New Jersey Turnpike Authority
P.O. Box 5042, Woodbridge, NJ 07095

June 13, 2025

Document Change Announcement

2007 Design Manual

Portable Longitudinal Steel Barrier

DCA2025DM-02

Subject: Revisions to
Section 10 Traffic Control During Construction

Description of Change:

This DCA adds portable longitudinal steel barrier as an approved alternate to precast concrete construction barrier. Clarification was added for mounting of modular glare screen systems in accordance with instructions of the glare screen system manufacturer and barrier manufacturer as applicable.

Contract documents shall utilize as basis of design, unless otherwise directed, precast concrete construction barrier adhering to the joint classes as defined on the TP Standard Drawings and Section 10 of the Design Manual.

Concurrent DCAs to Design Manual and Standard Supplementary Specifications are released to integrate these revisions.

Notice to New Jersey Turnpike Authority Staff and Design Consultants
Effective immediately, all contracts currently in the design phase shall incorporate the revisions herein. For advertised contracts awaiting the opening of bids this revision shall be incorporated via addendum. Contact your New Jersey Turnpike Authority Project Manager for instruction.

The revisions may be accessed on the Authority's webpage: https://www.njta.com/doing-business/professional-services

Recommended By:

(signature on original)

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Distribution: Senior Staff Engineering, Law, Maintenance & Operations Depts., All Prequalified Consultant Firms, File

NOTE: All text herein are REVISIONS, as indicated by the tracked changes, to the latest version of the Design Manual.

Section 10 - Traffic Control During Construction

10.1. Introduction

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10.2. General

The first two sheets of the Maintenance and Protection of Traffic Plans should be as shown on the Sample Plan, as appropriately modified for individual project needs. These sheets contain a standard legend of typical traffic control devices, general traffic control notes, an escape ramp detail, a typical section for placement of construction barrier, a table showing recommended spacing of the channeling devices and a table showing recommended sight distances to the beginning of the channel tapers. The legend and general traffic control notes should be reviewed and modified to include other project specific symbols and notes as necessary for each project. The Sample Plans can also be modified to include other project specific information necessary to adequately address traffic control needs. Where required for clarification, sectional views showing the placement of traffic control devices adjacent to the traveled way and the work site should be provided. The Authority's Standard Drawings may never be revised by an Engineer.

Additional Traffic Control Plans should follow the first two (2) standard sheets. These additional plans should be included to show plan views of project specific work sites when those locations need to be represented or where design features of traffic control devices (such as the type of ~~precast~~ construction barrier) or temporary pavement markings need to be indicated. The scale of the Traffic Control Plans should be selected so that the optimum amount of information is shown on a minimum number of plan sheets. The Traffic Control Plans should include a tabulation of the channelization devices needed for the project.

The Engineer shall note any recommendations that conflict with the Authority's Traffic Manual and provide justification for the Authority's appropriate Operations Department approval.

As a minimum, Traffic Control Plans should include the following items:

1. Required lane widths for each staging plan
2. Grading, drainage and utilities for temporary roadways and crossovers
3. Detours with respective detour signing
4. Temporary drainage associated with traffic staging
5. Temporary staging for drainage and other utilities

6. Temporary traffic signals and associated signal phasing design, if necessary
7. Advance warning signing for each staging plan
8. Traffic control and safety devices that are necessary for each stage of construction
9. Township and county
10. Graphic scale and north arrow
11. Allowable working hours
12. Accommodation for Pedestrian traffic (i.e. locations of temporary sidewalks)
13. Appropriate use of temporary / permanent barriers and end treatments
14. Appropriate plans and specifications to address safety concerns
15. Requirements of the State Police and/or local law enforcement

10.3. Maintenance and Protection of Traffic Plans

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10.4. Traffic Impact Report

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10.5. Development of Traffic Control Plan...

Design Parameters

The Authority recognizes the need to effectively and efficiently manage traffic through construction projects in order to reduce congestion, maintain high standards of safety for workers, pedestrians and motorists, and minimize impacts to the local community both business and residential.

On the New Jersey Turnpike and Garden State Parkway, congestion is mitigated through the use of their lane reduction tables. Any lane or roadway closings outside the allowable times will not be considered, unless the Engineer proposes a method to mitigate the speed differential risk, including but not limited to a traffic queue warning system. The Engineer shall also evaluate ramp construction to determine and mitigate any truck overturn risk.

