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CONSTRUCTION MANAGERS & SITE PLANNERS * * * PROJECT MANAGERS * * * CIVIL & CONSULTING ENGINEERS

T.E.D.S. Exception for Pinnacle Ridge

Date: January 9, 2007

Prepared by: Robert W. Jones II, P.E.
Vortex Engineering, Inc.
255 Vista Valley Drive
Fruita, CO 81521
970-245-9051
VEI # F04-006

Type of Design: Residential

Owner: Two R & D, LLC

Property Address: Mariposa Drive
Grand Junction, CO

Introduction

Two R & D, LLC is proposing to develop a residential subdivision with approximately 73 homes near the Pinnacle Ridge area of Grand Junction. The property is approximately 47 acres in size, and is located in the City of Grand Junction, Colorado. The site is currently vacant and has areas of steep terrain. The property is presently zoned RSF-2 and is zoned in alignment with the current Master Plan for this area.

Site Plan

The Site Plan for the Pinnacle Ridge development includes approximately 73 homes to be constructed in three phases; one (1) upper lot phase and two (2) lower lot phases. Phase 1 of this development includes 16 lower lots directly north of Mariposa Drive. Phase two (2) and three (3) of this development include 57 lots of which ___ are upper lots. Due to the steep terrain, and the site constraints associated with the third phase of this development, a cul-de-sac length greater than the 750' maximum has been proposed. The cul-de-sac length proposed for Phase 3 of the development is 1800± linear feet. This distance measures from the intersection of Pinnacle Hollow Court with the Pinnacle Heights Drive to the end of the cul-de-sac.

Additionally, the steep terrain presents a design difficulty in maintaining a maximum intersection grade of 4% and a maximum grade for a residential street of 12%. The intersection grade proposed east to west is approximately 4%. The intersection grade proposed north to south is the same grade as Pinnacle Heights Drive which is approximately 13%. Pursuant to these development issues, is the need of a T.E.D.S. exception.

Exception #1-Maximum Block Lengths

The Site Plan submitted to Community Development does not meet the maximum block lengths requirement per the TEDS manual for block one (1). The main street, Pinnacle Heights Drive, contains a block length of 1552 feet. The Maximum Block length between intersections requirement is per Section 5.1.1, which states, "Blocks shall not exceed 1,200 feet in length between intersections (streets providing multiple access, not cul-de-sacs) except where topography, traffic, or other conditions require longer blocks." This requirement is very difficult to meet in light of the existing terrain; in order to satisfy the access requirements recommended by City Staff and reduce surface disturbance there are minimal cross streets or cul-de-sacs along the length of the main street, Pinnacle Heights Drive.

Exception Considerations

1. Will the exception compromise safety?
 - The applicant considered and sketched other Conceptual layouts for this development. In order to access from Mariposa Drive, the proposed alignment required that the Maximum Block length be increased. The road has been designed in accordance with the TEDS standard in this section except for the block length. The exception will not compromise safety.
2. Have other alternatives been considered that will meet the standard?
 - The applicant did consider and design other available options. However given the topography of this site, a ring-road around the bottom of the steeper sections of the Pinnacle Ridge Subdivision is the only logical design. In order to minimize cuts and fills along this road, connecting roads to the east and west were minimized.
3. Has the proposed design been used in other areas?

- The proposed design has been used in many other areas.

4. Will the exception require CDOT or FHWA coordination?

- No.

5. Is this a one-time exception or a manual revision?

- The block length exception would be a one-time exemption.

Exception #2-Maximum Cul-de-Sac Length

The Site Plan submitted to Community Development does not meet the maximum 750' cul-de-sac length requirement per the TEDS manual. The cul-de-sac length requirement is per Section 5.1.3, which, states "No cul-de-sac shall be more than 750 feet long, measured from the center of the intersection to the center of the cul-de-sac." The Cul-de-sac proposed at this end of Pinnacle Heights Drive is approximately 1785 feet. This requirement is very difficult to meet in light of the existing terrain and the distance to the intersection of Pinnacle Hollow Court. In order to accommodate the maximum 12% slope requirement in the TEDS manual, the road alignment must follow the existing terrain as much as possible to minimize surface disturbance. In addition, the only way to eliminate the cul-de-sac length is to create a second access from the top. This is certainly not preferred and would significantly increase surface disturbance. Please reference the Site Plan attached with this application for a further depiction of the proposed cul-de-sac.

