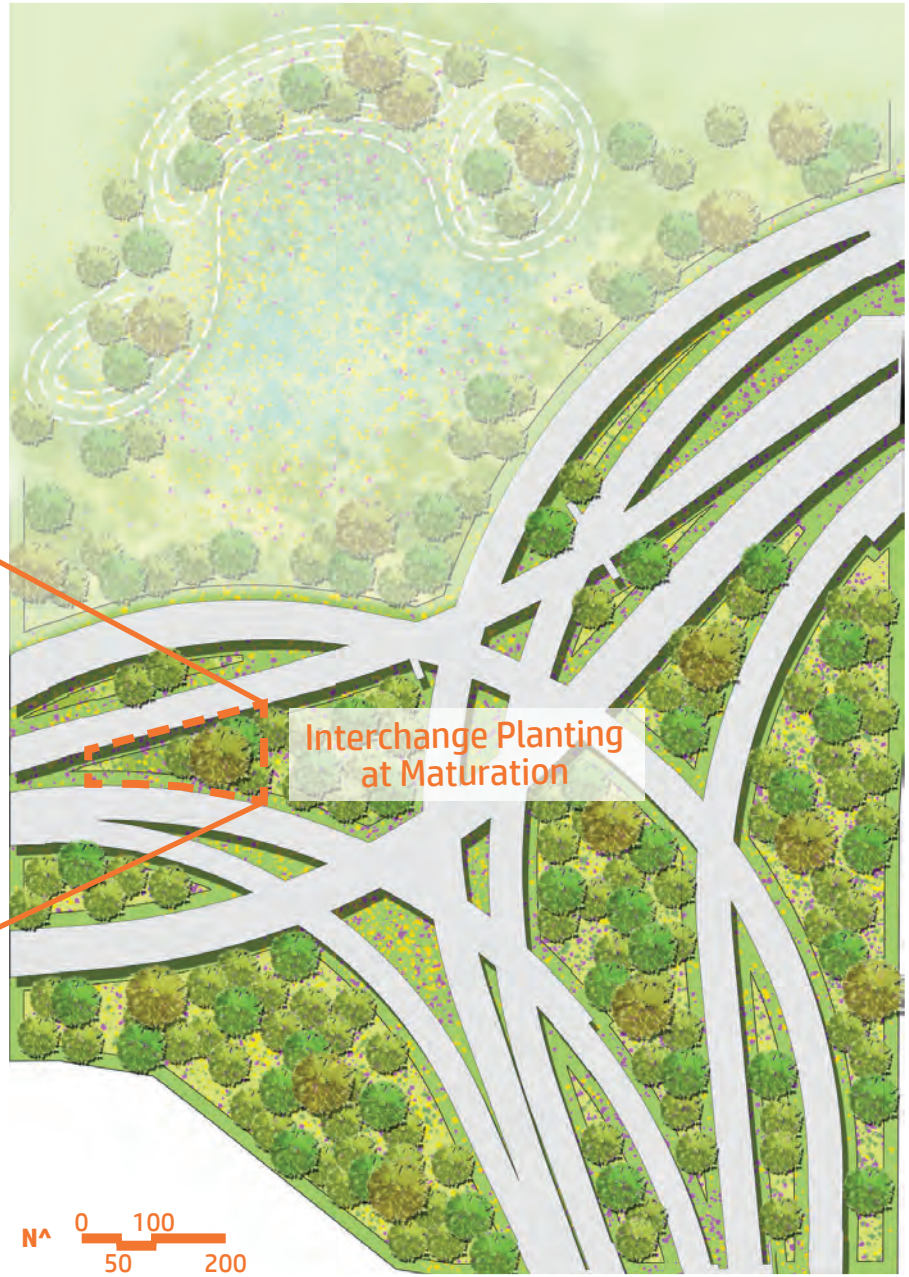
The illustrations to the left and below show the use of a fractured grid pattern for the placement of trees within the interchange.



Interchange Planting at Early Stage

The approach to planting such a space shall be one of restorative quality - planting large quantities in close proximity - where survival of the fittest tree specimen will result in a naturalistic appearance. The interchange planting will follow Keep Indianapolis Beautiful's (KIB) planting standard of 15' on-center maximum spacing.

Canopy Tree Grid Arrangement



TYPOLOGY 5: INTERCHANGE PLANTINGS, CANOPY TREES

The 20' No-Tree-Buffer-Zone within the interchange is a similar concept to *Typology 2: 10' Buffer-Zone* seen along the local roadways. This 20' No-Tree-Buffer Zone (occuring along the edge of all interstate roadways) is a continuation of the chosen seed mixes that extends from the inner portion of the interchange under any interchange bridges. This zone is void of planted trees, and any interior trees shall be planted so that mature canopy widths DO NOT impede the interstate roadway.

Aerial View Looking Towards Downtown of the Interchange Plantings

TYPOLOGY 6: DETENTION BASIN PLANTINGS

Design Intent

A heavily planted area for the purpose of stormwater detention - a dry extended detention basin - is favored over a traditional retention pond for benefits it offers the urban landscape.

Design Concept: 'The Wetlands'

A detention basin to resemble that of a wetland environment will provide more aesthetic value to the site, minimize the amount of standing water and allow even infiltration.

Benefits

- Filtrates pollutants from storm water runoff
- Allows for infiltration of otherwise standing water
- Designed alternative to traditional systems, offering aesthetic value
- Blends "natural" and urban environments
- Supports local flora and fauna

Seed Mix Composition:

STORMWATER SEED MIX

This planting application shall be used within the interchange for vegetated swales and in lieu of a retention pond.

The seed mix must tolerate highly fluctuating water levels and poor water quality associated with urban stormwater runoff with the following composition:

Approximately 10% Permanent Grass/Sedge Species Seed, 5% Forb Species Seed and 85% Temporary Cover Species Seed applied at a rate of approximately 35 PLS (Pure Live Seed) pounds per acre.

PRAIRIE SEED MIX

See *Typology 5: Interchange Plantings* section for Appropriate Seed Mix

The *Prairie Seed Mix* can be incorporated with the *Stormwater Seed Mix* in the upper third of basins that experience long, dry periods.

Detention Basin General Design Guidelines:

- Basin design should conform to regulations set by INDOT and local stormwater ordinances (IDEM Storm Water Quality Manual).
- Construct of basins should allow for the slow infiltration of water, with standing water persisting for no less than 24 hours and no longer than 72.
- Basins should be graded in a way that resembles a natural pond bed, having curvilinear and undulating forms.
- Bio-retention areas should be included at inlets/outlets of basins.
- Basin size should be dictated by the watershed coverage of collected runoff.
- Overall shape and side slopes should follow a 4:1,or flatter, ratio in construct.

Economy Prairie Seed Mix - Yellow Coneflower

Stormwater Seed Mix - Crested Oval Sedge

Naturalized Stormwater Detention Basin

TYPOLOGY 6: DETENTION BASIN PLANTINGS

SUGGESTED SPECIES:

Large, Deciduous Shrubs
Minimum 3-Gallon Container, Planted 8' On-Center

- Sandbar Willow *(Salix interior)*
- Gray Dogwood (*Cornus racemosa*)
- Spicebush *(Lindera benzoin)*
- Elderberry *(Sambucus canadensis)*

Shade Trees
Minimum 2" Caliper, Planted at 15' On-Center

- Bald Cypress (*Taxodium distichum var. distichum*)
- Swamp White Oak *(Quercus bicolor)*
- Black Willow *(Salix nigra)*
- Pin Oak *(Quercus palustris)*


Sandbar Willow


Gray Dogwood


Spicebush


Elderberry

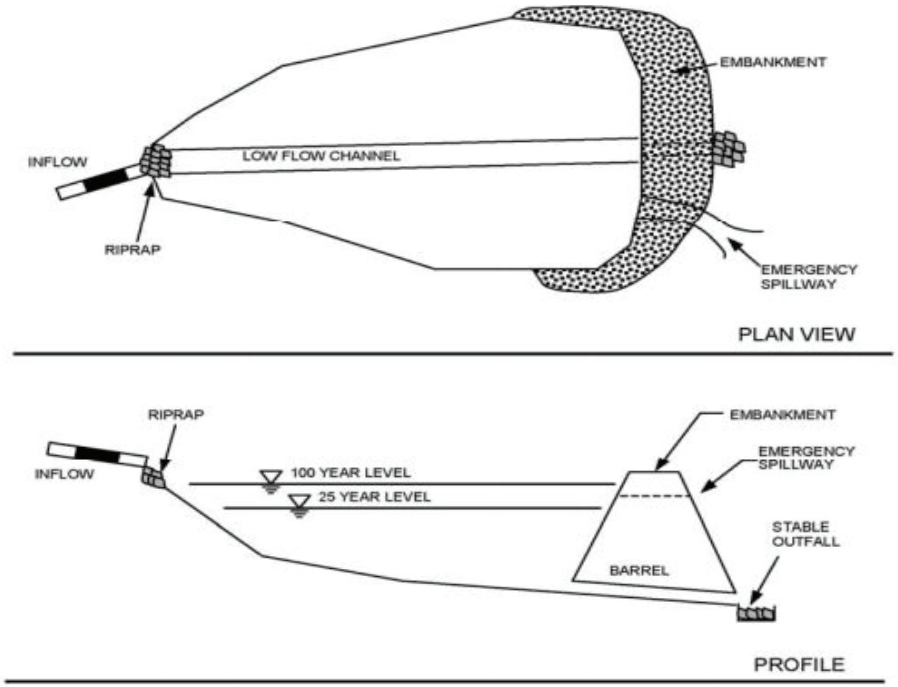

Bald Cypress


Swamp White Oak


Black Willow


Pin Oak

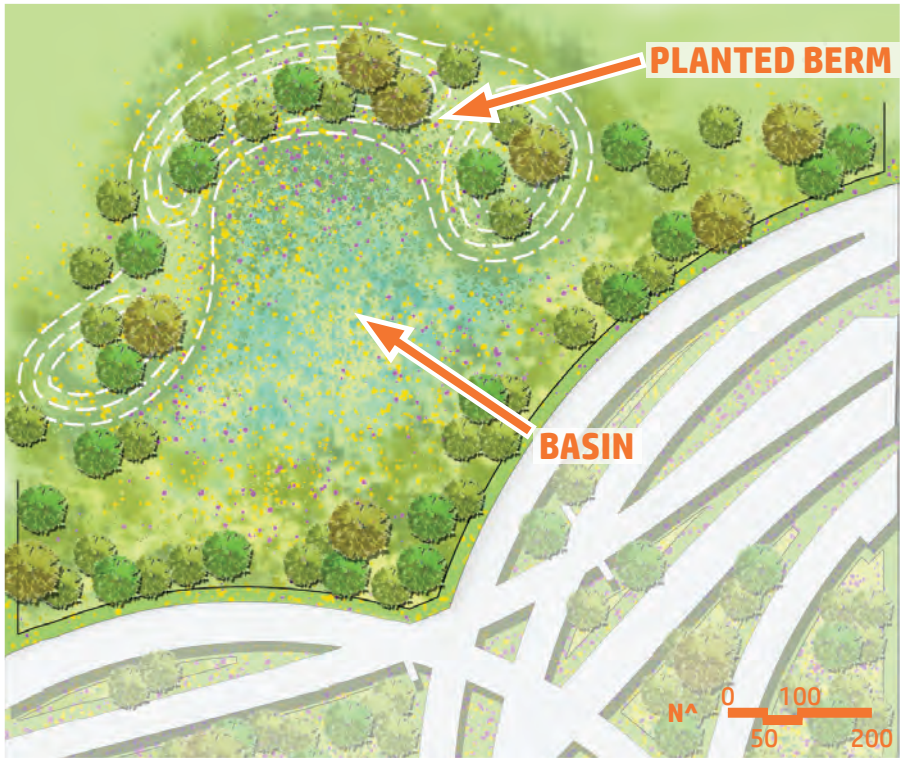
TYPOLOGY 7: DETENTION BASIN PLANTINGS



Source: Georgia Stormwater Managment Manual, 2001

The conceptual details above show an overview of how such a basin would be arranged. The area north of the interchange - space gained through the shrinking footprint of the new design - provides a perfect location for this to occur. A sculpted berm can provide aesthetic and functional value in the separation of the basin from public activities of the Frank & Judy O'Bannon Soccer Park.

Detention Basin Conceptual Design



University of Illinois
Planted Driy-Detention Basin

ATTACHMENT 7-1: Susceptibility Study

Prepare a Susceptibility Study to assess each building, structure, Utility, Utility Service Line, and other receptors with sensitive operations/processes and occupants in the survey area defined below and determine its susceptibility to disruption by vibration-producing Work. "Disruption" includes both cosmetic cracking (threshold damage) and impacts on sensitive equipment and its operation. Categorize the susceptibility of each building to cracking during Work as high, moderate, or low as defined below.

Susceptibility to cracking is the threshold of cosmetic cracking, which is:

- Threshold damage (e.g., opening of old cracks and formation of new plaster cracks, dislodging of loose structural particles such as loose bricks from chimneys)
- Architectural or minor damage that is superficial and does not affect the strength of the structure (e.g., broken windows, loose or fallen plaster, hairline cracks in masonry)

The categories of building susceptibility to vibration are:

- High susceptibility: An identified receptor has high susceptibility if it has already experienced a significant amount of degradation of its primary structural or nonstructural system, and additional vibrations may further degrade these elements and possibly result in injuries to persons in the building. Identified receptors with loose or unstable elements (such as loose bricks or structurally cracked terra-cotta cornices) are in this category.
- Moderate susceptibility: An identified receptor has moderate susceptibility if, although some building deterioration has occurred prior to construction activities, it has not yet experienced a significant degradation of its primary structure or its nonstructural systems that would lead to further building degradation due to construction vibrations. This category includes identified receptors with bricks that may be loose (as determined by visual inspection) and identified receptors with small to moderate quantities of fragile, potentially unstable contents that may be damaged by construction vibrations.
- Low susceptibility: An identified receptor has low susceptibility if it is not expected to experience cosmetic cracking when subject to moderate levels of vibrations (such as those permitted by the U.S. Bureau of Mines, Office of Surface Mining (OSM) vibration criteria) and if its contents will not be damaged by moderate vibration levels.

As part of the Susceptibility Study, determine whether there are sensitive operations or equipment nearby, such as hospitals, computerized industries or banks, and industrial machinery. Include a list of buildings with sensitive equipment or procedures in the Susceptibility Study.

The Susceptibility Study will include the three items listed below, which will be provided to INDOT as part of the Vibration Monitoring and Control Plan.

Anticipated Vibration-producing Activities

Identify locations where moderate to heavy construction activities will occur that are capable of producing vibrations that may cause damage, interference, or annoyance to receptors. Heavy activities include operations such as blasting, pile-driving, dynamic compaction, and percussive demolition. Moderate construction activities include operations such as vibratory compaction and heavy equipment operation. Present locations on a plan sheet or map that shows in-place topography, including nearby structures and buildings.

Potentially Impacted Receptors

Produce a map that includes the potential receptors established. Identify receptors by type of construction, size, material, address (if applicable), and owner. Identify all receptors in the survey area and categorize them as high, medium, or low susceptibility. The survey area is defined as the area including:

- All buildings and structures within a distance at which vibrations of 0.1 inch per second or greater will occur from construction activities and/or contributing structures within historic districts or individually listed properties listed in or eligible for the National Register of Historic Places within 140 feet of proposed construction work
- Any building that has sensitive operations or Utility that may be affected by vibration-producing activities

Establish Vibration Limits

Establish safe vibration levels that preclude damage to structures. Use these safe vibration levels as vibration limits for the Contract. Set separate levels for each receptor, if desired, but the limits may not be less stringent than those set forth in the OSM Alternative Blasting Level Criteria (Modified from Figure B1, RI 8507U.S. Bureau of Mines) or Table 1 below. Express the vibration criteria in peak particle velocity with units of inches per second (ips). **Structures within National Register of Historic Places historic districts or historic properties shall not exceed a PPV of 0.20 in/sec.**

Table 1 Peak Particle Velocity (PPV) Vibration Threshold

Structure and Condition	Maximum PPV (in/sec)	
	Transient Sources	Continuous/Frequent Intermittent Sources
Extremely fragile historic buildings, ruins, ancient monuments	0.12	0.08
Fragile buildings (non-engineered timber frame and masonry buildings)	0.20	0.10
Some older buildings	0.50	0.25
Older residential structures	0.50	0.30
New residential structures	1.0	0.50
Modern industrial/commercial buildings	2.0	0.50

ATTACHMENT 7-2: Pre-Construction Survey

Perform a Pre-construction Survey to document the existing condition of each receptor defined in accordance with Section 7.6 (Construction Vibration and Monitoring) prior to beginning any Work that produces perceptible ground vibrations. As part of the survey, complete the following items.

Public Notification

Contact each household, institutional operator, Utility Owner, structure owners, and business establishment identified as receptors in accordance with Section 7.6 (Construction Vibration and Monitoring). Notify each contact via a registered letter at least two weeks prior to the open house. Obtain confirmation of receipt of notification letter. Include the following, at a minimum, in the letter:

- Description of the proposed construction
- Explanation of the potential for producing vibrations
- Steps the Contractor will take to avoid potential damage from those vibrations
- Name and telephone number of a contact person to respond to any questions or concerns
- Description of the pre-construction survey, including probable dates that the survey will be conducted. Provide at least two dates
- Description of Vibration Monitoring Plan
- Invitation to the Open House

Hold an open house to discuss and educate the public about the Pre-construction Survey process prior to commencing surveys. At a minimum, communicate to the audience the information required in the letter. Staff the open house with enough personnel of sufficient expertise to fully answer questions from owners.

Condition Report

Buildings

Document the existing structural and cosmetic condition of each building identified as a receptor. Document conditions with digital photographs, videotape, and engineering sketches of each element of each building, including the following items:

- Interior subgrade and above-grade walls
- Floors
- Ceilings
- Roof
- Visible exterior as viewed from grade level
- Cracks (width, length, quantity)

Identify, in writing, each documented element by its relative location within the building. List the location of each building, the documentation of the existing conditions, and a description of any areas of concern. Include the following in the Building Condition Report:

- Name and address of person(s) contacted and (if known) telephone number

- Date letter was sent
- Location(s) and telephone number(s) of the building(s)

Provide INDOT and the building owner with a copy of the Building Condition Report before commencing vibration-causing activities.

Utilities, Storm Sewers, and Culverts

Document the existing structural and cosmetic condition of Utilities, storm sewers, and culverts identified as receptors. Document conditions with digital photographs, videotape, and engineering sketches of each element, including the following items at a minimum:

- Interior of pipe (cracks, fractures, loose or dislodged concrete liner, etc.)
- Joints (horizontal or vertical deflections or settlement, voids, leaks, etc.)
- Manholes, catch basins, or other appurtenances
- Headwalls

Identify, in writing, each documented element by its relative location along the sewer. List the location of the sewer, the documentation of the existing conditions, and a description of any areas of concern. Include the following in the Sewer Condition Report:

- Name and address of person(s) contacted and (if known) telephone number
- Date letter was sent
- Location(s) of the sewer

Provide INDOT and the sewer owner with a copy of the Sewer Condition Report before commencing activities that could impact a sewer or culvert.

Structures and Pavement

Document the existing structural and cosmetic condition of the structures and pavements (lanes and shoulders) that are deemed receptors. Document conditions with digital photographs or videotape, measurement and engineering sketches of structure or pavement, including the following items at a minimum:

- Cracks (width, length, quantity)
- Joints (separation, alignment)
- Spalling or delamination

List the limits of the pavement area inspected, the documentation of the existing conditions, and a description of any areas of concern. Include the following in the Structures and Pavement Condition Report:

- Name and address of person(s) contacted and (if known) telephone number
- Date letter was sent

ATTACHMENT 7-3: Vibration Monitoring Criteria

Monitor construction-related vibrations with Approved seismographs at the three most critical receptors within 140 feet of vibration-causing activities. In addition, monitor any vibration receptor within 300 feet identified as having high susceptibility. Monitor vibrations continuously during vibration-producing events. If the vibration level of any of the three components of the peak particle velocity exceeds the vibration limit, immediately cease the vibration-producing activity. Do not resume the vibration-producing activity until given written permission to do so by INDOT.

