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April 20, 2015

Mr. Chandler Van Schaack  
City of Boulder - Engineering Development Review  
1739 Broadway  
Boulder, CO 80306

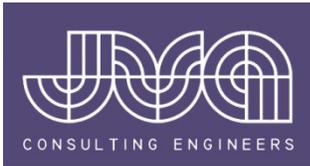
Reference: The Armory Community  
4750 Broadway, Boulder CO  
The Armory Community Variance Requests  
JVA, Inc. Job #1587.1c

Dear Chandler:

The purpose of this letter is to request three variances from the City of Boulder Design and Construction Standards (DCS). The first variance is a variance from DCS Section 2.07.E.3 – Design Control for Vertical Curves. The project is requesting that design control for vertical curves be based on the book “A Policy on Geometric Design of Highways and Streets,” prepared by the American Association of State Highway and Transportation Officials (AASHTO) in place of DCS Section 2.07.E.3. The second variance is a variance on Table 2-9: Maximum Street Grades located within Section 2.07.E.2-Maximum Street Grade. The project is requesting that the City allow for a shorter minimum distance for a maximum grade approaching an intersection for the Zamia Avenue/ 14<sup>th</sup> Street intersection. The third variance is to DCS Section 4.04.A.5 – Utilities Easements. The project is requesting that the City waive the requirement for providing ten feet of separation between trees and storm sewer pipe and allow for trees to be located within five feet of the site’s storm sewer system. JVA, Inc. has examined the design and construction feasibility issues related to the vertical alignments for the proposed roadways and feel that these variances are warranted. This letter serves as an official variance request to the standard vertical curve design, minimum distance for a maximum grade approaching an intersection, and horizontal separation for tree and storm sewers requirement as outlined in the City of Boulder DCS.

### EXISTING CONDITIONS

Armory Land Investors, LLC is proposing a development at 4750 Broadway Street in Boulder, Colorado. The subject property is approximately 8.55-acres of developed land located on a tract of land in the Northwest Quarter of the Southwest Quarter of the Southwest Quarter of Section 7, Township 1 North, Range 70 West of the 6th Principal Meridian in the City and County of Boulder, State of Colorado. More specifically, the site is bound by Broadway Street to the west, Lee Hill Drive to the north, 14<sup>th</sup> Street to the east and an existing residential development to the south. The site currently has access from Broadway and Lee Hill Road. The Silver Lake



Irrigation Ditch passes through the property from the southwest toward the northeast via a shallow swale and several culverts.

## PROPOSED PROJECT

Please review the attached “Sheet C4.0 & C4.1 – Preliminary Street Profile” dated April 17, 2015. The proposed development will divide the property into four blocks separated by two public streets. Blocks 1 and 2, located on the western half of the site will be comprised of mixed use buildings, an art pavilion, underground parking, access drives, and landscaping. Blocks 3 and 4, located on the eastern half of the site will contain residential townhomes, access drives, and landscaping. A new detention and water quality basin will be constructed Block 4 of the proposed development. The proposed streets, Zamia Avenue and 13<sup>th</sup> Street, will provide access to each block. Zamia Avenue will direct traffic east-west and will intersect with Broadway and 14<sup>th</sup> Street, while 13<sup>th</sup> Street will direct traffic in the north-south direction and will intersect with Lee Hill Road and connect to the of 13<sup>th</sup> street terminus to the south of the property. The irrigation ditch travelling through the site is anticipated to be fully encased with a large elliptical pipe.

## VARIANCE REQUESTS

**City of Boulder Code:** DCS Section 2.07.E.3 – Design Control for Vertical Curves

**Variance:** Design control for vertical curves shall be based on American Association of State Highway and Transportation Officials (AASHTO) design standards rather than City of Boulder standards.

The design controls for the sag and crest curves described City of Boulder DCS are based on a design speed of 30 mph. However, at this time it is anticipated that design speeds for the site will be 25 miles per hour. This design speed takes into consideration the narrow lane widths and site restrictions which call for slower speeds. JVA proposes to use design control in accordance with “A Policy on Geometric Design of Highways and Streets,” prepared by AASHTO in order to account for the lower design speeds. Please see AASHTO Exhibit 3-72, *Design Controls for Stopping Sight Distance and for Crest Vertical Curves*, and AASHTO Exhibit 3-75, *Design Controls Sag Vertical Curves*.

**City of Boulder Code:** DCS Table 2-9: Maximum Street Grades located within Section 2.07.E.2- Maximum Street Grade

**Variance:** Shorter minimum distance for a maximum grade approaching an intersection for the Zamia Avenue/14<sup>th</sup> Street intersection. At the intersection of Zamia and 14<sup>th</sup> Street the slope of the road will be 4% for the first 20-feet and then increase to 4.95% for the remaining 30-feet (not including the sag curve).

The Silver Lake ditch runs from southwest to northeast at the approximate center of the property. Irrigation water enters the site through an existing 30” CMP pipe under Broadway and exits the site through an existing 30” CMP pipe under Lee Hill Drive. In the developed condition it is



proposed that the Silver Lake ditch be piped through the site in a large, elliptical irrigation pipe. However, the existing irrigation ditch is very flat and only has 0.15 feet of fall in it through the entire site. This constraint leaves very little flexibility in the vertical position of the irrigation ditch.