Exception Considerations

1. Will the exception compromise safety?

- The current road sections are designed to TEDS Manual requirements in all other aspects besides those listed.
- Adequate area has been provided at the end of the cul-de-sac for emergency and the general public's vehicles to turn around, should the situation arise.

2. Have other alternatives been considered that would meet the standard?

The applicant considered and designed the only other option available in this circumstance. A direct access to Bella Pago Drive was designed and reviewed by the City of Grand Junction and Mesa County staff. While Mesa County staff approved this design and signed the construction documents, the City of Grand Junction's staff was vehemently against it. In fact, the City of Grand Junction staff recommended that the applicant propose access off of Mariposa Drive, which the applicant is now requesting. Additionally, the applicant designed an alternative road section up Pinnacle Heights Drive from the west. This alternative section had steep grades and 90 degree turns on tremendous cut and fills. This alternate design eliminates those 90 degree turns on cuts and fills.

Has the proposed design been used in other areas?

- Cul-de-sac lengths in excess of the maximum 750 foot length have been approved and constructed for various subdivisions throughout the Grand Valley. Specifically, the Saddle Rock subdivision,

located at 13 Road, has a cul-de-sac length of approximately 2,640 feet. No known safety problems or complaints are known at the time of this application.

4. Will the exception require CDOT or FHWA coordination?

➤ No.

5. Is this a one-time exception or a manual revision?

➤ The cul-de-sac length exception would be a one-time exception.

Exception #3-Maximum Grades For a Local Residential Street

The Site Plan submitted to Community Development does not meet the maximum 12 % grade allowable per the TEDS manual for Pinnacle Heights Drive. The Maximum Grades of streets requirement is per Section 5.1.5.1 which, states, "...Grades of streets shall not be less than 0.5%, nor more than 8%. In hilly terrain (defined as having grades of 10% or greater, as defined in section 7.2 of the City Zoning and Development code), the maximum grade for local residential streets is 12% for a maximum distance of 500 feet." The Pinnacle Heights Drive is 13% grade for a distance of 599.79'. Additionally, the Pinnacle Heights Street is greater than 8% grade for a distance of 298.21'. The TEDS requirement is very difficult to meet in light of the existing terrain and the distance to Pinnacle Hollow Court.

The only way to eliminate the steeper grades is to create an access from the top and connect to Bella Pago Drive, this alternative was vehemently opposed by City Staff. Please refer to the Site Plan attached with this application for a further depiction of the proposed road alignment.

Exception Considerations

1. Will the exemption compromise safety?

- The applicant considered and sketched other Conceptual layouts for this development. In order to access from Mariposa Drive, the proposed alignment and thus grades were required. The grade difference will probably be perceived by only a few drivers and given the slope exposure to the sun, there should be no real appreciable amount of icing.
- The current road sections are designed to T.E.D.S. Manual requirements in all other aspects besides those listed.

2. Have other alternatives been considered that would meet the standard?

- The applicant considered and designed the only other option available in this circumstance. A direct access to Bella Pago Drive was designed and reviewed by the City of Grand Junction and Mesa County staff. While Mesa County staff approved this design and signed the construction documents, the City of Grand Junction's staff was vehemently against it. In fact, the City of Grand Junction staff recommended that the applicant propose access off of Mariposa Drive, which the applicant is now requesting.

The increase in the slope of Pinnacle Heights Drive was necessary in order to eliminate the number of cuts proposed. By increasing the slope of Pinnacle Heights Drive from 12% to 13%, and exceeding the 8% grade drive for a distance of approximately 300 feet, approximately 14,935 cubic yards of cut was eliminated. Additionally, an increase in the slope from 12% to 13% resulted in a significant reduction in the height of the retaining walls required.

This alternate design is the culmination of years of planning and design on this project. The alternate design proposed also eliminates the need for 90 degree turns on tremendous cut and fills as the western access originally proposed. Additionally, the alternate design minimizes the crossing of slopes greater than 30%.

3. Has the proposed design been used in other areas?

- There are other areas of the City, particularly in the Redlands and around 28 1/4 Road that have steeper slopes through local intersections. The Spyglass Ridge development also has slopes of 12% that access the upper lots of the development.

4. Will the exception require CDOT or FHWA coordination?

- No.

5. Is this a one-time exception or a manual revision?

- The grade exception would be a one-time exception.