To this end, the scoping, design, scheduling and construction of projects should be accomplished in a manner that will provide standards of safety for workers and the traveling public, minimize congestion and community impacts by maintaining levels of service close to preconstruction levels and provide the contractor with adequate access to the roadway to complete the work efficiently, while meeting the quality requirements of the contract.

In order to achieve these objectives, an Engineer shall utilize the Authority's Road User Cost Manual and the appropriate Traffic Manual to evaluate potential alternatives, in terms of cost to the traveling public, as directed by the Authority's Project Manager. All projects should be

designed to minimize road user cost impacts. This may be accomplished through a variety of means including, but not limited to, reduced daytime construction hours, nighttime operations, detours, diversionary roads, crossovers, the use of shoulders as travel lanes, temporary roads and bridges, alternating traffic patterns, non-traditional methods of completing the work, and using faster setting materials. The incorporation of design elements to ease traffic impacts during future construction should also be considered. These could include wider lanes, shoulders or right of way, full depth shoulders, removable sidewalks on bridges, and other alternatives.

The basic safety principles governing the design of permanent roadways and roadsides should also govern the design of construction, maintenance and utility work sites. The goal shall be to safely route traffic through these areas with geometrics and traffic control devices, as nearly as possible, comparable to those for normal highway situations, with the design speed that is specified by the Authority's appropriate Operations Department. The following items should be considered in determining the overall approach to project specific traffic control:

1. Regarding hours of operation or lane restrictions, consideration should be given to the location of the project and calendar of events. Unless there are valid reasons to the contrary, travel lanes should not be reduced in number or width, nor work be permitted to interfere with traffic, on weekends, holidays (including the PM peak the day before and the AM peak the day after) and days of special events of major traffic generators near the project site, such as the Meadowlands Complex, Garden State Arts Center, shore areas during the summer, etc.
2. Through the Authority's Project Manager, discuss the project with the Authority's appropriate Operations Department to determine the number of lanes which can be closed during the day, during the night, or on weekends. Incorporate seasonal variations into the analysis. Through the Authority's Project Manager, the Engineer shall contact the Authority's appropriate Operations Department, which has jurisdiction and ask what lane or road closings they will allow and discuss independent findings with them. With concurrence from the responsible Operations Department, define the allowable lane closing periods.
3. Provide minimum lane widths of 11 feet for all lane shifts and diversionary roads~~, except;~~ where existing lane widths are less than 11 feet match existing lane width but no less than 10 feet.
4. Determine if detour routes are available. If potential detour routes exist, determine if their use would enhance the constructability of the project.
5. Determine if shoulders or temporary pavements can be used by traffic. Shoulders may require reconstruction prior to placing traffic on them. Short temporary roads may provide access to other existing roads making a detour possible.
6. Determine if guide rail has to be removed or relocated. If removal of guide rail reveals a blunt end then temporary impact attenuators should be provided.

7. Determine if temporary signals are required.
8. Determine if there are any reasons why a construction project should be substantially accelerated when under construction. If there are reasons for an accelerated construction process, discuss proposed methods of implementation with the Authority's project manager to determine the details of the acceleration (i.e. number of crews required, hours of work).
9. Using the Roadway Plans, determine the duration of the various construction operations required to build the project. Using this information, determine if lane closings can be set up and broken down over one work shift (8 hours±), over the weekend (Friday night to Monday morning), or must lane closings be maintained for longer continuous durations. Lane closings beyond the times specified in the Lane Reduction Tables are not permitted without the prior approval of the Authority's appropriate Operations Department. All of the above may apply. For New Jersey Turnpike and Garden State Parkway projects, the permissible lane closing hours are specified in the appropriate Traffic Control Manual.
10. Determine whether or not Movable Construction Barrier should be used. Refer to Subsection 10.9.
11. Review the guidelines for nighttime construction described in Subsection 10.10.
12. Review the time allowed for the staging of paving operations. Provide the appropriate amount of time for sufficient curing, deck patching, cooling asphalt pavement, placement of pavement markers and striping as necessary.