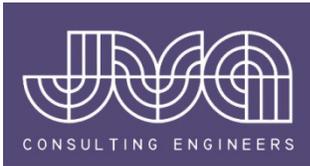
In order to get from the southwest corner of the site to the northwest corner the proposed irrigation pipe will need to pass under the proposed street in two locations. The first location is at the intersection of Zamia and North Broadway. The second crossing location is directly to the north of the intersection of 13<sup>th</sup> Street and the eastern section of Zamia. Due to the limited fall within the irrigation pipe the only way to provide a minimum 18-inches cover over the proposed irrigation pipe at the 13<sup>th</sup> Street/Zamia Street crossings was to elevate the intersection. Because the elevation of the 13<sup>th</sup> Street/Zamia Street intersection was raised the slope of the eastern section of Zamia also needed to increase. If the proposed development were to meet the maximum street grade requirements at the Zamia/14<sup>th</sup> Street intersection as outlined in Table 2-9 the resulting slope of the eastern section of Zamia Avenue would be greater than 5.0% which would present ADA compliance issues within the sidewalks. In order to ensure ADA compliant sidewalks on this section of the site the slope of the street was decreased to 4.94%. This slope still allows for a 4.00% slope at the Zamia/14<sup>th</sup> Street intersection. However, the development will only be able to achieve 20-feet of 4.00%, instead of the 50-feet, before the vertical curve on Zamia begins. This design variance is not expected to create hazardous conditions with only a minor change in grade marginally above the limit at the intersection.

Without significant public improvements beyond the scope of work of this development or substantial site redesign, the existing roadways, narrow right-of-way, and irrigation utility requirements limit the alignment of the proposed roadways in a way that cannot meet the two above City DCS. The proposed alignment is preferred to alternatives since it best meets City DCS while managing site specific restrictions without creating hazards or overburdening the developer and the City.

***City of Boulder Code:*** DCS 4.04.A.5 – Utilities Easements

***Variance:*** Reduce required horizontal separation between trees and underground storm sewer from ten feet to five feet.

The narrow street sections are proposed in order to reduce the urban impact of the site and reduce vehicular speeds. However, this narrow road section has reduced the horizontal area over which to run utilities. In order to meet the City's utility separation requirements the project will require a variance on the required horizontal separation between trees and utilities. In the current site plan ten feet of separation has been provided between the outside of pipe/outside of pipe between the sanitary and water mains and five feet of separation has been provided between the outside of pipe/outside of pipe between the water and storm sewer mains. With the narrow road sections and this utility layout the storm sewer system ends up being located five feet from the center of the landscape buffers adjacent to the streets.



In general, the storm sewer system will be located closer than ten feet to the street trees will have a depth of 6.8 feet to 10.0 feet below the landscape buffers. It was necessary to design the storm line deeper than necessary in order to pass underneath the irrigation pipe traveling across 13<sup>th</sup> Street on the northern end of the site. However, this deeper condition should help avoid conflicts with the trees root system.

There is no way to avoid this condition without significantly altering the current street configuration or to limit the trees planted within the landscape buffer and both of these options have a significant, negative effect on the overall intent of the design.

### CRITERIA FOR MODIFICATION OF CITY STANDARDS

Per Section 1.05(B) of the City of Boulder Design & Construction Standards dated November 16, 2000, certain criteria must be met to obtain an alteration, modification, or waiver of the City standards. The following is a list of the City criteria and the applicable responses:

- (1) The strict application of the provisions of these Standards would deprive an individual of the reasonable use of land or structure, and*

Response: The strict application of these provisions would have a negative impact on the general intent of the design. Strict application of the standards would be detrimental to the Owner. Other alignments will likely require public improvements.

- (2) Special circumstances peculiar to such land or development justify the requested alteration, modification, or waiver, and*

Response: Several special circumstances that justify the three variances.

- (3) Any alteration, modification, or waiver would result in a solution consistent with the goals of the underlying zoning district, a Boulder Valley Comprehensive Plan goal, a specific neighborhood plan, or an adopted design guideline, and*

Response: Approval of the three variances would result in a solution consistent with the goals of the zoning district, Boulder Valley Comprehensive Plan goals, and the City of Boulder without creating hazardous conditions.

- (4) Any alteration, modification, or waiver represents the minimum variance from these Standards that will accomplish the intended purpose, and*

Response: The vertical alignment of the road was designed as close as possible to the City Standards and would still meet accepted practices based on the AASHTO manual. The grade approaching intersection is acceptable by City standards but requires a shortened minimum



distance to manage site limitations. The reduced required horizontal separation between the trees and storm sewer should result in an improved street section and maintain the overall intent of the design.

*(5) Any alteration or modification will at least equal the suitability, strength, effectiveness, fire resistance, durability, safety, and sanitation performance requirements prescribed in these Standards, and*

Response: Acceptance of the proposed project's requested variances should not impact these criteria.

*(6) Any alteration, modification, or waiver will not harm the adjacent land owners, the neighborhood, or the welfare of the public at large, and*

Response: The proposed project's requested variances will not harm the adjacent land owners, the neighborhood, or the welfare of the public at large.

*(7) Any alteration, modification, or waiver will not create an additional maintenance or financial burden for the affected property owners or the City.*

Response: The acceptance of this variance should not create an additional maintenance or financial burden for the adjacent property owners or the City.

This letter was prepared based on recent comment review meetings.

Please contact JVA, Inc. if additional information is needed. If all is in order, please notify the applicant of approval of this variance request.

JVA, INCORPORATED

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Kenneth J. Clifford, P.E.  
Project Manager

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Charles R. Hager, IV, P.E. #37146  
Vice President/Senior Project Manager

Enclosures:

Sheet C4.0 – Preliminary Street Profile  
Sheet C4.1 – Preliminary Street Profile