Maintain records of all vibration-producing activities for which vibration monitoring is required, including:

- Location of the vibration-producing event
- Distance from the event to the monitoring Site(s)
- Maximum peak particle velocity

Immediately notify INDOT and receptor owner when a violation of the vibration limits occurs. Stop the activity that produced the violation until permission to proceed is given in writing by INDOT. Immediately submit a report to INDOT that explains the conditions of the violation and the steps to be taken to reduce the vibrations to below the vibration limit. Based on this report, INDOT will decide if permission to proceed with the construction activity will be granted.

In accordance with the project's monitoring plan, the Design-Build Contractor shall mark existing cracks in such a way that future observations would clearly indicate whether cracks remained unchanged, opened, closed, or propagated. The Design-Build Contractor shall monitor and log all cracks and crack monitoring devices daily and immediately notify INDOT of any observed change. It is recommended, but not required, to have and record meteorological data for the proximity to the project. Cracks that can be documented during the project to respond to changes in meteorological conditions will not require additional explanation in the final report.

Monitoring Equipment

Supply a suitable number of seismographs to cover monitoring requirements described above. Use seismographs capable of measuring, recording, and producing a printed paper version of the frequency and peak particle velocity in each of three mutually perpendicular axes. Equipment must also be capable of recording vibrations as a histogram, a peak reading over a selected period of time. The instruments must have an appropriate sampling rate and velocity range to measure vibration levels generally found in construction activities. Each vibration instrument must have current calibration documentation, which must remain current during the course of monitoring. Obtain INDOT Approval of all vibration monitoring equipment prior to usage on the Project.

Vibration Damage Arbitration

INDOT's Acceptance of the Vibration Monitoring and Control Plan does not guarantee that damage will not be caused by construction activities, nor does it relieve the Contractor from responsibility should damage occur. The Vibration Monitoring and Control Plan do not preclude receptor owners from claiming damage.

If a receptor owner claims vibration damage anytime up to one year after Substantial Completion and the Contractor does not agree with those claims, schedule and attend an arbitration hearing with the receptor

owner (subject to the receptor owner's agreement to use arbitration). The cost of the arbitrator will be borne by the Contractor. Advise the receptor owner, in writing, of the availability of the arbitration option, and that the Contractor will pay the arbitrator. Also advise the receptor owner that the Contractor cannot provide legal advice to the receptor owner, that the receptor owner should consider obtaining legal counsel, and that the receptor owner will be responsible for the costs of its own legal counsel.

Select an arbitrator from the list of arbitrators provided by the American Arbitration Association in accordance with the Association's procedures.

Post-Construction Survey

Conduct post-construction building, structure, Utility, sewer, culvert and pavement condition surveys for all items that received a pre-construction survey. Include in the reports a description of any difference between the pre-construction survey and post-construction survey. Provide the survey report to INDOT and bring to INDOT's attention any occurrence of a receptor that experienced a difference in condition between the pre-construction and the post-construction survey. Post-construction surveys shall, at a minimum, meet the requirements set forth for the pre-construction survey.

Movement-Related Damage to Adjacent Properties

Install instrumentation where necessary to monitor movements of structures, Utilities, and other features within the zone of influence of constructed embankments. For embankments, the zone of influence is defined as a zone extending a minimum horizontal distance (H) from the toe of the embankment, where H is the height of the embankment. For retaining walls, the zone of influence extends from the toe of the footing to a minimum distance of twice the height of the wall.

Include instrument readings in supplemental settlement monitoring reports, as readings become available, including monitoring done during and after construction.

RESPONSIBLE PARTY	COMMITMENT NUMBER	COMMITMENT TEXT	AGENCY_REQUIRING_COMMITMENT	CONTACT FIRST NAME	CONTACT LAST NAME	CONTACT PHONE NUMBER
Design-Build Contractor	1	If the scope of work or permanent or temporary right-of-way amounts change, the INDOT Environmental Services Division (ESD) and the INDOT District Environmental Section will be contacted immediately.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	2	It is the responsibility of the project sponsor to notify school corporations and emergency services at least two weeks prior to any construction that would block or limit access.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	3	Any work in a wetland area within right-of-way or in borrow/waste areas is prohibited unless specifically allowed in the U.S. Army Corps of Engineers permit.	INDOT EWPO	Sandy	Bowman	317-233-5568
Design-Build Contractor	4	To minimize impacts to the state endangered Kirtland's snake, a silt fence shall be installed and maintained around any construction areas where ground disturbance will occur.	IDNR DFW	Christie	Stanifer	317-232-8163
Design-Build Contractor	5	An Indiana Tall Structure permit and FAA permit will be required for the project. James Kinder, Program Manager at the INDOT Office Aviation, shall be cc'd on all coordination with the FAA.	INDOT Aviation	James	Kinder	317-232-1485
Design-Build Contractor	6	If a metal cast iron casing sitting horizontally in the ground or metal cast iron pipes are observed during construction, DNR Division of Oil and Gas shall be called within 24 hours.	IDNR Oil & Gas	Brian	Royer	317-417-6556
Design-Build Contractor	7	The Indianapolis Cultural Trail (except the Payne Connection) shall remain open during construction, and access will not be impacted.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	8	A 90-foot section of Pogue's Run Trail east of the Monon Trail along 10th Street may not be closed more than three months total during construction.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	9	A detour of the Monon Trail will be constructed. The detour will follow the Old Northside Trail for approximately 870 feet, then it will require construction of a temporary trail that will continue west/southwest for approximately 600 feet within the interchange right-of-way and join College Avenue. One lane along the east side of College Avenue that is currently used for parking will be temporarily converted to a bike path. Pedestrians will be able to use the existing sidewalk. Approximately 200 feet north of the intersection of College Avenue and 11th Street, a temporary multiuse path will be constructed within INDOT right-of-way east of College Avenue to connect to 10th Street and the Cultural Trail. The entire detour route will be constructed within existing INDOT or City right-of-way and will be compliant with the Americans with Disabilities Act (ADA) Either the Monon Trail or the constructed detour must be open to trail users at all times.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	10	The portions of the trail from the Monon Trail to College Avenue and south along College Avenue will remain a permanent feature, pending a maintenance agreement from the City.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	11	A trail node will be constructed at the intersection of the Monon Trail and the detour trail. The trail node will be constructed in accordance with the Indy Greenways Design Standards.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	12	Construction work within the Frank and Judy O'Bannon Old Northside Soccer Park is limited to the reconstruction of the Old Northside Trail for the Monon Trail detour and permanent trail. No other construction or staging activities will occur in the Park.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	13	If closure of both the Monon Trail and the prescribed pedestrian/bicyclist detour are required, the design-build contractor shall provide a short-term temporary detour for bicyclists and pedestrians of no more than three consecutive days. A short-term detour can only be used two times per year and must have written approval from INDOT and the City of Indianapolis.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	14	The public art sculptures and signs that are currently located along the Payne Connection will be reinstalled once the interstate bridges have been constructed.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	15	The project elements shall be designed in accordance with the North Split Aesthetic Design Guidelines.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	16	A tree and vegetation planting plan shall be developed in accordance with the North Split Aesthetic Design Guidelines.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	17	Reconstructed bridges over local streets shall be built with a span equal to; or greater than the existing span. Minimum local street requirements are listed in Table 1 in Section J - Environmental Commitments section of the EA.	INDOT ES	Ron	Bales	317-234-4916
INDOT	18	INDOT will develop and implement a Traffic Incident Management Plan in cooperation with law enforcement and emergency responders from throughout the region.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	19	Eliminating the Meridian/Delaware Street entrance ramp to southbound I-65 and the C-D road will create a partial interchange, which is typically avoided by FHWA since some motorists are unable to reenter at the same location. To address these concerns, wayfinding signage will be provided to indicate alternative routes to enter I-65.	INDOT ES	Ron	Bales	317-234-4916
Design-Build Contractor	20	The concentration of naphthalene discovered at the surface sample from temporary monitoring well DB-1 was detected at a level above the IDEM RCG SLs that requires notification of presence, but does not appear to warrant further special handling, if localized. Verification of soil conditions in the vicinity of these locations shall be implemented during excavation activities. A competent person shall screen the soil while working in the area. Communication of the conditions, dust control, field screening, soil management, and sample collection may be required to protect workers and ensure proper handling, based on the competent person's assessment while working in this area.	INDOT SAM	Marlene	Mathas	317-232-5113

Design-Build Contractor	21	Mercury and lead containing surface soil in the immediate vicinity of temporary monitoring well GP-19 was discovered in concentrations that exceed the IDEM RCG SLs. The concentrations identified were high enough that if the area is to be disturbed, then additional provisions, including soil sampling to delineate the extent of the elevated concentrations of mercury, will need to be implemented. The removal and disposal of the soil will need to be defined and sampled to characterize the nature and extent of the concentrations within the constraints of the roadway construction activities to be completed in that location. This data will be required to determine the requirements for proper handling and disposal of the soil.	INDOT SAM	Marlene	Mathas	317-232-5113
Design-Build Contractor	22	Concentrations of lead were identified at multiple locations that exceeded 100 mg/kg, which is not above the IDEM RCG SLs; however, it is above the RCRA Toxicity Characteristic Leaching Procedure (TCLP) 20X rule. These temporary well locations DB-1, DB-8, GP-12, GP-19, and GP-20 identified lead above the criteria stated above. If soil is to be disposed of from the vicinity of these locations, the soil will need to be containerized and sampled for waste disposal parameters (i.e. a minimum of TCLP lead and anything additional that may be required by the selected disposal facility). Based on the limited data collected, the lead concentrations do not appear to limit the excavation and reuse of the soil in these areas. Best practices such as dust control measures, etc., shall be implemented to minimize the potential of exposure to surface lead concentrations during construction activities.	INDOT SAM	Marlene	Mathas	317-232-5113
Design-Build Contractor	23	There was an elevated detection of cadmium in soil from temporary monitoring well DB-6 (78-80 feet-bgs). Based on the depth of this exceedance, it is unlikely to be unearthed and become a concern; however, if soil from this depth is encountered, the provisions (from commitment No. 23 above) shall be implemented.	INDOT SAM	Marlene	Mathas	317-232-5113
Design-Build Contractor	24	Several properties with environmental concerns were identified with elevated chlorinated solvent concentrations in groundwater in the RFI/IDEM VFC review. The residual concentrations, based on data reviewed on the IDEM VFC, are relatively low level, but groundwater in this area will require containerization and proper handling, if encountered. Therefore, provisions for the management of this material will need to be implemented if saturated soil or groundwater (dewatering) will be brought to the surface during construction activities in this area. BMPs shall be implemented for dewatering activities in this area. Communication of the conditions, containment of the liquids, controls to prevent runoff of extracted groundwater onto the surface, and sample collection at a minimum may be required to protect workers and ensure proper handling.	INDOT SAM	Marlene	Mathas	317-232-5113
Design-Build Contractor	25	The limited scope of the subsurface investigation that was conducted for this project does not account for all potential exposure pathways to workers nor to all contaminants. When a concern or change in condition is observed during any activity, a stop work and assessment of the situation shall be implemented to protect against exposure or mishandling of contaminated materials. This shall be in accordance with the Hazardous Materials Management Plan (HMMP) as described in Section 7.3.2 of the Technical Provisions.	INDOT SAM	Marlene	Mathas	317-232-5113
Design-Build Contractor	26	Personnel who may be exposed to hazardous substances are required to be Hazardous Waste Operations and Emergency Response (HAZWOPER 29 CFR 1920.120) trained; if they meet any of the following conditions: (1) Engaged in clean-up operations at an uncontrolled waste site (forced or voluntary), (2) Implementing corrective actions covered by RCRA, (3) Perform operations involving hazardous waste which are conducted at treatment, storage and disposal facilities, and (4) Emergency response operations for releases of, or substantial threats of release of, hazardous substances.	INDOT SAM	Marlene	Mathas	317-232-5113
Design-Build Contractor	27	If groundwater monitoring wells are encountered in the project area, they shall be maintained in place if feasible. If they cannot be maintained, the contractor must contact the INDOT Project Manager who shall notify the INDOT Permits Group. The INDOT Permits Group shall notify the permit holder that the well must be removed prior to construction. The permit holder is responsible for coordination with IDEM and the INDOT Permits Group for replacement or relocation of the well. If a property owner cannot be found in connection with the monitoring well, then well abandonment shall be included in the project contract. All well abandonment activities must be completed by an Indiana Licensed Well Driller in accordance with IAC 312-13-10. Regardless of whether the well is abandoned by the contractor or the property owner, a record of well abandonment, including the well driller's license number, must be provided to the INDOT Project Manager once the well has been abandoned.	INDOT SAM	Marlene	Mathas	317-232-5113
Design-Build Contractor	28	The portions of archaeology site 12-Ma-1062 that lie outside the proposed project area should be clearly marked so that they are avoided by all ground-disturbing project activities. If avoidance is not feasible, then a plan for subsurface archaeological investigations must be submitted to the DHPA for review and comment. Any further archaeological investigations must be done in accordance with the "Secretary of the Interior's Standards and guidelines for Archaeology and Historic Preservation."	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	29	Adjacent to the Old Northside Historic District and Morris Butler House, a Do Not Disturb Area will be identified along the north side of I-65 from College Avenue to Alabama Street in order to preserve existing trees. The design-build contractor will only be allowed to install new drainage connections (to existing pipes) in this area. No clearing of trees 2-inch diameter at breast height (DBH) or greater is allowed in the Do Not Disturb Area. The design-build contractor will have 15 feet north of the retaining wall to work; everything north of that will be a Do Not Disturb Area. Trees shall be preserved in this Do Not Disturb Area. This will result in a slightly taller retaining wall in order to tie back down to the existing slope, but greater shielding will be provided with existing vegetation.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	30	Shrubs will be planted in the 15-foot disturbed area along the north side of I-65 from College Avenue to Alabama Street between the retaining wall and Do Not Disturb Area in accordance with the North Split Aesthetic Design Guidelines.	INDOT CRO	Anuradha	Kumar	317-234-5168

Design-Build Contractor	31	Shrubs shall be planted on the side of the slope sout of I-65 between Alabama Street and College Avenue in accordance with the North Split Aesthetic Design Guideline. Trees shall be installed along the toe of the slope space where space permits.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	32	Adjacent to the Saint Joseph Neighborhood Historic District and Chatham-Arch Historic District, shrubs will be planted on the side slope south of I-65 between Alabama Street and College Avenue. Trees will be planted along the toe of slope if space allows.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	33	The northern earthen berm in the interchange, where pavement shall be removed, shall be maintained and trees planted on it as visual shielding for the Old Northside Historic District from the interchange in accordance with the North Split Aesthetic Design Guidelines.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	34	The southwestern earthen berm in the interchange, where pavement shall be removed, shall be maintained and trees planted on it as visual shielding for the Chatham-Arch Historic District from the interchange in accordance with the North Split Aesthetic Design Guidelines.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	35	If existing vegetation is removed during construction, new trees shall be planted along the western side slope of I-65/I-70 south of the interchange from 10th Street south to St. Clair Street.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	36	Adjacent to the Lockerbie Square Historic District, a Do Not Disturb Area shall be identified along the west side of I-65/I-70 from Michigan Street to New York Street along the toe of slope in order to preserve the existing trees. The design-build contractor shall only be allowed to install new drainage connections (to existing pipes) in this area. No clearing of trees 2-inch dbh or greater is allowed in the Do Not Disturb Area. This will result in a short retaining wall in order to tie back down to the existing slope, but greater shielding will be provided with existing vegetation.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	37	Planted trees shall be 2-inch dbh in size or greater.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	38	To improve connectivity between the Old Northside and Saint Joseph Neighborhood Historic Districts, improvements will be made to the Alabama Street underpass. Improvements include new lighting on the bridge and signage along Alabama Street identifying each neighborhood in accordance with the North Split Aesthetic Design Guidelines.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	39	To improve connectivity between the Old Northside and Saint Joseph Neighborhood Historic Districts, improvements will be made to the Central Avenue underpass. Improvements include a wider bridge opening (65 feet to at least 76 feet), wider sidewalks, new lighting on the bridge, vertical bridge walls, elimination of drainage from the bridge above onto the street and sidewalks, and space for murals in accordance with the North Split Aesthetic Design Guidelines.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	40	To improve connectivity between the Old Northside and Chatham-Arch Historic Districts, improvements will be made to the College Avenue underpass. Improvements include wider bridge openings (79 feet to at least 87 feet), wider sidewalks, new lighting on the bridge, vertical bridge walls, elimination of drainage onto the street and sidewalks, and space for murals in accordance with the North Split Aesthetic Design Guidelines.	INDOT CRO	Anuradha	Kumar	317-234-5168
INDOT	41	INDOT shall provide funding for a portion of and possible right-of-way use for the Old Northside Connector, a pedestrian and bicycle path to connect the alley south of the Benjamin Harrison Presidential Site to Pennsylvania Street. This item is contingent upon a maintenance agreement with the Benjamin Harrison Presidential Site to maintain the Connector. The Old Northside Connector would not be open to vehicular traffic.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	42	A temporary detour will be required for the Monon Trail during construction. The detour shall be 12-feet wide and compliant with the Americans with Disabilities Act (ADA). The detour shall reconstruct a portion of the Old Northside Trail in the O'Bannon Soccer Park and divert onto INDOT property before connecting to College Avenue. The trail shall pass under College Avenue and divert to the southeast on INDOT property to connect to existing sidewalk across 10th Street from the Cultural Trail. The portion of the detour within the O'Bannon Soccer Park, within INDOT right-of-way west to College and under the College Avenue bridges will remain as a permanent feature to improve connectivity between the Old Northside and Chatham-Arch Historic Districts.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	43	Construction vehicles and equipment shall not use the brick portion of 10th Street from Delaware Street to Central Avenue.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	44	To protect the brick portion of 10th Street, "No Construction Traffic" and "Local Traffic Only" signs shall be installed at the entrance to the brick portion of 10th Street from Delaware Street to Central Avenue.	INDOT CRO	Anuradha	Kumar	317-234-5168
INDOT	45	INDOT will complete an oral history initiative, which will focus on: the history of the historic neighborhoods in the area surrounding the North Split, planning and construction of the interstate, impacts resulting from the construction of the interstate, and revitalization efforts.	INDOT CRO	Anuradha	Kumar	317-234-5168
INDOT	46	The collected oral histories may be used to develop a documentary film, podcast, website, or other publicly accessible format.	INDOT CRO	Anuradha	Kumar	317-234-5168
INDOT	47	INDOT will develop a traveling exhibit that will be available for use by local schools, libraries, non-profit organizations, and other public venues to highlight the history of the neighborhoods before and after the construction of the interstate. The exhibit will include mapping and photographs and will explore the social, cultural, and architectural history of the area. The exhibit could also include a history of transportation in the area and how the neighborhoods have evolved following construction of the interstate.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	48	The design-build contractor shall develop a Vibration Monitoring and Control Plan. The plan should at least include all buildings within historic properties or districts within 140 feet of project construction activities.	INDOT CRO	Anuradha	Kumar	317-234-5168