10.6. Temporary Traffic Striped and Traffic Markings

Temporary traffic stripes and traffic markings shall be as per the Standard Drawings, Standard Specifications, and Supplemental Specifications. ~~The Authority's policy on temporary traffic stripes and traffic markings is as follows:~~

~~1. Traffic paint (latex or alkyd) shall be used when traffic stripes or traffic markings are required on intermediate pavement layers that need to be opened to traffic due to stage construction. The traffic stripes shall be calculated in linear feet for each 6 inch width of actual stripe (gaps are not counted) under the item TEMPORARY PAVEMENT STRIPING. Diagonal gore lines, crosswalks, and stop lines shall be calculated in linear feet for each 6 inch width of actual stripe under the item TEMPORARY PAVEMENT STRIPING (Linear Foot). Words, arrows and other pavement symbols shall be calculated in square feet under the supplementary item TEMPORARY PAVEMENT MARKINGS, SYMBOLS (Square Foot). Where lane shifts are necessary on the intermediate layers or on existing pavements not being repaved, and temporary striping will remain in place less than three (3) months, removable pavement marking tape or temporary pavement markers shall be specified and calculated accordingly. The placement of temporary pavement markers shall be in accordance with the Sample Plans.~~

~~2.~~1. ~~Long life traffic stripes or traffic markings may be considered for stage construction, detours, and diversionary roads on those occasions when it can be justified based on cost considerations, site conditions, or length of time when the stripes or markings will be in place.~~

10.7. Lane and Roadway Closures

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10.8. ~~Precast Concrete~~ Construction Barrier

10.8.1. Introduction

In general, ~~Precast Concrete~~ Construction Barrier ~~(PCCB)~~ should be installed only if it is clear that the barrier offers the least hazard potential. Elimination of the warranting obstruction should always be the first alternative considered. Limiting excavations to that which can be backfilled during the same work shift or covering minor excavations are practical examples of how obstructions, commonly encountered during construction, can be eliminated. In some cases, a detour may be the most practical solution, especially on projects that would require large quantities of construction barrier.

There may be situations where there is not a clear choice as to whether or not a construction barrier is warranted or where site conditions or construction operations will exclude the use of a construction barrier even though one is warranted. The Engineer should constantly be on the lookout for situations where the site conditions and/or the operational characteristics of the road such as adverse geometrics, high operating speed and high traffic volume, will make the use of construction barrier appropriate even though not specifically required by the warrants shown in Subsection 10.8.2. Such cases should be evaluated on an individual basis and, in the final analysis, must usually be resolved by engineering judgment. In such cases, adequate documentation should be included in the job file so that whatever action is taken, it cannot be misconstrued as being arbitrary.

10.8.2. Warrants

The following guidelines are to be used to establish warrants for using ~~PCCB~~ construction barrier when developing Traffic Control Plans. Three factors must be considered in determining if an obstruction warrants a construction barrier:

1. The physical characteristics of the obstruction.
2. The distance from the traveled way to the obstruction.
3. How long the obstruction will exist.

For an obstruction to warrant a construction barrier, all three of these criteria must indicate that a barrier is needed.

Physical Characteristics: A warranting obstruction is defined as a non-traversable roadside or a fixed object that is located within the clear zone and whose physical characteristics are such that injuries resulting from an impact with the obstruction would probably be more severe than injuries resulting from an impact with construction barrier.

Also, other examples of using construction barrier ~~PCCB~~ to protect patron vehicles from warranting obstructions are:

1. To protect traffic from entering work areas such as excavations.
2. To protect construction such as falsework for bridges and other exposed objects.
3. To separate two-lane, two-way traffic on one roadway of a normally divided roadway section. ~~Whenever two-way traffic is to be maintained on one side of a normally divided highway, opposing traffic shall be separated as follows and such separation shall be shown on the Traffic Control Plan.~~

   ~~Where the two-lane, two-way, one-side arrangement is used, the Traffic Control Plans shall include the above provisions for the separation of opposing traffic except:~~

   ~~a. Transition Zones - Positive Barrier (PCCB or approved alternate), with a buffer area equal to the maximum deflection limit of the proposed barrier.~~

   ~~b. Between Transitions - Positive Barrier, as described in A above or by delineation devices as deemed appropriate by the Operations Department.~~

   ~~c. Striping and complimentary signing shall be used in conjunction with A and B above.~~

Duration of Existence: construction barrier ~~PCCB~~ is warranted if an obstruction will remain within the clear zone for more than one work shift.

