TETRA TECH

November 20, 2017

Norfolk Zoning Board of Appeals
Michael J. Kulesza, Chairman
1 Liberty Lane
Norfolk, MA 02056

Re: 40B - Peer Review (Status Update)
Abbyville Commons/Preserve at Abbyville
Lawrence Street
Norfolk, Massachusetts

Dear Chairman Kulesza:

As discussed at the public hearing we have been coordinating with the applicant's engineer United Consultants, Inc. (UCI) to validate excavation quantities presented by the applicant and explore ways to reduce the volume of material that will be removed from the site.

UCI has provided Autocad files of both existing and proposed conditions as well as back-up calculations for proposed excavation quantities to assist with the analysis. Using electronic files provided we were able to create three dimensional surfaces of both existing and proposed conditions that allow for precise calculation of earthwork volumes utilizing specific design tools within the Autocad software. We found initial estimates prepared by the applicant were reasonable given estimation methods used. However those estimates are no longer relevant since they were based on a prior development plan and can now be re-estimated using more accurate methods.

For comparison purposes we also developed two alternate grading strategies which contemplate raising the proposed site by five (5) feet and by ten (10) feet. The raised site options were developed simply by modifying the entrance grading to raise the entry elevation of the site and maintain all internal site grading patterns. Our analysis generated the following estimated earthwork quantities for the three potential development scenarios.

Table 1 – Earthwork Comparison

Development Option	Description	Area of Disturbance (Acres)	Cut (CY)	Fill (CY)	Earthwork Total (CY)	Net (CY)
Proposed	Proposed Plan	63.3	1,611,000	129,000	1,740,000	1,482,000
Option 1	Raise Site 5'	63.4	1,263,000	277,000	1,540,000	986,000
Option 2	Raise Site 10'	63.4	971,000	496,000	1,467,000	475,000

When evaluating viability and general suitability of one option versus another it is important to consider the complete range of impacts associated with each option including effect on schedule, overall site activity and temporary disturbance. For example, although Option 2 results in the least amount of offsite export it will require the largest open construction footprint and the most on-site construction activity, will generate the most dust and require the longest construction schedule. It will also require the deepest fills which can present

Infrastructure Northeast
Marlborough Technology Park, 100 Nickerson Road, Marlborough, MA 01752
Tel 508.786.2200 Fax 508.786.2201 tetratech.com

settlement concerns for foundations and utilities. The benefits of reducing export volumes must be balanced with related increases of other negative impacts.

Graphical representation of cuts/fills for the three development scenarios are provided in attached figures to assist in comparison of options. The cut/fill graphic shows extent and depth of project cuts/fills. Cuts are shown in red and fills are shown in blue and depth is represented graphically by color density with darker shades representing deeper cuts/fills.

The results of our analysis were discussed at the November 7, 2017 working session with the applicant and its engineers at which time we expressed our opinion that relatively simple changes could be made to entry grading that would significantly reduce net export of material without requiring significant design changes or otherwise compromising the design. In particular, raising the site approximately five (5) feet appeared to represent a reasonable balance of impacts.

The applicant agreed to review our findings and consider alternate grading strategies. We will review revised plans when they are available and will assess resulting expected truck trip volume and frequency.

Please note, our primary concern continues to be the apparent lack of suitable access to accommodate the large volume of construction vehicles expected to access the site from Park Street via the Lawrence Street causeway over Bush Pond. This issue was also discussed at the November 7th working session and the applicant assured us that it was a mutual concern and they were working with the Town to develop a cooperative solution addressing the narrow roadway width. We recommend a clear strategy for safe accommodation of construction truck traffic that considers existing vehicular, bicycle and pedestrian access along Lawrence Street be implemented prior to commencement of any significant construction activity.

We will continue working with the applicant to address abutter and town concerns and we are happy to discuss our comments at your request. Please don't hesitate to contact us with any questions, or if you require additional information.