Design-Build Contractor	49	The Vibration Monitoring and Control Plan will include the following key elements: i. Identifying buildings that are sensitive to vibration; ii. Conducting pre-construction surveys of residences, historic buildings, and other vibration-sensitive structures in the project corridor to determine the appropriate vibration limits for the type of structure and conditions of the structure; iii. Developing and implementing a vibration monitoring program for construction activities; iv. Conducting post-construction surveys; v. Phasing construction activities that create vibration so that multiple sources of vibration do not occur at the same time; vi. Prohibiting or limiting certain activities that create higher vibration levels during specific nighttime hours; vii. Developing a method for responding to community complaints; and viii. Keeping the public informed of proposed construction schedules, and identifying activities known to be a source of vibration.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	50	Maximum vibration peak particle velocity (PPV) thresholds for historic properties that the Vibration Monitoring and Control Plan must meeting are 0.20 in/sec for fragile structures (non-engineered timber and masonry buildings) and 0.12 in/sec for extremely fragile structures (buildings, ruins, ancient monuments).	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	51	Consulting parties will be provided the Vibration Monitoring and Control Plan for a 30-day review period. The design-build contractor will be required to respond to consulting party comments.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	52	In the event vibration damage does occur, the Design-build Contractor will be responsible for the cost and repair of any vibration damage to historic properties. Any repairs shall be coordinated with the SHPO to ensure they are carried out in accordance with the Secretary of Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings. This will be contingent on property owners allowing pre and post construction surveys of their buildings.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	53	Where access to privately owned property is necessary for vibration monitoring or damage repair, consent shall be obtained prior to entry.	INDOT CRO	Anuradha	Kumar	317-234-5168
Design-Build Contractor	54	If there is additional impervious area over what is currently there, the project must consider the downstream capacity of the existing storm sewer system.	MCSWMD	Kathy	Allen	317-327-8428
Design-Build Contractor	55	The project must comply with the *City of Indianapolis Storm Water Design and Construction Manual* including Chapter 700 for post-construction water quality requirements.	MCSWMD	Kathy	Allen	317-327-8428
Design-Build Contractor	56	The project shall include temporary erosion and sediment control measures during all phases of construction.	MCSWMD	Kathy	Allen	317-327-8428
Design-Build Contractor	57	Native plantings shall be installed within the right-of-way where possible in accordance with the North Split Aesthetic Design Guidelines.	IDNR DFW	Christie	Stanifer	317-232-8163
INDOT	58	Most transportation corridor designers and municipalities are trending toward LED lighting. Certain types of LED lighting can have negative impacts on both human and wildlife health and safety. The Division of Fish and Wildlife strongly encourages visiting the International DarkSky Association's website to learn more about the potential negative impacts of improper impacts of improperly selected LED lighting systems, if required: http://darksky.org/lighting/led-practical-guide/.	IDNR DFW	Christie	Stanifer	317-232-8163
Design-Build Contractor	59	Where a stormwater basin is utlized, the slopes shall be 4:1 or flatter, the basin irregular in shape, and it shall be planted in accordance with the Aesthetic Design Guidelines.	IDNR DFW	Christie	Stanifer	317-232-8163
Design-Build Contractor	60	Avoid the use of concrete and riprap unless required by INDOT standards.	IDNR DFW	Christie	Stanifer	317-232-8163
Design-Build Contractor	61	Consider strategies to reduce diesel emissions, such as project construction/demolition contracts that require the use of equipment with clean diesel engines and the use of clean diesel fuels.	USEPA	Kenneth	Westlake	312-886-2910
Design-Build Contractor	62	Use energy efficient lighting, including the use of solar powered lights when feasible.	USEPA	Kenneth	Westlake	312-886-2910
Design-Build Contractor	63	Incorporate native saplings and shrubs into the landscape plan for the right-of-way, to help reduce noise, and maintain air quality for nearby residences and trail users in accordance with the North Split Aesthetic Design Guidelines.	USEPA	Kenneth	Westlake	312-886-2910
Design-Build Contractor	64	Wetlands M and N shall be avoided by all contstruction activities.	INDOT EWPO	Sandy	Bowman	317-233-5568

MAINLINE ALIGNMENTS

Revision Date: February 6, 2020

	DESIGN ELEMENT	MANUAL SECTION (IDM,English Units,2013)	DESIGN CRITERIA				
DESIGN CONTROLS	**Functional Classification**	40-1.01	Urban Freeway				
	Geometric Design Table	Ch. 53	Fig. 53-1				
	Design Forecast Period	40-2.02	20 Years				
	Design Vehicle	Fig. 40-4A	WB-65				
	Access Control	40-5.0	Full Control				
	Level of Service	40-2.0	Desirable: B Minimum: D				
	Movement Description		I-70 EB/WB	I-65 SB/NB	I-65/I-70 SB/NB	I-65/I-70 NB to I-70 EB	I-65/I-70 NB to I-65 NB
	***Design Speed**	40-3.0	55 mph			***50 mph / 55 mph	***50 mph / 55 mph
	Advisory Speed		N/A	N/A	N/A	45 mph	40 mph
	Posted Speed		55 mph	55 mph	55 mph	55 mph	55 mph
	AADT (2021)		93,737 WB | 100,568 EB	53,313 SB | 51,774 NB	58,288 SB | 62,989 NB	48,680	34,480
	AADT (2041)		99,926 WB | 112,807 EB	54,650 SB | 58,376 NB	64,063 SB | 76,198 NB	57,330	41,090
	DHV (2041)		9493 (WB - AM) + 9927 (EB - PM)	4372 (SB - AM) + 5429 (NB - AM)	5125 (SB - AM) + 6553 (NB - AM)	5733 (PM)	4109 (AM)
	Trucks (% DHV)		12% WB, 13% EB	5% SB, 4% NB	10% SB, 9% NB	13%	3%
	Directional Distribution		47% WB / 53% EB	48% SB / 52% NB	46% SB / 54% NB		
	NHS Designation		Y	Y	Y	Y	Y

* Indicates Level One controlling design criteria. A deviation from such is a design exception, and is subject to approval. See section 40-8.0

** Per IDM 45-1.01 (02) c., when more than 2 travel lanes are sloping in the same direction the third, fourth, etc. lanes will be sloped at 3%.

FREEWAY TO FREEWAY SYSTEM RAMP ALIGNMENTS

Revision Date: February 6, 2020

	DESIGN ELEMENT	MANUAL SECTION (IDM,English Units,2013)	DESIGN CRITERIA								
DESIGN CONTROLS	**Functional Classification**	40-1.01	Urban Freeway								
	Interchange Type	48-2.0	Freeway to Freeway System Interchange								
	Geometric Design Table	Fig. 53-1	Fig. 53-1								
	Design Forecast Period	40-2.02	20 Years								
	Design Vehicle	Fig. 40-4A, Fig 46-1E	WB-65								
	Access Control	40-5.0	Full Control								
	Level of Service	40-2.0	Desirable: B Minimum: D								
	Movement Description		I-70 WB to I-65/I-70 SB			I-65 SB to I-65/I-70 SB	I-70 WB to I-65 NB	I-65 SB to I-70 EB	I-65 SB CD to I-65/I-70 SB	I-70 WB to I-65 SB CD	
	*** Design Speed**	Fig. 53-1	55 mph			***45 mph / 55 mph	55 mph	55 mph	55 mph	50 mph	
	Advisory Speed		45 mph			45 mph	50 mph	45 mph	45 mph	45 mph	
	Posted Speed		55 mph			55 mph	55 mph	55 mph	55 mph	50 mph	
	AADT (2021)		36,289			18,925	31,350	32,125	14,430	26,092	
	AADT (2041)		43,111			19,100	32,513	31,900	23,160	25,100	
	DHV (2041)		3880 (AM)			1528 (PM)	2601 (AM)	2552 (PM)	2316 (AM)	3012 (AM)	
	Trucks (% DHV)		15%			7%	6%	5%	4%	4%	
	NHS Designation		Y			Y	Y	Y	N	N	

* Indicates Level One controlling design criteria. A deviation from such is a design exception, and is subject to approval. See section 40-8.0

** Per IDM 45-1.01 (02) c., when more than 2 travel lanes are sloping in the same direction the third, fourth, etc. lanes will be sloped at 3%.

*** See Attachment 8-1B Design Speed Diagram

RAMP ALIGNMENTS

Revision Date: February 5, 2020

	DESIGN ELEMENT	MANUAL SECTION (IDM,English Units,2013)	DESIGN CRITERIA													
DESIGN CONTROLS	**Functional Classification**	40-1.01	Urban Freeway													
	Interchange Type	48-2.0	Freeway to Freeway System Interchange													
	Geometric Design Table	Chapter 48	Chapter 48													
	Design Forecast Period	40-2.02	20 Years													
	Design Vehicle	Fig. 40-4A, Fig 46-1E	WB-65													
	Access Control	40-5.0	Full Control													
	Level of Service	40-2.0	Desirable: B Minimum: D													
	Movement Description		I-65 NB to 12th St CD		11th St CD to I-70 EB		I-65 SB CD to Michigan St		I-65 SB CD to Ohio St		Michigan St to I-65 NB		Michigan St to I-70 EB		I-65 SB to I-65 SB CD	
	Ramp Type	48-5.03 (03),48-5.03 (05)	Directional		Directional		Directional		Directional		Directional		Directional		Directional	
	***Design Speed**	48-5.01, Fig 48-5A	45 mph	30 mph	45 mph	30 mph	45 mph	30 mph	45 mph	30 mph	45 mph	30 mph	45 mph	30 mph	45 mph	
	Posted Speed		45 mph	30 mph	45 mph	30 mph	45 mph	30 mph	45 mph	30 mph	45 mph	30 mph	45 mph	30 mph	45 mph	
	AADT (2021)		8,777		14,120		15,020		7,353		5,800		7,158		7,850	
	AADT (2041)		9,854		16,420		14,710		7,284		6,267		7,358		8,083	
	DHV (2041)		1281 (AM)		1642 (PM)		1471 (AM)		1384 (AM)		752 (PM)		1398 (PM)		970 (AM)	
	Trucks (% DHV)		2%		7%		2%		1%		2%		1%		3%	
	NHS Designation		N		N		N		N		N		N		N	
Special Features																
The Line "R_CD11th_E70" horizontal alignment shall follow Low-Speed Urban street criteria from the beginning of the alignment to the PI located over Alabama Street per IDM Figure 43-3D.																

* Indicates Level One controlling design criteria. A deviation from such is a design exception, and is subject to approval. See section 40-8.0

** Per IDM 45-1.01 (02) c., when more than 2 travel lanes are sloping in the same direction the third, fourth, etc. lanes will be sloped at 3%.

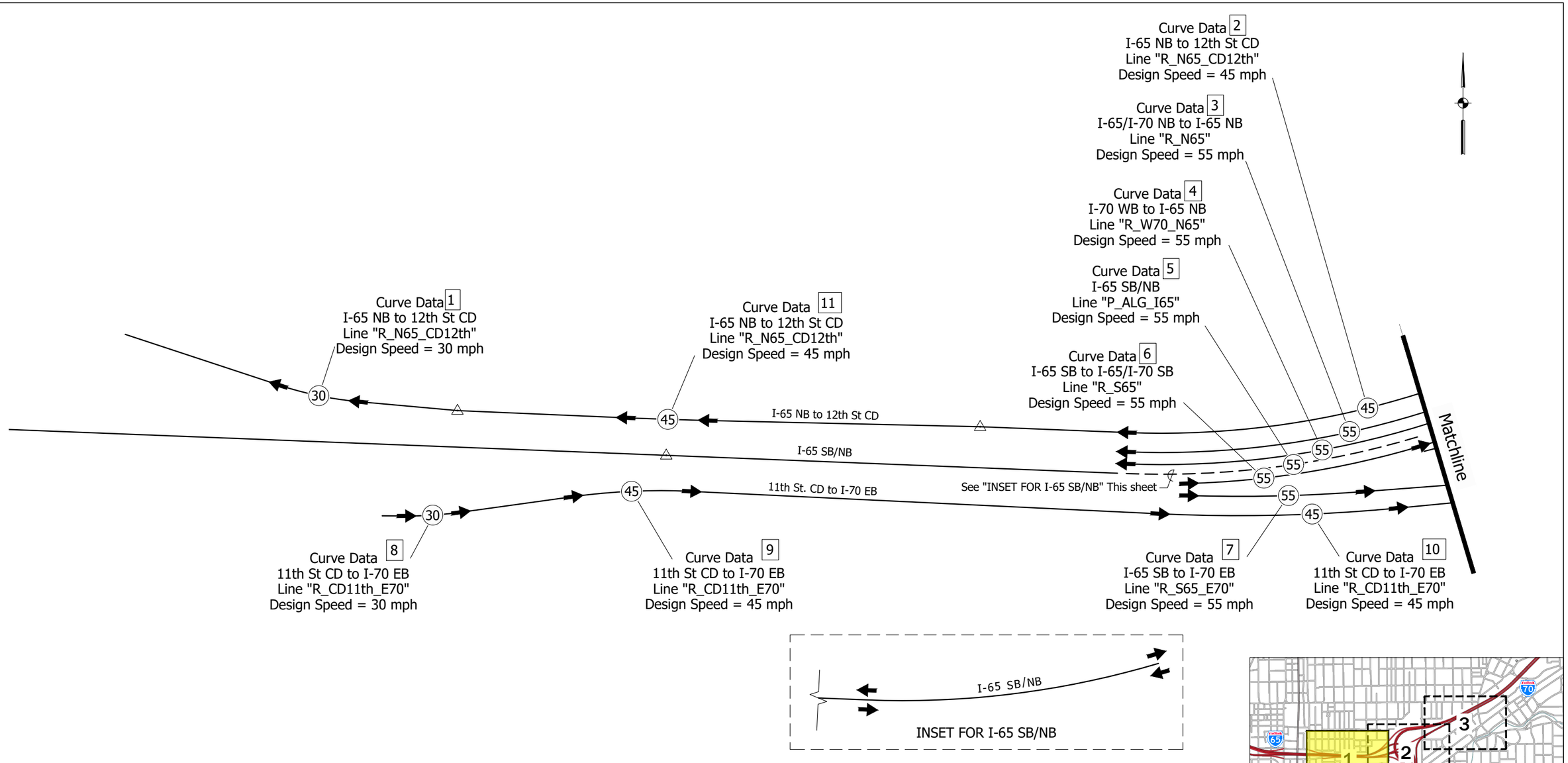
LOCAL ROADS

Revision Date: December 10, 2019

	DESIGN ELEMENT	MANUAL SECTION (IDM,English Units,2013)	DESIGN CRITERIA														
DESIGN CONTROLS	**Street Name**		Alabama Street	Central Avenue	College Avenue	Commerce Avenue	Delaware Avenue	Lewis Street	Market Street	Michigan Street	New York Street	Ohio Street	St. Clair Street	Washington Street	Valley Avenue	Vermont Street	10th Street
	Alignment Name																
	Functional Classification	40-1.01	Minor Arterial	Minor Arterial	Minor Arterial	Major Collector	Minor Arterial	Local Road	Minor Collector	Minor Arterial	Minor Arterial	Local Road	Local Road	Principal Arterial	Local Road	Local Road	Minor Arterial
	Geometric Design Table		Fig. 55-3F	Fig. 55-3E	Fig. 55-3E	Fig. 55-3G	Fig. 55-3E	Fig. 55-3H	Fig. 55-3G	Fig. 55-3E	Fig. 55-3E	Fig. 53-9	Fig. 55-3H	Fig. 55-3E	Fig. 55-3H	Fig. 55-3H	Fig. 55-3E
			Built-Up	Built-Up	Built-Up		Built-Up		Built-Up	Built-Up	Built-Up	Built-Up		Built-Up		Built-Up	Built-Up
	Design Forecast Period	55-4.01	20 Years														
	Access Control	40-5.0	None														
	Level of Service	40-2.0	Desirable: C Minimum: D														
	***Design Speed**	55-4.01	30 mph	35 mph	35 mph	30 mph	35 mph	25 mph	30 mph	30 mph	25 mph	30 mph	25 mph	35 mph	25 mph	30 mph	35 mph
	Posted Speed		30 mph	35 mph	35 mph	30 mph	35 mph	25 mph	30 mph	30 mph	25 mph	30 mph	25 mph	35 mph	25 mph	30 mph	35 mph
	AADT (2021)		519 (NB) + 1490 (SB)	9948 (SB)	9434 (NB) + 7024(SB)	4047(NB) + 6212(SB)	12529		2209(EB) + 268(WB)	5859 (WB)	11034(EB)	7500		11324 (EB) + 18676(WB)	158(NB) + 236(SB)	TBD	9494(EB) + 6850 (WB)
	AADT (2041)		1365 (NB) + 1780 (SB)	1045 (NB) + 9194 (SB)	7170 (NB) + 7886(SB)	4467(NB) + 6054(SB)	13757		1462(EB) + 781(WB)	10184(EB) + 8299(WB)	7737(EB) + 4902(WB)	7994		12515 (EB) + 27936 (WB)	158(NB) + 250(SB)	TBD	9253 (EB) + 7553 (WB)
	DHV (2041)		100 (NB) + 264 (SB)	158 (NB) + 1317 (SB)	798(NB) + 723(SB)	425(NB) + 576(SB)	1875	Not in the model	223(EB) + 143(WB)	822(EB) + 670(WB)	1028(EB) + 651 (WB)	1488	Not in the model	1450(EB) + 3041(WB)	19(NB) + 30(SB)	TBD	1037(EB) + 913(WB)
	Trucks (% DHV)		2% both	2% both	2% NB, 3% SB	5% NB, 2% SB	1%		2% both	3% (WB) both	1% both directions	1%		2% both directions	5% NB, 3% SB	TBD	2% EB, 3% WB
	Directional Distribution		43% NB / 57% SB	10% NB / 90% SB	52% NB / 48% SB	42% NB / 58% SB	N.A. (one-way)		65% EB / 35% WB	55% EB / 45% WB	61% EB / 39% WB	N.A. (one-way)		31% EB / 69% WB	39% NB / 61% SB	TBD	55% EB / 45% WB

* Indicates Level One controlling design criteria. A deviation from such is a design exception, and is subject to approval. See section 40-8.0

** Per IDM 45-1.01 (02) c., when more than 2 travel lanes are sloping in the same direction the third, fourth, etc. lanes will be sloped at 3%.