10.8.3. Applications

Construction Barrier shall be either Precast Concrete Construction Barrier or Portable Longitudinal Steel Barrier. The Designer shall utilize Precast Concrete Construction Barrier (PCCB) as the basis of design for Construction Documents. Construction barrier shall be designed for the field conditions and maintaining sight distances. Contract documents shall include any additional guidance as necessary (i.e. maximum barrier section length required to meet field conditions). Alternative construction barriers such as Portable Longitudinal Steel Barrier (PLSB) may be

considered if they conform to the prescribed deflection distances associated with PCCB joint classes as defined under 10.8.3.1 Precast Concrete Construction Barrier.

The approach length of need (L.O.N.) is the minimum length of construction barrier required in front of the warranting obstruction to shield the hazard effectively. See Exhibit 10-1 for instructions on how to determine the L.O.N. for ~~PCCB~~construction barrier.

EXHIBIT 10 -1 LENGTH OF NEED OF ~~PRECAST CONCRETE~~ CONSTRUCTION BARRIER

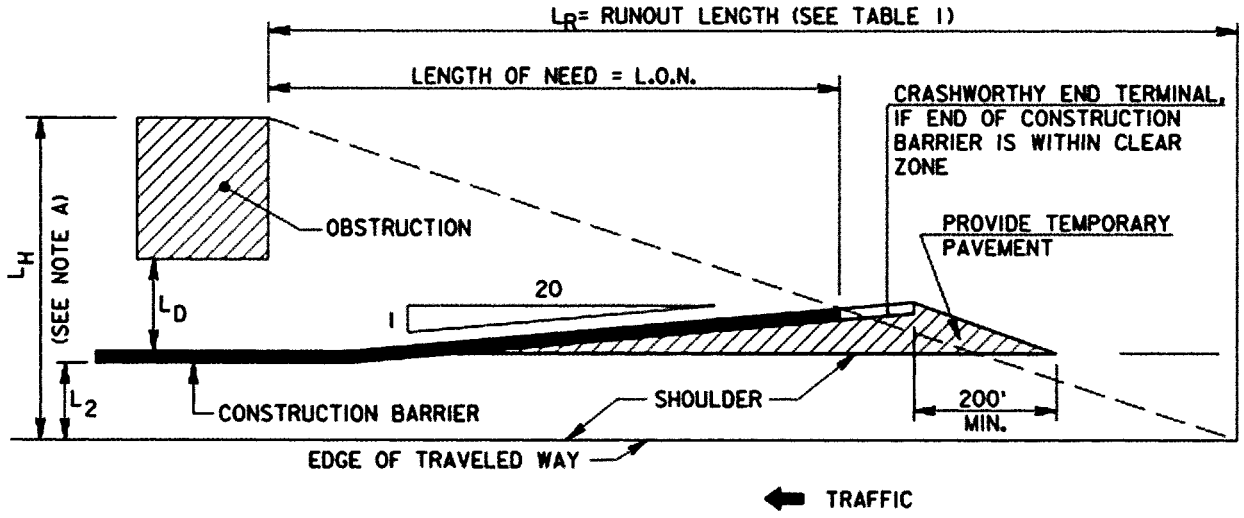


TABLE - 1				
	TRAFFIC VOLUME (A.D.T.)			
	OVER 6,000	2,000-6,000	800-2,000	UNDER 800
DESIGN SPEED (M.P.H.)	L_R	L_R	L_R	L_R
70	480	440	400	360
60	400	360	330	300
50	320	290	260	240
40	240	220	200	180
30	170	160	140	130

NOTE A. IF OBSTRUCTION EXTENDS BEYOND CLEAR ZONE, MAKE L_H EQUAL TO CLEAR ZONE EXCEPT IF OBSTRUCTION IS A CRITICAL SLOPE, SEE EXHIBIT 4-7.

NOTE B. IF ROADWAY IS CURVED, DRAW LAYOUT TO SCALE AND OBTAIN L.O.N. DIRECTLY BY SCALING FROM DRAWING.