Very truly yours,

Sean P. Reardon, P.E.,
Vice President

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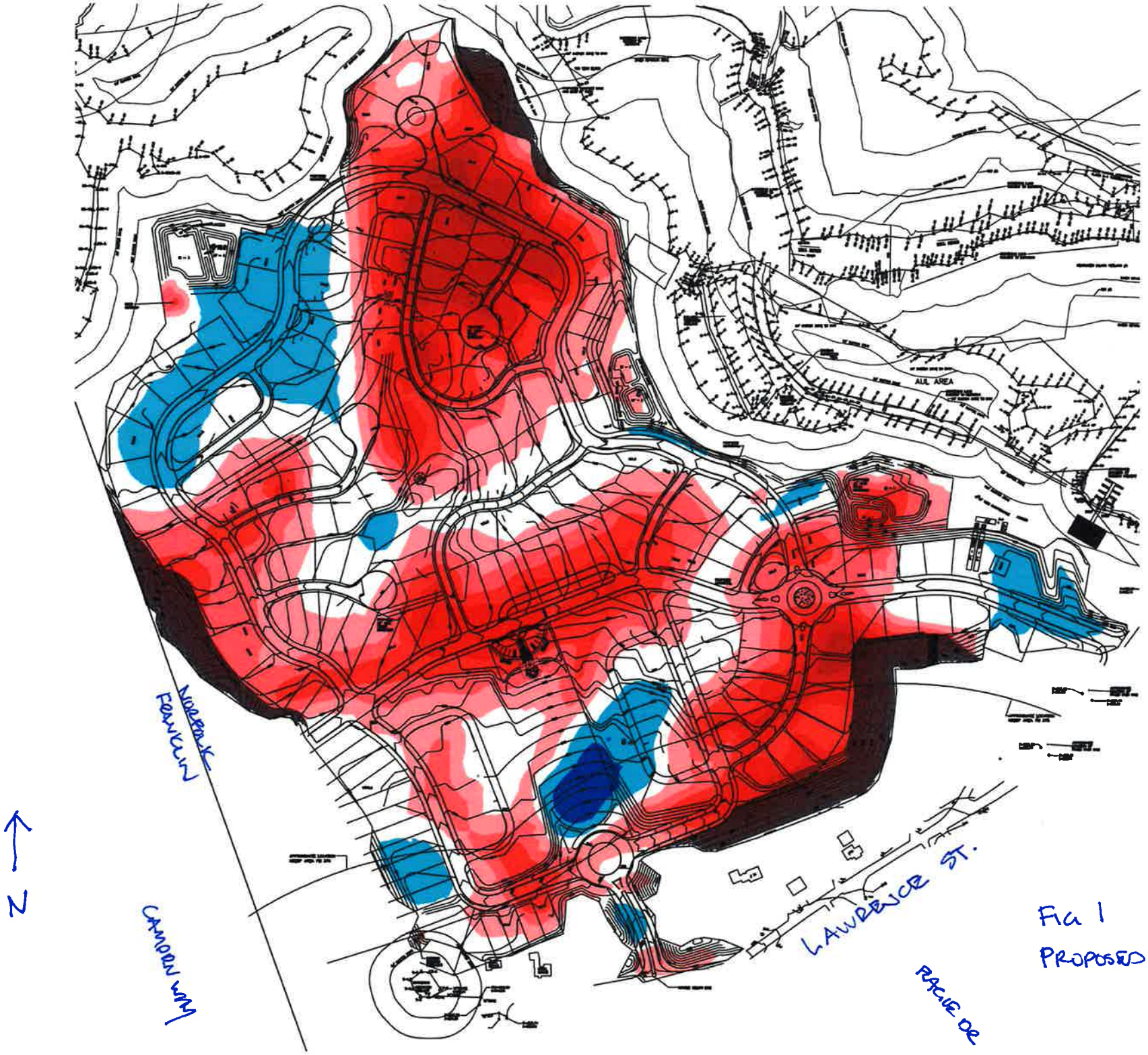