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SCALE : FEET

NORTH SPLIT UPGRADES DRIVING PROGRESS

INDIANA DEPARTMENT OF TRANSPORTATION

DOWNTOWN INDIANAPOLIS NORTH SPLIT IMPROVEMENTS

DESIGN SPEED DIAGRAM

Curve Data 1
I-70 WB to I-65 NB
Line "R_W70_N65"
Design Speed = 55 mph

Curve Data 2
I-70 WB to I-65 SB CD
Line "R_W70_CDS65"
Design Speed = 50 mph

Curve Data 3
I-70 WB to I-65/I-70 SB
Line "R_W70"
Design Speed = 55 mph

Curve Data 4
I-65 SB to I-65 SB CD
Line "R_S65_CDS65"
Design Speed = 45 mph

Curve Data 5
I-65 SB to I-70 EB
Line "R_S65_E70"
Design Speed = 55 mph

Curve Data 6
I-70 WB to I-65 NB
Line "R_W70_N65"
Design Speed = 55 mph

Curve Data 7
I-65/I-70 NB to I-70 EB
Line "R_E70"
Design Speed = 50 mph

Curve Data 8
I-65 SB to I-70 EB
Line "R_S65_E70"
Design Speed = 55 mph

Curve Data 9
I-65/I-70 NB to I-65 NB
Line "R_N65"
Design Speed = 50 mph

Curve Data 10
I-70 WB to I-65 NB
Line "R_W70_N65"
Design Speed = 55 mph

Curve Data 11
I-70 WB to I-65 SB CD
Line "R_W70_CDS65"
Design Speed = 55 mph

Curve Data 12
I-65/I-70 NB to I-70 EB
Line "R_E70"
Design Speed = 55 mph

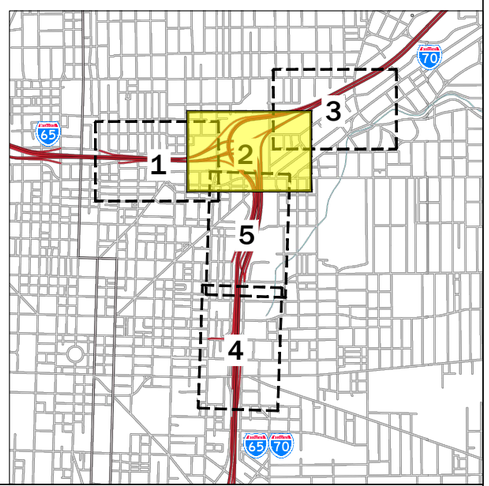
Curve Data 13
I-65 SB to I-65/I-70 SB
Line "R_S65"
Design Speed = 45 mph

I-65 NB to 12th St CD
I-65 SB to I-65/I-70 SB
11th St. CD to I-70 EB
I-65 SB to I-65 SB CD
I-70 WB to I-65 SB CD
I-70 WB to I-65/I-70 SB
I-70 WB to I-65 NB
I-65 SB to I-70 EB
I-65/I-70 NB to I-70 EB
I-65/I-70 NB to I-65 NB
Matchline
Matchline
Matchline

LEGEND

P.C/P.T/Traffic Direction

Indicates Design Speed



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NORTH SPLIT UPGRADES DRIVING PROGRESS

INDIANA DEPARTMENT OF TRANSPORTATION
DOWNTOWN INDIANAPOLIS NORTH SPLIT IMPROVEMENTS

DESIGN SPEED DIAGRAM

Matchline

I-70 EB/WB

Curve Data 1
I-70 WB to I-65/I-70 SB
Line "R_W70"
Design Speed = 55 mph

Curve Data 2
I-70 WB to I-65 NB
Line "R_W70_N65"
Design Speed = 55 mph

I-70 WB to I-65/I-70 SB

I-70 WB to I-65 NB

I-65 SB to I-70 EB

I-65/I-70 NB to I-70 EB

55

Matchline

Curve Data 3
I-65 SB to I-70 EB
Line "R_S65_E70"
Design Speed = 55 mph

I-70 EB/WB

55

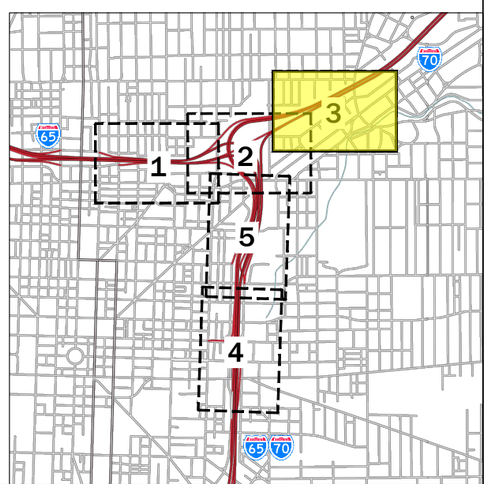
Curve Data 4
I-70 EB/WB
Line "P_ALG_I70"
Design Speed = 55 mph

Matchline

LEGEND

P.C/P.T/Traffic Direction

55 Indicates Design Speed



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NORTH SPLIT UPGRADES DRIVING PROGRESS

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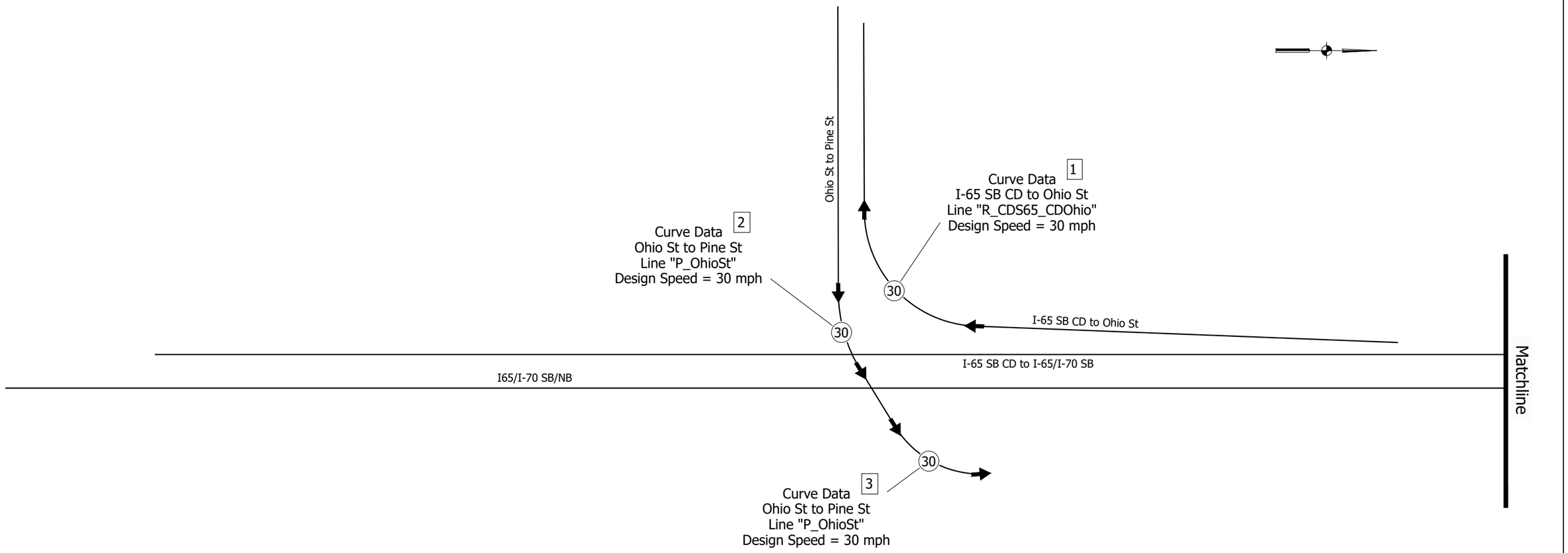
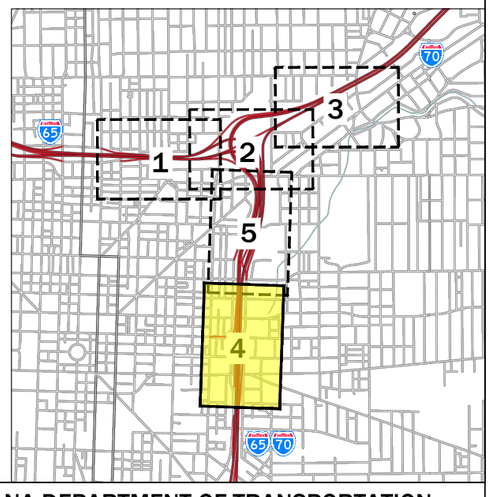
DOWNTOWN INDIANAPOLIS NORTH SPLIT IMPROVEMENTS

DESIGN SPEED DIAGRAM





LEGEND

P.C/P.T/Traffic Direction

55 Indicates Design Speed

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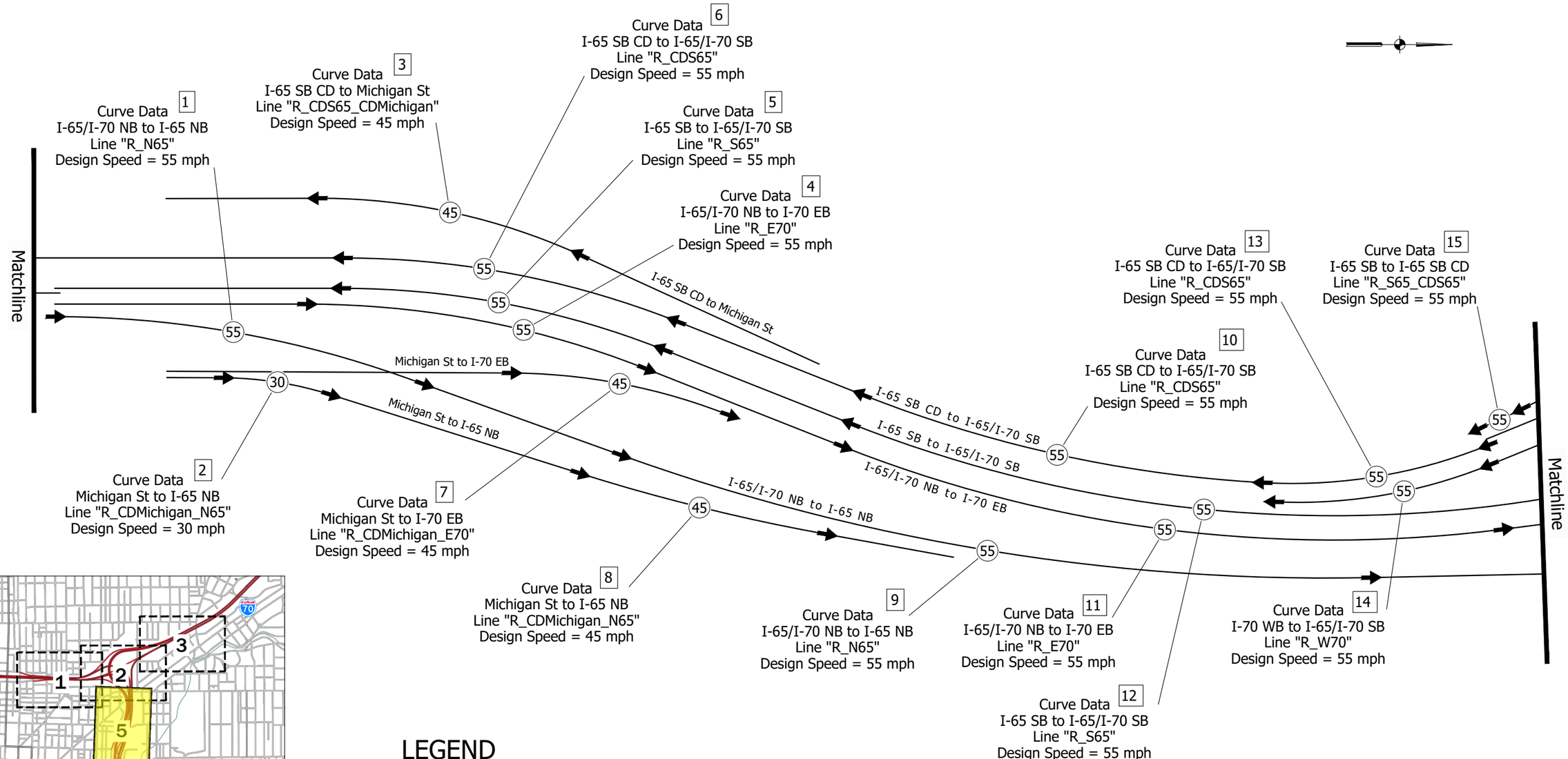
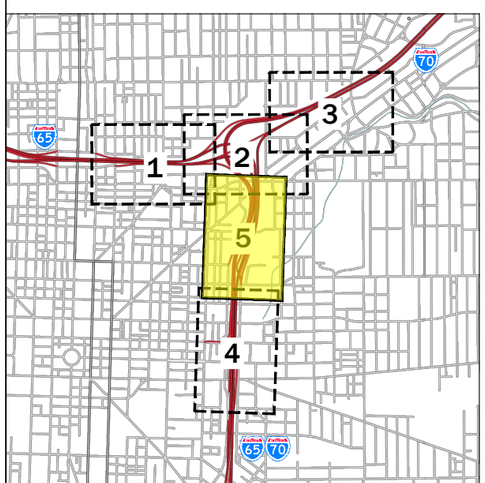
DESIGN SPEED DIAGRAM





LEGEND

P.C/P.T/Traffic Direction

55 Indicates Design Speed

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NORTH SPLIT UPGRADES DRIVING PROGRESS

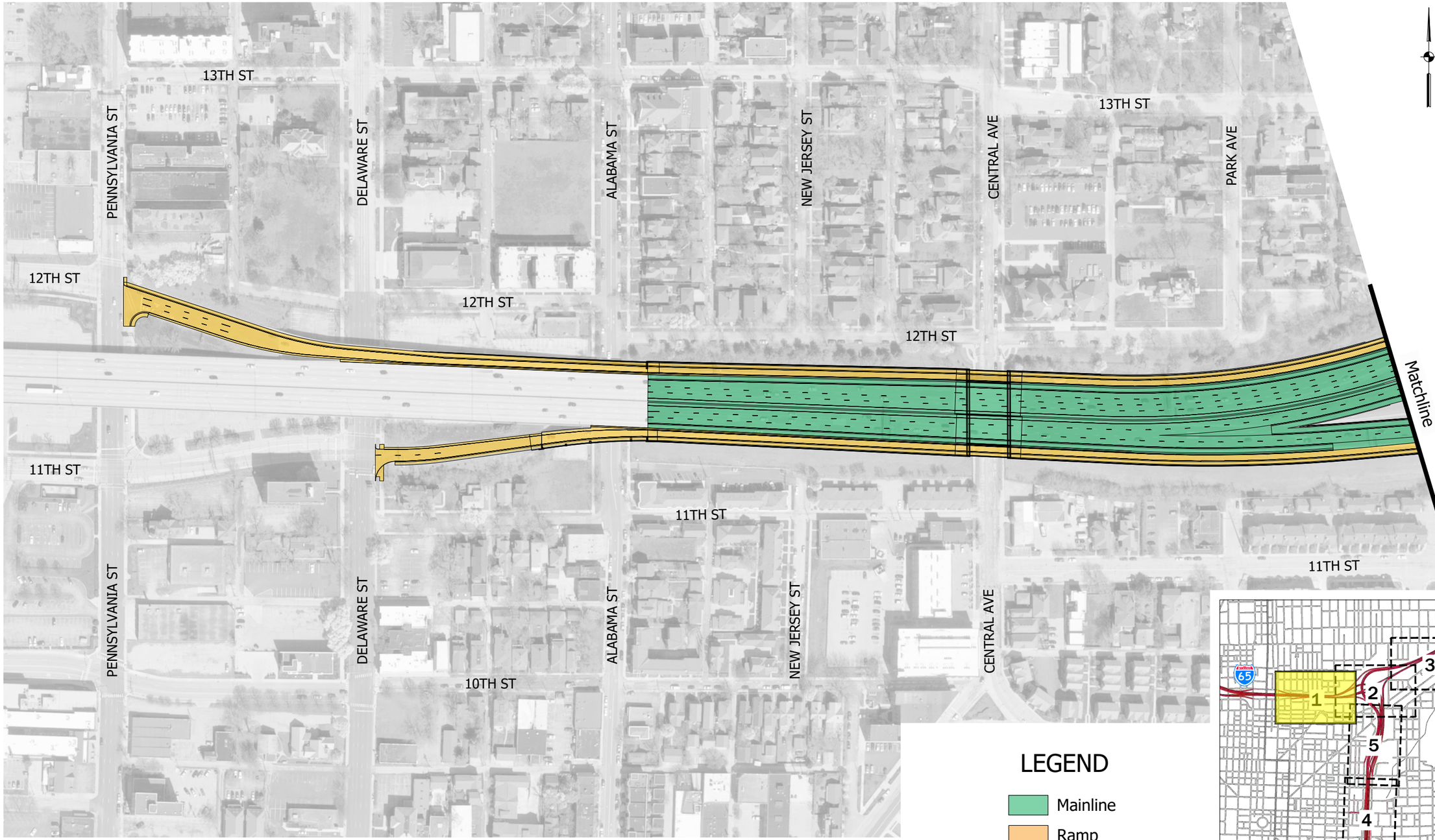
INDIANA DEPARTMENT OF TRANSPORTATION
DOWNTOWN INDIANAPOLIS NORTH SPLIT IMPROVEMENTS

DESIGN SPEED DIAGRAM

Attachment 8-1C - Minimum Profile Grades

Created By: **HWS 6/19/19**
Checked By: **TBL 6/20/19**
Revised By: **TBL 12/4/19**

Movement	Location	Grade (%)	Barrier
I-65 SB/NB	Starting 65 ft. East of East edge of pavement of Alabama St., to approximately 90 ft. East of East edge of pavement of Alabama St.	0.3	Y
	Starting from Center of pavement of Central Ave., to approximately 25 ft. East of Center of pavement of Central Ave.	-0.3	Y
I-70 EB/WB	Starting 100 ft. East of East edge of pavement of Dr Andrew J Brown Ave., to approximately 145 ft. East of East edge of pavement of Dr Andrew J Brown Ave.	0.45	N
	Starting 180 ft. East of East edge of pavement of Roosevelt Ave./Commerce Ave., to approximately 305 ft. East of East edge of pavement of Roosevelt Ave./Commerce Ave.	0.45	N
I-70 WB to I-65/I-70 SB	Starting 115 ft. East of East edge of pavement of Dr Andrew J Brown Ave., to approximately 85 ft. East of East edge of pavement of Dr Andrew J Brown Ave.	-0.45	N
	Starting 250 ft. East of East edge of pavement of Yandes St., to approximately 170 ft. East of East edge of pavement of Lewis St.	-0.3	N
	Starting 435 ft. South of South edge of pavement of 10th St., to approximately 550 ft. South of South edge of pavement of 10th St.	0.44	Y
I-65/I-70 NB to I-70 EB	Starting 100 ft. East of East edge of pavement of Lewis St., to approximately 110 ft. East of East edge of pavement of Columbia Ave.	0.34	N
	Starting 65 ft. East of East edge of pavement of Dr Andrew J Brown Ave., to approximately 165 ft. East of East edge of pavement of Dr Andrew J Brown Ave.	0.45	N
I-65/I-70 NB to I-65 NB	Starting 140 ft. North of North edge of pavement of St. Clair St., to approximately 660 ft. South of South edge of pavement of 10th St.	-0.4	Y
I-65 SB to I-65/I-70 SB	Starting 145 ft. West of West edge of pavement of College Ave., to approximately 45 ft. West of West edge of pavement of College Ave.	-0.44	Y
	Starting 575 ft. South of South edge of pavement of 10th St., to approximately 190 ft. North of North edge of pavement of St. Clair St.	0.41	Y
I-70 WB to I-65 NB	Starting 125 ft. East of East edge of pavement of Dr Andrew J Brown Ave., to approximately 170 ft. West of East edge of pavement of Columbia Ave.	-0.4	Y
I-65 SB to I-70 EB	Starting 300 ft. West of West edge of pavement of Columbia Ave., to approximately 175 ft. East of East edge of pavement of Dr Andrew J Brown Ave.	0.44	Y
I-65 SB CD to I-65/I-70 SB	Starting 295 ft. North of North edge of pavement of New York St., to approximately 175 ft. North of North edge of pavement of New York St.	0.35	Y
I-70 WB to I-65 SB CD	Starting 55 ft. East of East edge of pavement of Lewis St., to approximately 40 ft. West of East edge of pavement of Lewis St.	-0.11	N
I-65 SB to I-65 SB CD	Starting at the West edge of College Ave., to approximately 180 ft. East of West edge of College Ave.	-0.32	N
I-65 NB to 12th St CD	Starting 470 ft. West of West edge of pavement of College Ave., to approximately 305 ft. East of East edge of pavement of Central Ave.	-0.3	Y
	Starting 5 ft. East of East edge of pavement of Central Ave., to approximately 20 ft. West of East edge of pavement of Central Ave.	0.39	Y
	Starting 90 ft. East of East edge of pavement of Alabama St., to approximately 2 ft. West of East edge of pavement of Delaware St.	-0.39	Y
11th St CD to I-70 EB	Starting 45 ft. East of East edge of pavement of Alabama St., to approximately 85 ft. East of East edge of pavement of Alabama St.	0.3	Y
	Starting 20 ft. West of East edge of pavement of Central Ave., to approximately 45 ft. East of East edge of pavement of Central Ave.	0.3	Y
I-65 SB CD to Michigan St	Starting 475 ft. North of North edge of pavement of Michigan St., to approximately the North edge of pavement of Michigan St.	-0.22	N
I-65 SB CD to Ohio St	Starting 125 ft. South of South edge of pavement of Vermont St., to approximately 300 ft. South of South edge of pavement of Vermont St.	0.26	N
Michigan St to I-65 NB	Starting 65 ft. North of North edge of pavement of Michigan St., to approximately 70 ft. North of North edge of pavement of Michigan St.	-0.3	N
Michigan St to I-70 EB	Starting 65 ft. North of North edge of pavement of Michigan St., to approximately 70 ft. North of North edge of pavement of Michigan St.	-0.3	N
Ohio St	Starting 25 ft. East of East edge of pavement of College Ave., to approximately 190 ft. East of East edge of pavement of College Ave.	-0.34	N
	Starting 220 ft. South of South edge of pavement of New York St., to approximately 100 ft South of South edge of pavement of New York St.	-0.3	N



