

TABLE C
 RESOLUTION SUMMARY of JUNE 3, 2019 CATE STREET EXTENSION TRAFFIC STUDY - MIXED USE PROPOSAL
 TRANSPORTATION PEER REVIEW #2

| | | |
|-------------|--|---|
| Color Code: | | Addressed/ Corrected |
| | | Change in progress or confirmation needed |

| Comment # | Comment | Status | Response |
|-----------------------|---|---|--|
| Updated Traffic Study | | | |
| 1 | Regarding the Traffic Impact Study; Study Area, Traffic Counts, Background Growth Used and Crash Data. TEC Concurrs with Traffic Impact Study | Addressed | |
| 2 | Regarding the Revised size of the project, Land Use selection and Traffic Generation TEC Concurrs with Traffic Impact Study | Addressed | |
| 3 | Regarding the Trip redistribution created by the construction of Cate St. Ext.; TEC Concurrs with Traffic Impact Study | Addressed | |
| 4 | Comment is in regard to dedicated Route 1 Bypass northbound right turn lane into Cate St. Ext. instead of Cottage St. as the traffic study shows to work best TEC recommends this be discussed with NHDOT | Addressed Comment to be discussed with NHDOT during permitting | Applicant will discuss with NHDOT |
| 5 | Regarding the Cate St. Ext. Westbound lanes configuration, suggest dedicated left turn lane, thru right and rededicated right at Cate St. Ext. /Route 1 bypass intersection TEC recommends Acquisition of NHDOT Access Permit and consultation on Southbound Route 1 left turn lane length | Addressed Comment to be discussed with NHDOT during permitting | Queue data based on synchro, which is know to be overly conservative, NHDOT requires SimTraffic. Queue lengths to be recalculated using SimTraffic. Design being revised according to new queue data and if possible to accommodate suggestion. |

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| 6 | <p>Regarding the extension of the southbound left turn lane into Cate St. Ext., Current plans not depicting it as proposed</p> <p>TEC recommends Acquisition of NHDOT Access Permit and consultation on Southbound Route 1 left turn lane length</p> | <p>Addressed</p> <p>Comment to be discussed with NHDOT during permitting</p> | <p>Queue data based on synchro, which is know to be overly conservative, NHDOT requires SimTraffic. Queue lengths to be recalculated using SimTraffic.</p> <p>Inclusion of Left turn lane is provided in updated plans</p> |
| 7 | <p>Regarding westbound left turn lane on Cate St. Ext, and elimination of the Cottage / Coakley signal by closing the median and not allowing thru traffic from Cottage to Coakley and vice versa</p> <p>TEC acknowledges the elimination of the signal is not part of this project and for the city and NHDOT to work together on.</p> <p>TEC recommends the Cate St. Ext. Westbound left turn lane</p> | <p>Addressed</p> <p>Comment to be discussed with NHDOT during permitting</p> | <p>Queue data based on synchro, which is know to be overly conservative, NHDOT requires SimTraffic. Queue lengths to be recalculated using SimTraffic.</p> <p>Inclusion of Left turn lane is provided in updated plans</p> |
| 8 | <p>Regarding the Islington Street / Proposed Cate St. (Existing Bartlett St.) Pharmacy driveway intersection</p> | <p>Continued City Monitoring of queue lengths at intersection recommended to optimize Signal timing</p> <p>No further Development Team action required</p> | |