FIG 1
PROPOSED PLAN

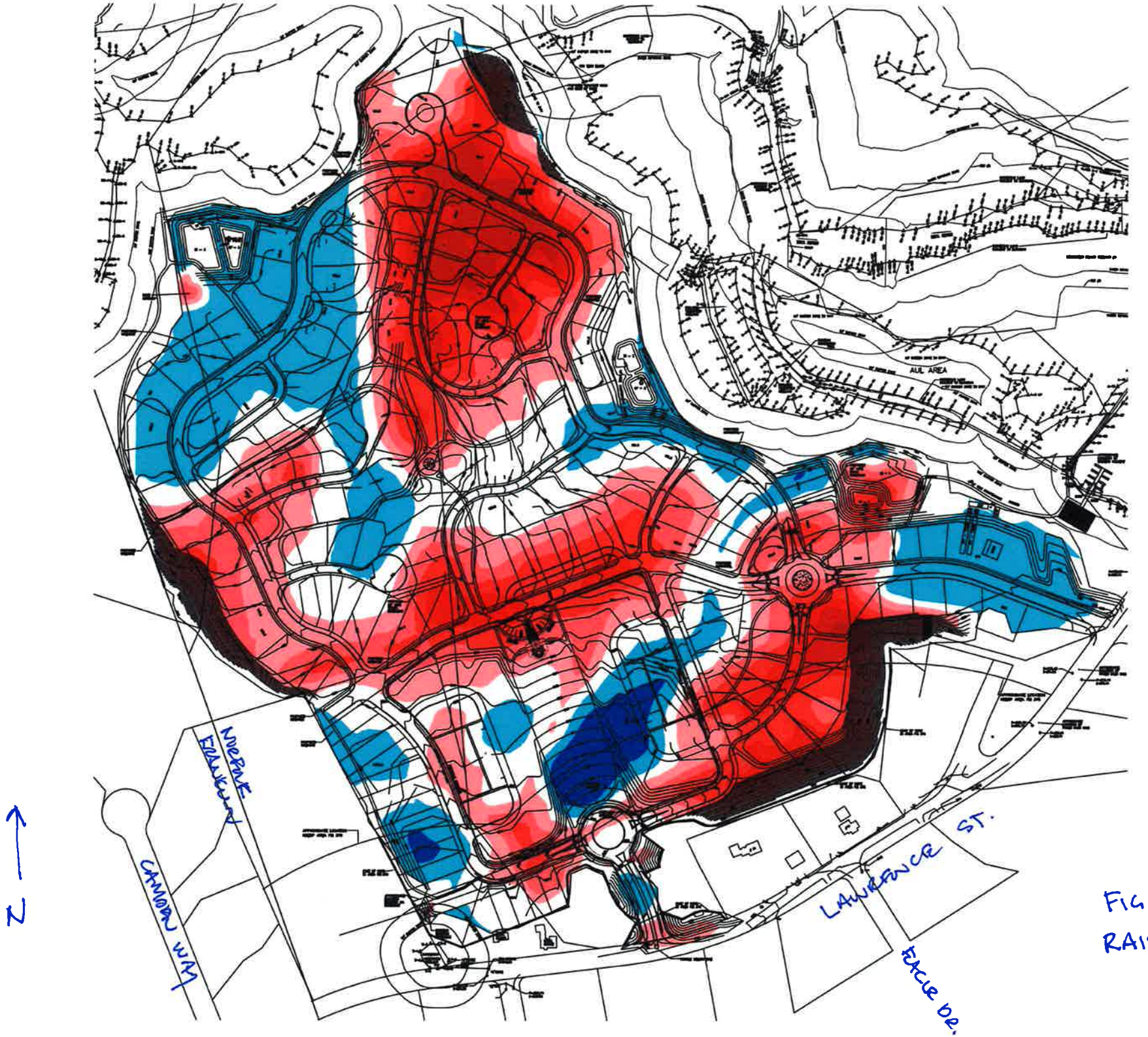
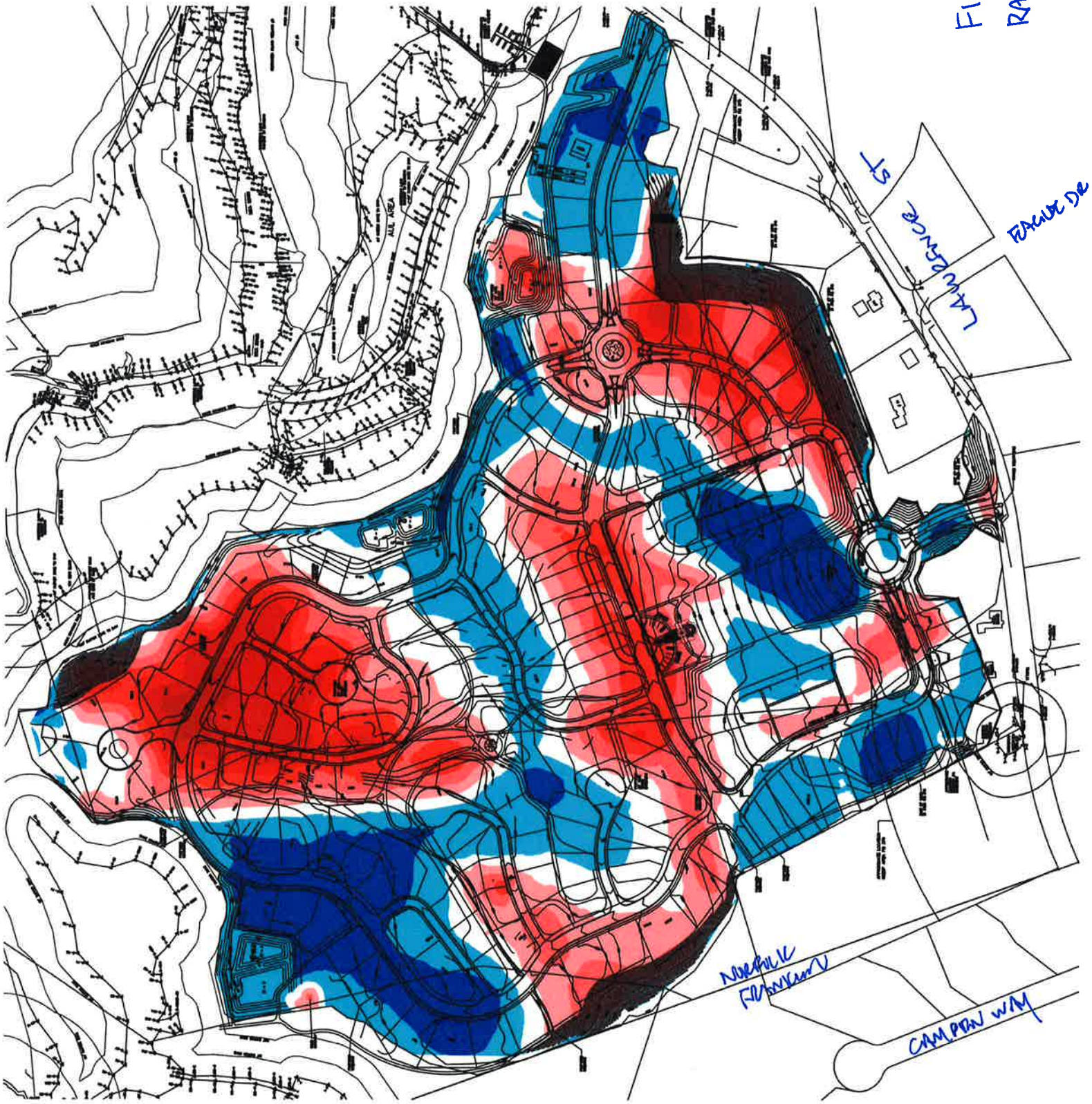