Exception #4-Maximum Grades Through Local Street Intersections

The Site Plan submitted to Community Development does not meet the maximum 4% grade through a local street intersection requirement per the TEDS manual for the intersection of Pinnacle Heights Drive and the stub street to the east which connects the Pinnacle Ridge Development to the Ridges Mesa Subdivision. The Maximum Grades through Local Street Intersections requirement is per Section 5.2.4, which states, "...the maximum allowable grade in the intersection is 4% and extends a minimum of 50 feet in each direction from the outside edge of the traveled way of the intersecting street." This requirement is very difficult to meet in light of the existing terrain. It also states, "Grades above 4% will only be allowed on local and collector streets in areas with steep topography or other unusual circumstances that prevent a flatter grade, and must be documented as a design exception." which the current site design certainly meets.

In order to try and accommodate the maximum 12% slope requirement in the TEDS manual, the road alignment must follow the existing terrain as much as possible to minimize surface disturbance. In addition the only way to provide a connecting access street to promote the interconnectivity of neighborhoods, is to provide a stub street on Pinnacle Heights Drive. While the 4% intersecting grade going east-west can be accommodated, this connecting stub street is on a section of Pinnacle Heights Drive which is 13%; thus the requested TEDS exception. The intersecting street is at a right angle to the Pinnacle Heights Drive, and it is believed that this intersection will not compromise safety. Please reference the Site Plan attached with this application for a further depiction of the proposed road alignment.

Exception Considerations

1. Will the exception compromise safety?

- The applicant considered and sketched other Conceptual layouts for this development. In order to access from to the adjacent development, the proposed alignment and thus grades were required.
- The current road sections are designed to TEDS Manual requirements in all other aspects besides those listed.

2. Have other alternatives been considered that would meet the standard?

- A connecting to the eastern property from the northeast corner of the Pinnacle Ridge Subdivision was designed. This alternate design resulted in a significant cut and fill with retaining walls proposed and was not recommended by City Staff. The applicant considered and designed the only other option available in this circumstance.

3. Has the proposed design been used in other areas?

- There are other areas of the City, particularly in the Redlands and around 28 ¼ Road that have steeper slopes through local intersections.

4. Will the exception require CDOT or FHWA coordination?

- No.

5. Is this a one-time exception or a manual revision?

- The intersection grade exception would be a one-time exception.

Additional Considerations

The Grand Junction Fire Department has provided a preliminary review of the Pinnacle Heights Drive design and has committed to granting preliminary approval for this proposal subject to a review of final engineering drawings if the following requirements are provided:

1. All lots accessed from Pinnacle Heights Drive, from where it is narrower than 28' must have approved fire sprinkler systems installed in the homes.
2. "No Parking" signs must be posted along both sides of the street where the street is less than 22' wide.
3. Turnout areas must be provided for any hydrants proposed along the narrow street.

Conclusion

The streets in this development have been designed to accommodate and abide by all other design requirements in the T.E.D.S. manual. Furthermore, given the alternative of accessing the top of this development from the west, the above exceptions are necessary. City staff has already determined the alternative of accessing the top from the west to be unfavorable and opposable. Two R&D, LLC agrees with staff, that the most sensible access to this subdivision is as it has been proposed. No known public safety elements have been compromised with this design. This development appears to be an excellent opportunity and should serve an important community service in this area.

ould you have any questions or require additional information, please do not hesitate to contact me at 970-245-9051. Thank you.

Sincerely,

Vortex Engineering, Inc.
Robert W. Jones II, P.E.

Cc: File

February 23, 2007

Robert W. Jones II, P.E.
Vortex Engineering, Inc.
255 Vista Valley Drive
Fruita, CO 81521

RE: *Design Exception #05-07, Pinnacle Ridge Subdivision
TEDS Exceptions for Cul de Sac Length, Block Length, Street Grade and
Intersection Grade*

Dear Robert,

Please find attached the committee's decision for the above referenced request. This design exception was approved as modified and with further information required.

If you have any questions concerning the modifications or the requested information, please feel free to contact the Development Engineer in charge of your project or Tim Moore, Public Works and Planning Director at 970.244.1557.

Sincerely,



Sue Mueller
Sr. Administrative Assistant

cc: Rick Dorris, Development Engineer
File

DESIGN EXCEPTION #05-07

To: Tim Moore, Public Works and Planning Director
Lisa Cox, Planning Manager
Jim Bright, Acting Fire Chief

From: Tim Moore, Public Works and Planning Director

Copy to: Rick Dorris

Date: January 22, 2007

RE: Pinnacle Ridge Subdivision
TEDS Exceptions for Cul de Sac Length, Block Length, Street Grade, and Intersection Grade.