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| 9 | Regarding requested updated study at Cate St. / Bartlett St. Intersection | Awaiting review of additional information provided Tuesday, June 11, 2019 | Development Team Traffic Engineer provided additional information Tuesday June 11, 2019 to City Staff and TEC |
| 10 | Regarding the Operation of the Driveways intersecting Cate St. / Cate St. Extension TEC concurs with finding that they will operate with acceptable levels of services | Addressed | |
| Site Plan | | | |
| 11 | Sight triangles should be provided at driveway intersections with Cate St / Cate St. Ext. to ensure landscaping (trees) do not interfere with adequate sight distance | Addressed | Sight lines have been added to the driveway locations on the Turning Movement Plans. |
| 12 | Applicant shall discuss need for a school bus stop shelter with the School Department and DPW to determine need and, if needed, location | | Applicant will contact the School Department and DPW to discuss the need for a School Bus Stop Shelter |
| 13 | Turning templates for the SU-40 delivery vehicle and Garbage truck should be revised to show circulation possible without conflict with parked cars or leaving proposed pavement or pavement layout should be revised to accommodate needed turns. | Addressed | Turning Movements have been revised to ensure that there are no conflicts with parked cars |
| 14 | Large truck Turning Templates (WB-50) should be revised to show circulation possible without conflict with parked cars or leaving proposed pavement or pavement layout should be revised to accommodate needed turns. | Addressed | WB-50 was originally used as a stand in for the Tower 5 vehicle. This has been replaced. |

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| 15 | Portsmouth Fire Department Tower 5 turning movements should be provided for the site to ensure it can circulate freely. | Addressed | Tower 5 turning movements have been run and are depicted on sheets CT-202 through CT-204 |
| 16 | Applicant should coordinate the need for fire lanes with Portsmouth Fire Dept. and the need for fire hydrants on site. TEC notes hydrants are provided on site as shown on the plans. | Addressed | Hydrant locations have been reviewed at TAC Work Sessions with Fire Department and Public Works |
| 17 | Applicant should coordinate with Portsmouth fire regarding whether direct access to the rear of building A is needed | Addressed | The project has been before TAC numerous times and the Fire Department has not expressed concern regarding Building A or access to the back side. |
| 18 | Addition of crosswalks within the parking area between the center of Commercial building and the parking field should be added as well as any other areas where conflicts could be created between building entrances and parking fields | | This will be reviewed and cross walks added in locations that make sense with the curb tipdowns Per Section 10.1110 |
| 19 | A Sign Summary should be provided depicting the sign legend, sign size and sign lettering dimensions in compliance with the MUTCD | Addressed | A sign Legend has been added to the Road Plan Set and to the Site Plan Set |
| 20 | Stop sign and stop bar at easternmost townhouse entrance should be flipped to right side of lane line | Addressed | This has been corrected |
| 21 | Parking Calculations for the Apartment buildings should be revisited and revised per Section 10.1112.31 | Addressed | Revised parking Calculation on CS-002 note #4 |
| 22 | Townhouse parking should be clarified to ensure compliance with Section 10.11.12.31 30 resident and 5 visitor spaces required | Addressed | Revised parking Calculation on CS-002 note #4 |

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| 23 | <p>Commercial Building Parking should be reviewed / revised to ensure compliance with Section 10.11.12.32</p> <p>Shared parking calcs. Should be done for the entire site per section 10.1112.61 and 10.5B83.20 using a worst case scenario time period of 6:00 PM to Midnight</p> | Addressed | Revised parking Calculation on CS-002 note #4 |



June 20, 2019

Ms. Juliet T.H. Walker, AICP
Planning Director
Planning Department
1 Junkins Avenue
Portsmouth, NH 03801

RE: Response to Cate Street Extension Peer Review Comments, June 3, 2019
Response to Cate Street Extension Traffic Study - Peer Review Comments, June 3, 2019

Dear Ms. Walker,

While we have provided responses to the review comments provide by TEC and City Staff in the form of color coded matrices, one per letter, a small number of the comments regarding Cate Street and the Cate Street Extension Alignment merit a more in depth discussion. The following are responses to comments that we felt deserved more detail.