NOTE C. IF BARRIER END IS PARALLEL TO ROADWAY (NO FLARE), THEN CHANGE "1/20" IN FORMULA TO "0".

NOTE D. SEPARATION BETWEEN BARRIER TO OBSTRUCTION, $L_D \geq$ MAXIMUM BARRIER DEFLECTION,

EXAMPLE

$$L.O.N. = \frac{L_H - L_2}{\frac{1}{20} + \frac{L_H}{L_R}}$$

$L_2 = 15'$

$L_H = 25'$

$L_R = 480'$

$$L.O.N. = \frac{25 - 15}{\frac{1}{20} + \frac{25}{480}}$$

DESIGN SPEED = 70 MPH L.O.N. = 98.0
ADT = 26,000

10.8.3.1. Precast Concrete Construction Barrier

Precast Concrete Construction Barrier (PCCB) shall be MASH TL-3 compliant. The TP Standard Drawings define PCCB barrier types as Alternate A and Alternate B. The barrier section anchoring and connection treatments between each section to achieve the required minimum clear area behind the barrier are defined by the PCCB Joint Class (A, B, C, and D). PCCB barrier comes in standard 20-foot sections but other section lengths are also available. The Designer shall evaluate and identify in the Contract Documents if there are site conditions that constrain the section lengths of PCCB used. Joint Classes delineate the deflection allowances of PCCB. PCCB ~~, Alternates A and B are the only barrier types approved for use on construction projects.~~

Alternates A or B may be used at all locations where Joint Class A, B, or C are specified; PCCB Alternate B must be used where Joint Class D is specified. Refer to the TP Standard Drawings for details on the alternate barrier types.

When PCCB is specified, the joint class and limits for the barrier should be indicated on the Traffic Control Plans based on the minimum clear area available behind the barrier as noted in Table 10.8-1. ~~–~~Joint Class B shall not be used as median barrier (traffic on both sides of the barrier) and may only be used to shield traffic on one side of the barrier, with the steel box beam stiffening always attached to the non-traffic side of the barrier. The applicable joint class of PCCB shall be provided when construction barrier is to be used as bridge parapet based on the width of the shelf provided for the required minimum clear area of the joint class.

The following chart summarizes the respective joint treatments:

Table 10.8-1 PCCB Joint Treatment

Joint Class	Minimum Clear Area Behind PCCB	Joint Treatment
A	39 inches	Connection key and barrier end sections fully pinned
B	33 inches	Connection key and non-shrink grout at every joint; 6-inch x 6-inch steel box beam spanning each joint; and barrier end sections fully pinned
C	12 inches	Connection key and non-shrink grout at every joint; traffic side of all barrier sections pinned; and barrier end sections fully pinned
D	0 inches	Connection key and non-shrink grout at every joint; and bolt every anchor pocket hole in every barrier section

Anchoring PCCB to a bridge deck that is High Performance Concrete (HPC) or has a Latex Modified Concrete (LMC) overlay undermines the effectiveness of the HPC or LMC. In addition, the extra costs associated with placement of HPC or LMC make it especially undesirable to lessen its effectiveness by drilling holes through it. The Engineer is advised to investigate alternatives in order to eliminate the need for anchoring barrier on bridge decks, when possible, so as not to compromise the benefits of the HPC or LMC overlay.

Where different joint classifications are required within a section of barrier, the controlling joint class shall extend beyond the area required for limited deflection as noted in table:

Table 10.8-2 PCCB - Transition Between Joint Classes

PCCB - Transition Between Joint Classes	
Joint Class Transition	**Transition Requirements**
D to C	Extend one complete barrier section of Joint Class D beyond the work area requiring limited deflection.
D to B D to A	Extend one complete barrier section of Joint Class D beyond the work area requiring limited deflection and pin the first hole of the Joint Class A or B barrier section on the traffic side of the PCCB.
C to B C to A	Extend one complete barrier section of Joint Class C beyond the work area requiring limited deflection and pin the first hole of the Joint Class A or B barrier section on the traffic side of the PCCB.
B to A	Extend Joint Class B box beam stiffing for 50 ft. minimum beyond the work area requiring limited deflection.