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0 200 400 600 800 1,000

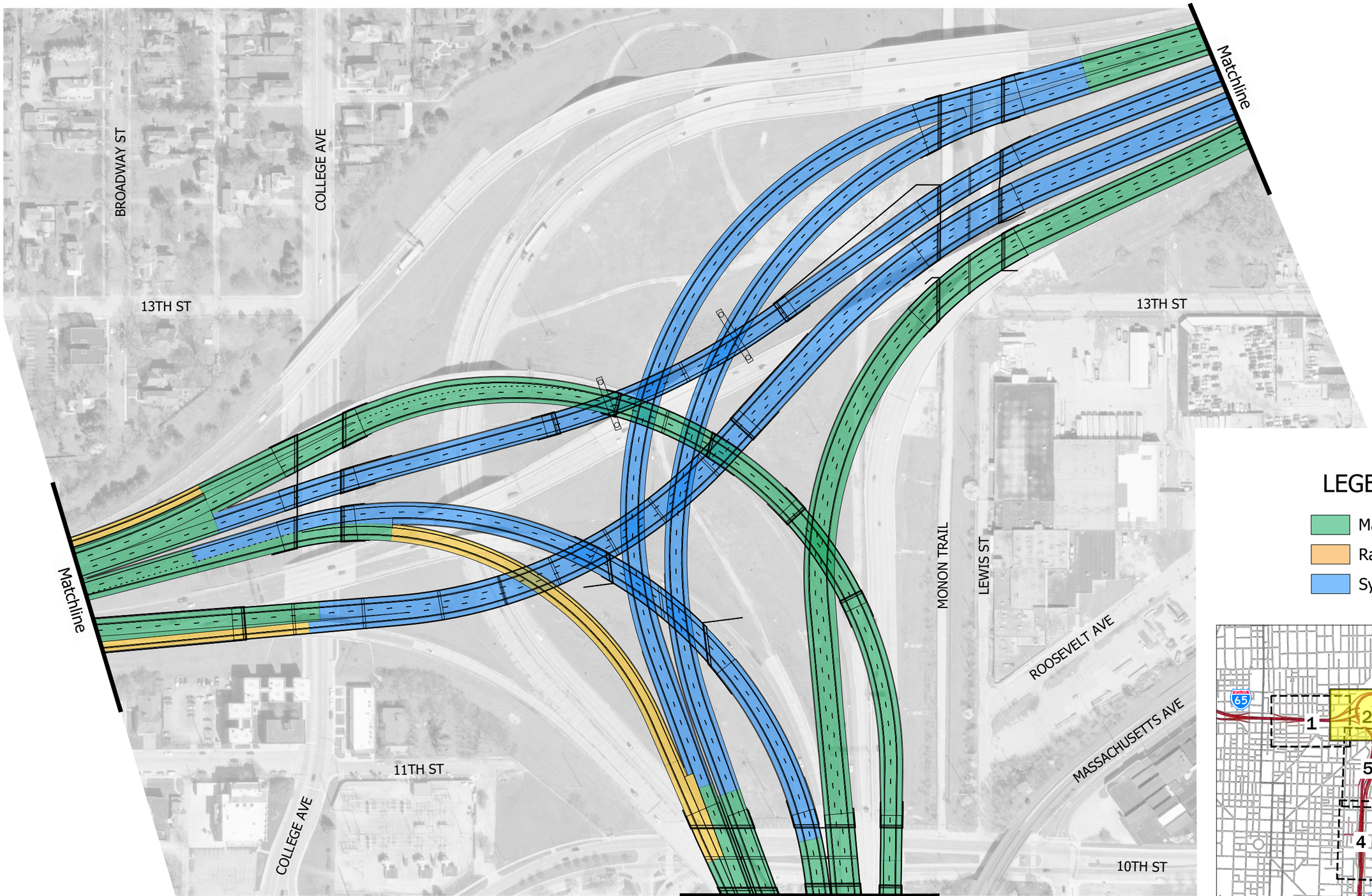
SCALE : FEET

NORTH SPLIT UPGRADES DRIVING PROGRESS

INDIANA DEPARTMENT OF TRANSPORTATION

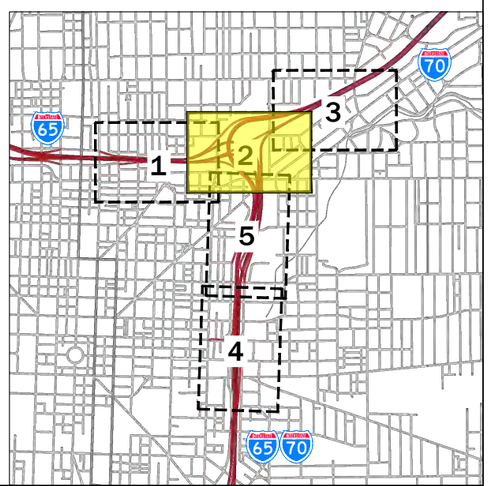
DOWNTOWN INDIANAPOLIS NORTH SPLIT IMPROVEMENTS

MAINLINE/RAMP LIMITS



LEGEND

- Mainline
- Ramp
- System Ramp



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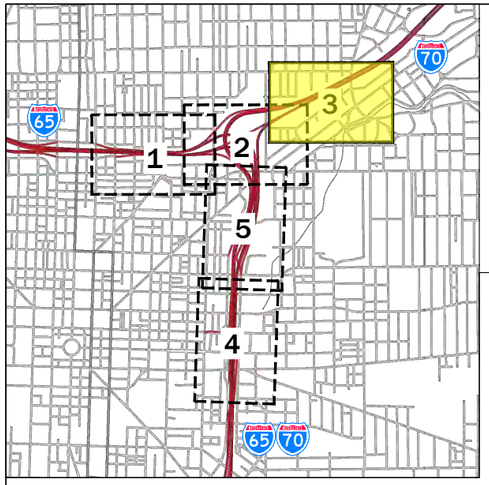

LEGEND

- Mainline
- Ramp
- System Ramp

ARSENAL AVE
SHELDON ST
ROOSEVELT AVE
Matchline
DR A J BROWN AVE
LUDLOW AVE
YANDES ST
COLUMBIA AVE
COMMERCE AVE
ROOSEVELT AVE
Matchline
MASSACHUSETTS AVE
18TH ST
Matchline
LUDLOW AVE
COLUMBIA AVE

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INDIANA DEPARTMENT OF TRANSPORTATION

DOWNTOWN INDIANAPOLIS NORTH SPLIT IMPROVEMENTS

MAINLINE/RAMP LIMITS

COLLEGE AVE

COLLEGE AVE

WASHINGTON ST

MARKET ST

OHIO ST

NEW YORK ST

VERMONT ST

DAVIDSON ST

DAVIDSON ST

DAVIDSON ST

Matchline

PINE ST

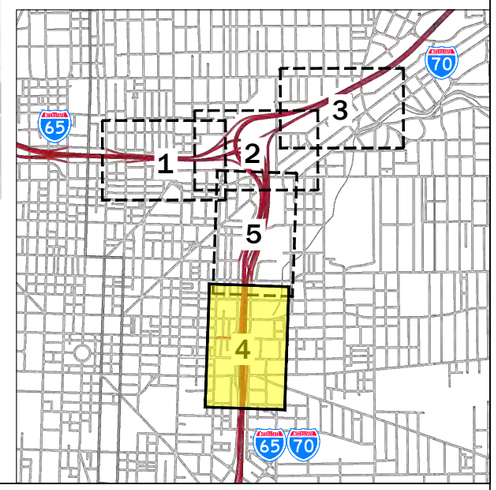
PINE ST

WASHINGTON ST

MARKET ST

OHIO ST

NEW YORK ST



LEGEND

- Mainline
- Ramp
- System Ramp

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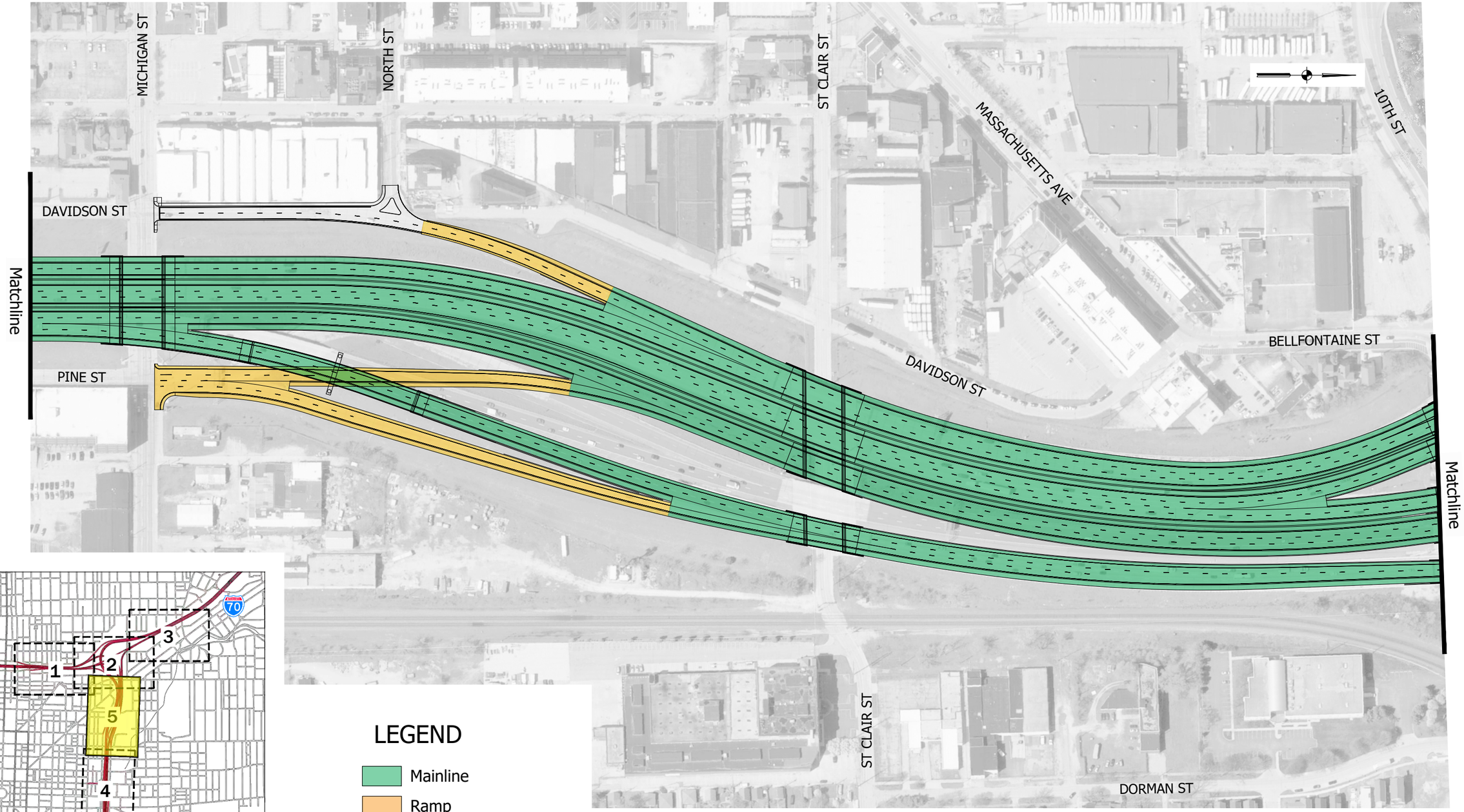
MAINLINE/RAMP LIMITS



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NORTH SPLIT UPGRADES DRIVING PROGRESS

INDIANA DEPARTMENT OF TRANSPORTATION
DOWNTOWN INDIANAPOLIS NORTH SPLIT IMPROVEMENTS

MAINLINE/RAMP LIMITS

Level One Design Exception Table For Shoulder & Bridge Clear Roadway Width

Location No.	Begin Station	End Station	Reason	Direction	Req'd Min. Shldr Width (ft)	Prop. Shldr Width (ft)	Bridge Note	AADT (2041)	% Trucks	Design Speed (mph)	Advisory Speed (mph)	Classification	Access Control	Terrain
1	I-65 - Line "P_ALG_I65" - Left shoulder from western project limits to a point approx. 1,500 feet east													
	25+74.63	40+79.84	Match Existing	NB & SB	10.0	6.0	1	58,376	4%	55	N/A	Urban Freeway	Full	Level
2	I-65/I-70 - Line P_ALG_I65/I70 - Left shoulder from southern project limits to a point approx. 2,750 feet north													
	113+00.00	140+49.55	Match Existing	SB	10.0	7.7	2	64,063	10%	55	N/A	Urban Freeway	Full	Level
	113+00.00	140+49.55	Match Existing	NB & SB	10.0	8.0	3	76,198	9%	55	N/A	Urban Freeway	Full	Level
3	I-65 SB Ramp - Line R_S65 - Left shoulder from 180 feet south of Michigan Street to a point approx. 1,200 feet north													
	142+01.00	153+74.32	Match Existing	SB	10.0	7.7	4	19,100	7%	50	40	Urban Freeway	Full	Level
4	I-70 EB Ramp - Line R_E70 - Left shoulder from 180 feet south of Michigan Street to a point approx. 1,200 feet north													
	100+00.00	111+46.00	Match Existing	EB	10.0	8.0	5	57,330	13%	50	45	Urban Freeway	Full	Level
5	I-65 NB to 12th Street Exit Ramp - Line R_N65_CD12th - Left shoulder for the entire length of the 12th Street CD													
	104+86.15	131+96.82	Environmental	WB	4.0	2.0	6	9,854	2%	55	45	Urban Freeway	Full	Level
6	11th Street Entrance Ramp to I-70 EB - Line R_CD11th_E70 - Left shoulder for the entire length of the 11th Street CD													
	100+51.96	119+65.37	Environmental	EB	4.0	2.0	6	16,420	7%	50	45	Urban Freeway	Full	Level
7	I-65 SB CD to Ohio Street Exit Ramp - Line R_CDS65_CDOhio - Left shoulder from back of gore to start of curb and gutter													
	107+22.28	111+83.39	Match Existing	SB	4.0	3.0	7	7,284	1%	45 / 25	N/A	Urban Freeway	Full	Level

Bridge Note Legend:

1) Shoulder widths on bridges over Central Avenue will be 5.875', reduced by transition from roadway median barrier to barrier and 1-inch open joint on the bridges.

2) Shoulder widths on bridges over Washington Street, Market Street, CSX RR & Ohio Street, New York Street, and Michigan Street will be 7.573', reduced by transition from roadway median barrier to barrier and 1-inch open joint on the bridges.

3) Shoulder widths on bridges over Washington Street, Market Street, CSX RR & Ohio Street, and New York Street will be 7.875', reduced by transition from roadway median barrier to barrier and 1-inch open joint on the bridges.

4) Shoulder widths on bridges over St. Clair Streetwill be 9.875', reduced by transition from roadway median barrier to barrier and 1-inch open joint on the bridges.

5) Shoulder widths on bridges over Michigan Street and St. Clair Street will be 7.875' and 9.875' respectively, reduced by transition from roadway median barrier to barrier and 1-inch open joint on the bridges.

6) Shoulder widths on bridges over Central Avenue will be 1.875', reduced by transition from roadway median barrier and 1-inch open joint on the bridges.

7) Bridge clear roadway width to match approach roadway.

Added 12/10/2019

DES No.	Feature (Over/Under)		Right Shoulder Usable	Right Shoulder Paved	Bridge Clear Width
1901847	I-65/I-70 NB over Washington Street	Required	*11'*	*10'*	*68'-0"*
		Provided	11'-8"	11'-8"	67'-6 1/2"
1901848	I-65/I-70 SB over Washington Street	Required	*11'*	*10'*	*54'-8 3/8"*
		Provided	10'-10 1/2"	10'-10 1/2"	54'-5 3/8"
1901849	I-65/I-70 SB CD over Washington Street	Required	*11'*	*10'*	*34'-7 1/4"*
		Provided	9'-8"	9'-8"	34'-1 3/4"
1901850	I-65/I-70 NB over Market Street	Required	*11'*	*10'*	*68'-0"*
		Provided	11'-8"	11'-8"	67'-6 1/2"
1901851	I-65/I-70 SB over Market Street	Required	*11'*	*10'*	*54'-8 3/8"*
		Provided	10'-10 1/2"	10'-10 1/2"	54'-5 3/8"
1901852	I-65/I-70 SB CD over Market Street	Required	*11'*	*10'*	*34'-7 1/4"*
		Provided	9'-8"	9'-8"	34'-1 3/4"
1901853	I-65/I-70 NB over CSX Railroad & Ohio Street	Required	*11'*	*10'*	*68'-0"*
		Provided	11'-8"	11'-8"	67'-6 1/2"
1901854	I-65/I-70 SB over CSX Railroad & Ohio Street	Required	*11'*	*10'*	*54'-8 3/8"*
		Provided	10'-10 1/2"	10'-10 1/2"	54'-5 3/8"
1901855	I-65/I-70 SB CD over CSX Railroad & Ohio Street	Required	*11'*	*10'*	*34'-7 1/4"*
		Provided	9'-8"	9'-8"	34'-1 3/4"
1901856	I-65/I-70 NB over New York Street	Required	*11'*	*10'*	*68'-0"*
		Provided	11'-8"	11'-8"	67'-6 1/2"
1901857	I-65/I-70 SB over New York Street	Required	*11'*	*10'*	*54'-8 3/8"*
		Provided	10'-10 1/2"	10'-10 1/2"	54'-5 3/8"
1901858	I-65/I-70 SB CD over New York Street	Required	*9'*	*8'*	*64'-7 3/8"*
		Provided	11'-8"	11'-8"	64'-1 7/8"
1902179	I-65/I-70 NB over Vermont Street	Required	*11'*	*10'*	*68'-0"*
		Provided	11'-8"	11'-8"	67'-6 1/2"
1902180	I-65/I-70 SB over Vermont Street	Required	*11'*	*10'*	*54'-8 3/8"*
		Provided	10'-10 1/2"	10'-10 1/2"	54'-5 3/8"
1901861	I-65/I-70 SB CD over Vermont Street	Required	*9'*	*8'*	*45'-6 1/8"*
		Provided	11'-8"	11'-8"	45'-0 5/8"
1901862	I-65 NB & I-70 EB over Michigan Street	Required	*11'*	*10'*	*73'-2 1/2"*
		Provided	12'-0"	12'-0"	73'-1"
1901863	I-65 SB/I-70 WB over Michigan Street	Required	*11'*	*10'*	*54'-8 3/8"*
		Provided	10'-10 1/2"	10'-10 1/2"	54'-5 3/8"