Response to Cate Street Extension Peer Review Comments, June 3, 2019

- 1. The City classifies Cate Street / Cate Street Extension as a Neighborhood Connector, per the City of Portsmouth Complete Streets Design Guidelines, dated June 2017. Accordingly, the design speed for this roadway should be 30 mph. To the maximum extent practical, all design criteria should meet a design speed of 30 mph, or adequate justification shall be provided for specific elements not meeting this design speed, for consideration by the City.*

The radius cited per AASHTO Table 3.7 is applicable for a roadway that is superelevated at 4.0%; however, the typical roadway sections and grading plans show that the roadway is crowned at 2.0%. AASHTO Table 3.13 indicates the minimum radii for various cross slopes, including normal crown (-2.0%).

The review engineers at TEC are correct. The City has a target design speed for a neighborhood connector road of 30 mph. However there are a number of justifications for smaller curves and slower design speeds on a portion of Cate Street.

Unfortunately, the property and Right of Way that the proposed Cate Street and Cate Street Extension re-alignment are being designed on have a number of geometric limitations; the lot shape and existing Right of Way create pinch points limiting the curves that can fit between Cate Street and Islington at The Bartlett Street Intersection, and Cate Street and the Cate Street Extension to Route 1 Bypass. In part this is why smaller curves have been selected that are designed for speeds less than 30 mph. There are other reasons for slower speeds as you approach the intersection with Bartlett Street.

Surrounding Neighborhood and Roads:

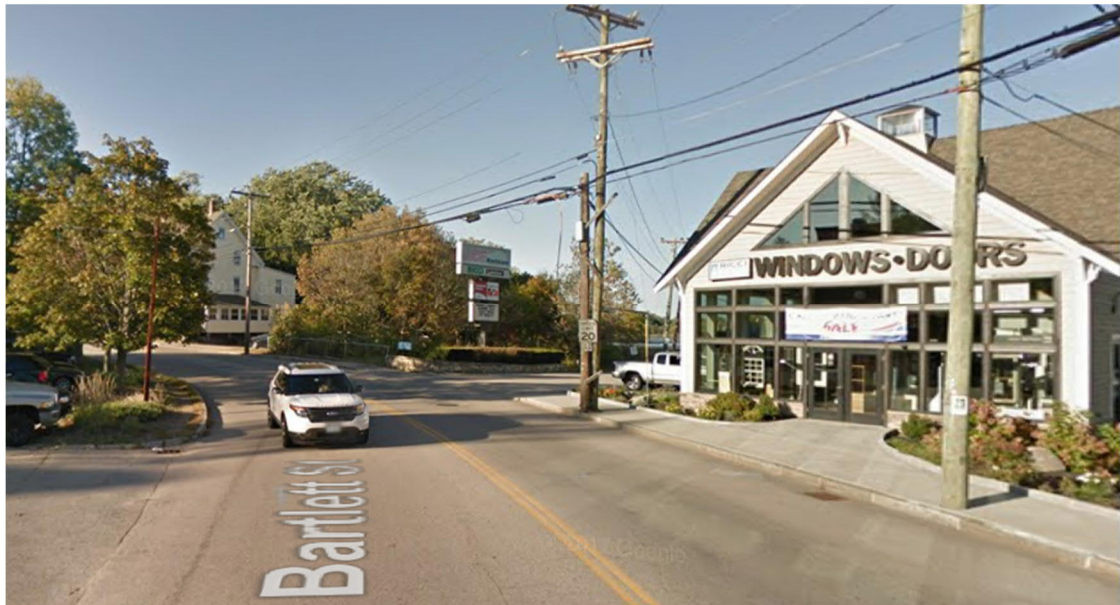
The surrounding neighborhood and street network, its posted speed limits and typical traffic is also of a concern since these roads are quieter and in the case of Woodbury Avenue and Bartlett Street have sections with posted design speeds of 20 mph in close proximity to the Bartlett Street Cate Street intersection.



Woodbury Avenue southbound toward Bartlett Street – “Sharp Curve” 20 MPH



Bartlett Street South of Thornton Street – posted 20 MPH



Bartlett Street looking North toward Ricci Lumber – posted 20 MPH

The traffic from Cate Street will be encountering drivers on Bartlett and Islington Streets that will be travelling at slower speeds. These drivers will have been travelling at these slower speeds for some time when they reach the Cate Street Bartlett Street intersection. Drivers turning north onto Bartlett Street from Cate Street will need to be travelling at 20 mph immediately.