DESCRIPTION OF THE SITUATION

The applicant desires to develop the old Energy Center subdivision. The Energy Center Subdivision was platted in the 1950's and never constructed. It didn't have public access and was land locked. The City does not recognize the Energy Center plat. The applicant has purchased the entire Energy Center property with the exception of an enclaved parcel owned by the Foster family (which isn't participating with the new subdivision) and one other parcel (single lot) whose owner is participating with the new subdivision.

The Pinnacle Ridge plan was not supported by staff and was denied by the Planning Commission. The decision was appealed to City Council but the appeal is on hold while the applicant revises the plan hoping to gain staff support. If staff support is gained, the project will be taken back to Planning Commission. The applicant has implemented several staff suggestions to try to achieve this goal. The main suggestions are to delete lots in a steep slope area on the west side of the subdivision and to access the "high ground" lots by constructing a north-south street on the east side of the parcel. The original plan created access to the "high ground" lots using a curvy street with deep cuts and fills across expansive soils. Although staff suggested the north-south street on the east property line the applicant was advised that several TEDS exceptions are required.

Site Description:

The plan is to create approximately 73 lots on approximately 47 acres. The parcel is bounded by the Ridges Subdivision on the north and west sides, by Mariposa and City

Property on the south, and by both developed and undeveloped private property on the east. Ted Munkres' Ridge Heights development, which is beginning to come alive, borders the parcel for about 600' on the east.

The topography on the site is steep with over 160' of relief.

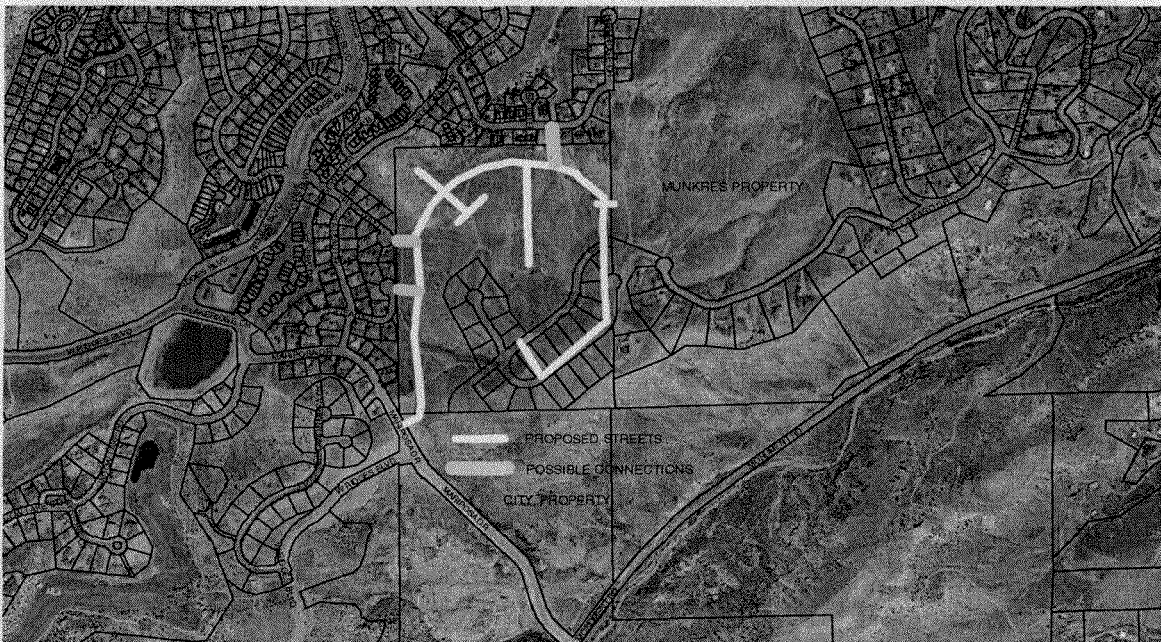
See the attached "new" and "old" plans.

Requested Exceptions:

#1 Maximum Block Length: The proposed Pinnacle Heights Drive exceeds the maximum allowable block length of 1200' in section 5.1.1 of TEDS. The goal of this requirement is to provide interconnectivity between neighborhoods and greater circulation for service vehicles, emergency vehicles, and residents. The block length of Pinnacle Heights Drive is approximately 2800' from its connection with Mariposa to the stub street to the Munkres parcel. The analysis in the applicant's request states a block length of 1500'; this is incorrect.

