A traffic impact study and preliminary engineering report were developed that addresses all the requirements of this section. Please see the traffic impact study included in this section as well as the preliminary engineering report section for required information.

The dead-end streets are necessary due to topographic constraints of the site. The site is bounded by existing development on the west and south. The existing residential development to the west does not provide an opportunity to extend proposed streets to the west to connect to existing road networks. There is a small section of the property that abuts Highway 12 (Euclid Avenue) right-of-way in the northwest corner of the subdivision. In this location there is a very large cut section (approximately 50-ft) down to the roadway from the property. It would not be possible to construct a connection to Highway 12 in this location due to the elevation difference. Overlook Boulevard within Overlook Estates abuts the property on the north side. There is a large cut at this dead-end street (approximately 20-ft) from the existing ground on the property. It would not be possible to construct a street that meets the grade requirements for the City of Helena to connect to existing Overlook Boulevard. Finally, there are two drainages that cross through the subject property. The site has some steep existing grades. Due to topography of the site, to meet street grade requirements of the City, and reduce cuts and fills for proposed roads to limit construction disturbance several dead-end streets are proposed throughout the subdivision. All dead-ends meet the length requirements of 600-ft. Additional information to justify the proposed dead-end streets is included below.

Based on the City of Helena Subdivision Regulations, there are compelling circumstances that exist for this proposed development for the proposed dead-end streets. City of Helena Code Section 12-4-2-E states,

“Dead-end streets are allowed only when the applicant can demonstrate a dead-end street is necessary due to compelling circumstances such as enhancement of safety, compliance with the complete streets resolution of 19799, topography constraints, mitigating disturbance of existing watercourses, mitigation of access obstructions, or a temporary dead end street intended for the future extension. Dead end streets may not exceed six hundred feet (600’) in total length. Dead end streets longer than one hundred fifty feet (150’) must have an emergency turnaround designed and installed according to the standards and requirements of the city. (Ord. 3167, 9-23-2013)”

We have prepared exhibits and descriptions for each dead-end street proposed for the development to assist with your evaluation.

- Crowley Court – The proposed Crowley Court would provide a direct connection onto Hauser Boulevard. Crowley Court is proposed to be constructed to the west from Hauser Boulevard with a cul-de-sac at the end of the street. The proposed cul-de-sac has a diameter of 97 feet from face of curb to face of curb, meeting the International Fire Code Institute Application Manual (1995 Ed.) and the City of Helena Engineering

Standards. Extending Crowley Court further to the west would impact the existing drainage as a crossing of this drainage would be necessary to connect to Lee Drive. Additionally, the disturbance footprint of the natural topography would be large as the maximum fill height would be approximately 17 feet in the drainage and the maximum excavation height would be approximately 25 feet east of the drainage. See attached Dead-end Exhibit 1 for a plan and profile view of the adverse impacts of the Crowley Court extension.

- Lee Court – The proposed Lee Court would be constructed north of the proposed Livezey Avenue with a cul-de-sac at the end of the street. The proposed cul-de-sac has a diameter of 97 feet from face of curb to face of curb, meeting the International Fire Code Institute Application Manual (1995 Ed.) and the City of Helena Engineering Standards. Extending Lee Court further to the north would provide a connection to Overlook Boulevard. A connection to Overlook Boulevard would create safety concerns due to steep road grades that would also not be compliant with the City of Helena street grades code 12-4-3 along with non-compliant vertical curve k values for sag and crest curves. There is nearly 40 feet of elevation relief from the existing Overlook Boulevard to the proposed Lee Court cul-de-sac over a short distance. Road grades would be over 33%. These topographic constraints support the need for a cul-de-sac at this location. See attached Dead-end Exhibit 2 for a plan and profile view of the adverse impacts of the Lee Court extension.