Railroad Overpass and Approach Curve to Islington Street:

The final curve on Cate Street that approaches the Railroad Overpass before Islington Street to the southeast is 110-ft. This curve cannot be posted for speeds above 20 mph. Further it would be unsafe in our opinion to do so due to the narrow opening of the overpass and the imposing construction.

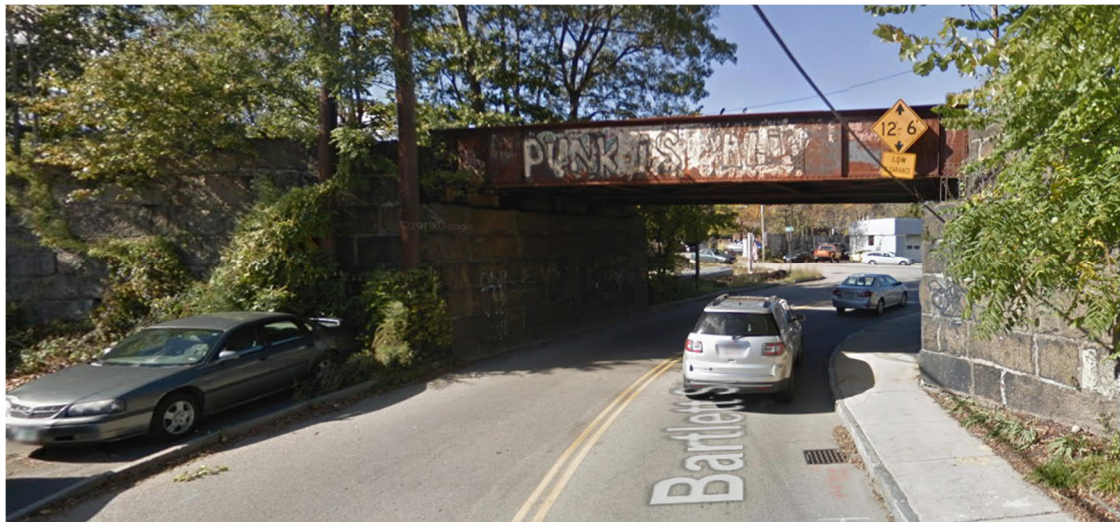
The photos on the following page illustrate both the limitations created height and width wise by the overpass and, in the second photo, the proximity to Cate Street which will be re-aligned to curve into the overpass.

Drivers coming from the intersection at Islington north through the overpass to Cate Street and Bartlett Street will have limited sight distance. Increased design speeds headed to this intersection will exacerbate the situation for these drivers further impacting decision time for them as they judge turning onto Cate Street and or Bartlett Street.

The Low clearance at this location will limit truck traffic as well. Trucks will need to turn north onto Bartlett Street from Cate Street. Large trucks will not be able to clear the overpass due to height.



Bartlett Street looking south through the railroad overpass toward Islington Street – Low Clearance 12'6"



Bartlett Street looking north through the railroad overpass toward Cate Street – Low Clearance 12'6"

Reverse Curves: Cate Street Approaching Bartlett Street:

The selection of the Radii for the reverse curves that are encountered as one drives east along Cate Street toward Bartlett Street and the re-aligned Cate Street radius of 110-ft just prior to the rail overpass was not done lightly. A number of variables were considered.