Added 12/10/2019

1901864	I-65/I-70 SB CD over Michigan Street	Required	*11'*	*10'*	*44'-7 1/4"*
		Provided	11'-8"	11'-8"	44'-1 3/4"
1901881	I-65 NB over St. Clair Street	Required	*11'*	*10'*	*54'-3 1/4"*
		Provided	*10'-4 1/4"	10'-4 1/4"	53'-11 1/4"
1901889	I-70 EB over St. Clair Street	Required	*11'*	*10'*	*58'-0"*
		Provided	12'-0"	12'-0"	57'-10 1/2"
1901892	I-65 SB/I-70 WB over St. Clair Street	Required	*11'*	*10'*	*69'-0"*
		Provided	10'-10 1/2"	10'-10 1/2"	68'-9"
1901896	SB CD over St. Clair Street	Required	*11'*	*10'*	*67'-2 7/8"*
		Provided	11'-7"	11'-7"	66'-9 3/8"
1901906	I-65 NB CD Exit Ramp over Central Avenue	Required	*9'*	*8'*	*22'-0"*
		Provided	*8'-0"	8'-0"	21'-10 1/2"
1901907	I-65 NB over Central Avenue	Required	*11'*	*10'*	*64'-0"*
		Provided	9'-10 1/2"	9'-10 1/2"	63'-9"
1901908	I-65 SB over Central Avenue	Required	*11'*	*10'*	*57'-0"*
		Provided	9'-10 1/2"	9'-10 1/2"	56'-9"
1901909	I-65 SB CD Entrance Ramp over Central Avenue	Required	*9'*	*8'*	*22'-0"*
		Provided	*8'-0"	8'-0"	21'-10 1/2"
1901930	I-70 EB over Roosevelt Ave @ Comm Ave	Required	*11'*	*10'*	*94'-0'*
		Provided	8'-0"	8'-0"	93'-10 1/2"
1901933	I-65 over 7 Streets, Access Rd, Monorail (aka "Monster Bridge") - Pennsylvania Exit Ramp	Required	*9'*	*8'*	*24'-0"*
		Provided	*8'-0"	8'-0"	22'-0"
1901934	I-65 over 7 Streets, Access Rd, Monorail (aka "Monster Bridge") - Delaware Entrance Ramp	Required	*9'*	*8'*	*22'-0"*
		Provided	*8'-0"	8'-0"	20'-0"

Italics = Min. Design Criteria

* = Required effective usable shoulder width is provided

Red = Violates Min. Design Criteria, Design Exception Required

NORTH SPLIT UPGRADES DRIVING PROGRESS

CURVE ADVISORY SPEED TABLE

Revised 02-02-2020
~~Revised 12/10/2019~~

Movement	Curve	Design Speed	Advisory Speed	Advisory Plaque
P_ALG_I65	Curve #1	55	45	
R_CDS65	Curve #1	55	45	Yes (40 mph)
	Curve #3	55	50	No
R_N65	Curve #3	50	40	Yes (40 mph)
	Curve #4	55	50	No
R_S65	Curve #1	55	45	Yes (45 mph)
	Curve #2	50	45	Yes (45 mph)
	Curve #4	55	50	No
R_S65_CDS65	Curve #1	45	40	Yes (40 mph)
	Curve #2	55	40	Yes (40 mph)
R_S65_E70	Curve #2	55	45	Yes (45 mph)
	Curve #3	55	50	No
R_W70	Curve #2	55	45	Yes (45 mph)
	Curve #3	55	45	Yes (45 mph)
R_W70_CDS65	Curve #1	50	45	No
R_W70_N65	Curve #2	55	50	No
	Curve #3	55	50	No
	Curve #5	55	50	No

*P_ALG_I65 Curve #1 and R_S65 Curve #1 are the same curve

By: AJA 6/13/2019
Checked By: TBL 6/21/2019

NORTH SPLIT UPGRADES DRIVING PROGRESS

SHOULDER WIDTH OVERDESIGN

Revision Date: October 10, 2019

Movement	Proposed Shoulder Width	Rationale
P_ALG_I70 EB	Left Shoulder = 14'	Match existing shoulder widths
	Right Shoulder = 14'	Match existing shoulder widths
P_ALG_I70 WB	Left Shoulder = 14'	Match existing shoulder widths
	Right Shoulder = 14'	Match existing shoulder widths
Michigan St to I-70 EB	Left Shoulder = 6'	Additional width provides a barrier offset
	Right Shoulder = 10'	Additional width provides a barrier offset
Michigan St to I-65 NB	Left Shoulder = 6'	Additional width provides a barrier offset
	Right Shoulder = 10'	Additional width provides a barrier offset
I-70 EB	Right Shoulder = 16'	Additional width required for Horizontal Stopping Sight Distance
	Right Shoulder = 12'	Additional width provides a barrier offset
I-65 NB	Left Shoulder = 10'	Additional width required for Horizontal Stopping Sight Distance
	Right Shoulder = 12'	Additional width provides a barrier offset
I-65 SB CD to I-65/I-70 SB	Left Shoulder = 8.6'	Match existing shoulder widths
I-65 SB to I-65/I-70 SB	Right Shoulder = 13'	Additional width provides a barrier offset
I-65 SB to I-65 SB CD	Left Shoulder = 6'	Additional width provides a barrier offset
	Right Shoulder = 12'	Additional width required for Horizontal Stopping Sight Distance
I-65 SB to I-70 EB	Left Shoulder = 12'	Additional width required for Horizontal Stopping Sight Distance
	Right Shoulder = 12'	Additional width required for Horizontal Stopping Sight Distance
I-70 WB to I-65/I-70 SB	Left Shoulder = 11'	Additional width required for Horizontal Stopping Sight Distance
I-70 WB to I-65 SB CD	Left Shoulder = 13'	Additional width required for Horizontal Stopping Sight Distance
	Right Shoulder = 12'	Additional width provides a barrier offset
I-70 WB to I-65 NB	Left Shoulder = 10'	Additional width required for Horizontal Stopping Sight Distance
	Right Shoulder = 12'	Additional width required for Horizontal Stopping Sight Distance

Note: Maximum shoulder widths on I-65 and I-70 mainline and ramps shall be limited to 16 feet.

NORTH SPLIT UPGRADES DRIVING PROGRESS

Completed By: CAP 3/14/2019
Revised By: HWS 6/21/2019
Revised By: CCR 1/22/2020

Table 1 - Reduced Barrier Offset

Location	Shldr Width, Lt		Barrier Offset, Lt		Shldr Width, Rt		Barrier Offset, Rt	
65 NB /70 EB 425 feet South of Washington to 335 feet North of Vermont St.	8	ft	0	ft	12	ft	0	ft
65 SB /70 WB 425 feet South of Washington to 335 feet North of Vermont St.	7.7	ft	0	ft	11	ft	0	ft
65 NB / SB 75 feet East of Alabama St. to 115 feet West of Park Ave.	6	ft	0	ft	10	ft	0	ft

NORTH SPLIT UPGRADES DRIVING PROGRESS

Revised 2/4/2020 by HWS

UNDERPASS SIDEWALKS CONSTRUCTION LIMITS

STREET	ALIGNMENT	BEGIN CONSTRUCTION	END CONSTRUCTION
Washington St.	Line "PR-W"	215+07.90	218+30.50
Market St.	Line "MARKET"	115+21.90	117+78.90
New York St.	Line "NEW YORK"	10+24.80	13+43.10
Vermont St.	Line "VERMONT"	10+36.40	13+44.60
Michigan St.	Line "MICHIGAN"	10+36.60	13+45.00
St. Clair St.	Line "ST CLAIR"	10+33.70	15+97.60
10th St.	Line "10th-REL"	109+92.50	116+02.90
Alabama St.	Line "ALABAMA"	11+07.80	13+58.50
Central Ave.	Line "CENTRAL"	10+73.60	13+03.60
College Ave.	Line "COLLEGE"	11+79.90	21+02.50

ATTACHMENT 9-1

UNIQUE SPECIAL PROVISIONS

PAVEMENT

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

Description

This Work shall consist of constructing a continuously reinforced concrete pavement, CRCP, on a prepared subbase in accordance with 105.03.

Materials

Materials for concrete shall be in accordance with CRCP Concrete Mix Design Criteria USP. Coarse aggregate for all concrete shall be of Class AP quality. Steel reinforcement shall be in accordance with 703.02 and shall be epoxy coated. The metal chairs, spacers, clips, wire, or other mechanical means used for fastening or holding reinforcement in place shall also be epoxy coated. Curing material shall be in accordance with 504.02.

Whitewashing shall be a Hydrated Lime slurry mixture consisting of hydrated lime and water. The mixture shall contain one part hydrated lime to four parts of total slurry by weight. The slurry shall be mixed to form a homogenous material for application during whitewashing the surface of HMA subbase. The Hydrated Lime shall be in accordance with 913.04. The water used in the slurry mixture shall be in accordance with 913.01.

Concrete Mix Design and Criteria

The mix design and criteria for pavement concrete shall be in accordance with CRCP Concrete Mix Design Criteria USP.

Trial Batch

The concrete for CRCP shall have a trial batch in accordance with 501.06 and meet the requirements of the CRCP Concrete Mix Design Criteria USP.

Lots and Sublots

Lots and sublots for CRCP shall be in accordance with 501.07.

Acceptance

Acceptance of CRCP shall be in accordance with 501.08.

Construction Requirements

Continuously reinforced concrete pavement shall be in accordance with 501.09 through 501.29 and the following:

(a) Placement of Reinforcement. The pavement reinforcement shall be placed such that the reinforcement in the completed pavement will be at the location shown on the Plans with a placement tolerance for individual bars of inch horizontally and vertically.

Reinforcement bars shall be tied securely together. The minimum length of longitudinal bars shall be 30 ft, except as required to establish the lap arrangement selected.

During the placement of Portland cement concrete, INDOT will check the depth and lateral placement of the pavement reinforcement at such times and places as INDOT may elect.

Pavement reinforcement shall be supported on steel chair supports at the depth below the pavement surface as shown on the plans. The Design-Build Contractor shall submit Working Drawings showing details of the chair supports and their spacing to INDOT and obtain INDOT’s approval before

any fabrication is begun. The chair supports shall possess the necessary rigidity and be spaced at intervals close enough to hold the reinforcement at the proper depth and position. However, the spacing of the chair supports shall not exceed 3 ft transversely or 4 ft longitudinally. The chair supports shall be fabricated with sand plates unless the steel chair supports are fabricated using the transverse bar and have two continuous subbase bearing members attached to the upright supports. Wire size for the bearing member shall be W7 or larger.

Pavement reinforcement bars shall be assembled by fastening the longitudinal bars to the transverse bars, without welding, using wire, clips, or other acceptable methods meeting the approval of INDOT. The size and spacing of the bars shall be as shown on the plans.

(b) Whitewashing shall be applied to the surface of the HMA subbase prior to placing CRCP. The homogenous slurry will be sprayed, under pressure, uniformly over the HMA subbase surface. The slurry shall be agitated to keep all materials in uniform suspension throughout the mixing and distribution cycles. Whitewashing shall be applied and sufficiently cured prior to placing and securing the steel reinforcement. Concrete paving shall not be allowed to take place when the whitewashed HMA subbase surface temperature is greater than 110^{0}F.

If the applied whitewashing becomes discolored or removed as a result of installing the reinforcing steel, the slurry shall be reapplied to insure a uniform and complete whitewashing coverage of the HMA separation layer. The whitewash shall not be applied to the steel reinforcement.

(c) Joints and Wide Flange Beam Terminal Joints. The longitudinal and transverse joints and Wide Flange Beam Terminal Joints shall be constructed in accordance with 503 and as shown on the plans with the following exceptions:

(1) Longitudinal Sawed Joints. The tie bars in longitudinal sawed joints shall be positioned on the prepared subbase prior to concrete placement and shall either be supported on approved assemblies or securely tied to the underside of the longitudinal bars of the pavement reinforcement.

(2) Transverse Construction Joints. Transverse construction joints shall be made at the end of each day or when an interruption in the concreting operation of 30 minutes or more occurs, provided the length of pavement laid from the last joint is 12 ft or more and the distance from the construction joint to the nearest bar-lap is at least 3 1/2 ft. If a transverse construction joint is not formed within 7 days or there is a break in the CRCP paving operations for 7 or more days, the joint shall be constructed as shown in Attachment 09-4, Transverse Joint, Type 1.

The transverse construction joint shall be formed by means of a suitable split header board conforming to the cross section of the pavement, accurately set and securely held in place in a plane perpendicular to the surface of the pavement. The pavement reinforcement bars shall extend continuously through the split in the header board and shall be supported beyond the joint by steel chair supports. The header board shall be kept clean without oil.

Excess mortar material accumulated at the front of the paver shall be wasted and not incorporated into the pavement at the joint. Before paving operations are resumed, the header board shall be removed, any concrete or mortar that may have leaked through the holes or split in the header shall be chipped from the face of the joint and removed, all surplus concrete on the subbase shall be cleared away, and any irregularities in the subbase shall be corrected. The fresh concrete shall be deposited directly against the old and shall be consolidated with a hand vibrator inserted into the concrete and worked along the entire length of the joint. Transverse construction joints shall not be edged or sealed. The pavement areas adjacent to both sides of a transverse construction joint shall receive additional consolidation from hand vibrators inserted into the concrete and the surface shall be refinished. These areas shall extend at least 10 ft from the joint.

(3) Transverse Terminal Joint. When specified, transverse terminal joints shall be constructed at the ends of a construction section according to the details shown on the Plans and Attachment 14-2 of the Technical Provisions. The concrete sleeper slab shall be constructed of Class A concrete. The coarse aggregate in the Class A concrete shall be of Class AP quality. The sleeper slab shall be constructed to the same slope and cross section as the pavement and the entire top surface shall be given a smooth finish with a steel trowel. The concrete sleeper slab shall be completed and cured in accordance with 504.04, before the pavement and remainder of the transverse terminal joint is constructed. A liquid membrane forming compound shall be used. The surface of the concrete sleeper slab hall be free of any dust, dirt, or other foreign material at the time the continuously reinforced concrete pavement is placed.

(d) Pavement thickness shall be verified in accordance with 501.26, except the random cores shall be located such that none of the longitudinal or transverse steel reinforcement is cut.

Method of Measurement

CRCP will be quantified by the square yard of the thickness specified. The area of CRCP will be the planned width of the pavement multiplied by the length of the pavement or as directed in writing. The width of the pavement will be as shown on the typical cross section of the plans. The length of the pavement will be measured parallel to the surface of the pavement along the centerline of the roadway or ramp, excluding paving exceptions as shown on the plans.

The steel reinforcement, the metal chairs, spacers, clips, wire, or other mechanical means used for fastening or holding reinforcement in place within the CRCP will not be quantified.

Hydrated lime slurry for whitewashing will not be quantified.

The wide flange beam terminal joint will not be quantified.

The transverse terminal joint will not be quantified.

Basis of Item

The accepted quantities of CRCP will be included in QC/QA-Continuous Reinforced Concrete Pavement, 13 In., per square yard for the thickness specified, completed in place. Steel reinforcement, the metal chairs, spacers, clips, wire, or other mechanical means used for fastening or holding reinforcement in place in the CRCP shall be included in the QC/QA-Continuous Reinforced Concrete Pavement, 13 In..

Transverse terminal joints and wide flange beam terminal joints shall be included in the cost of the QC/QA-Continuous Reinforced Concrete Pavement, 13 in..

Adjustments to the contract payment with respect to flexural strength, thickness, air content, and air content range will be included in a quality assurance adjustment pay item in accordance with 109.05.1

CRCP thickness determination will be made in accordance with 501.31.

The item list will include:

Item No.	Item Description	Unit Symbol
501-XXXXX	QC/QA-Continuous Reinforced Concrete Pavement, 13 In.	SYS
501-06727	Coring, PCCP	LS

The following shall be considered incidental to this item:

Trial batch demonstrations shall be included in the cost of QC/QA-Continuous Reinforced Concrete Pavement, 13In..

Material, transportation, placement, and all incidentals necessary for whitewashing.

Corrections for pavement smoothness and re-texturing.

Coring and refilling of the pavement holes for appeals.

Traffic control for appeals shall be supplied.

Removal and replacement of QC/QA-Continuous Reinforced Concrete Pavement, 13 In., damaged by freezing.

CRCP Concrete Mix Criteria

The CMD shall contain at least one, but no more than two supplementary cementitious materials, SCM. The CMD shall produce workable concrete mixtures, with the minimum amount of water, and having the following properties:

Minimum total cementitious content ..... 500 lbs/cu yd
Minimum portland cement content ..... 350 lbs/cu yd
*Allowable amount of single SCM, % of total cementitious, by weight..... 20% to 40%**
*Allowable amount of two SCM, % of total cementitious, by weight..... 25% to 40%***
*Allowable amount of silica fume, % of total cementitious, by weight..... 3% to 7%****
Maximum water/cementitious ratio 0.42
Maximum Slump ..... 8 in.
Air..... 5.8% to 9.2%
Minimum flexural strength, third point loading ..... 570 psi at 7 days
Relative yield.....0.98 to 1.02

** For a binary system that contains fly ash or GGBFS combined with cement*
***For ternary mixes, the amount of fly ash or GGBFS in the binder system shall not be less than 15% of the total cementitious defined by the CMDP.*
****Silica fume shall only be a SCM component of a ternary binder system.*

The coarse aggregate shall be of class AP quality and consist of dolomite aggregates that meet the requirements of 904.01 and ITM 205. A list of approved dolomite aggregate sources is available on the Department's website. The CMD shall include a combined aggregate gradation that is within the limits of the following table. Proportions will be based upon saturated surface dry (SSD) aggregates.

Combined Aggregate Gradation (Percent Retained) [(a)(b)]		
Sieve Size	*Lower Limit*	*Upper Limit*
1 in. (25 mm)	*0*	*0*
¾ in. (19 mm)	*0*	*20*
½ in. (12.5 mm)	*4*	*20*
3/8 in. (9.5 mm)	*4*	*20*
No. 4 (4.75 mm)	*4*	*20*
No. 8 (2.36 mm)	*0*	*12*
No. 16 (1.18 mm)	*0*	*12*
No. 30 (600 µm)	*4*	*20*
No. 50 (300 µm)	*4*	*20*
No. 100 (150 µm)	*0*	*10*
No. 200 (75 µm)	*0*	*2*

(a) The total volume of coarse sand (#8-#30) shall be ≥ 20%
(b) The total volume of fine sand (#30-#200) shall be ≥ 25% and ≤ 40%

Absorption tests shall be performed on the fine aggregate in accordance with AASHTO T 84 and on the coarse aggregate in accordance with AASHTO T 85. Absorption test results for a

particular size of aggregate that differ by more than 1.0 percentage point from the Department's source value shall be investigated. The Design-Build Contractor shall report any differences that exceed 1.0% to the Department. The Design-Build Contractor's results shall be used when calculating the water/cementitious ratio.

If type IP, type IP-A, type IS or type IS-A cements are to be used, the portland cement content shall be increased to a minimum of 500 lbs/cu yd. The additional use of SCM, other than silica fume, will not be allowed when blended cement types IP, IP-A, IS, or IS-A are used.

Chemical admixtures type A, type B, type C, type D, type E, type F, and, type G may be allowed with prior written approval. A*dmixture type C shall not be used in conjunction with type 3 cement. Calcium chloride shall not be used.*

CRCP Trial Batch

A trail batch shall be conducted in accordance with 501.06, except the concrete shall meet the following requirements:

a) Air content shall be 5.8% to 9.2%.
b) The plastic unit weight shall be within ± 3.0% from the target plastic unit weight of the CMDS.
c) The water/cementitious ratio shall be within ± 0.015 of the target value of the CMDS and shall not exceed 0.425

CRCP Pay Factors for Air Content

LOT AVERAGE AIR CONTENT	
Percent, %	Pay Factors
> 9.8	*
9.7 – 9.8	*0.85*
9.5 – 9.6	*0.95*
9.3 – 9.4	*0.99*
5.8 – 9.2	*1.00*
5.7	*0.93*
5.6	*0.90*
5.5	*0.85*
5.4	*0.79*
< 5.4	*
* The CRCP will be adjudicated as a failed material in accordance with normal Department practice as listed in 105.03. The CRCP may be subject to removal and replacement or left in place with reduced or no payment.	

LOT RANGE FOR AIR CONTENT	
Percent, %	Pay Factors
0.0 – 2.5	1.00
2.6 – 3.0	0.99
3.1 – 3.5	0.97
> 3.5	*

* The CRCP will be adjudicated as a failed material in accordance with normal Department practice as listed in 105.03. The CRCP may be subject to removal and replacement or left in place with reduced or no payment.

NEXT GENERATION CONCRETE SURFACE

Description

This Work shall consist of construction of the Next Generation Concrete Surface, NGCS, on newly constructed continuously reinforced concrete pavements, CRCP, and portland cement concrete pavements, PCCP, using diamond grinding and grooving techniques in accordance with 105.03.