- Livezey Court – The proposed Livezey Court would be constructed west of the proposed Livezey Avenue with a cul-de-sac at the end of the street. The proposed cul-de-sac has a diameter of 97 feet from face of curb to face of curb, meeting the International Fire Code Institute Application Manual (1995 Ed.) and the City of Helena Engineering Standards. Extending Livezey Court further to the west to connect to the adjacent private property would create safety concerns due to steep road grades that would also not be compliant with the City of Helena street grades code 12-4-3 along with non-compliant vertical curve k values for sag and crest curves. Road grades would be over 24%. There is an existing 24-inch water transmission main that would be impacted by the large excavation required to construct this road extension. Additionally, the connection to the property to the west is a private storage unit development with no public access. All these constraints support the need for a cul-de-sac at this location. See attached Dead-end Exhibit 3 for a plan and profile view of the adverse impacts of the Livezey Court extension.

- Brakeman Court – The proposed Brakeman Court would be constructed north of the proposed Brakeman Avenue with a cul-de-sac at the end of the street. The proposed cul-de-sac has a diameter of 97 feet from face of curb to face of curb, meeting the International Fire Code Institute Application Manual (1995 Ed.) and the City of Helena Engineering Standards. Extending Brakeman Court further to the north to connect to the Livezey Court would create safety concerns due to steep road grades that would also not be compliant with the City of Helena street grades code 12-4-3 along with non-compliant vertical curve k values for sag and crest curves. Road grades would be over 15%. These topographic constraints support the need for a cul-de-sac at this location.

See attached Dead-end Exhibit 4 for a plan and profile view of the adverse impacts of the Brakeman Court extension.

- Flowerree Court – The proposed Flowerree Court would provide a direct connection to Park Drive. Flowerree Court is proposed to be constructed to the west from Park Drive with a cul-de-sac at the end of the street. The proposed cul-de-sac has a diameter of 97 feet from face of curb to face of curb, meeting the International Fire Code Institute Application Manual (1995 Ed.) and the City of Helena Engineering Standards. Extending Flowerree Court to Brakeman Avenue would create safety concerns due to steep road grades that would also not be compliant with the City of Helena street grades code 12-4-3 along with non-compliant vertical curve k values for sag and crest curves. Road grades would be over 29%. These topographic constraints support the need for a cul-de-sac at this location. See attached Dead-end Exhibits 5 and 6 for a plan and profile view of the adverse impacts of the Flowerree Court extension.

Connectivity of internal roads within the development was utilized as much as possible but due to the extreme topographic hardships experienced as this location dead-end streets to provide safe access to residents and to meet the City of Helena Engineering Standards and fire codes was necessary. A quick examination of mountainous areas along the City of Helena's southern border shows that there are numerous dead-end streets consisting of culd-de-sacs and hammerheads that have been constructed as similar topographic hardships were likely exhibited. The above explanations and attached exhibits support the use of dead-end streets for this development is adequate.

Several blocks exceed the 600-ft block length requirement. The block lengths are necessary due to topographic constraints of the site. The subdivision regulations allow for longer block lengths when a longer length is needed to meet grade limitations, the existing built environment, water bodies or railroad crossings, or industrial uses. There are three blocks that exceed the 600-ft block length requirement, Livezey Avenue from Hauser to Lee Drive (689.99-ft), Lee Drive from Livezey Avenue to Brakeman Court (636.61-ft), and Brakemen Avenue from Park Drive to Lee Drive (971.05-ft). The exception applies to these proposed roads due to topographic constraints to meet grade limitations on the proposed roads. The subdivision regulations require a maximum road grade of 10% and 4% at intersections. Due to the existing topography the addition of additional intersection and connector streets would not allow us to meet the maximum grade requirements of the subdivision regulations. Further, there is an existing drainage on the east side of the development that divides the subdivision. To provide additional access to the project Livezey Avenue crosses this drainage and the best location to connect to Lee Drive is on the ridge. This is the only place that allows Lee Drive to meet required grade requirements. Due to the drainage, it would be difficult to connect Crowley Court over Brakeman Avenue and meet road grade requirements. Therefore, due to topographic constraints of the site we are requesting the exception, allowed within the subdivision regulations, to the block length requirements for these three blocks within the development.

All other aspects of the proposed roads will meet the requirements of the subdivision regulations and engineering standards.