As touched upon in the earlier portion of the letter, the Right of Way under City control as you approach the Development site from Bartlett Street is limited. Due to this the Curve between Cate Street and the railroad overpass heading south to Islington Street can be no larger than a 110-ft radius. Shifting the tangent section of Cate Street running west to east, south toward the



Brayerston Condominiums reduces the curve radius while marginally increasing the possible curve that will fit as one travels west toward Route 1 Bypass into the site. However, a larger curve entering the Development site west of the Cate Street Bartlett Street intersection will shorten the tangent approaching the curve in the intersection. Currently the Tangent between curves is 106-ft long. Shortening this tangent is not advised. Typically a minimum tangent between reverse curves of 100-ft is advised for low speed roads. Tangents help the driver transition between curves and direction changes.

Larger radii reverse curves were explored. See exhibits attached to this letter.

A phone call was had on June 17, 2019 with Eric Eby, City of Portsmouth Traffic Engineer, about the road design and the reverse curves. A number of the topics discussed above were reviewed. During the call the reverse curves were discussed, we expressed our concern with superelevating the curves and with eliminating the tangents with Mr. Eby.

No Tangent Between Curves

Mr. Eby agreed that eliminating the tangents was not a satisfactory design outcome. He echoed our concerns that it limits driver's ability to transition between curves and direction changes.

Superelevating Curves

We discussed our concern with superelevating the curves and that it would encourage faster speeds approaching the limiting or controlling radius at the Cate Street Intersection which at 110-ft is only able to be posted at 20 mph. Mr. Eby agreed that super elevating the curves would not be a satisfactory outcome.

It was explained that due to the above, and the fact that the last curve approaching the railroad overpass was the controlling curve, that for design we would do our best while maintaining tangents between curves to allow drivers to transition. Mr. Eby asked that we provide further signage and traffic calming in the revision. To this end we have done the following:

Signage

Per MUTCD table 2C-5 we have provided the following signage in advance of the curves in each direction for reduced curve speed.

1. "Winding Road" W1-5L and "Advisory 20 MPH" W13-1P
2. "One Direction Large Arrow" W1-6

6/19/2019

Chapter 2C - MUTCD 2009 Edition - FHWA

Table 2C-5. Horizontal Alignment Sign Selection

| Type of Horizontal Alignment Sign | Difference Between Speed Limit and Advisory Speed | | | | |
|---|---|-------------|-------------|----------|----------------|
| | 5 mph | 10 mph | 15 mph | 20 mph | 25 mph or more |
| Turn (W1-1), Curve (W1-2), Reverse Turn (W1-3), Reverse Curve (W1-4), Winding Road (W1-5), and Combination Horizontal Alignment/Intersection (W1-10) (see Section 2C.07 to determine which sign to use) | Recommended | Required | Required | Required | Required |
| Advisory Speed Plaque (W13-1P) | Recommended | Required | Required | Required | Required |
| Chevrons (W1-8) and/or One Direction Large Arrow (W1-6) | Optional | Recommended | Required | Required | Required |
| Exit Speed (W13-2) and Ramp Speed (W13-3) on exit ramp | Optional | Optional | Recommended | Required | Required |

Note: Required means that the sign and/or plaque shall be used, recommended means that the sign and/or plaque should be used, and optional means that the sign and/or plaque may be used.

Including these signs provides both the required and recommended signage for the curves that are provided.

Maintaining the curves as designed also allows for a safer transition to the speed required to navigate the final curve to Islington Street or a northbound turn onto Bartlett Street which is posted at 20 mph.

Traffic Calming

In the event that the Curves were to remain at 155-ft radii, we were to discuss means of traffic calming employed to help keep drivers on Cate Street and Cate Street Extension wary and attentive. We offer the following:

1. Signage ahead of the curves (discussed above)
2. Mid-block Crosswalks – Flashing Beacons: A crosswalk from the Apartment Buildings to the multi-use trail has been provided. With this crosswalk “Trail Crossing Ahead” signage and pedestrian actuated flashing beacons are provided.


A second mid-block crosswalk with the same signage and flashing beacon is provided at the beginning of the multi-use path near the Cate /Bartlett intersection.

3. Driveways: There are 5 driveways that intersect Cate Street and Cate Street Extension as well as the portion of Cate Street that heads north over Hodgson Brook. These intersecting driveways and the vehicles entering and exiting will also serve to slow traffic.