FIG 2
RAISE 5'

FIG 3
RAISE 10'



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Cut/Fill Report

PROPOSED PLAN

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Drawing: P:\125280\143-125280-18001\CAD\ModelFiles\P:\125280\143-125280-18001\CAD\ModelFiles\Proposed.dwg

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
cut fill	full	1.000	1.000	2757666.46	1611011.15	129247.41	1481763.74<Cut>

Totals

	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	2757666.46	1611011.15	129247.41	1481763.74<Cut>

* Value adjusted by cut or fill factor other than 1.0

Cut/Fill Report RAISE 5'

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By user: nick.korzec

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Volume Summary							
Name	**Type**	**Cut Factor**	**Fill Factor**	**2d Area** (Sq. Ft.)	**Cut** (Cu. Yd.)	**Fill** (Cu. Yd.)	**Net** (Cu. Yd.)
cut fill	full	1.000	1.000	2762301.13	1262820.67	276899.39	985921.28<Cut>

Totals				
	2d Area (Sq. Ft.)	**Cut** (Cu. Yd.)	**Fill** (Cu. Yd.)	**Net** (Cu. Yd.)
Total	2762301.13	1262820.67	276899.39	985921.28<Cut>

* Value adjusted by cut or fill factor other than 1.0

Cut/Fill Report

RAISE 10'

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By user: nick.korzec

Drawing: P:\125280\143-125280-18001\CAD\ModelFiles\P:\125280\143-125280-18001\CAD\ModelFiles\Proposed (raised10).dwg

Volume Summary

Name	Type	Cut Factor	Fill Factor	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
cut fill	full	1.000	1.000	2762301.13	970851.64	496467.60	474384.04<Cut>

Totals

	2d Area (Sq. Ft.)	Cut (Cu. Yd.)	Fill (Cu. Yd.)	Net (Cu. Yd.)
Total	2762301.13	970851.64	496467.60	474384.04<Cut>

* Value adjusted by cut or fill factor other than 1.0