Equipment Requirements

The grinding shall be completed by mechanical grinding equipment in accordance with 508.08(c) and the equipment shall weigh a minimum of 35,000 lbs including the grinding head and be of a size that will grind a strip at least 4 ft wide in a single pass. Grinding equipment that causes raveling, aggregate fractures, spalls, or disturbance to the transverse or longitudinal joints shall not be permitted. The equipment shall have a positive means of vacuuming the grinding residue from the pavement surface leaving the surface in a clean, near-dry condition.

The equipment shall be maintained to ensure it is in proper working order, with attention paid to the roundness of the match and depth control wheels. Any wheels found to be out of round shall be replaced immediately.

Construction Requirements

The construction operation shall be scheduled and proceed in a manner that produces a neat, uniform finished surface. Shoulder, auxiliary or ramp lane grinding shall transition from the edge of the mainline as required to provide drainage, leaving no more than a 3/16 in. ridge and an acceptable riding surface. When conditions require a feather pass into the shoulder, auxiliary or ramp lanes, conventional diamond grinding shall be used. Joint sealing shall be completed subsequent to the diamond grinding operations and shall be installed in a recessed condition. NGCS construction shall be accomplished using a two-pass operation as described herein.

The Design-Build Contractor shall construct a single lane NGCS test grind 500 ft in length to demonstrate that the equipment and procedures used are capable of attaining the desired surface texture and smoothness requirements. The Design-Build Contractor shall not proceed beyond the test grind limits until the test grind has been approved in writing by INDOT.

Grinding shall be accomplished in a manner that eliminates joint or crack faults so there is no more than a 1/16 in. differential between the adjacent sides of the joints and cracks. Grinding shall also substantially remove pavement conditions such as warp and curl to provide an acceptable ride in accordance with the smoothness requirements described herein.

Lateral drainage shall be achieved by maintaining a constant cross slope between grinding extremities in each lane. The finished cross slope shall mirror the pre-grind cross slope and shall have no variations of slope greater than 1/8 in. when measured with a 10 ft straightedge placed perpendicular to the centerline. Smoothness requirements will not apply to areas outside the ground area.

Grinding shall begin and end at lines normal to the pavement centerline at the project limits. Passes of the grinding head shall not overlap more than 1 inch. No unground surface area between passes will be permitted.

This Work shall be constructed in two separate operations. The first operation will create the flush ground surface. The flush grind blades shall be mounted on a 4 ft grinding head, stacked with 1/8 in. wide blades separated by 0.035 +/-0.005 inch wide spacers. The blades used to produce the flush ground surface shall be flat across their contact surface and in the same plane with other flush grind blades when mounted. The complete head, when stacked with all blades, shall be straight across its length without bowing when mounted on the diamond grinding machine. No unground surface area between passes will be allowed. The surface shall meet the smoothness requirements described herein.

The second operation will provide the longitudinal grooves. The longitudinal grooves shall be 1/8 in. wide and will be 1/8 in. to 3/16 in. in depth. The longitudinal grooves shall be spaced on 1/2 in. to 5/8 in. centers. The grooves shall be constructed parallel to the centerline. The Design-Build Contractor shall use a guide to ensure proper alignment of the grooves to centerline.

Final Surface Finish

The NGCS grinding process shall produce a pavement surface that is true to grade and uniform in appearance with a longitudinal grooved texture. The flush ground surface shall appear smooth and shall contain no ridges that exceed 1/32 in. The longitudinal grooves shall be constructed parallel to the centerline. All of the pavement surfaces specified shall be textured utilizing the NGCS unless approved by INDOT.

Slurry Handling and Removal

The operation shall be coordinated such that the slurry or residue materials are continuously removed from the pavement. The slurry shall not encroach into adjacent pavement lanes carrying traffic, or flow into gutters or other drainage facilities and shall be immediately and directly deposited into a tanker truck and removed from the jobsite. Final disposal of the material shall be in an approved manner and in accordance with 104.07.

Smoothness Requirements

Each segment of the finished NGCS shall be in accordance with the USP entitled Inertial Profiler with Smoothness Adjustments for PCCP except that the pay factors for smoothness in accordance with 501.28(d) shall not apply. Surfaces shall be measured for smoothness acceptance following the flush grinding operation and prior to the longitudinal grooving operation. The pavement shall meet an International Roughness Index (IRI) criteria of 60 inches per mile or less for each pavement section of 300 feet. All high or low point deviations with an IRI greater than 150 in./mile, utilizing a 25 ft window, shall be corrected. Corrections shall be made in accordance with 501.25(d).

Basis of Item

NGCS construction will not be quantified and shall be included in the quantity of the PCCP and CRCP.

AGGREGATE DRAINAGE LAYER

SECTION 302, BEGIN LINE 3, INSERT AND DELETE AS FOLLOWS:

302.01 Description

This work shall consist of a foundation course of selected materials, placed and compacted on a prepared subgrade in accordance with 105.03.

Subbase for PCCP shall consist of 3 in. of coarse aggregate No. 8 as the aggregate drainage layer placed over a 6 in. coarse aggregate No. 53 as the separation layer. Dense graded subbase shall consist of a 6 in. coarse aggregate No. 53. *Aggregate drainage layer shall consist of coarse aggregate meeting the requirements below.*

MATERIALS

302.02 Materials

Materials shall be in accordance with the following:

Coarse Aggregate, Class B or Higher, Size No. 8 904
Coarse Aggregate, Class D or Higher, Size No. 53..... 904

Coarse aggregate No. 8 used ~~as an aggregate drainage layer~~ *with Subbase for PCCP* shall consist of 100% crushed stone ~~or ACBF~~.

A coarse aggregate gradation which meets the requirements of ITM 225 and as follows, shall be submitted to INDOT for approval as an aggregate drainage layer.

- *Aggregates shall consist of 100% crushed stone*
- *The maximum aggregate size, smallest sieve which 100 percent of the aggregate sample pass, shall not exceed 3 times the layer thickness to be constructed.*

SECTION 302, BEGIN LINE 53, INSERT AND DELETE AS FOLLOWS:

(b) Aggregate Drainage Layers

~~Compaction shall consist of two passes with a vibratory roller before trimming, and one pass with the same roller in static mode after trimming. A vibratory roller shall be equipped with a variable amplitude system, a speed control device, and have a minimum vibration frequency of 1,000 vibrations per minute. A roller in accordance with 409.03(d)4 may be used.~~

Aggregate drainage layers shall be compacted to achieve the maximum allowable deflection as determined with the Light Weight Deflectometer, LWD, testing in accordance with ITM 508. Compaction shall not occur if the moisture content of the aggregate is greater than optimum moisture content. The optimum moisture content will be determined in accordance with 203.24(a). The maximum allowable deflection will be determined from a test section. Test sections

shall be constructed in accordance with ITM 514 except that the roller weight shall not exceed 10 t.

Acceptance of the compaction of aggregates will be determined by averaging three LWD tests obtained at a random station determined in accordance with ITM 802. The location of the three LWD tests will be at 2 ft from each edge of the construction area and at 1/2 of the width of the construction area. The average deflection shall be equal to or less than the maximum allowable deflection as determined by the test section. The frequency of the LWD testing will be three tests for each 800 t for compacted aggregate.

Construction traffic shall ~~not be allowed~~ *be minimalized* on the aggregate drainage layer. ~~except where placement of the PCCP is restricted. Exceptions shall be submitted for approval.~~ *The aggregate drainage layer shall be proofrolled in accordance with 203.26 using a tandem or tri-axle dump truck loaded to the legal limit and operated between 2 to 4 mph.* All displacement or rutting of the aggregate drainage layers shall be repaired prior to placing subsequent material.

When an aggregate drainage layer is placed under a patch the aggregate shall be compacted in accordance with 203.25.

SECTION 302, BEGIN LINE 74, INSERT AS FOLLOWS:

302.08 Method of Measurement

Subbase for PCCP*,* ~~*or*~~ dense graded subbase*, and aggregate drainage layer* will be measured by the cubic yard based on the theoretical volume to the neat lines as shown on the plans. The quantity shown in the Schedule of Pay Items will be adjusted if it is shown to be different by more than 2% of the measured quantity.

302.09 Basis of Item

The accepted quantities of subbase for PCCP*,* ~~or~~ dense graded subbase*, and aggregate drainage layer* will be quantified per cubic yard, complete in place.

The item list will include:

Item No.	Item Description	Unit Symbol
302-07455	Dense Graded Subbase	CYS
302-06464	Subbase for PCCP	CYS
302-12387	*Aggregate Drainage Layer*	*CYS*

The following shall be considered incidental to these items:

The cost of compacting, water, aggregate placed outside neat lines as shown on the plans, and necessary incidentals.

The cost of furnishing the materials, supplier's representative, supplemental test data, all labor and equipment required for furnishing and placing the aggregate drainage layer.

QUALITY CONTROL/QUALITY ASSURANCE QC/QA, PORTLAND CEMENT CONCRETE, PCCP

SECTION 501.03, LINE 31 INSERT THE FOLLOWING:

Portland Cement……901.01(b)**

SECTION 501.03, AFTER LINE 32 INSERT THE FOLLOWING:

Silica fume……901.04

SECTION 501.03, AFTER LINE 34 INSERT THE FOLLOWING:

*** Type IS-A and Type IP-A blended cements are not allowed.*

SECTION 501.04(a), LINE 48, DELETE AND INSERT AS FOLLOWS:

(g) the specific gravity of ~~pozzolan~~ *each supplementary cementitious material (SCM)*

SECTION 501.04(a), LINE 68, DELETE AND INSERT AS FOLLOWS:

2. ~~pozzolan~~ *SCM* source or type

SECTION 501.04(b), LINES 95 & 96, DELETE AS FOLLOWS:

~~6. increase in cement content from the amount designated in the original CMDP.~~

SECTION 501.05, LINES 117-125 DELETE AND INDERT AS FOLLOWS:

The CMD shall *contain at least one, but no more than two SCM's, and* produce workable concrete mixtures having the following properties:

Minimum ~~portland~~ *total* ~~cement~~ cementitious content *defined by CMDP*…….....~~400~~ *500* lbs/cu yd

*Allowable amount of single SCM defined by CMDP, % of total cementitious, by weight...20.0 - 40.0%**

*Allowable amount of two SCM's defined by CMDP, % of total cementitious, by weight.....25.0 – 40.0%***

Minimum portland cement content defined by CMDP……350 lbs/cu yd

*Allowable amount of silica fume SCM defined by CMDP, % of total cementitious content….3.0 – 7.0%***

Maximum *allowable* water/cementitious ratio of concrete mixture *with fly ash SCM* …..~~0.450~~ *0.440*

Maximum allowable water cementitious ratio of concrete mixture with ggbfs SCM……0.450

~~Minimum portland cement/fly ash ratio .....3.2 by weight~~

~~Minimum portland cement/GGBFS ratio .....2.3 by weight~~

Target air content *defined by CMDP* ..... ~~6.5~~ *7.0*%

Minimum flexural strength, third point loading .....570 psi at 7 days

**For binary binder system that contains fly ash or ggbfs combined with cement. If blended cement is used it shall be either a Type IP(25≤X≤40) or Type IS(25≤X≤40) or Type IL. Blended cements, except for Type IL, shall not be used in combination with plant added ggbfs or fly ash to create a binary binder system. When using a Type IL blended cement, plant addition of fly ash or ggbfs is allowed. The limestone dust in Type IL cement will not be considered in calculating the amount of SCM.*

***For ternary binder system ~~mixes, the amount of fly ash or ggbfs in the binder system shall not be less than 15.0% of the total cementitious defined by the CMDP~~. that contain two SCM's combined with a cement. For example: fly ash and ggbfs, or fly ash and silica fume, or ggbfs and silica fume. A blended cement shall not be combined with a plant added SCM of the same type of pozzolan to create a ternary system. For example: a Type IP cannot be combined with a plant added fly ash and ggbfs. When using a Type IL blended cement, plant addition of both fly ash and ggbfs is allowed. The limestone dust in Type IL cement will not be considered in calculating the amount of SCM. Silica fume may only be a SCM component of a ternary binder system. If a blended cement is used, silica fume may be a component of the ternary system.*

SECTION 501.05, LINES 146 TO 151, DELETE AND INSERT THE FOLLOWING:

~~Fly ash or GGBFS used as an additive, or blended cements may only be incorporated in the concrete mix between April 1 and October 15 of the same calendar year. If type IP, type IP-A, type IS or type IS-A cements are to be used, the minimum portland cement content shall be increased to 500 lbs/cu yd. The use of fly ash or GGBFS as an additive will not be allowed when blended cement types IP, IP-A, IS, or IS-A are used.~~

Hand placed paving operations meeting the requirements of 508.04(c) and occurring prior to April 1 or after October 15, of the same calendar year, shall utilize concrete having a ternary binder system that contains silica fume as one of the SCM's. Concrete with a ternary binder system containing silica fume as one of the SCM's, may be used in any approved method of pavement placement without calendar restriction. Placement operations that involve form riding equipment in accordance with 508.04(b), may utilize any approved binary CMDP, without calendar date restrictions, with written approval by the Department.

SECTION 501.06, LINES 166 – 169, DELETE AND INSERT THE FOLLOWING:

conduct the air content test. The air content shall be ~~5.0~~ *5.5*% to 10.0%. The plastic unit weight shall be within ± 3.0% from the target plastic unit weight of the CMDS. The water/cementitious ratio shall be within ± ~~0.030~~ *0.015* of the target value of the CMDS and shall not exceed ~~0.450~~ *the maximum amount allowed for the appropriate mix in accordance with 501.05*. The flexural strength shall be determined by averaging a

SECTION 501.06, LINES 176 – 181, DELETE AS FOLLOWS:

~~A trial batch is not required for a CMDS that has any of the following criteria:~~
~~(a) minimum cement content of 564 lbs/cu yd and a~~
~~target water/cementitious ratio of 0.420~~
~~(b) class C concrete in accordance with 702 using Class AP coarse aggregate.~~

SECTION 501.15, LINES 288-289, DELETE AND INSERT THE FOLLOWING:

when the ambient temperature is 35°F and above~~, unless procedures outlined in the QCP for lower temperatures are followed~~. *If the local forecast predicts an average minimum temperature below 40 °F for 10 consecutive days, the QCP shall provide details prior to the cold weather to address changes in materials, concrete batching and mixing processes, construction methods, curing, and protection of the in situ concrete to insure that the necessary quality characteristics will not be compromised as a result of the cold weather.* Prior to attaining opening to traffic

SECTION 501.23(a). LINES 356-357, DELETE AND INSERT THE FOLLOWING:

Construction vehicles or equipment will be allowed on the PCCP ~~after 10 days or~~ when flexural tests indicate a modulus of rupture of 550 psi or greater. ITM 402

SECTION 501.23(b), LINES 364-367, DELETE AND INSERT THE FOLLOWING:

The PCCP may be opened to traffic ~~after 14 days. The PCCP may be opened earlier if the test beams of ITM 402~~ *when flexural tests* indicate a modulus of rupture of 550 psi or greater. *ITM*

402 may be used as an alternate method to determine the flexural strength. If adequate strengths are not ~~met within 14 days~~ *achieved*, an investigation by the INDOT and Design-Build Contractor will be conducted to determine if the PCCP is deficient. Resolutions for

SECTION 501.27(b), LINE 518, DELETE AND INSERT THE FOLLOWING:

0.030 of the target value or exceed ~~0.450~~ *the maximum allowed for the appropriate mixture in accordance with 501.05*. A stop paving order will be issued if the

SECTION 501.27(d), LINES 533 – 534, DELETE AND INSSERT THE FOLLOWING:

The average lot air content values shall not vary more than - ~~0.8~~ *1.2*% to + ~~2.4~~ *2.2*% from the ~~6.5~~ 7.0% target air content. The range of sublot air content values shall not

SECTION 501.28(b)1., LINE 606, DELETE AND INSERT THE FOLLOWING:

LOT AVERAGE AIR CONTENT	
Percent, %	Pay Factors
> 9.8	*
9.7 – 9.8	~~0.80~~ *0.85*
9.5 – 9.6	~~0.90~~ *0.95*
9.3 – 9.4	~~0.95~~ *0.99*
~~9.0~~ *5.8* – 9.2	~~0.99~~ *1.00*
5.7 ~~– 8.9~~	~~1.00~~ *0.93*
5.6	~~0.93~~ *0.90*
5.5	~~0.90~~ *0.85*
5.4	~~0.85~~ *0.79*
~~5.3~~	~~0.79~~
< ~~5.3~~ *5.4*	*
* The PCCP will be adjudicated as a failed material in accordance with normal Department practice as listed in 105.03. The PCCP may be subject to removal and replacement or left in place with reduced or no payment.	

LOT RANGE FOR AIR CONTENT	
Percent, %	Pay Factors
0.0 – 2.5	1.00
2.6 – 3.0	0.99
3.1 – 3.5	0.97
> 3.5	*

* The PCCP will be adjudicated as a failed material in accordance with normal Department practice as listed in 105.03. The PCCP may be subject to removal and replacement or left in place with reduced or no payment.

SECTION 501.28(b)2., LINE 609, DELETE AND INSERT THE FOLLOWING:

If a sublot value is less than ~~5.0~~ *5.5*% or greater than 10.0%, the PCCP will be

SUBGRADE TREATMENT TYPE 1D

The Standard Specifications are revised as follows:

SECTION 207, BEGIN LINE 9, INSERT AS FOLLOWS:

207.02 Materials

Materials shall be in accordance with the following:

Chemical Modifiers..... 215.02
Coarse Aggregate, Class D or Higher,
Size No. 5, 8, 43, 53, or 73 904
Geogrid, Type IB 918.05
Geocell Confining System 214
Geotextile for Pavement and Subgrade ..... 918.02(c)
Water 913.01

Air-cooled blast furnace slag shall not be used for subgrade treatment, type ID.

SECTION 207, BEGIN LINE 31, INSERT AS FOLLOWS:

207.03 Construction Requirements

(a) Subgrade Construction Methods

The subgrade shall be constructed uniformly transversely across the width of the pavement including shoulders or curbs unless shown otherwise on the plans, by one of the following methods:

(a) chemical modification in accordance with 215;

(b) aggregate No. 53 in accordance with 301;

(c) geogrid in accordance with 214 placed under aggregate No. 53 in accordance with 301, or

(d) soil compaction to 100% of maximum dry density~~.~~*;*

(e) *geotextile in accordance with 214 placed under aggregate No. 5, 8, and 53 in accordance with 301*.

Longitudinally, the treatment may vary depending on the method of construction.

SECTION 207, BEGIN LINE 71, INSERT AS FOLLOWS:

207.04 Subgrade Treatment Types

The subgrade treatment type shall be as specified on the contract plans. If required, the subgrade foundation shall be corrected as directed by INDOT prior to subgrade treatment.

Type	Subgrade Description
I	24 in. of soil compacted in accordance with 203.23
IA	[blank]
IB	14 in. chemical soil modification
IC	12 in. coarse aggregate No. 53 in accordance with 301
ID	12 in. of coarse aggregate with a geotextile in accordance with 918.02(c)
II	6 in. coarse aggregate No. 53 in accordance with 301
IIA	8 in. chemical soil modification
III	In-place compaction in accordance with 203.23
IV	12 in. coarse aggregate No. 53 with Type IB geogrid in accordance with 214
IVA	12 in. coarse aggregate with Geocell confining system in accordance with 214
V	3 in. of subgrade excavated and replaced with 3 in. coarse aggregate No. 53

Type ID subgrade treatment shall be constructed with 9 in. of coarse aggregate No. 53 over 3 in. of coarse aggregate No. 5 or No. 8. Geotextile, Type 2B in accordance with 918.02(c) shall be placed above and below the layer of No. 5 or No. 8 coarse aggregate.

In areas where shallow utilities are encountered or chemical modification is not allowed, the Design-Build Contractor may submit a request to INDOT to substitute Type IC for Type IB.