With the addition of the appropriate signage for the curves as in the revision, the correct signage for the mid-block crosswalks and well as the desire to maintain tangent and curves with no superelevation, it is our opinion that the design is justified as proposed. Any increase in curve radius would not provide any noticeable benefit.

Thank you for providing your review. Should you have additional questions/comments, please do not hesitate to contact me.

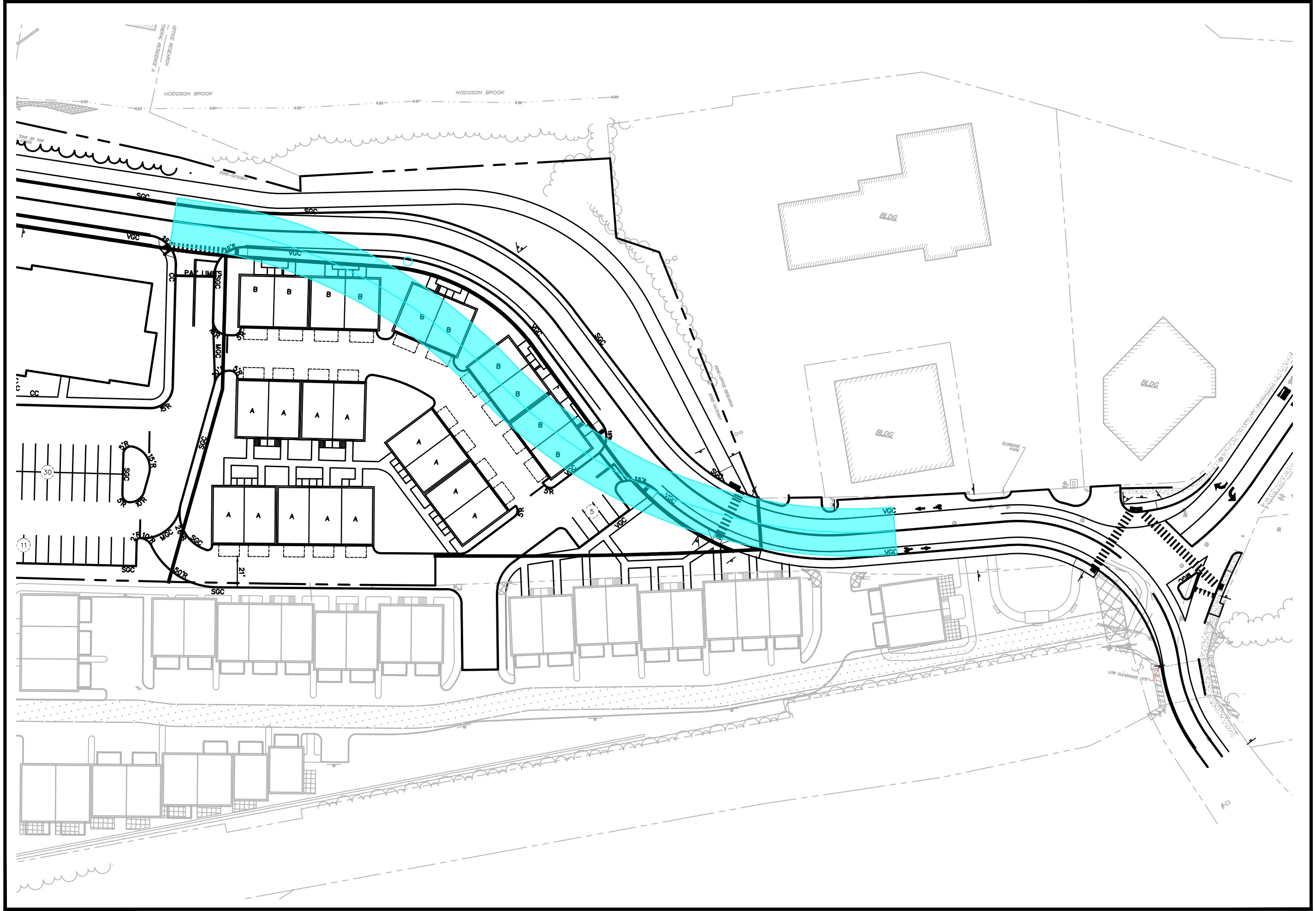
Sincerely,



Rick Lundborn, PE
rlundborn@fando.com
207-363-0669 x2314

RL/bh
c: file

File Path: F:\P20180317A\10\CH\3\DWG\CURVE EXHIBIT.dwg Layout: E1 Plotted: Thu, June 20, 2019 - 4:29 PM User: rlundborn
 PLOTTER: DWG TO PDF-PC3 CTB File: FO-STB
 LAYER STATE:



| | | | |
|--|--|--------------------------------------|--|
| <p>SCALE: HORIZ.: VERT.: DATUM: HORIZ.: NAD83 VERT.: NGVD29</p> <p>GRAPHIC SCALE</p> | | | |