Staff had not commented on excessive block length before this latest revision. Their original design had a block length of around 2500' but we neglected to comment on it when taking it to Planning Commission.

They did not present any options to their design because they don't control the land that would provide options. The picture below shows how three connections could be made to shorten the block length. All three would require purchasing additional property (two would be City/Ridges property). Likely, all three would upset the neighbors.



MAP NOTE: The parcel lines are from the Energy Center Plat which is not recognized.

EXCEPTION CONSIDERATIONS

1. Will the exception compromise safety?

Staff does not believe the exception will compromise safety.

2. Have other alternatives been considered that would meet the standard?

Yes, the alternative above has been considered by staff but not by the applicant. The applicant considered an alternative connecting to Bella Pago but this was fraught with problems due to property ownership, grades, and awkward geometry.

3. Has the proposed design been used in other areas?

The Redlands has several long cul de sacs with no cross connection and long block lengths before cross connecting.

4. Will the exception require CDOT or FHWA coordination?

No.

5. Is this a one-time exception or a manual revision?

This is a one time exception.

#2 Maximum Cul de Sac Length: The proposed cul de sac length is 1450' where the TEDS maximum is 750'. A TEDS exception for a cul de sac of approximately 1500' was previously granted for this project with the old street configuration.

EXCEPTION CONSIDERATIONS

1. Will the exception compromise safety?

Staff does not believe the exception will compromise safety.

2. Have other alternatives been considered that would meet the standard?

Yes, the alternative would be to continue the street back down to Pinnacle Heights Drive but this creates a curvy road with deep cuts and fills across expansive soils.

3. Has the proposed design been used in other areas?

The Redlands has several long cul de sacs.

4. Will the exception require CDOT or FHWA coordination?

No.

5. Is this a one-time exception or a manual revision?

This is a one time exception.

#3 Maximum Street Grade: Section 5.1.5.1 of TEDS allows a maximum street grade of 12% for up to 500'. Their proposal is for approximately 13% for approximately 600'.

This is required to access the “high ground” lots from the lower area due to the steep terrain.

EXCEPTION CONSIDERATIONS

1. Will the exception compromise safety?

Steeper grades are somewhat less safe than shallower grades. This grade isn't much steeper or longer than already allowed by TEDS. The question for the committee is will this grade compromise safety too much. Preliminary discussions with the Fire Department indicate they may support this. They have discovered other districts that allow grades this steep.

2. Have other alternatives been considered that would meet the standard?

Yes, their original alternative met the TEDS standard but is considered by staff to be less safe than the current proposal since there was a 90 degree turn in a steep section of the street.

3. Has the proposed design been used in other areas?

“Residential Street Design and Traffic Control” by ITE shows maximum grade criterion up to 15% for local streets. AASHTO’s “Geometric Design of Highways and Streets” says grades should be less than 15%.

4. Will the exception require CDOT or FHWA coordination?

No.

5. Is this a one-time exception or a manual revision?

This is a one time exception.

#4 Maximum Grades Through Intersection: Section 5.2.4 of TEDS requires street grades to be 4% or less approaching intersections. This proposal has a 13% grade on the through street but the side street should be at or below 4%.

EXCEPTION CONSIDERATIONS

1. Will the exception compromise safety?

Again, this is less safe than the TEDS requirements but the side street will be stop controlled and the through street won't. AASHTO references the approach leg being 5% or less and 2% or less when snow may create poor driving conditions but is silent on the through street. The critical situation is where the stop controlled side street is entering at a steep grade.

2. Have other alternatives been considered that would meet the standard?

Their original alternative had a stub street into the Munkres property but it didn't have an intersection so the intersection criteria didn't apply. Their street however was steep and awkward with the terrain.

3. Has the proposed design been used in other areas?

There are several areas in town where the through street has a grade of 5 to 7% at intersections. Staff doesn't know of any that are 13%. Intersections in mountain communities surely deal with this frequently.

4. Will the exception require CDOT or FHWA coordination?

No.

5. Is this a one-time exception or a manual revision?

This is a one time exception.

Staff Recommendation

Staff recommends approval of the exceptions as requested with the following modifications:

#1 MAXIMUM BLOCK LENGTH

- Provide one intermediate connection. It can be one of the cul de sacs on the west side or through the Motz parcel to Hidden Valley.