PCCB shall not be installed on side slopes steeper than 10H:1V. The approach end shall either be flared at 20:1 on both the New Jersey Turnpike and Garden State Parkway beyond the clear distance or, when terminated within the clear zone, the approach end of the barrier shall be shielded with an appropriate attenuator system. PCCB shall be placed on a traversable surface, preferably paved. The deflection area behind a barrier shall be able to bear traffic and shall be free from obstructions. When barrier is used as parapet protection the integrity of the surface should be evaluated to ensure adequacy of the barrier anchorage to provide the width of the shelf behind the barrier to accommodate the barrier movement.

Construction barrier systems other than the Authority's standard PCCB may be considered and approved by the Authority on a project-by-project basis.

Consideration of an alternative barrier system requires that the barrier satisfactorily demonstrated MASH TL-3 compliance; sources for alternative type barriers include:

https://www.roadsidepooledfund.org/mash-implementation/search/
https://mwrsf.unl.edu/researchhub.php

Contract documents shall include all appropriate details for installation of the alternative barrier system conforming to the conditions under which it received MASH compliance. If an alternative barrier system is identified, the contract documents shall include the maximum deflection per MASH testing for the specified barrier system.

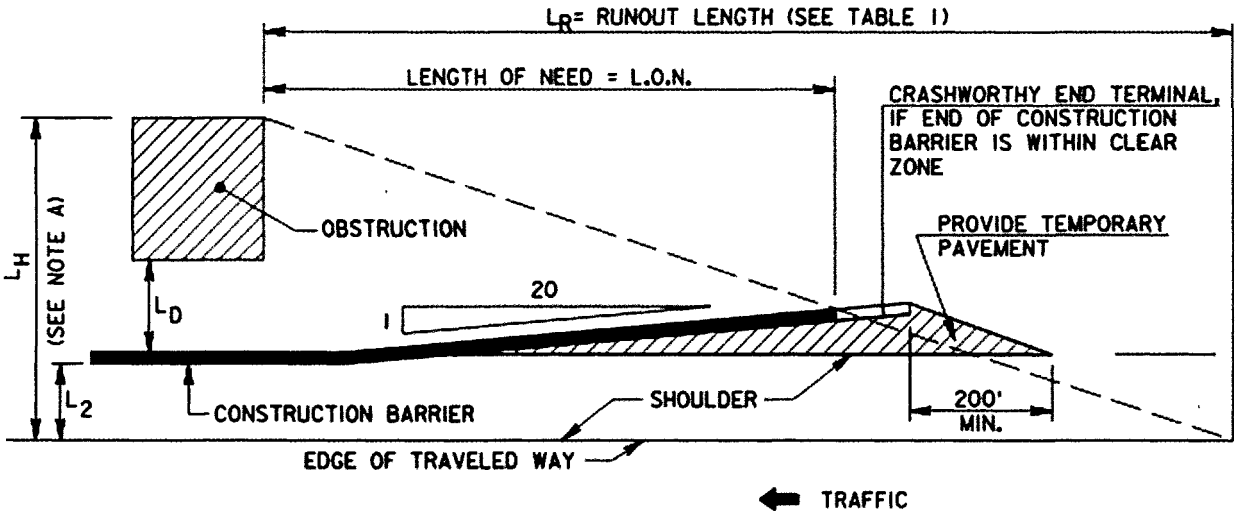
~~The approach length of need (L.O.N.) is the minimum length of construction barrier required in front of the warranting obstruction to shield the hazard effectively. See Exhibit 10-1 for instructions on how to determine the L.O.N. for PCCB.~~

10.8.3.2. Portable Longitudinal Steel Barrier

Portable Longitudinal Steel Barrier (PLSB) systems are considered an alternate to Portable Concrete Construction Barrier (PCCB) and may be used where the deflection distances of the PLSB are compliant with the required PCCB deflection distances as defined by the PCCB Joint Class in accordance with 10.8.3.1 Precast Concrete Construction Barrier. PLSB are generally considered advantageous to PCCB in consideration of ease of installation, flexibility in deployment, and reduced transportation costs due to their lighter weight; PLSB shall be MASH TL-3 compliant devices.

The Designer shall include in the Traffic Control Plans and Contract Documents any additional restrictions on use of PLSB in lieu of PCCB.

~~EXHIBIT 10-1 LENGTH OF NEED OF PRECAST CONCRETE CONSTRUCTION BARRIER~~



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