| <p>FUSS & O'NEILL UPPER SQUARE BUSINESS CENTER 5 FLETCHER STREET, SUITE 1 KENNEBUNK, MAINE 04043 207.563.6669 www.fandol.com</p> | | | |
| <p>CATE STREET DEVELOPMENT, LLC</p> | | <p>NEW HAMPSHIRE</p> | |
| <p>335-FT REVERSE CURVES NO TANGENT POSSIBLE</p> | | | |
| <p>CATE STREET</p> | | | |
| <p>PORTSMOUTH</p> | | | |
| <p>PROJ. No.: 20180317.A10 DATE: 06/20/2019</p> | | | |
| <p>E-1</p> | | | |
| <p>DATE</p> | | <p>DESCRIPTION</p> | |
| <p>3. 6/20/2019 TAC SUBMITTAL</p> | | <p>JVA/DAD RRL DESIGNER REVIEWER</p> | |
| <p>2. 5/20/2019 TAC SUBMITTAL</p> | | <p>JVA/DAD RRL</p> | |
| <p>1. 3/18/2019 TAC SUBMITTAL</p> | | <p>JVA/DAD RRL</p> | |
| <p>No.</p> | | <p>RRL</p> | |



| No. | DATE | DESCRIPTION | DESIGNER REVIEWER |
|-----|-----------|---------------|-------------------|
| 3. | 6/20/2019 | TAC SUBMITTAL | JVA/DAD |
| 2. | 5/20/2019 | TAC SUBMITTAL | JVA/DAD |
| 1. | 3/18/2019 | TAC SUBMITTAL | JVA/DAD |