#2 MAXIMUM CUL DE SAC LENGTH

- Sprinkle all houses past the connection to the Munkres parcel.
- Provide an intermediate turn around near lots 6 or 7.

#3 MAXIMUM STREET GRADE

- The City is uncomfortable with this. Please find examples of 13% grades around the Valley. Notify the City so we can investigate the grade and it's effect on service vehicles, street maintenance issues, and winter time problems. The next course of action will be discussed after the examples are investigated.

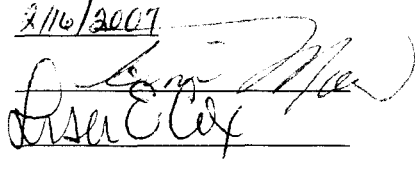
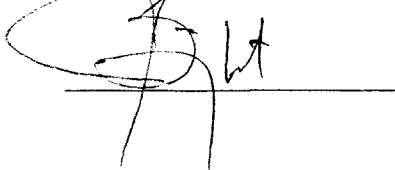
#4 MAXIMUM GRADES THROUGH INTERSECTION

- Same as for #3 above.

Approved as Requested: _____

Approved as Modified and Information Requested: X

Denied: _____

Dated: 2/16/2007



April 20, 2007

Robert W. Jones, II, PE
Vortex Engineering, Inc.
255 Vista Valley Drive
Fruita CO 81521

Re: Design Exception #05-07, Pinnacle Ridge Subdivision

Dear Robert,

On February 23, 2007 we conditionally granted you two exceptions.

Two exception requests were denied; the Maximum Street Grade and the maximum Grades through Intersections. We asked that you find examples of 13% grades around the Valley and notify us so we could investigate the grade and its' effect on service vehicles, street maintenance issues and winter time problems.

You recently supplied plans for the new streets with grades ranging from 10% to 12%. The Development Engineer has visited the area and the 12% grades appear acceptable.

Based on the recent plans you submitted your remaining exceptions will be approved as modified. The modifications required appear on the attached Design Exception Update.

If you have any questions concerning the modifications or the requested information, please feel free to contact the Development Engineer in charge of your project or Tim Moore, Public Works and Planning Director at 970.244.1557.

Sincerely,



Sue Mueller
Sr. Administrative Asst.

Cc: Rick Dorris, Development Engineer


DESIGN EXCEPTION #05-07 UPDATE

To: Tim Moore, Director of Public Works Planning
Lisa Cox, Planning Manager
Jim Bright, Acting Fire Chief

From: Rick Dorris, Development Engineer



Date: March 27, 2007

Date: January 22, 2007

RE: Pinnacle Ridge Subdivision
Update to the TEDS Exceptions for Street Grade, and Intersection Grade.

Back in January we processed a TEDS exception for this development. We conditionally granted two of the exceptions. They also asked for an exception to allow a 13% street grade for about 800' and for a 13% grade through an intersection. We asked them to provide examples of steep grades in the valley so we could determine if they have historically been a problem.

I passed their letter on to Dave Van Wagoner with the street department. As can be seen from their letter, most of the streets are in Redlands Mesa and Spyglass Ridge in areas that aren't well populated yet and they haven't had any issues. Dave said the County sands Country Club Park where it joins 340 and when the snow gets deep they will plow it.

Vortex supplied plans for the new streets. Their grades range from 10% to 12%. They appear to meet TEDS. I visited the Spyglass subdivision and the 12% grades don't seem that steep although this is March and no snow is on the ground.

Staff Recommendation

Staff recommends approval of the exceptions as modified.

- The grade shall not be more than 13% for not longer than 800' from PVI to PVI.
- All lots from the start of the 13% grade and beyond shall have sprinkler systems installed in the houses. A note to this effect (listing the specific lots) shall be placed on the plat and in the CC & R's.
- The sprinkler system shall be an approved fire sprinkler system designed to meet the minimum design standards of NFPA 13D and the International Fire Code, 2006 edition, as amended by the City of Grand Junction. The amendment prohibits the use of separate water supplies (such as tanks and pumps) when the home is served by a public water purveyor.
- Submit a revised 11 X 17 plan showing all the TEDS exceptions modifications required by the City.

Approved as Requested: _____

Approved as Modified and Information Requested: X

Denied: _____

Dated: 4/6/2007

[Signature]
 Municipality
 [Signature]