SECTION 207, BEGIN LINE 107, INSERT AS FOLLOWS:

207.05 Basis of Item

Subgrade treatment will be measured in both cut and fill areas by the square yard per type. Chemicals for modification, excavation, aggregates, *geotextile,* and geogrid materials will not be measured.

The undercutting of rock, where encountered, will be measured in accordance with 203.27(b).

SECTION 207, BEGIN LINE 124, INSERT AS FOLLOWS:

The item list will include:

Item No. **Item Description** **Unit Symbol**

207-XXXXX Subgrade Treatment, Type _____ .....SYS

The following shall be considered incidental to this item:

Subgrade treatments including testing, sampling, aggregates, chemicals for modification, geogrid, geotextile and geocell confining system, coarse aggregate for subgrade Type IC, *Type ID*, Type II, Type IV, Type IVA, Type V, water, and the excavation required.

PCCP JOINTS

The Standard Specifications are revised as follows:

SECTION 503, DELETE LINE 16, INSERT AS FOLLOWS:

Hot Pour Joint Material……906.02(a)2.

SECTION 503, BEGIN LINE 49, DELETE AND INSERT AS FOLLOWS:

~~Sawed contraction joints shall be cut in two operations.~~ The ~~initial~~ saw cut shall

SECTION 503, BEGIN LINE 59, DELETE AND INSERT AS FOLLOWS:

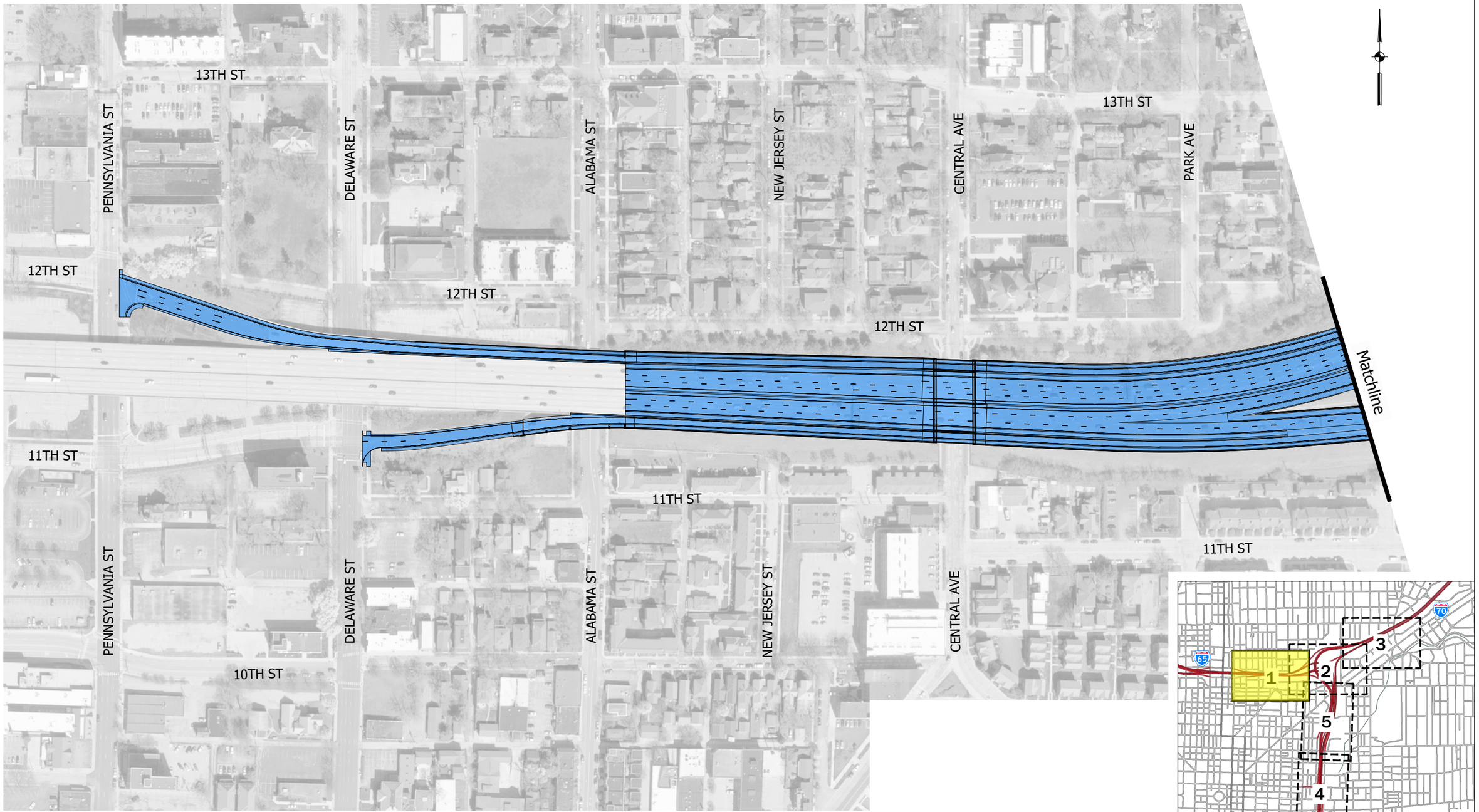
The ~~second~~ saw cut shall be made after the concrete has sufficiently cured, but before opening the pavement to non-construction traffic. *The width of the saw cut shall be measured for specification compliance at the time of the sawing operations.* Slurry or saw residue

SECTION 503, BEGIN LINE 78, DELETE AND INSERT AS FOLLOWS:

construction traffic uses the PCCP prior to sealing. *The sawed joint shall be cleaned as specified in 503.05(a).*

SECTION 503, BEGIN LINE 214, DELETE AS FOLLOWS:

~~When preformed elastomeric joint seals are used, the material shall be installed in one continuous piece by means of an approved machine. The seal shall not be stretched more than 5% while being placed and show no twisting, rollover, folding, cutting, or excess lubricant-adhesive on the top of the seal. Elastomeric joint seal may be installed in two separate pieces for phased construction with the splice point occurring at the highest point of the joint. The splicing method used shall be in accordance with the seal manufacturer's recommendations.~~



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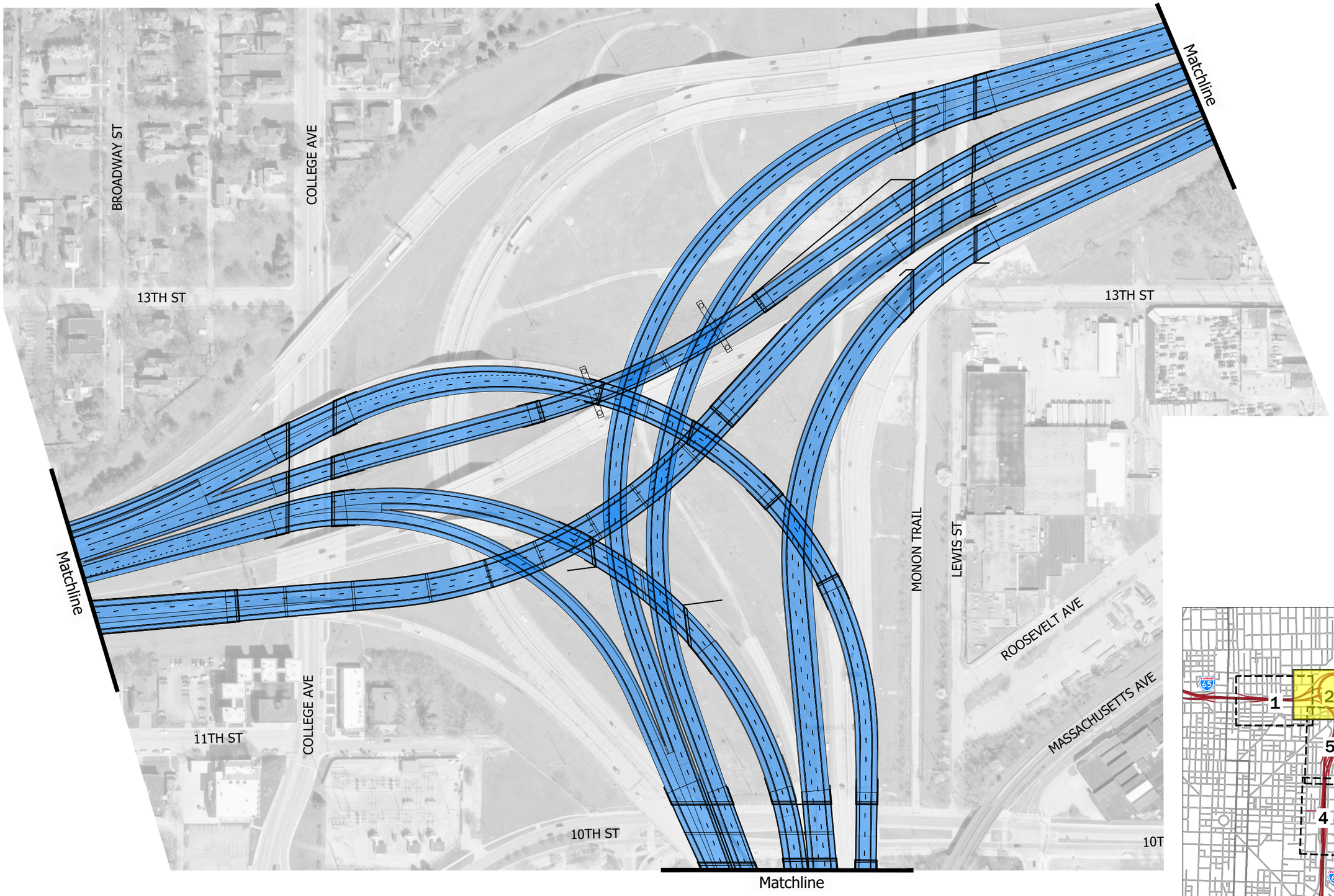
SCALE : FEET

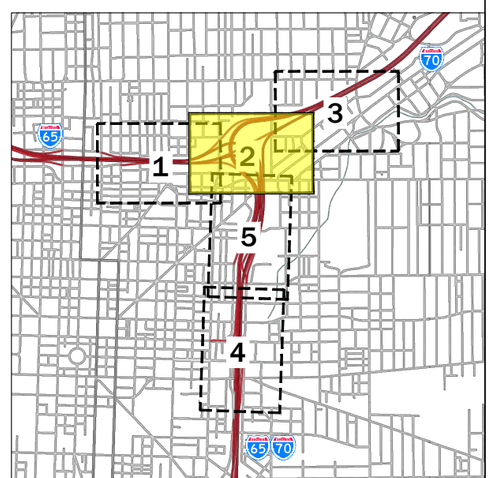
NORTH SPLIT UPGRADES DRIVING PROGRESS

INDIANA DEPARTMENT OF TRANSPORTATION

DOWNTOWN INDIANAPOLIS NORTH SPLIT IMPROVEMENTS

PAVEMENT LIMITS





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DOWNTOWN INDIANAPOLIS NORTH SPLIT IMPROVEMENTS

PAVEMENT LIMITS

ARSENAL AVE
SHELDON ST
ROOSEVELT AVE
Matchline
DR A J BROWN AVE
LUDLOW AVE
YANDES ST
COLUMBIA AVE
COMMERCE AVE
ROOSEVELT AVE
Matchline
MASSACHUSETTS AVE
18TH ST
Matchline
LUDLOW AVE
COLUMBIA AVE

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DOWNTOWN INDIANAPOLIS NORTH SPLIT IMPROVEMENTS

PAVEMENT LIMITS

COLLEGE AVE

COLLEGE AVE

WASHINGTON ST

MARKET ST

OHIO ST

NEW YORK ST

VERMONT ST

DAVIDSON ST

DAVIDSON ST

DAVIDSON ST

PINE ST

PINE ST

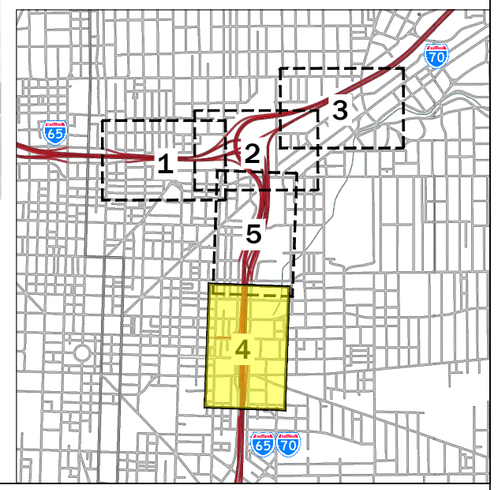
Matchline

WASHINGTON ST

MARKET ST

OHIO ST

NEW YORK ST



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NORTH SPLIT UPGRADES DRIVING PROGRESS

INDIANA DEPARTMENT OF TRANSPORTATION

DOWNTOWN INDIANAPOLIS NORTH SPLIT IMPROVEMENTS

PAVEMENT LIMITS

MICHIGAN ST

NORTH ST

ST CLAIR ST

MASSACHUSETTS AVE

10TH ST

DAVIDSON ST

Matchline

PINE ST

DAVIDSON ST

BELLFONTAINE ST

Matchline

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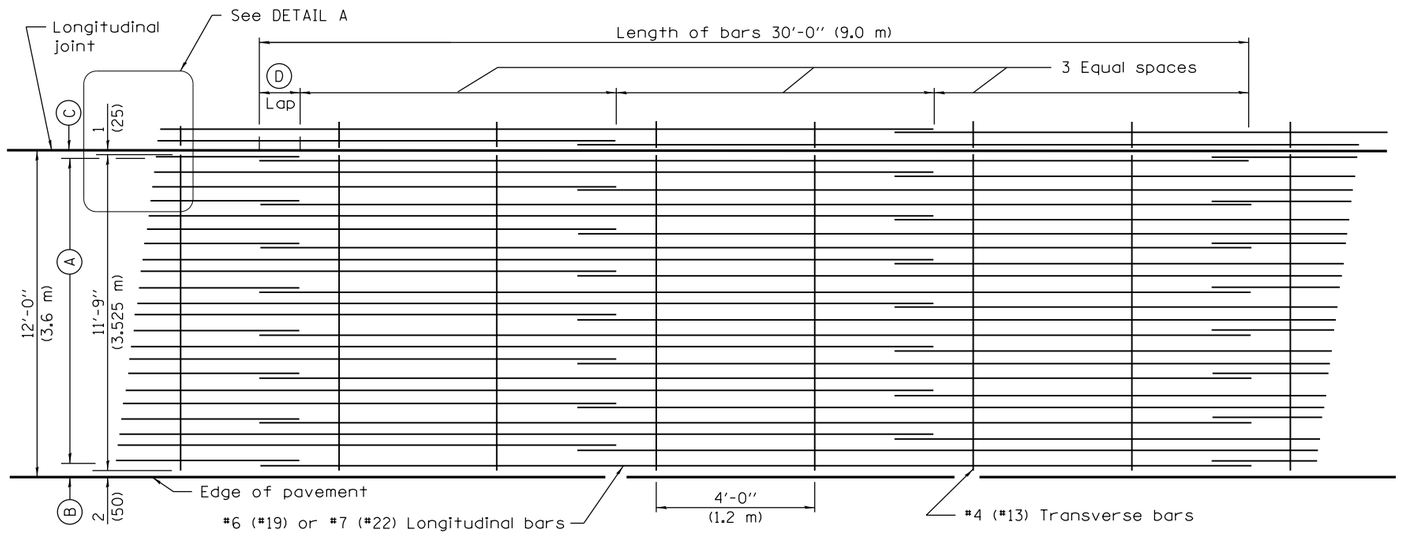
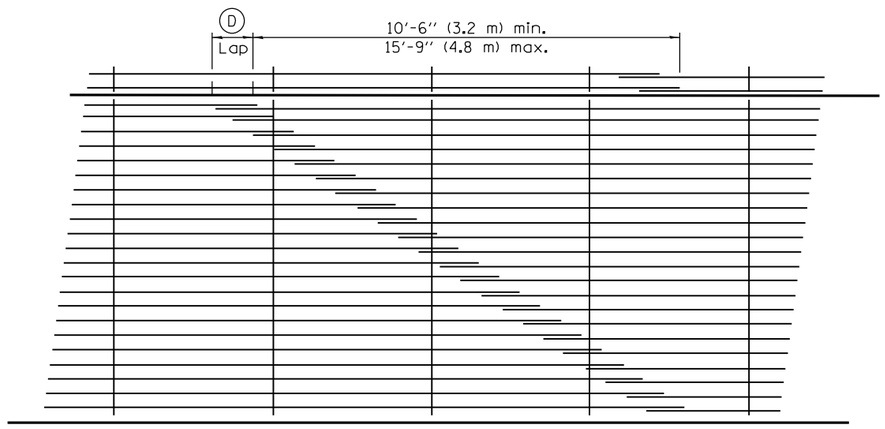
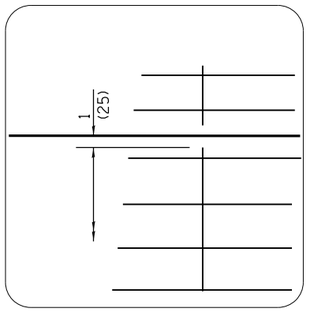


ENGLISH (inches)					
Bar Size	Pavement Thickness	Ⓐ (Approx. Spacing)	Ⓑ	Ⓒ	Ⓓ
#6	7¾ thru 8½	18 spaces (19 bars) @ 7⅝	3½	3	22
#6	8¾ thru 9½	20 spaces (21 bars) @ 6⅞	3½	3	22
#6	9¾ thru 10½	22 spaces (23 bars) @ 6¼	3½	3	22
#6	10¾ thru 11½	24 spaces (25 bars) @ 5¾	3½	3	22
#6	11¾ thru 12½	27 spaces (28 bars) @ 5⅛	3½	3	22
#7	9¾ thru 10½	16 spaces (17 bars) @ 8⅝	3½	3	26
#7	10¾ thru 11½	18 spaces (19 bars) @ 7⅝	3½	3	26
#7	11¾ thru 12½	19 spaces (20 bars) @ 7¼	3½	3	26
#7	12¾ thru 13½	21 spaces (22 bars) @ 6½	3½	3	26
#7	13¾ thru 14½	23 spaces (24 bars) @ 6	3½	3	26
#7	14¾ thru 15½	24 spaces (25 bars) @ 5¾	3½	3	26
#7	15¾ thru 16½	26 spaces (27 bars) @ 5¼	3½	3	26

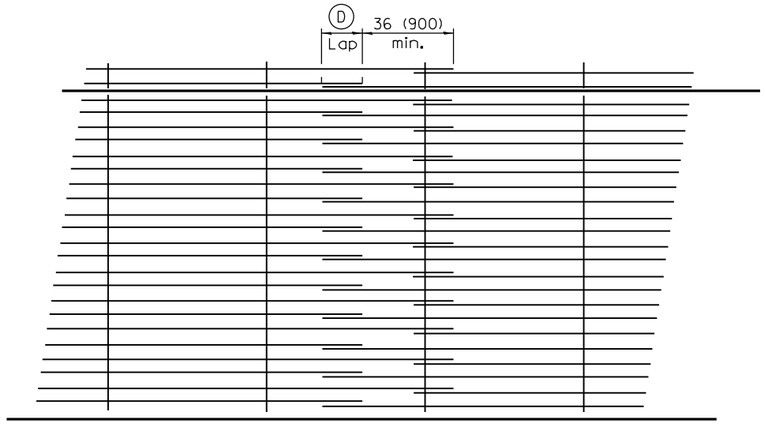
LAP DETAIL I





DETAIL A

LAP DETAIL II



LAP DETAIL III

GENERAL NOTES

Except as noted or shown, the dimensions and notes specified for LAP DETAIL I are typical for LAP DETAIL II and III.

The Ⓑ dimension and the distance from the end of the transverse bar to the edge of pavement may be increased by 1 (25) for slip form paving.

All dimensions are in inches (millimeters) unless otherwise shown.

BAR REINFORCEMENT FOR CRC PAVEMENT