SCALE:
 HORZ.:
 VERT.:
 DATUM: NAD83
 VERT.: NGVD29

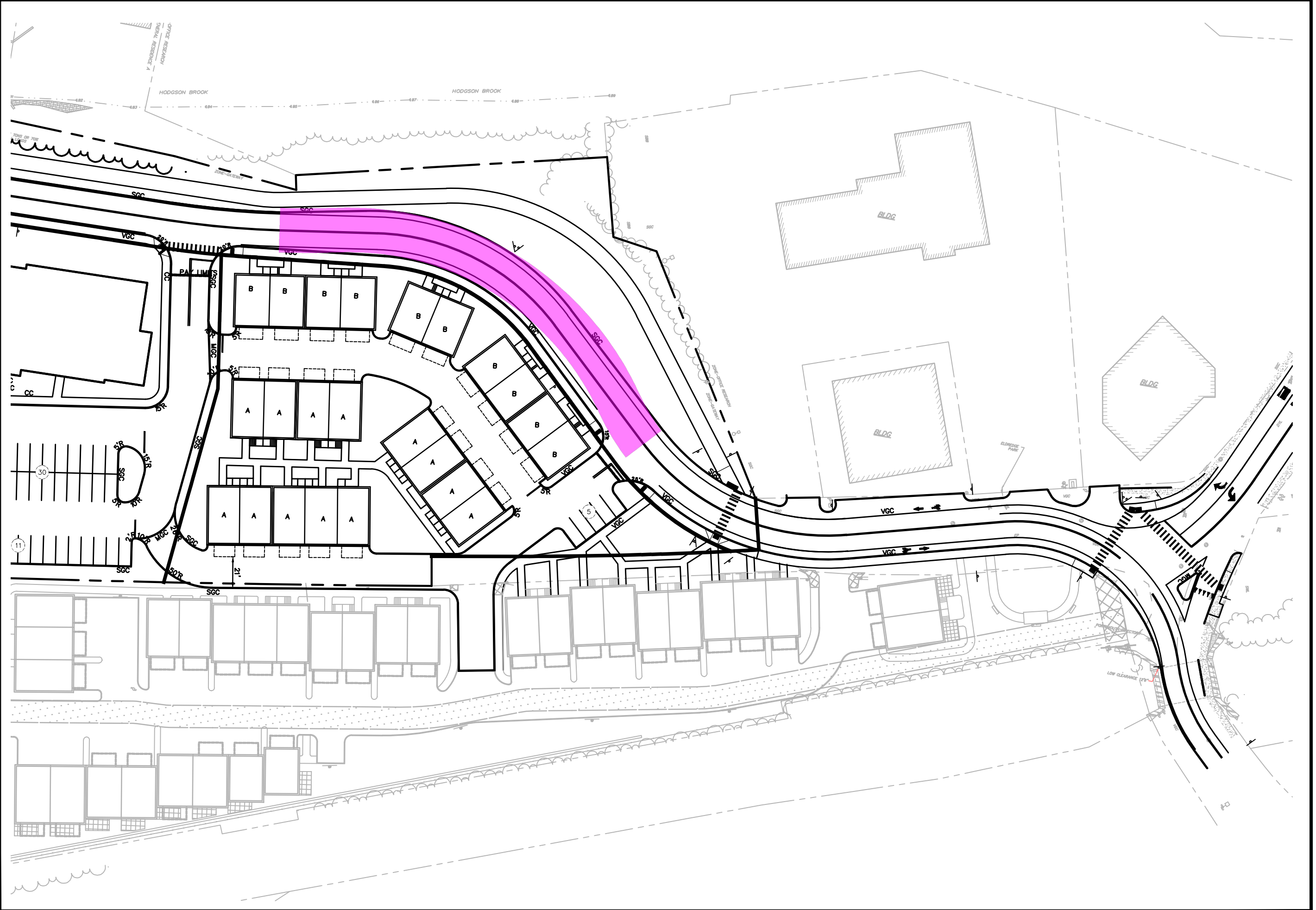
GRAPHIC SCALE

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 207.563.0669
 www.fussandoneill.com

CATE STREET DEVELOPMENT, LLC
 335-FT TO 155-FT CURVES
 NO TANGENT POSSIBLE
 CATE STREET
 PORTSMOUTH NEW HAMPSHIRE

PROJ. No.: 20180317.A10
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E-2



CATE STREET DEVELOPMENT, LLC
200-FT TO 155-FT CURVES
NO TANGENT POSSIBLE
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SCALE: HORIZ.: VERT.:
DATUM: HORIZ.: NAD83 VERT.: NAVD29
GRAPHIC SCALE

| No. | DATE | DESCRIPTION | DESIGNER/REVIEWER |
|-----|-----------|---------------|-------------------|
| 3. | 6/20/2019 | TAC SUBMITTAL | JVA/DAD |
| 2. | 5/20/2019 | TAC SUBMITTAL | JVA/DAD |
| 1. | 3/18/2019 | TAC SUBMITTAL | JVA/DAD |

PROJ. No.: 20180317.A10
DATE: 06/20/2019

E-3